Final Design Concept Report

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L, Pima to Gilbert Road)
General Purpose Lanes

ADOT CONTRACT NO. 2005-026
PROJECT NO. 202L MA 009 H8169 01L
FEDERAL ID NO. NH-202-B(BEC)T

Prepared For:

Arizona Department of Transportation

Prepared By:

AECOM

2325 E. Camelback Road, Suite 200
Phoenix, Arizona 85016

OCTOBER 2012

ON THE MOVE
PARTNERS IN PROGRESS

ARIZONA DEPARTMENT OF TRANSPORTATION
OFFICE MEMO
INTERMODAL TRANSPORTATION DIVISION
October 29, 2012

TO: **STEVE BEASLEY, VALLEY PROJECT MANAGEMENT, EM01**
JULIE KLIEWER, PHOENIX CONSTRUCTION DISTRICT, E700
TIM WOLFE, PHOENIX MAINTENANCE DISTRICT, PM04
CHAUN HILL, ASSISTANT STATE ENGINEER, EM01
ANNETTE RILEY, ROADWAY DESIGN SECTION, 605E

FROM: **RON MCCALLY, VALLEY PROJECT MANAGEMENT, EM01**

SUBJECT: **DESIGN MEMORANDUM**
202L MA 009 H8169 01L
RED MOUNTAIN FREEWAY (SR 202L)
SR 101L, PIMA – GILBERT ROAD

This memorandum is prepared pursuant to Section 3.3 of the ADOT Action Plan for Federal-Aid Highway projects. The proposed major design features for this project are described in the attached Final Design Concept Report.

Your concurrence/approval on the proposed major design features is requested.

Stephen Beasley
STEVE BEASLEY, VALLEY PROJECT MANAGEMENT

Concurrence: for Donna L. Wright — 11-19-2012
JULIE KLIEWER, PHOENIX CONSTRUCTION DISTRICT ENGINEER, E700 — **Date**

Concurrence: Tim Wolfe — 11-19-2012
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Concurrence: John P. Chaun Hill — 11/26/12
CHAUN HILL, ASSISTANT STATE ENGINEER
VALLEY PROJECT MANAGEMENT, EM01 — **Date**

Approved: Annette Riley — 12/11/12
ANNETTE RILEY, MANAGER, ROADWAY DESIGN SECTION, 605E — **Date**

CC: Environmental Planning Group, EM02
Roadway Design, 615E

Project ID:

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EXECUTIVE SUMMARY

This Final Design Concept Report (DCR) describes the development, evaluation and recommendation to provide additional general-purpose lanes on the Red Mountain Freeway (SR 202L) from the Pima Freeway (SR 101L) (Milepost 9.80) to Gilbert Road (Milepost 16.90). This project is located in the Arizona Department of Transportation's (ADOT's) Phoenix Construction District within Maricopa County in south-central Arizona.

The Arizona Transportation Board has approved funding in the ADOT Five-Year Transportation Facilities Construction Program (2013-2017) to begin final design and right-of-way acquisition for this project, as follows:

Milepost	Location	Type of Work	Funds Source	Funding Amount ($000)	Fiscal Year
10	SR 101L (Pima) to Gilbert Road	Design GPL	RARF	$4,600	2014
10	SR 101L (Pima) to Gilbert Road	Right-of-Way	RARF	$1,000	2014

The construction project is not currently programmed by ADOT, but is included in the Regional Transportation Plan Freeway Program (RTPFP) in Fiscal Year (FY) 2019.

The Maricopa Association of Governments (MAG), Regional Public Transportation Authority (RPTA) and ADOT have worked together for many years to develop a comprehensive plan for the Regional Freeway System that is included in the Regional Transportation Plan (RTP) that was adopted by the MAG Regional Council in November 2003.

The voters of Maricopa County passed Proposition 400 in November 2004, authorizing the continuation of an existing half-cent sales tax for the next 20 years to be used for implementing the MAG RTP. A portion of the revenues collected from the half-cent sales tax extension will be deposited into the Regional Area Road Fund (RARF) to fund the RTPFP projects. This project is included in the RTPFP Life-Cycle Program that was certified in July 2012.

Traffic demand is causing the SR 202L corridor to become increasingly congested during the morning (westbound direction) and evening (eastbound direction) peak travel periods. Future traffic projections indicate the congestion will increase. Additional general-purpose lanes would increase the freeway capacity and help alleviate increased levels of traffic congestion in the future.

The purpose of this report is to evaluate the safety and operational characteristics of the existing SR 202L freeway, and to evaluate alternatives to provide additional general-purpose lanes as identified in the RTPFP. The alternatives analysis includes the evaluation of the No-Build and Build Alternatives for the additional general-purpose lanes. The Build Alternatives include the following improvements:

- Add one general-purpose lane in the eastbound and westbound directions from the SR101L/SR202L Traffic Interchange (TI) to Gilbert Road
- Add an auxiliary lane in the eastbound direction between the Alma School Road entrance ramp (Ramp D) and the Country Club Drive exit ramp (Ramp B)

The No-Build and two Build Alternatives were evaluated and the Build Alternatives are presented in Appendices D and E.

Alternative 1 would eliminate the need for any design exceptions within the segment of SR 202L between SR 101L and Country Club Drive. A new design exception would be required for a reduced outside shoulder (6' width) for approximately 250', reduced lane widths (11' width) and reduced horizontal stopping sight distance along eastbound SR 202L between Country Club Drive and Center Street. Alternative 2 would also require design exceptions for a reduced median shoulder (4' width) along westbound SR 202L between the SR101L/SR202L TI and Dobson Road and for a reduced median shoulder (4' width) along eastbound SR 202L between Alma School Road and Country Club Drive.

The total estimated cost for Alternative 1 is $74,074,900; and includes $4,640,000 for design, $975,000 for right-of-way, and $68,459,900 for construction. The total estimated cost for Alternative 2 is $64,960,600; and includes $4,123,000 for design, and $60,837,600 for construction. The estimate for Alternative 2 excludes right-of-way acquisition for the Radio Disney property located east of Country Club Drive.

Build Alternative 1 is preferred based on an evaluation of the geometric design criteria, benefits to traffic operations, environmental considerations, right-of-way acquisition requirements, utility impacts, project costs, conformance with adopted regional transportation plans, and public agency input and public participation.

The acquisition of new right-of-way is anticipated for the Preferred Alternative. Temporary Construction Easements (TCE's) will be required and the locations and limits will be identified during final design.

Coordination for this project has been conducted and will continue to be required with the following public agencies: ADOT, MAG, Salt River Pima-Maricopa Indian Community (SRPMIC), Federal Highway Administration (FHWA), Maricopa County Department of Transportation (MCDOT), Flood Control District of Maricopa County (FCDMC), and the cities of Mesa, Phoenix, Tempe, and Chandler.

Coordination with concurrent construction projects may be required for this project. Coordination will also be required with several utility companies, the Salt River Project (SRP) and the Central Arizona Project (CAP).

Mitigation measures for this project are identified in Section 7.2. The Environmental Document will include all final mitigation and coordination requirements.

Additional reports prepared as part of the study include an American Association of State Highway and Transportation Officials (AASHTO) Controlling Design Criteria Report, a Final Traffic Report, a Final Onsite Drainage Concept Report, an Air Quality Analysis Technical Report, a Mobile Source Air Toxics (MSAT) Report, a Noise Analysis Technical Report, Hazardous Materials Inventory, Biology Evaluation and Categorical Exclusion.

1.0 INTRODUCTION

1.1 FOREWORD

This Final Design Concept Report (DCR) describes the development, evaluation and recommendation to provide additional general-purpose lanes on the Red Mountain Freeway (SR 202L) from the Pima Freeway (SR 101L) (Milepost 9.80) to Gilbert Road (Milepost 16.90). This project is located in the Arizona Department of Transportation's (ADOT's) Phoenix Construction District within Maricopa County in south-central Arizona. The approximate 7.1-mile project corridor traverses developed areas of the City of Mesa and areas adjacent to the Salt River Pima-Maricopa Indian Community (SRPMIC). Project location and vicinity maps are provided with Figures 1 and 2.

The purpose of this report is to evaluate the safety and operational characteristics of the existing SR 202L between SR 101L and Gilbert Road, and to evaluate alternatives to provide additional general-purpose lanes as identified in the Regional Transportation Plan Freeway Program (RTPFP). The alternatives analysis includes the evaluation of the No-Build and two Build Alternatives. The Build Alternatives include the following improvements:

- Add one general-purpose lane in the eastbound and westbound directions from the SR101L/SR 202L Traffic Interchange (TI) to Gilbert Road
- Add an auxiliary lane in the eastbound direction between the Alma School Road entrance ramp (Ramp D) and the Country Club Drive exit ramp (Ramp B)

A Categorical Exclusion document and related technical reports have been developed in concert with this design concept report.

1.2 NEED FOR THE PROJECT

The Red Mountain Freeway (SR 202L) is a major element of the Maricopa Association of Governments (MAG) adopted RTPFP. This segment of SR 202L accommodates traffic from the Pima Freeway (SR 101L), the Price Freeway (SR 101L), the Santan Freeway (SR 202L), and Interstate 10 (I-10). The project is located within the City of Mesa and portions of unincorporated Maricopa County, and is adjacent to the SRPMIC and the City of Tempe.

In recent years, Maricopa County has been one of the fastest growing regions in the United States. Population projections indicate that the population of Maricopa County will double between 2000 to 2030. Growing traffic demand has caused the SR 202L corridor to become increasingly congested during the morning and evening peak travel periods, and traffic volume projections indicate the congestion will increase in the future. Additional general-purpose lanes would increase the freeway capacity and help alleviate the increased traffic congestion.

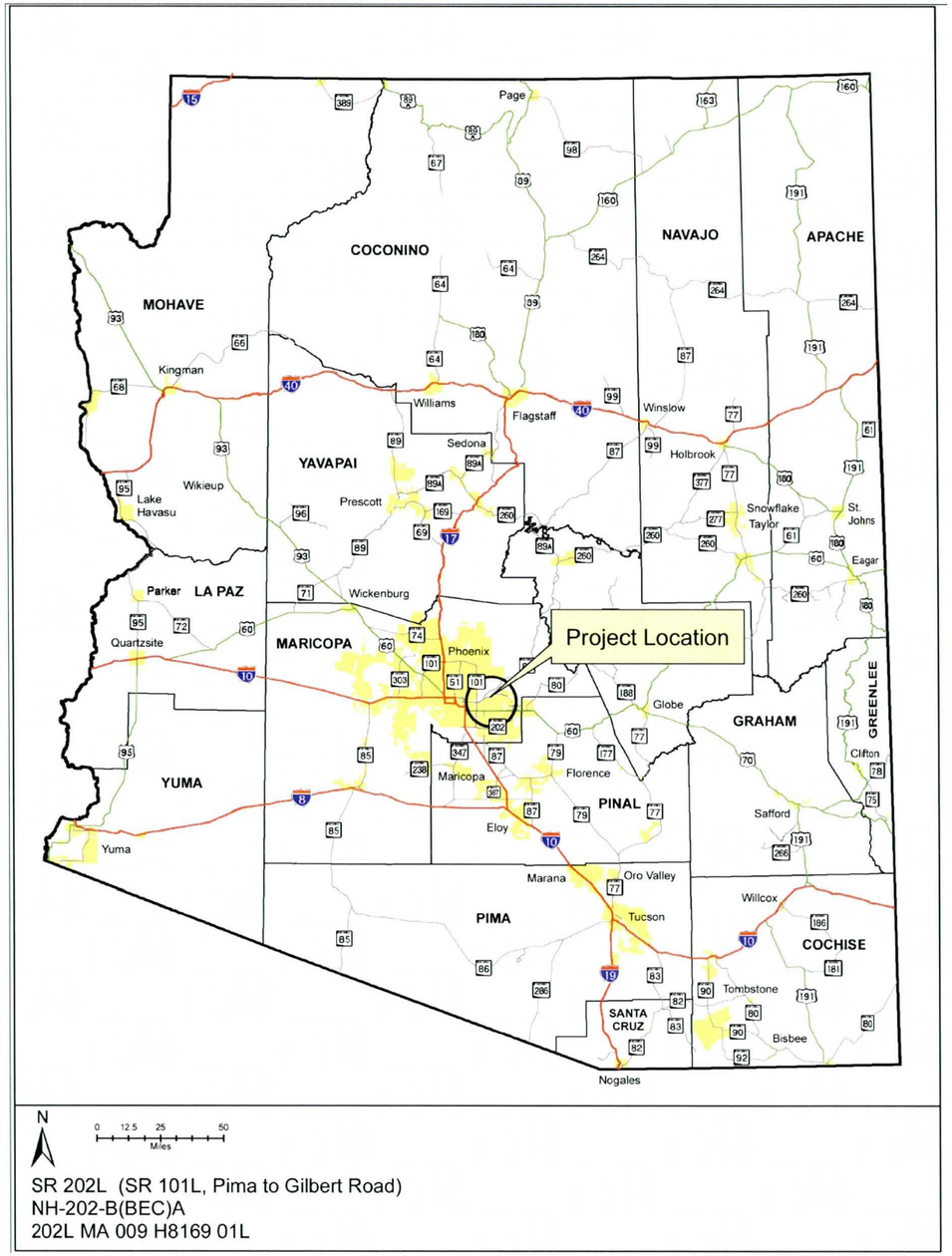


Figure 1 – Project Location Map

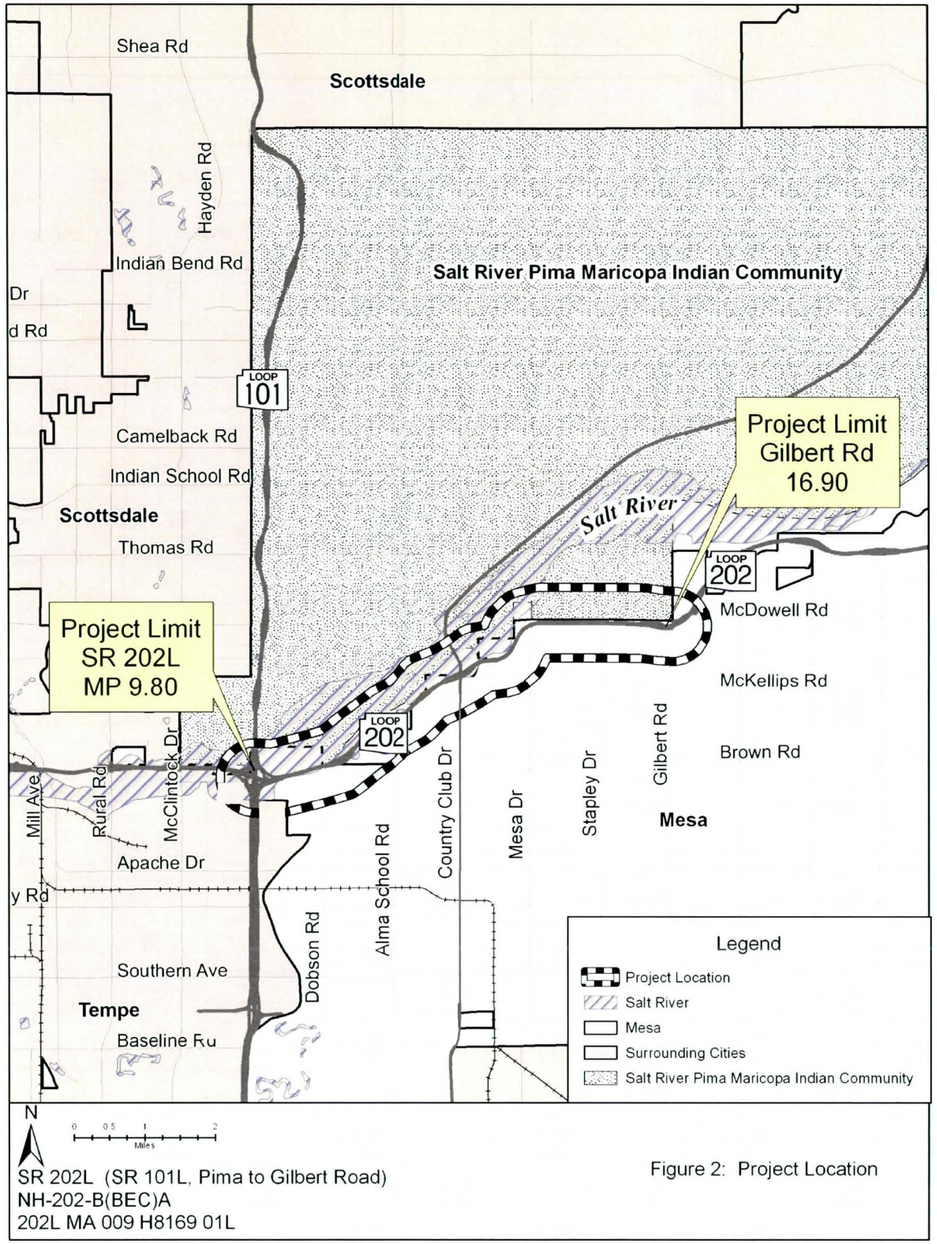


Figure 2 – Vicinity Map

MAG, the Regional Public Transit Authority (RPTA) and ADOT have worked together for many years to develop a comprehensive plan for the Regional Freeway System which is included in the Regional Transportation Plan (RTP) that was adopted by the MAG Regional Council in November 2003.

The voters of Maricopa County passed Proposition 400 in November 2004, authorizing the continuation of an existing half-cent sales tax for the next 20 years to be used for implementing the RTP. A portion of the revenues collected from the half-cent sales tax extension will be deposited into the Regional Area Road Fund (RARF) for the RTPFP. The SR 202L widening project is included in the RTPFP.

1.3 CHARACTERISTICS OF THE CORRIDOR

1.3.1 Roadway Characteristics

SR 202L is classified as a controlled-access Urban Principal Freeway/Expressway with a posted speed limit of 65 mph.

The westbound and eastbound roadway sections include three 12' wide general-purpose lanes plus one 12' wide high occupancy vehicle (HOV) lane. The median shoulder width is generally 11' wide except at the freeway Overpasses where it transitions to 10' wide. An 8' shoulder is provided at freeway Underpasses. A 42" median concrete barrier separates the westbound and eastbound roadways. The outside shoulder is typically 10' wide throughout the study area (12' adjacent to concrete half barrier). The existing lane configuration is shown on Figure 4 (pages 19 to 21).

SR 202L intersects with the Pima Freeway (SR 101L) with a fully directional freeway-to-freeway system interchange. Additional freeway lanes are provided on SR 202L to improve maneuverability for traffic approaching and departing this interchange.

Eastbound SR 202L Mainline

The SR101L/SR202L Ramp N-E/S-E (1 lane) enters the SR 202L mainline and continues to east of the Dobson Road exit ramp to provide four general-purpose lanes and one HOV lane within this area. The Dobson Road exit ramp (1 lane) is a tapered exit from the outside lane. An American Association of State Highway Transportation Officials (AASHTO) lane drop is located immediately east of the Dobson Road exit ramp gore thereby reducing the number of general-purpose lanes from four to three prior to the Dobson Road Overpass. Three general-purpose lanes and an HOV lane continue to the east on SR 202L between Dobson Road and Gilbert Road.

The Dobson Road entrance ramp (1 lane) is configured as a parallel entrance that transitions into an auxiliary lane that continues to the Alma School Road exit. The Alma School Road exit ramp (1 lane) is a parallel exit configuration with a mandatory exit from the auxiliary lane.

The Alma School Road entrance ramp (1 lane) enters the SR 202L mainline with a parallel entrance configuration that transitions into an additional lane that continues to the east of the McKellips Road exit ramp. An AASHTO lane drop is located immediately east of the McKellips

Road exit ramp gore that reduces the number of lanes from four to three prior to the McKellips Road Overpass. The McKellips Road exit ramp (1 lane) is a tapered exit from the outside lane.

The Country Club Drive exit ramp (1 lane) is a tapered exit from the outside general-purpose lane. The Country Club entrance ramp (1 lane) is a parallel entrance configuration that merges into the adjacent general-purpose lane prior to the Center Street Underpass. The Gilbert Road exit ramp (1 lane) is a tapered exit from the outside general-purpose lane.

Westbound SR 202L Mainline

Three general-purpose lanes are provided in the westbound direction between Gilbert Road and Dobson Road. The Gilbert Road entrance ramp (1 lane) is a parallel entrance configuration that merges into the adjacent general-purpose lane. The Country Club Drive exit ramp (1 lane) is a tapered exit from the outside general-purpose lane. The Country Club Drive entrance ramp (1 lane) is a parallel entrance that transitions into the adjacent general-purpose lane prior to the McKellips Road Overpass.

The McKellips Road entrance ramp (1 lane) enters the SR 202L mainline with a parallel entrance that merges into an additional lane that continues to Alma School Road. The Alma School Road exit ramp (1 lane) is a tapered exit from the outside lane. An AASHTO lane drop is located immediately west of the Alma School Road exit ramp gore thereby reducing the number of lanes from four to three prior to the Alma School Road Overpass.

The Alma School Road entrance ramp (1 lane) is a parallel entrance that transitions into an auxiliary lane that continues to the Dobson Road exit ramp. The Dobson Road exit ramp (1 lane) is a mandatory exit from the auxiliary lane.

The Dobson Road entrance ramp is a parallel entrance that transitions into an additional lane that continues to the SR101L/SR202L TI exit ramp (4 lanes + 1 HOV lane total).

The SR101L/SR202L TI Ramp W-S/W-N exit (2 lanes) is configured as a mandatory exit from the outside lane and the second lane designed as an optional lane within the SR 202L through movement. Three general-purpose lanes and one HOV lane continue to the west through the system interchange.

SR 202L is elevated between SR101L to west of the Center Street Underpass. SR 202L is depressed from west of the Center Street Underpass to Gilbert Road. The depressed freeway section is generally bordered with noise walls, retaining walls, earthen berms, or a combination of berms and walls along the residential developments.

Service Interchanges and Grade Separations

Service interchanges provide full freeway access at Dobson Road, Alma School Road, and Country Club Drive. Service interchanges with partial freeway access are at McKellips Road (ramps to/from the west) and Gilbert Road (ramps to/from the west).

Grade separations and freeway Overpasses provide local street connectivity at Center Street, Mesa Drive, and Stapley Drive. An equipment Underpass is provided under the freeway to provide access between the City of Mesa Water Reclamation Plant and the percolation ponds, and an oversized equipment Underpass is provided for the sand and gravel business west of Alma School Road.

Cross Streets

Dobson Road is a six lane arterial street that terminates immediately north of the interchange. At the Dobson Road TI, the roadway section consists of two lanes in the southbound direction of travel, two left-turn lanes for the northbound to westbound traffic movement, and one left-turn lane for the southbound to eastbound traffic movement. One right-turn lane is provided for the northbound to eastbound traffic movement.

Alma School Road is a six lane arterial street south of SR 202L and a four lane arterial street north of SR 202L. At the Alma School Road TI, the roadway section consists of two lanes in the northbound direction of travel, three lanes in the southbound direction of travel, two left-turn lanes for the northbound to westbound traffic movement, and one left-turn lane for the southbound to eastbound traffic movement. One right-turn lane is provided for the northbound to eastbound traffic movement and one right-turn/through lane is provided for the southbound to westbound traffic movement.

McKellips Road is a six lane arterial street south of SR 202L and a four lane arterial street north of SR 202L. At the McKellips Road TI, the roadway section consists of two lanes in the northbound direction of travel, two lanes in the southbound direction of travel, and two left-turn lanes for the northbound to westbound traffic movement. One right-turn/through lane is provided for the southbound to westbound traffic movement.

Country Club Drive is a six lane arterial street south of SR 202L and a four lane arterial street north of SR 202L. At the Country Club Drive TI, the roadway section consists of two lanes in the northbound direction of travel, three lanes in the southbound direction of travel, two left-turn lanes for the northbound to westbound traffic movement, and two left-turn lanes for the southbound to eastbound traffic movement. One right-turn lane is provided for the northbound to eastbound traffic movement and one shared right-turn/through lane is provided for the southbound to westbound traffic movement.

Center Street is a two lane collector street. The roadway section consists of one lane in the northbound direction of travel and one lane in the southbound direction of travel.

Mesa Drive is a two lane arterial street. The roadway section consists of one lane in the northbound direction of travel and one lane in the southbound direction of travel. The existing Overpass was designed for lanes associated with a potential future traffic interchange.

Stapley Drive is a two lane arterial street. The roadway section consists of one lane in the northbound direction of travel and one lane in the southbound direction of travel. The Overpass was originally designed to accommodate a future four lane arterial street.

Gilbert Road is a six lane arterial street. At the Gilbert Road TI, the roadway section consists of three lanes in the northbound direction of travel, three lanes in the southbound direction of travel, two left-turn lanes for the northbound to westbound traffic movement. One right-turn lane and one shared right-turn/through lane are provided for the southbound to westbound traffic movement.

1.3.2 Transit Facilities and Routes

Valley Metro currently operates Express Route 535 that originates in northeast Mesa and provides service to downtown Phoenix. The bus route utilizes the high occupancy vehicle (HOV) lanes on the SR 202L mainline between I-10 and Power Road. Three inbound (AM) and three outbound (PM) routes are provided during the morning and evening peak periods. A temporary park-and-ride lot is located at Village Grove Plaza (southeast corner of Gilbert and McKellips Roads); and only one inbound and one outbound trip stops at this location per day. No additional park-and-rides or transit services are planned within the study area.

1.3.3 Land Use and Ownership

Jurisdiction and Ownership

Land in the project area is generally privately-owned with the exception of a parcel owned by the Bureau of Land Management (BLM) east of SR 101L, approximately one-tenth mile south of SR 202L. The SRPMIC generally borders the corridor to the north. The corridor falls within the City of Mesa. There is a section of unincorporated Maricopa County in the vicinity of the Alma School Road TI.

Existing Land Use

Much of the land adjacent to SR 202L is classified as rural or vacant, with the exception of pockets of industrial and public facility uses at major intersections. The Salt River parallels the freeway to the north. Between Alma School Road and Country Club Drive, small lot and medium-density residential development exists. Riverview Park, a 51-acre recreation site, is located near the southwest corner of SR 202L and Dobson Road. Adjacent to the park to the west is one of Mesa's two sewage treatment plants – the Northwest Water Reclamation Plant. Between Center Street and Gilbert Road on the south side of SR 202L the City of Mesa Lehi community exists and on the north side is the SRPMIC Lehi community.

The City of Mesa Water Reclamation Plant is located near the southeast corner of the SR101L/SR202L TI. Reclaimed water lines discharge from the water treatment plant to the percolation ponds located near the northeast quadrant of the SR101L/SR202L TI. A reclaimed water line also continues to the east along SR 202L that provides a source of water for the freeway landscaping. Existing maintenance roads adjacent to the percolation ponds are used by ADOT, the City of Mesa and the Flood Control District of Maricopa County (FCDMC).

The Salt River is immediately adjacent to the project on the north side of the ADOT right-of-way. The US Army Corp of Engineers (ACOE), in partnership with the SRPMIC, has completed final design of the Va Shly'ay Akimel Project – Salt River Ecosystem Restoration project. This project is planning a system of enhanced ponds, wetlands, trails, and other facilities. The project plans include the regrading of the two percolation ponds immediately adjacent to SR 202L and creating permanent wetlands. The City of Tempe Rio Salado pathway would tie into the future Va Shly'ay Akimel pathways. Construction of this project is not currently funded and Intergovernmental Agreements between the ACOE, SRPMIC, ADOT, and City of Mesa have not been executed.

Riverview Park and Riverview Golf Course are located near the southeast quadrant of the SR101L/SR202L TI, and has been identified as the site of the future Chicago Cubs Spring Training facility. The area south of the Dobson Road TI includes the Mesa Riverview commercial development area. This development includes large retail centers, restaurants, automotive dealerships and other commercial businesses. The City of Mesa and the Maricopa County Department of Transportation (MCDOT) are planning a new Dobson Road bridge over the Salt River. This new bridge would provide additional access to the new facility from areas to the north.

A sand and gravel operation is located on the southwest and northeast corners of SR 202L and Alma School Road. The mined material is transported by truck through a cast-in-place concrete equipment Underpass to the northeast location where it is processed for sale. Based on current Maricopa County Geographic Information System (GIS) data, the facility is located within the jurisdictional limits of Maricopa County.

The Radio Disney Group, LLC radio station is located adjacent to the ADOT right-of-way south of SR 202L between Country Club Drive and Center Street. Correspondence received from the property owner states that any new right-of-way acquisition from this property would significantly impact the operations of the radio station, possibly requiring relocation of the facility and a total acquisition of the property.

General Plan Land Use

Future build-out of the vacant/rural land uses between Dobson Road and Mesa Drive are anticipated to include: mixed use/employment uses spanning SR 202L with interspersed natural areas/open space along the Salt River, medium-density residential development near Alma School Road, and clustered high-density residential development near Country Club Drive. Between Mesa Drive and Gilbert Road, low-density residential development is expected to fill in the existing rural areas both north and south of SR 202L.

The Mesa General Plan identifies an approximate half-mile corridor between SR 101L and Country Club Drive (primarily between SR 202L and the Tempe Canal) as the Red Mountain Freeway Corridor Economic Activity Area, defined more specifically as a potential future employment and business concentration area. This is supported by the future land use plan, which primarily depicts mixed use/employment uses in this area.

The area bounded by Mesa Drive and Gilbert Road on the west and east, and SR 202L and the Consolidated Canal on the north and south, is known as the Lehi Sub-Area in Mesa, characterized by its rural character. A sub-area plan was conducted to further refine General Plan recommendations and develop an action plan to guide future land use development in the area,

which residents would like to maintain as semi-rural. A summary of the Sub-Area Plan recommendations include:

- Future development should be exclusively low-density residential development
- Desire to maintain rural equestrian lifestyle with comprehensive trail system
- Preference given against a future freeway ramp at Mesa Drive/SR 202L
- Future freeway enhancements or expansions should include a sound wall and/or earth berm and rubberized asphalt to decrease traffic noise
- Future expansion of SR 202L or bridges across the freeway should allow for a separated 12-foot multi-use path in compliance with the City's Parks Master Plan

1.3.4 Right-Of-Way

The existing right-of-way width varies from a minimum of approximately 95' to several hundred feet along the SR 202L corridor.

1.3.5 Utilities and Railroads

Existing utilities within the study area were determined based on information obtained from ADOT as-built drawings, as well as facility plans and quarter-section maps obtained from each local jurisdiction and utility company. These utilities are presented in Table 1.

Table 1 – Existing Utility Crossings

Cross Street	Utility Description
SR101L TI to Gilbert Road	
SR101L TI to Dobson Road	City of Mesa 54" effluent line; 60" storm drain; City of Mesa 20" sewer force main inside equipment Underpass; City of Mesa 72" storm drain; City of Mesa 36" water line and 36" sanitary sewer in a 17' utility easement along south right-of-way line, ADOT Freeway Management System (FMS) conduit, conductor, and fiber optic cable
Dobson Road to Alma School Road	City of Mesa 16" reclaimed water line in 30" casing; Salt River Project (SRP) 2-8'x8' reinforced concrete pipe box (RCB) culvert Tempe Drain; City of Mesa 40'x17' equipment Underpass; City of Mesa 16" reclaimed water line in 30" casing; City of Mesa 36" reclaimed water line and 36" sanitary sewer in 17' utility easement (easement ending just west of the Tempe Drain) along the south side of the freeway , ADOT FMS conduit, conductor, and fiber optic cable
Alma School Road to McKellips Road	City of Mesa 8" ductile iron pipe (DIP) water line along east side of Alma School Road; City of Mesa 36" reclaimed water line and SRP underground electric duct bank along the south right-of-way line; City of Phoenix 96" water transmission main in 25' easement outside south right-of-way line; 24" concrete (RGRCP) private irrigation pipeline; SRP irrigation pipe lateral and turnout structure, ADOT FMS conduit, conductor, and fiber optic cable
Country Club Drive to Center Street	City of Mesa 36" reclaimed water line along south side of the freeway, ADOT FMS conduit, conductor, and fiber optic cable

Table 1 – Existing Utility Crossings (continued)

Cross Street	Utility Description
SR101L TI to Gilbert Road (continued)	
Center Street	CenturyLink underground telephone fiber optic line; SRP 12kV overhead power line along the east side of Center Street across the freeway; City of Mesa 8" DIP sanitary sewer in 16" steel casing, 4" polyethylene (PE) gas line in 8" steel casing, and 8" DIP water line in 16" steel casing; City of Mesa sewer lift station on south side of the freeway; SRP 69kV power line along Lehi Road on south side of freeway, ADOT FMS conduit, conductor, and fiber optic cable
Mesa Drive	SRP well site on south side of the freeway; City of Mesa 8" DIP sanitary sewer in 16" steel casing, 4" PE gas line in 8" steel casing, and 8" DIP water line in 16" steel casing; SRP 12kV overhead power line along the west side of City of Mesa Drive across the freeway; underground telephone fiber optic line, ADOT FMS conduit, conductor, and fiber optic cable
Mesa Drive to Stapley Drive	SRP 12kV overhead power line crossings at STA 621+20, 631+60, 645+25, and 655+35; City of Mesa 12" DIP water line in 18" steel casing and 4" PE gas line in 8" steel casing, ADOT FMS conduit, conductor, and fiber optic cable
Stapley Drive to Gilbert Road	CenturyLink underground telephone fiber optic line; SRP well site on south side of the freeway; WAPA double circuit 230kV overhead power lines; SRP 3-duct underground electric conduits; SRP 30" and 24" RGRCP irrigation siphons and manholes, ADOT FMS conduit, conductor, and fiber optic cable

The City of Mesa Water Reclamation Plant, located near the southeast quadrant of the SR101L/SR202L TI, treats wastewater for the City of Mesa and the SRPMIC. Reclaimed water lines convey treated effluent from the plant to the percolation ponds located near the northeast quadrant of the SR101L/SR202L TI. The area along the northern portion of the corridor between SR101L/SR202L TI and Dobson Road is constrained by the existing percolation ponds and maintenance access road. A roadway barrier exists (with access control fence) between the westbound SR 202L roadway and the percolation pond maintenance road.

The City of Mesa is not currently receiving groundwater recharge credits from the Arizona Department of Environmental Quality (ADEQ) at the percolation ponds due to the shallow depth of the water table. Therefore, the percolation ponds are no longer used for their original intended purpose. The pond located the furthest west and north of SR 202L is currently used twice a year when the water treatment plant is flushed and the chlorine in the system is allowed to evaporate. The capacity of this pond is constrained by the capacity of the water reclamation plant and the volume should not be impacted. The proposed improvements along SR 202L would not impact this pond.

A 20" force main crosses SR 202L inside the City of Mesa Water Treatment Plant equipment Underpass and a 36" reclaimed water line extends from the water treatment plant to east of Higley Road along the south right-of-way line.

There are existing radio towers associated with the Radio Disney Group, LLC radio station located adjacent to the ADOT right-of-way south of SR 202L and west of Center Street. The available right-of-way in this location narrows to approximately 10' between the access control fence and the existing edge of pavement and includes the 36" effluent line and ADOT utilities.

1.3.6 Drainage

1.3.6.1 Offsite Drainage

Background

The most significant offsite drainage feature in the project area is the Salt River. From SR 101L to Country Club Drive the SR 202L freeway is located adjacent to the Salt River's south bank, which was stabilized with cement stabilized alluvium (CSA) for the construction of the freeway. The CSA hardbank consists of an 8' thick section at 1.5H:1V or 1H:1V slopes from the toe-down elevation (10' below computed scour elevation) to a point at least 3' above the river's 100-year water surface elevation (corresponding to the pre-Roosevelt Dam discharge of 220,000 cubic feet per second (cfs). The Salt River is the outfall for all storm runoff within the project limits.

East of Country Club Drive, the SR 202L freeway turns away from the Salt River following an alignment immediately south of the SRPMIC boundary. Agricultural parcels located between Oak Street (½ miles north of McDowell Road) and SR 202L contribute flows to the freeway's drainage system along this segment. All other agricultural areas and materials pits to the north outfall directly into the Salt River.

Existing Offsite Drainage System Overview

The contributing watershed on the southeast side of SR 202L is comprised of developed areas within unincorporated Maricopa County and the City of Mesa, with a mix of recreational, industrial, commercial, agricultural and residential land uses. The upper limits of the watershed are defined by the Southern, Crosscut and Tempe Canals, with flow patterns sloping from east to west. Storm and irrigation tailwater runoff is intercepted by a system of drainage channels and detention basins located along the south side of the corridor, conveying flows to pass-through culverts that allow their final outfall to the Salt River. The offsite system is divided in sections as follows:

- SR 101L to Alma School Road: Runoff reaching the Riverview Golf Course is collected in an unlined open channel that runs inside ADOT right-of-way along the SR 202L eastbound roadway between Stations 380+00 and 393+00. The channel discharges into a drop structure that also collects runoff from the wastewater treatment plant. Flows are conveyed through a 60" pipe culvert underneath SR 202L to the Salt River. Runoff reaching the detention facility at Riverview Park is conveyed across SR 202L through a 72" pipe culvert to the Salt River. Runoff from the Mesa Riverview commercial park and the materials pit is retained on-site.
- A detention basin on the southwest corner of the Alma School Road TI collects offsite and freeway onsite flows. The basin's outfall is a 54" pipe culvert that discharges into the Salt River. It should be noted that the Alma School Drain, a concrete lined channel that crosses the freeway just east of Dobson Road, and a materials pit equipment pass located about 1,400' west of Alma School Road, provide emergency outfalls for events that exceed the capacity of the Alma School TI detention basin system.
- Alma School Road to Center Street: Runoff from the adjacent residential development is collected in a series of detention basins that outfall to the Salt River through pipe culverts, and a connection to the 72" storm drain trunk line along Country Club Drive that outfalls to the Salt River.
- Center Street to Gilbert Road: A system of concrete-lined channels that parallel SR 202L inside ADOT right-of-way exists on both sides of the corridor. The Basin Outfall Channel conveys flows northeast from a detention basin located on the southeast quadrant of the Center Street intersection, and meets the South Channel at a drop structure and culvert crossing the freeway at Station 588+00. The South Channel conveys flows west from the detention basin, located on the northeast quadrant of the McDowell Road TI, to the aforementioned drop structure. The North Channel accepts flows from the McDowell and Gilbert Road TIs and conveys them west to the Outfall Channel, at a point about 200' south of the outfall to the Salt River. The North Channel is also the outfall for the Mesa Drive Pump Station.

  The Outfall Channel receives flows from the Basin Outfall, South and North Channels and conveys them to the Salt River.

Hydrologic modeling of the offsite system was completed during the original design of SR 202L by several consultants under the direction and approval of ADOT. Flows estimated for the existing 100-year storm models were used in the hydraulic design of open channels and culverts.

Drainage Channels

Grader ditches and channels exist along the entire length of SR 202L and are typically designed for the 100-year event. A summary of significant channels within the project limits is provided in Table 2. Shallow grader ditches not included in Table 2 are unlined, v-shaped or trapezoidal, with 3:1 or flatter side slopes.

Table 2 – Offsite Channel Summary

Channel Section and Location	Lining Material	Length (ft)	Depth (ft)	Side Slopes (H:1) LT	Side Slopes (H:1) RT	Top Width (ft)	Bottom Width (ft)	Design Flow (cfs)
V-Shaped; SR101L/SR202L TI Ramp N-E Station 58+80 to Station 70+36	Unlined	1,156	2	3	3	12	0	13
Trapezoidal; Riverview Golf Course Outfall - SR 202L Station 379+30 to Station 380+12	Concrete	108	3	3	3	26	8	144
Trapezoidal; Riverview Golf Course Outfall - SR 202L Station 380+12 to Station 392+75	Unlined	1,263	2	6	3	26	8	144
Trapezoidal; Riverview Park Outfall SR 202L Station 396+00 to Station 400+44	Unlined	444	2	3	3	20	8	23

Table 2 – Offsite Channel Summary (continued)

Channel Section and Location	Lining Material	Length (ft)	Depth (ft)	Side Slopes (H:1) LT	Side Slopes (H:1) RT	Top Width (ft)	Bottom Width (ft)	Design Flow (cfs)
Trapezoidal; Riverview Park SR 202L Station 406+49 to Station 400+44	Concrete	605	2	3	3	20	8	23
Trapezoidal; Dobson Rd TI Ramp B Station 17+00 to Station 5+16	Unlined	1,184	2	3	3	20	8	66
Trapezoidal; Country Club Dr TI Ramp D Station 17+00 to Station 5+00	Unlined	1,200	2	4	4	21	5	n/a
Trapezoidal; Basin Outfall Channel Center Street Basin to Outfall Channel Drop Structure	Concrete	1,465	10	1.5	1.5	35.25	6	311 to 429
Trapezoidal; Outfall Channel Drop Structure to Salt River	Concrete	1,617	11	1.5	1.5	38.25 to 42.25	6 to 10	723 to 931
Trapezoidal; South Channel Gilbert Road TI to Outfall Channel Drop Structure	Concrete	11,462	3 to 7	2	2	16 to 32	5 to 10	39 to 429
Trapezoidal; North Channel Gilbert Road TI to Outfall Channel	Concrete	11,613	5 to 9	2	2	25 to 37	6 to 10	125 to 352

Box Culverts

Two box culvert crossings of SR 202L exist within the project limits that allow the passage of offsite flows to their outfall at the Salt River. Three additional box culverts located along the North and South Channels are within ADOT right-of-way but do not cross SR 202L. Table 3 is a summary of existing box culverts. The equipment Underpasses at Stations 394+80 and 458+90 are not considered dedicated drainage structures.

Table 3 – Box Culvert Summary

Location (SR 202L Station or Cross Road)	Size	Length (ft)	Skew (Degrees)	Design Q (cfs)	Connecting Feature
429+07	2-8'x8'	513	27°51' Lt	845	Alma School Drain
588+02	2-8'x6'	277	0°	723	Outfall Channel
Mesa Drive	8'x6'	170	35°	216	South Channel
Mesa Drive	8'x6'	140	0°	314	North Channel
Stapley Drive	8'x6'	140	0°	264	North Channel

Regulated Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) that cover the project area place the SR 202L freeway within a Zone X with the exception of the segment between SR 202L Stations 386+00 and 403+00 which is within a Zone AE. According to FCDMC personnel, a Letter of Map Revision was never sent to FEMA when the levee embankments along the north side of SR 202L were built by ADOT. As a result, the floodway/floodplain delineations were never revised to reflect containment within the river embankments, thus leaving the segment of SR 202L within a Zone AE. However, since the levee embankments provide 100-year flood protection, construction of freeway improvements would not be subject to additional regulatory requirements by the FCDMC or FEMA (e-mails included in Appendix B).

A Zone AE is defined as a floodplain area that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. Mandatory flood insurance purchase requirements and floodplain management standards apply.

A Zone X is defined as an area of minimal flood hazard outside of a Special Flood Hazard Area with higher elevation than that of the 0.2-percent-annual-chance flood.

Salt River

The Flood Control District of Maricopa County (FCDMC) updated the Salt River Hydraulic Engineering Center River Analysis System (HEC-RAS) model in June 2010, *Salt River Hydraulic Master Plan*, Stantec. The new HEC-RAS model accounts for the recent modifications to the Roosevelt Dam completed in 1996. The Salt River in the project area flows at 207,000 cubic feet per second and there is no available freeboard along the CSA bank protection. The CSA bank protection has not been certified by FEMA as a levee.

There is an existing retaining wall next to the westbound lanes of SR 202L between SR 101L and Dobson Road parallel to the existing CSA bank protection along the Salt River. Constructing widening to the north could create the need to reconstruct portions of the bank protection. This would likely encroach into the Salt River and the SRPMIC.

The hydraulic conditions of the Salt River channel have changed since the construction of the original wall and bank protection along the south bank of the river with the initial SR 202L construction project. There is now CSA bank protection on the north bank of the Salt River that did not exist previously. Moving the wall and CSA further north with this project could result in increased river velocity thereby creating the need for deeper scour protection and the need to raise the top elevation of the CSA on both sides of the river to accommodate the higher water surface elevation. This would likely result in a permanent encroachment into SRPMIC property which would require right-of-way acquisition.

If widening into the Salt River floodplain occurs, the FCDMC would require that a new HEC-RAS model be developed using the data from the June 2010 model as the basis for the new analysis. All analysis would have to be conducted to their current updated standards, and reviewed and

approved by the FCDMC. The scour analysis would have to be completed using current FCDMC criteria that would likely result in additional scour protection depth beyond the 15' currently constructed. FCDMC would also require a 16' width maintenance access road at the top of the CSA bank protection and another 16' width access road at the base of the slope. New agreements would likely be required between ADOT, FCDMC, the Army Corp of Engineers, and SRPMIC.

1.3.6.2 Onsite Drainage System

Overview

Onsite drainage management changes with the profile of SR 202L. Small closed conduit systems that drain to detention basins are typical of the segment between SR 101L and Center Street. Detention basins also accept offsite flows and attenuate peak discharges that outfall to the Salt River. The depressed freeway segment east of Center Street includes trunk lines that converge at the Mesa Drive pump station and discharges into the North Channel.

Connections of SR 202L right-of-way inlets to local storm drain systems exist at the Dobson Road and Country Club Drive TIs.

Onsite drainage systems were originally designed for three general-purpose lanes plus an HOV lane. Modifications to the onsite drainage systems included in the construction of the HOV lanes did not change the size or geometry of trunk lines, basins, or the Mesa Drive pump station. Design criteria and guidelines used in the original and HOV lanes design are the same as current standards, including design storm frequency and spread criteria.

Catch Basins

ADOT Standard C-15.91 and C-15.92 catch basins are used along the outside roadway shoulders with curb and gutter or barrier. Special-detail grated inlets are used along the median barrier in superelevated roadway sections. ADOT Standard C-15.80 inlets are used to collect runoff at roadside and infield areas.

Pavement runoff along short segments of the roadway without curb and gutter is collected in grader ditches and roadside inlets.

Storm Drain Trunk Lines

Two storm drain trunk lines that convey flows to the Mesa Drive pump station parallel the eastbound lanes of SR 202L. The west trunk line begins with a 24" diameter reinforced concrete pipe (RCP) at Station 555+30 and ends with twin 96" RCPs at the junction vault at Station 600+70. The east trunk line begins with a 36" RCP at Station 732+80 and also ends with twin 96" RCPs at the junction vault at Station 600+70. Both trunk lines are located outside of the eastbound roadway shoulder, 5' or more behind the back of curb.

Two additional junction vaults are located at Stations 597+07 and 602+66. These vaults accommodate the transition of both trunk lines from single pipe to twin pipes upstream of the vault at Station 600+70, which is connected to the Mesa Drive pump station by a 96" RCP. The vaults, twin 96" RCPs and the 96" RCP connecting to the pump station were designed to provide underground storage in addition to the pump station's wet well.

The design event for the trunk lines is the 50-year storm since the trunk lines drain a depressed segment of SR 202L.

Pump Station at Mesa Drive

The Mesa Drive pump station is located on the North West quadrant of the SR 202L and Mesa Drive intersection. The pump station has an 18 cfs nuisance flow submersible pump and four 50 cfs mixed flow pumps. The 50-year 24-hour inflow hydrograph has a peak flow of 251 cfs and a storage requirement of approximately 110,000 cubic feet. The outfall pipe is a 104' long 72" RCP that runs from the discharge structure to the North Channel.

Detention Basins

Several detention basins exist along the south side of SR 202L that collect offsite and onsite flows. These basins were constructed with the freeway in order to attenuate peak flows and manage storm runoff upstream of the outfall to the Salt River. Table 4 is a summary of detention basins within the project limits.

Table 4 – Detention Basins Summary

Location (SR 202L Station or TI Quadrant)	Design Headwater Depth (ft)	Outlet Pipe Size (in)
Alma School Road TI, Southwest	8	54
Station 490+00	2.5	24
McKellips Road TI, Southeast	4.2	2-48
Country Club Drive TI, Southwest	Not available	24
Country Club Drive TI, Southeast	Not available	24
Center Street Underpass, Southeast	5.8	36

1.3.7 Structures

1.3.7.1 Bridge Structures

The existing bridge structures within the project limits were constructed between the years of 1997 and 2001. The sufficiency of bridge vertical clearances is summarized in the AASHTO Criteria Report.

A summary of the existing bridges within the study area is provided in Table 5.

Table 5 – Existing Bridge Summary

Structure Number	Mile Post	Structure Name	Superstructure and Foundation Type(s)	Minimum Vertical Clearance (ft)
2444	11.00	Dobson Road TI OP, Eastbound (EB)	Two span, cast-in-place/post-tensioned concrete box girder bridge (5'-0 structure depth); Stub abutments on drilled shaft foundations and a three-column pier; Each column founded on individual drilled shaft foundations	16.92
2445	11.00	Dobson Road TI OP, Westbound (WB)		17.19 (1)
2887	11.72	Haul Road OP	Reinforced concrete box frame (40' x 17' x 260'); located at approximate SR 202L Station 458+90	16.09
2446	12.01	Alma School Road TI OP, EB	Two span, prestressed AASHTO Type IV concrete girder bridge (5'-5" maximum structure depth); Full-height abutments consisting of a shallow abutment cap with a concrete fascia wall supported on formed columns founded on large diameter drilled shaft foundations and a three-column pier, with each column on individual drilled shaft foundations	17.10 (1)
2447	12.01	Alma School Road TI OP, WB		17.07 (1)
2493	12.80	McKellips Road TI OP, EB	Single span, cast-in-place/post-tensioned concrete box girder bridge (7'-9" structure depth); Stub abutments on drilled shaft foundations	18.67
2494	12.80	McKellips Road TI OP, WB		19.67
2491	13.21	Country Club Drive TI OP, EB	Two span, precast/prestressed AASHTO Type V concrete girder bridge (6'-3" maximum structure depth); Stub abutments on a single row of drilled shafts and a three-column pier, each column founded on individual drilled shaft foundations	16.24 (1)
2492	13.21	Country Club Drive TI OP, WB		16.67
2564	13.79	Center Street UP	Two span, cast-in-place/post-tensioned concrete box girder bridge (5'-3" structure depth); Partial-height and full-height abutments and a two-column pier on spread footings	16.82
2565	14.53	Mesa Drive UP	Two span, cast-in-place/post-tensioned concrete box girder bridge (5'-0" structure depth); Partial-height and full-height abutments and three-column pier on spread footings	18.30
2566	15.54	Stapley Drive UP	Two span, cast-in-place/post-tensioned concrete box girder bridge (5'-3" structure depth); Partial-height abutments and two-column pier on spread footings	18.28
2577	16.44	Gilbert Road Ramp A UP	Three span, post-tensioned concrete box girder bridge (9'-3" structure depth); Stub abutments and single-column piers on spread footings	19.21
2579	16.55	Consolidated Canal Bridge	Single span, precast/prestressed AASHTO Type IV concrete girder bridge (5'-7 1/2" maximum structure depth); Stub abutments on drilled shaft foundations	N/A
2580	16.55	SRP Equipment UP (at Gilbert Road)	Cast-in-place reinforced concrete rigid frame (20'-0" x 16'-3")	16.05
2578	16.57	Gilbert Road TI UP	Two span, post-tensioned concrete box girder bridge (6'-0" structure depth); Partial-height and full-height abutments and five-column pier on spread footings	22.46

(1) Minimum Vertical Clearance per Supplemental Survey.
Note: Structures with span lengths of 20 feet or less do not have maintenance logs and are not assigned a structure number.

1.3.7.2 Retaining Walls

A review of the as-built plans indicate the majority of the existing retaining walls were built as cast-in-place concrete walls with spread footings or as Mechanically Stabilized Earth (MSE) walls. Existing wall types and locations are listed in Table 6. As-built stationing data is shown in the tables unless noted otherwise.

Table 6 – Existing Retaining Walls

Route/General Location	Retaining Wall Description (Approximate Freeway Centerline Stationing Unless Noted Otherwise)	Retaining Wall Type
SR 202L, Dobson Road TI	EB wall south of Dobson Road Ramp B from SR 202L Station 401+49.04 to Station 407+98.72	ADOT B-Standard, Case III
	WB wall along north edge of Dobson Ramp A Road from Dobson Ramp A Station 13+09.62 to SR 202L Station 401+39.98	ADOT B-Standard, Case II
SR 202L, Alma School Road TI	EB wall on west side of Alma School Road Overpass from SR 202L Station 464+22.64 to Station 471+93.82	MSE Wall
	WB wall on east side of Alma School Road Overpass from SR 202L Station 474+18.99 to Station 476+86.78	MSE Wall
	EB wall on east side of Alma School Road Overpass from SR 202L Station 473+57.19 to Station 481+90.01	MSE Wall
	WB wall on west side of Alma School Road Overpass from SR 202L Station 471+78.31 to Station 472+40.74	MSE Wall
SR 202L, McKellips Road TI	EB wall on south edge of McKellips Road Ramp B from SR 202L Station 494+69.90 to McKellips Ramp B Station 13+91.92	MSE Wall
	EB wall on southwest side of McKellips Road Overpass from SR 202L Station 501+75.97 to Station 508+92.05	MSE Wall
	WB wall on northwest side of McKellips Road Overpass from SR 202L Station 500+94.97 to Station 507+98.94	MSE Wall
	Wall along southwest side of McKellips Road Overpass from SR 202L Station 507+98.94 to 508+92.05	MSE Wall
	Wall along northeast side of McKellips Road Overpass from SR 202L Station 510+22.15 to Station 510+93.54	MSE Wall
SR 202L, Country Club Drive TI	EB wall on west side of country Club Drive Overpass from SR 202L Station 528+09.47 to Station 534+38.79	ADOT B-Standard, Case II
	WB wall on east side of country Club Drive Overpass from SR 202L Station 537+70.71 to Station 543+05.00	ADOT B-Standard, Case II
SR 202L, Center Street Underpass	Wall In northwest corner of Center Street and the SR 202L Mainline from SR 202L Station 564+40.00 to Station 565+24.10	ADOT B-Standard, Case II
	EB wall, south of SR 202L Mainline from SR 202L Station 574+32.60 to Station 576+17.04	ADOT B-Standard, Case II
SR 202L, between Mesa Drive and Stapley Road	Wall along eastbound SR 202L Station 617+11.24 to Station 657+54.35	Combination wall from SR 202L Station 617+04.41 to Station 631+50.00 and Station 665+09.59 to Station 657+54.35; Sound wall from SR 202L Station 631+50.00 to Station 665+09.59
	Side wall north of the WB SR 202L Mainline from SR 202L Station 632+60.46 to Station 634+59.84	ADOT B-Standard, Case II
SR 202L, between Stapley Road Underpass and Gilbert Road Underpass	Combination wall south of eastbound SR 202L Mainline and east of Stapley Road Underpass from SR 202L Station 658+17.34 to Station 675+93.72	Non-standard, reinforced concrete, cantilever wall
	Combination wall from SR 202L Station 675+93.72 to Gilbert Ramp B Station 22+24.18	Combination wall from SR 202L Station 675+93.72 to 677+13.72; Sound wall from SR 202L Station 677+13.72 to Gilbert Road Ramp B Station 13+07.27; Combination wall from Gilbert Road Ramp B Station 13+07.27 to 20+59.18; Sound wall from Gilbert Road Ramp B Station 20+59.18 to 22+24.18

Table 6 – Existing Retaining Walls (continued)

Route/General Location	Retaining Wall Description (Approximate Freeway Centerline Stationing Unless Noted Otherwise)	Retaining Wall Type
SR 202L, between Stapley Road Underpass and Gilbert Road Underpass (continued)	Wall along south edge of Gilbert Road Ramp A from Gilbert Ramp A Station 31+27.24 to 33+06.94	ADOT B-Standard, Case II from Gilbert Road Ramp A Station 31+27.24 to 32+76.94; Non-standard reinforced cantilever wall from Gilbert Road Ramp A Station 32+76.94 to Station 33+06.94
	Wall along north edge of Gilbert Road Ramp B from Gilbert Ramp B Station 26+48.48 to 30+72.52	ADOT B-Standard, Case II
	Wall south of EB SR 202L Mainline and east of Gilbert Road Underpass from Gilbert Road Station 102+93.00 to Station 103+41.50	ADOT B-Standard, Case II
	Wall along north edge of Gilbert Road Ramp A from Gilbert Road Station 103+01.63 to Gilbert Ramp A Station 39+04.61	ADOT B-Standard, Case II from Gilbert Road Ramp A Station 39+04.61 to 40+87.93; Non-standard reinforced concrete cantilever wall from Gilbert Road Station 103+01.63 to Gilbert Road Ramp A Station 40+87.93
	At northwest corner of SRP Equipment Underpass from SRP Equipment Underpass Station 6+64.65 to Station 8+75.00	Non-standard, reinforced concrete cantilever wall
	At southwest corner of SRP Equipment Underpass from SRP Equipment Underpass Station 5+54.65 to Station 8+75.00	Non-standard, reinforced concrete cantilever wall
	At northeast corner of SRP Equipment Underpass from SRP Equipment Underpass Station 10+85.00 to Station 13+00.03	Non-standard, reinforced concrete cantilever wall
	At southeast corner of SRP Equipment Underpass from SRP Equipment Underpass Station 10+85.00 to Station 13+99.03	Non-standard, reinforced concrete cantilever wall
	Wall along south edge of McDowell Road from McDowell Road Station 3+19.98 to Station 11+39.36	ADOT B-Standard, Case II

1.3.7.3 Noise Walls

Existing noise wall locations are presented in Table 7. Two of the walls in Table 7 are combination noise/retaining walls. While the majority of noise walls along SR 202L are masonry, the combination walls integrate a cast-in-place reinforced concrete retaining wall with a masonry noise wall on top. As-built stationing data is shown in the tables unless noted otherwise.

Table 7 – Existing Noise Walls

Route/General Location	Noise Wall Description (Approximate Freeway Centerline Stationing Unless Noted Otherwise)	Sound Wall Type
SR 202L, Center Street to Mesa Drive	EB wall on west side of Center Street Underpass from SR 202L Station 558+99.23 to Station 564+94.11	Non-standard, reinforced concrete wall
	South of SR 202L Mainline North of existing concrete channel; Located from SR 202L Station 570+97.32 to Station 602+29.01	Masonry Noise Wall (SD 8.02); A portion of which is on retaining wall from SR 202L Station 574+27.69 to Station 576+20.44
SR 202L, Center Street to Mesa Drive	EB wall south of the SR 202L Mainline and West Underpass from SR 202L Station 599+09.33 to Station 602+17.42	Non-standard, reinforced concrete wall
SR 202L, Center Street to Mesa Drive	Wall south of EB SR 202L Mainline from SR 202L Station 603+69.95 to Station 610+78.33	Non-standard, reinforced concrete wall
	Screen wall North of SR 202L Mainline and South of existing concrete lined channel from Center Street to Gilbert Road; Located from SR 202L Station 605+87.75 to Station 711+41.37 with a gap from SR 202L Station 657+50.96 to Station 658+12.34 at Stapley Drive	Masonry Noise Wall (SD 8.02) on retaining wall from SR 202L Station 632+58.86 to Station 634+58.71
SR 202L, Mesa Drive to Stapley Road	Wall south of EB SR 202L Mainline from SR 202L Station 609+06.03 to Station 617+11.24	Non-standard, reinforced concrete wall

1.3.7.4 Reinforced Concrete Box Culverts

Existing reinforced concrete box culvert (RCBC) locations are presented in Table 8. As-built stationing data is shown in Table 8 unless noted otherwise.

Table 8 – Existing Reinforced Concrete Box Culverts

Route/General Location	Approximate Freeway Centerline Stationing (Unless Noted Otherwise)	Structure Description	Structure Type
SR101LL/SR202L TI	SR 202L Station 356+50.00	2 cell - 12' x 12', 300' long RCBC that crosses under SR 202L; Parallel to SR 101L	ADOT B-Standards 1.10, 2.20 and 2.25, Table III
SR 202L, SR 101L to Dobson Road	SR 202L Station 394+80.00	16' x 14' RC rigid box frame equipment Underpass; Wing walls consist of lengths of 150' at the south end and 42'	ADOT B-Standards 01.10, 03.10, 18.10 and 22.60
SR 202L, SR 101L to McKellips Road	SR 202L Station 429+07.00	2 cell - 8' x 8', 513' long RCBC; U-shaped channel at outlet and 40' long flared wing walls at inlet	ADOT B-Standards 01.10, 02.20, 02.25, 02.70 and 19.50
SR 202L, Country Club Drive to Gilbert Road	SR 202L Station 588+01.96	2 cell - 8' x 6', 277' long RCBC; Floor of culvert has been retrofitted with additional floor slab approximately1' thick	ADOT B-Standard 02.20

1.3.8 Signing and Lighting

1.3.8.1 Guide Signs

The existing overhead freeway guide signs are mounted on bridge fascias, supported with cantilever sign supports or supported with tubular sign bridges. The majority of the existing overhead sign supports were not designed to accommodate future pavement widening based on a review of the current as-built plans; and the final design plans for the sign rehabilitation project (Project No. 202L MA 009 H7749 01C). Table 9 identifies the existing overhead sign structures that would be required to be modified to support the additional general-purpose and auxiliary lanes associated with this project.

Table 9 – Existing Sign Structures Requiring Modifications

Direction of Travel	Station	Sign Support Type
Eastbound	392+65	Cantilever
Eastbound	404+00	Cantilever
Eastbound	415+11	Cantilever
Eastbound	428+00	Cantilever
Eastbound	441+00	Cantilever
Eastbound	453+65	Cantilever
Eastbound	471+92	Bridge Fascia
Eastbound	487+00	Cantilever
Eastbound	495+30	Cantilever
Eastbound	504+00	Cantilever
Eastbound	518+15	Cantilever
Eastbound	584+50	Cantilever
Eastbound	635+80	Cantilever
Eastbound	673+80	Cantilever

Table 9 – Existing Sign Structures Requiring Modifications (continued)

Direction of Travel	Station	Sign Support Type
Eastbound	687+00	Cantilever
Westbound	282+40	Sign Bridge
Westbound	392+09	Cantilever
Westbound	440+81	Cantilever
Westbound	451+00	Cantilever
Westbound	457+86	Cantilever
Westbound	480+00	Cantilever
Westbound	486+00	Cantilever
Westbound	504+00	Cantilever
Westbound	559+50	Cantilever
Westbound	572+75	Cantilever
Westbound	599+10	Cantilever
Westbound	651+90	Cantilever

1.3.8.2 Freeway Lighting

The existing SR 202L freeway mainline lighting consists of median mounted 50 and 69 foot "U" poles. The service interchange ramp lighting consists of "H" poles, "I" poles, offset mounted poles, and under deck bridge lighting.

The SR 202L mainline and ramp lighting systems are energized with 240/480 volt Type IV load centers. Table 10 lists the locations of the existing load centers and the limits of the lighting fixtures associated with each load center. Table 11 lists the existing mainline SR 202L conduit crossing locations.

Table 10 – Existing SR 202L Load Center Locations

Load Center Locations	Load Center Address	Western Limit (SR 202L Station)	Eastern Limit (SR 202L Station)
Ramp (N-W), Station 34+50, Right	2730 W. 8th Street	363+00	390+10
Ramp (W-S), Station 57+50, Right	1140 N. Price Road	368+40	390+10
Dobson Road, Station 420+00, 280' Southwest	1211 N. Dobson Road	373+70	441+60
Alma School Road, Station 471+20, 210' Southwest	1825 N. Alma School Road	445+30	488+50
McKellips Road, Station 509+80, 245' Southeast	727 W. McKellips Road	493+25	506+60
Country Club Drive, Station 536+40, 245' Northwest	2244 N. Country Club Drive	510+75	563+70

Table 10 – Existing SR 202L Load Center Locations (continued)

Load Center Locations	Load Center Address	Western Limit (SR 202L Station)	Eastern Limit (SR 202L Station)
Center Street, Station 566+20,116' Southeast	2399 N. Center Street	567+25	584+85
Mesa Drive, Station 603+70, 126' Northwest	2796 N. Mesa Drive	588+40	630+60
Stapley Drive, Station 658+30, 130' Southeast	2695 N. Stapley Drive	634+15	683+65
Gilbert Road, Station 713+30, 154' Northeast	2797 N. Gilbert Road	687+00	709+60

Table 11 – Existing Mainline Lighting Conduit Crossings

Direction of Travel	SR 101L Station	Description
SR 202L Eastbound	391+05	2 inch
SR 202L Eastbound	501+27	2 inch
SR 202L Eastbound	533+70	2 inch
SR 202L Eastbound	538+00	2 inch
SR 202L Eastbound	566+30	2 inch
SR 202L Eastbound	603+52	2 inch
SR 202L Eastbound	658+50	2 inch
SR 202L Eastbound	695+72	2 inch
SR 202L Westbound	434+20	2 inch
SR 202L Westbound	482+23	2 inch
SR 202L Westbound	501+27	2 inch
SR 202L Westbound	533+70	2 inch
SR 202L Westbound	538+00	2 inch
SR 202L Westbound	566+30	2 inch
SR 202L Westbound	603+52	2 inch
SR 202L Westbound	658+50	2 inch

1.3.9 Freeway Management System

The existing Freeway Management System (FMS) currently consists of ramp meters at various entrance ramps, and vehicle detectors at the locations shown in Table 12.

Table 12 – Existing FMS System Components

Direction of Travel	SR 202L Station	FMS Element
Eastbound	394+00	System Loops
Eastbound	430+30	System Loops
Eastbound	430+60	Ramp Meter
Eastbound	447+50	System Loops

Table 12 – Existing FMS System Components (continued)

Direction of Travel	SR 202L Station	FMS Element
Eastbound	482+09	System Loops
Eastbound	501+60	System Loops
Eastbound	525+75	Conduit Crossing
Eastbound	549+33	System Loops
Eastbound	549+33	Ramp Meter
Eastbound	586+60	Conduit Crossing
Eastbound	598+96	System Loops
Eastbound	615+15	System Loops
Eastbound	647+45	System Loops
Eastbound	710+28	System Loops
Westbound	371+49	System Loops
Westbound	394+45	System Loops
Westbound	413+60	System Loops
Westbound	413+60	Ramp Meter
Westbound	447+50	System Loops
Westbound	462+65	System Loops
Westbound	481+70	System Loops
Westbound	499+17	System Loops
Westbound	526+26	System Loops
Westbound	552+63	System Loops
Westbound	586+28	System Loops
Westbound	620+20	System Loops
Westbound	635+90	System Loops
Westbound	686+20	Ramp Meter
Westbound	686+82	System Loops

Construction of the FMS Phase 6C (Project No. 202L MA 009, TRACS. No. H7490 01C) is underway to upgrade the FMS system between SR 101L and Gilbert Road. This project will incorporate Dynamic Message Signs (DMS) and Closed Circuit Television (CCTV) cameras into the SR 202L FMS system at the locations shown in Table 13.

Table 13 – FMS Phase 6C System Components

Direction of Travel	SR 202L Station	FMS Element
Eastbound	371+00	System Loops
Eastbound	371+34	Conduit Crossing
Eastbound	394+00	Piezoelectric Sensors
Eastbound	414+90	Conduit Crossing
Eastbound	415+00	DMS, Controller Cabinet
Eastbound	415+00	Controller Cabinet
Eastbound	421+00	Conduit Crossing
Eastbound	423+50	CCTV, Controller Cabinet
Eastbound	427+50	Conduit Crossing
Eastbound	427+50	Controller Cabinet
Eastbound	447+50	Piezoelectric Sensors
Eastbound	472+30	Conduit Crossing

Table 13 – FMS Phase 6C System Components (continued)

Direction of Travel	SR 202L Station	FMS Element
Eastbound	478+50	Controller Cabinet
Eastbound	501+60	Piezoelectric Sensors
Eastbound	508+50	Conduit Crossing
Eastbound	508+65	Conduit Crossing
Eastbound	525+25	Conduit Crossing
Eastbound	535+10	Conduit Crossing
Eastbound	537+30	CCTV, Controller Cabinet, 4.9 GHZ Antenna
Eastbound	541+00	Controller Cabinet, 900 MHZ YAGI Antenna, Conduit Crossing
Eastbound	566+50	CCTV, Controller Cabinet, 4.9 GHZ Antenna
Eastbound	599+00	Controller Cabinet, 4.9 GHZ Antenna
Eastbound	603+00	Conduit Crossing
Eastbound	622+45	DMS, Controller Cabinet, 900 MHZ YAGI Antenna
Eastbound	635+50	Conduit Crossing
Eastbound	647+40	Controller Cabinet, 900 MHZ YAGI Antenna
Eastbound	657+00	CCTV, Controller Cabinet, 4.9 GHZ Antenna
Eastbound	686+00	Conduit Crossing
Eastbound	710+25	Controller Cabinet, 900 MHZ YAGI Antenna
Eastbound	712+50	CCTV, Controller Cabinet, 4.9 GHZ Antenna
Eastbound	712+95	Load Center Cabinet
Westbound	371+34	Controller Cabinet
Westbound	394+50	Piezoelectric Sensors
Westbound	419+20	Controller Cabinet
Westbound	448+50	Piezoelectric Sensors
Westbound	467+60	Controller Cabinet
Westbound	471+40	CCTV, Controller Cabinet,
Westbound	481+70	Piezoelectric Sensors
Westbound	505+00	Controller Cabinet
Westbound	509+50	CCTV, Controller Cabinet
Westbound	512+65	DMS, Controller Cabinet,
Westbound	531+00	Controller Cabinet
Westbound	586+30	Controller Cabinet, 900 MHZ YAGI Antenna
Westbound	604+00	CCTV, Controller Cabinet, (2) 4.9 GHZ Antenna
Westbound	635+90	Controller Cabinet, 900 MHZ YAGI Antenna
Westbound	636+20	DMS, Controller Cabinet
Westbound	689+10	Controller Cabinet, 900 MHZ YAGI Antenna

This project will also construct new fiber-optic trunk lines along the south right-of-way line for existing and future communications to the Traffic Operations Center (TOC). The City of Mesa will also place fiber optic telecommunication lines within the new duct bank between SR 101L and Country Club Drive.

1.3.10 Geotechnical Conditions

The subsurface conditions for this segment of SR 202L were determined based on review of as-built plans and available geotechnical investigation reports of the various projects completed along SR 202L within the study limits.

The project site is located in the Basin and Range Geologic Province of the southwestern United States. The Basin and Range Province is characterized by a modern landscape consisting of

broad alluvial valleys interspersed with and bounded by uplifted and fault-block mountain ranges, often with well-developed pediments and alluvial fans. Generally, the mountain ranges and valleys trend in a north-south to northwest-southeast direction. The modern landscape was formed by late Tertiary (Miocene-Pliocene) extensional tectonism and high-angle normal faulting followed by subsequent erosion of the uplifted mountains and depositions of the sediments in the newly-formed basins.

The Salt River sediments comprise the approximate upper 100' to 150' of the section. The upper layer of the Salt River sediments, mainly consisting of sand, gravel and cobble (locally referred to as SGC) were formed by the broad ancestral meandering, incising and infilling of paleochannels originating in the mountains upstream (east) of the project limits. The SGC deposit is known to extend to depths of 150' or more at the western terminus of the project. Most of the SGC is non-plastic and uncemented, though it does contain isolated lenses or layers (generally at depth) with higher percentages of low to medium plastic fines. The upper 5' to 10' of this stratum also locally consists of weakly to moderately cemented calcium carbonate. Though much of the SGC layer is exposed within the active Salt River channel, a large portion of this deposit at and beyond the stream banks is overlain by a more recent (Quaternary Age) alluvial deposit of silt, sand, and clay with minor gravels. These sediments, at depth, are often well consolidated and, in many locales, are slightly indurated.

From an engineering standpoint, the general subgrade conditions can be grouped into the soils present to the east and west of Mesa Drive. The subgrade materials encountered from Mesa Drive (heading east) to Gilbert Road within the original test borings generally consist of firm to hard, fine grained, sandy clay soils with occasional silty to clayey sand layers to depths of 6' to 13'. Plasticity is variable with the more silty layers being generally non-plastic to low in plasticity and clay layers being medium to high in plasticity. The cementation of the soils varies between layers from un-cemented to moderately cemented with occasional strongly cemented layers. Below the depths of 6' to 13' sandy gravel with varying amounts of cobbles and boulders (SGC) was encountered. These soils are generally very dense, non-plastic, and un-cemented. These soils were present to the full depth of exploration. The subgrade materials encountered from Mesa Drive (heading west) to the SR 101L within the original test borings generally consist of fill soils consisting of very loose to very dense sandy gravel, silty sandy gravel, and silty sand were encountered to depths of 3' to 45' at Country Club Drive TIOP, McKellips Road TIOP, and Alma School Road TIOP. The deepest fill was encountered at Alma School Road TIOP, and the shallowest was encountered at Country Club Drive TIOP. These soils are generally very loose to very dense and non-plastic to low in plasticity. Below the fill soils, or starting at the ground surface in areas where fill was not encountered, medium dense to dense fine grained silty sand with occasional layers of soft to moderately firm sandy silt or sandy clay was encountered to depths of 7.5' to 42'. Plasticity is variable with the more silty layers being generally non-plastic to low in plasticity and the clay layers are generally medium to high in plasticity. The cementation of the soils varies between layers from un-cemented to moderately cemented with occasional strongly cemented layers. Sandy gravel with varying amounts of cobbles and boulders (SGC) was encountered below the depths of 7.5' to 45' extending to the termination depth in all of the test borings. The SGC is generally very dense, non-plastic, and un-cemented.

These fair quality subgrade soils may require over excavation or mitigation techniques. See Section 4.12.3 for additional information regarding subgrade soils.

Groundwater was encountered within numerous test borings advanced in the vicinity of the SR 101L/SR 202 TI. Borings advanced encountered water at depths ranging from 40' and 116'. Most of the water encountered above 65' was considered to be perched groundwater which is believed to be the result of past irrigation of farm fields in the near vicinity.

1.3.11 Existing Pavement Structural Sections

As-built plans were reviewed to inventory the existing mainline pavement sections. The typical mainline and HOV pavement section consists of asphalt rubber-asphalt concrete friction course (AR-ACFC) over portland cement concrete pavement (PCCP) over aggregate base (AB) (Class 2) or asphalt concrete base (ACB). ACB is typically substituted for AB in areas of depressed roadways.

In some areas, with poor subgrade soils a combination of both ACB and AB were used. The poor subgrade materials were overexcavated and replaced with structural backfill. The pavement in the overexcavation areas consisted of AR-ACFC over continuously reinforced concrete pavement (CRCP) over ACB. For construction of the HOV lanes the area between Station 591+40 and Station 594+25 was overexcavated to a depth of 3.5 feet and backfilled with structural fill and layers of geogrid.

The existing pavement structural sections are summarized in Table 14.

Table 14 – Existing Pavement Structural Sections

Project Segment	Item	AR-ACFC (in)	PCCP (in)	AC (¾) (in)	AB (Class 2) (in)	ACB (in)	Total Thickness (in)
SR 202L, SR 101L to Country Club Drive	Mainline & Outside shoulders Sta. 352+00 to Sta. 399+10; Sta. 412+25 to Sta. 433+49; Sta. 462+27 to Sta. 482+54	1.0	12.5	-	4.0	-	17.5
	Outside shoulders (excluding above areas), Auxiliary lanes, Ramps, McKellips Road Ramp B (inside)	1.0	10.0	-	4.0	-	15.0
	McKellips Road Ramp B (outside)	1.0	-	6.0	7.0	-	14.0
SR 202L, Country Club Drive to Gilbert Road	Mainline & outside shoulders Sta. 523+05 to Sta. 556+00 Sta. 585+40 to Sta. 593+00	1.0	11.5	-	4.0	-	16.5
	Mainline & outside shoulders Sta. 556+00 to Sta. 585+40 Sta. 593+00 to Sta. 696+50	1.0	11.5	-	3.0	3.0	18.5
	Mainline & outside shoulders Sta. 696+50 to Sta. 731+00	1.0	12.0	-	-	4.0	17.0
	Ramps and gores	1.0	10.0	-	4.0	-	15.0

Table 14 – Existing Pavement Structural Sections (continued)

Project Segment	Item	AR-ACFC (in)	PCCP (in)	AC (¾) (in)	AB (Class 2) (in)	ACB (in)	Total Thickness (in)
SR 202L, SR 101L to Gilbert Road	HOV Lanes & inside shoulders Sta. 362+00 to Sta. 533+85	1.0	12.5	-	4.0	-	17.5
	HOV Lanes & inside shoulders Sta. 533+85 to Sta. 556+00 Sta. 585+40 to Sta. 591+40	1.0	11.5	-	4.0	-	16.5
	HOV Lanes & inside shoulders Sta. 556+00 to Sta. 585+40 Sta. 594+25 to Sta. 710+98	1.0	11.5	-	-	4.0	16.5
	HOV Lanes & inside shoulders Sta. 591+40 to Sta. 594+25	1.0	13.0(1)	-	42.0(2)	4.0	60.0

1) CRCP
2) Structural Backfill with Geogrid

1.3.12 Previous Projects

Projects that were previously constructed or designed for future construction within the project limits are shown in Table 15.

Table 15 – Previous Projects

Project Number and/or TRACS Number	Begin Milepost	As-Built/ Design Date	Description
RAM-600-1-512 101L-MA-050 H2220-01C	52.3	1993	Price Road Tunnel Extension and Outfall Channel
RAM-600-8-525 202L-MA-013 H0875-04C	13.5	1996	Construct Roadway Dobson Road Connection
STP-600-8(6)P 202L-MA-013 H0875-02C	13.2	1998	Construct Roadway Loop 101-McKellips Road
STP-600-8(8)P 202L-MA-013 H0875-03C	13.2	1998	Construct Roadway Loop 101-McKellips Road
RAM-600-8-526 202-MA-016 H3878-01C	16.4	1999	Construct Roadway McKellips Road-Country Club Drive
RAM-600-1-518 101L-MA-052 H2413-01C	51.1	1999	Construct TI (Ramps ES, NW) Pima, Red Mt. TI, Phase I
RAM-600-1-536 101-MA-052 H2413-02C	51.1	1999	Construct Roadway and Structures Pima, Red Mountain TI, Phase II, Part A
RAM-600-1-536 101-MA-052 H2413-02C	51.1	1999	Construct Roadway and Structures Pima, Red Mountain TI, Phase II, Part B
RAM-600-1-536 101-MA-052 H2413-02C	51.3	1999	Construct Roadway and Structures Pima, Red Mountain TI, Phase II, Part C
RAM-600-1-525 101L-MA-052 H2414-01C	52.0	1999	Grade, Drain, and Pave Pima, Red Mountain TI, Phase III
RAM-600-1-547 101-MA-52 H4732-01C	52.0	1999	Construct Roadway and Structures Pima, Red Mountain TI, Phase IV

Table 15 – Previous Projects (continued)

Project Number and/or TRACS Number	Begin Milepost	As-Built/ Design Date	Description
TEA-101-C(1)P 101L-MA-052 H4857-01C	7.8	2002	Landscape and Irrigation Pima-Red Mountain TI
ACSTP-600-8(9)B 202L-MA-013 H4921-01C	13.0	2002	Construct Roadway Country Club Drive-Gilbert Road Phase A
ACSTP-600-8-(10)B 202L-MA-017 H5299-01C	16.3	2003	Construct Roadway Gilbert Road-Higley Road
TEA 600-8-(012)P 202L-MA-013 H4921-02C	16.6	2003	Construct Roadway Country Club Drive-Gilbert Road Phase B
RAM-202-B-509 202L-MA-013 H6412-01C	13.9	2004	Construct Walls Center Street-Gilbert Road
STP-202-B(006)B 202-MA-021 H5781-01C	20.8	2008	Construct Roadway Higley Road-Power Road
NH-202-B(201)B 202-MA-009 H7058-01C	9.9	2010	Construct HOV Lanes SR 101L (Pima)-Gilbert Road
IM-202-B(203)B 202-MA-009 H7749-01C	9.6	2011	Sign Rehabilitation 202, MP 9-17 Sign Rehabilitation
202-B(200)A 202-MA-009 H7490-01C	9.9	2011	Construct FMS Phase 6C SR 101L (Pima)-Gilbert Road
City of Mesa Project No. 99-12	10.5	2000	Northwest Water Reclamation Plant Lift Station, Force Main and Effluent Return Line
City of Mesa Project No. 04-067-001	13.8	2009	Pressure Reducing Valve Station (PRV 31) Lehi Road

2.0 TRAFFIC AND CRASH DATA

2.1 CRASH ANALYSIS

The ADOT Traffic Studies Section provided crash data for the segment of the SR 202L corridor between the SR101L/SR202L TI and Gilbert Road. There were a total of 320 reported crashes within the study area between December 1, 2004 and November 30, 2009. Figure 3 (page 16) and Table 16 illustrate the yearly crash summary by freeway segment during this time period. The following is a summary of some key characteristics of the crash data:

- Of the 320 crashes reported, 240 resulted in property damage only (75%), 79 resulted in injuries (25%), and 1 resulted in a fatality (<1%).
- 70% of the crashes involved another motor vehicle while 19% involved a fixed object. These two types of crashes accounted for 89% of the crashes.
- Of the 224 crashes with another motor vehicle, 70% (156 crashes) were rear-end crashes, and 24% (53 crashes) were sideswipe crashes.
- 68% of the crashes occurred during daylight hours, 8% occurred at dusk or dawn, and the remaining 24% occurred during hours of darkness.

Table 16 – Mainline Crash Summary

Freeway Segment	No. of Crashes (February 2005 – December 2009)	Crash Rate (2005 – 2009) (Crash/Million Vehicle Miles)
Eastbound SR 202L		
SR 101 to Dobson Road	19	0.12
Dobson Road to Alma School Road	86	0.74
Alma School Road to Country Club Drive	6	0.05
Country Club Drive to Gilbert Road	7	0.03
Westbound SR 202L		
Gilbert Road to Country Club Drive	6	0.02
Country Club Drive to Alma School Road	24	0.18
Alma School Road to Dobson Road	130	1.12
Dobson Road to SR 101L	42	0.27

According to the *Regional Freeway Bottleneck Study* (Maricopa Association of Governments, 2006), the average crash rate on the Regional Freeway System was 0.78 accidents per million vehicle miles in 2000. This study also documented the 75th percentile as 1.41 crashes per million vehicle miles. Only one of the calculated segment rates is more than the average crash rate, and all eight of the segments are below the 75th percentile.

This evaluation indicates that 53% of the crashes on this segment of the SR 202L corridor occur during the A.M. and P.M. peak periods with 74% of these crashes being rear-end crashes. This type of crash is commonly associated with congested traffic conditions. Providing additional freeway capacity may reduce the level of congestion and provide a better balanced level-of-service throughout the corridor, which may reduce these crash rates.

2.2 EXISTING TRAFFIC CONDITIONS

Historical traffic count data was obtained from ADOT Multimodal Planning Division (MPD) for years 2008 and 2009. In addition, SR 202L mainline traffic counts were conducted at several locations within the study area in September 2010. The existing Average Daily Traffic (ADT) and peak hour volumes are shown on Figure 4 (pages 19 to 21).

Since vehicles can enter/exit the HOV lanes at any given point throughout the corridor, the mainline volumes include an estimate of the ingress and egress of vehicles from the HOV lanes. Therefore, the volumes shown in Figure 4 do not balance between the entrance and exit ramps. Detailed data on traffic volumes can be found in Appendix A of the Traffic Report.

The existing SR 202L mainline daily traffic volumes vary within the study area from approximately 119,500 vehicles per day (vpd) at the west end (SR101L/SR202L TI to Dobson Road) to approximately 76,300 vpd at the east end (Gilbert Road). The McKellips Road ramps have the highest traffic volumes (10,200 – 13,000 vpd).

The traffic factors shown in Table 17 are based on traffic counts that were obtained in September 2010. The portion of ADT occurring within the peak hour is approximately 8 to 9%, the directional distribution is approximately 70 to 80% in the peak direction of travel, and approximately 6% of the daily traffic is classified as commercial vehicles (trucks).

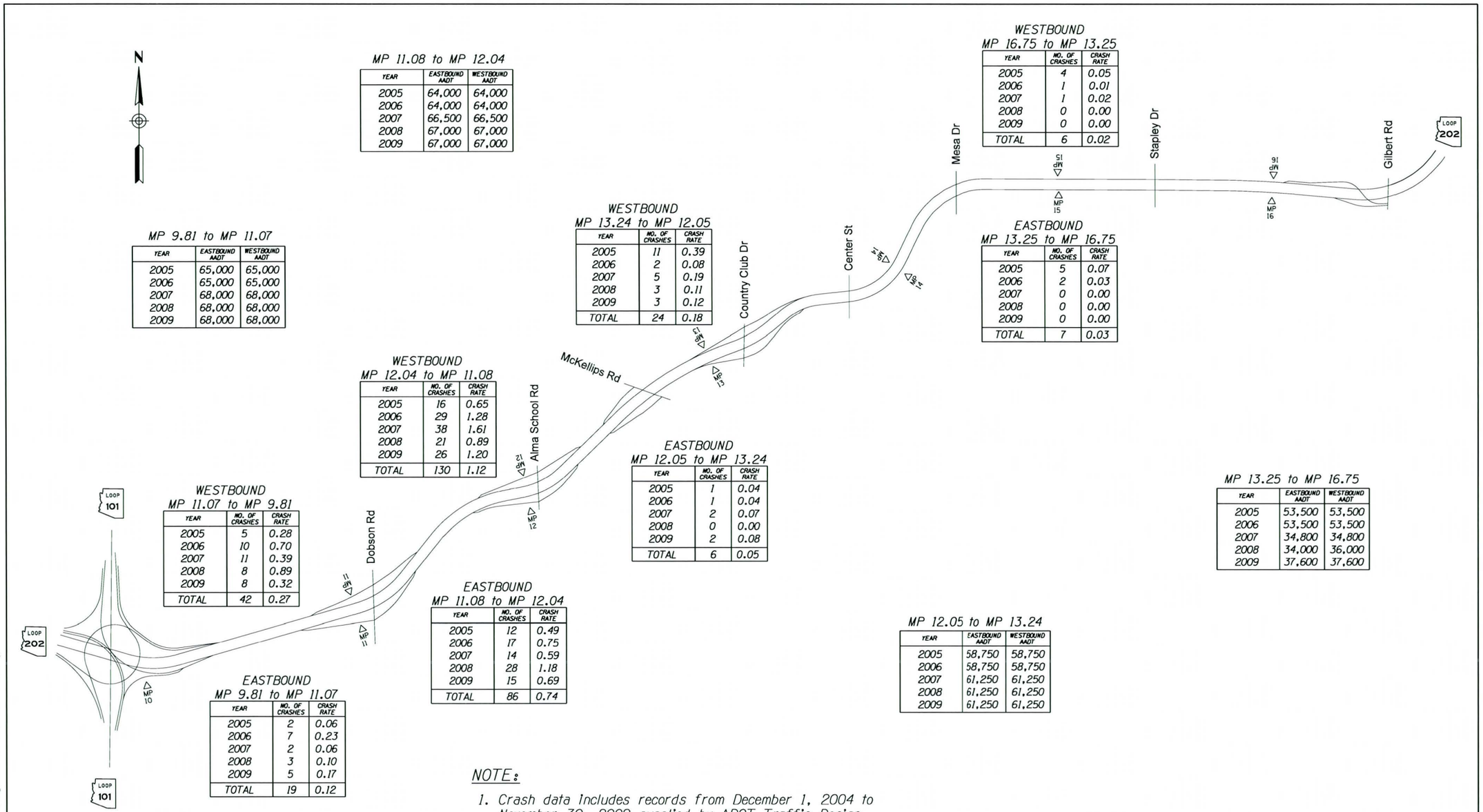
The traffic factors listed in the ADOT MPD Roadway Inventory Management Section from 2008 and 2009 generally agree with these percentages. However, the daily truck traffic listed is slightly lower with 3% daily commercial vehicles.

Table 17 – Mainline Traffic Factors

	A.M. Peak Hour			P.M. Peak Hour		
	K value	Directional Split		K value	Directional Split	
		NB/WB	SB/EB		NB/WB	SB/EB
Within SR 101L Interchange	8%	78%	22%	9%	26%	74%
SR 101 – Dobson Road	7%	72%	28%	9%	27%	73%
Alma School Road – McKellips Road	8%	76%	24%	9%	29%	71%
Country Club Drive – Gilbert Road	9%	82%	18%	9%	24%	76%

Source: September 2010 Traffic Counts

(Text continued on page 17)



MP 11.08 to MP 12.04

YEAR	EASTBOUND AADT	WESTBOUND AADT
2005	64,000	64,000
2006	64,000	64,000
2007	66,500	66,500
2008	67,000	67,000
2009	67,000	67,000

MP 9.81 to MP 11.07

YEAR	EASTBOUND AADT	WESTBOUND AADT
2005	65,000	65,000
2006	65,000	65,000
2007	68,000	68,000
2008	68,000	68,000
2009	68,000	68,000

WESTBOUND
MP 13.24 to MP 12.05

YEAR	NO. OF CRASHES	CRASH RATE
2005	11	0.39
2006	2	0.08
2007	5	0.19
2008	3	0.11
2009	3	0.12
TOTAL	24	0.18

WESTBOUND
MP 16.75 to MP 13.25

YEAR	NO. OF CRASHES	CRASH RATE
2005	4	0.05
2006	1	0.01
2007	1	0.02
2008	0	0.00
2009	0	0.00
TOTAL	6	0.02

EASTBOUND
MP 13.25 to MP 16.75

YEAR	NO. OF CRASHES	CRASH RATE
2005	5	0.07
2006	2	0.03
2007	0	0.00
2008	0	0.00
2009	0	0.00
TOTAL	7	0.03

WESTBOUND
MP 12.04 to MP 11.08

YEAR	NO. OF CRASHES	CRASH RATE
2005	16	0.65
2006	29	1.28
2007	38	1.61
2008	21	0.89
2009	26	1.20
TOTAL	130	1.12

EASTBOUND
MP 12.05 to MP 13.24

YEAR	NO. OF CRASHES	CRASH RATE
2005	1	0.04
2006	1	0.04
2007	2	0.07
2008	0	0.00
2009	2	0.08
TOTAL	6	0.05

MP 13.25 to MP 16.75

YEAR	EASTBOUND AADT	WESTBOUND AADT
2005	53,500	53,500
2006	53,500	53,500
2007	34,800	34,800
2008	34,000	36,000
2009	37,600	37,600

WESTBOUND
MP 11.07 to MP 9.81

YEAR	NO. OF CRASHES	CRASH RATE
2005	5	0.28
2006	10	0.70
2007	11	0.39
2008	8	0.89
2009	8	0.32
TOTAL	42	0.27

EASTBOUND
MP 11.08 to MP 12.04

YEAR	NO. OF CRASHES	CRASH RATE
2005	12	0.49
2006	17	0.75
2007	14	0.59
2008	28	1.18
2009	15	0.69
TOTAL	86	0.74

EASTBOUND
MP 9.81 to MP 11.07

YEAR	NO. OF CRASHES	CRASH RATE
2005	2	0.06
2006	7	0.23
2007	2	0.06
2008	3	0.10
2009	5	0.17
TOTAL	19	0.12

MP 12.05 to MP 13.24

YEAR	EASTBOUND AADT	WESTBOUND AADT
2005	58,750	58,750
2006	58,750	58,750
2007	61,250	61,250
2008	61,250	61,250
2009	61,250	61,250

NOTE:

1. Crash data includes records from December 1, 2004 to November 30, 2009 supplied by ADOT Traffic Design.
2. Traffic volume data from 2005-2009 was obtained from the ADOT MPD Roadway Inventory Management Section.
3. Crash Rate is per million vehicle miles.

NOT TO SCALE - SCHEMATIC ONLY

SR 202L
SR101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 3
YEARLY CRASH SUMMARY

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5/31/2012

2.3 FUTURE TRAFFIC CONDITIONS

2.3.1 Description of Alternatives

This design concept study evaluated the No-Build and SR 202L Widening Build Alternatives. The No-Build Alternative would not include any improvements to this segment of the SR 202L corridor.

The Build Alternative would provide additional freeway capacity by constructing the following improvements:

- Add one general-purpose lane in the eastbound and westbound directions from the SR101L/SR202L TI to Gilbert Road
- Add an auxiliary lane in the eastbound direction between the Alma School Road entrance ramp and the Country Club Drive exit ramp

2.3.2 Traffic Volume Projections

MAG provided traffic volume projections for Design Year 2035. MAG maintains a regional traffic forecasting model to develop future traffic volume projections based on projected socio-economic, population, employment, origin-destination, and other regionally based data. The output from the model includes daily, peak period, and peak hour traffic volumes for general-purpose and HOV lanes for the regional freeway system.

Network simulation output was provided by MAG for the No-Build and Build Alternatives. The 2035 model includes all transportation system improvements identified in the RTP through year 2031. The 2035 traffic volume projections that were received from MAG were post-processed in accordance with the procedures recommended by MAG. Once the post-processing was completed, the final 2035 traffic volume projections were reviewed by MAG staff.

The 2035 traffic volume projections for the No-Build Alternative are shown in Figure 5 (pages 22 to 24). The 2035 traffic volume projections for the Build Alternatives are shown in Figure 6 (pages 25 to 27). The Build Alternatives evaluated in Section 3 have the same lane configuration with the only differences being in lane and shoulder widths.

2.4 OPERATIONAL ANALYSIS

Traffic operational analyses were conducted for the Existing Condition, No-Build Alternative, and the Build Alternatives. The following sections describe the analysis methodology and evaluation results.

2.4.1 Analysis Methodology

An operational analysis was performed for all segments of the mainline, general-purpose lanes, ramp junctions, and weave sections for the existing conditions, No-Build, and the Build Alternative. The CORSIM computer program was used to provide a simulation of the entire freeway system within the study area. CORSIM is a microscopic traffic simulation program that uses roadway geometry and traffic volume inputs to simulate operations of an entire freeway network. CORSIM has the ability to provide various measures of effectiveness for each link within the system. The vehicle density and speed outputs from CORSIM were used as the measure of effectiveness to relate to a level-of-service as established by the Highway Capacity Manual (HCM).

The concept of level-of-service (LOS) uses qualitative measures that characterize operational conditions within a stream of traffic. The descriptions of individual levels-of-service characterize these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience. Six levels of service are defined for each type of facility for which the analytical procedures are available. They are given letter designations from 'A' to 'F', with LOS 'A' representing the best operational conditions and LOS 'F' representing an over-capacity condition with a high degree of congestion. Each level of service represents a range of operating conditions.

Table 18 depicts the vehicle densities (vehicles per mile per lane) and corresponding levels-of-service established in the HCM.

Table 18 – Vehicle Densities and Corresponding Levels-of-Service

Level-of-Service	Density Range (pc/mi/ln)
A	0-11
B	>11-18
C	>18-26
D	>26-35
E	>35-45
F	>45

Source: 2000 HCM, pg. 23-3

In order to verify the CORSIM output, additional analyses were performed using the Highway Capacity Software (HCS), which uses the procedures from the 2000 Highway Capacity Manual (HCM) to provide the traffic operational characteristics in terms of level-of-service. One of the major disadvantages of using HCS for analyzing a major freeway network is that it does not address the cumulative effects of delay on an entire system. HCS only allows for the evaluation of a single location within an overall system and does not take into account the effects of conditions upstream and downstream. For example, a severe upstream bottleneck may limit the amount of traffic reaching a downstream location. Similarly, a severe downstream bottleneck may cause queuing to such an extent that it effects an upstream location. Therefore, CORSIM was used to evaluate the entire system and HCS was used to verify the CORSIM results.

The following CORSIM model input assumptions were used for the operational analysis:

- Free flow speed of 65 mph for the mainline general-purpose lanes
- Free flow speed of 55 mph for the system interchange ramps
- Free flow speed of 50 mph for the service interchange ramps
- Commercial vehicle percentage was assumed to be 5% during peak hours

The commercial vehicle percentage is based on recent experience in observing the existing traffic conditions and performing operational analysis for projects on the Regional Freeway System, and not on the existing ADOT count data. The ADOT MPD Roadway Inventory Management Section indicates that 3% of the daily traffic is classified as commercial vehicles. However, the recent traffic counts indicate that roughly 5% of the vehicles in the peak hour would be classified as commercial vehicles. Therefore the 5% default suggested by the Highway Capacity Manual was used for the operational analysis.

Since the objective of this study is to evaluate capacity improvements for the SR 202L mainline, the operational analysis was constrained to the SR 202L mainline general-purpose lanes and ramp junctions. An operational analysis of the service interchanges is not included in this study.

(Text continued on page 28)

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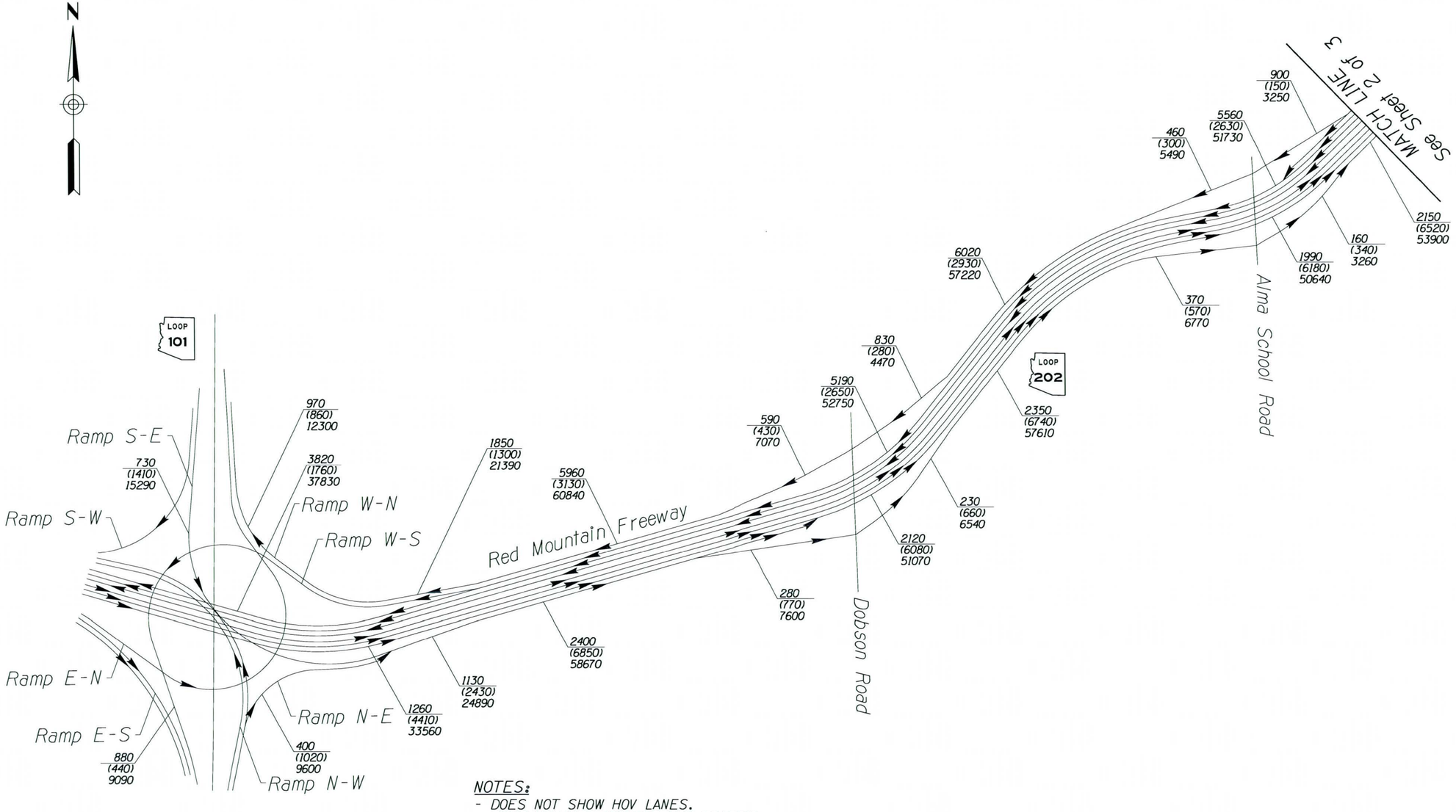

SR 202L
SR 101L to Gilbert Road

AECOM

NOTES:
- DOES NOT SHOW HOV LANES.
- RAMP VOLUMES INCLUDE HOV TRAFFIC.
- MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND
xxx - 2010 AM Peak Hour
(xxx) - 2010 PM Peak Hour
xxxx - 2010 Average Daily Traffic

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

FIGURE 4
2010 EXISTING VOLUMES &
LANE CONFIGURATION
SHEET 1 OF 3

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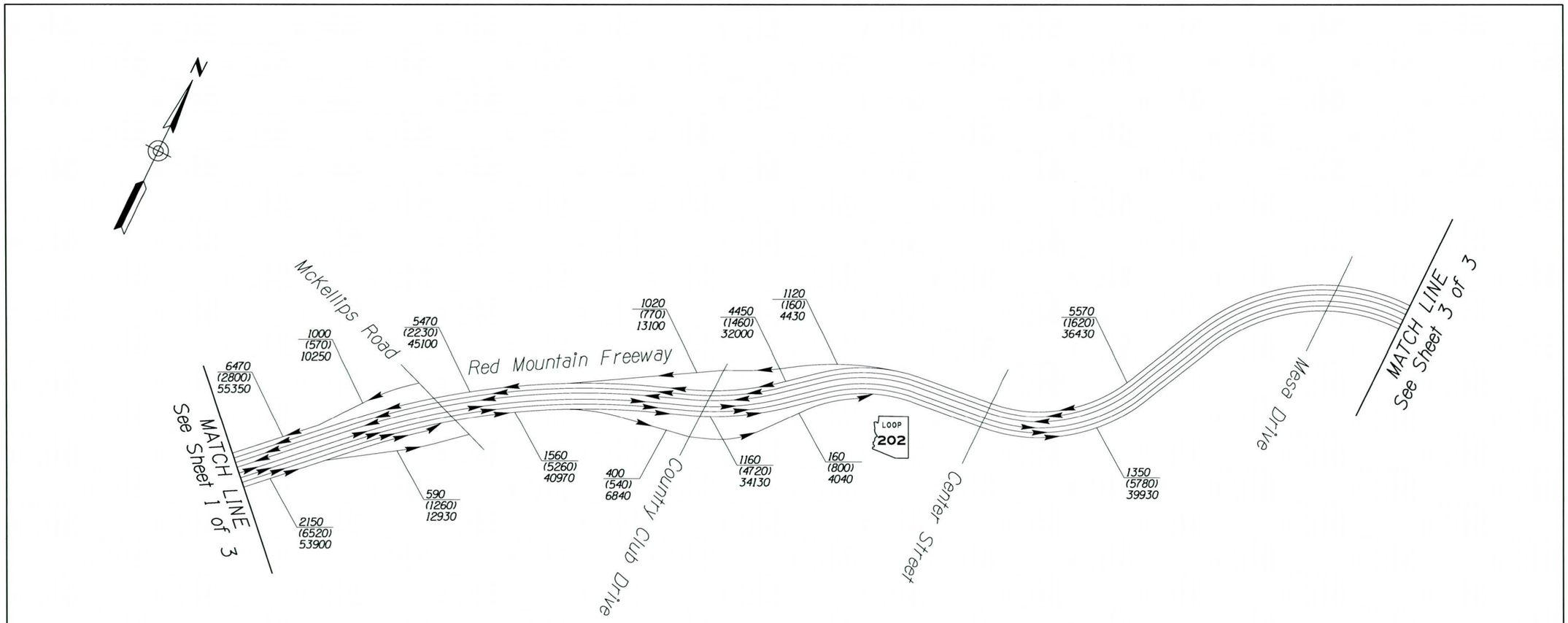

NOTES:
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LEGEND

xxx - 2010 AM Peak Hour
(xxx) - 2010 PM Peak Hour
xxxx - 2010 Average Daily Traffic

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

FIGURE 4
2010 EXISTING VOLUMES &
LANE CONFIGURATION
SHEET 2 OF 3

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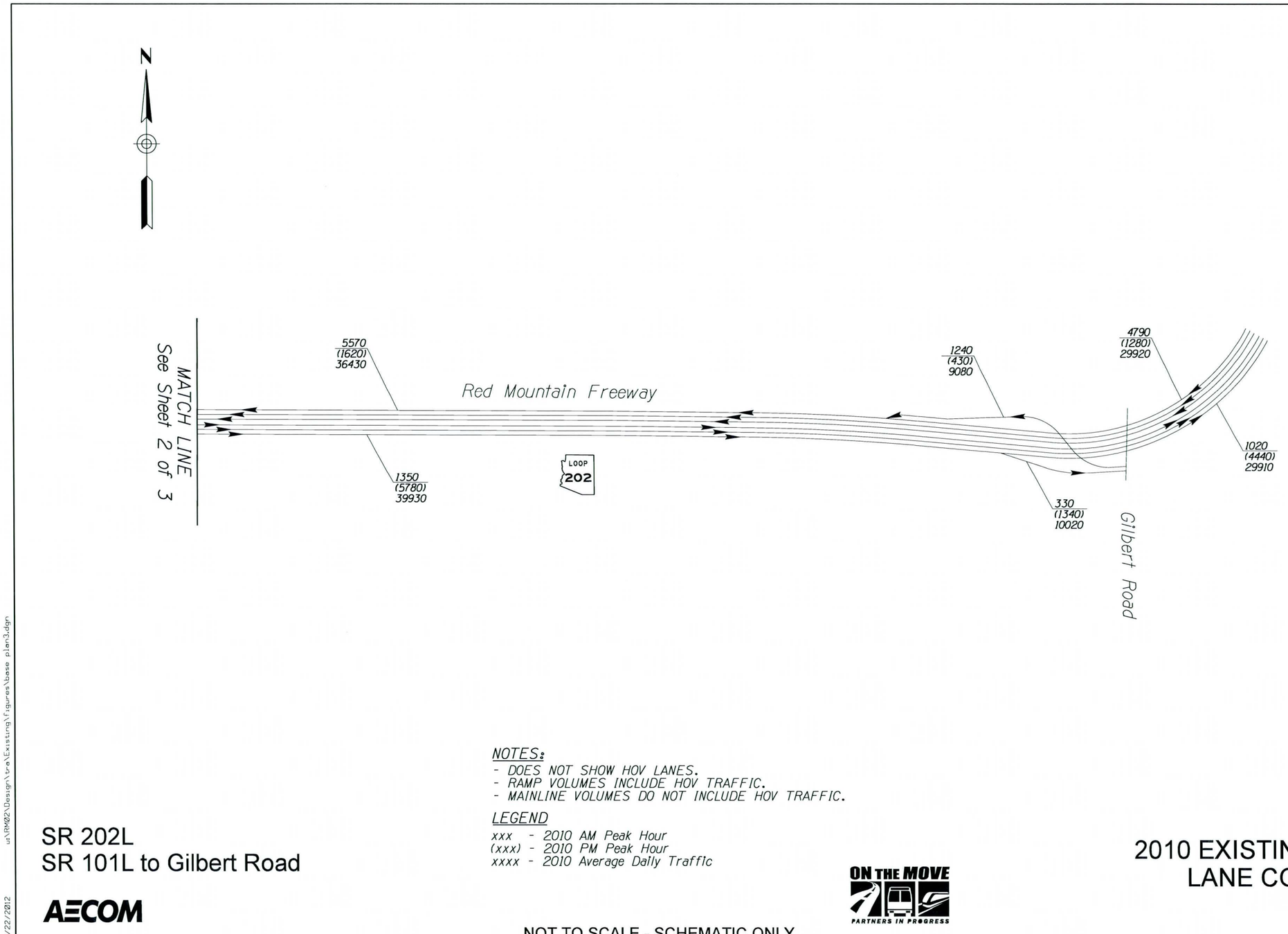
8/22/2012



NOTES:
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- MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND
xxx - 2010 AM Peak Hour
(xxx) - 2010 PM Peak Hour
xxxx - 2010 Average Daily Traffic

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

FIGURE 4
2010 EXISTING VOLUMES &
LANE CONFIGURATION
SHEET 3 OF 3

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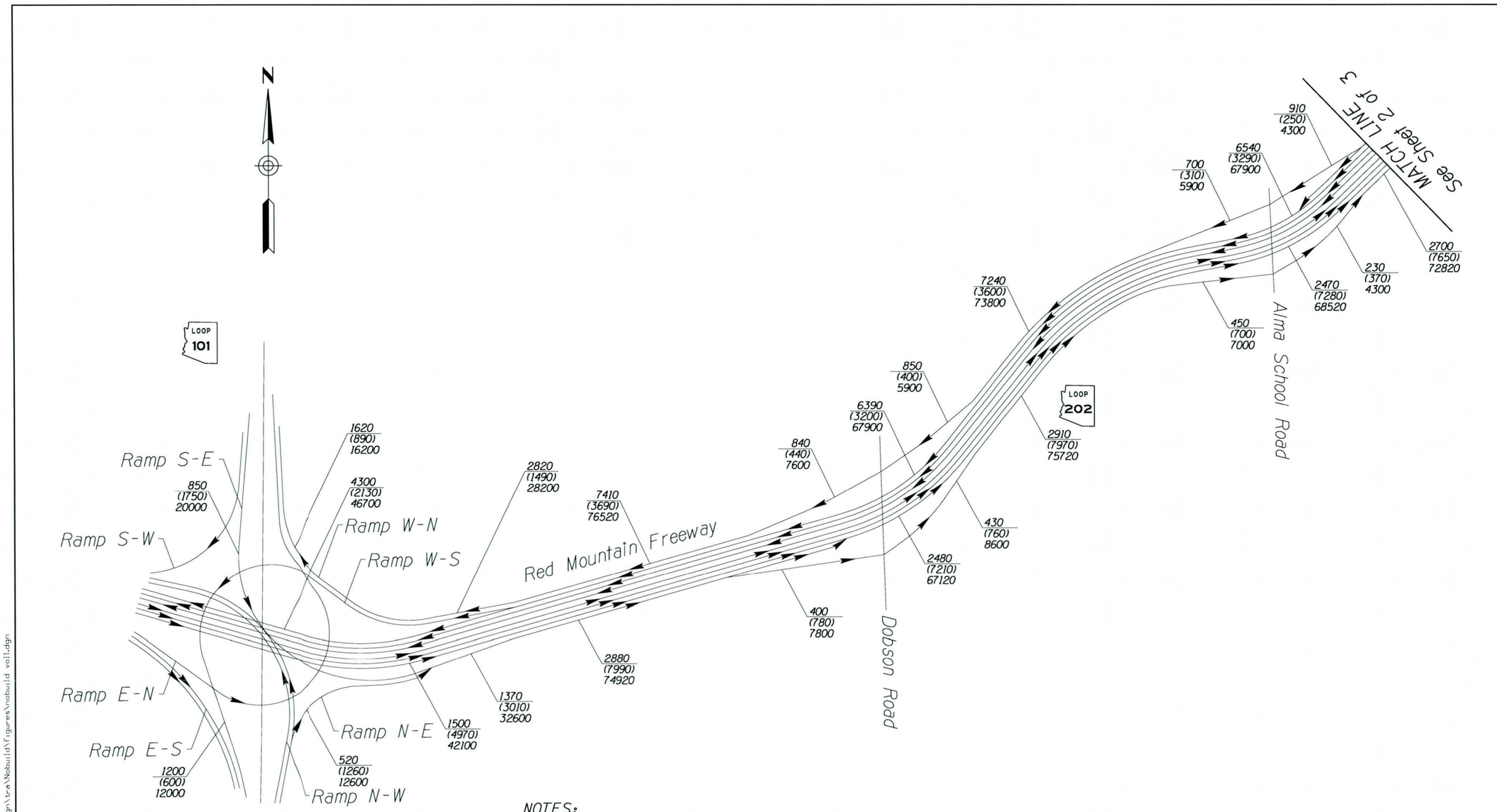

NOTES:
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- MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND
xxx - 2010 AM Peak Hour
(xxx) - 2010 PM Peak Hour
xxxx - 2010 Average Daily Traffic

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

FIGURE 5
NO-BUILD ALTERNATIVE
2035 VOLUMES & LANE CONFIGURATION
SHEET 1 OF 3

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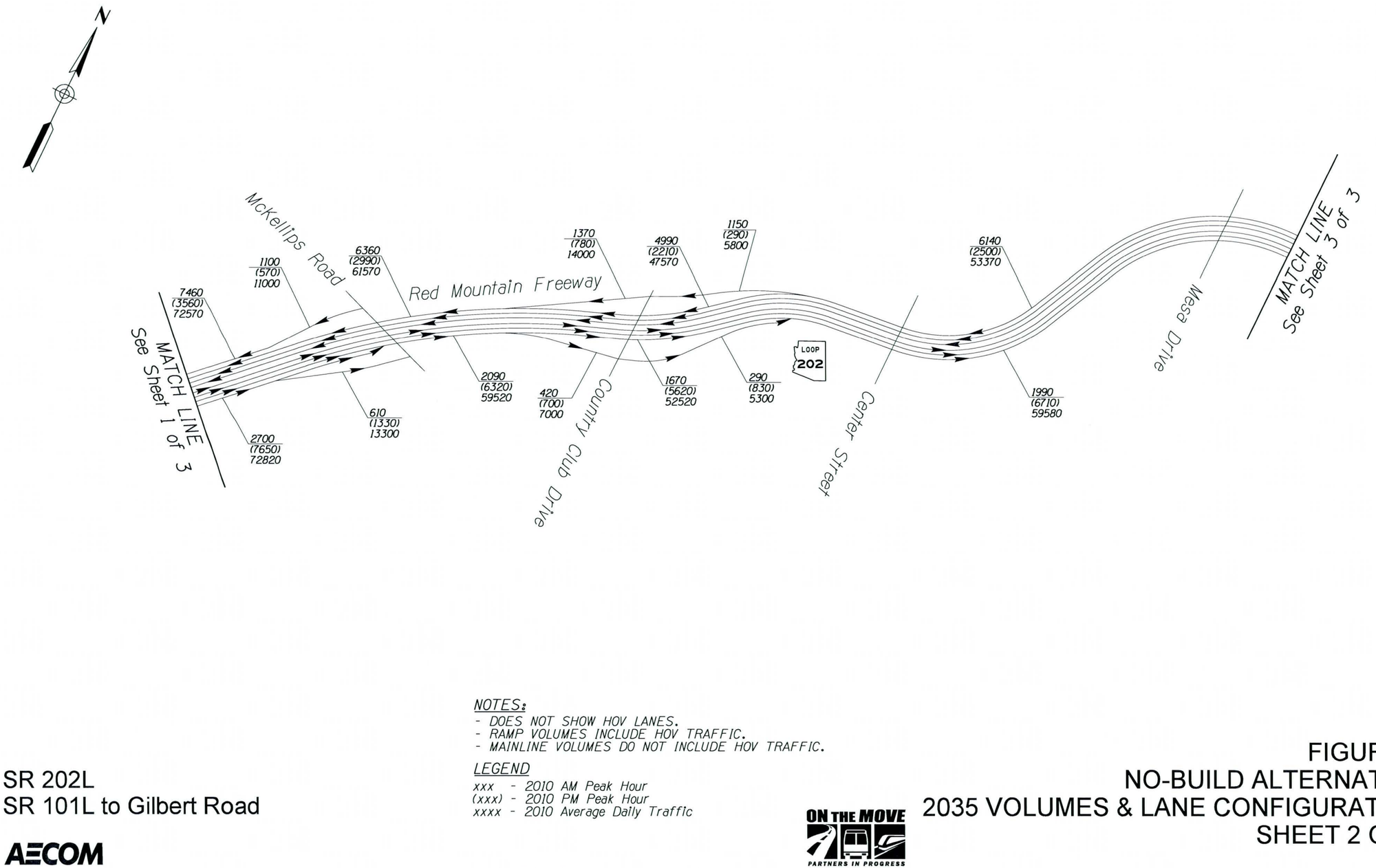

NOTES:
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- *MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.*

LEGEND

xxx - 2010 AM Peak Hour
(xxx) - 2010 PM Peak Hour
xxxx - 2010 Average Daily Traffic

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 5
NO-BUILD ALTERNATIVE
2035 VOLUMES & LANE CONFIGURATION
SHEET 2 OF 3

NOT TO SCALE - SCHEMATIC ONLY

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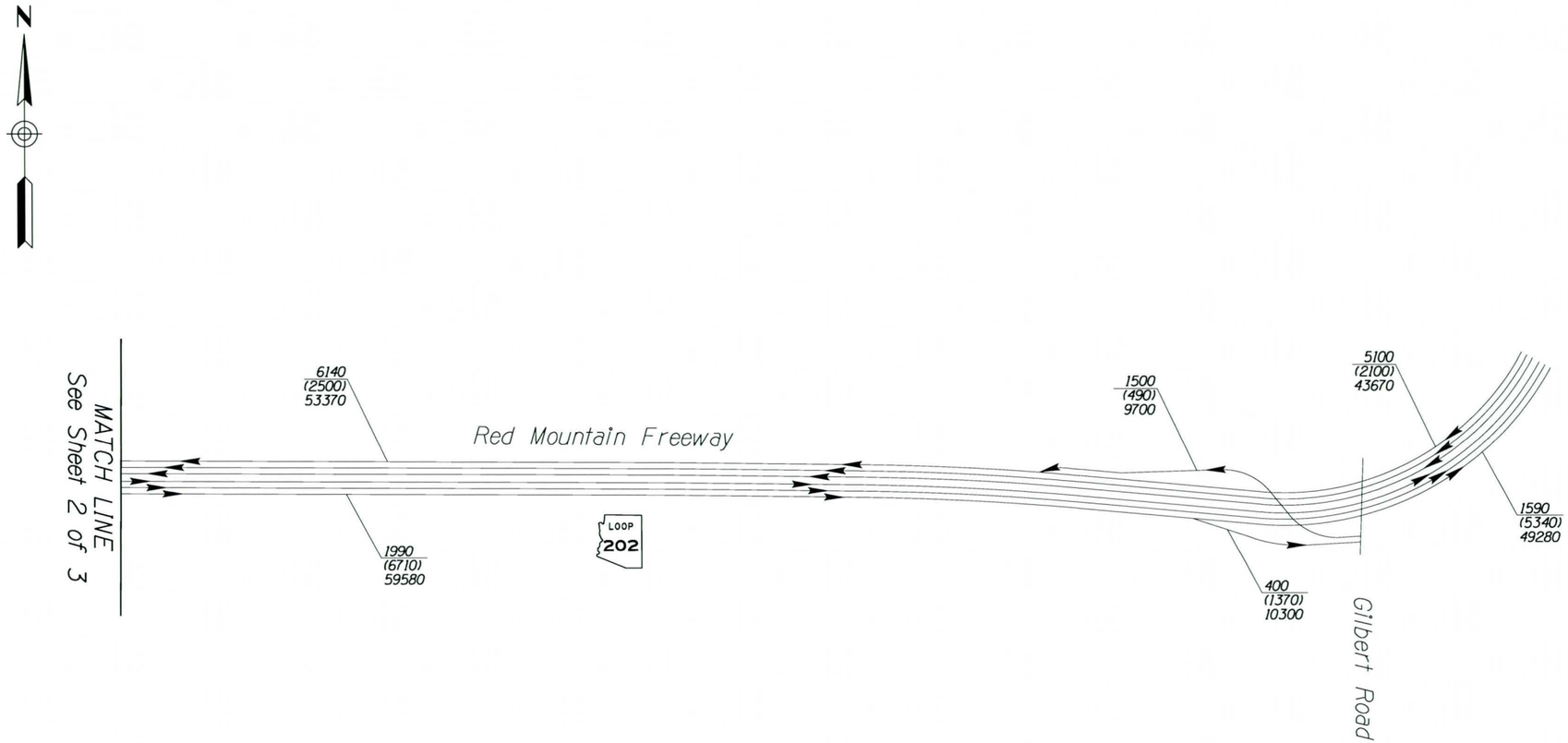

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- MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

xxx - 2010 AM Peak Hour
(xxx) - 2010 PM Peak Hour
xxxx - 2010 Average Daily Traffic

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 5
NO-BUILD ALTERNATIVE
2035 VOLUMES & LANE CONFIGURATION
SHEET 3 OF 3

NOT TO SCALE - SCHEMATIC ONLY

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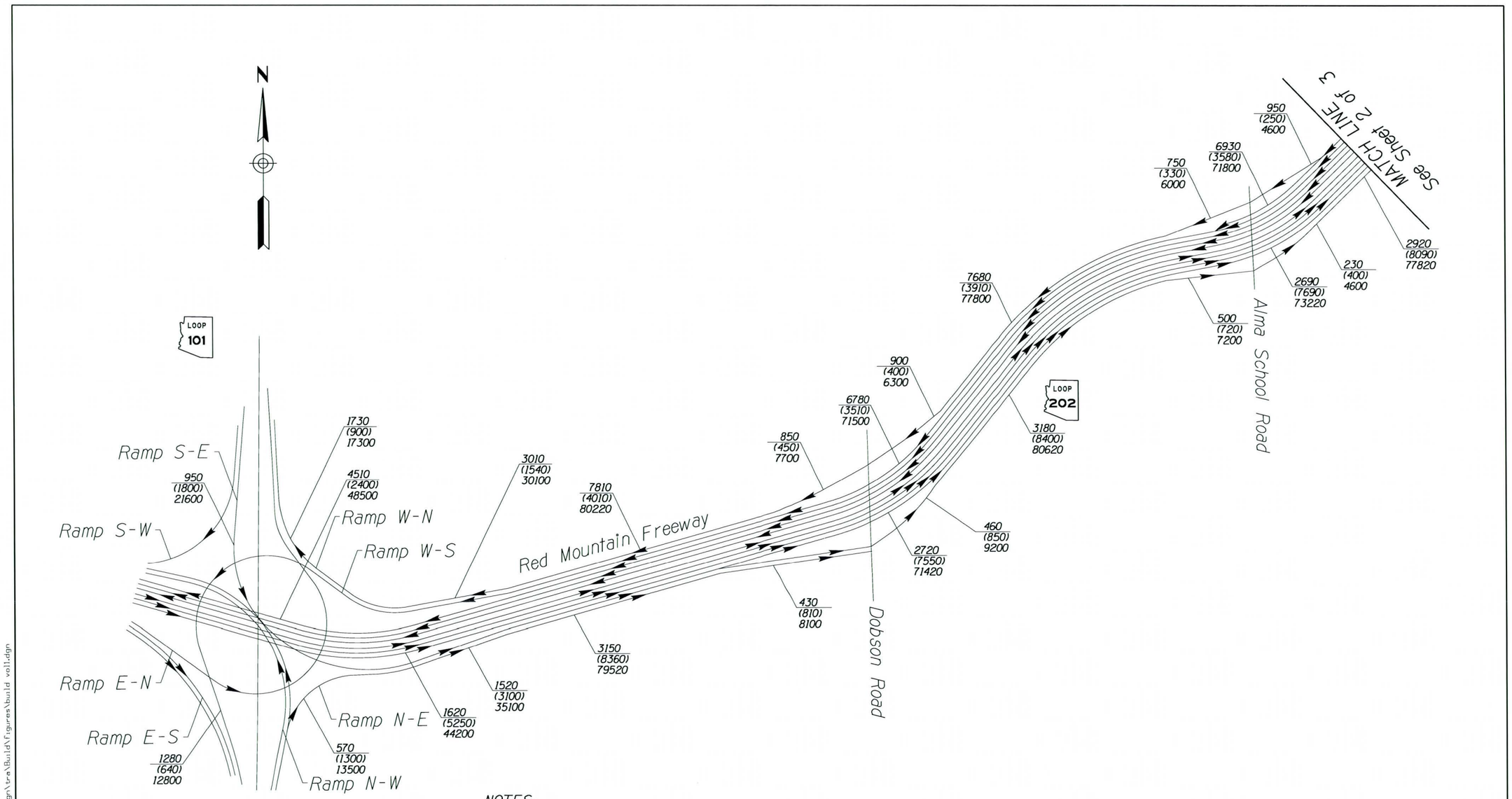

SR 202L
SR 101L to Gilbert Road

AECOM

NOTES:
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- MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND
xxx - 2010 AM Peak Hour
(xxx) - 2010 PM Peak Hour
xxxx - 2010 Average Daily Traffic

NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 6
BUILD ALTERNATIVE
2035 VOLUMES & LANE CONFIGURATION
SHEET 1 OF 3

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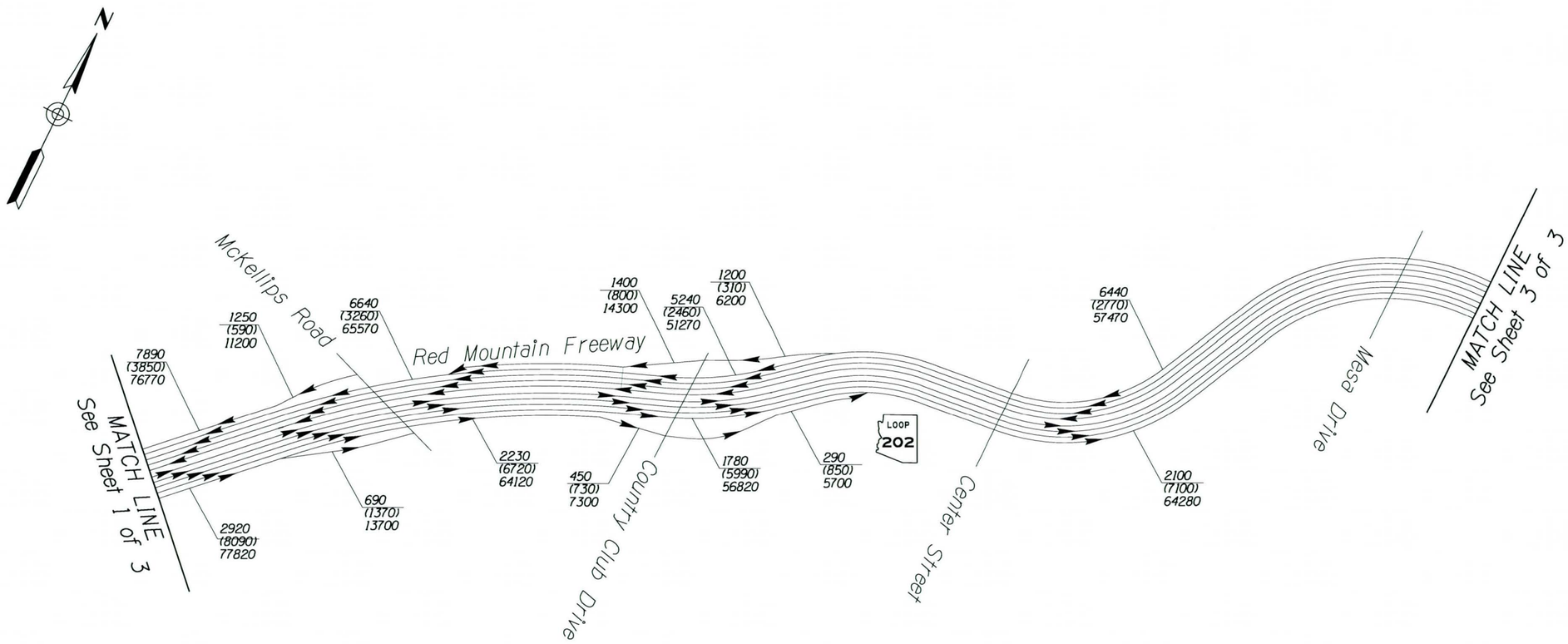

NOTES:
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- MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

xxx - 2010 AM Peak Hour
(xxx) - 2010 PM Peak Hour
xxxx - 2010 Average Daily Traffic

SR 202L
SR 101L to Gilbert Road

AECOM

NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 6
BUILD ALTERNATIVE
2035 VOLUMES & LANE CONFIGURATION
SHEET 2 OF 3

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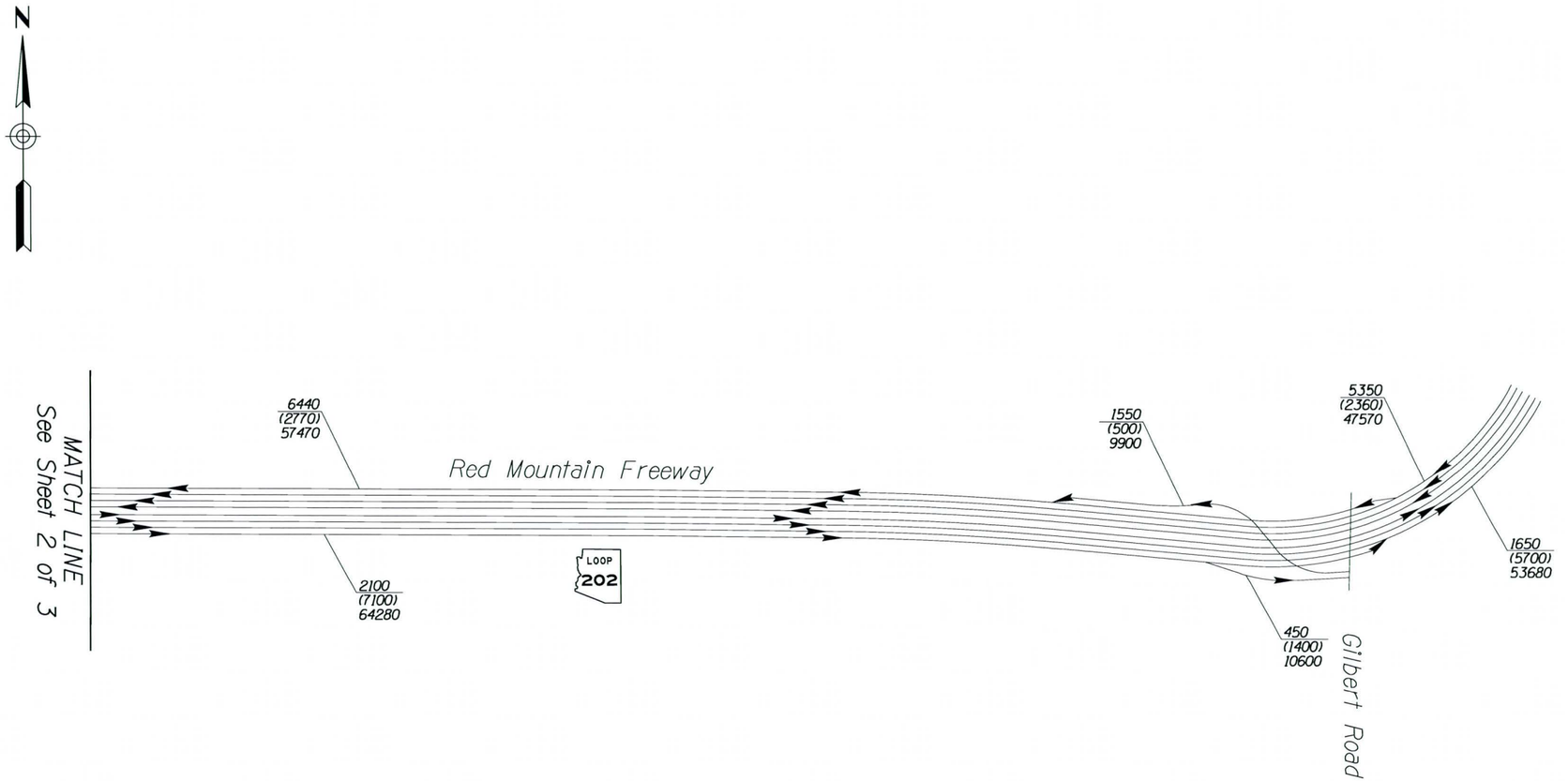

NOTES:
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- MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND
xxx - 2010 AM Peak Hour
(xxx) - 2010 PM Peak Hour
xxxx - 2010 Average Daily Traffic

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 6
BUILD ALTERNATIVE
2035 VOLUMES & LANE CONFIGURATION
SHEET 3 OF 3

NOT TO SCALE - SCHEMATIC ONLY

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2.4.2 Analysis Results

Traffic operational analyses were conducted using the CORSIM traffic simulation computer program to evaluate the level-of-service (LOS) that would be provided for the Existing Conditions, No-Build, and the Build Alternatives.

2.4.2.1 Existing Conditions

The lane configurations, A.M. and P.M. peak hour traffic volumes, and LOS analysis results for the Existing Conditions (2010) are depicted in Figures 7 and 8 (pages 30 to 35). The results of the analysis indicate significant congestion (LOS 'E' or 'F') is currently being experienced on the SR 202L mainline within the following areas:

- A.M. Peak Hour:
  - All segments of the SR 202L mainline are operating at a LOS 'D' or better
- P.M. Peak Hour:
  - Eastbound SR 202L mainline from the Dobson Road exit ramp to the Dobson Road entrance ramp
  - Ramp S-E/N-E entrance ramp

The analysis results indicate the westbound SR 202L traffic currently experiences the peak congestion during the A.M. peak hour however the corridor continues to operate at acceptable LOS 'D' or better during this peak hour.

In the eastbound direction of travel, congestion is occurring during the P.M. peak hour due to the type of weave and limited weave length currently provided between the SR101L/SR202L TI Ramp S-E/N-E entrance and Dobson Road. There are four general-purpose lanes and a 1,200' long auxiliary lane at this location. An AASHTO lane drop is provided immediately east of the Dobson Road exit ramp gore that transitions the number of general-purpose lanes to three lanes prior to the Dobson Road Overpass. Three general-purpose and one HOV lane continue to the east. The AASHTO lane drop contributes to the overall increase in congestion in this area.

2.4.2.2 No-Build Conditions

The No-Build Alternative lane configurations, 2035 A.M. and P.M. peak hour traffic volume projections, and LOS analysis results are shown in Figures 9 and 10 (pages 36 to 41). Under this scenario, significant congestion (LOS 'E' or 'F') would be expected to occur within the following segments of the SR 202L mainline:

- A.M. Peak Hour:
  - Westbound SR 202L mainline from the Gilbert Road entrance ramp to the Country Club Drive exit ramp
  - Westbound SR 202L mainline from the Country Club Drive entrance ramp to the SR101L/SR202L TI
- P.M. Peak Hour:
  - Eastbound SR 202L mainline from the SR101L/SR202L TI to the Alma School Road entrance ramp

The projected growth in traffic demand between 2010 and 2035 will result in increased congestion resulting in significantly longer traffic queue lengths in both the A.M. and P.M. peak hours.

2.4.2.3 Build Alternative

The Build Alternative lane configurations, 2035 A.M. and P.M. peak hour traffic volume projections, and LOS analysis results are shown in Figures 11 and 12 (pages 42 to 47), respectively. No congestion is expected in either direction of travel based on the analysis results. However, the SR101L/SR202L TI Ramp N-E/S-E entrance is anticipated to continue to be congested within the limits of the ramp during the P.M. peak hour.

2.5 SUMMARY OF OPERATIONAL RESULTS

The Build Alternative would construct the following improvements:

- Add one general-purpose lane in the eastbound and westbound directions from the SR101L/SR202L TI to Gilbert Road
- Add an auxiliary lane in the eastbound direction between the Alma School Road entrance ramp and the Country Club Drive exit ramp

The additional capacity provided with the Build Alternative is anticipated to meet the projected 2035 traffic demand. The Build Alternative would provide additional capacity to carry, on average, approximately 700 more vehicles (total eastbound and westbound) during both the A.M. and P.M. peak hours than the No-Build Alternative.

As shown in Table 19, the Build Alternative would operate with no congestion (LOS 'E' or 'F') on the mainline and within the study corridor during both the A.M. and P.M. Peak Hours.

Table 19 - Miles of LOS 'E' or 'F' for Each Alternative

Description	Miles of LOS 'E' or 'F'		
	Eastbound	Westbound	Total
2035 No-Build A.M. Peak	0	4.9	4.9
2035 No-Build P.M. Peak	2.0	0	2.0
2035 Build Alternative A.M. Peak	0	0	0
2035 Build Alternative P.M. Peak	0	0	0

The existing eastbound bottleneck between the SR101L/SR202L TI entrance ramp and the Dobson Road exit ramp would be eliminated with the Build Alternative. However, the SR101L/SR202L TI entrance ramp is still anticipated to be congested (within the limits of the ramp) during the P.M. Peak Hour.

Performance measures for each eastbound and westbound segment operating at LOS 'E' and LOS 'F' in the No-Build Alternative are presented in Table 20 and Table 21.

Table 20 - A.M. Peak Hour Performance Measures

Description	2035 No-Build Alternative	2035 Build Alternative
Westbound		
Gilbert Road to Country Club Drive		
Number of General Purpose Lanes	3	4
Traffic Volume (vph)	6130	6420
Travel Speed (mph)	58	60
Density (veh/ln-mile) (LOS)	38 (E)	29 (D)
Country Club Drive to McKellips Road		
Number of General Purpose Lanes	3	4
Traffic Volume (vph)	6350	6620
Travel Speed (mph)	49	58
Density (veh/ln-mile) (LOS)	46 (F)	31 (D)
McKellips Road to Alma School Road		
Number of General Purpose Lanes	3	4
Traffic Volume (vph)	7450	7870
Travel Speed (mph)	56	59
Density (veh/ln-mile) (LOS)	36 (E)	28 (D)
Alma School Road to Dobson Road		
Number of General Purpose Lanes	3	4
Traffic Volume (vph)	7280	7690
Travel Speed (mph)	57	59
Density (veh/ln-mile) (LOS)	38 (E)	30 (D)
Dobson Road to SR101 Exit Ramp		
Number of General Purpose Lanes	4	5
Traffic Volume (vph)	7450	7850
Travel Speed (mph)	59	55
Density (veh/ln-mile) (LOS)	35 (E)	34 (D)

Notes: 1) Traffic volumes shown reflect the volume that can be accommodated based on the CORSIM model output.
2) Segments of SR 202L that are shown include only those areas where congestion occurs for the No-Build Alternative.

Table 21 - P.M. Peak Hour Performance Measures

Description	2035 No-Build Alternative	2035 Build Alternative
Eastbound		
SR 101L Entrance Ramp to Dobson Road		
Number of General Purpose Lanes	4	5
Traffic Volume (vph)	7390	8330
Travel Speed (mph)	55	56
Density (veh/ln-mile) (LOS)	36 (E)	35 (D)
Dobson Road to Alma School Road		
Number of General Purpose Lanes	3	4
Traffic Volume (vph)	7320	8400
Travel Speed (mph)	57	59
Density (veh/ln-mile) (LOS)	37 (E)	31 (D)

Notes: 1) Traffic volumes shown reflect the volume that can be accommodated based on the CORSIM model output.
2) Segments of SR 202L that are shown include only those areas where congestion occurs for the No-Build Alternative.

(Text continued on page 48)

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NOTES:

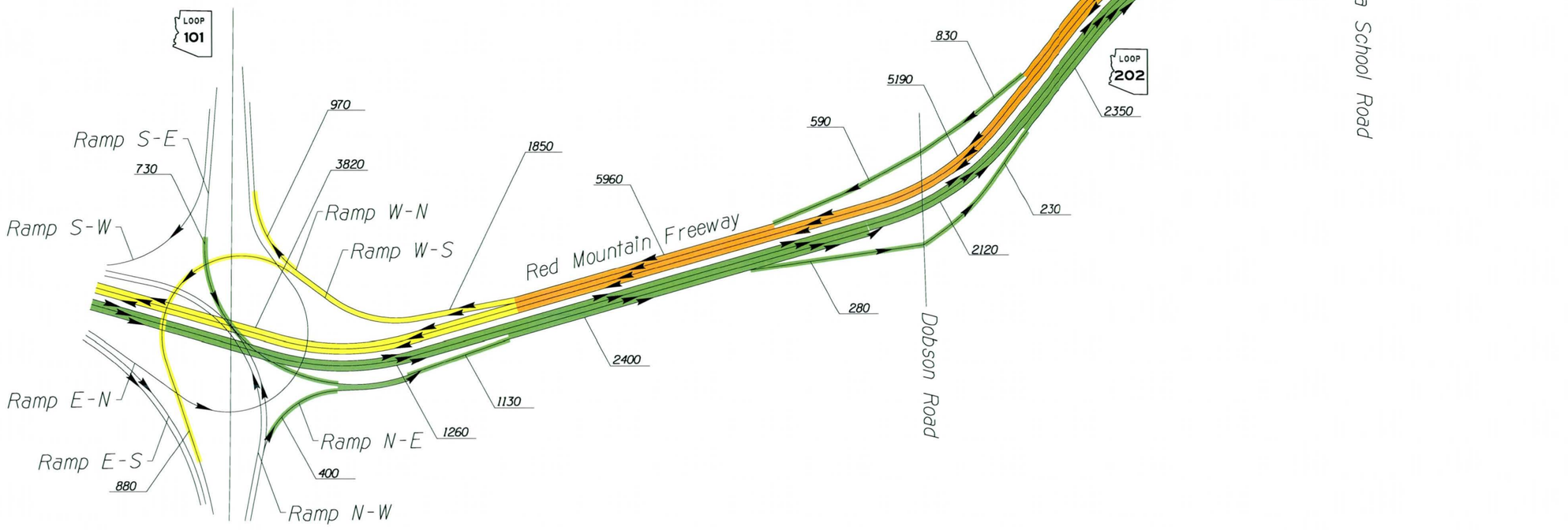
1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour



SR 202L
SR 101L to Gilbert Road

AECOM

NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 7
2010 EXISTING CONDITIONS
AM PEAK HOUR LEVEL OF SERVICE
SHEET 1 OF 3

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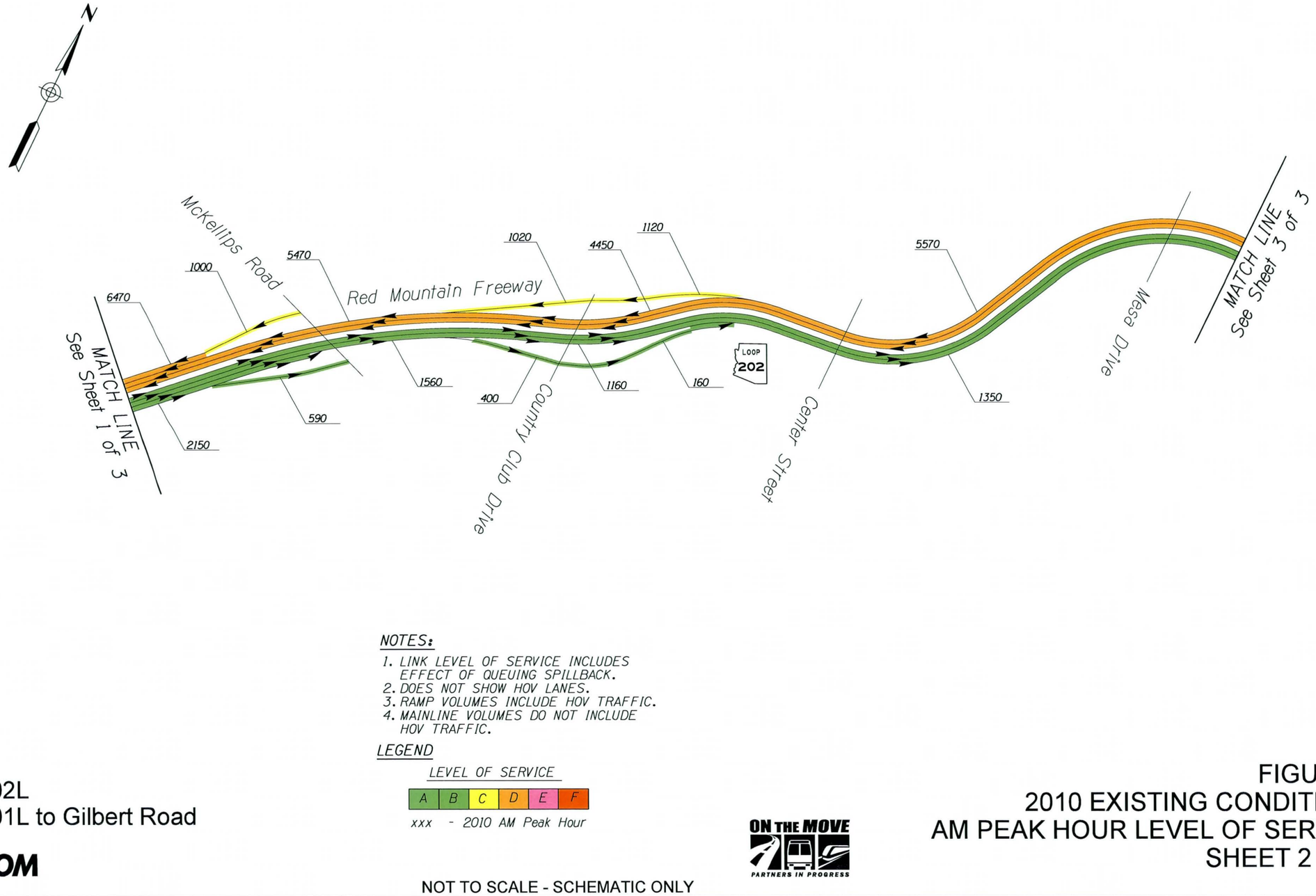

NOTES:

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2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

FIGURE 7
2010 EXISTING CONDITIONS
AM PEAK HOUR LEVEL OF SERVICE
SHEET 2 OF 3

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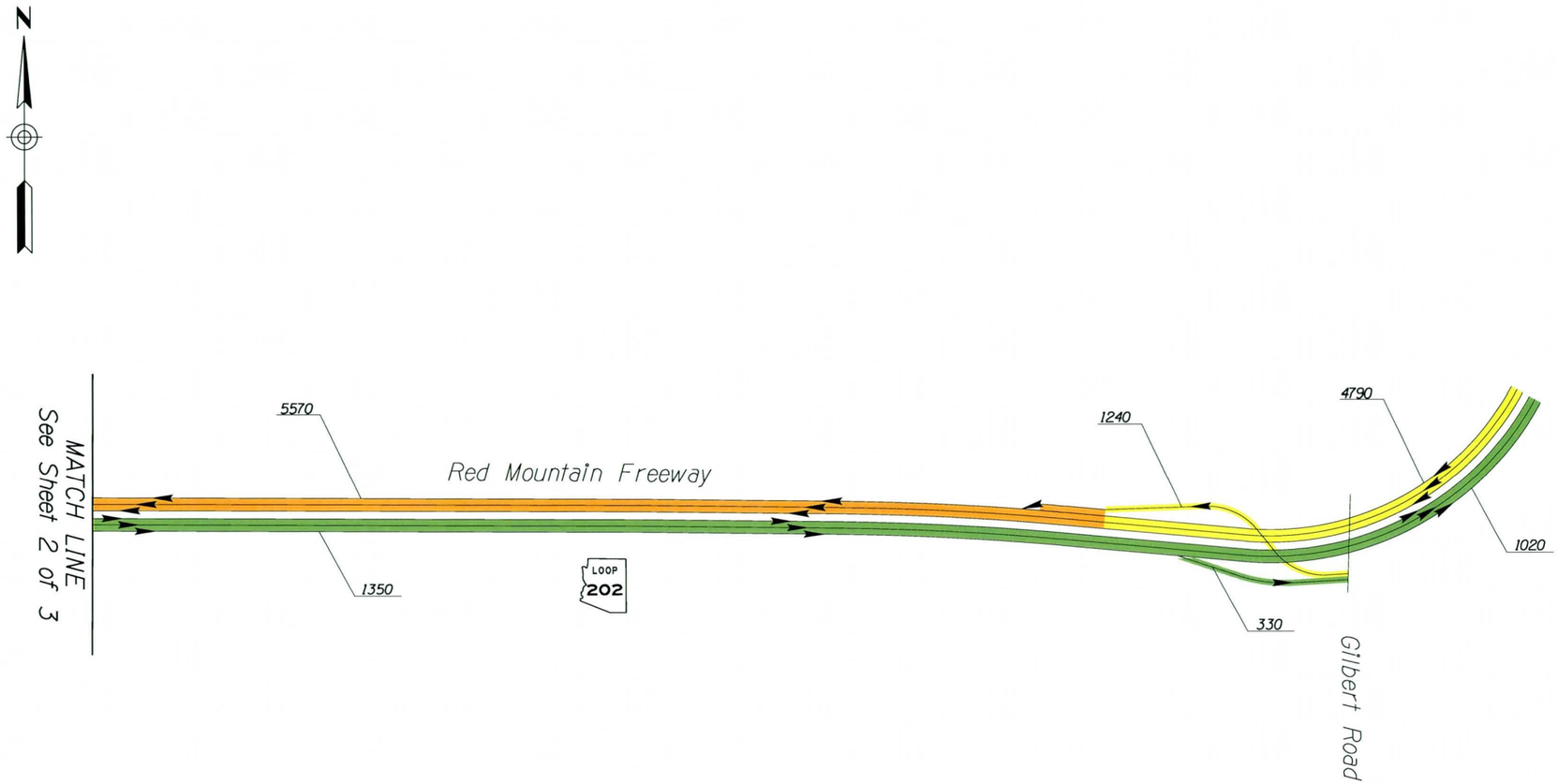

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3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

FIGURE 7
2010 EXISTING CONDITIONS
AM PEAK HOUR LEVEL OF SERVICE
SHEET 3 OF 3

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8/22/2012

NOTES:

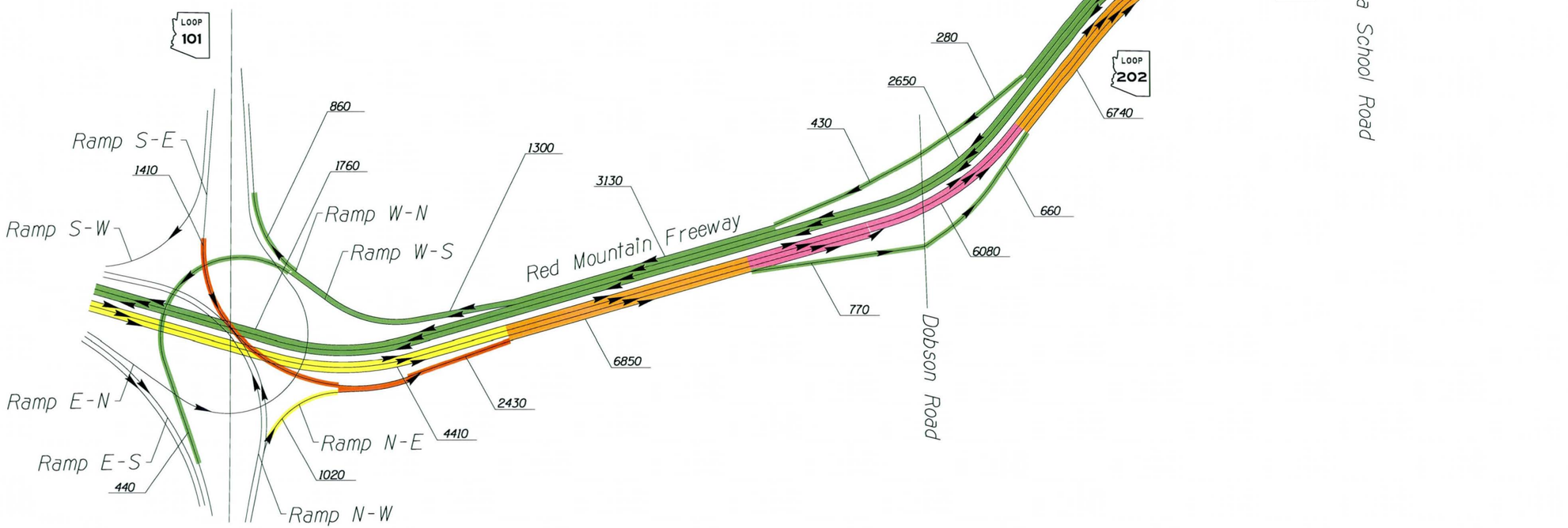
1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour



SR 202L
SR 101L to Gilbert Road

AECOM

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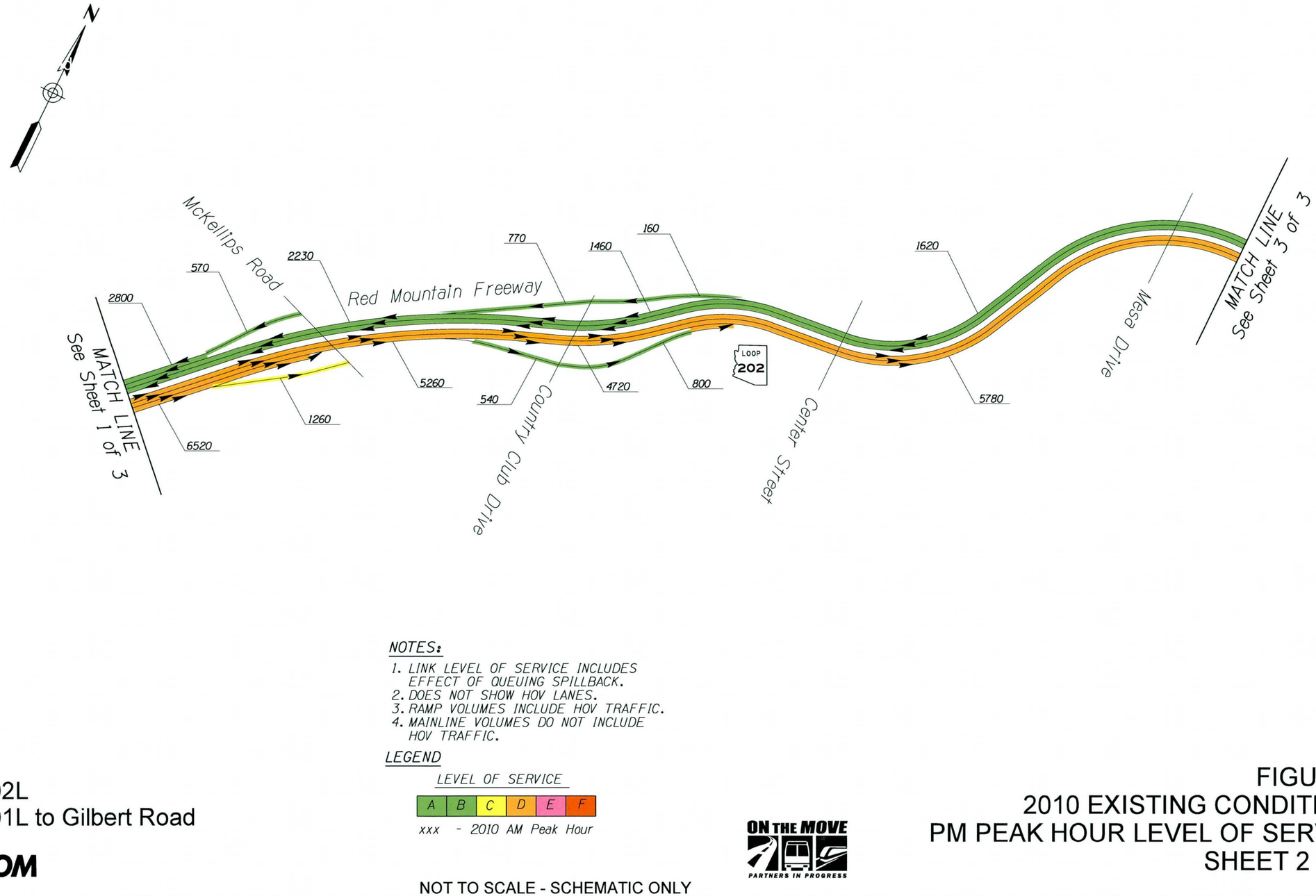
NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 8
2010 EXISTING CONDITIONS
PM PEAK HOUR LEVEL OF SERVICE
SHEET 1 OF 3



NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

FIGURE 8
2010 EXISTING CONDITIONS
PM PEAK HOUR LEVEL OF SERVICE
SHEET 2 OF 3

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NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 8
2010 EXISTING CONDITIONS
PM PEAK HOUR LEVEL OF SERVICE
SHEET 3 OF 3

u:\RM02\Design\tra\Existing\figures\losPM-3.dgn
8/22/2012

NOTES:

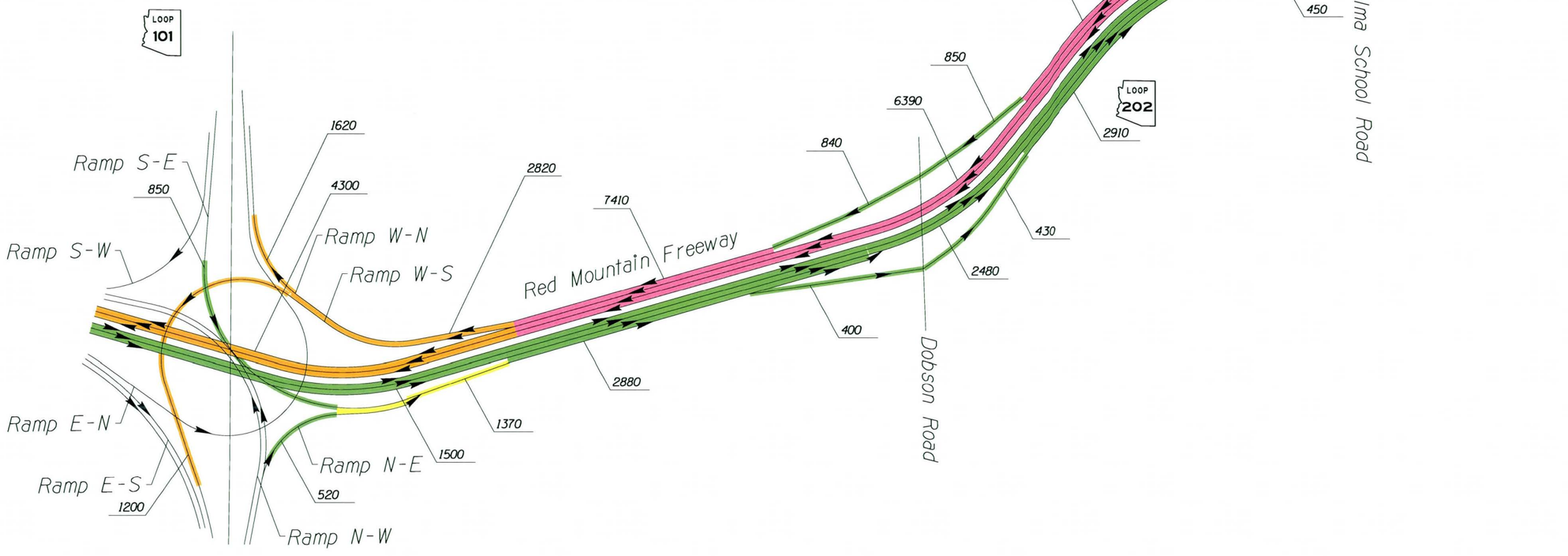
1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour



SR 202L
SR 101L to Gilbert Road

AECOM

NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 9
NO-BUILD ALTERNATIVE
2035 AM PEAK HOUR LEVEL OF SERVICE
SHEET 1 OF 3

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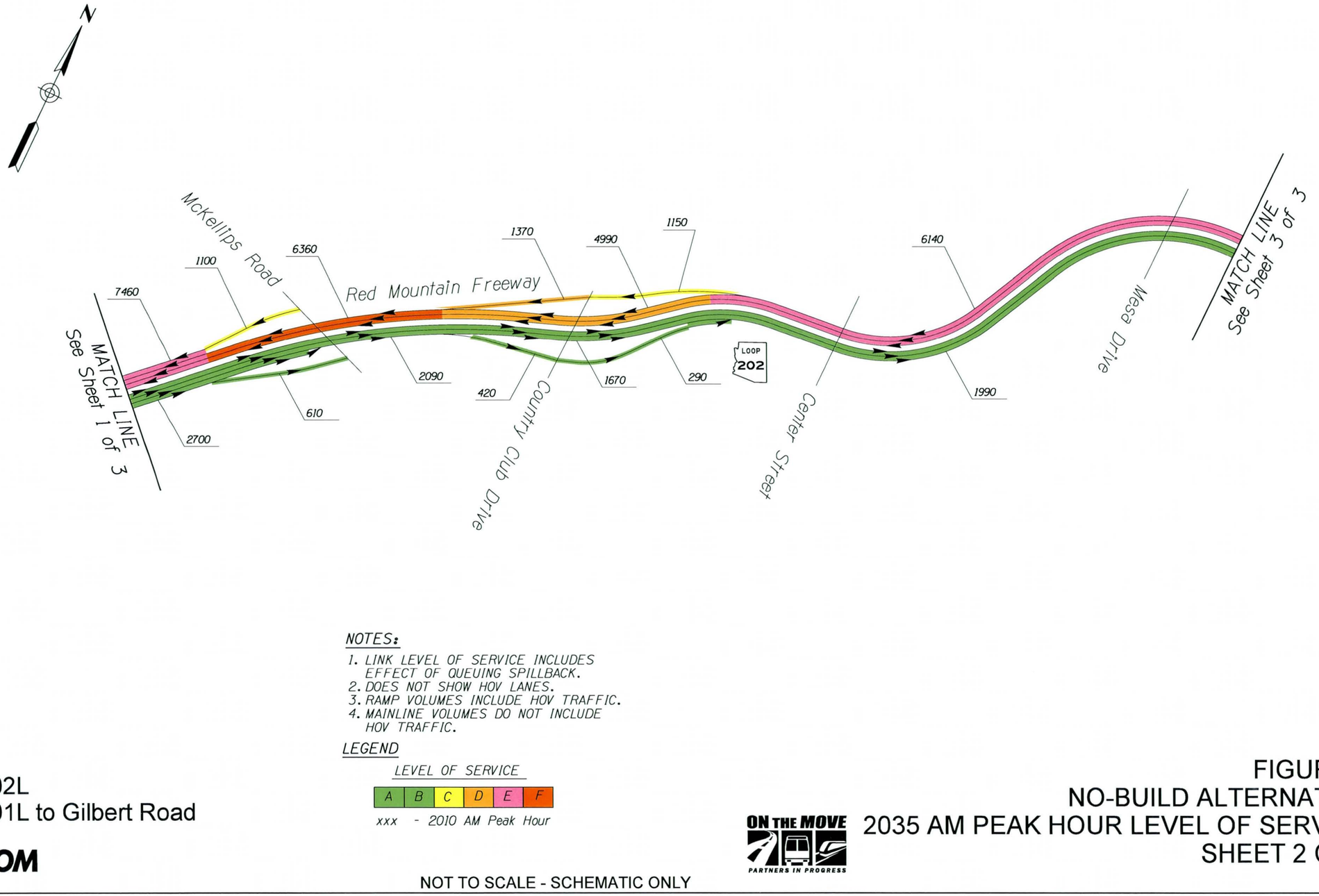
8/27/2012



NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

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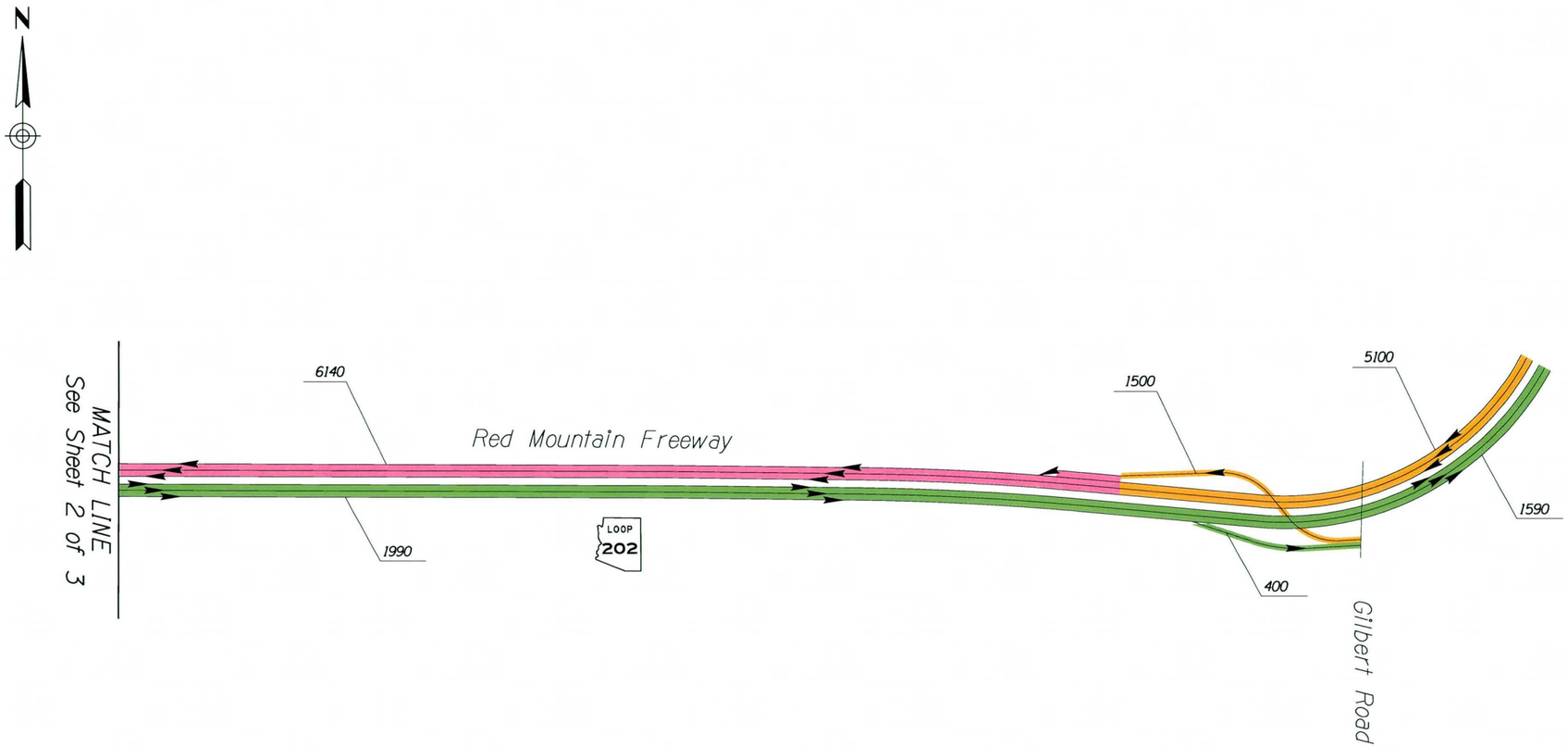
NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 9
NO-BUILD ALTERNATIVE
2035 AM PEAK HOUR LEVEL OF SERVICE
SHEET 2 OF 3



NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

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8/27/2012

SR 202L
SR 101L to Gilbert Road

AECOM

NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 9
NO-BUILD ALTERNATIVE
2035 AM PEAK HOUR LEVEL OF SERVICE
SHEET 3 OF 3

NOTES:

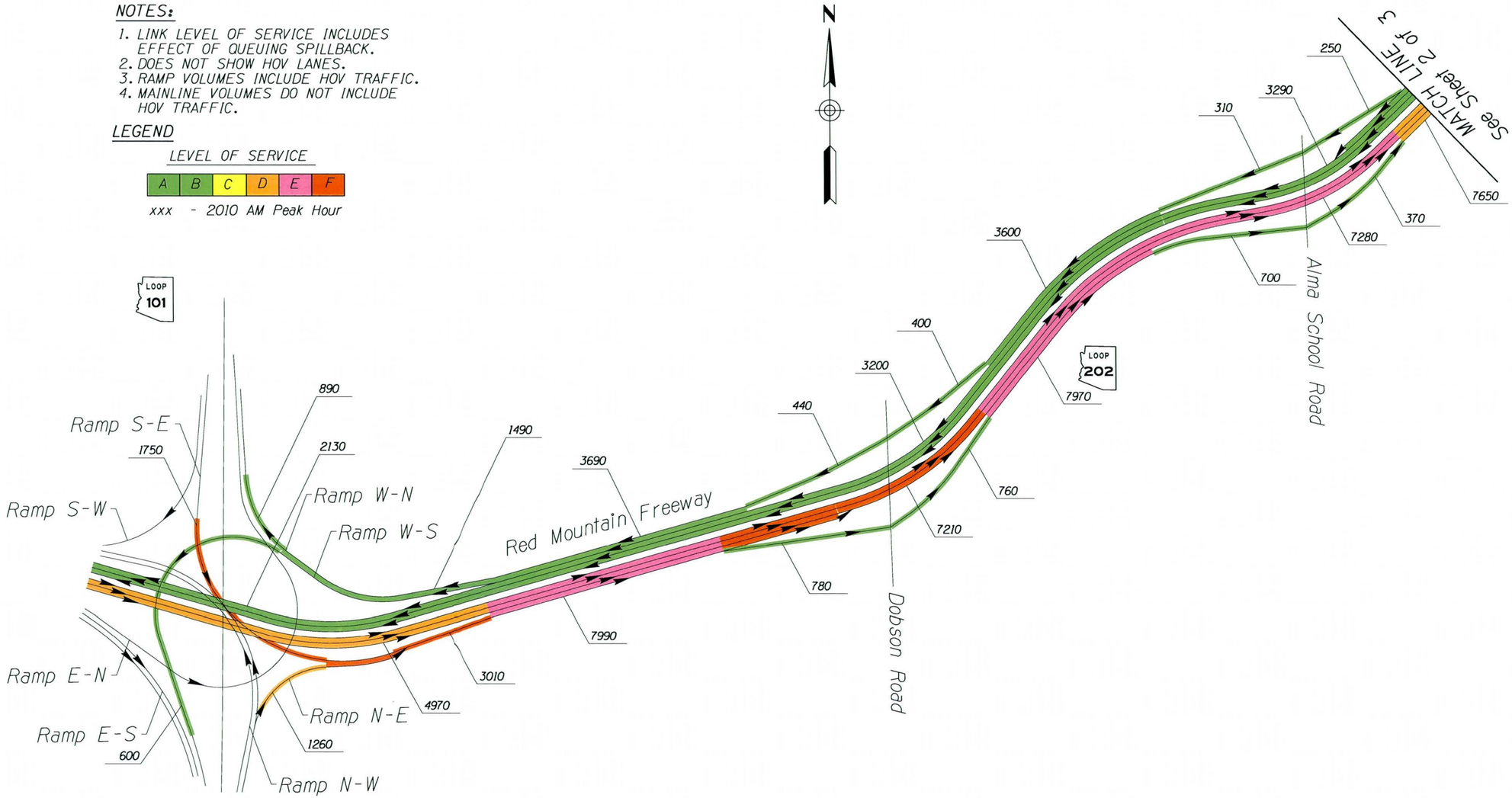
1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour



SR 202L
SR 101L to Gilbert Road

AECOM

FIGURE 10
NO-BUILD ALTERNATIVE
2035 PM PEAK HOUR LEVEL OF SERVICE
SHEET 1 OF 3

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

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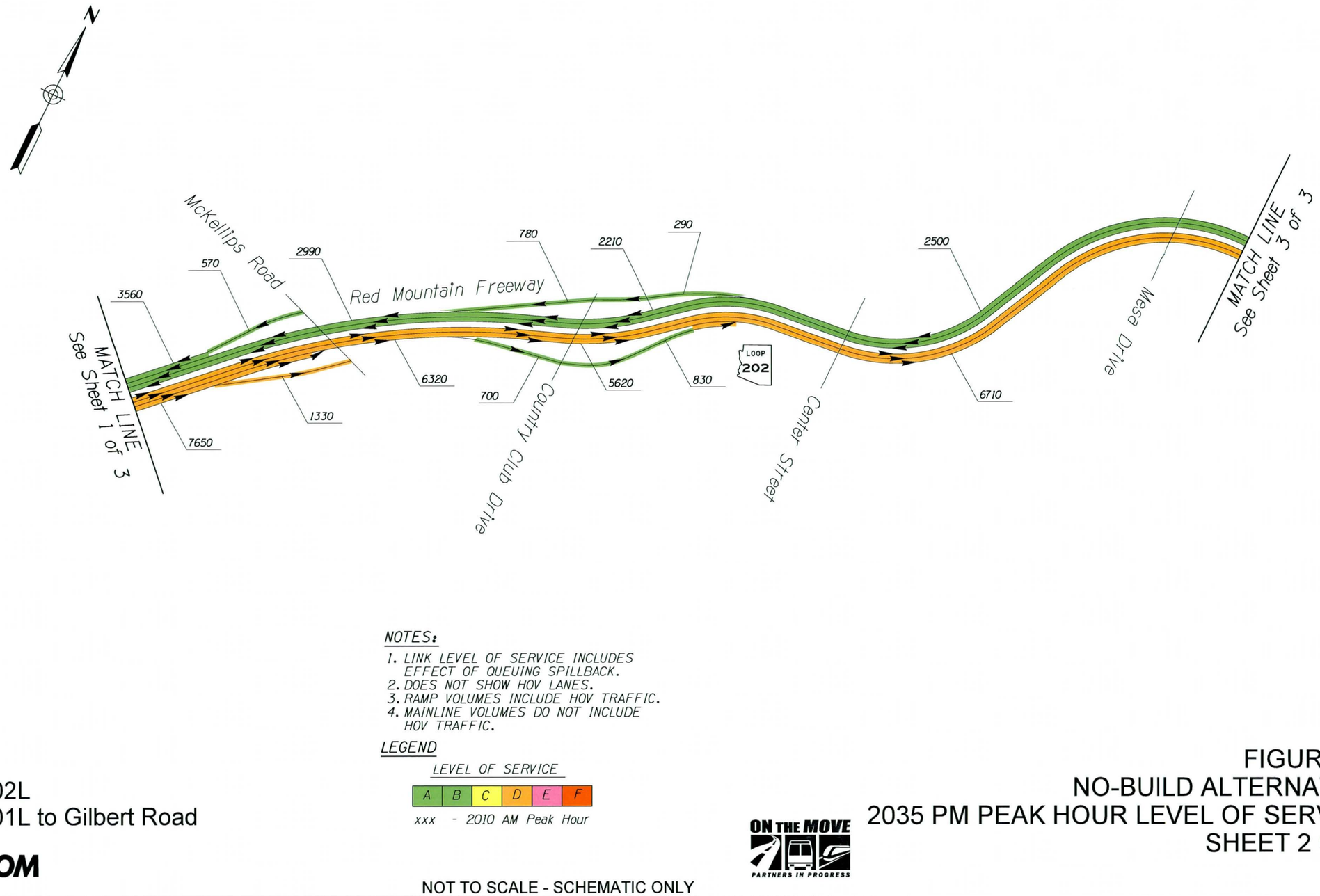
8/27/2012



NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 10
NO-BUILD ALTERNATIVE
2035 PM PEAK HOUR LEVEL OF SERVICE
SHEET 2 OF 3

NOT TO SCALE - SCHEMATIC ONLY

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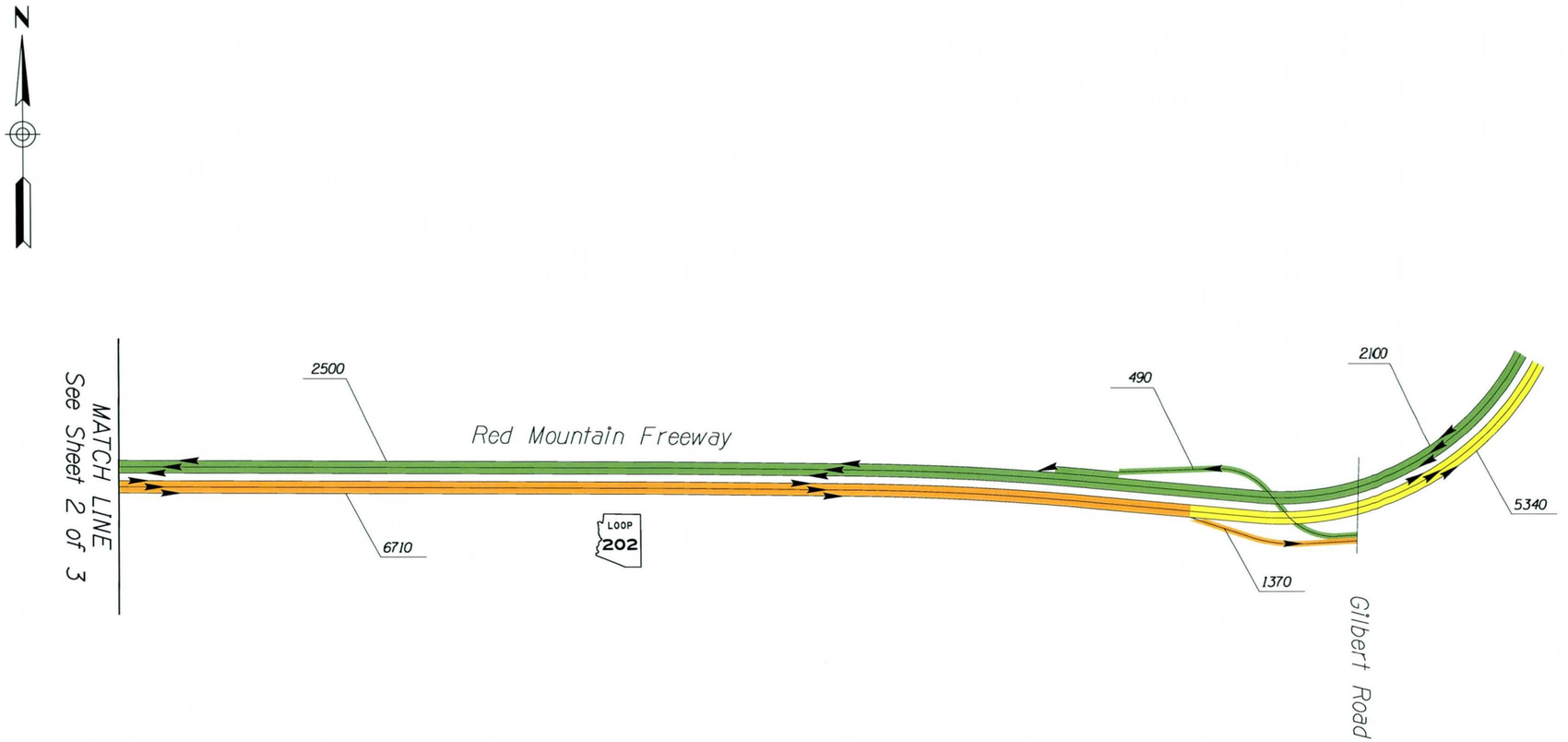
8/27/2012



NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

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8/27/2012

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 10
NO-BUILD ALTERNATIVE
2035 PM PEAK HOUR LEVEL OF SERVICE
SHEET 3 OF 3

NOT TO SCALE - SCHEMATIC ONLY

NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

FIGURE 11
BUILD ALTERNATIVE
2035 AM PEAK HOUR LEVEL OF SERVICE
SHEET 1 OF 3

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

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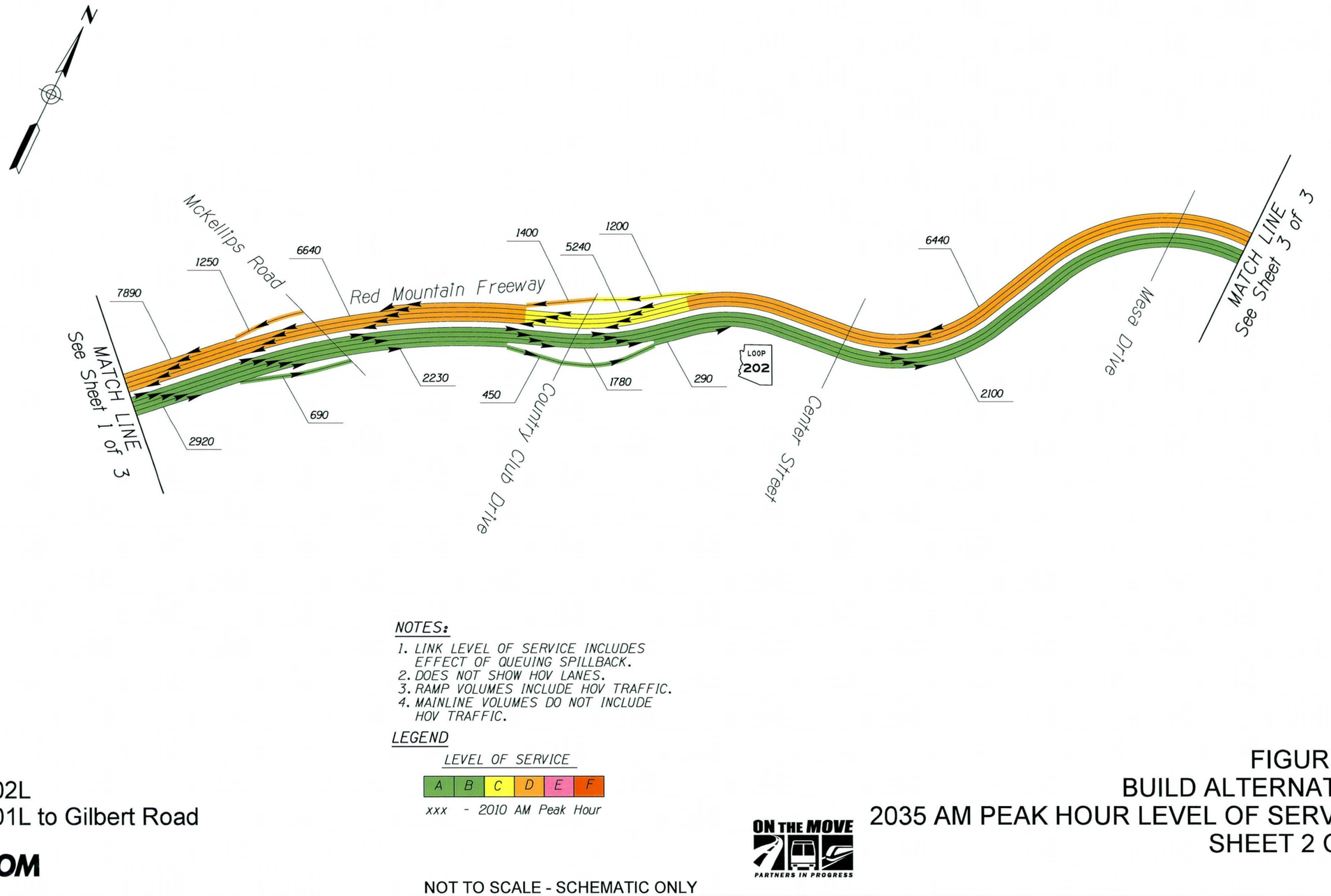

NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

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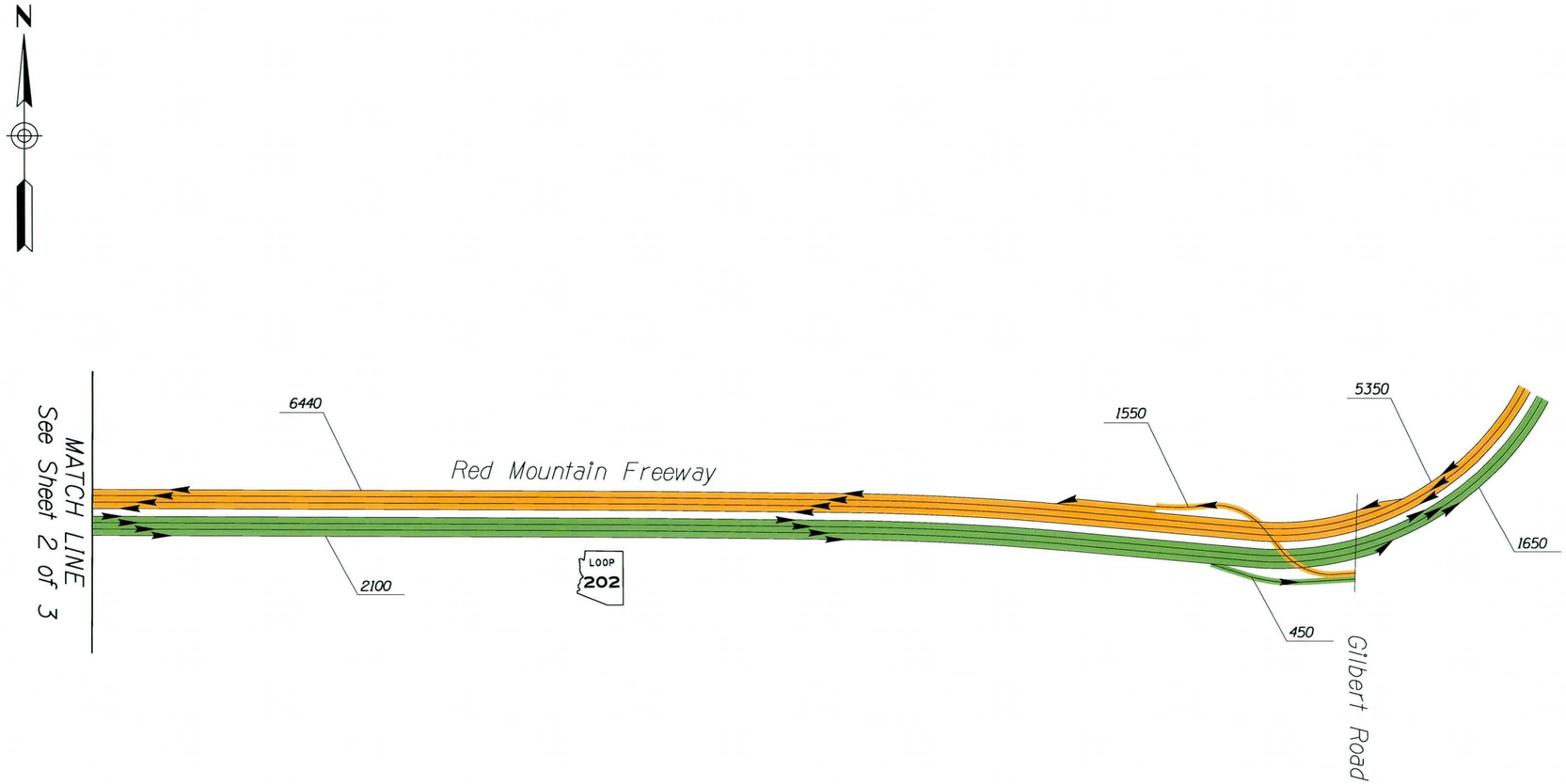
NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 11
BUILD ALTERNATIVE
2035 AM PEAK HOUR LEVEL OF SERVICE
SHEET 2 OF 3



NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

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8/27/2012

SR 202L
SR 101L to Gilbert Road

AECOM

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 11
BUILD ALTERNATIVE
2035 AM PEAK HOUR LEVEL OF SERVICE
SHEET 3 OF 3

NOT TO SCALE - SCHEMATIC ONLY

NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

FIGURE 12
BUILD ALTERNATIVE
2035 PM PEAK HOUR LEVEL OF SERVICE
SHEET 1 OF 3

ON THE MOVE
PARTNERS IN PROGRESS

NOT TO SCALE - SCHEMATIC ONLY

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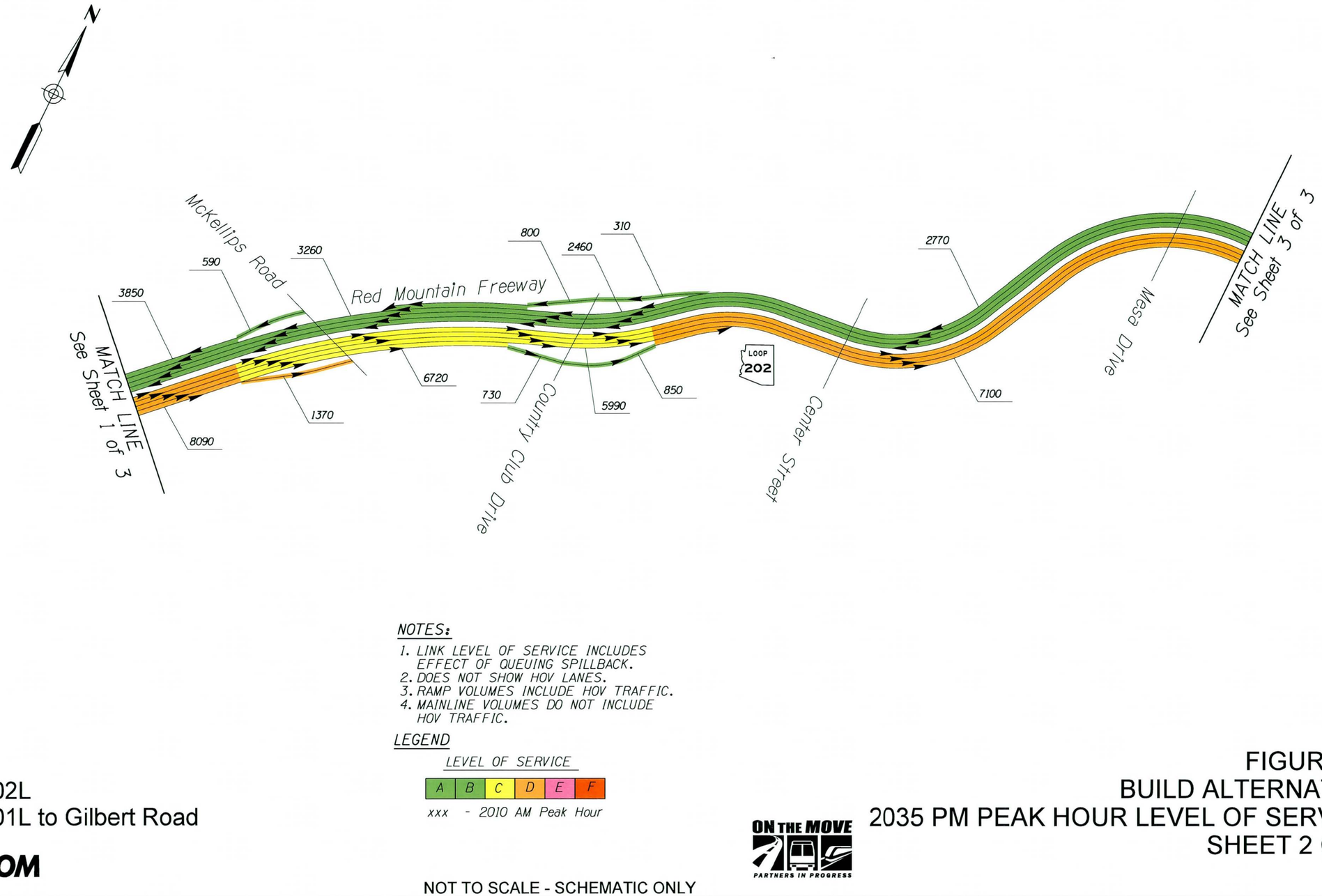

NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 12
BUILD ALTERNATIVE
2035 PM PEAK HOUR LEVEL OF SERVICE
SHEET 2 OF 3

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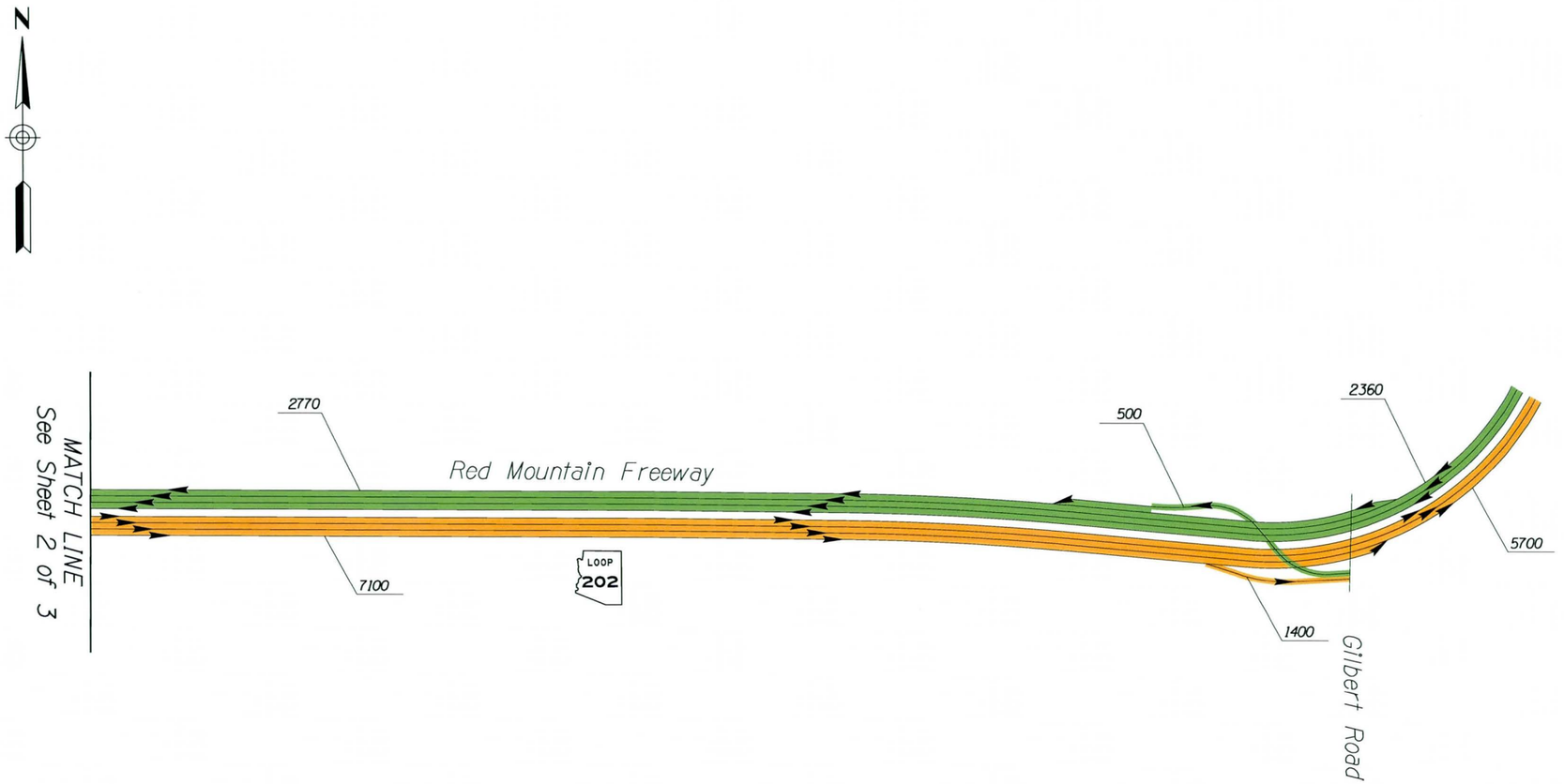
8/27/2012



NOTES:

1. LINK LEVEL OF SERVICE INCLUDES EFFECT OF QUEUING SPILLBACK.
2. DOES NOT SHOW HOV LANES.
3. RAMP VOLUMES INCLUDE HOV TRAFFIC.
4. MAINLINE VOLUMES DO NOT INCLUDE HOV TRAFFIC.

LEGEND

LEVEL OF SERVICE

A	B	C	D	E	F

xxx - 2010 AM Peak Hour

SR 202L
SR 101L to Gilbert Road

AECOM

NOT TO SCALE - SCHEMATIC ONLY

ON THE MOVE
PARTNERS IN PROGRESS

FIGURE 12
BUILD ALTERNATIVE
2035 PM PEAK HOUR LEVEL OF SERVICE
SHEET 3 OF 3

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8/27/2012

3.0 DESIGN CONCEPT ALTERNATIVES

3.1 INTRODUCTION

Design concepts were developed to provide one additional general-purpose lane in each direction through the SR 202L corridor from SR 101L to Gilbert Road. The alternatives were developed to conform to adopted regional transportation plans, achieve geometric design requirements, improve traffic operations, minimize environmental impacts, minimize right-of-way acquisition and utility impacts, and minimize construction costs.

Public agencies that have been involved in the alternative development and evaluation process include ADOT, MCDOT, FCDMC, SRPMIC, City of Mesa, and Federal Highway Administration (FHWA).

3.2 EVALUATION CRITERIA

Six screening criteria were developed to evaluate the Build and No-Build Alternatives for the widening of SR 202L. Each evaluation criterion is described below:

- **Conformance with Adopted Regional Transportation Plans:** This criterion evaluated the ability of the alternative to achieve the goals and objectives of the Regional Transportation Plan.
- **Geometric Design:** The alternatives were evaluated for the use of applicable geometric design criteria, and minimize the need for design exceptions where possible.
- **Traffic Operations:** This criterion evaluated the alternatives for potential benefits to the operational performance and levels of service of the freeway system within the study area.
- **Environmental Considerations:** The criterion evaluated the alternatives for its social and economic considerations, amount of disturbance to developed areas and vegetation, potential noise and air quality impacts, potential changes in visual character and quality, potential impacts to cultural and biological resources and hazardous materials issues.
- **Right-of-Way Requirements and Utility Impacts:** The alternatives were evaluated based upon the right-of-way acquisition requirements and potential conflicts with existing public utilities.
- **Project Cost:** This criterion evaluated the construction cost of the action alternative.

3.3 DESIGN CONCEPT ALTERNATIVES CONSIDERED

Alternative freeway widening concepts were developed for SR 202L based on the features required to meet the operational goals for the projected traffic volumes and anticipated travel patterns.

Consideration was given to the SR 202L mainline, service and system interchange ramp operations and geometric design requirements; right-of-way acquisition and utility impacts; environmental impacts and mitigation requirements; conformance with regional transportation plans; and project costs.

No changes would be proposed to the existing SR 202L mainline horizontal and vertical alignments. SR 202L would be widened to provide the additional mainline general-purpose and auxiliary lanes, and realign the existing service interchange ramps to coincide with the widened mainline pavement. The existing roadway would generally be widened to provide a continuous 11' median shoulder, 12' HOV lane, 12' general-purpose lanes and a 12' outside shoulder.

Each alternative would retain the existing HOV lanes to encourage carpooling and support the existing and planned Bus Rapid Transit (BRT) and express bus routes that use the HOV lanes.

A brief description of each alternative, along with the results of the alternative evaluation, is included in this section.

3.3.1 SR 202L Widening Build Alternative 1

A design concept was developed to construct one additional general-purpose lane on SR 202L from the SR101L/SR202L TI to Gilbert Road as presented in Appendix E.

Eastbound SR 202L Mainline

The roadway widening would add a single general-purpose lane and would generally retain the existing lane addition and termination configurations for the SR 202L mainline, service interchange entrance and exit ramps, and auxiliary lanes throughout the corridor. Some of the existing lane configurations would be modified to improve traffic operations and improve the existing lane drops to conform to current ADOT standards.

At the SR101L/SR202L TI, the existing SR 202L mainline configuration (three general-purpose lanes and one HOV lane) would be retained approaching the Ramp S-E/N-E entrance ramp. This alternative would improve the eastbound SR 202L mainline departing the SR101L/SR202L TI by reconfiguring the Ramp S-E/N-E entrance to allow each ramp to enter the SR 202L mainline with a "lane-add" design, thereby eliminating the current bottleneck at this location. Ramp S-E (1 lane) and Ramp N-E (1 lane) would enter the mainline with a two lane entrance into eastbound SR 202L. This two lane ramp entrance, combined with the eastbound SR 202L mainline (3 lanes), would provide five general-purpose lanes and one HOV lane departing the system interchange.

The Dobson Road exit ramp would be developed as a two lane ramp with a mandatory exit from the outside lane, and the second lane would be designed as an optional exit lane with the freeway through movement. The existing fourth general-purpose lane that currently drops just west of the Dobson Road Overpass bridge would be extended to the east to provide four general-purpose lanes and one HOV lane. The Dobson Road entrance ramp (1 lane) would be designed as a parallel entrance that transitions into an auxiliary lane that continues to the Alma School Road exit ramp (1 lane). Four general-purpose lanes and one HOV lane would continue through the Alma School Road TI.

The Alma School Road entrance ramp (1 lane) would be designed as a parallel entrance ramp that transitions into an additional auxiliary lane that continues to the Country Club Drive exit ramp

(five general-purpose lanes and one HOV lane total). The McKellips Road exit ramp (1 lane) would be developed as a tapered exit from the outside lane.

The Country Club Drive exit ramp would be designed as a parallel exit ramp. The outside general-purpose lane would be dropped at the Country Club Drive exit ramp to provide four general-purpose lanes and one HOV lane that would continue to the east to Gilbert Road.

Due to right-of-way constraints at the Radio Disney Group, LLC radio station (formerly KNIX), the lane widths would be transitioned from 12' to 11' through the mainline curvature over Country Club Drive. The Country Club Drive entrance ramp (1 lane) would be designed as a parallel entrance ramp that merges into the adjacent general-purpose lane prior to the Center Street Underpass. The roadway section at this location would include a 10' inside shoulder, one 11' HOV lane, four 11' general-purpose lanes, a 12' parallel entrance lane, and a 6' outside shoulder. Once the roadway is past the right-of-way constraint point, the outside shoulder width would be increased to 12'. After the parallel entrance lane is dropped, the general-purpose lane widths would be transitioned back from 11' to 12'. In this build alternative, design exceptions are required in this area.

Four general-purpose lanes and one HOV lane would continue to the east to Gilbert Road. The Gilbert Road exit ramp would be designed as a tapered exit ramp from the outside general-purpose lane. Four general-purpose lanes and one HOV lane would continue to the east under the Gilbert Road Underpass bridge. The fourth general-purpose lane would then be merged into the adjacent general-purpose lane to provide three general-purpose lanes that continue to the east.

Westbound SR 202L Mainline

The roadway widening would add a single general-purpose lane that would generally retain the existing lane addition and termination configurations for the SR 202L mainline, service interchange entrance and exit ramps, and auxiliary lanes throughout the corridor. Some of the existing lane configurations were modified to improve traffic operations and improve the existing lane drops to bring them up to current ADOT standards.

The fourth general-purpose lane would be created with a lane addition east of the Gilbert Road Underpass. Four general-purpose lanes and one HOV lane would continue to the west under Gilbert Road.

The Gilbert Road entrance ramp would be designed as a parallel entrance ramp. Four general-purpose lanes and one HOV lane would continue to the west to Country Club Drive. The Country Club Drive exit ramp would be designed as a tapered exit from the outside general-purpose lane. Four general-purpose lanes and one HOV lane would continue to the west to McKellips Road.

The Country Club Drive entrance ramp would be designed as a parallel entrance ramp that merges into the adjacent general-purpose lane prior to the McKellips Road entrance ramp gore. The McKellips Road entrance ramp would be designed as a parallel entrance ramp that transitions into an additional lane that continues to Alma School Road to provide five general-purpose lanes and one HOV in this area. The Alma School Road exit ramp would be designed as a tapered exit ramp from the outside lane. The outside lane would then be dropped with an AASHTO lane drop that would occur prior to the Alma School Road entrance ramp gore. Four general-purpose lanes and one HOV lane would continue to the west to Dobson Road.

The Alma School Road entrance ramp would be designed as a parallel entrance that transitions into an auxiliary lane that continues to the Dobson Road exit ramp. Four general-purpose lanes and one HOV lane would be provided at Dobson Road.

The Dobson Road entrance ramp would be designed as a parallel entrance that transitions into an auxiliary lane that continues to the SR101L/SR202L TI Ramp W-N/W-S exit. The Ramp W-N/W-S exit would be designed as a two lane mandatory exit from the outside lanes. Three general-purpose lanes and one HOV lane would then continue to the west through the system interchange.

This alternative would allow the majority of the project improvements to be constructed in accordance with ADOT and AASHTO standards. However, a design exception would be needed to reduce the general-purpose lane and outside shoulder widths on eastbound SR 202L to avoid right-of-way acquisition at the Radio Disney Group, LLC Radio Station property between Country Club Drive and Center Street.

SR 202L Mainline Structures

This section describes the structural elements required to support the Build Alternative 1 and includes recommendations for the new bridge structures, widening of existing bridge structures, retaining walls and noise walls.

Special Structure Considerations

Alternative 1 would require special structural considerations on westbound SR 202L between the Dobson Road entrance ramp and the City of Mesa equipment Underpass. A tall retaining wall currently exists along the north side of SR 202L that is adjacent to the existing CSA that serves as the south bank of the Salt River. The top of the CSA serves as a maintenance road for the FCDMC.

One structural option that was evaluated was to offset and reconstruct this retaining wall to the north of the existing wall. Construction of a new wall to accommodate the freeway widening would have resulted in substantial additional costs associated with reconstruction of the CSA. Discussions with representatives of the FCDMC also indicated any modifications to the CSA on the south river bank could result in modifications to the CSA on the north river bank to retain the current river hydraulic requirements. Therefore, this option was eliminated from further consideration by the project team.

A second option was evaluated that would remove a portion of the existing retaining wall to accommodate a cast-in-place concrete cantilever deck/moment slab to develop the roadway width needed for this alternative. This option would eliminate the need for full reconstruction of the

existing wall and CSA. This option was recommended by the project team for further evaluation with this alternative.

Widening of Existing Bridge Structures for Alternative 1

Table 22 shows feasible widening concepts for bridge structures impacted by Alternative 1.

Table 22 – Bridge Structure Widening Concepts Alternative 1

Bridge Description	Bridge Length	Number of Spans	C_L-C_L Span Lengths	Approx Width of Widening*	Proposed Superstructure Depth	Existing Superstructure Type	Proposed Widening Concept
Dobson Road TI Overpass	221'-10⅜" (EB); 223'-5" (WB)	2	101'-5⅝", 114'-4" (EB); 102'-1", 115'-2¾" (WB)	12' EB and WB	5'-0" EB 4'-9" WB	5'-0" cast-in-place post-tensioned concrete box girder bridge	Hydraulically jacked post-tensioned (PT) box and/or steel through girders for falsework could address temporary construction clearance issues by building the structure above finished grade; increasing the available falsework depth can also reduce the number of falsework towers need and associated lane impacts
Alma School Road TI Overpass	157' (EB); 157'-9½" (WB)	2	69'-4⅞", 82'-3" (EB); 69'-8½", 82'-8½" (WB)	12' EB 24' WB	5'-5" EB 4'-7" WB	AASHTO Type IV Girders (5'-5" max.)	AASHTO Type IV girders (EB) AASHTO Type III girders (WB) to obtain 16'-4" minimum vertical clearance
McKellips Road TI Overpass	186'-11⅝" (EB); 186'-2½" (WB)	1	180'-4½" (EB); 179'-5⅞" (WB)	24' EB and WB	7'-9" EB and WB	7'-9" cast-in-place post-tensioned concrete box girder bridge	Hydraulically jacked PT box and/or steel through girders for falsework could address temporary construction clearance issues by building the structure above finished grade; increasing the available falsework depth can also reduce the number of falsework towers need and associated lane impacts
Country Club Road TI Overpass	246'-6¼" (EB); 247'-11½" (WB)	2	116'-8½", 122'-7⅜" (EB); 117'-3 ¾", 123'-4⅞" (WB)	12' EB and WB	6'-3" EB and WB	AASHTO Type V Girders (6'-3" max.)	Utilize AASHTO Type V girders in both directions

* Structural widening does not include the width associated with the partial removal of the existing deck.

The existing bridge structures would be widened to accommodate the proposed roadway widening. Noise walls would be provided at the locations and heights determined by the noise technical analysis.

Right-of-Way

Approximately 2.6 acres of new right-of-way would be required from the Seyenna Vistas Mobile Home Park in support of the new alignment of the McKellips Road exit ramp. The acquisition would impact approximately 16 lots within the facility. Temporary Construction Easements (TCE's) may be required to support the construction of various project features throughout the corridor.

Other Supporting Features

The existing onsite drainage systems would be reconfigured by constructing new catch basins at the new shoulder location, and extending the existing lateral pipes to the new catch basins. The existing offsite drainage systems would not be impacted by the proposed roadway improvements. The proposed onsite drainage system concept is shown in Appendix E and described in Section 4.9 of this report.

The existing FMS system would be impacted by the proposed roadway widening. The proposed FMS system modifications are described in Section 4.9.4 of this report.

The existing signing, pavement markings and lighting would be modified in accordance with the proposed lane requirements and roadway widths associated with the Build Alternative. Revised signing and pavement markings associated with this alternative are provided in Appendix E.

The existing utilities that may be impacted by this alternative are discussed in Section 4.11 of this report. No significant utility impacts are anticipated with this alternative.

Estimated Project Cost

The total estimated cost for Alternative 1 is $74,074,900; and includes $4,640,000 for design, $975,000 for right-of-way, and $68,459,900 for construction.

3.3.2 SR 202L Widening Build Alternative 2

This alternative was developed to evaluate the potential use of reduced lane and shoulder widths on westbound SR 202L between Dobson Road and the SR101L/SR202L TI Ramp W-N/W-S exit, and on eastbound SR 202L between Alma School Road at Country Club Drive, to evaluate the potential for project cost savings and reduce right-of-way impacts in these areas.

This alternative also evaluates the option of full width widening at the location of the eastbound Country Club Drive entrance ramp adjacent to the Radio Disney Group, LLC radio station. Additional right-of-way would be required at this location. This alternative is depicted in Appendix F.

Eastbound SR 202L Mainline

The lane configurations are the same as Alternative 1. In order to eliminate the right-of-way acquisition from the Seyenna Vistas Mobile Home Park, the inside shoulder width would transition from 11' to 4' through the mainline horizontal curve at Alma School Road. This would allow the freeway widening to occur without requiring a realignment of the McKellips Road exit ramp.

The 4' inside shoulder would continue until the Country Club Drive exit ramp. The inside shoulder would transition from 4' to 11' through the horizontal curvature to the west of the Country Club Drive structure. To support this alternative, a design exception would be needed to reduce the inside shoulder width to 4' between Alma School Road and Country Club Drive.

East of Country Club Drive, the mainline and ramp lane and shoulder widths would be designed in accordance with ADOT and AASHTO requirements.

Westbound SR 202L Mainline

The lane configurations are the same as Alternative 1. In order to eliminate the need to construct the cantilevered roadway and avoid the extensive use of retaining walls along westbound SR 202L between the SR101L/SR202L TI Ramp W-N/W-S exit and the Dobson Road TI entrance ramp, a reduced roadway section was evaluated in this area. The westbound SR 202L inside shoulder would transition from 11' to 4' through the horizontal curvature over Dobson Road. The 4' median shoulder would continue to the west of SR101L/SR202L TI Ramp W-N/W-S exit, and then match the existing 4' median shoulder that continues west to Scottsdale Road.

Widening of Existing Bridge Structures for Alternative 2

Table 23 shows feasible widening concepts for bridge structures impacted by Alternative 2.

Table 23 – Bridge Structure Widening Concepts Alternative 2

Bridge Description	Bridge Length	Number of Spans	C_L-C_L Span Lengths	Approx Width of Widening*	Proposed Superstructure Depth	Existing Superstructure Type	Proposed Widening Concept
Dobson Road TI Overpass	221'-10⅜" (EB); 223'-5" (WB)	2	101'-5⅝", 114'-4" (EB); 102'-1", 115'-2¾" (WB)	12' EB and WB	5'-0" EB 4'-9" WB	5'-0" cast-in-place post-tensioned concrete box girder bridge	Hydraulically jacked PT box and/or steel through girders for falsework could address temporary construction clearance issues by building the structure above finished grade; increasing the available falsework depth can also reduce the number of falsework towers need and associated lane impacts
Alma School Road TI Overpass	157' (EB); 157'-9½" (WB)	2	69'-4⅞", 82'-3" (EB); 69'-8½", 82'-8½" (WB)	12' EB 24' WB	5'-5" EB 4'-7" WB	AASHTO Type IV Girders (5'-5" max.)	AASHTO Type IV girders (EB) AASHTO Type III girders (WB) to obtain 16'-4" minimum vertical clearance
McKellips Road TI Overpass	186'-11⅝" (EB); 186'-2½" (WB)	1	180'-4½" (EB); 179'-5⅞" (WB)	12' EB 24' WB	7'-9" EB and WB	7'-9" cast-in-place post-tensioned concrete box girder bridge	Hydraulically jacked PT box and/or steel through girders for falsework could address temporary construction clearance issues by building the structure above finished grade; increasing the available falsework depth can also reduce the number of falsework towers need and associated lane impacts
Country Club Road TI Overpass	246'-6¼" (EB); 247'-11½" (WB)	2	116'-8½", 122'-7⅜" (EB); 117'-3 ¾", 123'-4⅞" (WB)	12' EB and WB	6'-3" EB and WB	AASHTO Type V Girders (6'-3" max.)	Utilize AASHTO Type V girders in both directions

* Structural widening does not include the width associated with the partial removal of the existing deck.

Right-of-Way

Approximately 0.1 acres of new right-of-way would be required from the Radio Disney Group, LLC Radio Station. Recent discussions with Disney Productions have indicated that any encroachment into their property could significantly impact the operational characteristics of the radio towers, resulting in a potentially significant impact to the station operations with a high acquisition cost.

Estimated Project Cost

The total estimated cost for Alternative 2 is $64,960,600; and includes $4,123,000 for design and $60,837,600 for construction. This estimate excludes any right-of-way costs associated with acquisition from the Radio Disney property.

3.3.3 No-Build Alternative

The "No-Build" Alternative would not result in any of the improvements identified in the RTPFP. The current congested freeway conditions would be expected to worsen as the traffic demand continues to grow in the future.

3.4 EVALUATION OF THE SR 202L MAINLINE WIDENING ALTERNATIVES

The "No-Build" and "Build" alternatives were evaluated in terms of their technical merits and environmental impacts when compared with the evaluation criteria.

3.4.1 No Build Alternative

The following is a summary of the No Build Alternative when compared to the evaluation criteria:

- Conformance with Adopted Regional Transportation Plans: This alternative does not achieve the goals and objectives of the voter-approved Regional Transportation Plan.
- Geometric Design: This alternative does not include any changes to the existing roadway. The McKellips Road eastbound exit ramp terminal will continue to intersect the crossroad at a skew angle that does not conform to current geometric design criteria.
- Traffic Operations: This alternative results in the lowest performing traffic operations as discussed in Chapter 2.0. The current freeway operates at deficient levels of service during the AM and PM peak hours and will continue to degrade over time.
- Environmental Considerations: This alternative results in the fewest environmental impacts. However, with increased congestion levels, the potential for higher levels of mobile source air toxins increases.
- Right-of-Way Requirements and Utility Impacts: This alternative does not result in any right-of-way or utility impacts

- Construction Cost: The "No-Build" alternative does not result in any construction related costs. However, there is potential for higher costs associated with maintenance.

Based on the evaluation of the traffic operational performance of the existing roadway, the non-conformance with the RTP, and an evaluation of the current roadway conditions, the No Build Alternative has been determined to be inadequate and was eliminated from further consideration.

3.4.2 SR 202L Widening Build Alternative 1

The following is a summary of the Build Alternative 1 when compared to the evaluation criteria:

- Conformance with Adopted Regional Transportation Plans: This alternative is consistent with the goals and objectives of the voter-approved Regional Transportation Plan. This alternative would add an additional general-purpose lane in each direction of travel along SR 202L.
- Geometric Design: This alternative would generally provide full shoulder and lane widths that conform to current AASHTO and ADOT design criteria. The westbound SR 202L approach to the SR101L/SR202L TI would be designed in accordance with ADOT and AASHTO design standards within this high traffic volume area. The horizontal geometry of the eastbound McKellips Road exit ramp intersecting with McKellips Road would be improved and would intersect the crossroad at a better performing skew angle.

  Build Alternative 1 would not meet current design criteria for shoulder and general-purpose lane widths for a short segment of the eastbound SR 202L mainline between the Country Club Drive TI and Center Street along the Radio Disney Group, LLC radio station. The 11' lanes and the 6' outside shoulder along the Country Club Drive eastbound entrance ramp would require design exceptions. However, this area would be anticipated to experience fairly low traffic volumes during the peak travel periods in the design year.
- Traffic Operations: The build alternatives result in the highest performing traffic operations as discussed in Chapter 2.0. The Build Alternative 1 conditions would result in LOS 'D' or better operating conditions during the A.M. and P.M. peak hours, and are expected to result in approximately 5.1 fewer miles of vehicle queuing (LOS 'E' and 'F') during the A.M. peak hour and 2.1 fewer miles of vehicle queuing during the P.M. peak hour when compared to the No-Build Alternative.

  This alternative would also eliminate the existing bottleneck on eastbound SR 202L between the SR101L/SR202L TI Ramp S-E/N-E entrance and the Dobson Road exit ramp.
- Environmental Considerations: This alternative would result in the potential for increased environmental impacts at locations that would require additional right-of-way. The realignment of the eastbound McKellips Road exit ramp would require relocation of residents of the Seyenna Vistas Mobile Home Park. New noise walls would be required at three locations.
- Right-of-Way Requirements and Utility Impacts: Approximately 2.6 acres of new right-of-way would be required along the eastbound McKellips Road exit ramp at the Seyenna Vistas Mobile Home Park with the relocation of 16 homes within the park.

  This alternative would result in utility conflicts with the City of Mesa 36" reclaimed water line and a SRP irrigation structure along the new McKellips Road eastbound exit ramp.
- Project Cost: The total estimated cost for Alternative 1 is $74,074,900; which includes $4,640,000 for design, $975,000 for right-of-way, and $68,459,900 for construction. The current project budget is $74,600,000.

3.4.3 SR 202L Widening Build Alternative 2

The following is a summary of the Build Alternative 2 when compared to the evaluation criteria:

- Conformance with Adopted Regional Transportation Plans: This alternative is consistent with the goals and objectives of the voter-approved Regional Transportation Plan. This alternative would add an additional general-purpose lane in each direction of travel along SR 202L.
- Geometric Design: Design exceptions to the AASHTO "Green Book" and ADOT Roadway Design Guidelines (RDG) would be required to reduce the width of the inside shoulders from 10' to 4' in the westbound direction of travel between Dobson Road and the SR101L/SR202L TI and localized areas of the outside shoulder from 12' to 7.29'. In the eastbound direction of travel between Alma School Road and Country Club Drive the inside shoulder would be reduced from 10' to 4'. The use of a reduced shoulder width would be undesirable within these heavily traveled areas where traffic would be required to make more complex traffic maneuvers.

  The McKellips Road eastbound exit ramp terminal will continue to intersect the crossroad at a skew angle that does not conform to current geometric design criteria.
- Traffic Operations: The traffic operation characteristics for Alternative 2 would be the same as Alternative 1.
- Environmental Considerations: This alternative would result in minimal environmental impacts associated with the acquisition of new right-of-way. New noise walls would be required at three locations similar to Alternative 1.
- Right-of-Way Requirements and Utility Impacts: New right-of-way would be required along the Country Club Drive eastbound entrance ramp adjacent to the Radio Disney Group, LLC radio station.

  Encroachment into this area would necessitate the relocation of the City of Mesa 36" reclaimed water line and ADOT FMS utilities. Relocation of these utilities and the additional right-of-way would likely significantly impact the operations of the Radio Disney Group, LLC radio towers.

  The original construction of SR 202L acquired a portion of this same property. At the time, the acquisition limits were set based on the maximum encroachment that would be allowed by the radio station without impacting the operation of the facility. Further encroachment into the property would likely impact the underground grid for the existing radio towers on the site. Current zoning within the City of Mesa requires that a specific square footage of

property and appropriate set-backs be provided for each tower. Acquiring additional right-of-way could violate current City zoning, result in significant impacts to the radio station operations, and could potentially result in a total acquisition of the property.

- Project Cost: The total estimated cost for Alternative 2 is $64,960,600; and includes $4,123,000 for design, and $60,837,600 for construction. The right-of-way cost was not determined due to the unavailability of an estimated cost to relocate the radio station. This alternative would be approximately $9,639,400 below the current project budget of $74,600,000.

3.4.4 Comparison of Alternatives

Roadway geometric design, traffic operational characteristics, right-of-way impacts, environmental impacts, and estimated project cost were the criteria used for the evaluation process.

Alternative 1 would provide one additional general-purpose lane in each direction of travel in a manner that would achieve all ADOT and AASHTO geometric design criteria in all locations except in the vicinity of the Radio Disney Group, LLC radio station.

The disadvantage of this alternative would be the new right-of-way acquisition that would be required from the Seyenna Vistas Mobile Home Park near McKellips Road, and the more costly retaining wall and cantilevered roadway construction required along the westbound SR 202L mainline between the SR101L/SR202L TI Ramp W-S/W-N exit and the Dobson Road entrance ramp. The Alternative 1 estimated project cost is $74,074,900 which is approximately $9,114,300 higher than Alternative 2, and $525,100 below the current project budget of $74,600,000.

Alternative 2 would provide the same traffic carrying capacity as Alternative 1, but would require additional design exceptions to reduce the inside shoulder width from 11' to 4' and outside shoulder width from 12' to 7.29' on the SR 202L westbound mainline between SR 101 and Dobson Road, and the inside shoulder width from 11' to 4' on the eastbound SR 202L mainline between Alma School Road and Country Club Drive. By reducing the shoulder widths at these locations, new right-of-way acquisition would not be required from the Seyenna Vistas Mobile Home Park, and all of the new roadway lanes would be provided within the existing roadway width on westbound SR 202L between the SR101L/SR202L TI and Dobson Road. The total estimated project cost for this alternative is $64,960,600 which is $9,639,400 below the current project budget of $74,600,000.

The segment of the westbound SR 202L mainline, between SR 101L and Dobson Road, is located within an area approaching a system traffic interchange that involves complex traffic maneuvers for travelers on SR 202L continuing to the west or destined to SR 101L (to the north and south). The westbound SR 202L traffic is also competing with traffic entering the freeway at the Dobson Road entrance ramp, which introduces an area of weaving traffic that increases the potential for congested conditions and vehicle crashes. Reducing the inside shoulder width would limit the opportunity for disabled vehicles to pull off the roadway, thereby complicating the safety and operational characteristics of this complex freeway segment. A similar situation also would exist between Alma School Road and McKellips Road in the eastbound direction of travel.

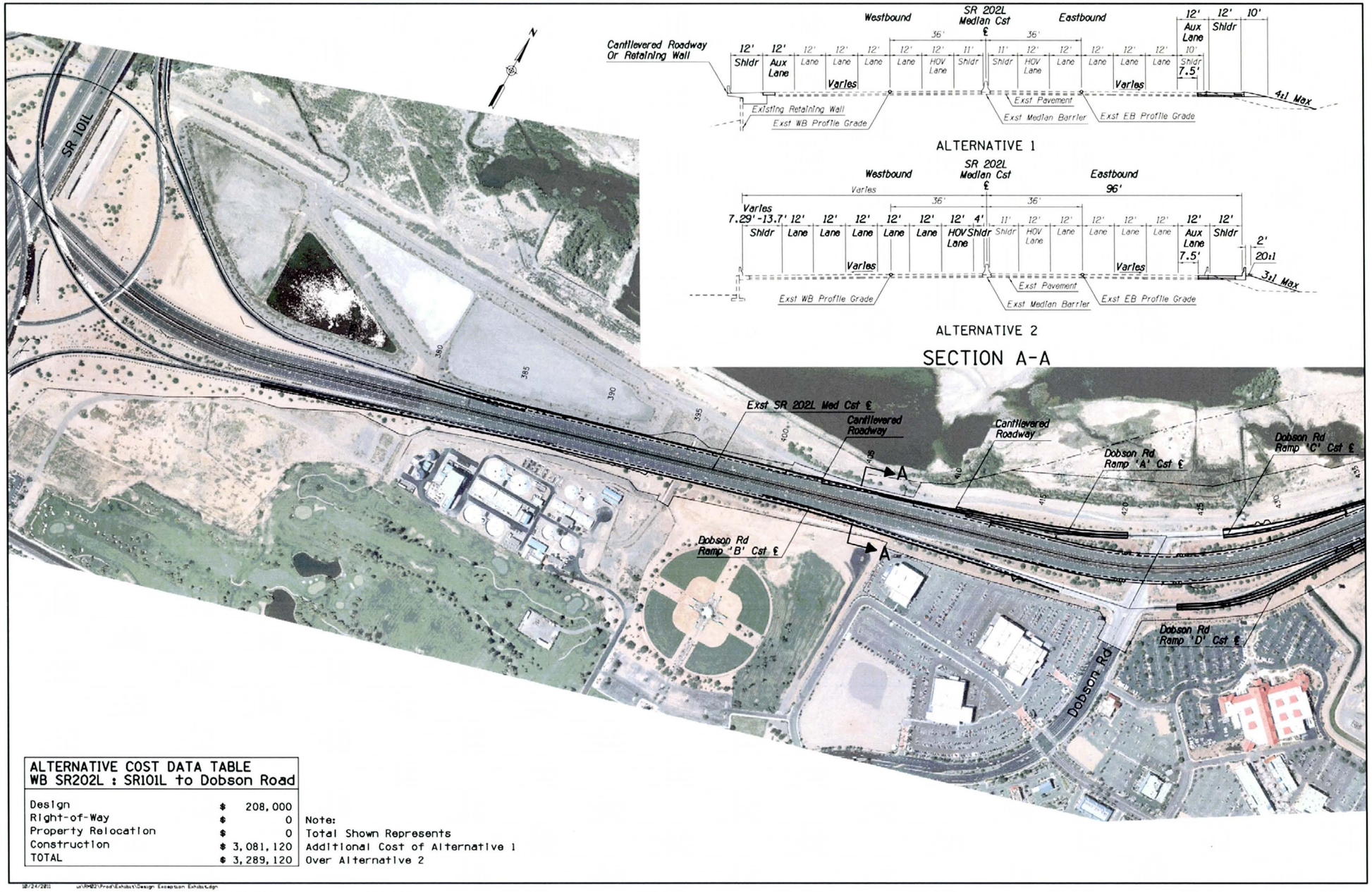
A cost analysis was completed to determine the increased cost associated with providing the full-improvements shown in Alternative 1 compared to reduced width improvements which would require design exceptions as shown in Alternative 2. The additional costs of Alternative 1 over Alternative 2 in the two design exception areas are shown in Figure 13 (pages 54 and 55).

3.4.5 Recommendations

The Project Team recommends the SR 202L Widening Build Alternative 1 for this project. In making this recommendation, the design team completed a multidiscipline screening process that included extensive agency input.

Discussions with representatives of the ADOT Valley Project Management, Roadway Design Section, Traffic Design Section, Phoenix Construction District (PCD), Phoenix Maintenance District, Environmental Planning Group (EPG), Right-of-Way Group, Bridge Group and the FHWA indicated the strong desire for Alternative 1 which would construct these complicated roadway segments in accordance with the ADOT RDG and AASHTO "Green Book" requirements due to the projected volume of traffic and the complexity of the traffic maneuvers required of travelers. Therefore, Alternative 1 is preferred for this project.

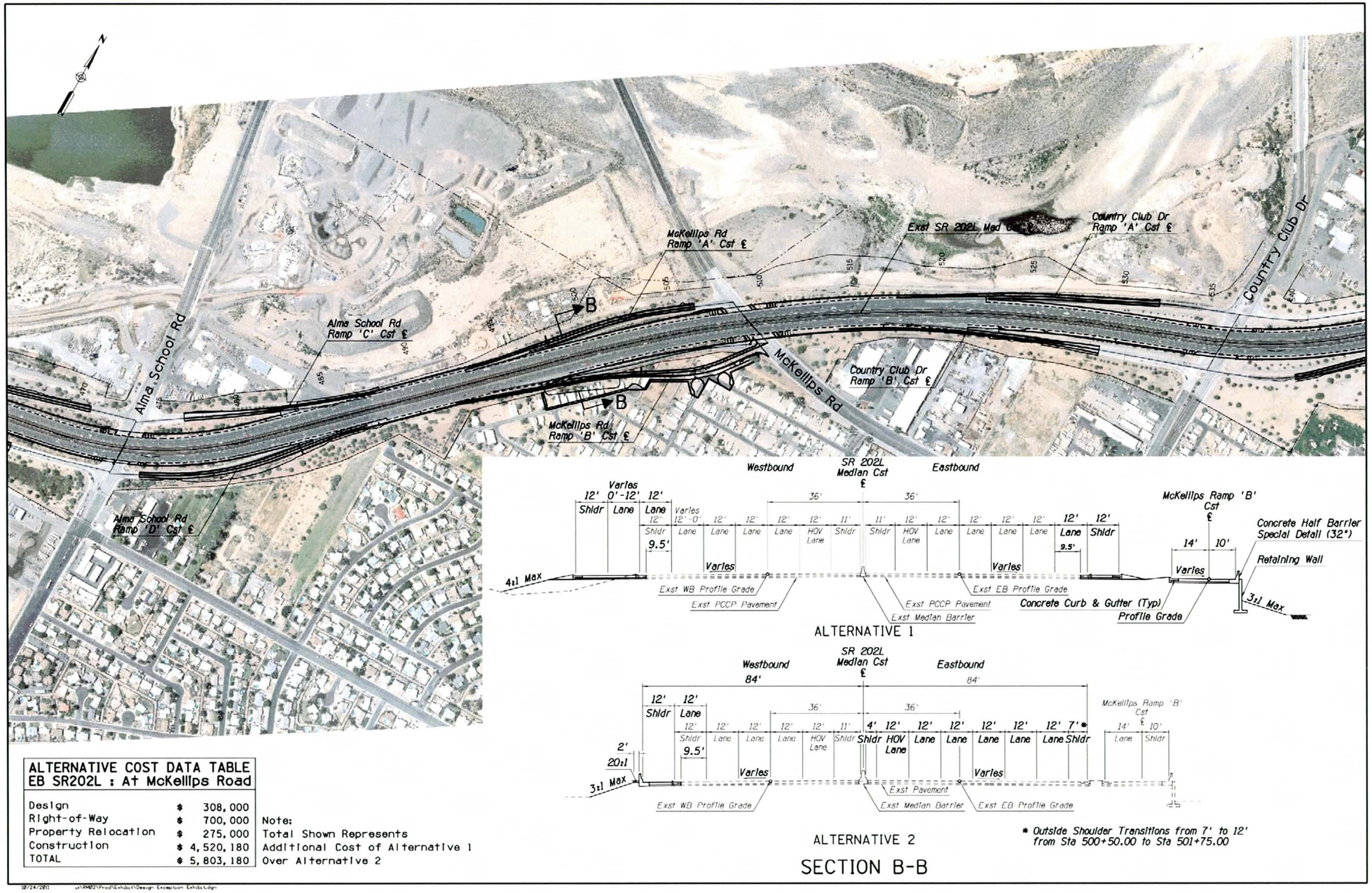
(Text continued on page 56)



ALTERNATIVE COST DATA TABLE WB SR202L : SR101L to Dobson Road		
Design	$	208,000
Right-of-Way	$	0
Property Relocation	$	0
Construction	$	3,081,120
TOTAL	$	3,289,120

Note:
Total Shown Represents
Additional Cost of Alternative 1
Over Alternative 2

Figure 13 – Build Alternative Cost Comparison
(Sheet 1 of 2)



ALTERNATIVE COST DATA TABLE EB SR202L : At McKellips Road		
Design	$ 308,000	Note:
Right-of-Way	$ 700,000	Total Shown Represents
Property Relocation	$ 275,000	Additional Cost of Alternative 1
Construction	$ 4,520,180	Over Alternative 2
TOTAL	$ 5,803,180	

Figure 13 – Build Alternative Cost Comparison
(Sheet 2 of 2)

4.0 MAJOR DESIGN FEATURES OF THE PREFERRED ALTERNATIVE

4.1 DESIGN CONTROLS

SR 202L is classified as an Urban Principal Freeway/Expressway. A summary of the design controls for the mainline lanes is provided in Table 24. A summary of the design controls for the system and service interchange ramps are provided in Tables 25 and 26.

Table 24 – Design Controls for SR 202L Mainline

Description Of Criteria	Values For Design
Design Year:	2035
Design Speed (Existing):	65 mph
Superelevation:	Match existing (0.06 ft/ft maximum)
Cross Slope:	2.0%
Lane Width:	12 ft.
Shoulder Width:	
- Median:	10 ft.
- Outside:	12 ft.
Maximum Horizontal Curve:	3 degree, 27 minutes
Maximum Gradient:	Not applicable, match existing
Taper Rate:	65:1
Slope Standards:	
- Cut slopes:	Varies, 3:1 maximum
- Fill slopes:	Varies, 3:1 maximum
Minimum Vertical Clearance:	
- Highway structure:	16.5 ft.
- Pedestrian Overpass:	17.5 ft.

Table 25 – Design Controls for System Interchange Ramps

Description Of Criteria	Values For Design
Design Year:	2035
Design Speed:	55 mph
Superelevation:	Match Existing (0.06 ft/ft maximum)
Cross Slope:	2.0%
Pavement Width:	
- Single lane ramps:	28 ft.
- Two lane ramps:	36 ft., plus 2 ft. offset to barrier
- Three lane ramps:	48 ft., plus 2 ft. offset to barrier
Lane Width:	12 ft.
Shoulder Width:	
- Inside shoulder:	4 ft., plus 2 ft. offset to barrier
- Outside shoulder:	8 ft., plus 2 ft. offset to barrier
Maximum Horizontal Curvature:	5 degree, 15 minute
Maximum Gradient:	+4%, -5%
Slope Standards:	
- Cut slopes:	Varies, 3:1 maximum
- Fill slopes:	Varies, 3:1 maximum
Minimum Vertical Clearance:	
- Highway structure:	16.5 ft.
- Pedestrian Overpass:	17.5 ft.

Table 26 – Design Controls for Service Interchange Ramps

Description Of Criteria	Values For Design
Design Year:	2035
Design Speed:	
- Nose of gore (exit ramps):	60 mph
- Nose of gore (entrance ramps):	55 mph
- Ramp body:	50 mph
- Ramp terminal:	35 mph
Superelevation:	Match Existing (0.06 ft/ft max.)
Pavement Width:	
- Single lane exit ramp:	22 ft., plus 2 ft. offset to barrier
- Two lane exit ramp:	34 ft., plus 2 ft. offset to barrier
- Entrance ramp:	28 ft., plus 2 ft. offset to barrier
Lane Width:	12 ft.
Maximum Horizontal Curve:	6 degree, 45 minute
Maximum Gradient:	+4%, -5%, +/- 3% at crossroad
Slope Standards:	
- Cut slopes:	Varies, 3:1 maximum
- Fill slopes:	Varies, 3:1 maximum
Minimum Vertical Clearance:	
- Highway structure:	16.5 ft.
- Pedestrian Overpass:	17.5 ft.

4.2 ROADWAY CONFIGURATION

Eastbound SR 202L Mainline

The roadway widening would add a single general-purpose lane and would generally retain the existing lane configurations for the SR 202L mainline, service interchange entrance and exit ramps, and auxiliary lanes throughout the corridor. Some of the existing lane configurations were modified to improve traffic operations and improve the existing lane drops to conform to current ADOT standards.

A design concept was developed to construct one additional general-purpose lane in each direction on SR 202L from the SR101L/SR202L TI to Gilbert Road as presented in Appendix E. At the SR101L/SR202L TI, the existing SR 202L mainline configuration (three general-purpose lanes and one HOV lane) would be retained approaching the Ramp S-E/N-E entrance ramp. This alternative would improve the eastbound SR 202L mainline departing the SR101L/SR202L TI by reconfiguring the Ramp S-E/N-E entrance to allow each ramp to enter the mainline with a "lane-add" design, thereby eliminating the current bottleneck at this location. Ramp S-E (1 lane) and Ramp N-E (1 lane) would enter parallel to provide a two lane entrance into eastbound SR 202L. This two lane ramp entrance, combined with the eastbound SR 202L mainline (3 lanes), would provide five general-purpose lanes and one HOV lane departing the system interchange.

The Dobson Road exit ramp would be developed as a two lane ramp with a mandatory exit from the outside lane, and the second lane designed as an optional lane with the freeway through movement. The existing fourth general-purpose lane that drops just west of the Dobson Road

Overpass bridge would be extended to provide four general-purpose lanes and one HOV lane would continue to the east to Gilbert Road.

The Dobson Road entrance ramp (1 lane) would be designed as a parallel entrance that transitions into an auxiliary lane that continues to the Alma School Road exit ramp. The Alma School Road exit ramp would be designed as a parallel exit with a mandatory exit from the auxiliary lane.

The Alma School Road entrance ramp (1 lane) would be designed as a parallel entrance that transitions into an additional lane that continues to the Country Club Drive exit ramp (five general-purpose lanes and one HOV lane total). The McKellips Road exit ramp would be developed as a tapered exit from the outside lane.

The Country Club Drive exit ramp (1 lane) would be designed as a parallel exit with a mandatory exit from the outside general-purpose lane.

Due to right-of-way constraints at the Radio Disney Group, LLC radio station, the lane widths would be transitioned from 12' to 11' through the mainline horizontal curve at Country Club Drive. The Country Club Drive entrance ramp (1 lane) would be designed as a parallel entrance ramp that merges into the adjacent general-purpose lane prior to the Center Street Underpass. The roadway section at this location would include 10' inside shoulder, one 12' HOV lane, four 11' general-purpose lanes, a 12' parallel entrance lane, and a 6' outside shoulder. Once the roadway is past the right-of-way constraint point, the outside shoulder width would be increased to 12'. After the parallel entrance lane is dropped, the general-purpose lane widths would be transitioned from 11' to 12'.

Four general-purpose lanes and one HOV lane would continue to the east to Gilbert Road. The Gilbert Road exit ramp would be designed as a tapered exit ramp from the outside general-purpose lane. Four general-purpose lanes and one HOV lane would continue to the east under the Gilbert Road Underpass bridge. The fourth general-purpose lane would then be merged into the adjacent general-purpose lane to provide three general-purpose lanes that continue to the east.

Westbound SR 202L Mainline

The roadway widening would add a single general-purpose lane and would generally retain the existing lane configurations for the SR 202L mainline, service interchange entrance and exit ramps, and auxiliary lanes throughout the corridor. Some of the existing lane configurations were modified to improve traffic operations and improve the existing lane drops to bring them up to current ADOT standards.

The fourth general-purpose lane would be created with a lane addition east of the Gilbert Road Underpass. The Gilbert Road entrance ramp (1 lane) would be designed as a parallel entrance ramp. Four general-purpose lanes and one HOV lane would continue to the west to Country Club Drive.

The Country Club Drive exit ramp (1 lane) would be designed as a tapered exit from the outside general-purpose lane. The Country Club Drive entrance ramp (1 lane) would be designed as a parallel entrance ramp that merges into the adjacent general-purpose lane prior to the McKellips Road entrance ramp gore.

The McKellips Road entrance ramp (1 lane) would be designed as a parallel entrance ramp that transitions into an additional lane that continues to Alma School Road to provide five general-purpose lanes and one HOV in this area. The Alma School Road exit ramp (1 lane) would be designed as a tapered exit ramp from the outside lane. The outside lane would then be dropped with an AASHTO lane drop that would occur prior to the Alma School Road entrance ramp gore. Four general-purpose lanes and one HOV lane would continue to the west to Dobson Road.

The Alma School Road entrance ramp (1 lane) would be designed as a parallel entrance that transitions into an auxiliary lane that continues to the Dobson Road exit ramp to provide four general-purpose lanes and one HOV lane near Dobson Road. The Dobson Road entrance ramp would be designed as a parallel entrance that transitions into an auxiliary lane that continues to the SR101L/SR202L TI Ramp W-N/W-S exit. The Ramp W-N/W-S exit would be designed as a two lane mandatory exit from the outside lanes. Three general-purpose lanes and one HOV lane would then continue to the west through the system interchange.

This alternative would allow the majority of the project improvements to be constructed in accordance with ADOT and AASHTO standards. However, a design exception would be needed to reduce the general-purpose lane and outside shoulder widths on eastbound SR 202L to avoid the Radio Disney Group, LLC radio station property east of Country Club Drive.

4.3 HORIZONTAL AND VERTICAL ALIGNMENTS

Plan and profile sheets are provided in Appendix E. The plans include the horizontal and vertical alignments for the existing SR 202L mainline, system and service interchange ramps, and arterial streets. No modifications are proposed to the existing horizontal and vertical alignments for the SR 202L mainline and crossroads.

4.4 ACCESS CONTROL

Access control already exists and will be maintained in accordance with ADOT and FHWA Access Control Policy requirements.

4.5 RIGHT-OF-WAY

Acquisition of new right-of-way within the project limits is anticipated for this project at the Seyenna Vistas Mobile Home Park (2.6 acres). TCE's will be required for the construction of the Preferred Alternative. The TCE locations and limits will be finalized during final design.

4.6 STRUCTURES

This section describes the features of the structural elements needed to support the Preferred Alternative under consideration. This section also includes recommendations for the new bridge structures, widening of existing bridge structures, retaining walls and noise walls.

4.6.1 Introduction

Four mainline Overpasses will be widened to accommodate the additional new general-purpose lanes and auxiliary lanes associated with the Preferred Alternative. The Overpasses that would be widened include:

- Dobson Road TI Overpass (Structure No. 2444 & 2445, MP 11.00)
- Alma School Road TI Overpass (Structure No. 2446 & 2447, MP 12.01)
- McKellips Road TI Overpass (Structure No. 2493 & 2494, MP 12.80)
- Country Club Drive TI Overpass (Structure No. 2491 & 2492, MP 13.21)

The existing bridges consist of either cast-in-place post-tensioned concrete box girders or precast prestressed AASHTO girders. A summary of the existing bridge structures is provided on Table 5 (page 9).

This study included an evaluation of potential alternatives to widen the existing bridges. This evaluation examined numerous issues including the ability to maintain minimum vertical clearances during construction, minimum vertical clearances for the widened bridge structures, maintenance of traffic during construction, constructability of the widened portion of the bridge, potential impacts to the existing ramps and ramp intersections, aesthetics, and construction costs. While this document is not intended to select the final bridge configuration at each location, the anticipated and feasible structure type(s) are discussed for each location.

4.6.2 Special Structure Considerations for the Preferred Alternative

The Preferred Alternative requires a special structural element to be constructed along the existing high retaining wall that is located along the westbound mainline between the City of Mesa's equipment Underpass and the Dobson Road entrance ramp. The existing retaining wall is located between the north side of SR 202L mainline and the CSA that functions as the south bank of the Salt River. The top of the CSA also serves as a maintenance access road for the FCDMC.

As shown on Figure 15 (page 64) and Figure 16 (page 65), the roadway width would be developed by a partial removal of the existing retaining wall to accommodate a cast-in-place concrete cantilever deck/moment slab. This approach would eliminate the need to relocate the existing wall and CSA while accommodating the full-width general-purpose lane and shoulder requirements associated with the Preferred Alternative.

As-built plans of the existing wall suggest that the existing subgrade material may have been unsuitable, requiring 5' of overexcavation at the taller portions of the existing wall during the construction of SR 202L. A full geotechnical analysis (including field exploration) should be performed to assess the need for potential remedial measures (i.e. foamed concrete), to reduce the additional dead and live load surcharge induced on the existing wall as a result of the new overhang configuration, and to address any potential settlement concerns that may compromise the integrity of the roadway embankment.

A similar concept would be proposed to accommodate the freeway widening above the existing City of Mesa water treatment plant equipment Underpass to avoid impacting the existing 20" sewer force main that is shown on Figure 14.

Figure 14 – Existing 20" Sewer Force Main at City of Mesa Equipment Underpass

4.6.3 Widening of Existing Bridge Structures

Structural Considerations

Cast-in-Place Post-Tensioned Concrete Box Girder

Post-tensioned structures are utilized extensively on the Regional Freeway System. The advantages of utilizing post-tensioned box girders for the widening of the existing structures include:

- This superstructure configuration would be consistent with the majority of the existing bridges that would be widened with the project and could match the aesthetics of the existing bridges.

- A similar superstructure configuration as the existing bridge would match the existing structural dynamics.
- This superstructure configuration would accommodate various roadway geometric situations that occur at interchange ramp taper and gore areas.
- The widened portion of the bridge can be built on falsework above traffic. If the required falsework vertical clearance is not available, the superstructure could be built at the elevation needed to provide the minimum vertical clearance and then hydraulically lowered into the final position. Alternatively, a through-girder concept could be utilized to gain additional temporary clearance.

The disadvantages of utilizing post-tensioned box girders for the widening of existing structures include:

Overpass structures located at crossroads would require the bridge to be constructed on falsework while maintaining traffic. The use of falsework would introduce the following issues for evaluation:

- Reduced vertical clearances: A minimum vertical clearance of 16' is required during construction. The falsework clearance has been reduced below this limit on previous projects by using overhead crash beams. However, the use of crash beams for sites with reduced vertical clearance is now discouraged due to safety and operational concerns. The minimum falsework clearance could be mitigated by constructing the widened portion of the bridge on falsework at an elevation higher than the existing bridge, and then lowering the superstructure onto the abutments and piers with hydraulic jacks. Consequently, this adds complexity to the bridge design and construction and increases the cost of the bridge.
- Traffic impacts during construction: The use of falsework may require additional falsework towers and reduce the number of open lanes during construction. Precast elements used in conjunction with cast-in-place alternatives can provide increased spans and reduce the number of or eliminate falsework towers. Typical falsework spans are generally limited to a maximum opening of 60'. Increasing the falsework spans beyond 60' is feasible; larger spans require larger falsework girders that may not be readily available to the contractor, which could increase the project cost and construction duration. This type of bridge construction will also have an increased number of construction closures.
- Construction costs: Post-tensioned structures are typically more cost effective if constructed on soffit fill. Several of the bridge structures on this project support freeway crossings over arterial streets which preclude a soffit fill construction method. At these locations, the widening of the existing bridge structures with this superstructure configuration would require the use of falsework, increasing the cost of construction.
- Reduced Safety: More construction activities will occur over and adjacent to traffic, thereby reducing worker and public safety.
- Construction duration: A cast-in-place post-tensioned superstructure would generally exceed the duration required for precast girder bridge construction by approximately 30 to 60 days. The construction duration would also be increased by approximately 60 days to allow for creep and shrinkage in the post-tensioned, widened structures to occur prior to placing a concrete deck closure pour. The total increase in construction duration by utilizing a post-tensioned box girder option for the bridge structure widening compared to precast girders would be approximately 90 days.
- Falsework: Multi-span bridges make the construction of falsework and lowering the superstructure into place by hydraulic jacking problematic. The hydraulic jacking of the superstructure must be sequenced carefully to ensure that unintentional redistribution of forces does not lead to overstressing the superstructure.
- Steel Through-Girders: The use of steel through-girders to mitigate temporary construction clearances would add additional cost to the bridge construction, because additional fabrication will be required for non-standard, welded steel plate girders.
- Matching the new and existing bridge decks: Many variables must be considered that affect the long and short term camber of a bridge including temperature, creep and shrinkage. Techniques that can be utilized to ensure the existing and new bridge deck elevations will match at the interface include larger closure pours, the placement of additional deck thickness with subsequent deck milling, placement of an asphalt overlay, developing more detailed camber calculations, providing additional creep and shrinkage testing of the concrete mix, providing additional post-tensioning that can be tensioned or de-tensioned to adjust the bridge structure widening profile, using high performance concrete to reduce creep and shrinkage effects and providing higher construction quality control.

Precast Prestressed Concrete Girders

A significant number of precast, prestressed concrete girder bridge structure widenings have been constructed throughout the Regional Freeway System. AASHTO girders or precast prestressed box beams are an excellent alternative structure type for the widening of both cast-in-place (CIP) post-tensioned concrete box girder and precast girder bridges.

The advantages of utilizing precast sections include:

- Reduced construction duration: The majority of the creep and shrinkage that would occur in the precast girders would be completed prior to the erection of the girder. Therefore, the widened portion of the bridge deck can be placed with one pour, eliminating the need for a closure pour.
- Falsework: The use of precast girders would eliminate the need for falsework, thereby reducing the impacts to traffic during the construction of the bridge. Crossroad closures would be required during the erection of the girders, placement of stay-in-place deck forms (if applicable), and concrete placement of the deck.

The disadvantages of utilizing precast sections include:

- Depth of superstructure: A precast girder bridge would generally require a deeper superstructure section, which could impact the vertical clearance over the crossroad.
- Roadway geometry: A precast girder superstructure is not as conducive as post-tensioned box girder bridges to accommodate unique roadway geometry situations that occur at traffic

interchange ramp connections. Therefore, additional deck area, that would not be used to support traffic, may be necessary at certain locations.

Steel Girders

Steel girders were considered for the bridge structure widenings associated with this project. However, steel girders react to temperature changes more abruptly than concrete structures. All of the structures that would be widened were originally constructed with precast, prestressed concrete girders and/or post-tensioned concrete box girders. Therefore, steel girders may experience greater expansion and contraction than concrete girders in a given day. This may lead to compatibility issues between the existing and widened structure. In addition, steel girders are not typically cost competitive in Arizona, require a long fabrication and delivery schedule, and require additional maintenance. Therefore, steel girder superstructure alternatives for the widening of existing concrete superstructures were conceptually eliminated from consideration.

4.6.4 Design and Constructability Requirements

The bridge design and constructability issues were discussed extensively with representatives of ADOT's Bridge Group, Phoenix Construction District, and representatives of the local agencies. Therefore, the initial evaluation of alternatives for the widening of the existing bridge structures included the items shown below.

Vertical Clearance

A minimum vertical clearance of 16'-0", or the existing vertical clearance (whichever is less), over active traffic lanes is desirable during construction. The falsework clearance can be reduced below this limit with the approval of ADOT Bridge Group and Phoenix Construction District and with the use of crash beams. However, the use of crash beams for sites with reduced vertical clearance is now discouraged due to safety and operational concerns. Therefore, the development of alternative bridge widening configurations for this study were based on maintaining the lesser of a 16'-0" minimum vertical clearance or the existing vertical clearance during construction.

ADOT Bridge Group has requested that the bridge widening alternatives provide 16'-6" vertical clearance over the crossroads in the final position. If the Overpass currently provides less than 16'-6" vertical clearance, then the existing clearance should be maintained for the widened portion of the Overpass where practical.

Bridge Barriers

All of the SR 202L mainline bridges within the project limits would use ADOT Standard 32" height F-shaped half barriers at the edge of the bridge deck. These bridges do not warrant the use of a 42" F-shape barrier as they do not pass over another freeway.

Concrete Strength

The bridge practice guidelines limit the maximum 28-day compressive strength of concrete to 6,500 pounds per square inch (psi) for precast girders and 6,000 psi for cast-in-place post-tensioned concrete box girders. The final designer can consider higher concrete strengths, if needed, with approval from ADOT Bridge Group.

Design Code

ADOT Bridge Group's current policy is that Load and Resistance Factor Design (LRFD), as amended by the *ADOT Bridge Design Guidelines,* will be required for the design of the widening of existing bridges that were previously designed using the *AASHTO Standard Specifications*. Any new bridge structures shall be designed in accordance with the most current ADOT *Bridge Design Guidelines*.

Design Loads

All of the existing bridge structures were originally designed for HS-20 loading, with provisions for an additional 25 pounds per square foot of deck area for a future wearing surface. The widened structures should be designed utilizing the HL-93 live load and additional dead load conditions.

Maintenance of Traffic Operations

Minimizing impacts to the traveling public will be an important consideration in the bridge widening type selection.

Condition of Existing Bridges

The condition of the existing bridge structures is summarized in the bridge evaluation request form included in the AASHTO Controlling Criteria Report in Appendix D.

4.6.5 Evaluation of Bridge Widening Alternatives

The initial alternative consideration for the widening of each bridge is discussed in this section of the report. A summary of the bridge widenings is presented in Table 27 (page 65) following the site-specific discussions. The selection of a bridge widening configuration is a preliminary recommendation that has been used for cost estimating purposes and is based upon the information known at the time of this report. A detailed structure evaluation and selection process will be performed during the next design phase of the project.

Unless noted otherwise, it is anticipated that all or part of the existing concrete deck overhangs on the existing bridges would be removed to allow the widened portion of the bridge to be connected to the existing superstructure.

4.6.5.1 Dobson Road TI Overpass (Structure No. 2444 & 2445, MP 11.00)

Existing Bridge Configuration

The existing bridges are two span, cast-in-place post-tensioned concrete box girder structures passing over Dobson Road. The span lengths of the existing eastbound bridge are 101.47' and 114.33'. The span lengths of the existing westbound bridge are 102.08' and 115.23'.

The bridges support the eastbound and westbound SR 202L roadways and are constructed within a crest vertical curve and on a horizontal curve with a 24° 09' 45" skew to the crossroad. The bridges are superelevated at 5.3% that slopes down toward the outside shoulder for the westbound roadway and down toward the median shoulder for the eastbound roadway.

The existing eastbound and westbound clear roadway widths on the bridges are both 70.00'. The widening of these structures would add one general-purpose lane in both directions of travel, resulting in clear roadway widths of 82.00' on both bridges.

Foundation Type

The existing substructures for the bridges consist of stub abutments and pier columns founded on drilled shaft foundations. It is anticipated that the substructures for the bridge widening would match the configuration of the existing substructures.

Feasible Structure Types and Traffic Control Requirements

Two structural options would be feasible for the widening of the existing structures. The first option would be to widen the existing bridges using a CIP post-tensioned concrete box girder configuration that would be constructed above the existing structure's finished grade on falsework (to achieve 16'-0" minimum temporary vertical clearance) and then hydraulically lowered into final position. It is anticipated that closures of the crossroad through lanes would be needed for the placement of falsework towers during construction of the superstructure for this option. Left-turn lane closures would be required to accommodate pier construction.

The second option would utilize side-by-side precast prestressed box beams. While the use of precast prestressed box beams would not precisely match the aesthetics of the existing bridges, this superstructure alternative would eliminate the need for long-term lane closures on Dobson Road during the bridge construction activities. It is anticipated that temporary lane closures would still be required for the pier construction. Falsework towers that may interfere with traffic operations during construction would not be necessary for this option. Preliminary analyses indicate that a release strength of 6,000 psi would be needed for precast box beams. ADOT Bridge Group has indicated that the use of 6,000 psi release strength would be acceptable for this bridge crossing.

Site Specific Issues

There are no other site-specific issues that would require consideration at this location.

Vertical Clearance

The existing minimum vertical clearance at these structures is approximately 16'-11". The final vertical clearance for the widened superstructure would be approximately 16'-6"

Initial Recommendation

The post-tensioned box girder was used for cost estimating purposes. However, both structural alternatives should be evaluated in the next design stage.

4.6.5.2 Alma School Road TI Overpass (Structure No. 2446 & 2447, MP 12.01)

Existing Bridge Configuration

The existing bridges are two span, precast prestressed concrete AASHTO Type IV girder structures passing over Alma School Road. The span lengths of the existing eastbound bridge are 69.41' and 82.25'. The span lengths of the existing westbound bridge are 69.71' and 82.71'.

The bridges support the eastbound and westbound SR 202L roadways and are constructed within a crest vertical curve and on a horizontal curve with a 19° 56' 30" skew to the crossroad. The bridges are superelevated at 5.7% that slopes down toward the outside shoulder for the westbound roadway and down toward the median shoulder for the eastbound roadway.

The existing eastbound and westbound clear roadway widths on the bridges are both 70.00'. The widening of these structures would add one general-purpose lane in the eastbound direction and add one general-purpose lane and one auxiliary lane in the westbound direction of travel, resulting in clear roadway widths of 82.00' and 94.00', respectively.

Foundation Type

The existing substructures for these bridges consist of full-height abutments consisting of a shallow abutment cap with a concrete fascia wall supported on formed columns and pier columns, both founded on drilled shaft foundations. It is anticipated that the substructures for the bridge widening would match the configuration of the existing substructures.

Feasible Structure Types and Traffic Control Requirements

Two structural options would be feasible for the widening of the existing structures. The first option would be to widen the existing eastbound bridge with precast prestressed concrete AASHTO Type IV girders. Special consideration was required for widening the structure in the westbound direction because of the high superelevation rate and the need to widen this bridge by two additional lanes. Matching the existing superstructure type in the westbound direction would result in a vertical clearance less than 16'-0". Therefore, closely spaced AASHTO Type III girders were evaluated for this structure and were determined to be feasible. The approximate vertical clearance with the use of AASHTO Type III girders would be 16'-4".

Another possible alternative would include side-by-side precast prestressed concrete box beams. However, these structural elements are not typically cost effective and would result in a greater

disparity in superstructure stiffness. Also, the use of precast prestressed box beams would not precisely match the aesthetics of the existing bridges.

The only significant lane closures anticipated for both alternatives would be for the construction of the pier caps within in the Alma School Road median.

Site Specific Issues

There is a sign structure supported by the existing eastbound abutment on the west side of Alma School Road that would need to be relocated.

Vertical Clearance

The existing minimum vertical clearance at these structures is approximately 17'-⅞". The final vertical clearance for the widened superstructure would be approximately 16'-4".

Initial Recommendation

The AASHTO girder alternative was utilized for cost estimating purposes. However, both structural alternatives should be evaluated in the next design stage.

4.6.5.3 McKellips Road TI Overpass (Structure No. 2493 & 2494, MP 12.80)

The existing bridges are single span, cast-in-place post-tensioned concrete box girder structures passing over McKellips Road. The span length of the existing eastbound bridge is 180.38'. The span length of the existing westbound bridge is 179.64'.

The bridges support the eastbound and westbound SR 202L roadways and are constructed within a crest vertical curve and on a horizontal curve with a 33° 18' 00" skew to the crossroad. The bridges are superelevated at 2.3% that slopes down toward the outside shoulder for the eastbound roadway and down toward the median shoulder for the westbound roadway.

The existing eastbound and westbound clear roadway widths on the bridges are both 70.00'. The widening of these structures would add one general-purpose lane and one auxiliary lane in both directions of travel, resulting in clear roadway widths of 94.00' on both bridges.

Foundation Type

The existing substructures for the bridges consist of stub abutments founded on drilled shaft foundations. The toe of existing slope paving is elevated and supported by a retaining wall that wraps around the full width of the bridge crossings. It is anticipated that the substructures for the bridge widening would match the configuration of the existing substructures.

Feasible Structure Types and Traffic Control Requirements

It is anticipated that the widened structures would match the superstructure configuration of the existing bridges. The CIP post-tensioned concrete box girder configuration would be constructed above the existing structure's finished grade on falsework (to achieve 16'-0" minimum temporary vertical clearance) and then hydraulically lowered into final position. It is anticipated that closures of through lanes on McKellips Road would be needed for the placement of falsework towers during construction of the superstructure.

Another feasible alternative would utilize precast concrete tub segments spliced together to reduce falsework towers to eliminate the need for hydraulic jacking.

Site Specific Issues

There are no other site-specific issues that would require consideration at this location.

Vertical Clearance

The existing minimum vertical clearance at these structures is approximately 18'-8". The final vertical clearance for the widened superstructure would be approximately 17'-8".

Initial Recommendation

The post-tensioned box girder superstructure was utilized for cost estimating purposes.

4.6.5.4 Country Club Drive TI Overpass (Structure No. 2491 & 2492, MP 13.21)

Existing Bridge Configuration

The existing bridges are two span, precast prestressed concrete AASHTO Type V girder structures passing over Country Club Drive. The span lengths of the existing eastbound bridge are 116.71' and 122.61'. The span lengths of the existing westbound bridge are 117.31' and 123.41'.

The bridges support the eastbound and westbound SR 202L roadways and are constructed within a crest vertical curve and on a horizontal curve with a 25° 38' 11" skew to the crossroad. The bridges are superelevated at 4.8% that slopes down toward the outside shoulder for the westbound roadway and down toward the median shoulder for the eastbound roadway.

The existing eastbound and westbound clear roadway widths on the bridges are both 70.00'. The widening of these structures would add one general-purpose lane in the westbound and eastbound directions of travel, resulting in clear roadway widths of 82.00' on both bridges.

Foundation Type

The existing substructures for the bridges consist of stub abutments and pier columns founded on drilled shaft foundations. It is anticipated that the substructures for the bridge widening would match the configuration of the existing substructures.

Feasible Structure Types and Traffic Control Requirements

Two structural options were considered for the widening of the existing structures. The first option would be to widen the existing bridges with prestressed precast concrete AASHTO Type V girders in both directions.

(Text continued on page 64)

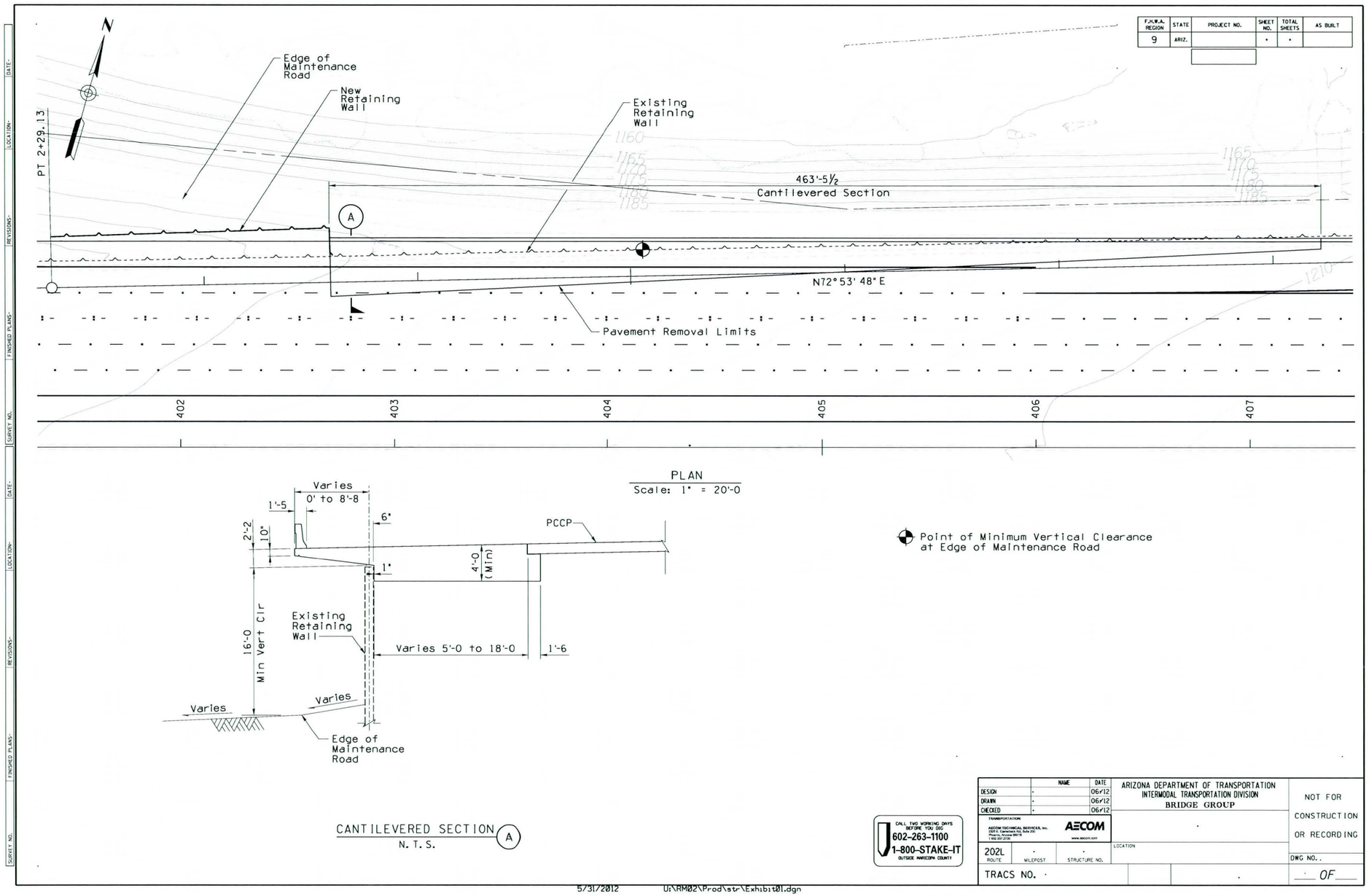


Figure 15 – Cantilever Overhang on West Side of Existing Wall
Station 402+69.80 to Station 407+33.26

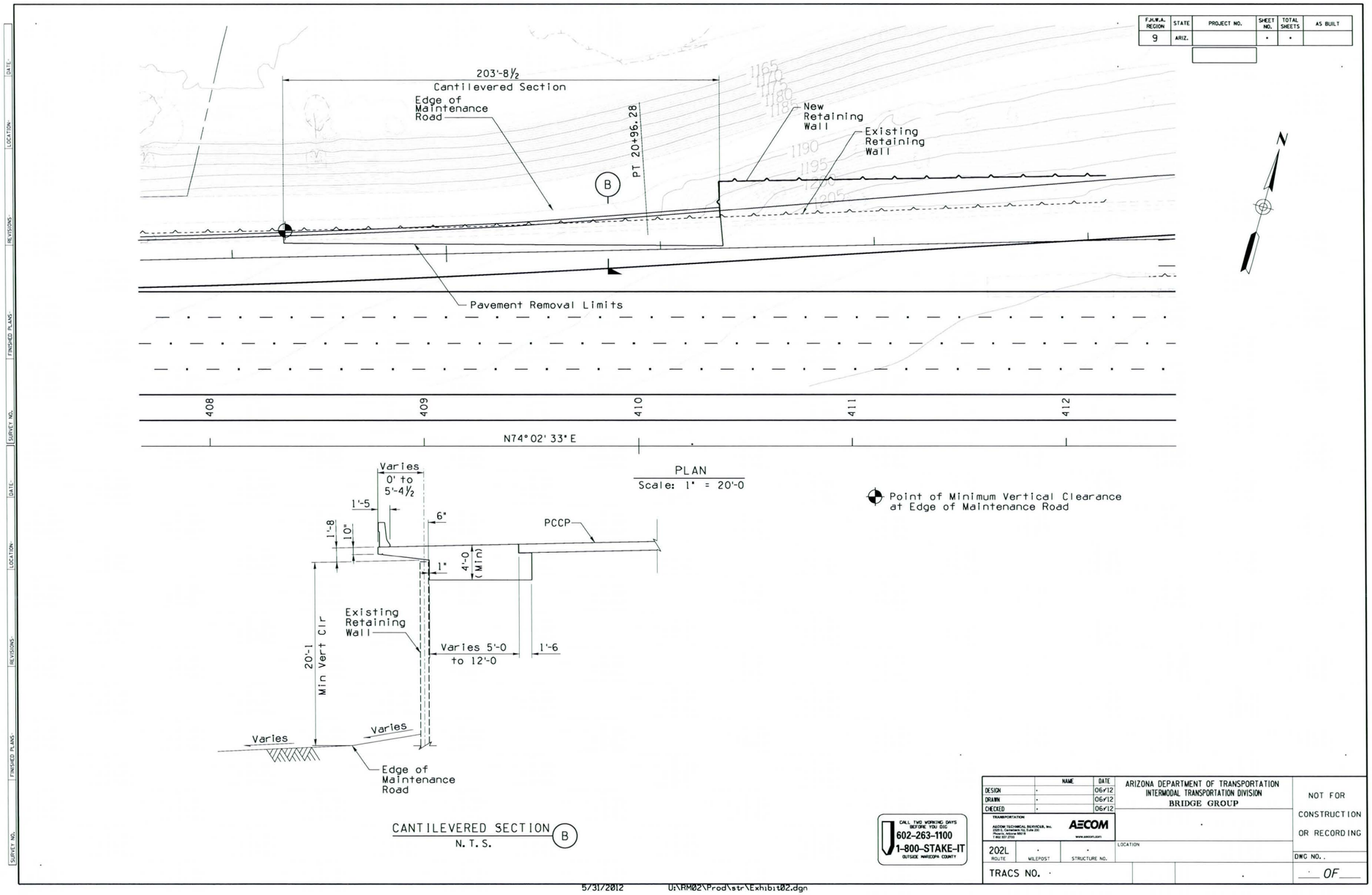


**Figure 16 – Cantilever Overhang on East Side of Existing Wall
Station 408+34.87 to Station 410+38.57**

Another alternative for evaluation would include side-by-side precast prestressed concrete box beams. However, these are not typically cost effective and would result in a greater disparity in superstructure stiffness. Also, the use of precast prestressed box beams would not precisely match the aesthetics of the existing bridges. Preliminary analyses also indicate that 28-day concrete strengths exceeding 9,000 psi would be required to make precast box beams viable. ADOT Bridge Group would not approve this concrete strength and would therefore preclude this as an alternative.

The only significant lane closures anticipated for both alternatives would be for the construction of the piers within the Country Club Drive median.

Site Specific Issues

There are no other site-specific issues that would require consideration at this location.

Vertical Clearance

Supplemental survey revealed that the existing vertical clearance for the eastbound structure on the median side was 16.24'. The widening in the westbound direction, with an identical superstructure, would be 16.23'.

Initial Recommendation

An AASHTO Type V girder superstructure is recommended at this location, although precast box beams could also be assessed as an alternative in the next design stage.

4.6.5.5 Recommendations

The initial bridge widening configurations used for the Order of Magnitude, project cost estimates are summarized in Table 27.

Table 27 – Bridge Structure Widening Concepts for the Preferred Alternative

Bridge Description	Bridge Length	Number of Spans	C_L-C_L Span Lengths	Approx Width of Widening*	Proposed Superstructure Depth	Existing Superstructure Type	Proposed Widening Concept
Dobson Road TI Overpass	221'-10⅜" (EB); 223'-5" (WB)	2	101'-5⅝", 114'-4" (EB); 102'-1", 115'-2¾" (WB)	12' EB and WB	5'-0" EB 4'-9" WB	5'-0" cast-in-place post-tensioned concrete box girder bridge	Hydraulically jacked PT box and/or steel through girders for falsework could address temporary construction clearance issues by building the structure above finished grade; increasing the available falsework depth can also reduce the number of falsework towers need and associated lane impacts
Alma School Road TI Overpass	157' (EB); 157'-9½" (WB)	2	69'-4⅞", 82'-3" (EB); 69'-8½", 82'-8½" (WB)	12' EB 24' WB	5'-5" EB 4'-7" WB	AASHTO Type IV Girders (5'-5" max.)	AASHTO Type IV girders (EB) AASHTO Type III girders (WB) to obtain 16'-4" minimum vertical clearance

Table 27 – Bridge Structure Widening Concepts for the Preferred Alternative (continued)

Bridge Description	Bridge Length	Number of Spans	C_L-C_L Span Lengths	Approx Width of Widening*	Proposed Superstructure Depth	Existing Superstructure Type	Proposed Widening Concept
McKellips Road TI Overpass	186'-11⅝" (EB); 186'-2½" (WB)	1	180'-4½" (EB); 179'-5⅞" (WB)	24' EB and WB	7'-9" EB and WB	7'-9" cast-in-place post-tensioned concrete box girder bridge	Hydraulically jacked PT box and/or steel through girders for falsework could address temporary construction clearance issues by building the structure above finished grade; increasing the available falsework depth can also reduce the number of falsework towers need and associated lane impacts
Country Club Road TI Overpass	246'-6¼" (EB); 247'-11½" (WB)	2	116'-8½", 122'-7⅜" (EB); 117'-3 ¾", 123'-4⅞" (WB)	12' EB and WB	6'-3" EB and WB	AASHTO Type V Girders (6'-3" max.)	Utilize AASHTO Type V girders in both directions

* Structural widening does not include the width associated with the partial removal of the existing deck.

4.6.6 Retaining Walls

New retaining walls would be required throughout the corridor to accommodate the roadway widening for the Preferred Alternative. The retaining wall alternatives that could be considered for this project are cantilevered walls on spread footings, cantilevered walls on drilled shaft foundations, mechanically stabilized earth (MSE) walls, soil nailed walls, and soldier/tieback walls. The design of the walls will utilize the current AASHTO LRFD Specifications and the ADOT *Bridge Design Guidelines*.

The new retaining walls may require special design considerations due to the proximity of new walls to existing walls, or new walls in close proximity to existing or proposed right-of-way. At these locations, the following alternatives should be evaluated during final design:

- Offset the new wall from the existing wall to provide sufficient area to construct a new spread footing.
- Provide a specialty wall design that could be founded on:
  - L-shape spread footings.
  - Single or multiple rows of drilled shaft foundations utilizing a shaft cap to transfer the loads from the wall to the shafts.
- Tie-back or soil nail walls may be considered. However, the existing roadway embankment may not be suitable for lateral restraint.
- MSE walls

An evaluation will be required during final design to determine the feasibility of each wall alternative. The evaluation criteria should include right-of-way constraints, construction access availability, the ability to maintain traffic during construction, and estimated construction costs.

Preliminary Recommendations for Retaining Walls

For the purpose of this report, retaining walls are divided into three categories including standard cast-in-place walls, specialty walls, and combination walls. A summary of the retaining walls used for cost estimating purposes is provided in Table 28. Any walls not requiring special treatment are designated as standard walls. Standard walls are anticipated to be either ADOT standard cast-in-place walls or walls founded on similarly configured spread footing foundations. Walls that would require an unusual footing shape or would be founded on drilled shaft foundations; or are tie-back, soil nail, MSE walls are designated as specialty walls. Other retaining walls may require additional height to provide noise mitigation if indicated in the preliminary noise analysis. These walls are identified as combination walls. Unless specified as a combination/specialty wall, combination walls are also anticipated to be founded on spread footings. A detailed analysis should be performed during final design.

Table 28 – New Retaining Wall Summary for the Preferred Alternative

Alignment	Wall No.	Description	Approximate Station Limits	Approximate Wall Length	Average Wall Height/ Maximum Wall Height[1]	Wall Type[1]
SR202LMainline, Dobson Road Ramp B	R1	South edge of SR202L EB; South edge of Dobson Ramp B	SR202L Station 393+00 to Dobson Ramp B Station 12+00	2134'	4'/5'	Standard CIP Wall
Dobson Road Ramp D	R2	South edge of Dobson Ramp D	Dobson Ramp D Station 14+00 to Station 24+00	1008'	10'/15'	Standard CIP Wall
SR202L Mainline, Alma School Road Ramp B	R3	South edge of SR202L EB; South edge of Alma School Road Ramp B	SR202L Station 439+75 to Alma School Ramp B Station 20+50	2401'	5'/6'	Standard CIP Wall
SR 202L Mainline	R4	South edge of SR202L EB, West of Alma School Road TI	SR202L Station 465+25 to Station 470+00	479'	17'/28'	Standard CIP Wall
			SR202L Station 470+00 to Station 471+94	203'	31'/36'	Specialty Wall[2]
SR 202L Mainline	R5	South edge of SR202L EB, East of Alma School Road TI	SR202L Station 473+57 to Station 479+00	568'	15'/29'	Standard CIP Wall
SR202L Mainline, McKellips Road Ramp B	R6	South edge of SR202L EB; South edge of proposed McKellips Road Ramp B	SR202L Station 489+00 to McKellips Ramp B Station 23+75	1940'	13'/21'	Standard CIP Wall, except for CIP Combination Wall from Station 489+00 to Station 504+32.00
SR202L Mainline	R7	South edge of SR202L EB to McKellips Road	SR202L Station 508+00 to Station 509+12.50	143'	14'/26'	Standard CIP Wall, except for CIP Combination Wall from Station 508+00 to Station 508+90.74
SR202L Mainline	R8	South edge of SR202L EB starting at McKellips Road	SR202L Station 510+58.06 to Country Club Drive Ramp B Station 16+00	1239'	8'/29'	Standard CIP Wall, except for CIP Combination Wall from Station 10+80.86 to Station 12+02.86

Table 28 –New Retaining Wall Summary for the Preferred Alternative (continued)

Alignment	Wall No.	Description	Approximate Station Limits	Approximate Wall Length	Average Wall Height/ Maximum Wall Height[1]	Wall Type[1]
SR202L Mainline	R9	South edge of SR202L EB, West of Country Club Drive TI	SR202L Station 527+25 to Station 534+40	711'	12'/17'	Standard CIP Wall except CIP Combination Wall from Station 530+05.00 to Station 534+39.74
SR202L Mainline	R10	South edge of SR202L EB, East of Country Club Drive TI	SR202L Station 536+78 to Station 538+25	155'	7'/16'	CIP Combination Wall
SR202L Mainline	L1	North edge of SR202L WB	SR202L Station 381+00 to 402+70 and Dobson Road Ramp A Station 21+31 to Station 28+00	2840'	7'/24'	Standard CIP Wall
Dobson Road Ramp C, SR 202L Mainline, Alma School Road Ramp A	L2	North edge of SR 202L WB; North edge of Dobson Road Ramp C and Alma School Road Ramp A	Dobson Ramp C Station 16+00 to Alma School Ramp A Station 15+50	3522'	7'/14'	Standard CIP Wall
SR202L Mainline	L3	North edge of SR202L WB, west of Alma School Road TI	SR202L Station 470+75 to Station 472+40	158'	12'/24'	Standard CIP Wall
SR202L Mainline	L4	North edge of SR202L WB, East of Alma School Road TI	SR202L Station 474+18 to Station 476+25	196'	16'/22'	Standard CIP Wall
Alma School Road Ramp C, SR202L Mainline, McKellips Road Ramp A	L5	North edge of SR202L WB; North edge of Alma School Road Ramp C and McKellips Road Ramp A	Alma School Ramp C Station 16+00 to McKellips Road Ramp A Station 21+75	2515'	6'/11'	Standard CIP Wall
SR202L Mainline	L6	North edge of SR202L WB, West of McKellips Road TI	SR202L Station 502+25 to Station 506+00, SR202L Station 506+00 to Station 507+70.11, SR202L Station 507+70.11 to Station 507+85.67	380' 172' 44'	12'/23' 29'/33' 15'/20'	Standard CIP Wall Specialty Wall[1] Standard CIP Wall
SR202L Mainline, Country Club Drive Ramp A	L7	North edge of SR202L WB, East of McKellips Road TI	SR202L Station 509+25.95 to Station 509+40.39, SR202L Station 509+40.39 to Station 510+71.24, SR202L Station 510+71.24 to Country Club Ramp A Station 18+75	43' 133' 2071'	17'/21' 23'/36' 7'/11'	Standard CIP Wall Specialty Wall[1] Standard CIP Wall
SR202L Mainline	L8	North edge of SR202L WB, West of Country Club Drive TI	SR202L Station 534+00 to Station 535+18	115'	6'/12'	Standard CIP Wall
SR202L Mainline	L9	North edge of SR202L WB, East of Country Club Drive TI	SR202L Station 537+70 to Station 544+00	611'	13'/17'	Standard CIP Wall
SR202L Mainline, Gilbert Road Ramp A	L10	North edge of Gilbert Road Ramp A	SR202L Station 683+00 to Gilbert Ramp A Station 30+00	746'	4'/5'	Standard CIP Wall

(1) Wall type may be impacted pending further noise analyses, structural analyses, and/or geotechnical investigations. MSE walls are a viable alternative to CIP walls at the locations noted in this table, except as noted in (2).
(2) MSE walls are not a viable alternative at this location due to site constraints. An alternative specialty wall configuration will be required at this location.

4.6.7 Noise Walls

A noise mitigation study was prepared for this project. The findings of the noise wall analysis are summarized in Table 29 for the Preferred Alternative.

Specialty walls, in the form of lightweight concrete panels for the bridge structures, are identified in Table 29.

Table 29 – New Noise Wall Summary for the Preferred Alternative

Alignment	Wall No.	Description	Approximate SR202L Station Limits	Approximate Wall Length	Average Wall Height/ Maximum Wall Height[1]	Wall Type[1]
Alma School Road Ramp D SR202L Mainline McKellips Road Ramp B	Barrier 02A	South edge of SR202L EB from Alma School Road Ramp D to McKellips Road Ramp B	Station 480+87.00 to Station 489+00.00	818'	20'/20'	Standard Noise Wall
			Station 489+00.00 to Station 504+32.00	1528'	16'/20'	Combination Wall
SR202L Mainline	Barrier 02B	South edge of SR202L EB, over McKellips Road	Station 500+89.00 to Station 508+00.00	702'	16'/16'	Standard Noise Wall
			Station 508+00.00 to Station 508+90.74	88'	14'/14'	Combination Wall
			Station 508+90.74 to Station 510+80.86	188'	12'/14'	Specialty Wall
			Station 510+80.86 to Station 512+03.00	122'	12'/12'	Combination Wall
SR202L Mainline	Barrier 03	South edge of SR202L EB, over Country Club Drive	Station 530+05.00 to Station 534+39.74	436'	12'/12'	Combination Wall
			Station 534+39.74 to Station 536+77.98	246'	12'/12'	Specialty Wall
			Station 536+77.98 to Station 538+25.00	150'	14'/14'	Combination Wall
			Station 538+25.00 to Station 545+77.00	768'	16'/16'	Standard Noise Wall

4.7 DRAINAGE

4.7.1 Offsite Systems

Offsite drainage features are not expected to be impacted by the roadway widening. New proposed roadway edges do not conflict with existing offsite channels and the Salt River south bank. Concrete barrier is proposed as required to address clear-zone criteria. Variation in onsite peak flows will not affect the capacity of the offsite systems due to significant differences in design frequency and times of concentration between the onsite and offsite hydrographs.

4.7.2 Onsite Systems

Analysis Criteria

The drainage evaluation was conducted in accordance with the requirements of Chapter 600 of *ADOT's Roadway Design Guidelines*. The minimum catch basin spacing was based on the allowable spread requirements for each roadway classification, factoring on the planned AR-ACFC overlay.

On-Site System Overview

The proposed widening of the mainline and the reconstruction of ramps will require the relocation of all catch basins on the outside edges of the roadway. Some of the area inlets located within the infield areas will also need to be relocated. New area inlets are proposed to collect runoff from side slopes behind concrete barrier in the depressed segment of SR 202L.

The relocation of catch basins will require the expansion of the existing storm drain networks to allow connections to new inlets. Additional catch basins and manholes are required in order to meet design guidelines for spread, changes of direction, access for maintenance and spacing.

The original design of the onsite drainage systems included a provision for inside widening of the mainline, but not for the addition of pavement to the outside. Effects of the additional widening of the freeway to the hydraulic capacity of existing trunk lines and the Mesa Drive pump station are not included in the analysis.

Rainfall Data

New site specific rainfall data has been generated for this study using the utility in the National Oceanic and Atmospheric Administration (NOAA) 14 web site. Rainfall depth values from the NOAA 14 utility are generally lower than those used in the original storm drain design. The 10-year, 10-minute intensity value is 3.60 inches per hour (in/hr).

Gutter and Inlet Hydrology and Hydraulics

The delineation of onsite drainage basins was completed based on the location of inlets and roadway geometry for the Preferred Alternative. Rational method calculations were conducted using the rainfall intensities shown above and assumed a 10-minute time of concentration for the calculation of design peak flows.

Preliminary gutter and inlet hydrologic and hydraulic calculations follow guidelines and procedures in the *ADOT Hydraulic Manual* and HEC-22 publication. As previously indicated, the method of calculation accounts for a roadway section with a 1" rubberized asphalt overlay above the lip of gutter and n-values of 0.013 for the gutter and 0.016 for the pavement segment.

Gutter hydraulic and spread calculations account for a 1" overlay of rubberized asphalt to the lip of gutter, with a roughness coefficient (n) of 0.013 for the concrete gutter and 0.016 for asphalt

pavement, as directed by ADOT's Roadway Drainage Design Section. A curb height of 4" was used for at-grade and elevated freeway segments, and a curb height of 6" was used for depressed freeway areas.

The 4"-high curb is a variation of curb-and-gutter standard C-05.10 Type C. The 4" curb height would be obtained by extending the back slope of the gutter section from 1.5' to 2.0', increasing the hydraulic capacity of the gutter section to offset the cross-sectional loss resulting from the 1" rubberized asphalt overlay.

Proposed Improvements

Proposed improvements were located with the intent to use and supplement existing storm drain networks. This approach minimizes the amount of removals and need for installation of new storm drain, especially at locations where crossing of the mainline would be required.

Special detail catch basins and manholes are proposed at some locations in order to retain or improve maintenance access to existing trunk lines. These drainage structures would include oversized basins to allow for connections to pipes of large diameter and/or small offset alignments. Several existing manholes that are proposed to remain will require the reconstruction of the cone and cover in order to meet the new finished grade, especially along the depressed segment of the freeway where the access to the three vaults near Mesa Drive will also need reconstruction. The design of special detail maintenance access structures will be coordinated with ADOT Drainage Design Section and Phoenix Construction District representatives during final design.

As-built plans show that the trunk line along the outside of the eastbound roadway in the depressed segment may be deep enough to allow for the widening of the pavement and the construction of concrete barrier and retaining walls. It is recommended that the vertical and horizontal location of the trunk line be surveyed during Stage II design in order to identify potential conflicts.

4.8 EARTHWORK

The earthwork required for the project would include approximately 108,107 cubic yards of excavation and 140,152 cubic yards of embankment.

4.9 TRAFFIC DESIGN

4.9.1 Signing and Pavement Marking

A guide sign concept was prepared to ensure an effective signing plan could be developed for the Preferred Alternative. The goal of the signing concept is to provide clear advance guide signing for the route, while maintaining the integrity of the signing schemes on the SR 202L freeway corridor. A preliminary guide signing plan is provided on the plan sheets in Appendix E.

The existing signs and sign structures would be relocated or replaced to support the proposed freeway widening. The final sign locations will be determined during the development of the final design plans and must consider the existing and new locations of utilities, bridge structures, retaining and noise walls, drainage features, lighting standards, and other appurtenances. The retroreflective sheeting on the existing signs will be upgraded to Type IX or Type XI. Current ADOT design standards do not require sign lighting for this type of sheeting.

The recent sign rehabilitation project (Project No. 202L MA 009 H7749 01C) replaced several overhead sign panels and guide signs. For purposes of this DCR, it is assumed that all signs will be replaced. However, during final design of the SR 202L General Purpose Lanes project, an inventory of the signs should be prepared to determine if the signs meet the current standards and could be salvaged or relocated. The cost estimates depicted in Section 5 of this report anticipate replacement of all signs and sign structures.

The pavement marking concept was developed to incorporate the existing and new lane configurations for the mainline, auxiliary lanes, service interchange ramps and system interchange ramps. The in-lane pavement markings on westbound SR 202L approaching the system interchange will be updated with new lane configurations.

The preliminary pavement marking concept has been developed in accordance with the ADOT *Signing and Marking Standard Drawings* 2002 (and recent updates) that reference the requirements for lane lines, edge lines, and gore striping.

4.9.2 Traffic Signals

Realignment of McKellips Road Ramp 'B' will necessitate modifications to the existing traffic signals at the McKellips Road intersection. Existing signal poles at the southern intersection will need to be relocated with the new ramp intersection geometry. At the other service interchanges the impact of the widened bridge structures to the signal heads that are mounted on the bridge structure will need to be assessed during the development of final design.

4.9.3 Lighting

Currently, continuous freeway lighting is provided on SR 202L between SR 101L and Gilbert Road. This lighting consists of a mixture of median mounted high mast poles with two 400-Watt high pressure sodium (HPS) high mast fixtures, 400-Watt vertical offset fixtures, and horizontal mounted luminaires with 250-Watt high pressure sodium fixtures along the entrance and exit ramps. An evaluation of the existing lighting was conducted to determine if the existing lighting system could accommodate the additional travel lanes associated with the freeway widening.

The existing lighting would require modifications at certain locations, generally by placing an additional light fixture on an existing lighting assembly. The lighting evaluation was prepared in conformance with the criteria established in the *American National Standard Practice for Roadway Lighting, ANSI/IES RP-8-00*, published in 2000. This document identifies nationally recognized design criteria for roadway lighting that has been accepted by ADOT. In addition, the following criteria listed in ADOT's *Design Procedures Manual* were used in the lighting analysis:

- Freeway lighting provides an average maintained horizontal illuminance in the range of 0.6 to 0.8 foot-candles (Fc) on the traveled roadway;
- A minimum illuminance value of 0.2 foot-candles;
- An average to minimum uniformity ratio of 3:1 to 4:1;
- A light loss factor (LLF) of 0.81; and
- Light levels were calculated every six feet on the traveled roadway.

Based on the evaluation conducted with this study, the existing median lighting would be sufficient for the widened SR 202L roadways with a few additional fixtures mounted on existing poles at selected locations in this corridor.

The existing lighting located at the interchange ramp areas would be relocated in accordance with the new ramp alignments.

The lighting analyses should include a "spillover" evaluation where the freeway is located adjacent to residential neighborhoods. The lighting analysis for the crossroads will include an evaluation of the shadow effects of the freeway Overpasses and Underpasses, along with the use of under deck lighting to enhance the lighting beneath the bridge structures.

4.9.4 Freeway Management System

The Freeway Management System (FMS) after construction of the Phase 6C project will include an integrated system of Dynamic Message Signs (DMS), pull boxes, loop detectors, CCTV cameras, and wireless telemetry placed throughout this segment of the SR 202L. These FMS features are connected to the ADOT Traffic Control Center by fiber optic cable in three 3" conduits that are located along the south right-of-way from SR 101L to Country Club Drive. Wireless communications will be used between Country Club Drive and Gilbert Road. Due to coordination with the FMS Phase 6C design team, most of the FMS features will not require relocation with the general-purpose lanes project.

The conduit will need to be relocated along the McKellips Road eastbound exit ramp due to the realignment of the ramp into an area of new right-of-way acquisition. The existing fiber optic cable should be pulled back from the splice cabinet at the McKellips Road intersection to the first pull box located near the beginning of the Ramp B alignment. From Country Club Drive to Gilbert Road, three 3" conduits will be installed along the eastbound roadway to accommodate electrical power to the FMS facilities. The existing conduit within these boundaries will need to be abandoned in place. It is anticipated that conduits at the existing bridges will remain and be reused.

New ramp metering should be included in the SR 202L construction at all entrance ramps in the corridor. New system detectors would be added within the new general-purpose lanes at approximately one mile in each direction of travel in advance of each entrance ramp. The new system detector locations should be at the same locations as the existing detectors. The wireless communication system between Country Club Drive and Gilbert Road should be converted to fiber optic communications.

The FMS system must remain operational at all times during the construction of this project. All FMS equipment should be evaluated during final design to determine potential construction conflicts. ADOT Transportation Technology Group should be involved in reviews and provide guidance for the FMS design of the SR 202L improvements.

4.10 CONSTRUCTION PHASING AND TRAFFIC CONTROL

Traffic will be managed by detailed traffic control plans and by procedures and guidelines specified in Part VI of the current version of the *Manual on Uniform Traffic Control Devices* (MUTCD), and by the Arizona Supplement to Part VI of the MUTCD. Full freeway closures and freeway lane restrictions will be limited to nights and weekends.

Weekend and night closures are preferred over obliteration and restriping where practical. Existing mainline freeway traffic will be maintained with the existing striping during construction. Temporary concrete barrier will be used to separate work areas from traffic during widening.

Coordination will be required with the local agencies to develop project phasing that will minimize impact to traffic and construction duration. Restrictions due to arterial street and frontage road capacity constraints, freeway access, and emergency vehicle access could limit the construction activities.

The final construction phasing and traffic control plans will be developed during the final design. The detailed traffic control plans will prescribe requirements to assure lane assignment signs are either properly aligned with shifted lanes, are covered, or are removed.

4.11 UTILITY COORDINATION

During final design, each city and utility agency will receive and review the preliminary design plans for this project. Utility conflicts and their prior rights status will be identified and resolved with cooperation from the affected agencies. Construction plans for the relocations or adjustments of the utilities will be developed by the responsible parties.

The City of Mesa 54" effluent line from its Northwest Water Reclamation Plant (NWWRP) crosses the freeway near Station 380+35. During final design, this pipeline will be surveyed to ensure the widening of the westbound SR 202L mainline and Ramp W-S improvements will not impact this pipeline and the manhole on the north side of the freeway.

Another City of Mesa utility that may be impacted is the 20" sewer force main that is mounted on the inside of the equipment Underpass at Station 394+90. Any lengthening of the equipment Underpass to accommodate the westbound SR 202L mainline may require the reconfiguration or relocation of this pipeline.

The City of Mesa has a 36" reclaimed water line along the south side of the freeway within the entire project limits, with several 16" branches crossing the freeway. From approximately Station 408+00 to approximately Station 429+00 near the Tempe Drain, the 36" water line is located within a 7' wide utility easement just inside the ADOT access control fence. From the Tempe Drain to the eastern project limit, the reclaimed water line remains within ADOT right-of-way on the south side of the freeway. The reclaimed water line may be impacted by this project in several locations including: 1) Station 457+60; 2) along the Alma School Road eastbound exit ramp, and 3) along the McKellips Road eastbound exit ramp. Coordination will be required with the City of Mesa for the relocation of this facility at these locations.

The City of Phoenix has a 96" water transmission line along a 25' easement outside the south right-of-way line south of Alma School Road. This 96" water line and easement encroaches into ADOT right-of-way between Station 488+50 and Station 491+50. No adverse impact to this utility is anticipated.

The Salt River Project (SRP) Tempe Drain crosses the freeway at a skewed angle near Station 429+00 within a 2-8'x8' RCB that was built by ADOT with the original freeway construction project. SRP has a waterway easement, access rights, and maintenance responsibilities for the easement area. No adverse impact to this facility is anticipated.

Along the south side of McKellips Ramp B, near Station 507+45, there is an SRP irrigation lateral and turnout structure that will have to be piped and relocated. One other SRP Water utility that will be affected is the double-barrel irrigation siphons (30" and 24" RGRCP's) that cross the freeway corridor at Station 707+75 near Gilbert Road. Freeway mainline widening will place the four irrigation manholes at the bottom of the siphons on the outside edges of the outside shoulders of the eastbound and westbound lanes. These manholes may need to be removed and construction of new access manholes for the siphons may be required.

4.12 GEOTECHNICAL AND PAVEMENT DESIGN

4.12.1 Widened Bridge Structures

Site soils are generally considered to be well suited for the use of either shallow spread footing foundations or drilled shaft foundations. Spread footings should provide adequate support for the widened structures which are currently supported on shallow foundations. Allowable bearing pressures of 10 to 20 kips per square feet (ksf) would be anticipated for shallow spread foundations supported on the coarse grained SGC.

Table 30 provides a listing of the structures to be widened, the existing foundation conditions and preliminary recommended foundation types for the widened structures.

Table 30 – Summary of Existing and Preliminary Recommended Foundation Types for Widened SR 202L Bridges

Structure	Existing Foundation Type	Recommended Foundation Type	General Soil Conditions
Dobson Road TI OP	Drilled Shafts founded in SGC	Drilled Shafts founded in SGC	SGC below depths of 7.5' to 20'
Alma School Road TI OP	Abutments and Piers; Drilled Shafts founded in SGC	Drilled Shafts founded in SGC	SGC below depths of 11' to 23'
McKellips Road TI OP	Abutments on Drilled Shafts founded in SGC	Drilled Shafts founded in SGC	SGC below depths of 11' to 23'
Country Club Drive TI OP	Abutments and piers on Drilled Shafts founded in SGC	Drilled Shafts founded in SGC	SGC below depths of 9' to 16'

4.12.2 Retaining and Noise Walls

Existing retaining and noise walls were founded on spread footings. The majority of the new walls can likely be constructed as standard walls with spread footings at relatively low to moderate allowable soil bearing pressures. Variations of the wall types selected will likely be based upon constructability around the existing and new structures. Standard wall footings should be constructible provided the new walls are located a sufficient distance from existing walls (laterally and vertically). The use of drilled shaft foundations may be preferred in some locations, depending on proximity to existing structures, and in isolated areas as dictated by poor subgrade conditions. Other special design walls such as L-shaped footing walls may be needed due to the proximity of new walls to existing structures.

4.12.3 Subgrade Soils

The majority of the project alignment is underlain by relatively fair quality subgrade soils. However, overexcavation and removal of unsuitable soils was conducted during the recent construction of the HOV lanes project as indicated in Table 31. Additionally, between Station 591+40 and 594+25 separation fabric and layers of geogrid were placed within the structural backfill. Although much of these materials were removed or otherwise addressed during initial construction, investigations performed for this project should verify the subsurface site conditions.

Table 31 – Limits of Overexcavation Performed For the Construction of HOV Lanes

Limits of Overexcavation On SR 202L	Depth of Overexcavation (ft)
Station 372+00 to Station 396+00	3.0
Station 591+40 to Station 594+25	3.5
Station 625+25 to Station 689+50	3.0

Ground improvement by grout injection was performed to mitigate settlement conditions observed at two locations. The first location mitigated a small area along an eastbound shoulder retaining wall joint at approximately Station 588+00. The second location mitigated settlement of a former materials pit backfill, upon which a portion of the freeway was built, and along a drainage channel covering an area from approximately the westbound to eastbound shoulders between Station

591+50 and Station 594+00 on the mainline and extending southward and eastward to include the drainage channel from Station 592+00 through Station 596+00. These grout locations and dimensions described herein are based on a review of the Final Geotechnical Evaluation Report for ADOT Project 202 MA 009 H7058 01C.

4.12.4 Recommended Pavement Structural Sections

It is recommended that the widening of the SR 202L mainline pavements match the adjacent existing structural pavement section. Table 32 provides the recommended pavement structural sections:

Table 32 – Preliminary Recommended Pavement Sections

Project Segment	Item	AR-ACFC (inches)	PCCP (inches)	AB (Class 2) (inches)	ACB Mix (inches)	AC (¾) (inches)	Total Thickness (inches)
SR 202L, SR 101L to Country Club Drive	General Purpose Lanes and outside shoulders	1.0	12.5	4.0	--	-	17.5
	Ramps, Auxiliary Lanes, and Gores	1.0(1)	10.0	4.0	-	-	15.0
SR 202L, Country Club Drive to Gilbert Road	General Purpose Lanes and outside shoulders Sta. 523+05 to Sta. 556+00 Sta. 585+40 to Sta. 591+40	1.0	11.5	4.0	-	-	16.5
	General Purpose Lanes and Outside shoulders Sta. 556+00 to Sta. 585+40 Sta. 591+40 to Sta. 731+00	1.0	11.5	-	4.0	-	16.5
	Ramps, Auxiliary Lanes, and Gores	1.0(1)	10.0	4.0	--	--	15.0

(1) AR-ACFC is not typically present in gore areas and some of the ramps.

4.13 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY COORDINATION

Full-width widening in the westbound direction of SR 202L between Dobson Road and Alma School Road would encroach into the existing CSA bank protection along the Salt River. The current top-width of the bank protection is 16' and the remaining width would be approximately 13' from the back of the roadway barrier to the slope of the CSA bank protection. FCDMC would accept the 13' width in this area if a 4" steel safety railing along the edge of the slope is provided. The safety railing would likely require concrete foundations for stability.

Full-width widening in the westbound direction of SR 202L between Alma School Road and McKellips Road would encroach into the existing CSA bank protection in this area. The current top-width of the bank protection is 16' and the remaining width would be approximately 9' from the back of the roadway barrier to the edge of the CSA. This area is at-grade with the existing ground and does not pose a vertical safety hazard. It is not known if FCDMC is responsible for maintenance in this area. This area is within private property and FCDMC is not currently performing maintenance operations in this area. The FCDMC would accept grading a new access road at the same elevation as the existing to provide for a minimum of 12' width. ADOT could provide concrete or other protection, adjacent to the CSA to provide scour protection during a major flooding event.

5.0 ITEMIZED ESTIMATE OF PROBABLE COSTS

5.1 PROJECT COST ESTIMATES

The estimate of probable project costs for the Preferred Alternative is $74,074,900 as shown on Table 33. The ADOT Five-Year Transportation Facilities Construction Program (2013-2017) includes $4,600,000 for final design and $1,000,000 for right-of-way acquisition in Fiscal Year 2014. The construction project is not currently programmed by ADOT, but $69,000,000 is included in the RTPFP for construction in FY 2019. The total budget for this project is currently $74,600,000.

The estimated unit costs are based on unit prices obtained from recent ADOT bid results. Pavement structural sections used for this estimate are provided in Section 4.12.4 of this report.

The following is a list of assumptions that are reflected in the cost estimates for the Preferred Alternative:

- New right-of-way is anticipated for this project for the realignment of the eastbound McKellips Road exit ramp at the Seyenna Vistas Mobile Home Park. The right-of-way acquisition amount is based on $5.00 per square foot of the acquisition area plus $25,000 per required home relocation as provided by ADOT's Right-of-Way Group.
- Costs for landscaping are only for the restoration of disturbed areas.
- Drainage modifications would be limited to adjusting or replacing the existing drainage elements to match the pavement widening and ramp realignments.
- New freeway lighting would consist of providing additional luminaires to the existing median light poles. Relocation of light poles would be required within the ramp realignment areas.
- FMS improvements are included in the cost estimates.
- The earthwork factor applied to the project excavation is estimated to be 10% shrink. No additional earthwork quantities were included in anticipation of hazardous materials or unsuitable material sites.
- Environmental mitigation costs are not included in this cost estimate.

Table 33 – Order of Magnitude Estimate for the Preferred Alternative

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
2020031	REMOVAL OF PORTLAND CEMENT CONCRETE PAVEMENT	SQ.YD.	46,993	12.00	564,000
2020021	REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	52,683	6.00	316,100
2020027	REMOVAL OF CONCRETE BARRIER	L.FT.	36,825	10.00	368,300
2020034	REMOVAL OF SIGNS	L.SUM	1	10,000.00	10,000
2020041	REMOVAL OF PIPE	L.FT.	3,216	30.00	96,500
2020053	REMOVE CATCH BASINS	EACH	172	250.00	43,000
2020054	REMOVE MANHOLES	EACH	18	2,000.00	36,000
2020201	SAW CUTTING	L.FT.	70,092	2.00	140,200
202XXXX	REMOVE ATTENUATORS	EACH	13	3,000.00	39,000
2030301	ROADWAY EXCAVATION	CU.YD.	108,107	10.00	1,081,100
2030901	BORROW	CU.YD.	42,856	10.00	428,600
4010013	PORTLAND CEMENT CONCRETE PAVEMENT (13" PCCP OVER 4" AB)	SQ.YD.	49,545	35.00	1,734,100
4010013	PORTLAND CEMENT CONCRETE PAVEMENT (13" PCCP OVER 4" AC)	SQ.YD.	49,467	40.00	1,978,700
4010011	PORTLAND CEMENT CONCRETE PAVEMENT (11" PCCP OVER 4" AB)	SQ.YD.	44,432	30.00	1,333,000
4070040	ASPHALTIC CONCRETE (AR-ACFC 1" OVERLAY)	SQ.YD.	140,140	5.00	700,700
5011436	36" IRRIGATION PIPE (SRP)	L.FT.	220	430.00	94,600
5012524	STORM DRAIN PIPE, 24"	L.FT.	4,779	80.00	382,400
5012530	STORM DRAIN PIPE, 30"	L.FT.	14	90.00	1,300
5012536	STORM DRAIN PIPE, 36"	L.FT.	14	100.00	1,400
5012560	STORM DRAIN PIPE, 60"	L.FT.	62	220.00	13,700
5012566	STORM DRAIN PIPE, 66"	L.FT.	64	250.00	16,000
5012572	STORM DRAIN PIPE, 72"	L.FT.	96	300.00	28,800
5014042	FLARED END SECTION, 42" (C-13.25)	EACH	7	900.00	6,300
5030461	TRASH RACK FOR BOX CULVERT (SRP)	EACH	1	10,000.00	10,000
5030141	CONCRETE CATCH BASIN (MEDIAN, C-15.80)	EACH	53	3,000.00	159,000
5030602	CONCRETE CATCH BASIN (C-15.91)	EACH	27	3,000.00	81,000
5030604	CONCRETE CATCH BASIN (C-15.92)	EACH	128	3,500.00	448,000
5030606	CONCRETE CATCH BASIN (DETAIL)	EACH	4	3,500.00	14,000
5050001	MANHOLE (C-18.10)	EACH	51	4,000.00	204,000
5050081	IRRIGATION MANHOLE (SRP)	EACH	5	20,000.00	100,000
5050221	RECONSTRUCT MANHOLE (SRP)	EACH	4	10,000.00	40,000
6060048	BRIDGE SIGN STRUCTURE (SD9.20, TYPE 4F)	EACH	1	110,000.00	110,000
6060073	BRIDGE SIGN STRUCTURE (TAPERED TUBE, SINGLE BEAM)	EACH	1	30,000.00	30,000
6060074	FOUNDATION FOR BRIDGE SIGN STRUCTURE (TAPERED TUBE)	EACH	2	5,000.00	10,000
6060079	FOUNDATION FOR BRIDGE SIGN STRUCTURE (SD9.20, TYPE 4F)	EACH	2	5,000.00	10,000
6060150	CANTILEVER SIGN STRUCTURE	EACH	24	35,000.00	840,000
6060240	FOUNDATION FOR CANTILEVER SIGN STRUCTURE	EACH	24	5,000.00	120,000
6061001	SIGN MOUNT ASSEMBLY (FOR BRIDGE FASCIA)	EACH	1	3,000.00	3,000
6070002	BREAKAWAY SIGN POST S4X7.7	L.FT.	392	30.00	11,800
6070006	BREAKAWAY SIGN POST W8X18	L.FT.	108	48.00	5,200
6070022	FOUNDATION FOR BREAKAWAY SIGN POST S4X7.7	EACH	28	400.00	11,200
6070026	FOUNDATION FOR BREAKAWAY SIGN POST W8X18	EACH	6	700.00	4,200
6070038	SLIP BASE (2 1/2S)	EACH	84	200.00	16,800
6070055	SIGN POST (PERFORATED) (2 1/2 S)	L.FT.	1,008	12.00	12,100
6070060	FOUNDATION FOR SIGN POST (CONCRETE)	EACH	98	175.00	17,200
6080005	WARNING, MARKER, OR REGULATORY SIGN PANEL	SQ.FT.	1,770	20.00	35,400
6080018	EXTRUDED ALUM SIGN PANEL	SQ.FT.	5,509	25.00	137,800
7030095	MILEPOST MARKER (S-10)	EACH	12	300.00	3,600
7040070	PAVEMENT MARKING (WHITE THERMOPLASTIC) (0.090)	L.FT.	130,977	0.25	32,800
7040071	PAVEMENT MARKING (YELLOW THERMOPLASTIC) (0.090)	L.FT.	127,298	0.25	31,900
7040072	PAVEMENT MARKING (TRANSVERSE) (THERMOPLASTIC) (ALKYD) (0.090")	L.FT.	17,055	2.00	34,200
7040074	PAVEMENT SYMBOL (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	71	125.00	8,900
7050019	PAVEMENT MARKING, PREFORMED, TYPE I, LEGEND	EACH	4	180.00	800
7050047	PAVEMENT MARKING, PREFORMED, PATTERNED, WHITE STRIPE	L.FT.	99,483	4.00	398,000
7060013	PAVEMENT MARKER, RAISED, TYPE C	EACH	8,513	3.00	25,600
7060017	PAVEMENT MARKER, RAISED, TYPE E	EACH	3,488	3.00	10,500
7080001	PERMANENT PAVEMENT MARKING (PAINTED) (WHITE)	L.FT.	98,688	0.15	14,900
7080011	PERMANENT PAVEMENT MARKING (PAINTED) (YELLOW)	L.FT.	84,865	0.15	12,800
7080101	PERMANENT PAVEMENT MARKING (PAINTED SYMBOL)	EACH	71	100.00	7,100
7310092	POLE (TYPE H) (ALUMINUM)	EACH	16	2,000.00	32,000
7310276	POLE FOUNDATION (TYPE H) (BREAKAWAY)	EACH	16	2,000.00	32,000
7310551	MAST ARM (20 FT.) (TAPERED)	EACH	16	500.00	8,000
7320270	ELECTRICAL CONDUIT (3")	L.FT.	1,750	5.00	8,800
7320074	ELECTRICAL CONDUIT (3 - 3") (PVC) (FMS)	L.FT.	35,125	20.00	702,500
7320410	PULL BOX (NO. 5)	EACH	22	500.00	11,000
7320357	JUNCTION BOX (NO. 7)	EACH	41	700.00	28,700
7320455	PULL BOX(NO. 9)	EACH	28	3,000.00	84,000
7330446	RAMP METER SIGNAL AND SUPPORT ASSEMBLY	EACH	16	3,000.00	48,000
7330620	RELOCATE TRAFFIC SIGNALS	L.SUM	1	40,000.00	40,000
7350120	LOOP DETECTOR FOR TRAFFIC SIGNALS (6'x6')	EACH	349	500.00	174,500
7360030	LUMINAIRE (HORIZONTAL MOUNT) (HPS 250 WATT)	EACH	22	500.00	11,000
800X002	LANDSCAPING (6.51 MILES @ $50,000/MI)	EACH	6.51	50,000.00	325,500
8080695	CONCRETE PIPE PLUG	EACH	1	1,500.00	1,500

Table 33 – Order of Magnitude Estimate for the Preferred Alternative (continued)

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
8082136	SEWER PIPE, DUCTILE IRON, 36" (RELOCATE)	L.FT.	1,660	360.00	597,600
8082845	MANHOLE (RELOCATE)	EACH	1	20,000.00	20,000
8093154	SEWER PIPE, 54"	L.FT.	100	650.00	65,000
9050026	GUARD RAIL TERMINAL (TANGENT TYPE)	EACH	10	3,000.00	30,000
9050401	GUARD RAIL TRANSITION, W-BEAM TO CONCRETE BARRIER	EACH	10	3,000.00	30,000
9080084	CONCRETE CURB AND GUTTER	L.FT.	20,497	15.00	307,500
9100000	CONCRETE BARRIER (SINGLE FACE WITH GUTTER)	L.FT.	34,296	60.00	2,057,800
9100009	CONCRETE BARRIER ADJACENT TO RETAINING WALL	L.FT.	24,519	75.00	1,839,000
9100012	CONCRETE BARRIER (SPECIAL HALF) (42")	L.FT.	12,500	75.00	937,500
9140133	NOISE BARRIER WALL (COMBINATION-NOISE WALL PORTION ONLY)	SQ.FT.	33,355	25.00	833,900
9140134	NOISE BARRIER WALL (BRIDGE-LIGHT WEIGHT)	SQ.FT.	5,210	65.00	338,700
9140136	SOUND BARRIER WALL (CONCRETE)	SQ.FT.	39,770	30.00	1,193,100
9140153	RETAINING WALL (REGULAR)	SQ.FT.	186,190	55.00	10,240,500
9140155	RETAINING WALL (SPECIALTY)	SQ.FT.	14,320	150.00	2,148,000
9240050	MISCELLANEOUS WORK (EFFLUENT BYPASS PUMPING OPERATIONS)	L.SUM	1	50,000.00	50,000
9240051	MISCELLANEOUS WORK (RELOCATE IRRIGATION TURNOUT STRUCTURE) (SRP)	L.SUM	1	50,000.00	50,000
9999910	LUMP SUM (DOBSON ROAD OVERPASS EB)	L.SUM	1	503,400.00	503,400
9999910	LUMP SUM (DOBSON ROAD OVERPASS WB)	L.SUM	1	511,290.00	511,300
9999910	LUMP SUM (ALMA SCHOOL ROAD OVERPASS EB)	L.SUM	1	348,225.00	348,300
9999910	LUMP SUM (ALMA SCHOOL ROAD OVERPASS WB)	L.SUM	1	692,880.00	692,900
9999910	LUMP SUM (MCKELLIPS ROAD OVERPASS EB)	L.SUM	1	731,700.00	731,700
9999910	LUMP SUM (MCKELLIPS ROAD OVERPASS WB)	L.SUM	1	721,080.00	721,100
9999910	LUMP SUM (COUNTRY CLUB DRIVE OVERPASS EB)	L.SUM	1	469,290.00	469,300
9999910	LUMP SUM (COUNTRY CLUB DRIVE OVERPASS WB)	L.SUM	1	472,170.00	472,200
9999910	LUMP SUM (CANTILEVERED ROADWAY)	L.SUM	1	827,760.00	827,800
			ITEM TOTAL		**39,949,700**
PROJECT WIDE					
	Maintenance and Protection of Traffic (8%)	COST		3,196,000.00	3,196,000
	Dust and Water Palliative (0.75%)	COST		300,000.00	300,000
	Quality Control (0.75%)	COST		300,000.00	300,000
	Construction Surveying (1.5%)	COST		600,000.00	600,000
	Erosion Control (0.3%)	COST		120,000.00	120,000
	Mobilization (8% of all construction items)	COST		3,865,000.00	3,865,000
			PROJECT WIDE SUBTOTAL		**8,381,000**
	Unidentified Items (20% of Item Total and Project Wide Subtotal)	COST		9,667,000.00	9,667,000
			PROJECT WIDE TOTAL		**18,048,000**
OTHER COST					
	Construction Engineering (9%)	COST		5,220,000.00	5,220,000
	Construction Contingencies (5%)	COST		2,900,000.00	2,900,000
	Indirect Cost Allocation (3.42%)	COST		1,984,000.00	1,984,000
	Environmental Mitigation (Unknown at this time)	COST		-	-
	PCCP Quality Incentive	SQ.YD.	143,444	1.50	215,200
	AR-ACFC Smoothness Incentive	L.MILE	13	11,000.00	143,000
	Engineering Design (Includes Surveying and Geotechnical) (8% of all items)	COST		4,640,000.00	4,640,000
	Right-of-Way	COST		975,000.00	975,000
			OTHER COST TOTAL		**16,077,200**

SUMMARY	
ITEM TOTAL	**39,949,700**
PROJECT WIDE	**18,048,000**
OTHER COST TOTAL	**16,077,200**
TOTAL PROJECT COST	**74,074,900**

5.2 ESTIMATE OF FUTURE MAINTENANCE COSTS

An estimate of the additional future maintenance costs that would be the result of the additional roadway lane miles added to the freeway system was evaluated for the Preferred Alternative. The additional maintenance costs are estimated to be approximately $305,225 as shown in Table 34 below.

Table 34 – Estimate of Future Maintenance Costs

Annual Maintenance Cost Per Lane Mile Using PeCoS Latest FY Data[1]	
Category	**Metropolitan Phoenix**
1. Paved Surfaces & Shoulders	600
2. Roadside	3,070
3. Drainage & Environmental	300
4. Rest Areas	
5. Traffic Operations - Signal & Lighting; Signing & Striping - ITS	1,030
6. Landscaping	6,720
7. Winter Storms	
8. Emergency Response	130
9. Miscellaneous Maintenance[2]	2,400
10. Support and Other Operating Expenses	3,150
11. Other Specialty Items[3]	
MCL = Maintenance Cost per Lane Mile	**$17,400**
Annual Maintenance Cost of Project at PA/DCR Phase	**Metropolitan Phoenix[6]**
PW = Total Pavement Width[4]	12
NL = Number of Lane Miles	1
LP = Length of Project in Miles	14
PMC = Current Project Maintenance Cost	**$243,600**
Annual Maintenance Cost of Project at Beginning of Maintenance Phase	**Metropolitan Phoenix[6]**
IF = Inflation Factor[5]	1.058
N = Number of Years to Maintenance Phase	4
PMCI = Project Maintenance Cost including Inflation	**$305,225**

Notes:

1. Lane mile width is 12 ft, Total maintenance lane miles = 27,722 miles
   Metropolitan Phoenix maintenance lane miles = 2,016 miles, Other Locations = 25,706 miles
2. Miscellaneous maintenance include building and yard maintenance, work for other divisions, training, material handling, vegetation control and contract administration for categories not considered in the maintenance cost breakdown
3. For Other Specialty Items, contact Central Maintenance.
4. Total pavement width includes the main line, ramps and shoulders.
5. Based on increase in maintenance costs of 76% over the last 10 years
6. Numbers for maintenance cost at PA/DCR Phase and Beginning of Maintenance Phase represent an Example Project, 24 feet wide, 2 miles long, going into the maintenance phase 3 years later.

Gray areas require manual entry
NL = PW / 12
PMC = MCL x NL x LP
PMCI = PMC x (IF^N)

6.0 AASHTO CONTROLLING DESIGN CRITERIA

AASHTO Controlling Design Criteria have been reviewed for the existing roadways that will remain as a part of the proposed improvements. Existing and proposed features for each of the alternatives that do not meet current AASHTO (2004 Green Book) recommended guidelines are indicated below.

ADOT Design Criteria has also been reviewed for the existing roadways which will remain as a part of the proposed improvements. Existing and proposed features for each alternative that do not meet current *ADOT Roadway Design Guidelines* are also indicated below.

A complete listing of the existing SR 202L features and evaluation results are presented within the *Initial AASHTO Controlling Criteria Report*, dated June 2011. This report is included in Appendix D, along with a summary of the horizontal and vertical sight distance calculations for the new General Purpose lanes.

6.1 AASHTO NON-CONFORMING GEOMETRIC DESIGN ELEMENTS

Non-conforming AASHTO design elements that would not be upgraded as part of this project include the following:

The proposed outside shoulder width is less than the AASHTO recommended 10' minimum at the following locations:

a. EB MP 13.53 to MP 13.60 (east of Country Club Drive): 0.0' to 4.0' less than recommended

SR 202L Mainline EB

The proposed outside shoulder provides less than the AASHTO recommended horizontal stopping site distance on the outside travel lane due to roadway curvature and the placement of concrete half barrier adjacent to the mainline shoulder.

The superelevation rates are less than the recommended minimum by up to 0.003 '/ft. in five locations. This is considered to be in substantial conformance with the AASHTO requirements, and no design exceptions will be required.

Country Club Drive Ramp D:

The proposed outside shoulder provides less than the AASHTO recommended horizontal stopping sight distance on the outside travel lane due to roadway curvature and the placement of concrete half barrier, bridge abutment or sound wall adjacent to the mainline shoulder.

- Station 14+16.89 to Station 18+60.28 (HPI Station 16+41.69): 115' less than the recommended 495'

6.2 REQUEST FOR AASHTO DESIGN EXCEPTIONS

Design exceptions will be requested for the non-conforming design elements listed in Section 6.1 of this report.

6.3 ADOT NON-CONFORMING GEOMETRIC DESIGN ELEMENTS

Non-conforming ADOT design elements that would not be upgraded as part of this project include the following:

SR 202L Mainline (EB and WB):

The proposed general-purpose lane widths are less than the ADOT recommended 12' minimum at the following locations:

a. MP 13.21 to MP 13.85 (EB Station 534+17.80 to Station 569+75.00): 1.0' less than recommended

The proposed outside shoulder width is less than the ADOT recommended 10' minimum at the following locations:

b. EB MP 13.53 to MP 13.60 (east of Country Club Drive): 0.0' to 4.0' less than recommended

SR 202L Mainline EB

The proposed outside shoulder provides less than the AASHTO recommended horizontal stopping site distance on the outside travel lane due to roadway curvature and the placement of concrete half barrier adjacent to the mainline shoulder.

The superelevation rates are less than the recommended minimum by up to 0.003 '/ft. in five locations. This is considered to be in substantial conformance with the ADOT requirements, and no design exceptions will be required.

Country Club Drive Ramp D:

The proposed outside shoulder provides less than the ADOT recommended horizontal stopping sight distance on the outside travel lane due to roadway curvature and the placement of concrete half barrier, bridge abutment or sound wall adjacent to the mainline shoulder.

- Station 14+16.89 to Station 18+60.28 (HPI Station 16+41.69): 115' less than the recommended 495'

6.4 REQUEST FOR ADOT DESIGN DEVIATIONS

Design deviations will be requested for the non-conforming design elements listed in Section 6.3 of this report.

7.0 SOCIAL, ECONOMICAL, AND ENVIRONMENTAL CONCERNS

7.1 ENVIRONMENTAL DOCUMENTATION

A Categorical Exclusion (CE) was prepared as part of this project. The CE was approved on October 23, 2012.

7.2 MITIGATION MEASURES

Design Responsibilities

All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity.

The City of Mesa Floodplain Engineer and Maricopa County Floodplain Engineer will be provided an opportunity to review and comment on the design plans.

The Department project manager will contact the Department Hazardous Materials Coordinator (602.920.3882 or 602.712.7767) 60 days prior to bid advertisement to determine the need for additional site assessment or asbestos sampling.

During final design, the Project Manager will contact the Department Noise Coordinator (602.712.7767) to arrange for qualified personnel to review the noise analysis results and abatement considerations, if required due to changes in the project.

District Responsibilities

The Engineer will review the National Emissions Standards for Hazardous Air Pollutants notification received from the contractor. The contractor cannot start work associated with the demolition of a portion of the retaining wall located along SR 202L, between State Route 101L and Dobson Road, or the widening of the structures listed below until 10 working days have passed since the submittal of the notification to the regulatory agencies. Structures spanning SR 202L include:

- Dobson Road overpasses
- Haul Road overpass
- Alma School Road overpasses
- McKellips Road overpasses
- Country Club Drive overpasses
- Center Street underpass
- Mesa Drive underpass
- Stapley Drive underpass
- Gilbert Road Ramp A underpass
- Gilbert Road interchange underpass

The Engineer will submit the Contractors' Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Environmental Coordinator.

Contractor Responsibilities

To prevent the introduction of invasive species seeds, all earth moving and hauling equipment shall be washed at the Contractor's storage facility prior to entering the construction site.

All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity.

To prevent invasive species seeds from leaving the site, the Contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.

The Contractor, after coordination with the Engineer, shall communicate traffic control measures with the public, local officials, and the media prior to and during construction activities. Communication may include, but is not limited to, media alerts, direct mailings to area businesses and property owners, information on freeway variable message signs, and paid newspaper notices.

The Contractor, after coordination with the Engineer, shall provide a construction notice to residents and businesses in the general project area at least two (2) weeks prior to construction.

The Contractor, after coordination with the Engineer, shall notify the public and business owners of temporary access changes during construction at least seven (7) calendar days in advance of the change.

The Contractor shall contact local emergency services (hospital, fire, police) at least 14 calendar days in advance of the closure of the eastbound ramp at McKellips Road so that they can arrange for alternate travel routes.

Access to adjacent businesses and residences shall be maintained throughout construction.

If suspected hazardous materials are encountered during activity related to the construction of the project, the contractor shall stop all work immediately at that location and contact the Arizona Department of Transportation Engineer to make arrangements for proper treatment of those materials.

The Contractor shall update the asbestos surveys for concrete structures and roadway striping, and the lead-based paint survey prior to construction.

The contractor shall complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with the demolition of a portion of the retaining wall located along SR 202L, between State Route 101L and Dobson Road, and the widening the structures listed below and submit to the Engineer for review. After Engineer approval, the notification will be

submitted to the Department Hazardous Materials Coordinator (602.920.3882 or 602.712.7767) for a five (5) working day review and approval. Upon approval by the Department Hazardous Materials Coordinator the contractor shall file the notification with the Arizona Department of Environmental Quality and the Maricopa County Air Quality Department at least 10 working days prior to demolition/rehabilitation associated with the demolition of a portion of the retaining wall between State Route 101L and Dobson Road and the widening of any of the following bridge structures spanning SR 202L:

- Dobson Road overpasses
- Haul Road overpass
- Alma School Road overpasses
- McKellips Road overpasses
- Country Club Drive overpasses
- Center Street underpass
- Mesa Drive underpass
- Stapley Drive underpass
- Gilbert Road Ramp A underpass
- Gilbert Road interchange underpass

The Contractor, in association with the District, shall submit the Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality only after the District has reviewed and approved the Stormwater Pollution Prevention Plan.

This project is located within a designated municipal separate storm sewer system. Therefore the Contractor, in association with the District, shall send a copy of the certificate authorizing permit coverage and a copy of the Notice of Termination acknowledgement letter to the City of Mesa.

APPENDIX A
ALTERNATIVES ORDER OF MAGNITUDE ESTIMATES

Order of Magnitude Estimate for the Preferred Alternative

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
2020031	REMOVAL OF PORTLAND CEMENT CONCRETE PAVEMENT	SQ.YD.	46,993	12.00	564,000
2020021	REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	52,683	6.00	316,100
2020027	REMOVAL OF CONCRETE BARRIER	L.FT.	36,825	10.00	368,300
2020034	REMOVAL OF SIGNS	L.SUM	1	10,000.00	10,000
2020041	REMOVAL OF PIPE	L.FT.	3,216	30.00	96,500
2020053	REMOVE CATCH BASINS	EACH	172	250.00	43,000
2020054	REMOVE MANHOLES	EACH	18	2,000.00	36,000
2020201	SAW CUTTING	L.FT.	70,092	2.00	140,200
202XXXX	REMOVE ATTENUATORS	EACH	13	3,000.00	39,000
2030301	ROADWAY EXCAVATION	CU.YD.	108,107	10.00	1,081,100
2030901	BORROW	CU.YD.	42,856	10.00	428,600
4010013	PORTLAND CEMENT CONCRETE PAVEMENT (13" PCCP OVER 4" AB)	SQ.YD.	49,545	35.00	1,734,100
4010013	PORTLAND CEMENT CONCRETE PAVEMENT (13" PCCP OVER 4" AC)	SQ.YD.	49,467	40.00	1,978,700
4010011	PORTLAND CEMENT CONCRETE PAVEMENT (11" PCCP OVER 4" AB)	SQ.YD.	44,432	30.00	1,333,000
4070040	ASPHALTIC CONCRETE (AR-ACFC 1" OVERLAY)	SQ.YD.	140,140	5.00	700,700
5011436	36" IRRIGATION PIPE (SRP)	L.FT.	220	430.00	94,600
5012524	STORM DRAIN PIPE, 24"	L.FT.	4,779	80.00	382,400
5012530	STORM DRAIN PIPE, 30"	L.FT.	14	90.00	1,300
5012536	STORM DRAIN PIPE, 36"	L.FT.	14	100.00	1,400
5012560	STORM DRAIN PIPE, 60"	L.FT.	62	220.00	13,700
5012566	STORM DRAIN PIPE, 66"	L.FT.	64	250.00	16,000
5012572	STORM DRAIN PIPE, 72"	L.FT.	96	300.00	28,800
5014042	FLARED END SECTION, 42" (C-13.25)	EACH	7	900.00	6,300
5030461	TRASH RACK FOR BOX CULVERT (SRP)	EACH	1	10,000.00	10,000
5030141	CONCRETE CATCH BASIN (MEDIAN, C-15.80)	EACH	53	3,000.00	159,000
5030602	CONCRETE CATCH BASIN (C-15.91)	EACH	27	3,000.00	81,000
5030604	CONCRETE CATCH BASIN (C-15.92)	EACH	128	3,500.00	448,000
5030606	CONCRETE CATCH BASIN (DETAIL)	EACH	4	3,500.00	14,000
5050001	MANHOLE (C-18.10)	EACH	51	4,000.00	204,000
5050081	IRRIGATION MANHOLE (SRP)	EACH	5	20,000.00	100,000
5050221	RECONSTRUCT MANHOLE (SRP)	EACH	4	10,000.00	40,000
6060048	BRIDGE SIGN STRUCTURE (SD9.20, TYPE 4F)	EACH	1	110,000.00	110,000
6060073	BRIDGE SIGN STRUCTURE (TAPERED TUBE, SINGLE BEAM)	EACH	1	30,000.00	30,000
6060074	FOUNDATION FOR BRIDGE SIGN STRUCTURE (TAPERED TUBE)	EACH	2	5,000.00	10,000
6060079	FOUNDATION FOR BRIDGE SIGN STRUCTURE (SD9.20, TYPE 4F)	EACH	2	5,000.00	10,000
6060150	CANTILEVER SIGN STRUCTURE	EACH	24	35,000.00	840,000
6060240	FOUNDATION FOR CANTILEVER SIGN STRUCTURE	EACH	24	5,000.00	120,000
6061001	SIGN MOUNT ASSEMBLY (FOR BRIDGE FASCIA)	EACH	1	3,000.00	3,000
6070002	BREAKAWAY SIGN POST S4X7.7	L.FT.	392	30.00	11,800
6070006	BREAKAWAY SIGN POST W8X18	L.FT.	108	48.00	5,200
6070022	FOUNDATION FOR BREAKAWAY SIGN POST S4X7.7	EACH	28	400.00	11,200
6070026	FOUNDATION FOR BREAKAWAY SIGN POST W8X18	EACH	6	700.00	4,200
6070038	SLIP BASE (2 1/2S)	EACH	84	200.00	16,800
6070055	SIGN POST (PERFORATED) (2 1/2 S)	L.FT.	1,008	12.00	12,100
6070060	FOUNDATION FOR SIGN POST (CONCRETE)	EACH	98	175.00	17,200
6080005	WARNING, MARKER, OR REGULATORY SIGN PANEL	SQ.FT.	1,770	20.00	35,400
6080018	EXTRUDED ALUM SIGN PANEL	SQ.FT.	5,509	25.00	137,800
7030095	MILEPOST MARKER (S-10)	EACH	12	300.00	3,600
7040070	PAVEMENT MARKING (WHITE THERMOPLASTIC) (0.090)	L.FT.	130,977	0.25	32,800
7040071	PAVEMENT MARKING (YELLOW THERMOPLASTIC) (0.090)	L.FT.	127,298	0.25	31,900
7040072	PAVEMENT MARKING (TRANSVERSE) (THERMOPLASTIC) (ALKYD) (0.090")	L.FT.	17,055	2.00	34,200
7040074	PAVEMENT SYMBOL (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	71	125.00	8,900
7050019	PAVEMENT MARKING, PREFORMED, TYPE I, LEGEND	EACH	4	180.00	800
7050047	PAVEMENT MARKING, PREFORMED, PATTERNED, WHITE STRIPE	L.FT.	99,483	4.00	398,000
7060013	PAVEMENT MARKER, RAISED, TYPE C	EACH	8,513	3.00	25,600
7060017	PAVEMENT MARKER, RAISED, TYPE E	EACH	3,488	3.00	10,500
7080001	PERMANENT PAVEMENT MARKING (PAINTED) (WHITE)	L.FT.	98,688	0.15	14,900
7080011	PERMANENT PAVEMENT MARKING (PAINTED) (YELLOW)	L.FT.	84,865	0.15	12,800
7080101	PERMANENT PAVEMENT MARKING (PAINTED SYMBOL)	EACH	71	100.00	7,100
7310092	POLE (TYPE H) (ALUMINUM)	EACH	16	2,000.00	32,000
7310276	POLE FOUNDATION (TYPE H) (BREAKAWAY)	EACH	16	2,000.00	32,000
7310551	MAST ARM (20 FT.) (TAPERED)	EACH	16	500.00	8,000
7320270	ELECTRICAL CONDUIT (3")	L.FT.	1,750	5.00	8,800
7320074	ELECTRICAL CONDUIT (3 - 3") (PVC) (FMS)	L.FT.	35,125	20.00	702,500
7320410	PULL BOX (NO. 5)	EACH	22	500.00	11,000
7320357	JUNCTION BOX (NO. 7)	EACH	41	700.00	28,700
7320455	PULL BOX(NO. 9)	EACH	28	3,000.00	84,000
7330446	RAMP METER SIGNAL AND SUPPORT ASSEMBLY	EACH	16	3,000.00	48,000
7330620	RELOCATE TRAFFIC SIGNALS	L.SUM	1	40,000.00	40,000
7350120	LOOP DETECTOR FOR TRAFFIC SIGNALS (6'x6')	EACH	349	500.00	174,500
7360030	LUMINAIRE (HORIZONTAL MOUNT) (HPS 250 WATT)	EACH	22	500.00	11,000
800X002	LANDSCAPING (6.51 MILES @ $50,000/MI)	EACH	6.51	50,000.00	325,500
8080695	CONCRETE PIPE PLUG	EACH	1	1,500.00	1,500

Order of Magnitude Estimate for the Preferred Alternative (continued)

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9050026	GUARD RAIL TERMINAL (TANGENT TYPE)	EACH	10	3,000.00	30,000
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9140134	NOISE BARRIER WALL (BRIDGE-LIGHT WEIGHT)	SQ.FT.	5,210	65.00	338,700
9140136	SOUND BARRIER WALL (CONCRETE)	SQ.FT.	39,770	30.00	1,193,100
9140153	RETAINING WALL (REGULAR)	SQ.FT.	186,190	55.00	10,240,500
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9240051	MISCELLANEOUS WORK (RELOCATE IRRIGATION TURNOUT STRUCTURE) (SRP)	L.SUM	1	50,000.00	50,000
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9999910	LUMP SUM (MCKELLIPS ROAD OVERPASS WB)	L.SUM	1	721,080.00	721,100
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9999910	LUMP SUM (CANTILEVERED ROADWAY)	L.SUM	1	827,760.00	827,800
				ITEM TOTAL	**39,949,700**
PROJECT WIDE					
	Maintenance and Protection of Traffic (8%)	COST		3,196,000.00	3,196,000
	Dust and Water Palliative (0.75%)	COST		300,000.00	300,000
	Quality Control (0.75%)	COST		300,000.00	300,000
	Construction Surveying (1.5%)	COST		600,000.00	600,000
	Erosion Control (0.3%)	COST		120,000.00	120,000
	Mobilization (8% of all construction items)	COST		3,865,000.00	3,865,000
				PROJECT WIDE SUBTOTAL	**8,381,000**
	Unidentified Items (20% of Item Total and Project Wide Subtotal)	COST		9,667,000.00	9,667,000
				PROJECT WIDE TOTAL	**18,048,000**
OTHER COST					
	Construction Engineering (9%)	COST		5,220,000.00	5,220,000
	Construction Contingencies (5%)	COST		2,900,000.00	2,900,000
	Indirect Cost Allocation (3.42%)	COST		1,984,000.00	1,984,000
	Environmental Mitigation (Unknown at this time)	COST		-	-
	PCCP Quality Incentive	SQ.YD.	143,444	1.50	215,200
	AR-ACFC Smoothness Incentive	L.MILE	13	11,000.00	143,000
	Engineering Design (Includes Surveying and Geotechnical) (8% of all items)	COST		4,640,000.00	4,640,000
	Right-of-Way	COST		975,000.00	975,000
				OTHER COST TOTAL	**16,077,200**

SUMMARY	
ITEM TOTAL	**39,949,700**
PROJECT WIDE	**18,048,000**
OTHER COST TOTAL	**16,077,200**
TOTAL PROJECT COST	**74,074,900**

Order of Magnitude Estimate for Build Alternative 2

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
2020031	REMOVAL OF PORTLAND CEMENT CONCRETE PAVEMENT	SQ.YD.	40,678	2.00	488,200
2020021	REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	51,688	6.00	310,200
2020027	REMOVAL OF CONCRETE BARRIER	L.FT.	32,336	10.00	323,400
2020034	REMOVAL OF SIGNS	L.SUM	1	10000.00	10,000
2020041	REMOVAL OF PIPE	L.FT.	3,107	30.00	93,300
2020053	REMOVE CATCH BASINS	EACH	171	250.00	42,800
2020054	REMOVE MANHOLES	EACH	17	2000.00	34,000
2020201	SAW CUTTING	L.FT.	68,347	2.00	136,700
202XXXX	REMOVE ATTENUATORS	EACH	13	3000.00	39,000
2030301	ROADWAY EXCAVATION	CU.YD.	97,731	10.00	977,400
4010013	PORTLAND CEMENT CONCRETE PAVEMENT (13" PCCP OVER 4" AB)	SQ.YD.	42,230	35.00	1,478,100
4010013	PORTLAND CEMENT CONCRETE PAVEMENT (13" PCCP OVER 4" AC)	SQ.YD.	48,332	40.00	1,933,300
4010011	PORTLAND CEMENT CONCRETE PAVEMENT (11" PCCP OVER 4" AB)	SQ.YD.	34,328	30.00	1,029,900
4070040	ASPHALTIC CONCRETE (AR-ACFC 1" OVERLAY)	SQ.YD.	122,096	5.00	610,500
5012524	STORM DRAIN PIPE, 24"	L.FT.	4,561	80.00	364,900
5012530	STORM DRAIN PIPE, 30"	L.FT.	8	90.00	800
5012560	STORM DRAIN PIPE, 60"	L.FT.	62	220.00	13,700
5012566	STORM DRAIN PIPE, 66"	L.FT.	64	250.00	16,000
5012572	STORM DRAIN PIPE, 72"	L.FT.	96	300.00	28,800
5014042	FLARED END SECTION, 42" (C-13.25)	EACH	6	900.00	5,400
5030141	CONCRETE CATCH BASIN (MEDIAN, C-15.80)	EACH	53	3000.00	159,000
5030602	CONCRETE CATCH BASIN (C-15.91)	EACH	26	3000.00	78,000
5030604	CONCRETE CATCH BASIN (C-15.92)	EACH	126	3500.00	441,000
5030606	CONCRETE CATCH BASIN (DETAIL)	EACH	5	3500.00	17,500
5050001	MANHOLE (C-18.10)	EACH	51	4000.00	204,000
5050081	IRRIGATION MANHOLE (SRP)	EACH	4	20000.00	80,000
5050221	RECONSTRUCT MANHOLE (SRP)	EACH	4	10000.00	40,000
6060048	BRIDGE SIGN STRUCTURE (SD9.20, TYPE 4F)	EACH	1	110000.00	110,000
6060079	FOUNDATION FOR BRIDGE SIGN STRUCTURE (SD9.20, TYPE 4F)	EACH	2	5000.00	10,000
6060150	CANTILEVER SIGN STRUCTURE	EACH	24	35000.00	840,000
6060240	FOUNDATION FOR CANTILEVER SIGN STRUCTURE	EACH	24	5000.00	120,000
6061001	SIGN MOUNT ASSEMBLY (FOR BRIDGE FASCIA)	EACH	1	3000.00	3,000
6070002	BREAKAWAY SIGN POST S4X7.7	L.FT.	392	30.00	11,800
6070006	BREAKAWAY SIGN POST W8X18	L.FT.	108	48.00	5,200
6070022	FOUNDATION FOR BREAKAWAY SIGN POST S4X7.7	EACH	28	400.00	11,200
6070026	FOUNDATION FOR BREAKAWAY SIGN POST W8X18	EACH	6	700.00	4,200
6070038	SLIP BASE (2 1/2S)	EACH	84	200.00	16,800
6070055	SIGN POST (PERFORATED) (2 1/2 S)	L.FT.	1,008	12.00	12,100
6070060	FOUNDATION FOR SIGN POST (CONCRETE)	EACH	98	175.00	17,200
6080005	WARNING, MARKER, OR REGULATORY SIGN PANEL	SQ.FT.	1,770	20.00	35,400
6080018	EXTRUDED ALUM SIGN PANEL	SQ.FT.	5,509	25.00	137,800
7030095	MILEPOST MARKER (S-10)	EACH	12	300.00	3,600
7040070	PAVEMENT MARKING (WHITE THERMOPLASTIC) (0.090)	L.FT.	130,977	0.25	32,800
7040071	PAVEMENT MARKING (YELLOW THERMOPLASTIC) (0.090)	L.FT.	127,298	0.25	31,900
7040072	PAVEMENT MARKING (TRANSVERSE) (THERMOPLASTIC) (ALKYD) (0.090")	L.FT.	17,055	2.00	34,200
7040074	PAVEMENT SYMBOL (EXTRUDED THERMOPLASTIC) (ALKYD) (0.090")	EACH	71	125.00	8,900
7050019	PAVEMENT MARKING, PREFORMED, TYPE I, LEGEND	EACH	4	180.00	800
7050047	PAVEMENT MARKING, PREFORMED, PATTERNED, WHITE STRIPE	L.FT.	99,483	4.00	398,000
7060013	PAVEMENT MARKER, RAISED, TYPE C	EACH	8,513	3.00	25,600
7060017	PAVEMENT MARKER, RAISED, TYPE E	EACH	3,488	3.00	10,500
7080001	PERMANENT PAVEMENT MARKING (PAINTED) (WHITE)	L.FT.	98,688	0.15	14,900
7080011	PERMANENT PAVEMENT MARKING (PAINTED) (YELLOW)	L.FT.	84,865	0.15	12,800
7080101	PERMANENT PAVEMENT MARKING (PAINTED SYMBOL)	EACH	71	100.00	7,100
7310092	POLE (TYPE H) (ALUMINUM)	EACH	16	2000.00	32,000
7310276	POLE FOUNDATION (TYPE H) (BREAKAWAY)	EACH	16	2000.00	32,000
7310551	MAST ARM (20 FT.) (TAPERED)	EACH	16	500.00	8,000
7320270	ELECTRICAL CONDUIT (3")	L.FT.	1,750	5.00	8,800
7320074	ELECTRICAL CONDUIT (3 - 3") (PVC) (FMS)	L.FT.	35,125	20.00	702,500
7320410	PULL BOX (NO. 5)	EACH	22	500.00	11,000
7320357	JUNCTION BOX (NO. 7)	EACH	41	700.00	28,700
7320455	PULL BOX(NO. 9)	EACH	28	3000.00	84,000
7330446	RAMP METER SIGNAL AND SUPPORT ASSEMBLY	EACH	16	3000.00	48,000
7350120	LOOP DETECTOR FOR TRAFFIC SIGNALS (6'x6')	EACH	349	500.00	174,500
7360030	LUMINAIRE (HORIZONTAL MOUNT) (HPS 250 WATT)	EACH	22	500.00	11,000
800X002	LANDSCAPING (6.51 MILES @ $50,000/MI)	EACH	6.51	50000.00	325,500
8080695	CONCRETE PIPE PLUG	EACH	1	1500.00	1,500
8082136	SEWER PIPE, DUCTILE IRON, 36" (RELOCATE)	L.FT.	1,250	360.00	450,000
8082845	MANHOLE (RELOCATE)	EACH	1	20000.00	20,000
8093154	SEWER PIPE, 54"	L.FT.	100	650.00	65,000
9050026	GUARD RAIL TERMINAL (TANGENT TYPE)	EACH	10	3000.00	30,000
9050401	GUARD RAIL TRANSITION, W-BEAM TO CONCRETE BARRIER	EACH	10	3000.00	30,000
9080084	CONCRETE CURB AND GUTTER	L.FT.	18,217	15.00	273,300
9100000	CONCRETE BARRIER (SINGLE FACE WITH GUTTER)	L.FT.	36,040	60.00	2,162,400
9100009	CONCRETE BARRIER ADJACENT TO RETAINING WALL	L.FT.	20,786	75.00	1,559,000
9100012	CONCRETE BARRIER (SPECIAL HALF) (42")	L.FT.	12,500	75.00	937,500

Order of Magnitude Estimate for Build Alternative 2 (continued)

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
9140133	NOISE BARRIER WALL (COMBINATION-NOISE WALL PORTION ONLY)	SQ.FT.	18,440	25.00	461,000
9140134	NOISE BARRIER WALL (BRIDGE-LIGHT WEIGHT)	SQ.FT.	5,215	65.00	339,000
9140136	SOUND BARRIER WALL (CONCRETE)	SQ.FT.	41,175	30.00	1,235,300
9140136	SOUND BARRIER WALL (CONCRETE) (SPECIAL)	SQ.FT.	11,725	75.00	879,400
9140153	RETAINING WALL (REGULAR)	SQ.FT.	149,770	55.00	8,237,400
9140155	RETAINING WALL (SPECIALTY)	SQ.FT.	14,320	150.00	2,148,000
9240050	MISCELLANEOUS WORK (EFFLUENT BYPASS PUMPING OPERATIONS)	L.SUM	1	50000.00	50,000
9999910	LUMP SUM (DOBSON ROAD OVERPASS EB)	L.SUM	1	503400.00	503,400
9999910	LUMP SUM (DOBSON ROAD OVERPASS WB)	L.SUM	1	511290.00	511,300
9999910	LUMP SUM (ALMA SCHOOL ROAD OVERPASS EB)	L.SUM	1	348225.00	348,300
9999910	LUMP SUM (ALMA SCHOOL ROAD OVERPASS WB)	L.SUM	1	692880.00	692,900
9999910	LUMP SUM (MCKELLIPS ROAD OVERPASS EB)	L.SUM	1	556200.00	556,200
9999910	LUMP SUM (MCKELLIPS ROAD OVERPASS WB)	L.SUM	1	721080.00	721,100
9999910	LUMP SUM (COUNTRY CLUB DRIVE OVERPASS EB)	L.SUM	1	469290.00	469,300
9999910	LUMP SUM (COUNTRY CLUB DRIVE OVERPASS WB)	L.SUM	1	472170.00	472,200
			ITEM TOTAL		**35,491,200**
PROJECT WIDE					
	Maintenance and Protection of Traffic (8%)	COST		2840000.00	2,840,000
	Dust and Water Palliative (0.75%)	COST		267000.00	267,000
	Quality Control (0.75%)	COST		267000.00	267,000
	Construction Surveying (1.5%)	COST		533000.00	533,000
	Erosion Control (0.3%)	COST		107000.00	107,000
	Mobilization (8% of all construction items)	COST		3435000.00	3,435,000
			PROJECT WIDE SUBTOTAL		**7,449,000**
	Unidentified Items (20% of Item Total and Project Wide Subtotal)	COST		8589000.00	8,589,000
			PROJECT WIDE TOTAL		**16,038,000**
OTHER COST					
	Construction Engineering (9%)	COST		4638000.00	4,638,000
	Construction Contingencies (5%)	COST		2577000.00	2,577,000
	Indirect Cost Allocation (3.42%)	COST		1763000.00	1,763,000
	Environmental Mitigation (Unknown at this time)	COST		0.00	-
	PCCP Quality Incentive	SQ.YD.	124,890	1.50	187,400
	AR-ACFC Smoothness Incentive	L.MILE	13	11000.00	143,000
	Engineering Design (Includes Surveying and Geotechnical) (8% of all items)	COST		4123000.00	4,123,000
	Right-of-Way	COST		0.00	-
			OTHER COST TOTAL		**13,431,400**

SUMMARY

ITEM TOTAL	**35,491,200**
PROJECT WIDE	**16,038,000**
OTHER COST TOTAL	**13,431,400**
TOTAL PROJECT COST	**64,960,600**

Note: The estimated cost for new right-of-way acquisition is not included for the Radio Disney Group, LLC property.

APPENDIX B

SUMMARY OF COMMENTS

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L Pima – Gilbert Road)
Federal ID No.: NH-202-B(BEC)A
TRACS No.: H8169 01L

INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS

ACTION CODES: A = WILL COMPLY *B = CONSULTANT TO EVALUATE
**C = ADOT TO EVALUATE *D = DESIGN TEAM RECOMMENDS NO FURTHER ACTION

* REQUIRES A WRITTEN EXPLANATION BY CONSULTANT/DESIGNER
** REQUIRES FINAL DISPOSITION

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Steve Beasley, ADOT Valley Project Management			
		Initial Design Concept Report			
1	General	Be sure Phoenix Construction District has reviewed and is in agreement with the Mitigation Measures listed.	A/B	A	The DCR was distributed to Julie Kliewer, Mike Zimnik and Jim Windsor; We will contact them to obtain the concurrence for the mitigation measures.
2	13	On Page 13, should we include a discussion of historical settlement problems and the repairs implemented near Mesa Drive?	A	A	Will include a reference to Section 4.12.3 where this item is discussed in greater detail.
3	General	At the McKellips Road off-ramp, the DCR proposes fixing the design exceptions for shoulder width and for ramp geometrics at the intersection with McKellips Road. This requires significant impacts to the Seyenna Vistas MHP. If the shoulder width design exception is rectified, and the ramp geometrics at McKellips are not, what are the impacts to the MHP and the costs?	D	D	This condition was considered during the alternatives development phase. Improving the shoulders to eliminate the design exception would require reconstruction of the entire ramp under both scenarios. An evaluation was performed and concluded that the incremental cost of providing retaining walls and a higher skew angle at the intersection would be approximately $4,084,000, and the improved ramp geometry with a 20 degree skew at the intersection would be approximately $3,974,000 including both right-of-way costs and residential relocation within the site.
4	I	Left hand column, 4th paragraph down, 1st sentence: Replace the words "which authorized" with "authorizing".	A	A	
5	I	Right column, 2nd paragraph down, 2nd sentence: Revise to read "Either alternative would require a new design exception for a reduced … "	B/C	D	Radio Disney, LLC has provided a letter to ADOT outlining the complications of widening into their property. For this reason, a design exception will likely be required for both alternatives. However, it remains important to include an alternative that would provide full-width improvements in this area. Discussion is included that explains the complications associated with impacts to this parcel.

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L Pima – Gilbert Road)
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INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Steve Beasley, ADOT Valley Project Management (continued)			
		Initial Design Concept Report			
6	I	Right column, 2nd paragraph down, 3rd sentence: Revise to read "Alternative 2 would also require design exception for a reduced median shoulder (4' width) along westbound SR 202L between the SR101L/SR202L TI and Dobson Road, and for a reduced median shoulder…"	A	A	
7	I	Right hand column, 3rd paragraph down, 4th sentence: Delete the word "potential".	A	A	
8	I	Right hand column, 3rd paragraph down, last sentence: Replace the word "estimated" with "estimates".	A	A	
9	I	Right hand column, last paragraph: Replace the word "a" with "an" before Initial Traffic Report and Initial Onsite Drainage Report.	A	A	
10	2	In Figure 2: Replace the word "Phoenix" with "Scottsdale".	A	A	
11	2	Right hand column, 2nd paragraph, 1st sentence: Replace the words "which authorized" with "authorizing".	A	A	
12	47	Right hand column, 1st paragraph under Eastbound SR 202L Mainline, 2nd sentence: Replace the word "were" with "would be".	A	A	
13	47	Right hand column, 2nd paragraph under Eastbound SR 202L Mainline: Delete the quotation marks on the word "bottleneck".	A	A	
14	47	Right hand column, 3rd paragraph under Eastbound SR 202L Mainline: Revise the 1st sentence to read "….and the second lane would be designed as an optional exit lane…"	A	A	
15	47	Right hand column, 3rd paragraph under Eastbound SR 202L Mainline: Check to make sure Figure 6 (page 26) shows four general-purpose lanes and one HOV lane as stated in the last sentence of this paragraph.	D	D	The Figure 6 lane diagrams show only general-purpose lanes and auxiliary lanes. The HOV lanes are not included in the diagram as described with the note on the figure.
16	47	Right hand column, last paragraph, 1st sentence: Add the word "auxiliary" between "additional" and "lane".	A	A	
17	48	Left hand column, 3rd paragraph down, 1st sentence: Add "(formerly KNIX)" after Radio Disney Group, LLC radio station.	A	A	
18	48	Left hand column, 3rd paragraph down, add the sentence: "In this build alternative, design exceptions are required in this area."	A	A	
19	51	Left hand column, 4th paragraph, 1st sentence under 3.4.2 SR 202L Widening Build Alternative 1: Replace the word "sort" with "short".	A	A	
20	51	Left hand column, 4th paragraph, 2nd sentence under 3.4.2 SR 202L Widening Build Alternative 1: Delete the words "width" and "a", and replace the word "Exception" with "Exceptions".	A	A	
21	52	Comment on the 3rd and 4th paragraphs under 3.4.4 comparison of Alternatives: What happens if we don't fix DE's at McKellips? What is cost? Leave DE's at McKellips and at CCD? What if we fix shoulder width but don't realign the ramp at McKellips?	A	A	Additional clarifying information will be included to discuss ramifications of not fixing the DEs. The 5th and 6th paragraphs discuss the ramifications and Figure 13 show the cost differences between the two alternatives.

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L Pima – Gilbert Road)
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INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Farzana Yasmin, ADOT TTG			
		Initial Design Concept Report			
1	General	I reviewed the initial DCR and I do not have any comments.	A	A	
		Raymond Huang, ADOT Phoenix Regional Traffic			
		Initial Traffic Report			
1	General	This report uses HCM 2000 to analyze the level-of-service. What is the reason for not using the latest HCM?	B	D	The traffic analysis for the DCR was performed in the Spring of 2011, prior to the release of the newer version of the HCM. CORSIM was used for the traffic analysis and the changes in the newer version of the HCM are not likely to change the results of the traffic analysis. It was agreed during discussions at the comment resolution meeting that no further action is required.
2	16	On page 16, the free flow speed of system interchange ramps is stated 55 mph. The post speed is 40 mph on this location. The assumption seems to be too high.	D	D	The speeds listed on page 16 are based on RDG design speeds and provide different free-flow speeds for the different facility types. The 40 mph posted speed is an advisory speed.
3		On page 16, it shows 5% of the vehicles in the peak hour would be classified as commercial vehicles. Recommend confirm the data with TPG Data Collections group.	A	A	The text will clarify the use of 5% during the peak hour similar to Section 2.2 of the ITR. The 5% would be considered a conservative value.
4	General	There is no improvement proposed for the SR101L/SR202L Ramp S-E/N-E ramp. The condition remained congested during the P.M. peak hour. Can we propose adding a lane on the entrance ramp?	A	A	The Recommended Alternative shown adds a lane to create a two-lane entrance ramp. Figures 11 and 12 will be updated to show lane arrows on the entrance ramp. Although the future conditions do not improve significantly, there is an operational improvement over the no-build. This DCR considered the addition of a general-purpose lane on SR 202L and did not evaluate improvements to the system TI.

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L Pima – Gilbert Road)
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TRACS No.: H8169 01L

INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Sherly Paul, ADOT Bridge Group			
		Initial Design Concept Report			
1	59	ADOT Bridge Group will be requiring widening of existing structures to be done in LRFD. This is required for all the projects that are currently in the 0-30% stages. So for the Initial DCR for the widening of 202, from SR 101L, Pima to Gilbert road (H 8169 01L), please make that changes to Design Code and Design Loads. (Page # 59). I do not have any other comments.	A	A	We will evaluate the structures using LRFD.
		Dan Macdonald, ADOT Roadway Engineering Group			
		Initial Design Concept Report			
1	Page 4	Existing Land Use, second paragraph, 1st sentence: This is not a sentence. Please revise.	A	A	
2	Page 4	Existing Land Use, fourth paragraph, 1st sentence: This sentence needs revision in order to make sense.	A	A	
3	Page 4	Existing Land Use, fifth paragraph, 1st sentence: This is not a sentence. Please revise.	A	A	
4	Page 4	General Plan Land Use, first paragraph, 1st sentence: This is a long, complicated sentence. Maybe it is the first comma which throws the whole sentence off. Please review to see how this sentence might be revised to read better.	A	A	
5	Page 5	Right-of-Way: Is the 100' dimension correct? It is difficult to get 6 freeway lanes with shoulders in 100 feet.	A/B	A	The DCR will include the corrected minimum R/W width (95' as measured)
6	Page 15	First paragraph under Table 16, 3rd sentence: There is only one of the segment rates that is more than the average crash rate, NOT TWO.	A	A	
7	Page 48	Left hand column, second full paragraph, 3rd sentence: The typical section shows the HOV lane as being 11 feet wide.	A	A	The text has been revised to 11'
8	Page 48	Westbound SR 202L Mainline, third paragraph, last sentence: This sentence needs to be revised to make it read better.	A	A	
9	Page 48	Westbound SR 202L Mainline, sixth paragraph, 2nd sentence: "The Ramp W-N/W-S exit would be ***designed*** as a two lane . . ."	A	A	
10	Page 59	Vertical Clearance, first paragraph, 4th sentence: This sentence needs to be revised to make it read better.	A	A	
11	Page 73	AASHTO Non-Conforming Geometric Design Elements, the sentence and accompanying bullets about median shoulders providing inadequate horizontal stopping sight distance – These design exceptions should have been requested with the construction of the HOV lanes. If nothing is being done to change that condition, is it necessary to request them again?	A	A	We will eliminate these design exceptions since they would have been addressed with the previous HOV lane project.
12	Page 74	ADOT Non-Conforming Geometric Design Elements, the sentence and accompanying bullets about median shoulders providing inadequate horizontal stopping sight distance – See comment # 11.	A	A	We will eliminate these design exceptions since they would have been addressed with the previous HOV lane project.
13	Appendix D	Typical Sections: See comment # 7.	A	A	The text has been revised to 11'

SR 202L, RED MOUNTAIN FREEWAY
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INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Dan Macdonald, ADOT Roadway Engineering Group (continued)			
		Initial Design Concept Report			
14	Appendix D	Typical Sections: It is acceptable in the DCR to show side slopes as 3:1 Max or 4:1 Max. But I hope the consultant doing the final design will understand that more control will be needed to be shown, so the contractor will know what is to be built.	A	A	The slope note is sufficient for the DCR phase of design, but we concur that additional information will be added with the Stage II (30%) design plans
15	Appendix D	Dwg No. C-2.06, first drainage feature on the north side (approx station 396+30): My suggestion would be to add *(Typ)* to the note for this location. This would do two things: 1) You could probably eliminate some or all of the other drainage notes, 2) You would then be consistent with what you have done on other plan sheets.	A	A	
16	Page 7	Onsite Systems, third paragraph: To me it does not make sense to add a general purpose lane and not know what effect that has on the existing drainage system. What if the spread is beyond the acceptable limits? To build the GPL and then wait for it to rain to see if the system works is unacceptable. This is ADOT Drainage's call, but my opinion is the situation needs to be investigated.	B	A	Additional clarifying language will be included in the report. The existing pipe system is typically not evaluated for these general-purpose lane widening projects because the cost to replace the system would be greater than the benefit gained. Drainage spread calculations were completed and additional inlets have been included to collect the additional pavement runoff to comply with ADOT drainage criteria.
17	Page 7	Proposed Improvements, second paragraph, last sentence: " . . . ADOT Drainage Design Section and Phoenix *Maintenance* District representatives . . ."	A	A	
		Initial Traffic Report			
18	Page 4	Table 1, Alma School Road – McKellips Road, P.M. Peak Hour: The directional split percentages add up to 100% for all segments except this one.	A	A	
19	Page 4	First paragraph under Table 2, 3rd sentence: Only one of the calculated segment rates is more than the average crash rate, NOT TWO.	A	A	
		Dennis Crandall, ADOT Roadway Drainage Group			
		Initial Design Concept Report and Initial Drainage Concept Report			
1	General	I have reviewed the subject documents from a drainage perspective and I do not have any comments.	A	A	
		Jim Wilson, ADOT Geotechnical Design			
		Initial Design Concept Report			
1	General	No comments from geotech design.	A	A	

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Federal ID No.: NH-202-B(BEC)A
TRACS No.: H8169 01L

INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Daniel Gabiou, ADOT Environmental Planning Group			
		Initial Design Concept Report			
1	i	Table of Contents: Review all subsections for correct subsection number	A	A	
2	i	Section 7.0: Rename to **ENVIRONMENTAL CONSIDERATIONS** and add the following subsections: 7.1 Overview 7.2 Air Quality 7.3 Hazardous Materials 7.4 Biological Resources 7.5 Noise Analysis 7.6 Cultural Resources 7.7 Other Environmental Considerations	D	D	The ADOT Predesign Section *Project Scoping Document Guideline,* September 2011 requires the document provide a reference to the Environmental Document rather than repeat the contents in the DCR. The mitigation Measures will also be moved to Section 7 in accordance with the Scoping Document Guidelines.
3	I	In the 1st paragraph, 1st sentence of the EXECUTIVE SUMMARY: Add the acronym (IDCR) after Initial Design Concept Report.	A	A	Acronym has been defined earlier in report
4	I	Right-hand column, 8th paragraph, add after the 1st sentence: The identified mitigations measures within this IDCR are subject to change upon completion of the environmental document.	B	A	The mitigation measures shown in the IDCR were included based on anticipated findings in the Categorical Exclusion. Since the submittal of the IDCR, the Draft CE has been submitted to EPG and the Mitigation Measures have been further defined. The DCR will be updated with the latest measures from the CE with consultation with the Phoenix Construction District.
5	I	Right-hand column, 8th paragraph: Revise the last sentence to read "The environmental document will include all final mitigation and coordination requirements."	A	A	
6	I	Right-hand column, last paragraph: Spell out the acronym AASHTO.	A	A	
7	I	Right hand column, last paragraph: Replace the word "a" with "an" before Initial Traffic Report and Initial Onsite Drainage Report.	A	A	
8	II	Delete the 1st paragraph under **ADOT Phoenix Construction District (PCD) Responsibilities.** No 404 permit required.	A	A	The DCR will be updated with the latest measures from the CE.
9	II	Top of right-hand column: Add "Structures include:" before list of structures	A	A	The text has been revised to include reference.
10	II	On first structure listed, Dobson Road TI OP: Revise to read: "Dobson Road TI Overpass (OP)".	A	A	
11	II	Add the following to the list of structures: • Center Street Underpass (UP) • Mesa Drive UP • Stapley Drive UP • Gilbert Road Ramp A UP • Gilbert Road Interchange UP	D	D	These structures will not be modified with this project.

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L Pima – Gilbert Road)
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INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Daniel Gabiou, ADOT Environmental Planning Group (continued)			
		Initial Design Concept Report			
12	II	In the last paragraph under **ADOT Phoenix Construction District (PCD) Responsibilities,** revise the last sentence to read: The PCD will also sign the Checklist and return it to the ADOT Environmental Planning Group (EPG).	A	A	Further clarify that EPG will submit to ACOE.
13	II	Delete the 1st paragraph under **Contractor Responsibilities**. No 404 permit required.	A	A	The DCR will be updated with the latest measures from the CE.
14	III	Left-hand column, 6th and 7th paragraphs regarding burrowing owls: Awaiting a response from Doug Smith as to if owl/swallow mitigation is necessary.	A	A	When the IDCR was initially developed all of the standard mitigation measures included that could potentially be applicable to the project. The IDCR was completed prior to the submittal of the draft CE and we did not go back to revise the mitigation measures. With regard to the burrowing owl and swallow, those mitigation measures are not included in the CE and will be removed from the IDCR.
15	III	Left-hand column, delete the 8th, 9th and 10th paragraphs regarding a 404 permit. No 404 permit required.	A	A	The DCR will be updated with the latest measures from the CE.
16	III	Right-hand column, 8th paragraph: hyphenate lead based.	A	A	
17	IV	Replace the 1st 2 paragraphs and bullet lists with the following: The Contractor shall complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with the demolition of a portion of the retaining wall between State Route 101L and Dobson Road and the widening of the structures listed below and submit to the Engineer for review. After Engineer approval, the notification will be submitted to the Department Hazardous Materials Coordinator (602-712-7767) for a 5 working day review and approval. Upon approval by the Department Hazardous Materials Coordinator, the Contractor shall file the notification with the Arizona Department of Environmental Quality and the Maricopa County Air Quality Department at least 10 working days prior to demolition/rehabilitation associated with the demolition of a portion of the retaining wall between State Route 101L and Dobson Road and the widening of any of the following bridge structures: • Dobson Road OP • Haul Road OP • Alma School Road OP • McKellips Road OP • Country Club Drive OP • Center Street UP • Mesa Drive UP • Stapley Drive UP • Gilbert Road Ramp A UP • Gilbert Road Interchange UP	A	A	The DCR will be updated with the latest measures from the CE.

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L Pima – Gilbert Road)
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INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Daniel Gabiou, ADOT Environmental Planning Group (continued)			
		Initial Design Concept Report			
18	4	Right-hand column, paragraphs 1 and 3: Define acronyms ACOE and GIS.	A	A	ACOE will be defined in the last paragraph in the left column.
19	5	In **Table 1 – Existing Utility Crossings**: Define acronyms RCB, FMs, DIP and PE.	A	A	
20	6	Left-hand column, 1st paragraph: Define acronym cfs.	A	A	
21	7	Left-hand column, 1st paragraph under **Regulated Floodplains**: Define the acronym AE.	A	D	"AE" is not an acronym
22	7	Right-hand column, 1st paragraph under **Salt River**: Define the acronym HEC-RAS.	A	A	
23	9	In **Table 6 – Existing Retaining Walls**: Define the acronyms EB, WB and N-W.	A	A	
24	11	In **Table 10 – Existing SR 202L Load Center Locations**: Define the acronyms Rt and W-S.	A	A	
25	13	Left-hand column, last paragraph: Has the acronym TIOP been previously defined?	A	A	
26	13	Right-hand column, 1st paragraph under **1.3.11 Existing Pavement Structural Section**: Capitalize the first letter of each word for asphalt rubber-asphalt concrete fiction Course or use a lowercase c in course.	A	A	
27	15	**Table 17 – Mainline Traffic Factors**: Are these figures from ADT or from the Arizona State Highway Systems Log – label.	A	A	Will define the source
28	16	**Figure 3 – Yearly Crash Summary**: Label where the figures come from (ADT or from the Arizona State Highway Systems Log)	A	A	A note will be added to identify the source of the data.
29	27	**2.5 Summary of Operational Results**, 2nd paragraph states "The Build Alternative would provide additional capacity to carry approximately 700 more vehicles during both the A.M. and P.M. peak hours than the No-Build Alternative as shown on Tables 20 and 21 (page 28). I am confused on this figure, see figures calculated on page 28.	A	A	The text will be updated and the methodology will be clarified.
30	28	**Table 21 – P.M. Peak Hour Performance Measures**: Comment on Note 2: So the additional 3290 vph are in areas where no congestion occurs?	D	D	The tables reflect the results in locations experiencing LOS E of F in the no-build condition.
31	48	In the last paragraph, the end of the last sentence, make the A in alternative lower case.	A	A	
32	49	2nd paragraph in the right-hand column, Section 4.11.4 is referenced. Should this be Section 4.9.4?	A	A	
33	50	4th paragraph in the right-hand column, Section 4.13 is referenced. Should this be Section 4.11?	A	A	
34	51	Right-hand column, 2nd bullet down in **Section 3.4.3 – SR 202L Widening Build Alternative 2**: Has RDG been previously defined?	A	A	
35	57	Right-hand column, 1st paragraph: delete the extra space before i.e.	A	A	
36	58	Left-hand column, bullet Reduced vertical clearances: delete the underline.	A	A	
37	59	Left-hand column, 1st paragraph under **Vertical Clearance**, last sentence reads: … configurations for this study were based on maintaining achieve a 16'-0" minimum vertical clearance… Should it be maintaining or achieving?	A	A	Will delete "achieve"

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L Pima – Gilbert Road)
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INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Daniel Gabiou, ADOT Environmental Planning Group (continued)			
		Initial Design Concept Report			
38	59	Left-hand column, 1st paragraph under **Concrete Strength**: Replace the acronym psi with per square inch (psi).	A	A	Will define as "pounds per square inch"
39	59	Right-hand column, under **4.6.5 Evaluation of Bridge Widening Alternatives**: Add a space between the 2 paragraphs.	A	A	
40	66	Right-hand column, under **Rainfall Data**: Replace in/hr with inches per hour (in/hr).	A	A	Will define here
41	67	Left-hand column: Add a space between the 1st 2 paragraphs.	A	A	
42	67	Left-hand column, 3rd paragraph under **4.9.1 Signing and Pavement Marking**: Change DCR to IDCR.	D	D	The next version of the report will be the Final DCR (DCR)
43	67	Right-hand column, 1st paragraph under **4.9.3 Lighting**: Was HPS previously defined?	A	A	Will define here
44	68	Left-hand column, 1st paragraph under **4.9.4 Freeway Management System**: Replace CCTV with closed circuit television (CCTV).	D	D	Defined on page 12
45	68	Right-hand column, 2nd and 3rd paragraphs down: Add a space between the paragraphs.	A	A	
46	71	2nd paragraph under **5.1 Project Cost Estimates**: replace Section 4.14.1 with Section 4.12.4.	A	A	
47	72	**Table 34 – Estimate of Future Maintenance Costs**: I am confused as to how the total PMCI figure of $350,225 is reached based on this table.	D	D	The table and methodology used were established by the Phoenix Maintenance District and Predesign. The values have been reviewed and verified to be correct.
48	73	Left-hand column, 2nd paragraph from the bottom: '/ft is called out. I'm not sure what this means – foot/foot?	A	A	Will be revised to 0.003'/ft
49	73	Left-hand column, last item a: Hs HPI been previously defined?	A	A	Will be defined here
50	74	Left-hand column, 2nd paragraph from the bottom: '/ft is called out. I'm not sure what this means – foot/foot?	A	A	Will be revised to 0.003'/ft
51	75	As marked up in the Table of Contents, Section 7.0: Rename to **ENVIRONMENTAL CONSIDERATIONS** and add the following subsections: 7.1 Overview 7.2 Air Quality 7.3 Hazardous Materials 7.4 Biological Resources 7.5 Noise Analysis 7.6 Cultural Resources 7.7 Other Environmental Considerations I will type up and send Section 7.0 over.	D	D	The ADOT Predesign Section *Project Scoping Document Guideline,* September 2011 requires the document provide a reference to the Environmental Document rather than repeat the contents in the DCR. The mitigation Measures will also be moved to Section 7 in accordance with the Scoping Document Guidelines.

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L Pima – Gilbert Road)
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INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Mark Venti, City of Mesa			
		Initial Design Concept Report			
1	1	Executive Summary – Page 1 – Why was Chandler a part of the coordination?	A	A	Chandler was included at the request of the project team because they have major retail centers a few miles from the project site.
2	General	The City of Mesa is planning to construct a shared use path along the south edge of the Rio Salado. The planning has been coordinated with Tempe's path, and is anticipated to be opened for the new Cub's Stadium at Riverview Park. Additionally, MCDOT has produced preliminary plans for a bridge crossing of the Salt River at Dobson Road. The initial DCR should acknowledge both of these future projects, as well as environmentally study and clear the areas of influence of both of these projects.	B/C	A	The project has had close coordination with the City of Mesa, SRPMIC, FCDMC, and COE. The recommended alternative includes a cantilevered roadway structure and retaining walls along the north side of SR 202L between SR 101L and Dobson Road. These were included so that there will not be impacts to the adjacent properties or floodplains and to be compatible with the proposed projects in the area. This SR 202L widening study will only provide environmental clearance for the SR 202L widening improvements. References are made to all of the adjacent projects mentioned throughout the DCR text. Additional discussion will be added for the City of Tempe Rio Salado Pathway and the Dobson Road bridge on page 4 of the DCR.
3	General	The initial DCR should also mention the potential for the City to use ADOT's access road for the construction or implementation of the path	A	A	Discussion of the ADOT and FCDMC maintenance access road will be included
4	General	Finally, the DCR should endorse the path project so the City of Mesa and the Maricopa Association of Governments (MAG) may reference this document when writing and justifying the state and regional enhancement grants.	D	D	The purpose of the DCR is to provide an alternatives evaluation and selection for the general-purpose lane widening along SR 202L and to provide sufficient environmental documentation for the proposed freeway improvements.
5	62-63	Sheets 62-63: Is it possible to give a dimension for the height of the cantilevered section over the ground surface?	A	A	A variable height dimension will be added: "Varies XX' to XX".
6	C-2.06 and C-2.12	Drawings C-2.06 and C-2.12: The plans should depict preliminary concepts for the shared use trail and the Dobson Road bridge over the Salt River.	D	D	It is anticipated that the SR 202L GPL project will be constructed before the shared use trail and Dobson Road project. Therefore, the plans depict the condition that is likely to be in place during the construction of this project. This project has actively coordinated with other area projects.

SR 202L, RED MOUNTAIN FREEWAY
(SR 101L Pima – Gilbert Road)
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INITIAL DESIGN CONCEPT REPORT REVIEW COMMENTS (continued)

ITEM NO.	DWG, SHT, PAGE NO.	COMMENT	DISPOSITION INIT.	DISPOSITION FINAL	RESPONSE
		Felicia Terry, Flood Control District of Maricopa County			
		Initial Design Concept Report			
1	General	Thank you for the opportunity to review the reports. It appears that neither alternative will affect the CSA levees that the District operates and maintains.	A	A	
2	4	Page 4, under Existing Land Use: The Va Shly'ay Ecosytem Restoration Project which is under design is described. Reference should also be made to the Maricopa County Department of Transportation Dobson Road Bridge Project, which is in the planning stage.	A	A	Additional language was added to Page 4 of the DCR.
3	7	Page 7, under **Salt River,** 1st sentence- after June 2010 add ("Salt River Hydraulic Master Plan", Stantec). 2nd sentence, change "…recent modifications to the Roosevelt Reservoir." to "… modifications to Roosevelt Dam completed in 1996".	A	A	
4	General	Right-of-way permits will be required for access to the FCDMC property during construction. This process should begin during the 60% Stage III plans.	A	A	
		Initial Drainage Concept Report			
5	6	Page 6, under 2.3 FLOODPLAINS, It should be noted that FCDMC's GIS files do not show any section of the SR 202L mainline within a Zone AE. The current FCDMC GIS system shows the Zone AE designation consistent with the FEMA FIRM maps.	B	A	The current FEMA maps show that a small section of the SR 202L is within a FEMA AE Zone. The DCR will be revised to explain that SR 202L is within a floodplain; however, there is flood protection due to a levee-like CSA embankment that was constructed during the original SR 202L project. Since this project would not impact the CSA bank protection, this project can be constructed without any additional documentation relative to the floodplain. FCDMC should be provided the opportunity to review the plans and reports during the final design of these improvements.
		Catherine Hollow, City of Tempe			
		Initial Design Concept Report			
1		The City of Tempe has no comments at this time. Thank you for the opportunity to review the Initial DCR.	A	A	

APPENDIX C

AASHTO DESIGN EXCEPTION REQUEST

U.S. Department of Transportation
Federal Highway Administration

ARIZONA DIVISION

4000 North Central Avenue
Suite 1500
Phoenix, Arizona 85012-3500
(602) 379-3646
Fax: (602) 382-8998
http://www.fhwa.dot.gov/azdiv/index.htm

May 22, 2012

In Reply Refer To:
Project NH-202-B(BEC)A
TRACS 202L MA 009 H8169 01L
SR 202L, SR101L to Gilbert Road
General Purpose Lane Widening
HOP-AZ

Mr. Paul O'Brien, P.E.
Predesign Section Manager
ADOT Roadway Engineering Group
206 South 17th Avenue MD 605E
Phoenix, Arizona 85007-3213

Dear Mr. O'Brien:

Your April 4, 2012 letter pertaining to Project NH-202-B(BEC)A (TRACS No. 202L MA 009 H8169 01L) SR 202L, SR 101L to Gilbert Road requested Federal Highway Administration (FHWA) approval of design exceptions involving lane and shoulder widths, and horizontal stopping sight distance. The requested design exceptions are the following:

1) Reduced lane width to 11-ft. lanes between MP 13.21 to MP 13.85 on the Eastbound mainline, and between MP 13.44 to MP 13.66 on the SR 202L Eastbound on-ramp at Country Club Drive.

2) Reduced mainline and ramp shoulder width to 6-ft. between MP 13.53 to MP 13.60 on the Eastbound mainline, and MP 13.44 to MP 13.53 for the EB SR 202L on-ramp from Country Club Drive.

3) Deficient mainline and ramp Horizontal Stopping Sight Distance between MP 13.42 and MP 13.54 for the eastbound mainline (533-ft. provided out of the 645-ft. required) and between MP 13.41 and MP 13.55 for the eastbound on-ramp at Country Club (380-ft. provided out of the 495-ft required).

It appears that the reason for all of the design exceptions is to avoid a radio station property which has an existing underground grid that supports a radio transmission tower located near the existing right-of-way. Acquiring the needed right-of-way to avoid design exception would require a total acquisition of the property, which would raise the cost of the project astronomically. While we realize that the substandard shoulder widths, lane widths, and sight distances created will be relatively permanent (not likely to be corrected in the future), and while also realize that the design exceptions may adversely affect overall safety, we agree that it is not prudent or practical to expend limited transportation funds for the total acquisition of the radio station property. Further, we believe these deficiencies are relatively minor, and are not out of

character with other segments of the Regional Freeway System. Accordingly, we approve of the design exceptions requested on this project.

Because delineation will be critical as the freeway transitions to 11-ft. lanes with reduced shoulders, FHWA recommends including in the project scope the construction of a new friction course. This would better delineate lane lines, and would avoid having stripe obliteration marks which may be a distraction to drivers.

If you have any question regarding this design exception approval, please contact Tom Deitering at 602-382-8971.

Sincerely yours,

Karla S. Petty
Division Administrator

cc:
Ron McCally (EM01)
Marta Raiford (605E)
Chaun Hill (EM01)
Steve Beasely (EM01)
ecc:
TDeitering
KDavis
KPetty
TDeitering:cdm

Arizona Department of Transportation

Intermodal Transportation Division

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janice K. Brewer
Governor

John S. Halikowski
Director

Jennifer Toth
State Engineer

April 4, 2012

Karla Petty
Division Administrator
Federal Highway Administration
ATTN: Karen King
4000 North Central Ave, Suite 1500
Phoenix, AZ 85012-1906

Subject: Design Exception Request
Project: 202L MA 009 H8169 01L
NH-202-B(BEC)A
SR 202L, Red Mountain Freeway (SR 101L, Pima to Gilbert Road)

Dear Ms King;

This widen existing roadway project is currently programmed in the FY 2012-2016 ADOT Five Year Transportation Facilities Construction Program Regional Transportation Plan Freeway Program. It is scheduled for construction in FY 2015.

Design Exceptions are requested for lane and shoulder width and horizontal stopping sight distance per the attached Design Exception Request Memorandum. This request has received concurrence of the Predesign Section Manager with Roadway Engineering Group.

The five year crash evaluation concludes that it does not appear that existing geometrics contributed to the reported crashes on SR 202L, Red Mountain Freeway between MP 13.18 and MP 13.85 during the five year evaluation period.

The Radio Disney Group, LLC operates a radio station adjacent to the ADOT right-of-way south of SR 202L between Country Club Drive and Center Street. Correspondence received from the property owner states that any new right-of-way acquisition from this property would damage an existing underground grid that supports a radio transmission tower located near the existing SR 202L right-of-way. Any impacts to the existing radio tower grid would significantly impact the operations of the radio station, possibly requiring relocation of the facility and a total acquisition of the property.

A Design Concept Report (DCR) will address operational and safety needs of the general-purpose lane widening project. The DCR will include 15% design plans and will address all current AASHTO design criteria for this project.

Please advise if further action is required on the above matter.

Sincerely;

Paul O'Brien, P.E.
Predesign Section Manager
Roadway Engineering Group

Attachments:
1. Design Exception Request Memorandum with concurrence of the Predesign Section Manager with Roadway Engineering Group.
2. Crash Analysis Report, March 21, 2012.

cc:
Project Manager, Ron McCally	MD EM01
Predesign Records Retention, Marta Raiford	MD 605E
Valley Project Management, Chaun Hill	MD EM01
Valley Project Management, Steve Beasley	MD EM01

Arizona Department of Transportation

Intermodal Transportation Division

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janice K. Brewer
Governor

John S. Halikowski
Director

Jennifer Toth
State Engineer

March 22, 2012

TO: PAUL O'BRIEN, P.E., MD 605E
Predesign Section Manager
Predesign Section

THRU: RON MCCALLY, MD 614E
Senior Project Manager
Valley Project Management

FROM: TROY H. SIEGLITZ, P.E.
Segment Manager
AECOM

SUBJECT: DESIGN EXCEPTION REQUEST
Project 202L MA 009 H8169 01L
State Route 202L, Red Mountain Freeway (SR 101L Pima – Gilbert Road)
General Purpose Lanes

The following roadway construction projects are included in the ADOT Five Year Transportation Facilities Construction Program (2012 - 2016):

- BMP 10, SR 101L (Pima) to Gilbert Road; Design GPL, $3,900,000 in FY 2014.
- BMP 10, SR 101L (Pima) to Gilbert Road; Construct GPL, $56,400,000 in FY 2015.

This project would construct additional general-purpose lanes on SR 202L from SR 101L (Pima Freeway) to Gilbert Road in accordance with the Regional Transportation Plan Freeway Program (RTPFP).

Traffic demand is causing the SR 202L corridor to become increasingly congested during the morning and evening peak travel periods, and future traffic projections indicate the congestion will worsen. Additional general-purpose lanes would increase the freeway capacity and help alleviate increased levels of traffic congestion in the future.

The majority of traffic in this segment of SR 202L consists of local and regional commuter traffic, along with regional commercial traffic. The projected average two-way traffic volume forecast for year 2035 is 159,700 vehicles per day (vpd) between the SR101L/SR202L Traffic Interchange (T.I.) and Dobson Road, 158,400 vpd between Dobson Road and Alma School Road, 129,700 vpd between McKellips Road and Country Club Drive, and 121,800 vpd between Country Club Drive and Gilbert Road. Trucks are anticipated to account for approximately 6% of the total.

Per the Design Exception and Design Variance Process Guide, this project is a Widen Existing Roadway project that is intended to widen the existing roadway to provide additional general-purpose lanes.

Design exceptions are hereby requested for: 1.) lane widths for the SR 202L eastbound mainline between a location east of Country Club Drive and a location east of Center Street as well as the lane width for Country Club Drive Ramp 'D' (AASHTO); 2.) ramp shoulder width for Country Club Ramp 'D' and SR 202L Eastbound Mainline (ADOT RDG); and 3.) horizontal stopping sight distance for Country Club Drive Ramp 'D' and SR 202L Eastbound Mainline (AASHTO)

The table below identifies the location by milepost (attachment shows station), type of design exception, and discrepancies between the proposed features and requirements:

Design Feature	Type of Design Exception	Location	Discrepancy from Required Design Value
1.) Lane widths for the SR 202L eastbound mainline between a location east of Country Club Drive and a location east of Center Street, Country Club Drive Ramp 'D'	AASHTO	MP 13.21-MP 13.85 EB (lanes); MP 13.44-MP 13.66 EB (ramp);	1.00' 1.00'
2.) Ramp Shoulder Width for Country Club Drive Ramp 'D' and SR 202L Eastbound Mainline	ADOT RDG	MP 13.44 – MP 13.53 EB (ramp) MP 13.53 – MP 13.60 EB (mainline)	4.00' 4.00'
3.) Horizontal Stopping Sight Distance for Country Club Drive Ramp 'D' and SR 202L Eastbound Mainline	AASHTO	MP 13.41 – MP 13.55 EB (ramp) MP 13.42 – MP 13.54 EB (mainline)	115' 112'

Evaluation and justification for design exceptions include the following:

1.) Lane Widths for the SR 202L Eastbound Mainline between a location east of Country Club Drive and a location east of Center Street, and Country Club Drive Ramp 'D': The existing eastbound SR 202L mainline includes an 10' median shoulder, one 12' HOV lane, three 12' general-purpose lanes and a 10' outside shoulder between Country Club Drive and Gilbert Road.

The proposed design would add one general-purpose lane in each direction of travel. This would require the existing roadway to be widened an additional 12' in each direction of travel and the realignment of the ramps to match the mainline widening. The additional eastbound widening in the area between Country Club Drive and east of Center Street presents many challenges due to existing site constraints.

During the original construction of SR 202L, right-of-way was acquired from the Radio Disney Group, LLC which operates the radio station adjacent to the ADOT right-of-way south of SR 202L between Country Club Drive and Center Street. Correspondence received from the property owner states that any new right-of-way acquisition from this property would damage an existing underground grid that supports a radio transmission tower located near the existing SR202L right-of-way. Any impacts to the existing radio tower grid would significantly impact the operations of the radio station, possibly requiring relocation of the facility and a total acquisition of the property.

In order to add one general-purpose lane in the eastbound direction of travel, reductions are being proposed for the lane widths (from 12' to 11') as shown on Exhibit 1. The eastbound mainline lane widths will be reduced to 11' from just east of Country Club Drive (Sta. 540+41.67) to a point just east of Center Street (Sta. 569+75.00). Country Club Drive Ramp 'D' will be reconstructed to match the new mainline width, with the ramp lane width reduced from 12' to 11'.

Based on the existing site constraints and the costs associated with a full roadway widening, the proposed design of the eastbound roadway in accordance with the Final Design Concept Report (DCR) is considered the preferable treatment at this location.

2.) **Ramp Shoulder Width for Country Club Drive Ramp 'D' and SR 202L Eastbound Mainline:** The Country Club Drive Ramp 'D' outside shoulder width would be reduced to 6' (including 2' shy distance to barrier) between Ramp 'D' Stations 23+61.49 and 27+92.94 and SR 202L Median Construction Centerline Stations 552+84.10 to 556+50.00 as shown on Exhibit 1, pages 6 and 7. The eastbound mainline shoulder width varies from 6' to 12' between Stations 555+00.00 and 556+50.00 to match the new mainline shoulder width.

Reconstruction of Country Club Drive Ramp 'D' and the eastbound mainline to the standard shoulder widths would require right-of-way acquisition from the Radio Disney Group, LLC property which would significantly impact the operations of the radio station and possibly require relocation of the facility and a total acquisition of the property. The reduced shoulder width on the ramp and the mainline allows the proposed improvements to be constructed with no additional right-of-way required from the radio station property.

Based on the existing site constraints and the costs associated with a full roadway widening, the proposed design of the Country Club Drive Ramp 'D' in accordance with the Final Design Concept Report (DCR) is considered the preferable treatment at this location.

3.) **Horizontal Stopping Sight Distance for Country Club Drive Ramp 'D' and SR 202L Eastbound Mainline:** The proposed Country Club Drive Ramp 'D' and SR 202L eastbound mainline shoulder widths would provide less than the AASHTO and ADOT RDG recommended horizontal stopping sight distance for vehicles entering on Country Club Ramp 'D' between ramp Stations 21+85.00 and 27+92.94, and between mainline Stations 552+84.10 and 554+20.00 where the ramp and mainline includes a concrete half-barrier adjacent to the outside shoulder.

The proposed shoulder widths would also provide less than the AASHTO and ADOT RDG recommended horizontal stopping sight distance for vehicles in the outermost eastbound travel lane between mainline Stations 547+00.00 and 553+40.00 where the ramp and mainline includes a concrete half-barrier adjacent to the outside shoulder.

Attachment 2 provides a summary of the calculated horizontal stopping sight distance (SSD) with the associated speed provided for this location. The sight distance formula considers a 2' height of object in accordance with the 2004 AASHTO Green Book. Another vehicle is the most likely object that needs to be detected for the ramp lane, and most vehicles can still be seen by drivers over the top of the barrier.

Reconstruction of eastbound mainline and Country Club Drive Ramp 'D' with shoulder widths necessary to provide the horizontal sight distance would require right-of-way acquisition from the Radio Disney Group, LLC property which would significantly impact the operations of the radio station and possibly require relocation of the facility and a total acquisition of the property. The reduced horizontal stopping sight distance on the ramp and the mainline allows the proposed improvements to be constructed with no additional right-of-way required from the radio station property.

Based on the existing site constraints and the costs associated with a full roadway widening, the proposed design of the eastbound roadway in accordance with the Final Design Concept Report (DCR) is considered the preferable treatment at this location.

Concur: Paul A Bruce

Predesign Section Manager
Predesign Section

Date: 4/4/12

ATTACHMENT 1

1) LANE WIDTHS FOR THE SR 202L EASTBOUND MAINLINE BETWEEN BETWEEN A LOCATION EAST OF COUNTRY CLUB DRIVE AND A LOCATION EAST OF CENTER STREET, AND COUNTRY CLUB DRIVE RAMP 'D'

See Exhibit 1

2) RAMP SHOULDER WIDTH FOR COUNTRY CLUB DRIVE RAMP 'D' AND SR 202L EASTBOUND MAINLINE

See Exhibit 1

3) HORIZONTAL STOPPING SIGHT DISTANCE FOR COUNTRY CLUB DRIVE RAMP 'D' AND SR 202L EASTBOUND MAINLINE

See Attachment 2

ATTACHMENT 2

Horizontal Stopping Sight Distance

Horizontal PI Station	Design Speed (mph)	Horizontal Curvature (Deg)	Horizontal Radius At Center of Target Lane (ft)	Effective Vertical Grade (%)	SDs Required (ft)	Horizontal SDs Provided (ft)	Horizontal Offset Required To face of Barrier (ft)	Horizontal Offset Provided To face of Barrier (ft)	Additional Horizontal Offset Provided To face of Barrier (ft)	Design Speed Provided (mph)
Proposed Design										
Country Club Ramp D										
26+02.04 (Outside)	55	3° 30' 00"	1565.52	0.0000	495	380	19.5	11.5	8.0	46.6
EB Mainline										
515+14.93 (Outside)	65	3° 30' 00"	1576.52	0.0000	645	533	32.9	22.5	10.4	57.9
Existing Conditions										
Exst Country Club D										
16+41.69 (Outside)	55	3° 30' 00"	1572.02	0.0000	495	476	19.4	18.0	1.4	53.9
Exst EB Mainline										
515+14.93 (Outside)	65	3° 30' 00"	1584.02	0.0000	645	618	32.7	30.0	2.7	63.4

Note:
SSD required was calculated from AASHTO 2004 formula.

AECOM

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602 337 2620 fax

March 21, 2012

Ron McCally
Project Manager
Arizona Department of Transportation
Valley Project Management
1611 West Jackson Street, MD EM01
Phoenix, Arizona 85007-3217

Re: Contract No. 2005-026
Crash Analysis for the Design Exception Report
Project No. 202L MA 009 H8169 01L
Federal ID No. NH-202-B(BEC)A
SR 202L, Red Mountain Freeway (SR 101L, Pima to Gilbert Road)

Dear Mr. McCally;

The ADOT crash records have been evaluated for the locations on the SR 202L mainline which have been identified to have lane width and shoulder width design exceptions, eastbound from MP 13.18 to MP 13.85 upon completion of the referenced project. The purpose of this evaluation was to determine if the reported crashes had a relationship to the roadway features or characteristics.

The ADOT Traffic Design Section provided crash data for the period between December 2004 and December 2009. All crash data was collected prior to the construction of the HOV lane and closure of the median along the SR 202L route within the project limits. The following is a brief summary of the crash experience during this time period for the segment of SR 202L evaluated.

A total of six crashes were reported on this segment of eastbound SR 202L between MP 13.18 and MP 13.85 during the five year study period. The following is a summary of each crash:

1. Milepost 13.3 in March 2005: The crash occurred in the daylight and involved a driver avoiding an object on the freeway which led to colliding with the concrete traffic barrier. This crash resulted in no apparent injury.
2. Milepost 13.4 in June 2005: A single vehicle crash occurred in the daylight and involved a driver experiencing inattention or a distraction which led to colliding with the concrete traffic barrier. This crash was an alcohol related crash and resulted in a possible injury.
3. Milepost 13.4 in December 2005: A single vehicle crash occurred in the dark and involved a driver speeding too fast which led to the vehicle overturning or rolling over. This crash was an alcohol related crash and resulted in a non-incapacitating injury.
4. Milepost 13.5 in January 2005: A rear-end collision occurred involving multiple vehicles. The crash occurred in the daylight and involved a driver experiencing inattention or a distraction in the rain under wet conditions. This crash resulted in no apparent injury.
5. Milepost 13.5 in April 2006: A single vehicle crash occurred in the daylight and involved a driver experiencing inattention or a distraction which led to a collision with a fixed object. This crash resulted in no apparent injury.
6. Milepost 13.5 in August 2006: A single vehicle crash occurred in the dark with an overturned vehicle. This crash resulted in a fatality. The specifics of the crash are unknown.

This evaluation indicates that 83% of the crashes on this segment of eastbound SR 202L were single vehicle crashes.

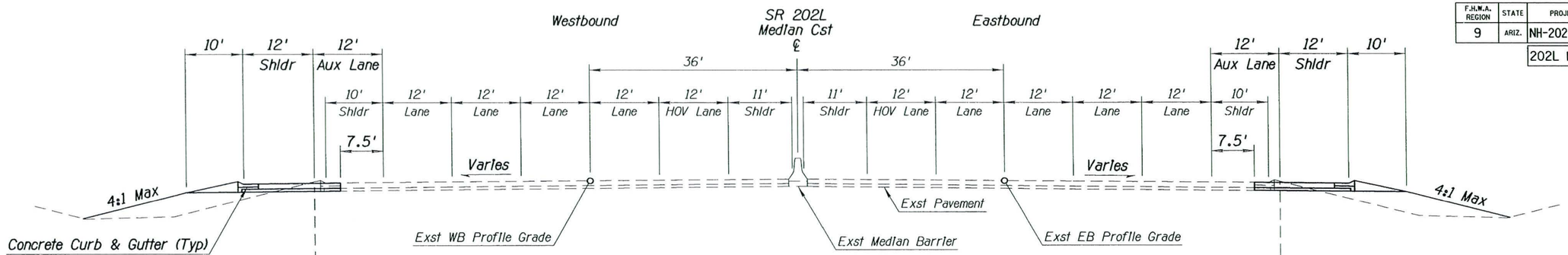
The evaluation of the crash data at the design exception segments did not reveal crash patterns that would correlate with existing roadway features or characteristics that are part of the design exception request (lane widths and shoulder widths).

If you have any questions or need additional information please call me at (60) 337-2603.

Respectfully,
AECOM

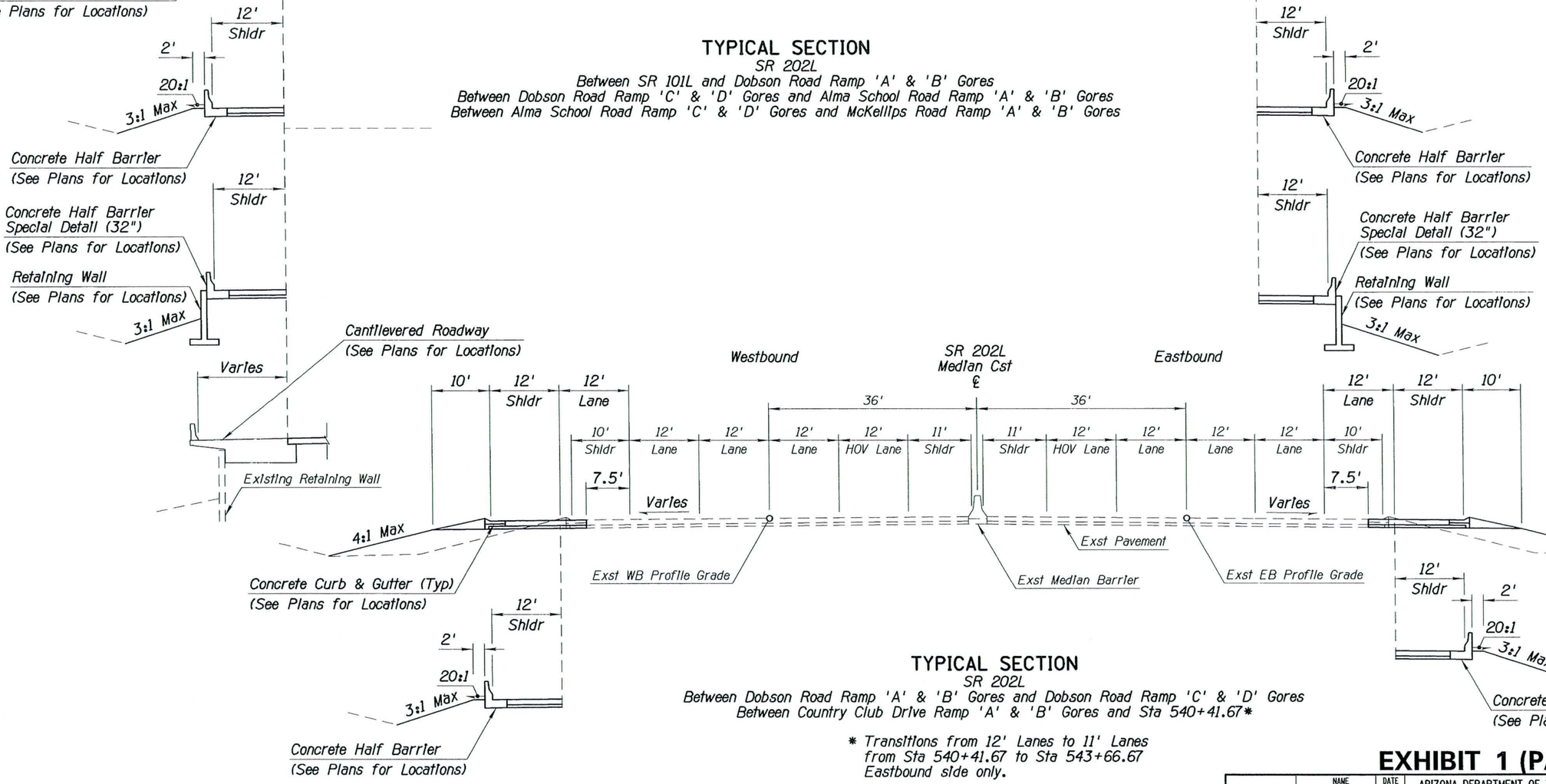
Kate E. Bondy, PE
Traffic Engineer

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



TYPICAL SECTION

SR 202L
Between SR 101L and Dobson Road Ramp 'A' & 'B' Gores
Between Dobson Road Ramp 'C' & 'D' Gores and Alma School Road Ramp 'A' & 'B' Gores
Between Alma School Road Ramp 'C' & 'D' Gores and McKellips Road Ramp 'A' & 'B' Gores



TYPICAL SECTION

SR 202L
Between Dobson Road Ramp 'A' & 'B' Gores and Dobson Road Ramp 'C' & 'D' Gores
Between Country Club Drive Ramp 'A' & 'B' Gores and Sta 540+41.67*

* Transitions from 12' Lanes to 11' Lanes from Sta 540+41.67 to Sta 543+66.67 Eastbound side only.

EXHIBIT 1 (PAGE 1 OF 7)

	NAME	DATE
DESIGN	GJJ	04-12
DRAWN	BAF	04-12
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DESIGN SHEET
TYPICAL MAINLINE SECTIONS

DCR

NOT FOR CONSTRUCTION OR RECORDING

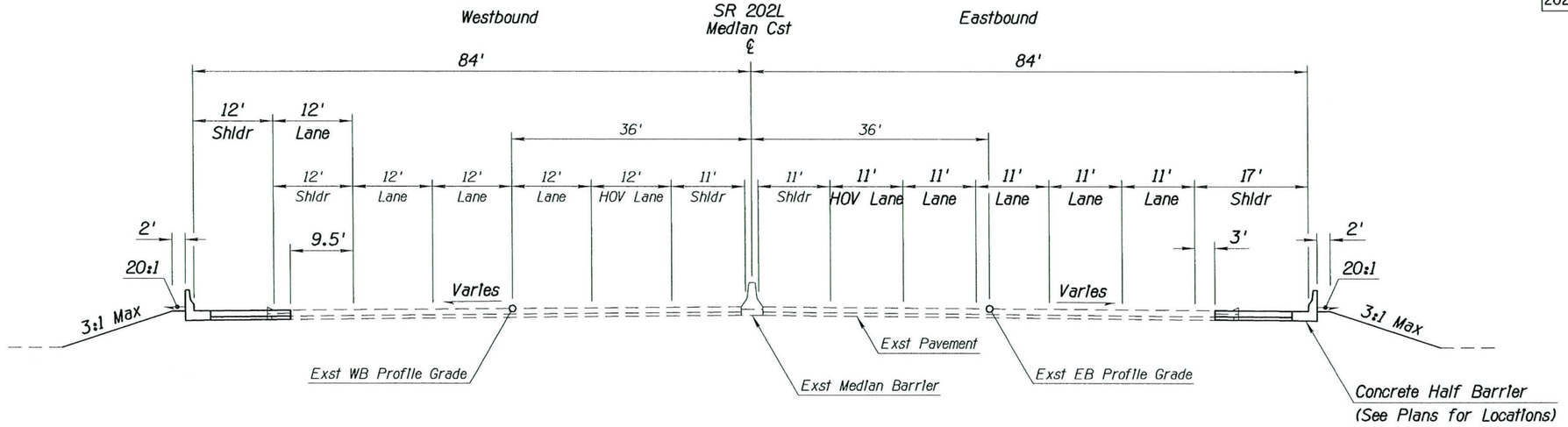
ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	G-2.01

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

3/21/2012 u:\RM02\Docs\report\Design Exception Request\h8169tyA1-1.dgn

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

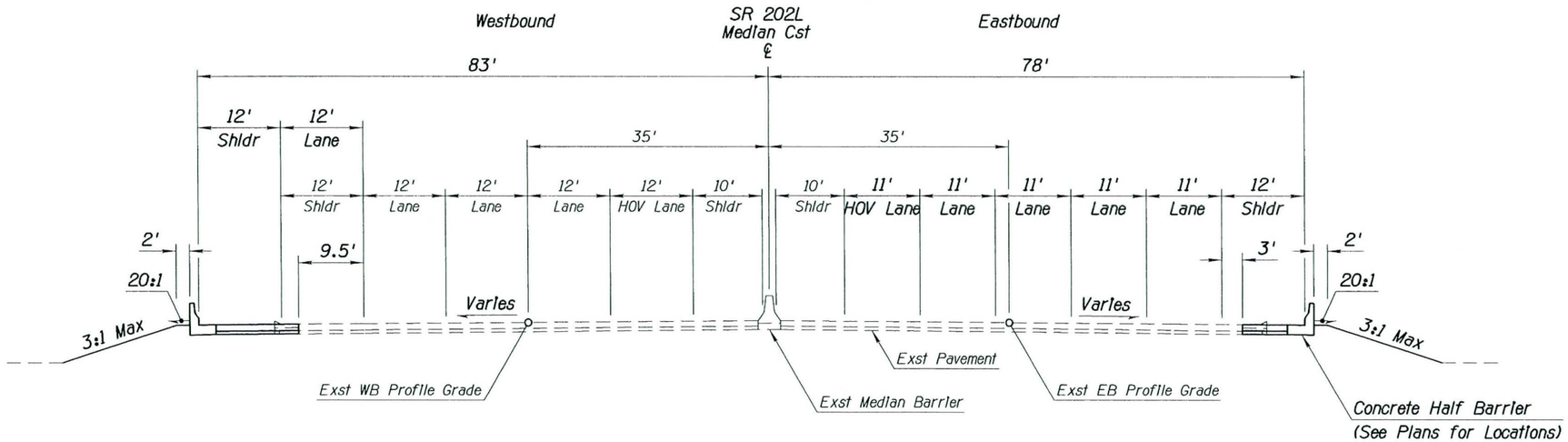
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



TYPICAL SECTION

Sta 543+66.67

PGL Offset Transitions from 36' to 35' from Sta 545+00.00 to Sta 546+50.00
Begin Right Edge Transition at Sta 544+10.00



TYPICAL SECTION

Country Club Drive Ramp 'D' Back of Gore

EXHIBIT 1 (PAGE 2 OF 7)

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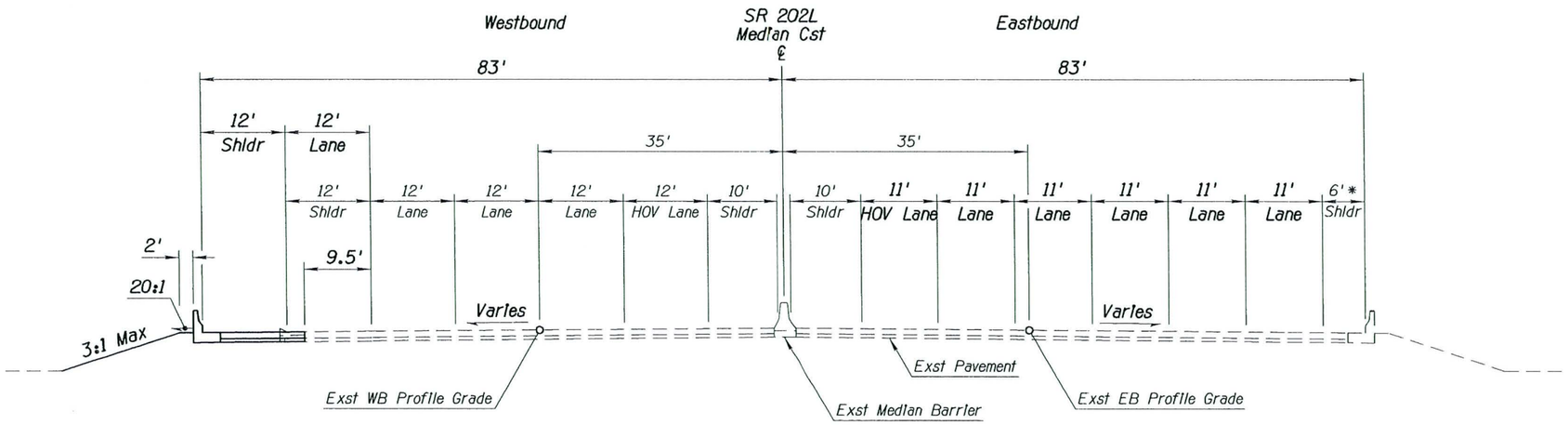
ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	G-2.03

TRACS NO. H8169 01L | NH-202-B(BEC)A | ____ OF ____

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



TYPICAL SECTION

Country Club Drive Ramp 'D' Entrance to Mainline

** Outside Shoulder Transitions from 6' to 12' from Sta 555+00.00 to Sta 556+50.00*

EXHIBIT 1 (PAGE 3 OF 7)

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ROUTE	LOCATION	DWG NO. G-2.04
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

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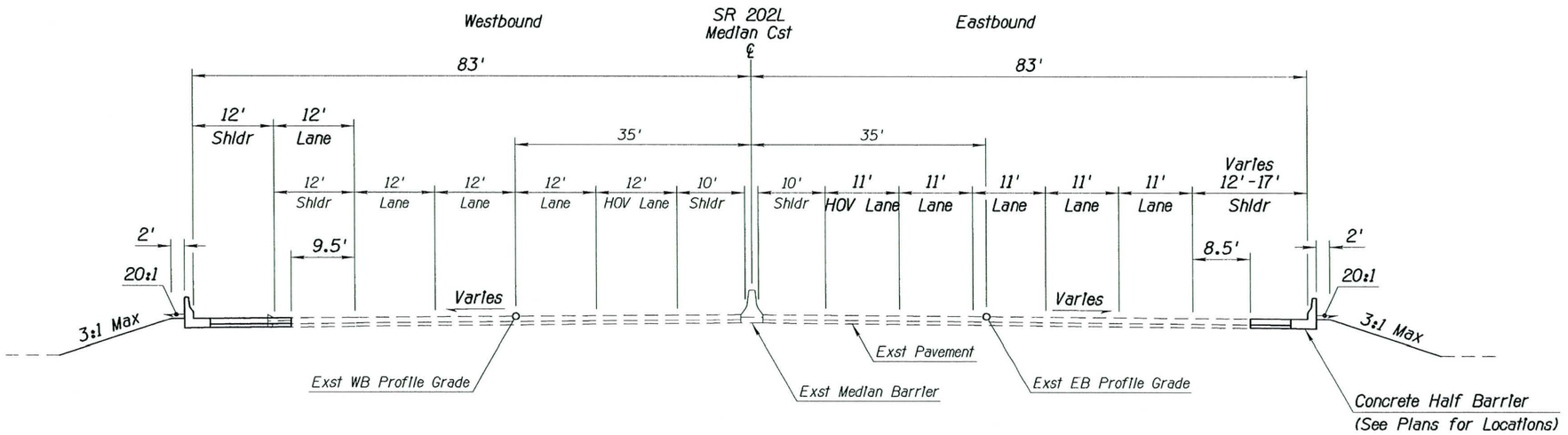
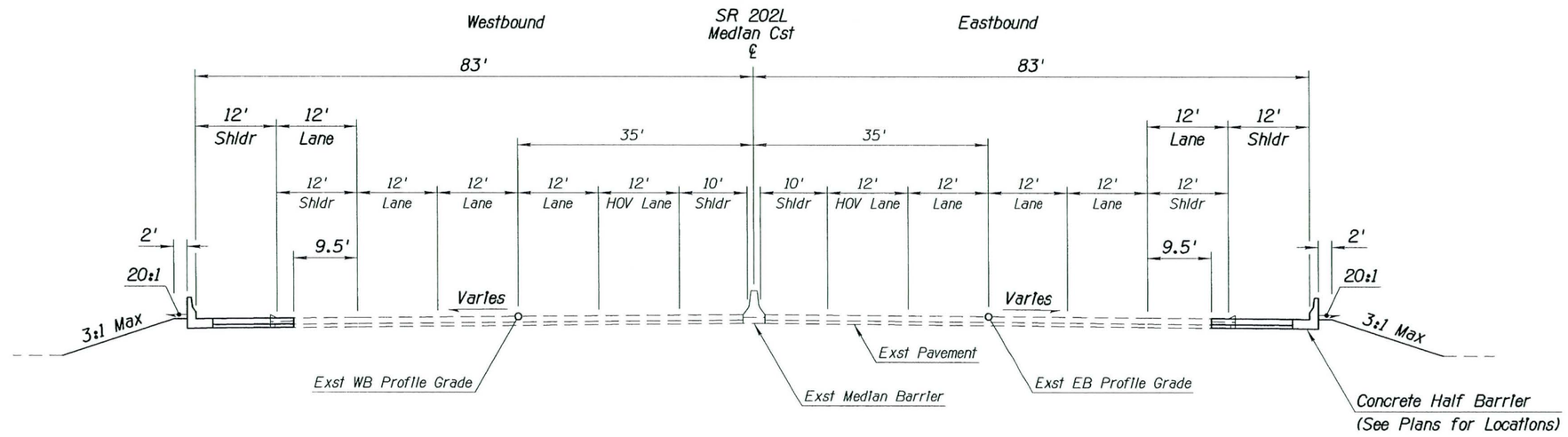
SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



TYPICAL SECTION

Country Club Drive Ramp 'D' Lane Drop



TYPICAL SECTION

Transition Lanes from 11' to 12' from Sta 566+50.00 to Sta 569+75.00

EXHIBIT 1 (PAGE 4 OF 7)

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DESIGN SHEET
TYPICAL MAINLINE SECTIONS

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ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. G-2.05

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

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F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

Section Line

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

Country Club Dr
Ramp 'B' Cst ℄

End Country Club Dr Ramp 'A' Cst ℄ PT Sta 19+75.00=
0.00' Lt Exst Country Club Dr Ramp 'A' Cst ℄ POC Sta 9+75.00

Exst R/W

Exst FCDMC
Maintenance Road

10

535

PC 19+50.00

CCA-2

16'

14'

PT 12+09.17

Exst Country Club Dr
Ramp 'A' Cst ℄

1209

N63°57'04"E

New Conc Curb & Gutter
Type C, Std C-05.10

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

N69°08'04"E

Widen Exst
Country Club Dr
Overpass (Typ)

N67°17'52"E

PC 2+00.00

Exst SR 202L
Med Cst ℄

1217

New Catch Basin
Extend Exst/24" RCP
(Typ)

New Conc Half Barrier
Special Detail

540

Exst R/W

5

545

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

Exst Country Club Dr
Ramp 'C' Cst ℄

New Retaining Wall

New WB Striping

PT 4+65.59

N51°20'15"E

Removal Limits

84'

Varies

PT 543+66.67

N50°09'25"E

14'

16'

65:1 Taper

+10.00
84.00' Rt

84'

PC 534+17.80

N69°08'04"E

1128

N70°08'05"E

New EB Striping

N45°58'55"E

Country Club Dr
Ramp 'D' Cst ℄

Exst Country Club Dr
Ramp 'D' Cst ℄

New Noise Wall

Removal Limits

Exst Country Club Dr Cst ℄ Sta 278+20.64=
Exst SR 202L Med Cst ℄ Sta 535+96.72

1224

CCD-1

14'

PT 6+16.88

PT 16+16.88

+50.00
14.00' Rt

+00.00
16.00' Rt

New Conc Half Barrier
Special Detail

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

New Combination Noise
and Retaining Wall

N70°51'36"E

N69°08'04"E

Exst Country Club Dr
Ramp 'B' Cst ℄

New Conc Half Barrier
Special Detail

Exst Country Club Dr Cst ℄

PC 2+31.00

Exst R/W

Begin Country Club Dr Ramp 'D' Cst ℄ PC Sta 15+00.00=
0.00' Lt Exst Country Club Dr Ramp 'D' Cst ℄ POC Sta 5+00.00

New Conc Curb & Gutter
Type C, Std C-05.10

200

15

515

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

EB Roadway Section

11' Inside Shldr
Varies 12'-11' HOV Lane
Varies 12'-11' Lane
Varies 12'-11' Lane
Varies 12'-11' Lane
Varies 12'-11' Lane
Varies 12'-16' Outside Shldr

EXHIBIT 1 (PAGE 5 OF 7)

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ALTERNATIVE 1 (RECOMMENDED)
PLAN SHEET
Sta 531+00 to Sta 545+00

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L
NH-202-B(BEC)A

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DWG NO. C-2.39

___ OF ___

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.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10'-11' Inside Shldr

Begin Country Club Dr Ramp 'C' Cst ℄ POT Sta 19+78.00=
0.00' Lt Exst Country Club Dr Ramp 'C' Cst ℄ POT Sta 9+78.00

545 10 550 25 15

+00.00 84.00' Lt
+50.00 83.00' Lt 8'
+00.00 8.00' Lt
PC 10+77.01
+00.00 10.00' Lt
PC 21+70.56

N51°20'15"E
14'
150:1 Taper
84'
Varies
14'
16'

New Conc Half Barrier
Std C-10.50, Gutter=2.5'
New Conc Curb & Gutter
Type C, Std C-05.10
Exst Country Club Dr
Ramp 'C' Cst ℄
Removal Limits
CCC-1
1220
PC 548+07.67
N50°09'25"E
1131
1227
65:1 Taper
N45°58'55"E
+00.00
78.00' Rt
New 24" RCP
New Manhole
New Noise Wall
New Conc Half Barrier
Special Detail
New Conc Half Barrier
Std C-10.50, Gutter=2.5'
New Conc Curb & Gutter
Type C, Std C-05.10
PC 14+16.89
PC 24+06.83
50:1 Taper
CCD-2
Country Club Dr
Ramp 'D' Cst ℄
New Catch Basin
Exst Country Club Dr
Ramp 'D' Cst ℄
25 15

Country Club Dr Ramp 'D' Cst ℄ POC Sta 24+41.42=
95.56' Rt Exst SR 202L Med Cst ℄ POC Sta 549+14.44
Nose of Gore Control Point

End Country Club Dr Ramp 'D' Cst ℄ PT Sta 27+92.94=
77.00' Rt Exst SR 202L Med Cst ℄ POC Sta 552+84.10

Exst R/W

EB Roadway Section

Varies 11'-10' Inside Shldr
11' HOV Lane
11' Lane
11' Lane
11' Lane
11' Lane
12' Outside Shldr
Note: PGL Transitions from 36'-35'
from Sta 545+00 to 546+50

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

Exst R/W
New 24" RCP
(Typ)
New Conc Curb & Gutter
Type C, Std C-05.10
New Manhole
(Typ)
New Catch Basin
Country Club Dr Ramp 'C' Cst ℄ Sta 29+11.45=
105.53' Lt Exst SR 202L Med Cst ℄ Sta 555+65.88
Nose of Gore Control Point
Country Club Dr
Ramp 'C' Cst ℄
Exst SR 202L
Med Cst ℄
555 30 20
New WB Striping
Mid-Section Line
PT 30+84.80
PT 21+21.85
PT 55r+71.95
N87°54'25"E
N87°54'24"E
N83°54'25"E
10'
+00.00
83.00' Rt
25:1 Taper
New EB Striping
Removal Limits
+84.10
83.00' Rt
+50.00
89.00' Rt
89'
New Conc Half Barrier
Std C-10.50, Gutter=2.5'
New Catch Basin
Extend Exst 24" RCP
(Typ)

Exst Radio Disney, LLC
KMIC Radio Station Towers

EB Roadway Section

10' Inside Shldr
11' HOV Lane
11' Lane
11' Lane
11' Lane
11' Lane
11' Lane
11' Lane
Varies 6'-12' Outside Shldr

EXHIBIT 1 (PAGE 6 OF 7)

	NAME	DATE
DESIGN	GJJ	04-12
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ALTERNATIVE 1 (RECOMMENDED)
PLAN SHEET
Sta 545+00 to Sta 559+00

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ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.41
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

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.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

EXIT 13 — 87 — Country Club Dr Payson

EXIT 13 — Fountain Hills Downtown Mesa Community Center

Center St

EXIT 13 — 78 — Country Club Dr Payson

N

Exst Country Club Dr Ramp 'C' Cst ℄

Country Club Dr Ramp 'C' Cst ℄

End Country Club Dr Ramp 'C' Cst ℄ POT Sta 33+59.06 = 71.00' Lt Exst SR 202L Med Cst ℄ POT Sta 560+00.00

560 565 570

Exst R/W

New WB Striping

New Conc Half Barrier Std C-10.50, Gutter=2.5'

New Catch Basin (Typ)

Exst SR 202L Med Cst ℄

Removal Limits

10'

3

83'

83'

1134

PC 565+13.96

N83°54'25"E

Mid-Section Line

89'

New EB Striping

+75.00 83.00' Rt

50:1 Taper

+00.00 83.00' Rt

Removal Limits

New 24" RCP (Typ)

Lehl Rd

New Manhole (Typ)

Exst R/W

+00.00 89.00' Rt

New Conc Half Barrier Std C-10.50, Gutter=2.5'

New Catch Basin Extend Exst 24" RCP (Typ)

Exst Center St Underpass

Exst Pump Station

Mid-Section Line

EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

EB Roadway Section

10' Inside Shldr
11' HOV lane
11' Lane
11' Lane
11' Lane
11' Lane
11' Lane
Varies 12'-17' Outside Shldr

EB Roadway Section

10' Inside Shldr
Varies 11'-12' HOV lane
Varies 11'-12' Lane
Varies 11'-12' Lane
Varies 11'-12' Lane
Varies 11'-12' Lane
Varies 17'-12' Outside Shldr

EXHIBIT 1 (PAGE 7 OF 7)

	NAME	DATE
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CHECKED	SDW	04-12

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AECOM TECHNICAL SERVICES, Inc. 3220 E. Camelback Rd. Suite 300 Phoenix, Arizona 85018 T 602.371.2700
AECOM www.aecom.com

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (RECOMMENDED)
PLAN SHEET
Sta 559+00 to Sta 573+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.46

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

3/21/2012 u:\RM02\Docs\report\Design Exception Request\h8169pA1-15.dgn

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

APPENDIX D

AASHTO CONTROLLING CRITERIA REPORT

PROJECT 202L MA 009 H8169 01L

SR 202 General Purpose Lanes

SR202L/SR101L (Red Mountain Freeway) TI – Gilbert Road

AASHTO CONTROLLING DESIGN CRITERIA REPORT

June 2011

ARIZONA DEPARTMENT OF TRANSPORTATION

INTERMODAL TRANSPORTATION DIVISION

ROADWAY ENGINEERING GROUP

ROADWAY PREDESIGN SECTION

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LIST OF EXISTING FEATURES REQUIRING DESIGN EXCEPTIONS

The following is a list of the existing design features requiring design exceptions:

(Note: The analysis of all design elements of the following roadways have been compared with the recommended AASHTO Controlling Design Criteria to identify geometric elements that do not comply with the AASHTO 2004 "Green" Book criteria.)

SR 202L MAINLINE (EB & WB)

The existing shoulder width is less than the recommended 10' (median) as follows:

1. MP 13.79 (Center Street UP) – 2.0' less than recommended.
2. MP 14.52 (Mesa Drive UP) – 2.0' less than recommended.
3. MP 15.54 (Stapley Drive UP) – 2.0' less than recommended.

The existing shoulder provides less than the AASHTO recommended horizontal stopping sight distance due to roadway curvature and the placement of concrete median barrier adjacent to the median shoulder:

1. MP 10.96 to MP 11.28 (EB HPI Station 424+61.45) – 84' less than the recommended 645'.
2. MP 11.93 to MP 12.21 (EB HPI Station 474+68.48) – 133' less than the recommended 645'.
3. MP 13.13 to MP 13.38 (EB HPI Station 538+96.62) – 19' less than the recommended 645'.
4. MP 13.78 to MP 14.10 (EB HPI Station 574+19.53) – 185' less than the recommended 645'.
5. MP 16.40 to MP 16.74 (EB HPI Station 718+42.32) – 101' less than the recommended 645'.
6. MP 11.46 to MP 11.91 (WB HPI Station 454+63.77) – 19' less than the recommended 645'.
7. MP 13.38 to MP 13.64 (WB HPI Station 553+04.26) – 185' less than the recommended 645'.
8. MP 14.26 to MP 14.67 (WB HPI Station 602+44.12) – 148' less than the recommended 645'.

The existing shoulder provides less than the AASHTO recommended horizontal stopping sight distance due to roadway curvature and the placement of concrete barrier adjacent to the outside shoulder:

1. MP 11.46 to MP 11.91 (EB HPI Station 454+63.77) – 11' less than the recommended 645'.
2. MP 13.38 to MP 13.64 (EB HPI Station 553+04.26) – 169' less than the recommended 645'.
3. MP 10.96 to MP 11.28 (WB HPI Station 424+61.45) – 78' less than the recommended 645'.
4. MP 11.93 to MP 12.21 (WB HPI Station 474+68.48) – 129' less than the recommended 645'.
5. MP 13.13 to MP 13.38 (WB HPI Station 538+96.62) – 10' less than the recommended 645'.

The superelevation rate is less than the recommended minimum on the following horizontal curves:

1. Beginning MP 10.00 (HPI Station 365+30.35) – .002 ft/ft less than the minimum.
2. Beginning MP 11.12 (HPI Station 424+61.45) – .002 ft/ft less than the minimum.
3. Beginning MP 11.69 (HPI Station 454+63.77) – .001 ft/ft less than the minimum.
4. Beginning MP 12.07 (HPI Station 474+68.48) – .002 ft/ft less than the minimum.
5. Beginning MP 13.29 (HPI Station 538+96.62) – .001 ft/ft less than the minimum.

The superelevation rates for these curves are considered to be in substantial conformance with the AASHTO requirements, and no design exception will be required.

DOBSON ROAD TI

Ramp A

The superelevation rate is less than the recommended minimum on the following horizontal curve:

1. HPI Station 16+94.94 – .004 ft/ft less than the minimum.

This segment of ramp will be upgraded under this project, and no design exception will be required.

ALMA SCHOOL ROAD TI

Ramp A

The vertical curve stopping sight distance is less than the recommended as follows:

1. VPI Station 6+05.00 – 41' less than the recommended 495'.

This segment of ramp will be upgraded under this project, and no design exception will be required.

Ramp D

The superelevation rate is less than the recommended minimum on the following horizontal curve:

1. HPI Station 5+43.00 – .005 ft/ft less than the minimum.

This segment of ramp will be upgraded under this project, and no design exception will be required.

MCKELLIPS ROAD TI

Ramp A

The vertical curve stopping sight distance is less than the recommended as follows:

1. VPI Station 7+50.00 – 9' less than the recommended 425'.

This segment of ramp will be upgraded under this project, and no design exception will be required.

Ramp B

The superelevation rate is less than the recommended minimum on the following horizontal curve:

1. HPI Station 12+18.36 – .005 ft/ft less than the minimum.

This segment of ramp may be upgraded under this project. However, the superelevation rate for this curve is considered to be in substantial conformance with the AASHTO requirements and no design exception will be required.

The vertical curve stopping sight distance is less than the recommended as follows:

1. VPI Station 8+50.00 – 4' less than the recommended 425'.

This segment of ramp may be upgraded under this project, or a design exception will be required.

COUNTRY CLUB DRIVE TI

Ramp D

The superelevation rate is less than the recommended minimum on the following horizontal curve:

1. HPI Station 4+26.61 – .009 ft/ft less than the minimum.

This segment of ramp will not be upgraded under this project.

GILBERT ROAD TI

Ramp A

The superelevation rate is less than the recommended minimum on the following horizontal curves:

1. HPI Station 29+81.90 – .005 ft/ft less than the minimum.

The superelevation rate for this curve is considered to be in substantial conformance with the AASHTO requirements and no design exception will be required.

The existing shoulder provides less than the recommended horizontal stopping sight distance due to roadway curvature and the placement of concrete barrier adjacent to the ramp shoulder:

1. HPI Station 29+81.39 – 123' less than the recommended 425'.

This segment of ramp will not be upgraded under this project.

Ramp B

The superelevation rate is less than the recommended minimum on the following horizontal curve:

1. HPI Station 26+75.88 – .012 ft/ft less than the minimum.

This segment of ramp will not be upgraded under this project.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
202L MAINLINE

PROJECT NUMBER:	802 MA 999 H6867 01L	**ROUTE:** SR 202L
PROJECT LOCATION:	SR101L/202L Red Mountain TI - Gilbert Road	**BEGINNING MP:** 9.70
HIGHWAY SECTION:	Red Mountain Freeway (SR202L)	**ENDING MP:** 16.70
FUNCTIONAL CLASSIFICATION:	Urban Freeway/Expressway - Controlled Access	

LANE AND SHOULDER WIDTH

	EXISTING (Feet)	AASHTO RECOMMENDED MINIMUM (Feet)
LANE WIDTH:	12	12
INSIDE SHOULDER WIDTH:	10-11	10
OUTSIDE SHOULDER WIDTH:	10-12	10

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 65 MPH

THE POSTED SPEED LIMIT IS: 65 MPH
TERRAIN IS: LEVEL

GRADES

EXISTING MAXIMUM GRADE IS: 2.4156% EB&WB

AASHTO ALLOWABLE MAXIMUM GRADE IS: 3.0000%

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020'/ft

AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020'/ft

TRAFFIC VOLUMES AND FACTORS

	Existing 2009 ADT (VPD)	Design Year 2030 ADT (VPD)	TRAFFIC FACTORS K=	D=	T=
See Attachment No. 5					

REMARKS

1

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
SR202L MAINLINE - CONTINUED

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Post Construction Clearance	AASHTO Minimum Allowable Clearance
See Attachment No. 3				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
See Attachment No. 4							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
See Attachment No. 1							

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	EXISTING SPEED (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
See Attachment No. 2						

REMARKS

2

ATTACHMENT NO. 1

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

Direction: SR 202L Eastbound

VPI Station	Curve Length (Ft)	Grades (%)		Existing SDs (Ft)	Minimum SDs (Ft)	Existing Speed (mph)	Design Speed (mph)
		Approach	Departure				
356+00.00	800	-0.7500	0.7500	>1500	645	>90	65
372+00.00	1,000	0.7500	-0.8087	1,192	645	>90	65
387+00.00	1,000	-0.8087	1.5000	2,424	645	>90	65
400+00.00	1,000	1.5000	1.0700	3,009	645	>90	65
422+00.00	1,200	1.0700	-1.8695	939	645	80	65
441+00.00	1,000	-1.8695	1.7920	1,062	645	86	65
471+00.00	2,200	1.7920	-2.4156	1,062	645	85	65
487+00.00	1,000	-2.4156	1.9733	899	645	77	65
508+00.00	1,800	1.9733	-2.0643	942	645	82	65
522+00.00	1,000	-2.0643	2.1021	973	645	80	65
536+50.00	1,650	2.1021	-1.6600	973	645	82	65
567+00.00	1,000	-1.6600	1.8000	1,129	645	89	65
585+50.00	1,600	1.8000	-1.3974	1,039	645	85	65
604+50.00	800	-1.3974	0.6500	3,427	645	>90	65
614+50.00	800	0.6500	-0.6000	1,263	645	>90	65
623+00.00	800	-0.6000	0.4000	>1500	645	>90	65
656+00.00	800	0.4000	-1.0000	1,171	645	>90	65
664+00.00	800	-1.0000	0.6500	>1500	645	>90	65
684+00.00	800	0.6500	-0.4000	1,428	645	>90	65
692+00.00	800	-0.4000	0.4000	>1500	645	>90	65
700+50.00	800	0.4000	0.4800	>1500	645	>90	65
728+50.00	800	0.4800	1.8949	>1500	645	>90	65
743+25.00	1,050	1.8949	-0.5584	961	645	82	65

Direction: SR 202 Westbound

VPI Station	Curve Length (Ft)	Grades (%)		Existing SDs (Ft)	Minimum SDs (Ft)	Existing Speed (mph)	Design Speed (mph)
		Approach	Departure				
356+00.00	800	-0.7500	0.7500	>1500	645	>90	65
372+00.00	1,000	0.7500	-0.8087	1,192	645	>90	65
387+00.00	1,000	-0.8087	1.5000	2,424	645	>90	65
400+00.00	1,000	1.5000	1.0700	3,009	645	>90	65
422+00.00	1,200	1.0700	-1.8695	939	645	81	65
441+00.00	1,000	-1.8695	1.7920	1,062	645	86	65
471+00.00	2,200	1.7920	-2.4156	1,062	645	86	65
487+00.00	1,000	-2.4156	1.9733	899	645	78	65
508+00.00	1,800	1.9733	-2.0643	981	645	82	65
522+00.00	1,000	-2.0643	2.1021	942	645	80	65
536+50.00	1,650	2.1021	-1.6600	973	645	81	65
567+00.00	1,120	-1.6600	1.5000	1,397	645	>90	65
588+00.00	1,400	1.5000	-1.5000	1,004	645	84	65
604+50.00	800	-1.5000	0.6500	2,650	645	>90	65
614+50.00	800	0.6500	-0.6000	1,263	645	>90	65
623+00.00	800	-0.6000	0.4000	>1500	645	>90	65
656+00.00	800	0.4000	-1.0000	1,171	645	>90	65
664+00.00	800	-1.0000	0.6500	>1500	645	>90	65
684+00.00	800	0.6500	-0.4000	1,428	645	>90	65
692+00.00	800	-0.4000	0.4000	>1500	645	>90	65
727+50.00	800	0.4000	2.0000	>1500	645	>90	65
743+25.00	1,300	2.0000	-0.5605	1,047	645	85	65

ATTACHMENT NO. 2

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
HORIZONTAL ALIGNMENT AND SUPERELEVATION

Direction: SR202L Eastbound and Westbound

HPI Station	Superelevation			Existing Speed (MPH)	Degree Curve	
	Max	Existing	Minimum		Max	Existing
365+30.35	0.060	0.053	0.055	65	3°-27'-00"	2°-29'-57"
424+61.45	0.060	0.053	0.055	65	3°-27'-00"	2°-30'-00"
454+63.77	0.060	0.048	0.049	65	3°-27'-00"	2°-00'-00"
474+68.48	0.060	0.057	0.059	65	3°-27'-00"	3°-00'-00"
515+14.93	0.060	0.023	0.023	65	3°-27'-00"	0°-45'-00"
538+96.62	0.060	0.048	0.049	65	3°-27'-00"	2°-00'-00"
553+04.26	0.060	0.060	0.060	65	3°-27'-00"	3°-30'-00"
574+19.53	0.060	0.060	0.060	65	3°-27'-00"	3°-30'-00"
602+44.12	0.060	0.059	0.059	65	3°-27'-00"	3°-00'-00"
680+01.74	0.060	NC	NC	65	3°-27'-00"	0°-15'-00"
718+42.32	0.060	0.056	0.055	65	3°-27'-00"	2°-30'-00"

NC - Normal Crown

ATTACHMENT NO. 3

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Post Construction Clearance	AASHTO Minimum Allowable Clearance
Dobson Road TI OP EB Structure No. 2444	11.00	N/A	16.92	16'
Dobson Road TI OP WB Structure No. 2445	11.00	N/A	17.08 (1)	16'
Haul Road OP Structure No. 2887	11.72	N/A	16.09	16'
Alma School Road TI OP EB Structure No. 2446	12.01	N/A	16.83 (1)	16'
Alma School Road TI OP WB Structure No. 2447	12.01	N/A	16.92 (1)	16'
McKellips TI OP EB Structure No. 2493	12.80	N/A	18.67	16'
McKellips TI OP WB Structure No. 2494	12.80	N/A	19.67	16'
Country Club TI OP EB Structure No. 2491	13.21	N/A	16.41 (1)	16'
Country Club TI OP WB Structure No. 2492	13.21	N/A	16.67	16'
Center Street UP Structure No. 2564	13.79	N/A	16.82	16'
Mesa Drive UP Structure No. 2565	14.53	N/A	18.30	16'
Stapley Drive UP Structure No. 2566	15.54	N/A	18.28	16'
Gilbert Road Ramp A UP Structure No. 2577	16.44	N/A	19.21	16'
Gilbert Road TI UP Structure No. 2578	16.57	N/A	22.46	16'

REMARKS

(1) Supplemental survey was carried out and minimum vertical clearances were noted for the following structures:
- Dobson Road TI OP Westbound = 17.19'
- Alma School Road TI OP EB = 17.10'
- Alma School Road TI OP WB = 17.07'
- Country Club Drive TI OP EB = 16.24'

ATTACHMENT NO. 4

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Dobson Road TI OP EB Structure No. 2444	11.00	70		Yes	Yes	HS-20+	HS-20
Dobson Road TI OP WB Structure No. 2445	11.00	70		Yes	Yes	HS-20+	HS-20
Haul Road OP Structure No. 2887	11.72	240		Yes	Yes	HS-20+	HS-20
Alma School Road TI OP EB Structure No. 2446	12.01	70		Yes	Yes	HS-20	HS-20
Alma School Road TI OP WB Structure No. 2447	12.01	70		Yes	Yes	HS-20+	HS-20
McKellips TI OP EB Structure No. 2493	12.80	70		Yes	Yes	HS-20+	HS-20
McKellips TI OP WB Structure No. 2494	12.80	70		Yes	Yes	HS-20+	HS-20
Country Club TI OP EB Structure No. 2491	13.21	70		Yes	Yes	HS-20	HS-20
Country Club TI OP WB Structure No. 2492	13.21	70		Yes	Yes	HS-20+	HS-20
Center Street UP Structure No. 2564	13.79	48		Yes	Yes	HS-20+	HS-20
Mesa Drive UP Structure No. 2565	14.53	81		Yes	Yes	HS-20+	HS-20
Stapley Drive UP Structure No. 2566	15.54	48		Yes	Yes	HS-20	HS-20
Gilbert Road Ramp A UP Structure No. 2577	16.44	36		Yes	Yes	HS-20+	HS-20
Gilbert Road TI UP Structure No. 2578	16.57	122		Yes	Yes	HS-20+	HS-20

REMARKS

ATTACHMENT NO. 5

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
TRAFFIC VOLUMES AND FACTORS

Begin MP	Section Begins At	End MP	Section Ends At	Existing 2010 ADT (VPD)	Design Year 2035 ADT (VPD)	TRAFFIC FACTORS K=	D=	T=
9.8	Exit 10 SL 101	11.07	Exit 10 Dobson Road	126,550	166,780	9%	58%	3%
11.07	Exit 10 Dobson Road	12.04	Exit 11 Alma School Rd	121,050	164,640	10%	74%	3%
12.04	Exit 11 Alma School Rd	12.73	Exit 12 McKellips Rd	115,300	160,640	10%	74%	3%
12.73	Exit 12 McKellips Rd	13.23	Exit 13 SR 87/Country Club Dr	92,120	135,740	10%	74%	3%
13.23	Exit 13 SR 87/Country Club Dr	16.56	Exit 16 Gilbert Rd	80,650	126,040	10%	74%	3%

Note: 1) Year 2010 & 2035 traffic volumes include HOV lane.
2) Traffic Factors were obtained from the Arizona Department of Transportation Multimodal Division's 2009 AADT's

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SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Dobson Rd TI
FUNCTIONAL CLASSIFICATION: Urban Arterial
Intersection Sta. 20+00.00 Dobson Rd Cst cl = 421+80.81 SR202L Med Cst cl
MAINLINE MILEPOST: 11.0

LANE AND SHOULDER WIDTH

	EXISTING (Feet) NB	SB	AASHTO RECOMMENDED MINIMUM (Feet)
LANE WIDTH:	11	11	10
INSIDE (left) SHOULDER WIDTH:	0	0	0
OUTSIDE (right) SHOULDER WIDTH:	Varies	Varies	0
MEDIAN WIDTH:	8		0

DESIGN SPEED
THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 55 mph
POSTED SPEED LIMIT IS: 45MPH
TERRAIN IS: LEVEL

GRADES

	EXISTING MAXIMUM GRADE IS (%) Ascending	Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	Descending
NB	0.5000	NA	6.0	6.0
SB	NA	-0.5000	6.0	6.0

CROSS SLOPE
EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,800	4,600	

REMARKS

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SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road Ramp A

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Dobson Rd TI
RAMP DESIGNATION: Ramp A
DESCRIPTION: WB Entrance Ramp
MAINLINE MILEPOST: 11.0

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 3
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
32	20	30	2,849

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
1.5512	-3.5584	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,800	4,600	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road Ramp A - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
15+39.88	1.0292	-3.5584	700	574	425	60	50
21+64.88	-3.5584	1.5512	200	212	250	31	35

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
1+14.57	0.060	0.020	NC	55	5°-24'-00"	0°-30'-00"
16+94.94	0.060	0.031	0.035 **	50	6°-53'-00"	2°-00'-00"

REMARKS

** Design Exception will not be requested because this segment of the ramp will be upgraded under this project.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road Ramp B

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Dobson Rd TI
RAMP DESIGNATION: Ramp B
DESCRIPTION: EB Exit Ramp
MAINLINE MILEPOST: 11.0

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
22-40 [1]	20	30	NA

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
1.8848	-1.9733	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,500	4,100	

REMARKS

[1] One lane ramp tapers to three lanes at cross road

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road Ramp B - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
9+00.00	0.9316	-1.9733	500	621	425	62	50
17+25.00	-1.9733	1.8848	200	278	250	37	35

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
N/A Tangent Alignment						

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road Ramp C

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Dobson Rd TI
RAMP DESIGNATION: Ramp C
DESCRIPTION: WB Exit Ramp
MAINLINE MILEPOST: 11.0

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
24-42 [1]	20	30	2,282

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
1.1164	-1.9510	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,600	9,300	

REMARKS

[1] One lane ramp tapers to three lanes at cross road

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road Ramp C - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
1+75.00	-1.9510	1.1164	200	385	250	47	35
10+00.00	1.1164	-1.6300	500	643	425	64	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
4+84.00	0.060	0.040	0.040	50	6°-53'-00"	2°-30'-00"
14+39.76	0.060	0.029	0.020	50	6°-53'-00"	1°-00'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road Ramp D

PROJECT NUMBER: H8169 01L
MAINLINE MILEPOST: 11.0
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Dobson Rd TI
RAMP DESIGNATION: Ramp D
DESCRIPTION: EB Entrance Ramp

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 3
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
30	20	30	1,132

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
4.9623	-4.1300	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,300	9,500	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Dobson Road Ramp D - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
1+75.00	-0.6800	4.9623	200	196	250	30	35
7+85.00	4.9623	-4.1300	800	436	425	49	50
12+85.00	-4.1300	-1.9994	200	1,085	425	85	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
5+56.00	0.060	0.056	0.056	50	6°-53'-00"	5°-00'-00"
16+28.27	0.060	0.020	0.020	50	6°-53'-00"	1°-00'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Alma School Rd TI
FUNCTIONAL CLASSIFICATION: Urban Arterial
Intersection Sta. 20+00.00 Alma School Rd Cst cl = 473+01.70 SR202L Med Cst cl
MAINLINE MILEPOST: 12.0

LANE AND SHOULDER WIDTH

	EXISTING (Feet) NB	EXISTING (Feet) SB	AASHTO RECOMMENDED MINIMUM (Feet)
LANE WIDTH:	11-14.5	11-14.5	10
INSIDE (left) SHOULDER WIDTH:	0	0	0
OUTSIDE (right) SHOULDER WIDTH:	0	0	0
MEDIAN WIDTH:	8		0

DESIGN SPEED
THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 55 mph
POSTED SPEED LIMIT IS: 45MPH
TERRAIN IS: LEVEL

GRADES

	EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
NB	0.6620	-0.7357	6.0	6.0
SB	0.7357	-0.6620	6.0	6.0

CROSS SLOPE
EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,800	4,600	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
20+00.00	0.2332	-0.6620	500	1,455	305	>90	45
25+00.00	-0.6620	0.7357	500	>1500	305	>90	45

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
22+67.37	0.040	NC	NC	45	8°-55'-00"	0°-30'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road Ramp A

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Alma School Rd TI
RAMP DESIGNATION: Ramp A
DESCRIPTION: WB Entrance Ramp

MAINLINE MILEPOST: 12.0

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 3
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
30	20	30	5,716

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
1.9567	-4.3301	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft

AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
N/A	5,400	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road Ramp A - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
6+05.00	1.9567	-4.3301	600	454	425	51	55
13+35.00	-4.3301	1.8469	200	184	250	28	35

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
5+90.50	0.060	0.020	0.020	55	5°-24'-00"	1°-00'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road Ramp B

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Alma School Rd TI
RAMP DESIGNATION: Ramp B
DESCRIPTION: EB Exit Ramp
MAINLINE MILEPOST: 12.0

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
24-42 [1]	20	30	1,900

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
1.9464	-2.7103	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
N/A	8,100	

REMARKS

[1] One lane ramp tapers to three lanes at cross road

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road Ramp B - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
9+00.00	1.3308	-2.7103	800	654	425	64	55
16+80.00	-2.7103	1.9464	200	229	250	33	35

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
3+99.24	0.060	0.057	0.055	60	4°-18'-00"	3°-00'-00"
13+42.73	0.060	0.020	0.020	50	6°-53'-00"	1°-00'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road Ramp C

PROJECT NUMBER: H8169 01L
MAINLINE MILEPOST: 12.0
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Alma School Rd TI
RAMP DESIGNATION: Ramp C
DESCRIPTION: WB Exit Ramp

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
24-40 [1]	20	30	2,855

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
3.1694	-1.9755	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
N/A	3,400	

REMARKS

[1] One lane ramp tapers to three lanes at cross road

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road Ramp C - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
1+75.00	-1.9755	3.1694	200	210	250	31	35
6+00.00	3.1694	-1.1837	450	473	425	52	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
10+92.25	0.060	0.048	0.035	50	6°-53'-00"	2°-00'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road Ramp D

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Alma School Rd TI
RAMP DESIGNATION: Ramp D
DESCRIPTION: EB Entrance Ramp
MAINLINE MILEPOST: 12.0

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 3
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
28	20	30	1,621

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
2.6233	-1.7575	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
N/A	3,300	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Alma School Road Ramp D - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
2+00.00	-1.7575	2.6233	200	243	250	34	35
8+00.00	2.6233	-1.7483	500	497	425	54	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
5+43.00	0.060	0.043	0.048**	50	6°-53'-00"	3°-30'-00"
13+70.38	0.060	0.020	0.020	50	6°-53'-00"	1°-00'-00"

REMARKS

** Design Exception will not be requested because this segment of the ramp will be upgraded under this project.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
McKellips Road

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: McKellips Rd TI
FUNCTIONAL CLASSIFICATION: Urban Arterial
Intersection Sta. 20+00.00 McKellips Rd Rd Cst cl = 509+18.99 SR202L Med Cst cl
MAINLINE MILEPOST: 12.7

LANE AND SHOULDER WIDTH

	EXISTING (Feet) NB	EXISTING (Feet) SB	AASHTO RECOMMENDED MINIMUM (Feet)
LANE WIDTH:	10-14.5	11-14.5	10
INSIDE (left) SHOULDER WIDTH:	0	0	0
OUTSIDE (right) SHOULDER WIDTH:	0	0	0
MEDIAN WIDTH:	4		0

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 55 mph

POSTED SPEED LIMIT IS: 45MPH
TERRAIN IS: LEVEL

GRADES

	EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
NB	NA	-3.7111	6.0	6.0
SB	3.7111	NA	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft

AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,800	4,600	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
McKellips Road - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
14+00.00	0.0500	3.7111	400	488	360	55	45
18+50.00	3.7111	0.5750	450	569	360	61	45
22+50.00	0.5750	0.2125	200	3,076	360	>90	45

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
21+44.21	0.060	0.040	0.030	45	6°-00'-00"	2°-00'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
McKellips Road Ramp A

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: McKellips Rd TI
RAMP DESIGNATION: Ramp A
DESCRIPTION: WB Entrance Ramp
MAINLINE MILEPOST: 12.7

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 3
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
30	20	30	2,276

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
1.9668	-3.6546	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
1,800	7,400	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
McKellips Road Ramp A - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
7+50.00	1.9668	-3.6546	450	416**	425	48	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
2+50.15	0.060	0.029	0.020	50	6°-53'-00"	1°-00'-00"
9+96.02	0.060	0.040	0.040	50	6°-53'-00"	2°-30'-00"

REMARKS

** Design Exception will not be requested because this segment of the ramp will be upgraded under this project.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
McKellips Road Ramp B

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: McKellips Rd TI
RAMP DESIGNATION: Ramp B
DESCRIPTION: EB Exit Ramp
MAINLINE MILEPOST: 12.7

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
28-40 [1]	20	30	2,282

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
2.0308	-3.5602	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
1,800	7,800	

REMARKS

[1] One lane ramp tapers to three lanes at cross road

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
McKellips Road Ramp B - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
8+50.00	2.0308	-3.4545	450	421**	425	48	50
14+00.00	-3.4545	-3.5602	0	10,216	250	>90	35

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
7+41.43	0.060	0.020	0.020	50	6°-53'-00"	1°-00'-00"
12+18.36	0.060	0.035	0.040 **	50	6°-53'-00"	2°-30'-00"

REMARKS

** Design Exception may be requested because this segment of the ramp might be upgraded under this project.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Country Club Rd TI
FUNCTIONAL CLASSIFICATION: Urban Arterial
Intersection Sta. 278+20.64 Country Club Rd Cst cl = 535+96.72 SR202L Med Cst cl

MAINLINE MILEPOST: 13.2

LANE AND SHOULDER WIDTH

	EXISTING (Feet) NB	EXISTING (Feet) SB	AASHTO RECOMMENDED MINIMUM (Feet)
LANE WIDTH:	12-14.5	12-14.5	10
INSIDE (left) SHOULDER WIDTH:	0	0	0
OUTSIDE (right) SHOULDER WIDTH:	0	0	0
MEDIAN WIDTH:	8		0

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 55 mph

POSTED SPEED LIMIT IS: 45MPH
TERRAIN IS: LEVEL

GRADES

	EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
NB	2.4875	-0.7488	6.0	6.0
SB	0.7488	-2.4875	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft

AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,800	4,600	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
271+50.00	0.6297	-0.7488	400	983	360	83	45
279+50.00	-0.7488	0.2622	500	>1500	360	>90	45
284+00.00	0.2622	2.4875	400	1,357	360	>90	45
288+00.00	2.4875	0.8477	400	858	360	78	45

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive Ramp A

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Country Club Dr TI
RAMP DESIGNATION: Ramp A
DESCRIPTION: WB Entrance Ramp

MAINLINE MILEPOST: 13.2

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 3
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
30	20	30	2,851

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
1.7026	-3.7095	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft

AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
N/A	5,400	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive Ramp A - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
2+00.00	0.4700	0.8487	400	>1500	495	>90	55
7+75.00	0.8487	-3.7095	750	596	425	61	50
12+50.00	-3.7095	1.7026	200	202	250	30	35

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
10+31.17	0.060	0.042	0.035	50	6°-53'-00"	2°-00'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive Ramp B

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Country Club Dr TI
RAMP DESIGNATION: Ramp B
DESCRIPTION: EB Exit Ramp
MAINLINE MILEPOST: 13.2

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
26-52 [1]	20	30	7,627

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
1.6169	-0.7800	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
N/A	8,100	

REMARKS

[1] One lane ramp tapers to four lanes at cross road

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive Ramp B - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
9+00.00	-0.3471	-0.7800	500	2,742	425	>90	50
16+50.00	-0.7800	1.6169	200	680	250	67	35

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
5+33.12	0.060	0.023	0.020	55	5°-24'-00"	0°-45'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive Ramp C

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Country Club Dr TI
RAMP DESIGNATION: Ramp C
DESCRIPTION: WB Exit Ramp
MAINLINE MILEPOST: 13.2

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
22-40' [1]	20	30	1,611

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
2.8000	-1.9201	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
N/A	3,400	

REMARKS

[1] One lane ramp tapers to three lanes at cross road

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive Ramp C - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
2+00.00	-1.9201	2.8000	200	226	250	32	35
10+00.00	2.8000	-1.5680	850	648	425	63	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
3+33.66	0.060	0.050	0.059 *	50	6°-53'-00"	6°-00'-34"
16+17.92	0.060	0.060	0.054	55	5°-24'-00"	3°-30'-00"

REMARKS

* Design Exception Required.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive Ramp D

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Country Club Dr TI
RAMP DESIGNATION: Ramp D
DESCRIPTION: EB Entrance Ramp
MAINLINE MILEPOST: 13.2

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 3
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
28	20	30	941

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
2.4800	-2.1342	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
N/A	3,300	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Country Club Drive Ramp D - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
2+00.00	-2.1342	2.4800	200	231	250	33	35
9+00.00	2.4800	-1.2348	800	682	425	66	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
4+26.61	0.060	0.050	0.059 **	50	6°-53'-00"	6°-00'-00"
16+41.69	0.060	0.060	0.060	55	5°-24'-00"	5°-15'-00"

REMARKS
** Design Exception Required.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Center Street

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE:
FUNCTIONAL CLASSIFICATION: Urban Arterial
Intersection Sta. 20+00.00 Center St Cst cl = 565+45.82 SR202L Med Cst cl

MAINLINE MILEPOST: 13.8

LANE AND SHOULDER WIDTH

	EXISTING (Feet) NB	EXISTING (Feet) SB	AASHTO RECOMMENDED MINIMUM (Feet)
LANE WIDTH:	12	12	10
INSIDE (left) SHOULDER WIDTH:	0	0	0
OUTSIDE (right) SHOULDER WIDTH:	Varies	Varies	0
MEDIAN WIDTH:	0		0

DESIGN SPEED
THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 55 mph

POSTED SPEED LIMIT IS: 45MPH
TERRAIN IS: LEVEL

GRADES

	EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
NB	0.9667	-1.2000	6.0	6.0
SB	1.2000	-0.9667	6.0	6.0

CROSS SLOPE
EXISTING CROSS SLOPE IS: 0.020 '/ft

AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,800	4,600	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Center Street - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
18+00.00	0.7600	0.9667	100	>1500	250	>90	45
19+50.00	0.9667	-1.2000	200	598	250	61	45
21+00.00	-1.2000	-0.7168	100	>1500	250	>90	45

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Mesa Drive

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE:
FUNCTIONAL CLASSIFICATION: Urban Arterial
Intersection Sta. 20+00.00 Mesa Dr Cst cl = 604+19.83 SR202L Med Cst cl
MAINLINE MILEPOST: 14.5

LANE AND SHOULDER WIDTH

	EXISTING (Feet) NB	EXISTING (Feet) SB	AASHTO RECOMMENDED MINIMUM (Feet)
LANE WIDTH:	12	12	10
INSIDE (left) SHOULDER WIDTH:	0	0	0
OUTSIDE (right) SHOULDER WIDTH:	Varies	Varies	0
MEDIAN WIDTH:	0		0

DESIGN SPEED
THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 55 mph
POSTED SPEED LIMIT IS: 45MPH
TERRAIN IS: LEVEL

GRADES

	EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
NB	1.0000	-0.9040	6.0	6.0
SB	-1.0000	0.9040	6.0	6.0

CROSS SLOPE
EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,800	4,600	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Mesa Drive - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
18+00.00	-0.0700	1.0000	100	>1500	250	>90	45
20+50.00	1.0000	-0.9040	200	667	250	66	45
23+00.00	-0.9040	-0.2200	100	>1500	250	>90	45

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Stapley Drive

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE:
FUNCTIONAL CLASSIFICATION: Urban Arterial
Intersection Sta. 20+00.00 Stapley Dr Cst cl = 657+83.99 SR202L Med Cst cl

MAINLINE MILEPOST: 15.5

LANE AND SHOULDER WIDTH

	EXISTING (Feet) NB	EXISTING (Feet) SB	AASHTO RECOMMENDED MINIMUM (Feet)
LANE WIDTH:	11	11	10
INSIDE (left) SHOULDER WIDTH:	0	0	0
OUTSIDE (right) SHOULDER WIDTH:	Varies	Varies	0
MEDIAN WIDTH:	0		0

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 55 mph

POSTED SPEED LIMIT IS: 45MPH
TERRAIN IS: LEVEL

GRADES

	EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
NB	0.3134	-0.4000	6.0	6.0
SB	0.4000	-0.3134	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft

AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,800	4,600	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Stapley Drive - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
18+90.00	0.3134	-0.4000	100	1,562	250	>90	45

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Gilbert Road

PROJECT NUMBER: H8169-01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Gilbert Rd TI
FUNCTIONAL CLASSIFICATION: Urban Arterial
Intersection Sta. 20+00.00 Gilbert Road Cst cl = 711+64.00 SR202L Med Cst cl

MAINLINE MILEPOST: 16.5

LANE AND SHOULDER WIDTH

	EXISTING (Feet) NB	EXISTING (Feet) SB	AASHTO RECOMMENDED MINIMUM (Feet)
LANE WIDTH:	11-17	11-17	10
INSIDE (left) SHOULDER WIDTH:	0	0	0
OUTSIDE (right) SHOULDER WIDTH:	0	0	0
MEDIAN WIDTH:	4		0

DESIGN SPEED
THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED OF THE HIGHWAY IS: 55 mph

POSTED SPEED LIMIT IS: 45MPH
TERRAIN IS: LEVEL

GRADES

	EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
NB	0.5819	-4.4800	6.0	6.0
SB	4.4800	-0.5819	6.0	6.0

CROSS SLOPE
EXISTING CROSS SLOPE IS: 0.020 '/ft

AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
6,800	4,600	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Gilbert Road - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
95+50.00	0.5819	-4.4800	700	546	360	56	45
100+00.00	-4.4800	-3.0000	200	>1500	360	>90	45
105+50.00	-3.0000	-0.4000	200	541	360	56	45
111+50.00	-0.4000	0.4010	200	>1500	360	>90	45

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
98+16.30	0.040	0.040	0.040	45	8°-55'-00"	6°-45'-00"

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Gilbert Road Ramp A

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Gilbert Rd TI
RAMP DESIGNATION: Ramp A
DESCRIPTION: WB Entrance Ramp
MAINLINE MILEPOST: 16.5

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 3
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
28-36	20	30	799

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
2.6000	-0.3701	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
10,200	9,500	

REMARKS

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Gilbert Road Ramp A - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Structure No. 2577	16.44	NA	NA	16'

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
16+50.00	-0.3701	2.6000	350	590	495	60	55
27+00.00	2.6000	1.0000	1000	1,174	425	>90	50
37+00.00	1.0000	1.7844	400	>1500	425	>90	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
14+21.05	0.060	0.020	0.020	55	5°-24'-00"	0°-45'-00"
29+81.90	0.060	0.051	0.056 *	50	6°-53'-00"	5°-00'-00"
37+61.52	0.060	0.053	0.060 *	50	6°-53'-00"	7°-00'-00"

REMARKS
* Design Exception Required.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Gilbert Road Ramp B

PROJECT NUMBER: H8169 01L
PROJECT LOCATION: SR101L - Gilbert Road
HIGHWAY SECTION: Red Mountain Freeway (SR202L)
INTERCHANGE: Gilbert Rd TI
RAMP DESIGNATION: Ramp B
DESCRIPTION: EB Exit Ramp
MAINLINE MILEPOST: 16.5

PAVEMENT WIDTH

CASE (1 OR 2 OR 3): 2
TRAFFIC CONDITIONS (A OR B OR C): C

TOTAL PAVEMENT WIDTH

Existing (Feet)	AASHTO Recommended Minimum (Feet)	AASHTO Maximum (Feet)	Minimum Ramp Inside Radius (Feet)
24-54 [1]	20	30	2,278

DESIGN SPEED

THE AASHTO RECOMMENDED MINIMUM DESIGN SPEED FOR RAMPS IS: Upper Range = 55 mph; Middle Range = 40 mph; Lower Range = 30 mph

GRADES

EXISTING MAXIMUM GRADE IS (%) Ascending	EXISTING MAXIMUM GRADE IS (%) Decending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Ascending	AASHTO ALLOWABLE MAXIMUM GRADE (%) Descending
4.0000	-0.2448	6.0	6.0

CROSS SLOPE

EXISTING CROSS SLOPE IS: 0.020 '/ft
AASHTO ALLOWABLE RANGE IS: 0.015'/ft - 0.020 '/ft

TRAFFIC VOLUMES AND FACTORS

YEAR	DESIGN YEAR	TRAFFIC FACTORS
2010	2030	K = N/A
		D = N/A
ADT (VPD)	ADT (VPD)	T = N/A
11,200	9,700	

REMARKS

[1] One lane ramp tapers to four lanes at cross road

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
Gilbert Road Ramp B - Continued

VERTICAL CLEARANCE

STRUCTURE	MILEPOST	Preconstruction Clearance	Postconstruction Clearance	AASHTO Minimum Allowable Clearance
Not Applicable				

STRUCTURES

STRUCTURE	MILEPOST	Existing Bridge Width	Recommended Bridge Width	Bridge Rail Geometry Adequate?	Bridge Rail Structure Adequate?	Existing Structural Capacity	Recommended Structural Capacity
Not Applicable							

VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE

VPI STATION	Approach Grade (%)	Departure Grade (%)	Length of Curve (Feet)	Existing Sight Distance (Feet)	Recommended Sight Distance (Feet)	Existing Speed (MPH)	Recommended Design Speed (MPH)
18+50.00	-0.2448	4.0000	500	506	495	56	55
28+50.00	4.0000	1.7230	500	724	425	71	50

HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE

HPI STATION	SUPERELEVATION Maximum (Ft/Ft)	SUPERELEVATION Existing (Ft/Ft)	SUPERELEVATION Minimum (Ft/Ft)	Existing Speed (MPH)	DEGREE OF CURVE Maximum	DEGREE OF CURVE Existing
13+25.47	0.060	NC	NC	55	5°-24'-00"	0°-15'-00"
26+75.88	0.060	0.028	0.040 *	50	6°-53'-00"	2°-30'-00"

REMARKS
* Design Exception Required.

ROADWAY ENGINEERING GROUP
ROADWAY PREDESIGN SECTION

PAGE _ OF _

DATE: 9/1/2010

TO: **SUNIL ATHALYE**
BRIDGE GROUP
BRIDGE MANAGEMENT SECTION, MD 635E

FROM: Christopher A. Labye, PE
AECOM, 2777 E Camelback Rd Ste 200
Phoenix, AZ 85016

FEDERAL REFERENCE NO: NH-202-B(BQU)A TRACS NO: H8169 01L
HIGHWAY: 202L
LOCATION: Phoenix, AZ
MP LIMITS: 11.00 TO: 16.57
PROJECT DESCRIPTION: 202L - Widening from 101L to Gilbert Road

SUBJECT: **BRIDGE EVALUATION REQUEST**

Please evaluate the following structures per AASHTO guidelines:

ROUTE NO.	MILEPOST	STR. NO. AND NAME	BRIDGE LENGTH	BRIDGE ROADWAY WIDTH	BRIDGE RAIL / BARRIER TYPE	BRIDGE RAIL / BARRIER GEOM. OK	BRIDGE RAIL / BARRIER STRUC OK	AC OVERLAY THICKNESS (EXISTING)	AC OVERLAY REMOVE (MINIMUM)	AC OVERLAY REPLACE/NEW (MAXIMUM)	VERTICAL CLEARANCE (MINIMUM) NB/EB	VERTICAL CLEARANCE (MINIMUM) SB/WB	BRIDGE LOAD RATING	BRIDGE SUFFICIENCY RATING
202L	11.00	2444 Dobson Road TI OP EB	222'	70'	Conc. barrier	Yes	Yes	0"	-	-	NB: 16.92'	SB: 17.00'	HS20+	F 94
			Comments:											
202L	11.00	2445 Dobson Road TI OP WB	223'	70'	Conc. barrier	Yes	Yes	0"	-	-	NB: 17.08'	SB: 17.17'	HS20+	F 94
			Comments:											
202L	11.72	2887 Haul Road OP	45'	240'	Conc. barrier	Yes	Yes	"2"	-	-	NB: 16.09'	SB: 16.10'	HS20+	85
			Comments: * AC pavement over 6' fill on the top concrete slab. Recommended repairs to be done by local maintenance team, mainly to patch soffit edges and wingwall spalls.											
202L	12.01	2446 Alma School Road TI OP EB	157'	70'	Conc. barrier	Yes	Yes	"2"	-	-	NB: 16.83'	SB: 17.17'	HS20+	F 94
			Comments: * Inspection 2 in 2003 when deck surface was bare concrete: Deck has medium size diagonal cracking @ piers & abutments.											
202L	12.01	2447 Alma School Road TI OP WB	158'	70'	Conc. barrier	Yes	Yes	"2"	-	-	NB: 16.92'	SB: 17.01'	HS20	F 94
			* Inspection 2 in 2003 when deck surface was bare concrete: Deck has medium size diagonal cracking @ piers & abutments. Recommended repair to be done by local maintenance team, mainly to patch barrier spalls.											
202L	12.80	2493 McKellips TI OP EB	187'	70'	Conc. barrier	Yes	Yes	"2"	-	-	NB: 19.50'	SB: 18.67'	HS20+	100
			Comments: * Inspection 2 in 2003 when deck surface was bare concrete: Fine cracks perpendicular to joints.											

ROADWAY ENGINEERING GROUP
ROADWAY PREDESIGN SECTION

PAGE _ OF _

DATE: 9/1/2010

TO: SUNIL ATHALYE
BRIDGE GROUP
BRIDGE MANAGEMENT SECTION, MD 635E

FROM: Christopher A. Labye, PE
AECOM, 2777 E Camelback Rd Ste 200
Phoenix, AZ 85016

FEDERAL REFERENCE NO: NH-202-B(BQU)A TRACS NO: H8169 01L
HIGHWAY: 202L
LOCATION: Phoenix, AZ
MP LIMITS: 11.00 TO: 16.57
PROJECT DESCRIPTION: 202L - Widening from 101L to Gilbert Road

SUBJECT: **BRIDGE EVALUATION REQUEST**

Please evaluate the following structures per AASHTO guidelines:

ROUTE NO.	MILEPOST	STR. NO. AND NAME	BRIDGE LENGTH	BRIDGE ROADWAY WIDTH	BRIDGE RAIL / BARRIER TYPE	BRIDGE RAIL / BARRIER GEOM. OK	BRIDGE RAIL / BARRIER STRUC OK	AC OVERLAY THICKNESS (EXISTING)	AC OVERLAY REMOVE (MINIMUM)	AC OVERLAY REPLACE/NEW (MAXIMUM)	VERTICAL CLEARANCE (MINIMUM) NB/EB	VERTICAL CLEARANCE (MINIMUM) SB/WB	BRIDGE LOAD RATING	BRIDGE SUFFICIENCY RATING
202L	12.80	2494 McKellips TI OP WB	186'	70'	Conc. barrier	Yes	Yes	*2"	-	-	NB: 20.30'	SB: 19.67'	HS20+	100
			Comments: * Inspection 2 in 2003 when deck surface was bare concrete: Fine cracks perpendicular to joints. Deck has longitudinal hairline to fine cracks. Recommended repair to be done by local maintenance team, mainly to clean joints and repair seals if any damages.											
202L	13.21	2491 Country Club TI OP EB	246'	70'	Conc. barrier	Yes	Yes	*2"	-	-	NB: 16.42'	SB: 16.41'	HS20+	F 94
			Comments: * Inspection 2 in 2001 when deck surface was bare concrete: Deck has minor hairline cracks. Recommended repair to be done by local maintenance team, mainly to repair a loose rock on slope paving.											
202L	13.21	2492 Country Club TI OP WB	248'	70'	Conc. barrier	Yes	Yes	*2"	-	-	NB: 16.75'	SB: 16.67'	HS20	F 94
			Comments: * Inspection 2 in 2001 when deck surface was bare concrete: Deck has minor hairline cracks.											
202L	13.79	2564 Center Street UP	221'	48'	Conc parapet w/ ped fence	Yes	Yes	0"	-	-	EB: 17.03'	WB: 16.82'	HS20+	97.31
			Measure new minimum vertical clearances for both traffic directions after new overlay and report them to Bridge Management Section.											
202L	14.53	2565 Mesa Drive UP	230'	81'	Conc parapet w/ ped fence	Yes	Yes	0"	-	-	EB: 18.30'	WB: 18.43'	HS20+	99.4
			Comments: Measure new minimum vertical clearances for both traffic directions after new overlay and report them to Bridge Management Section.											
202L	15.54	2566 Stapley Drive UP	248'	48'	Conc parapet w/ ped fence	Yes	Yes	0"	-	-	EB: 18.37'	WB: 18.28'	HS20+	99.7
			Comments: Measure new minimum vertical clearances for both traffic directions after new overlay and report them to Bridge Management Section.											

ROADWAY ENGINEERING GROUP
ROADWAY PREDESIGN SECTION

PAGE _ OF _

DATE: 9/1/2010

TO: SUNIL ATHALYE
BRIDGE GROUP
BRIDGE MANAGEMENT SECTION, MD 635E

FROM: Christopher A. Labye, PE
AECOM, 2777 E Camelback Rd Ste 200
Phoenix, AZ 85016

FEDERAL REFERENCE NO: NH-202-B(BQU)A TRACS NO: H8169 01L
HIGHWAY: 202L
LOCATION: Phoenix, AZ
MP LIMITS: 11.00 TO: 16.57
PROJECT DESCRIPTION: 202L - Widening from 101L to Gilbert Road

SUBJECT: **BRIDGE EVALUATION REQUEST**

Please evaluate the following structures per AASHTO guidelines:

ROUTE NO.	MILEPOST	STR. NO. AND NAME	BRIDGE LENGTH	BRIDGE ROADWAY WIDTH	BRIDGE RAIL / BARRIER TYPE	BRIDGE RAIL / BARRIER GEOM. OK	BRIDGE RAIL / BARRIER STRUC OK	AC OVERLAY THICKNESS (EXISTING)	AC OVERLAY REMOVE (MINIMUM)	AC OVERLAY REPLACE/NEW (MAXIMUM)	VERTICAL CLEARANCE (MINIMUM) NB/EB	VERTICAL CLEARANCE (MINIMUM) SB/WB	BRIDGE LOAD RATING	BRIDGE SUFFICIENCY RATING
202L	16.44	2577 Gilbert Road Ramp A UP	572'	36'	Conc. barrier	Yes	Yes	*2"	-	-	EB: 20.20'	WB: 19.21'	HS20	93.7
			Comments: Measure new minimum vertical clearances for both traffic directions after new overlay and report them to Bridge Management Section. * In 2003 inspection, when the deck surface was bare concrete: Deck has fine longitudinal and random cracks. Also, there is a spot of deck popout at the N lane towards the E end.											
202L	16.55	2579 Consolidated Canal Bridge	96'	104'	Conc parapet w/ steel rail	Yes	Yes	0"	-	-	-	-	HS20	77.68
			Comments: Gilbert Road on top. Will not be impacted by 202L widening.											
202L	16.55	2580 SRP Equipment UP	24'	104'	Conc parapet w/ ped fence	Yes	Yes	0"	-	-	EB: 16.05'	WB: 16.05'	HS20+	71.69
			Comments: Gilbert Road on top. SRP one-lane service road under the structure. Will not be impacted by 202L widening. There is a 2' minimum fill above the top of the frame. The road surface on top of the fill is paved with concrete.											
202L	16.57	2578 Gilbert Road TI UP	251'	122'	Conc parapet w/ ped fence	Yes	Yes	0"	-	-	EB: 24.38'	WB: 22.46'	HS20+	78.33
			Comments: Measure new minimum vertical clearances for both traffic directions after new overlay and report them to Bridge Management Section.											

Evaluation Completed by: Homer Saidi, P.E. Date: 9/3/2010

ROADWAY ENGINEERING GROUP
ROADWAY PREDESIGN SECTION

DATE: 9/1/2010

TO: SUNIL ATHALYE
BRIDGE GROUP
BRIDGE MANAGEMENT SECTION, MD 635E

FEDERAL REFERENCE NO: NH-202-B(BQU)A TRACS NO: H8169 01L
HIGHWAY: 202L
LOCATION: Phoenix, AZ
MP LIMITS: 11.00 TO: 16.57
PROJECT DESCRIPTION: 202L - Widening from 101L to Gilbert Road

FROM: Christopher A. Labye, PE
AECOM, 2777 E Camelback Rd Ste 200
Phoenix, AZ 85016

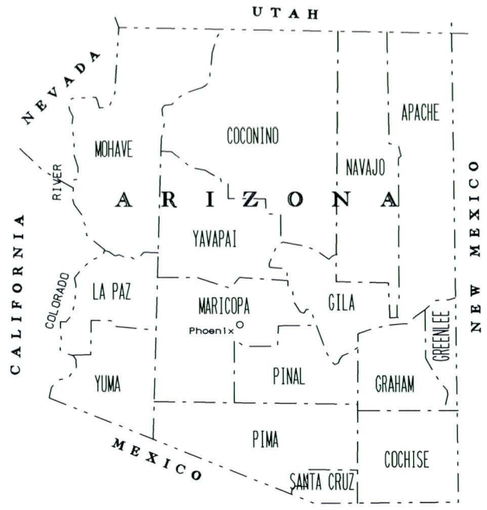
SUBJECT: BRIDGE EVALUATION REQUEST

Please evaluate the following structures per AASHTO guidelines:

ROUTE NO.	MILEPOST	STR. NO. AND NAME	BRIDGE LENGTH	BRIDGE ROADWAY WIDTH	BRIDGE RAIL / BARRIER			AC OVERLAY			VERTICAL CLEARANCE (MINIMUM)		BRIDGE LOAD RATING	BRIDGE SUFFICIENCY RATING
					TYPE	GEOM. OK	STRUC OK	THICKNESS (EXISTING)	REMOVE (MINIMUM)	REPLACE/NEW (MAXIMUM)	NB/EB	SB/WB		

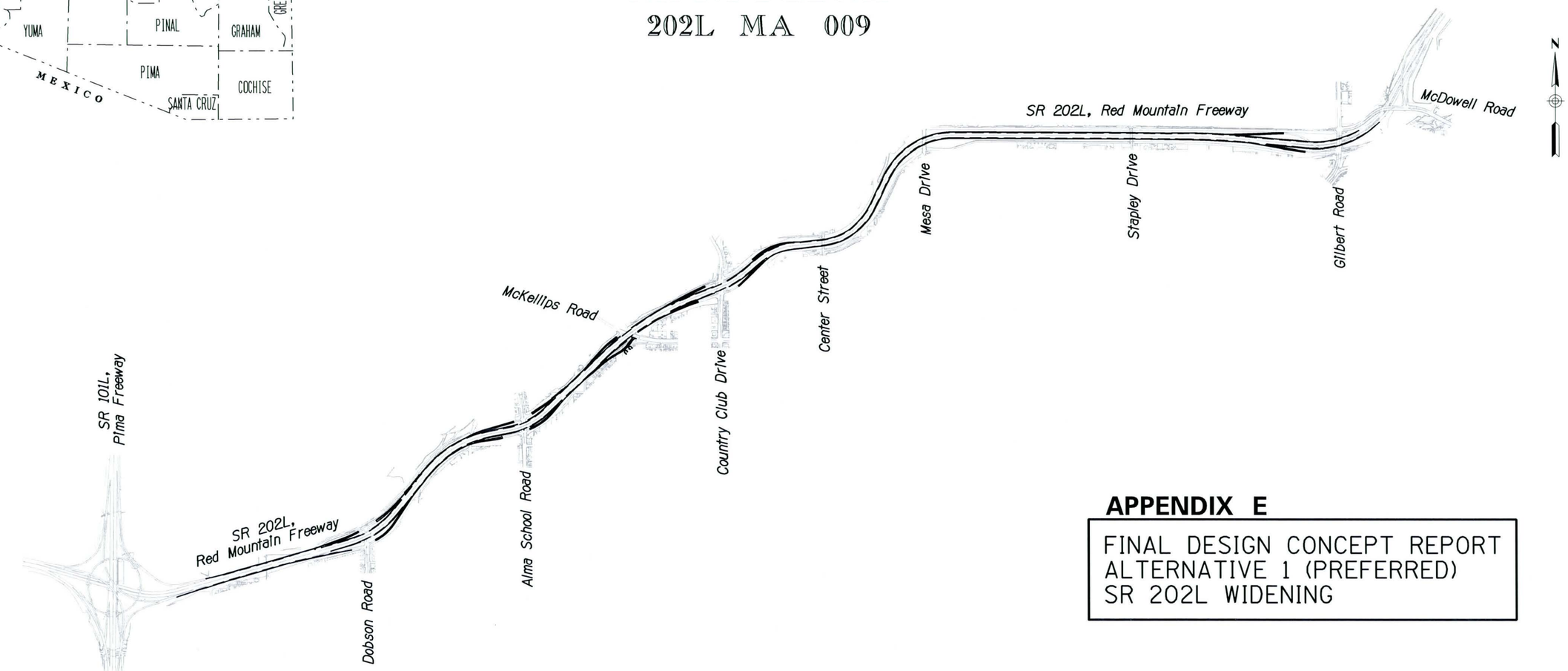
APPENDIX E

ALTERNATIVE 1 PLANS (PREFERRED ALTERNATIVE)



STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION

PLAN AND PROFILE OF PROPOSED
STATE HIGHWAY
NH-202-B(BEC)A
202L MA 009



APPENDIX E

FINAL DESIGN CONCEPT REPORT
ALTERNATIVE 1 (PREFERRED)
SR 202L WIDENING

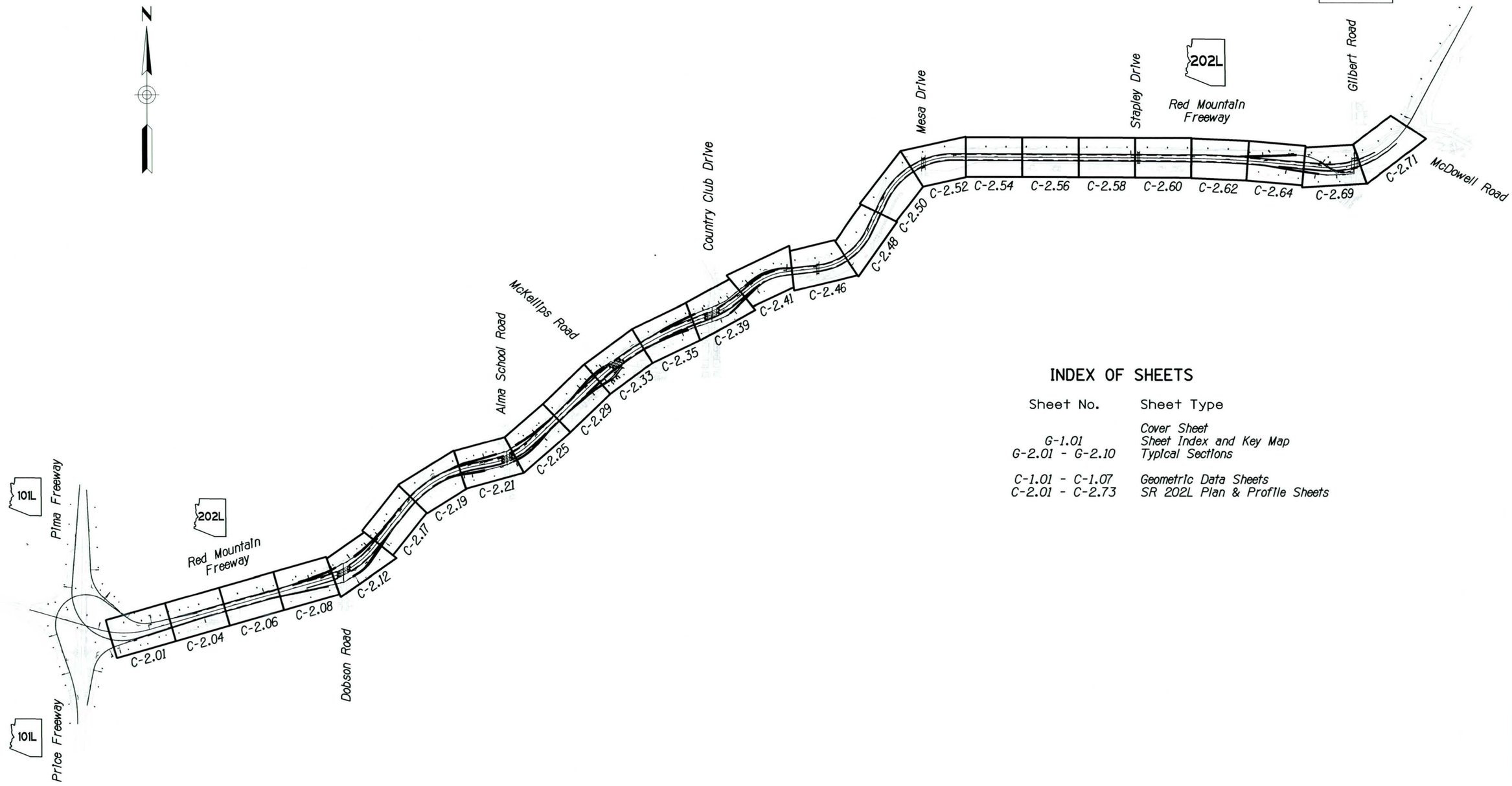
ADOT CONTRACT NO. 2005-026
TRACS NO. H8169 01L
STATE ROUTE 202L
RED MOUNTAIN FREEWAY
(SR 101L - GILBERT ROAD)

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
APPROVED: JENNIFER TOTH
STATE ENGINEER

APPROVED DATE

ASSISTANT STATE ENGINEER

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



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Sheet No.	Sheet Type
	Cover Sheet
G-1.01	*Sheet Index and Key Map*
G-2.01 - G-2.10	*Typical Sections*
C-1.01 - C-1.07	*Geometric Data Sheets*
C-2.01 - C-2.73	*SR 202L Plan & Profile Sheets*

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
SR 202L
SHEET INDEX AND KEY MAP

DCR

NOT FOR CONSTRUCTION OR RECORDING

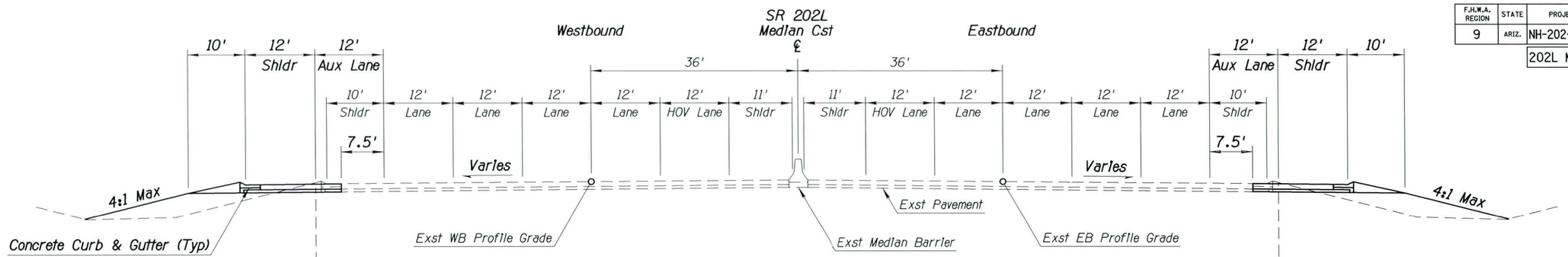
ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. G-1.01

TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

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

8/20/2012 U:\RM02\Prod\civ\h8169dsA1-01.dgn

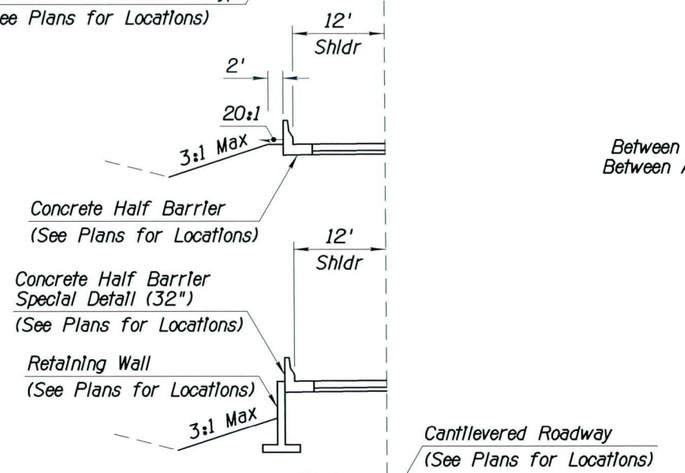
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

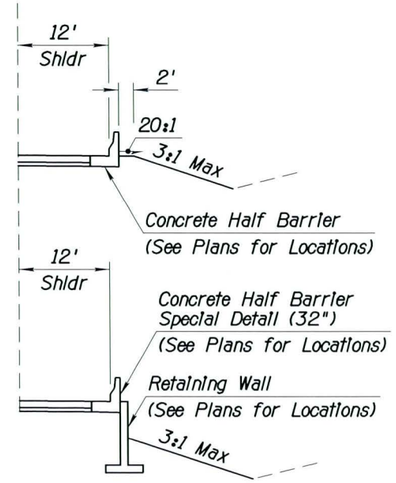


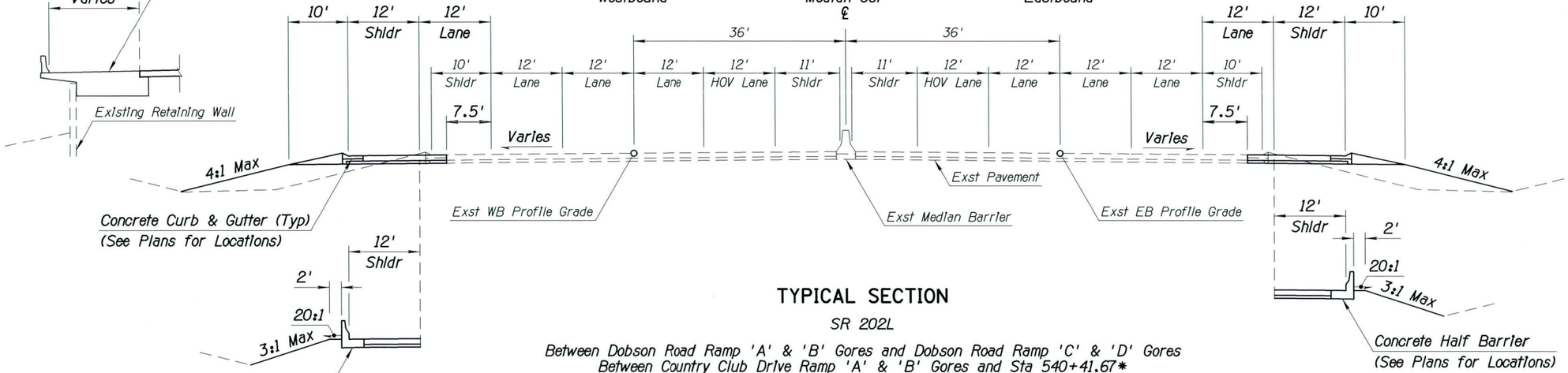
TYPICAL SECTION

SR 202L

Between SR 101L and Dobson Road Ramp 'A' & 'B' Gores
Between Dobson Road Ramp 'C' & 'D' Gores and Alma School Road Ramp 'A' & 'B' Gores
Between Alma School Road Ramp 'C' & 'D' Gores and McKellips Road Ramp 'A' & 'B' Gores





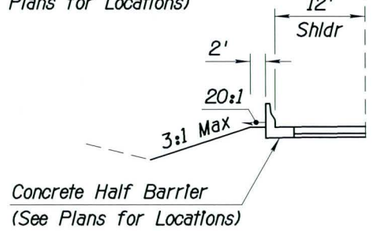


TYPICAL SECTION

SR 202L

Between Dobson Road Ramp 'A' & 'B' Gores and Dobson Road Ramp 'C' & 'D' Gores
Between Country Club Drive Ramp 'A' & 'B' Gores and Sta 540+41.67*

* Transitions from 12' Lanes to 11' Lanes
from Sta 540+41.67 to Sta 543+66.67
Eastbound side only.



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
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CHECKED	SDW	08-12

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ALTERNATIVE 1 (PREFERRED)
DESIGN SHEET
TYPICAL MAINLINE SECTIONS

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NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. G-2.01

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

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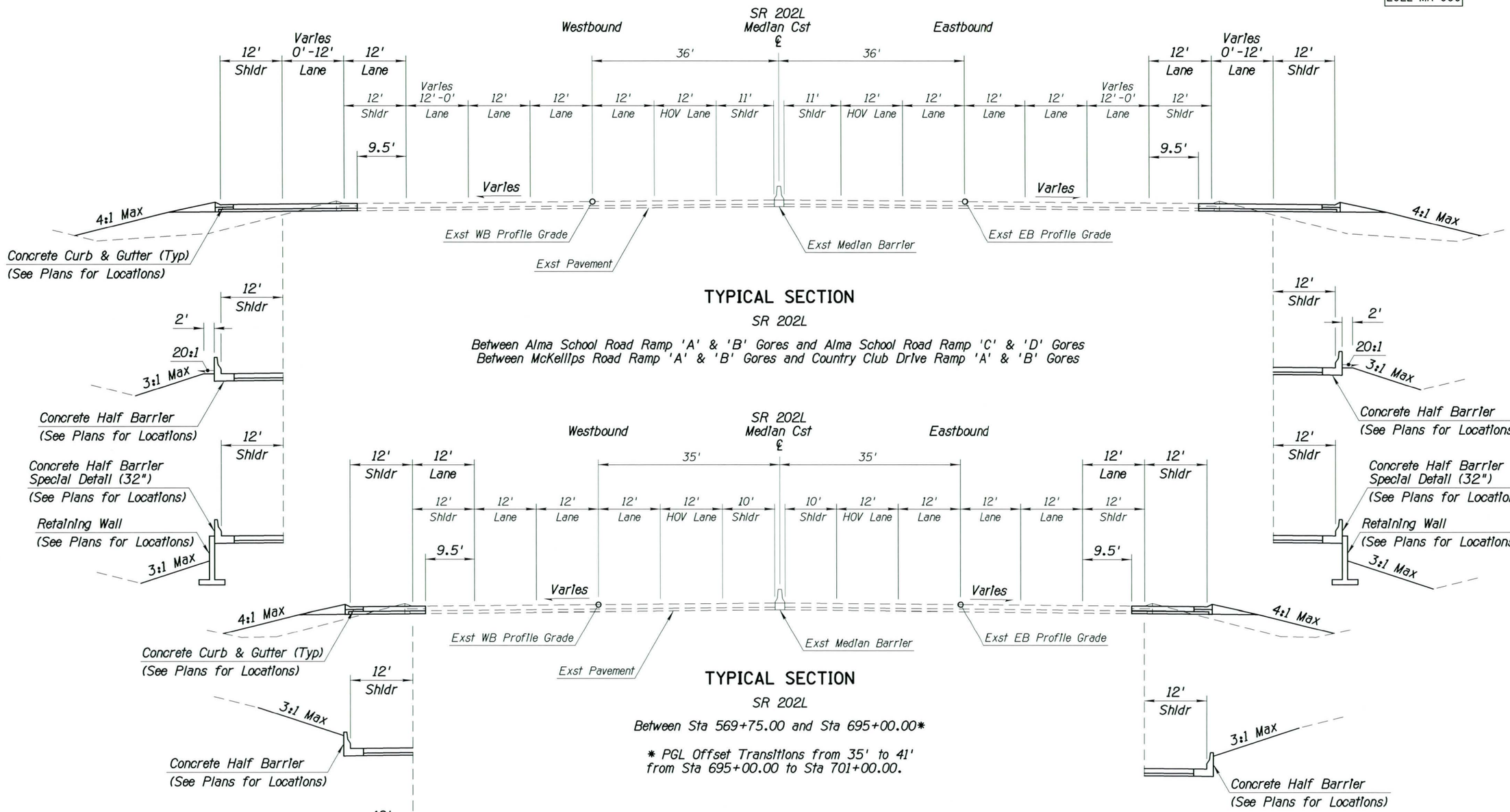
SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



TYPICAL SECTION

SR 202L

Between Alma School Road Ramp 'A' & 'B' Gores and Alma School Road Ramp 'C' & 'D' Gores
Between McKellips Road Ramp 'A' & 'B' Gores and Country Club Drive Ramp 'A' & 'B' Gores

TYPICAL SECTION

SR 202L

Between Sta 569+75.00 and Sta 695+00.00*

* PGL Offset Transitions from 35' to 41'
from Sta 695+00.00 to Sta 701+00.00.

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
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DESIGN SHEET
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NOT FOR CONSTRUCTION OR RECORDING

DWG NO. G-2.02

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA1-2.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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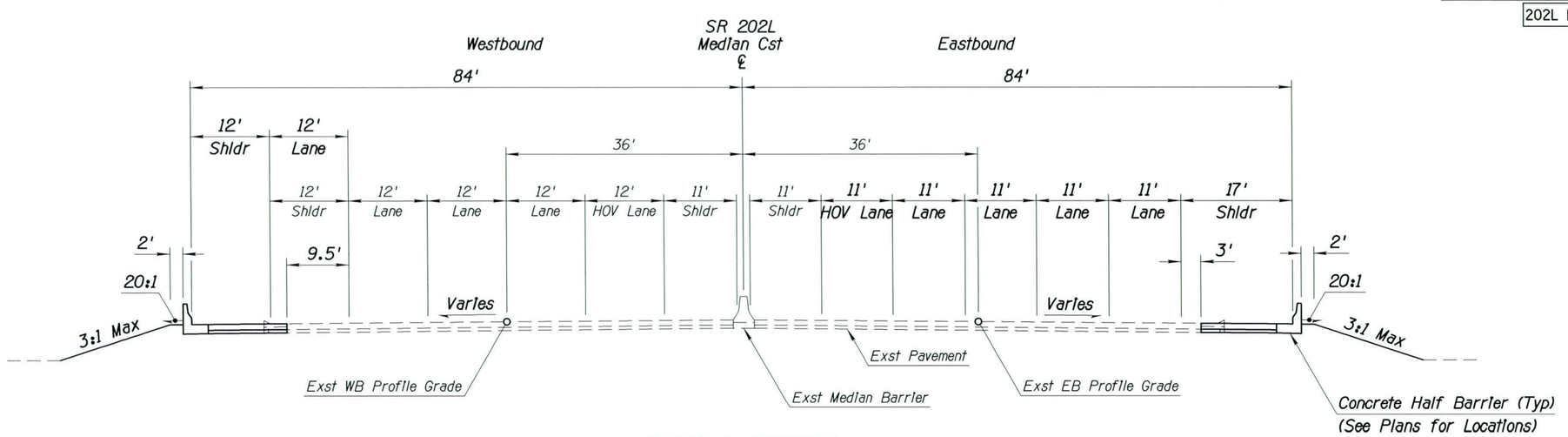
		202L MA 009			

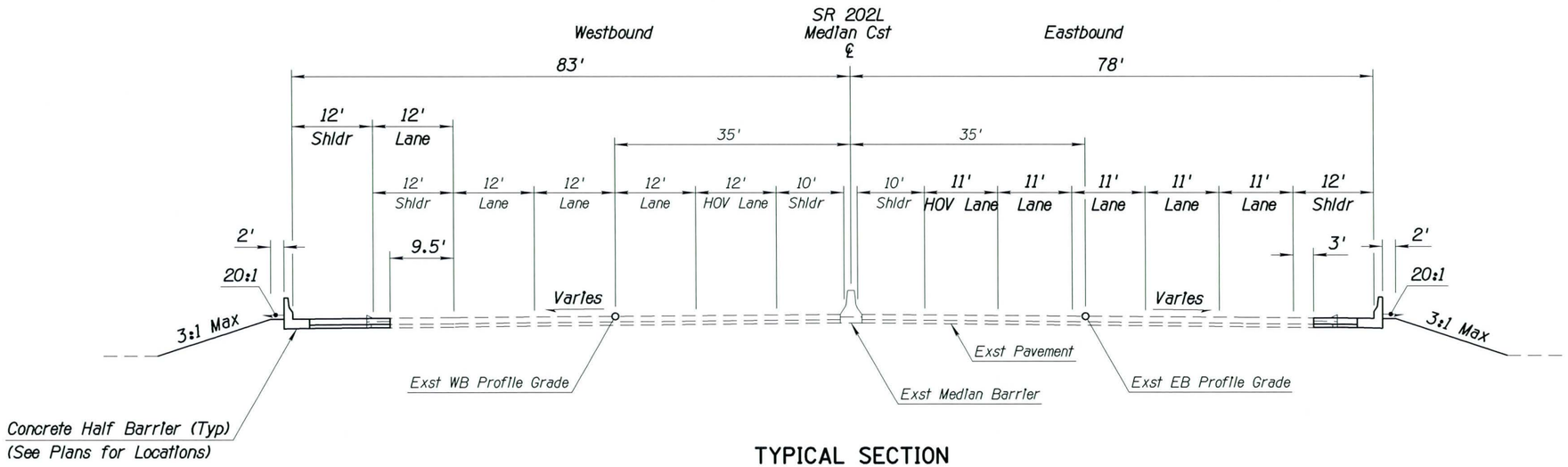


TYPICAL SECTION

SR 202L

Sta 543+66.67

PGL Offset Transitions from 36' to 35'
from Sta 545+00.00 to Sta 546+50.00
Begin Right Edge Transition at Sta 544+10.00



TYPICAL SECTION

Country Club Drive Ramp 'D' Back of Gore

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
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CHECKED	SDW	08-12

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ALTERNATIVE 1 (PREFERRED)
DESIGN SHEET
TYPICAL MAINLINE SECTIONS

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ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	G-2.03
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyAI-7.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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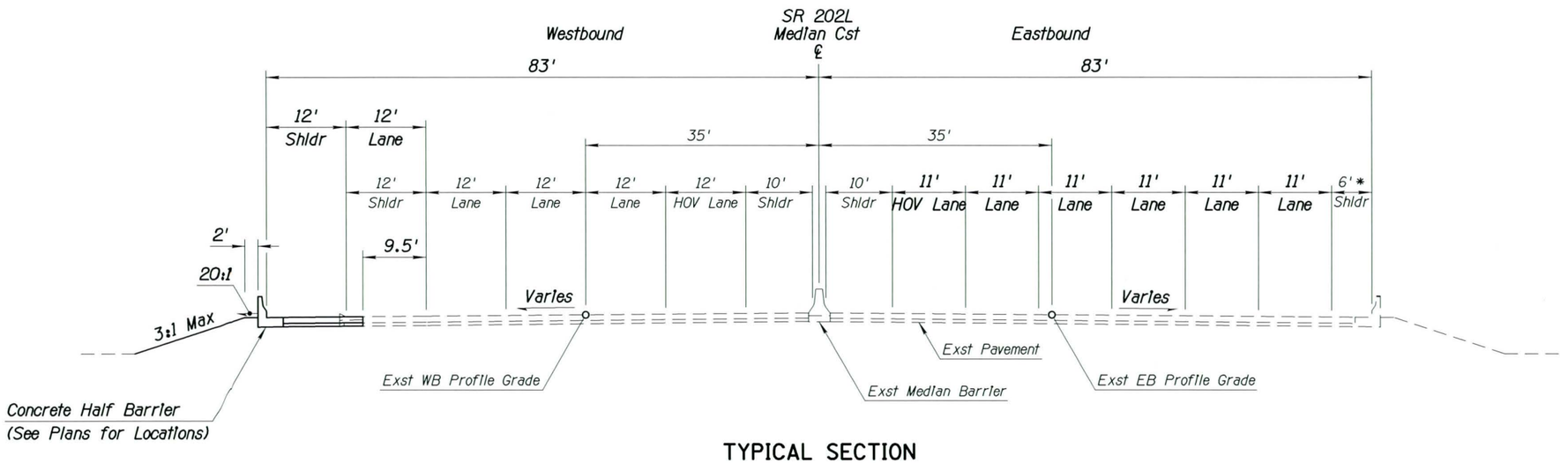
		202L MA 009			



TYPICAL SECTION

Country Club Drive Ramp 'D' Entrance to Mainline

** Outside Shoulder Transitions from 6' to 12' from Sta 555+00.00 to Sta 556+50.00*

APPENDIX E

	NAME	DATE
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CHECKED	SDW	08-12

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DESIGN SHEET
TYPICAL MAINLINE SECTIONS

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NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO. G-2.04
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA1-8.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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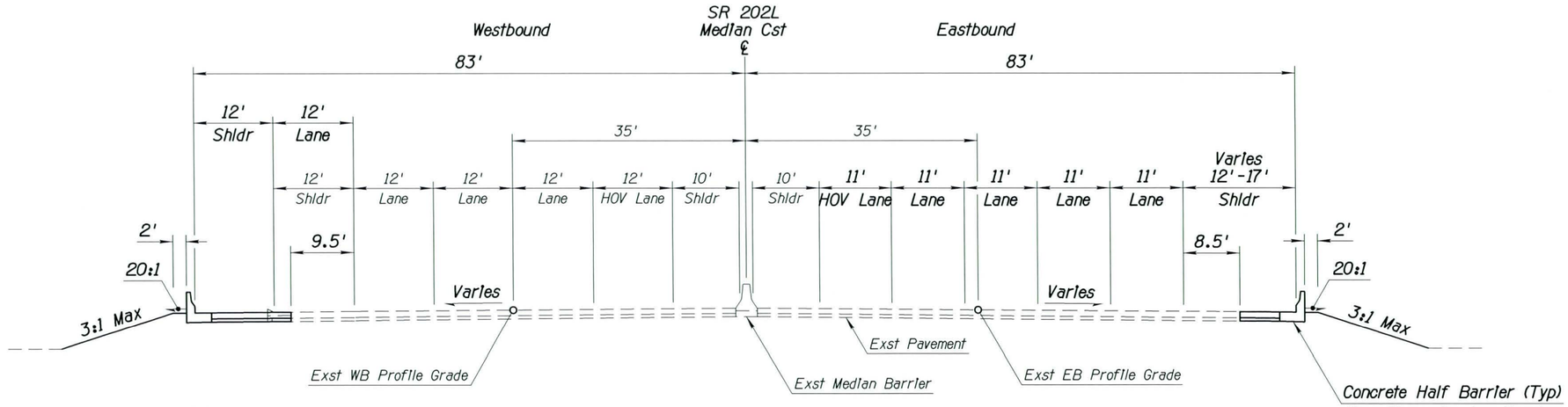
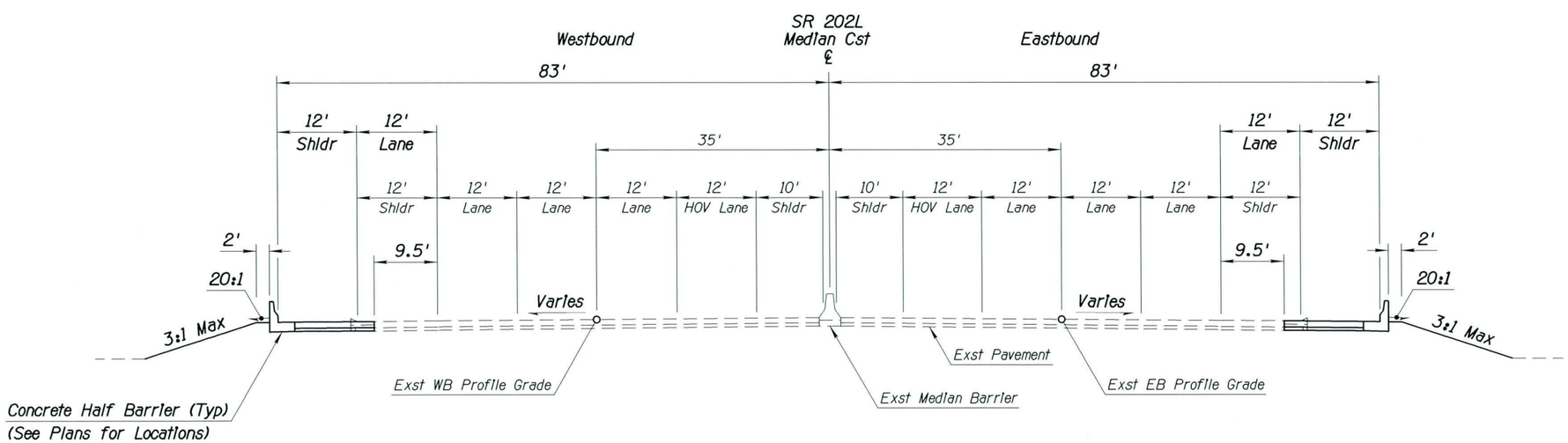


TYPICAL SECTION

Country Club Drive Ramp 'D' Lane Drop



TYPICAL SECTION

Transition Lanes from 11' to 12'
from Sta 566+50.00 to Sta 569+75.00

APPENDIX E

	NAME	DATE
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DESIGN SHEET
TYPICAL MAINLINE SECTIONS

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ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	G-2.05
TRACS NO. H8169 01L	NH-202-B(BEC)A	OF

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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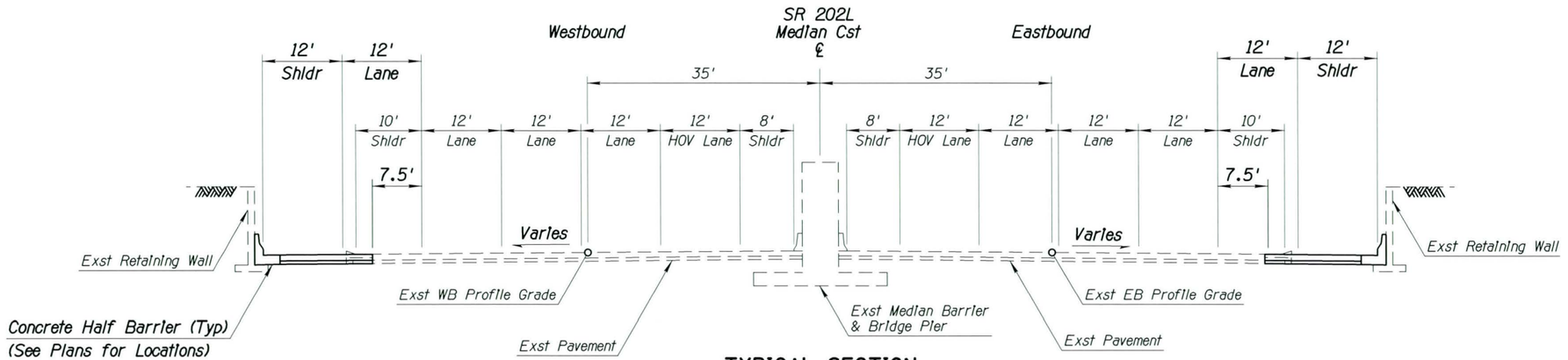
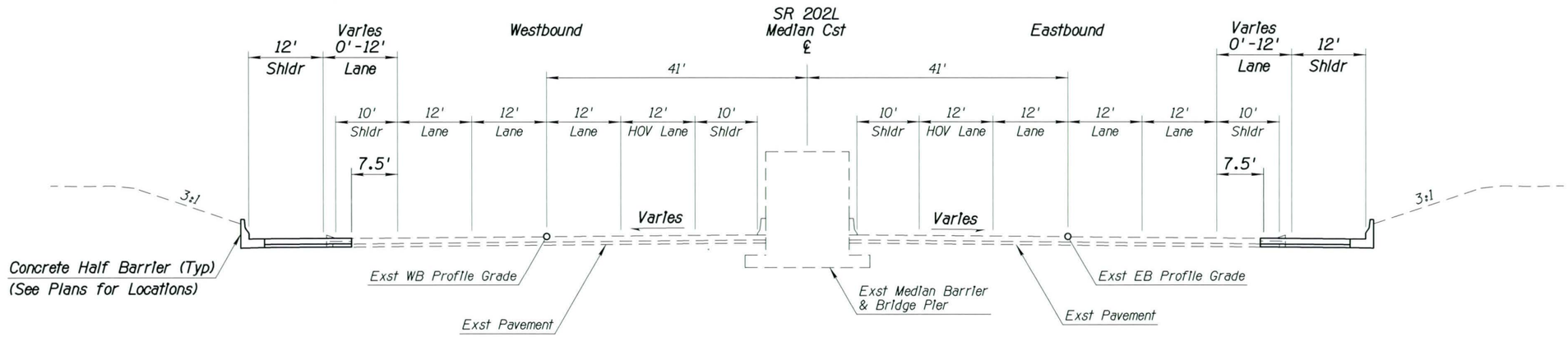


TYPICAL SECTION

SR 202L

At Center Street Underpass
At Mesa Drive Underpass
At Stapley Drive Underpass



TYPICAL SECTION

SR 202L

Sta 701+00.00 to Sta 723+10.00

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
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ALTERNATIVE 1 (PREFERRED)
DESIGN SHEET
TYPICAL MAINLINE SECTIONS

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ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	G-2.06
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA1-3.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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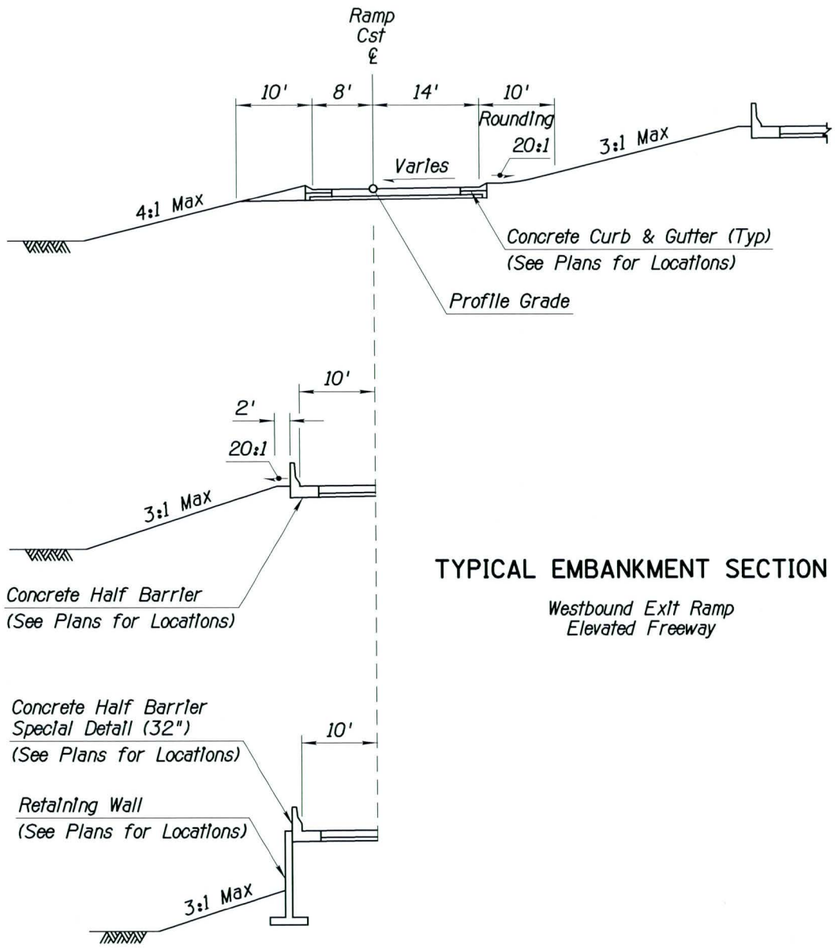
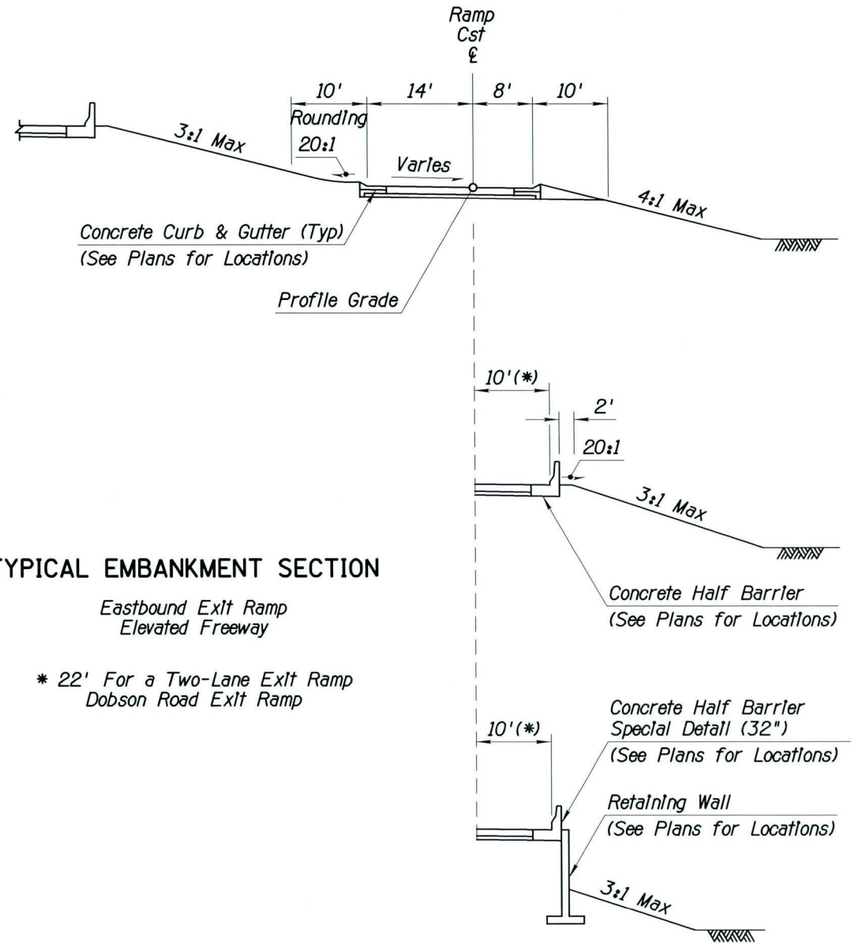


TYPICAL EMBANKMENT SECTION

Westbound Exit Ramp
Elevated Freeway



TYPICAL EMBANKMENT SECTION

Eastbound Exit Ramp
Elevated Freeway

* 22' For a Two-Lane Exit Ramp
Dobson Road Exit Ramp

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ALTERNATIVE 1 (PREFERRED)
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ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. G-2.07

TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

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

8/20/2012 U:\RM02\Prod\civ\h8169tyA1-4.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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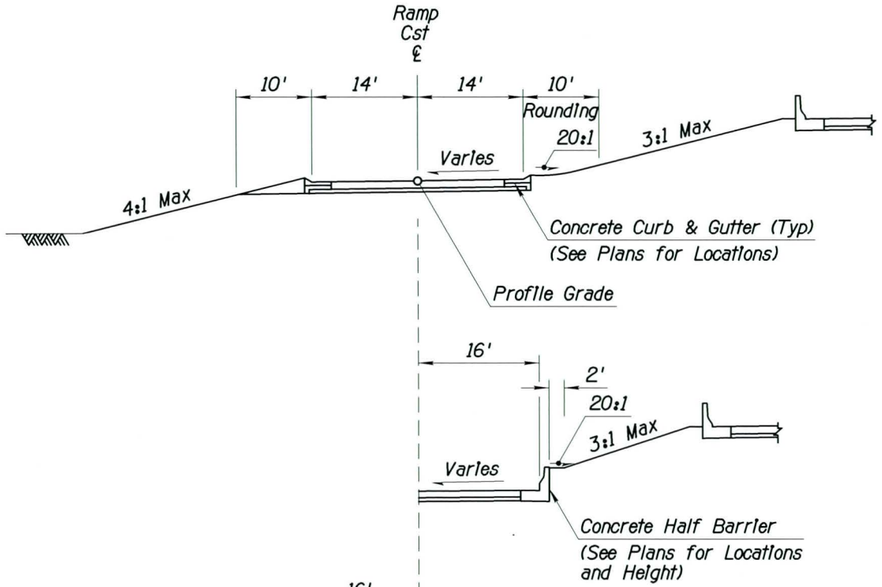
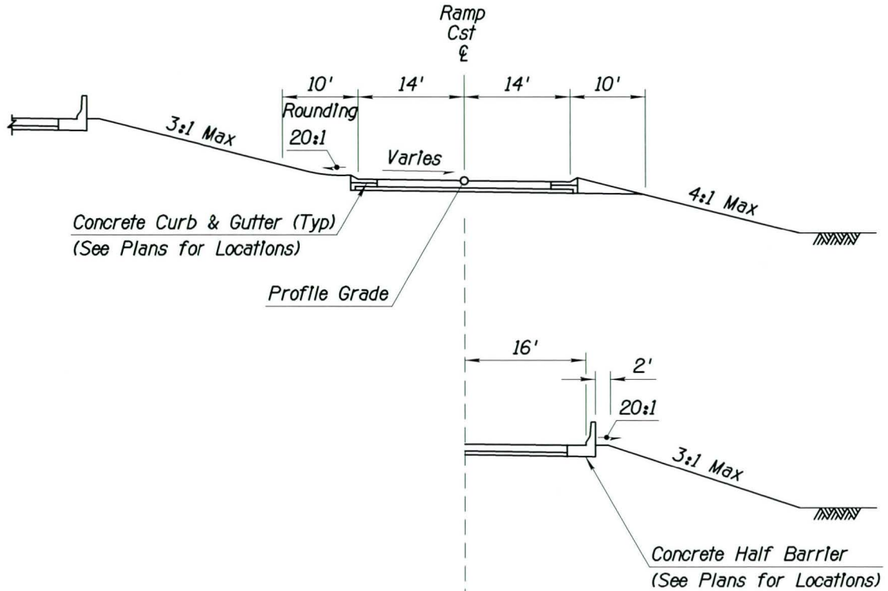
		202L MA 009			



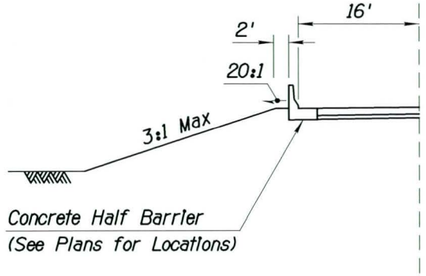
TYPICAL EMBANKMENT SECTION

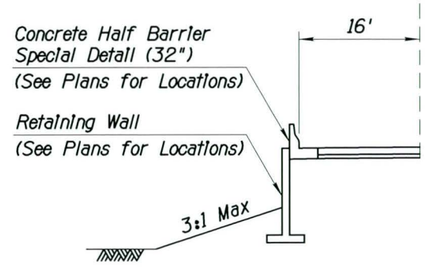
Westbound Entrance Ramp
Elevated Freeway

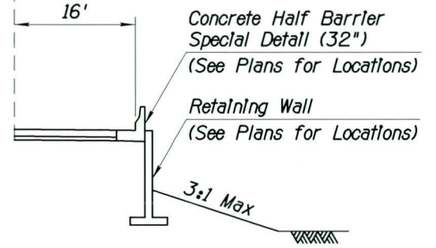


TYPICAL EMBANKMENT SECTION

Eastbound Entrance Ramp
Elevated Freeway







APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
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ALTERNATIVE 1 (PREFERRED)
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TYPICAL MAINLINE SECTIONS

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NOT FOR CONSTRUCTION OR RECORDING

DWG NO. G-2.08

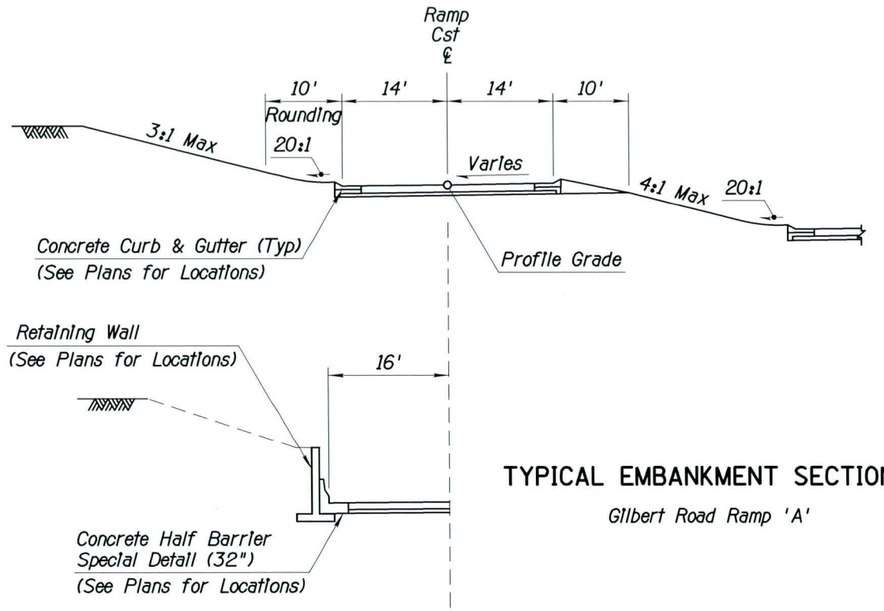
ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA1-5.dgn

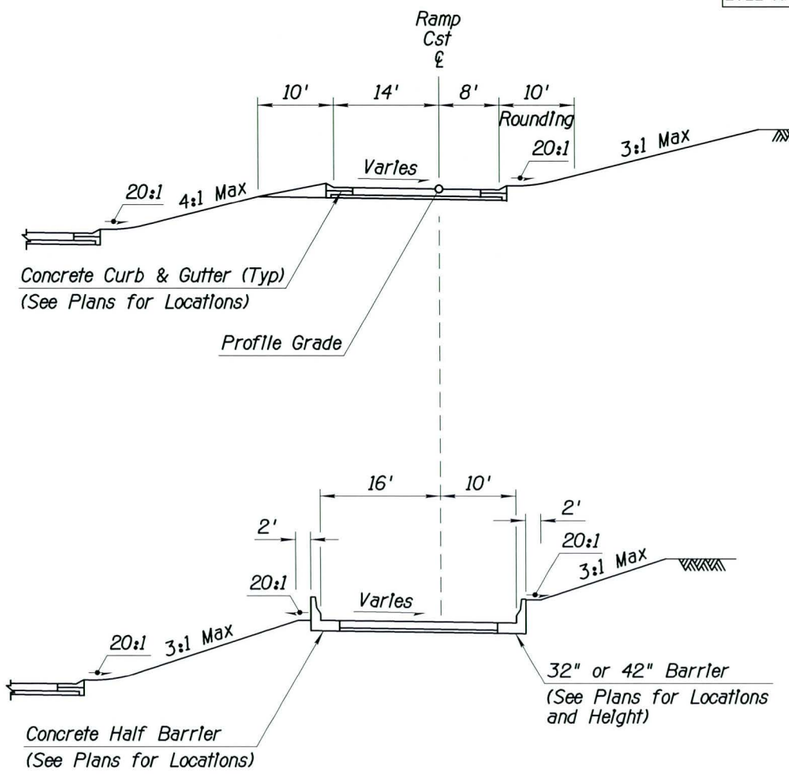
DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



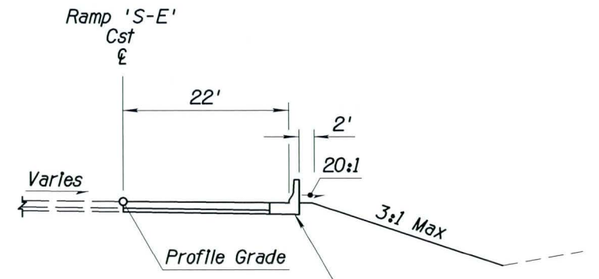
TYPICAL EMBANKMENT SECTION

Gilbert Road Ramp 'A'



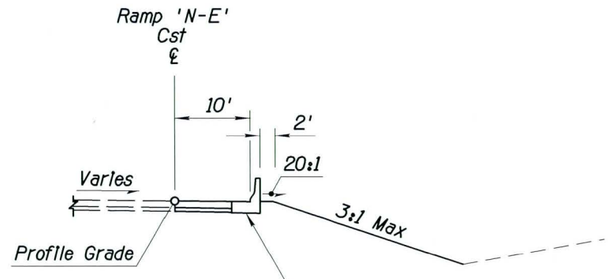
TYPICAL EMBANKMENT SECTION

Gilbert Road Ramp 'B'



TYPICAL SECTION

Ramp 'S-E'



TYPICAL SECTION

Ramp 'N-E'

APPENDIX E

	NAME	DATE
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ALTERNATIVE 1 (PREFERRED)
DESIGN SHEET
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ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	G-2.09
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

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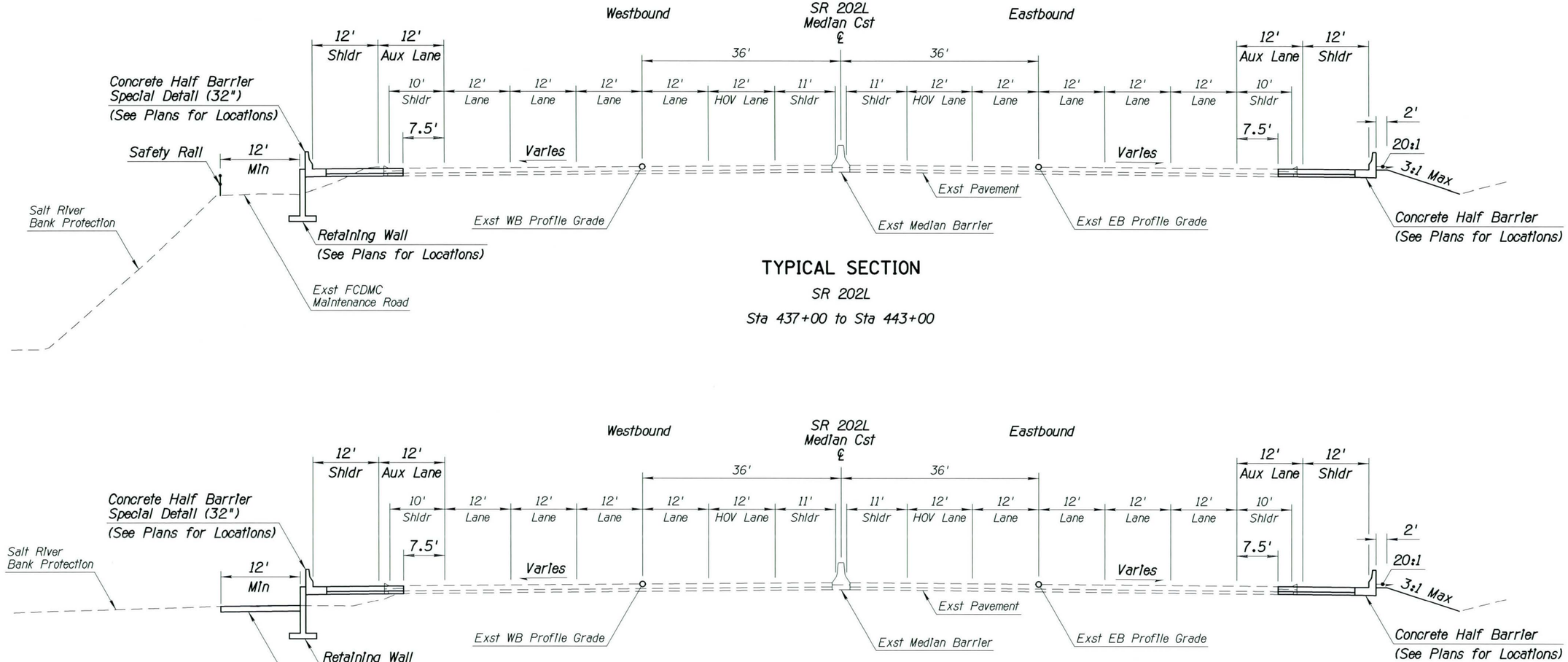
SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



TYPICAL SECTION

SR 202L

Sta 437+00 to Sta 443+00

TYPICAL SECTION

SR 202L

Sta 483+35 to Sta 488+00

APPENDIX E

	NAME	DATE
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ALTERNATIVE 1 (PREFERRED)
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DWG NO. G-2.10

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

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8/20/2012 U:\RM02\Prod\civ\h8169tyA1-10.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

All Coordinates Are Ground Coordinates And All Bearings Are Grid Bearings — G.A.F. = 1.00016

PLAN REF NO		P.I./P.O.T. STATION	COORDINATES												
600	Exst SR 202L Med Cst ℄	341+00.00	N=885965.856	E=706656.403	POT										
1101	Exst SR 202L Med Cst ℄	365+30.35	N=885295.960	E=708992.607	PI	SImple	Δ=31°57'27"	D=2°29'57"	R=2292.63	L=1278.74	T=656.48	Ext=92.14	e=0.053⅛ft	SEE SUPERELEVATION DIAGRAM	
	Exst SR 202L Med Cst ℄ Combined Curve	424+49.99	N=886939.467	E=714740.297	PI	TOTAL	Δ=35°32'02"			L=1721.35	T=884.87	T2=884.87		SEE SUPERELEVATION DIAGRAM	
20004	Exst SR 202L Med Cst ℄	417+89.36	N=886751.193	E=714081.862	SPI	Spiral	Δ_S=3°45'00"	"o"=1.64	t=149.98	Ls=300.00	LT=200.04	ST=100.04		SEE SUPERELEVATION DIAGRAM	
1104	Exst SR 202L Med Cst ℄	424+61.45	N=886977.863	E=714714.666	PI	SImple	Δ=28°02'02"	D=2°30'00"	R=2291.83	L=1121.35	T=572.13	Ext=70.33	e=0.053⅛ft	SEE SUPERELEVATION DIAGRAM	
20008	Exst SR 202L Med Cst ℄	431+10.71	N=887475.350	E=715166.691	SPI	Spiral	Δ_S=3°45'00"	"o"=1.64	t=149.98	Ls=300.00	LT=200.04	ST=100.04		SEE SUPERELEVATION DIAGRAM	
	Exst SR 202L Med Cst ℄ Combined Curve	454+35.58	N=889331.022	E=716643.223	PI	TOTAL	Δ=40°58'05"			L=2348.40	T=1220.66	T2=1220.66		SEE SUPERELEVATION DIAGRAM	
20011	Exst SR 202L Med Cst ℄	444+61.41	N=888532.361	E=716007.740	SPI	Spiral	Δ_S=3°00'00"	"o"=1.31	t=149.99	Ls=300.00	LT=200.03	ST=100.03		SEE SUPERELEVATION DIAGRAM	
1111	Exst SR 202L Med Cst ℄	454+63.77	N=889283.022	E=716672.073	PI	SImple	Δ=34°58'05"	D=2°00'00"	R=2864.79	L=1748.40	T=902.39	Ext=138.76	e=0.048⅛ft	SEE SUPERELEVATION DIAGRAM	
20015	Exst SR 202L Med Cst ℄	464+09.81	N=889517.425	E=717646.692	SPI	Spiral	Δ_S=3°00'00"	"o"=1.31	t=149.99	Ls=300.00	LT=200.03	ST=100.03		SEE SUPERELEVATION DIAGRAM	
	Exst SR 202L Med Cst ℄ Combined Curve	474+63.34	N=889713.045	E=718699.782	PI	TOTAL	Δ=33°39'45"			L=1482.08	T=758.56	T2=758.56		SEE SUPERELEVATION DIAGRAM	
20018	Exst SR 202L Med Cst ℄	469+62.41	N=889618.359	E=718190.054	SPI	Spiral	Δ_S=5°24'00"	"o"=2.83	t=179.95	Ls=360.00	LT=240.11	ST=120.10		SEE SUPERELEVATION DIAGRAM	
1118	Exst SR 202L Med Cst ℄	474+68.48	N=889757.257	E=718676.909	PI	SImple	Δ=22°51'45"	D=3°00'00"	R=1909.86	L=762.08	T=386.18	Ext=38.65	e=0.057⅛ft	SEE SUPERELEVATION DIAGRAM	
20022	Exst SR 202L Med Cst ℄	479+64.48	N=890074.396	E=719071.552	SPI	Spiral	Δ_S=5°24'00"	"o"=2.83	t=179.95	Ls=360.00	LT=240.11	ST=120.10		SEE SUPERELEVATION DIAGRAM	
1125	Exst SR 202L Med Cst ℄	515+14.93	N=892549.161	E=721617.676	PI	SImple	Δ=23°19'13"	D=0°45'00"	R=7639.44	L=3109.37	T=1576.51	Ext=160.97	e=0.023⅛ft	SEE SUPERELEVATION DIAGRAM	
1128	Exst SR 202L Med Cst ℄	538+96.62	N=893413.004	E=723883.956	PI	SImple	Δ=18°58'39"	D=2°00'00"	R=2864.79	L=948.87	T=478.82	Ext=39.74	e=0.048⅛ft	SEE SUPERELEVATION DIAGRAM	
1131	Exst SR 202L Med Cst ℄	553+04.26	N=894320.476	E=724971.479	PI	SImple	Δ=33°45'00"	D=3°30'00"	R=1637.02	L=964.28	T=496.58	Ext=73.66	e=0.060⅛ft	SEE SUPERELEVATION DIAGRAM	
1134	Exst SR 202L Med Cst ℄	574+19.53	N=894548.066	E=727103.529	PI	SImple	Δ=57°54'04"	D=3°30'00"	R=1637.02	L=1654.32	T=905.57	Ext=233.78	e=0.060⅛ft	SEE SUPERELEVATION DIAGRAM	
1137	Exst SR 202L Med Cst ℄	602+44.12	N=897227.610	E=728410.764	PI	SImple	Δ=64°11'39"	D=3°00'00"	R=1909.86	L=2139.81	T=1197.92	Ext=344.60	e=0.059⅛ft	SEE SUPERELEVATION DIAGRAM	
1140	Exst SR 202L Med Cst ℄	656+00.00	N=897208.018	E=734022.639	PI										
1141	Exst SR 202L Med Cst ℄	680+01.74	N=897182.168	E=736424.237	PI	SImple	Δ=4°29'19"	D=0°15'00"	R=22918.31	L=1795.45	T=898.18	Ext=17.59	e=NC	SEE SUPERELEVATION DIAGRAM	
1144	Exst SR 202L Med Cst ℄	718+42.32	N=896840.326	E=740250.499	PI	SImple	Δ=66°41'38"	D=2°30'00"	R=2291.83	L=2667.75	T=1508.14	Ext=451.70	e=0.056⅛ft	SEE SUPERELEVATION DIAGRAM	
1147	Exst SR 202L Med Cst ℄	761+66.53	N=900950.245	E=742473.790	POT										
35009	Exst Ramp 'W-S' Cst ℄	23+09.25	N=885877.066	E=710806.613	POT										
1251	Exst Ramp 'W-S' Cst ℄	38+09.20	N=885566.298	E=709339.212	PI	SImple	Δ=48°28'23"	D=7°38'22"	R=750.00	L=634.51	T=337.64	Ext=72.50	e=0.099⅛ft	SEE SUPERELEVATION DIAGRAM	
1254	Exst Ramp 'W-S' Cst ℄	71+93.82	N=887604.539	E=706586.246	PI	SImple	Δ=144°53'14"	D=7°38'22"	R=750.00	L=1896.57	T=2370.57	Ext=1736.38	e=0.099⅛ft	SEE SUPERELEVATION DIAGRAM	
1257	Exst Ramp 'W-S' Cst ℄	83+68.75	N=883789.904	E=707853.125	PI	SImple	Δ=19°16'20"	D=1°30'00"	R=3819.72	L=1284.82	T=648.54	Ext=54.67	e=0.023⅛ft	SEE SUPERELEVATION DIAGRAM	
35000	Exst Ramp 'W-S' Cst ℄	90+05.04	N=883141.448	E=707842.933	PT										
35500	Exst Ramp 'W-N' Cst ℄	16+49.49	N=885918.017	E=708884.325	POT										
1260	Exst Ramp 'W-N' Cst ℄	25+73.76	N=886530.646	E=708192.253	PI	SImple	Δ=45°32'30"	D=5°43'46"	R=1000.00	L=794.85	T=419.76	Ext=84.53	e=0.088⅛ft	SEE SUPERELEVATION DIAGRAM	
35504	Exst Ramp 'W-N' Cst ℄	49+38.24	N=888936.617	E=708068.566	POT										
33000	Exst Ramp 'S-E' Cst ℄	10+00.21	N=889066.157	E=707907.473	POT										
1263	Exst Ramp 'S-E' Cst ℄	53+71.92	N=884708.150	E=707561.577	PI	SImple	Δ=112°02'36"	D=4°40'38"	R=1225.00	L=2395.52	T=1817.62	Ext=966.89	e=0.081⅛ft	SEE SUPERELEVATION DIAGRAM	
1266	Exst Ramp 'S-E' Cst ℄	78+24.45	N=885818.757	E=711082.830	PI	SImple	Δ=1°32'52"	D=0°45'00"	R=7639.44	L=206.38	T=103.20	Ext=0.70	e=NC	SEE SUPERELEVATION DIAGRAM	
33006	Exst Ramp 'S-E' Cst ℄	79+27.63	N=885847.129	E=711182.051	PT										

CURVE DATA TABLE

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	RRD	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
GEOMETRIC DATA SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-1.01

TRACS NO. H8169 01L | NH-202-B(BEC)A | OF

8/20/2012 U:\RM02\Prod\civ\h8169g01.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

All Coordinates Are Ground Coordinates And All Bearings Are Grid Bearings — G.A.F. = 1.00016

PLAN REF NO		P.I./P.O.T. STATION	COORDINATES											
34500	Exst Ramp 'N-E' Cst ℄	10+00.19	N=883596.551	E=708074.622	POT									
1269	Exst Ramp 'N-E' Cst ℄	22+43.86	N=884817.493	E=708311.302	PI	Simple	Δ=50°56'29"	D=7°38'22"	R=750.00	L=666.82	T=357.26	Ext=80.74	e=0.099⅛ft	SEE SUPERELEVATION DIAGRAM
1272	Exst Ramp 'N-E' Cst ℄	26+77.26	N=885044.006	E=708735.738	PI	Simple	Δ=9°26'20"	D=3°49'11"	R=1500.00	L=247.11	T=123.84	Ext=5.10	e=0.100⅛ft	SEE SUPERELEVATION DIAGRAM
34501	Exst Ramp 'N-E' Cst ℄	43+24.07	N=885570.784	E=710296.613	POT									
40100	Exst Dobson Rd Ramp 'A' Cst ℄	0+00.00	N=886304.018	E=712256.107	PC									
1148	Exst Dobson Rd Ramp 'A' Cst ℄	1+14.57	N=886335.516	E=712366.260	PI	Simple	Δ=1°08'44"	D=0°30'00"	R=11459.16	L=229.13	T=114.57	Ext=0.57	e=NC	SEE SUPERELEVATION DIAGRAM
1151	Exst Dobson Rd Ramp 'A' Cst ℄	16+94.94	N=886800.296	E=713876.751	PI	Simple	Δ=11°52'12"	D=2°00'00"	R=2864.79	L=593.51	T=297.82	Ext=15.44	e=0.031⅛ft	SEE SUPERELEVATION DIAGRAM
1154	Exst Dobson Rd Ramp 'A' Cst ℄	23+32.36	N=887110.096	E=714436.259	POT									
1155	Exst Dobson Rd Ramp 'B' Cst ℄	0+00.00	N=886254.788	E=712607.720	POT									
1156	Exst Dobson Rd Ramp 'B' Cst ℄	18+85.45	N=886645.426	E=714452.258	POT									
1157	Exst Dobson Rd Ramp 'C' Cst ℄	0+00.00	N=887098.103	E=714436.671	POT									
1158	Exst Dobson Rd Ramp 'C' Cst ℄	4+84.00	N=887354.412	E=714847.234	PI	Simple	Δ=13°21'49"	D=2°30'00"	R=2291.83	L=534.55	T=268.49	Ext=15.67	e=0.040⅛ft	SEE SUPERELEVATION DIAGRAM
1161	Exst Dobson Rd Ramp 'C' Cst ℄	14+39.76	N=888035.966	E=715520.754	PI	Simple	Δ=6°09'06"	D=1°00'00"	R=5729.58	L=615.16	T=307.88	Ext=8.27	e=0.029⅛ft	SEE SUPERELEVATION DIAGRAM
40305	Exst Dobson Rd Ramp 'C' Cst ℄	17+47.05	N=888276.884	E=715712.449	PT									
1156	Exst Dobson Rd Ramp 'D' Cst ℄	0+00.00	N=886645.426	E=714452.258	POT									
1164	Exst Dobson Rd Ramp 'D' Cst ℄	5+56.00	N=886939.864	E=714923.896	PI	Simple	Δ=23°18'40"	D=5°00'00"	R=1145.92	L=466.22	T=236.38	Ext=24.13	e=0.056⅛ft	SEE SUPERELEVATION DIAGRAM
1167	Exst Dobson Rd Ramp 'D' Cst ℄	16+28.27	N=887826.664	E=715538.238	PI	Simple	Δ=3°47'46"	D=1°00'00"	R=5729.58	L=379.60	T=189.87	Ext=3.15	e=NC	SEE SUPERELEVATION DIAGRAM
40405	Exst Dobson Rd Ramp 'D' Cst ℄	18+18.00	N=887975.241	E=715656.459	PT									
1170	Exst Alma School Rd Ramp 'A' Cst ℄	0+00.00	N=889418.081	E=717086.277	POT									
1171	Exst Alma School Rd Ramp 'A' Cst ℄	5+90.50	N=889645.946	E=717631.041	PI	Simple	Δ=6°37'20"	D=1°00'00"	R=5729.58	L=662.22	T=331.48	Ext=9.58	e=0.048⅛ft	SEE SUPERELEVATION DIAGRAM
1174	Exst Alma School Rd Ramp 'A' Cst ℄	14+97.08	N=889897.201	E=718502.879	POT									
41200	Exst Alma School Rd Ramp 'B' Cst ℄	0+00.00	N=889066.062	E=716721.882	POT									
1175	Exst Alma School Rd Ramp 'B' Cst ℄	3+99.24	N=889280.154	E=717058.864	PI	Simple	Δ=23°36'51"	D=3°00'00"	R=1909.86	L=787.14	T=399.24	Ext=41.28	e=0.057⅛ft	SEE SUPERELEVATION DIAGRAM
1178	Exst Alma School Rd Ramp 'B' Cst ℄	13+42.73	N=889426.465	E=718002.408	PI	Simple	Δ=7°07'05"	D=1°00'00"	R=5729.58	L=711.80	T=356.36	Ext=11.07	e=NC	SEE SUPERELEVATION DIAGRAM
1181	Exst Alma School Rd Ramp 'B' Cst ℄	18+77.81	N=889573.598	E=718517.818	POT									
1182	Exst Alma School Rd Ramp 'C' Cst ℄	0+00.00	N=889885.227	E=718503.677	POT									
1183	Exst Alma School Rd Ramp 'C' Cst ℄	10+92.25	N=890500.213	E=719406.345	PI	Simple	Δ=9°55'09"	D=2°00'00"	R=2864.79	L=495.95	T=248.60	Ext=10.77	e=0.048⅛ft	SEE SUPERELEVATION DIAGRAM
41302	Exst Alma School Rd Ramp 'C' Cst ℄	13+39.61	N=890673.482	E=719584.611	PT									

CURVE DATA TABLE

APPENDIX E

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TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
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ARIZONA DEPARTMENT OF TRANSPORTATION
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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
GEOMETRIC DATA SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-1.02

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ____ OF ____

8/20/2012 U:\RM02\Prod\civ\h8169g02.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

All Coordinates Are Ground Coordinates And All Bearings Are Grid Bearings — G.A.F. = 1.00016

PLAN REF NO		P.I./P.O.T. STATION	COORDINATES											
1186	Exst Alma School Rd Ramp 'D' Cst ℄	0+00.00	N=889561.602	E=718518.108	POT									
1187	Exst Alma School Rd Ramp 'D' Cst ℄	5+43.00	N=889813.107	E=718999.350	PI	Simple	Δ=21°03'54"	D=3°30'00"	R=1637.02	L=601.86	T=304.36	Ext=28.05	e=0.043'/ft	SEE SUPERELEVATION DIAGRAM
1190	Exst Alma School Rd Ramp 'D' Cst ℄	13+70.38	N=890439.441	E=719550.425	PI	Simple	Δ=4°28'17"	D=1°00'00"	R=5729.58	L=447.15	T=223.69	Ext=4.36	e=NC	SEE SUPERELEVATION DIAGRAM
41405	Exst Alma School Rd Ramp 'D' Cst ℄	15+93.84	N=890595.348	E=719710.827	PT									
42101	Exst McKellips Rd Ramp 'A' Cst ℄	0+00.00	N=891091.816	E=720015.007	PC									
1193	Exst McKellips Rd Ramp 'A' Cst ℄	2+50.15	N=891266.170	E=720194.388	PI	Simple	Δ=5°00'00"	D=1°00'00"	R=5729.58	L=499.99	T=250.15	Ext=5.46	e=NC	SEE SUPERELEVATION DIAGRAM
1196	Exst McKellips Rd Ramp 'A' Cst ℄	9+96.02	N=891830.903	E=720682.098	PI	Simple	Δ=12°04'04"	D=2°30'00"	R=2291.83	L=482.71	T=242.25	Ext=12.77	e=0.040'/ft	SEE SUPERELEVATION DIAGRAM
1199	Exst McKellips Rd Ramp 'A' Cst ℄	15+08.97	N=892141.533	E=721092.558	POT									
1200	Exst McKellips Rd Ramp 'B' Cst ℄	0+00.00	N=891023.401	E=720151.223	POT									
1201	Exst McKellips Rd Ramp 'B' Cst ℄	7+41.43	N=891501.822	E=720717.643	PI	Simple	Δ=3°00'00"	D=1°00'00"	R=5729.58	L=299.99	T=150.03	Ext=1.96	e=NC	SEE SUPERELEVATION DIAGRAM
1204	Exst McKellips Rd Ramp 'B' Cst ℄	12+18.36	N=891828.264	E=721065.443	PI	Simple	Δ=8°49'52"	D=2°30'00"	R=2291.83	L=353.25	T=176.97	Ext=6.82	e=0.035'/ft	SEE SUPERELEVATION DIAGRAM
1207	Exst McKellips Rd Ramp 'B' Cst ℄	15+92.08	N=892039.553	E=721374.550	POT									
1208	Exst Country Club Dr Ramp 'A' Cst ℄	0+00.00	N=892866.259	E=722322.074	POT									
1209	Exst Country Club Dr Ramp 'A' Cst ℄	10+31.17	N=893350.279	E=723232.588	PI	Simple	Δ=7°07'45"	D=2°00'00"	R=2864.79	L=356.46	T=178.46	Ext=5.55	e=0.042'/ft	SEE SUPERELEVATION DIAGRAM
1212	Exst Country Club Dr Ramp 'A' Cst ℄	14+29.48	N=893492.311	E=723605.207	POT									
43201	Exst Country Club Dr Ramp 'B' Cst ℄	0+00.00	N=892460.570	E=721893.944	PC									
1213	Exst Country Club Dr Ramp 'B' Cst ℄	5+33.12	N=892703.630	E=722368.437	PI	Simple	Δ=7°59'02"	D=0°45'00"	R=7639.44	L=1064.52	T=533.12	Ext=18.58	e=0.023'/ft	SEE SUPERELEVATION DIAGRAM
1216	Exst Country Club Dr Ramp 'B' Cst ℄	18+32.95	N=893130.377	E=723598.038	POT									

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

1212	Exst Country Club Dr Ramp 'C' Cst ℄	0+00.00	N=893492.311	E=723605.207	POT									
1217	Exst Country Club Dr Ramp 'C' Cst ℄	3+33.66	N=893621.084	E=723913.016	PI	Simple	Δ=15°57'37"	D=6°00'34"	R=953.43	L=265.59	T=133.66	Ext=9.32	e=0.050'/ft	SEE SUPERELEVATION DIAGRAM
1220	Exst Country Club Dr Ramp 'C' Cst ℄	16+17.92	N=894424.482	E=724917.167	PI	Simple	Δ=36°34'09"	D=3°30'00"	R=1637.02	L=1044.83	T=540.90	Ext=87.05	e=0.060'/ft	SEE SUPERELEVATION DIAGRAM
1223	Exst Country Club Dr Ramp 'C' Cst ℄	23+00.40	N=894450.762	E=725636.147	POT									
1216	Exst Country Club Dr Ramp 'D' Cst ℄	0+00.00	N=893130.377	E=723598.038	POT									
1224	Exst Country Club Dr Ramp 'D' Cst ℄	4+26.61	N=893282.325	E=723996.671	PI	Simple	Δ=23°09'09"	D=6°00'00"	R=954.93	L=385.88	T=195.61	Ext=19.83	e=0.050'/ft	SEE SUPERELEVATION DIAGRAM
1227	Exst Country Club Dr Ramp 'D' Cst ℄	16+41.69	N=894130.374	E=724874.297	PI	Simple	Δ=23°16'41"	D=5°15'00"	R=1091.35	L=443.39	T=224.80	Ext=22.91	e=0.060'/ft	SEE SUPERELEVATION DIAGRAM
43405	Exst Country Club Dr Ramp 'D' Cst ℄	18+60.28	N=894209.981	E=725084.525	PT									
45101	Exst Gilbert Rd Ramp 'A' Cst ℄	10+14.37	N=897232.298	E=736489.411	PC									
1230	Exst Gilbert Rd Ramp 'A' Cst ℄	14+21.05	N=897210.892	E=736895.528	PI	Simple	Δ=6°05'40"	D=0°45'00"	R=7639.44	L=812.59	T=406.68	Ext=10.82	e=NC	SEE SUPERELEVATION DIAGRAM
1233	Exst Gilbert Rd Ramp 'A' Cst ℄	29+81.90	N=897294.723	E=738454.896	PI	Simple	Δ=37°49'49"	D=5°00'00"	R=1145.92	L=756.61	T=392.67	Ext=65.41	e=0.051'/ft	SEE SUPERELEVATION DIAGRAM
1236	Exst Gilbert Rd Ramp 'A' Cst ℄	37+61.52	N=896833.925	E=739119.058	PI	Simple	Δ=38°06'23"	D=7°00'00"	R=818.51	L=544.38	T=282.69	Ext=47.44	e=0.053'/ft	SEE SUPERELEVATION DIAGRAM
1239	Exst Gilbert Rd Ramp 'A' Cst ℄	41+86.91	N=896860.035	E=739564.674	POT									

CURVE DATA TABLE

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	RRD	08-12
CHECKED	SDW	08-12

TRANSPORTATION

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
GEOMETRIC DATA SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-1.03

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169g03.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

PLAN REF NO		P.I./P.O.T. STATION	COORDINATES			All Coordinates Are Ground Coordinates And All Bearings Are Grid Bearings								G.A.F. = 1.00016
45201	Exst Gilbert Rd Ramp 'B' Cst ℄	9+75.44	N=897053.995	E=737192.204	PC									
1240	Exst Gilbert Rd Ramp 'B' Cst ℄	13+25.47	N=897004.585	E=737538.726	PI	Simple	Δ=1°45'00"	D=0°15'00"	R=22918.31	L=700.00	T=350.03	Ext=2.67	e=NC	SEE SUPERELEVATION DIAGRAM
1243	Exst Gilbert Rd Ramp 'B' Cst ℄	26+75.88	N=896773.213	E=738869.228	PI	Simple	Δ=13°13'06"	D=2°30'00"	R=2291.83	L=528.73	T=265.55	Ext=15.33	e=0.028⅛ft	SEE SUPERELEVATION DIAGRAM
1246	Exst Gilbert Rd Ramp 'B' Cst ℄	33+68.83	N=896813.884	E=739563.347	POT									

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ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A

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DWG NO. C-1.04

___ OF ___

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

All Coordinates Are Ground Coordinates And All Bearings Are Grid Bearings — G.A.F. = 1.00016

PLAN REF NO		P.I./P.O.T. STATION	COORDINATES											
74500	Ramp 'N-E' Cst ℄	45+70.34	N=885329.765	E=709582.460	PC									
NE-1	Ramp 'N-E' Cst ℄	47+22.83	N=885378.526	E=709726.943	PI	Simple	Δ=1°08'37"	D=0°22'30"	R=15278.88	L=304.97	T=152.49	Ext=0.76	e=NC	SEE SUPERELEVATION DIAGRAM
74502	Ramp 'N-E' Cst ℄	48+75.31	N=885424.394	E=709872.370	PT									
75002	Ramp 'W-S' Cst ℄	31+65.62	N=885928.277	E=710942.060	PC									
WS-1	Ramp 'W-S' Cst ℄	34+81.54	N=885841.424	E=710638.318	PI	Simple	Δ=4°00'00"	D=0°38'00"	R=9046.70	L=631.57	T=315.92	Ext=5.51	e=NC	SEE SUPERELEVATION DIAGRAM
75000	Ramp 'W-S' Cst ℄	37+97.20	N=885775.971	E=710329.257	PT									
80100	Dobson Rd Ramp 'A' Cst ℄	16+91.00	N=886504.974	E=712915.245	PC									
DA-1	Dobson Rd Ramp 'A' Cst ℄	18+93.70	N=886560.702	E=713110.135	PI	Simple	Δ=3°22'39"	D=0°50'00"	R=6875.49	L=405.29	T=202.70	Ext=2.99	e=NC	SEE SUPERELEVATION DIAGRAM
DA-2	Dobson Rd Ramp 'A' Cst ℄	28+59.61	N=886880.541	E=714021.677	PI	Simple	Δ=9°38'19"	D=2°00'00"	R=2864.79	L=481.92	T=241.53	Ext=10.16	e=0.035⅛ft	SEE SUPERELEVATION DIAGRAM
80106	Dobson Rd Ramp 'A' Cst ℄	31+11.00	N=887002.869	E=714242.603	POT									
80200	Dobson Rd Ramp 'B' Cst ℄	7+21.04	N=886178.034	E=712339.295	PC									
DB-1	Dobson Rd Ramp 'B' Cst ℄	10+00.23	N=886254.788	E=712607.720	PI	Simple	Δ=4°00'00"	D=0°43'00"	R=7994.76	L=558.14	T=279.18	Ext=4.87	e=NC	SEE SUPERELEVATION DIAGRAM
80202	Dobson Rd Ramp 'B' Cst ℄	12+79.18	N=886312.631	E=712880.845	PT									
80300	Dobson Rd Ramp 'C' Cst ℄	13+25.00	N=887272.406	E=714710.937	POC									
DC-1	Dobson Rd Ramp 'C' Cst ℄	15+46.37	N=887398.474	E=714892.912	PI	Simple	Δ=11°02'05"	D=2°30'00"	R=2291.83	L=441.38	T=221.38	Ext=10.67	e=0.040⅛ft	SEE SUPERELEVATION DIAGRAM
DC-2	Dobson Rd Ramp 'C' Cst ℄	23+68.10	N=887988.039	E=715467.284	PI	Simple	Δ=5°44'36"	D=0°43'00"	R=7994.76	L=801.40	T=401.04	Ext=10.05	e=NC	SEE SUPERELEVATION DIAGRAM
80304	Dobson Rd Ramp 'C' Cst ℄	27+68.47	N=888301.856	E=715716.983	PT									
80409	Dobson Rd Ramp 'D' Cst ℄	12+71.62	N=886789.266	E=714682.665	POT									
DD-1	Dobson Rd Ramp 'D' Cst ℄	16+45.33	N=886987.168	E=714999.669	PI	Simple	Δ=23°40'55"	D=5°00'00"	R=1145.92	L=473.64	T=240.25	Ext=24.91	e=0.056⅛ft	SEE SUPERELEVATION DIAGRAM
DD-2	Dobson Rd Ramp 'D' Cst ℄	28+66.99	N=888001.539	E=715692.718	PI	Simple	Δ=4°10'00"	D=0°50'00"	R=6875.49	L=500.00	T=250.11	Ext=4.55	e=NC	SEE SUPERELEVATION DIAGRAM
80405	Dobson Rd Ramp 'D' Cst ℄	31+16.88	N=888197.253	E=715848.445	PT									
81100	Alma School Rd Ramp 'A' Cst ℄	8+41.98	N=889365.337	E=716939.698	POT									
ASA-1	Alma School Rd Ramp 'A' Cst ℄	13+08.78	N=889567.909	E=717360.256	PI	Simple	Δ=9°38'33"	D=2°45'00"	R=2083.48	L=350.63	T=175.73	Ext=7.40	e=0.048⅛ft	SEE SUPERELEVATION DIAGRAM
81104	Alma School Rd Ramp 'A' Cst ℄	22+35.00	N=889824.626	E=718251.048	POT									
81200	Alma School Rd Ramp 'B' Cst ℄	12+07.26	N=889158.959	E=716904.471	PC									
ASB-1	Alma School Rd Ramp 'B' Cst ℄	14+26.34	N=889262.550	E=717097.517	PI	Simple	Δ=17°23'31"	D=4°00'00"	R=1432.39	L=434.80	T=219.08	Ext=16.66	e=0.060⅛ft	SEE SUPERELEVATION DIAGRAM
ASB-2	Alma School Rd Ramp 'B' Cst ℄	22+43.81	N=889416.738	E=717903.741	PI	Simple	Δ=1°07'25"	D=1°00'00"	R=5729.58	L=112.37	T=56.19	Ext=0.28	e=NC	SEE SUPERELEVATION DIAGRAM
81204	Alma School Rd Ramp 'B' Cst ℄	23+00.00	N=889428.373	E=717958.712	POC									

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DWG NO. C-1.05

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | OF

8/20/2012 U:\RM02\Prod\civ\h8169g05.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

All Coordinates Are Ground Coordinates And All Bearings Are Grid Bearings — G.A.F. = 1.00016

PLAN REF NO		P.I./P.O.T. STATION	COORDINATES										
81300	Alma School Rd Ramp 'C' Cst ℄	12+75.00	N=890040.064	E=718730.945	POT								
ASC-1	Alma School Rd Ramp 'C' Cst ℄	17+90.93	N=890330.552	E=719157.319	PI	Simple	Δ=5°55'09"	D=0°50'00"	R=6875.49	L=710.30	T=355.47	Ext=9.18	e=NC	SEE SUPERELEVATION DIAGRAM
81304	Alma School Rd Ramp 'C' Cst ℄	23+62.38	N=890699.701	E=719594.369	POT									
81400	Alma School Rd Ramp 'D' Cst ℄	11+70.00	N=889640.342	E=718668.773	POT									
ASD-1	Alma School Rd Ramp 'D' Cst ℄	16+30.31	N=889853.545	E=719076.726	PI	Simple	Δ=22°48'54"	D=3°30'00"	R=1637.02	L=651.86	T=330.31	Ext=32.99	e=0.048⅛ft	SEE SUPERELEVATION DIAGRAM
ASD-2	Alma School Rd Ramp 'D' Cst ℄	23+41.05	N=890407.985	E=719535.279	PI	Simple	Δ=6°13'18"	D=2°00'00"	R=2864.79	L=311.08	T=155.69	Ext=4.23	e=0.040⅛ft	SEE SUPERELEVATION DIAGRAM
81406	Alma School Rd Ramp 'D' Cst ℄	24+96.44	N=890516.502	E=719646.924	PT									
82100	McKellips Rd Ramp 'A' Cst ℄	9+49.37	N=891065.619	E=719970.838	PC									
MA-1	McKellips Rd Ramp 'A' Cst ℄	10+99.45	N=891170.221	E=720078.456	PI	Simple	Δ=4°30'00"	D=1°30'00"	R=3819.72	L=300.00	T=150.08	Ext=2.95	e=0.032⅛ft	SEE SUPERELEVATION DIAGRAM
MA-2	McKellips Rd Ramp 'A' Cst ℄	19+09.92	N=891779.080	E=720613.620	PI	Simple	Δ=11°34'04"	D=2°30'00"	R=2291.83	L=462.71	T=232.15	Ext=11.73	e=0.040⅛ft	SEE SUPERELEVATION DIAGRAM
82106	McKellips Rd Ramp 'A' Cst ℄	22+90.96	N=892009.973	E=720918.718	POT									
82200	McKellips Rd Ramp 'B' Cst ℄	7+91.71	N=890875.450	E=720016.223	POT									
MB-1	McKellips Rd Ramp 'B' Cst ℄	16+20.59	N=891410.298	E=720649.450	PI	Simple	Δ=7°43'04"	D=2°00'00"	R=2864.79	L=385.89	T=193.24	Ext=6.51	e=0.040⅛ft	SEE SUPERELEVATION DIAGRAM
MB-2	McKellips Rd Ramp 'B' Cst ℄	21+93.73	N=891718.288	E=721133.495	PI	Simple	Δ=20°39'00"	D=6°53'00"	R=832.38	L=300.00	T=151.65	Ext=13.70	e=0.060⅛ft	SEE SUPERELEVATION DIAGRAM
82207	McKellips Rd Ramp 'B' Cst ℄	25+92.08	N=892039.553	E=721374.550	POT									
83100	Country Club Dr Ramp 'A' Cst ℄	4+93.55	N=892620.199	E=721880.352	POT									
CCA-1	Country Club Dr Ramp 'A' Cst ℄	12+20.81	N=892990.394	E=722506.345	PI	Simple	Δ=4°33'00"	D=1°00'00"	R=5729.58	L=455.00	T=227.62	Ext=4.52	e=0.023⅛ft	SEE SUPERELEVATION DIAGRAM
CCA-2	Country Club Dr Ramp 'A' Cst ℄	19+62.50	N=893316.200	E=723172.905	PI	Simple	Δ=0°30'00"	D=2°00'00"	R=2864.79	L=25.00	T=12.50	Ext=0.03	e=0.035⅛ft	SEE SUPERELEVATION DIAGRAM
83105	Country Club Dr Ramp 'A' Cst ℄	19+75.00	N=893321.592	E=723184.182	POC									
83200	Country Club Dr Ramp 'B' Cst ℄	7+46.37	N=892303.447	E=721688.618	PC									
CCB-1	Country Club Dr Ramp 'B' Cst ℄	11+58.19	N=892528.186	E=722033.712	PI	Simple	Δ=10°16'05"	D=1°15'00"	R=4583.66	L=821.44	T=411.82	Ext=18.46	e=0.032⅛ft	SEE SUPERELEVATION DIAGRAM
CCB-2	Country Club Dr Ramp 'B' Cst ℄	20+31.76	N=892867.646	E=722841.022	PI	Simple	Δ=3°39'58"	D=1°00'00"	R=5729.58	L=366.60	T=183.36	Ext=2.93	e=NC	SEE SUPERELEVATION DIAGRAM
83205	Country Club Dr Ramp 'B' Cst ℄	22+15.00	N=892927.766	E=723014.248	PT									
83300	Country Club Dr Ramp 'C' Cst ℄	19+78.00	N=894024.707	E=724417.496	POT									
CCC-1	Country Club Dr Ramp 'C' Cst ℄	26+43.86	N=894440.687	E=724937.421	PI	Simple	Δ=36°34'10"	D=4°00'00"	R=1432.39	L=914.24	T=473.30	Ext=76.17	e=0.057⅛ft	SEE SUPERELEVATION DIAGRAM
83304	Country Club Dr Ramp 'C' Cst ℄	33+59.06	N=894467.990	E=725684.482	POT									

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ROUTE: SR 202L
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DWG NO. C-1.06
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169g06.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

PLAN REF NO		P.I./P.O.T. STATION	COORDINATES			All Coordinates Are Ground Coordinates And All Bearings Are Grid Bearings								G.A.F. = 1.00016
83900	Country Club Dr Ramp 'D' Cst ℄	15+00.00	N=893342.371	E=724048.531	POC									
CCD-1	Country Club Dr Ramp 'D' Cst ℄	15+58.51	N=893377.590	E=724095.258	PI	Simple	Δ=7°00'46"	D=6°00'00"	R=954.93	L=116.88	T=58.51	Ext=1.79	e=0.059⅛ft	SEE SUPERELEVATION DIAGRAM
CCD-2	Country Club Dr Ramp 'D' Cst ℄	26+02.04	N=894102.823	E=724845.785	PI	Simple	Δ=20°51'00"	D=5°24'00"	R=1061.03	L=386.11	T=195.22	Ext=17.81	e=0.060⅛ft	SEE SUPERELEVATION DIAGRAM
83903	Country Club Dr Ramp 'D' Cst ℄	27+92.94	N=894179.627	E=725025.257	PT									
85100	Gilbert Rd Ramp 'A' Cst ℄	19+87.01	N=897245.778	E=736461.304	PC									
GA-1	Gilbert Rd Ramp 'A' Cst ℄	22+76.47	N=897230.905	E=736750.379	PI	Simple	Δ=4°49'17"	D=0°50'00"	R=6875.49	L=578.57	T=289.46	Ext=6.09	e=NC	SEE SUPERELEVATION DIAGRAM
GA-2	Gilbert Rd Ramp 'A' Cst ℄	36+31.63	N=897275.283	E=738105.154	PI	Simple	Δ=1°50'15"	D=5°00'00"	R=1145.92	L=36.75	T=18.38	Ext=0.15	e=0.056⅛ft	SEE SUPERELEVATION DIAGRAM
85104	Gilbert Rd Ramp 'A' Cst ℄	36+50.00	N=897275.296	E=738123.530	POC									
85200	Gilbert Rd Ramp 'B' Cst ℄	20+14.26	N=897038.822	E=737229.118	PC									
GB-1	Gilbert Rd Ramp 'B' Cst ℄	22+14.26	N=897007.895	E=737426.717	PI	Simple	Δ=1°00'00"	D=0°15'00"	R=22918.31	L=400.00	T=200.01	Ext=0.87	e=NC	SEE SUPERELEVATION DIAGRAM
GB-2	Gilbert Rd Ramp 'B' Cst ℄	29+46.74	N=896882.018	E=738148.309	PI	Simple	Δ=1°53'49"	D=0°30'00"	R=11459.16	L=379.36	T=189.70	Ext=1.57	e=NC	SEE SUPERELEVATION DIAGRAM
85206	Gilbert Rd Ramp 'B' Cst ℄	34+84.99	N=896807.117	E=738681.360	PC									

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

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ROUTE	LOCATION	DWG NO. C-1.07
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

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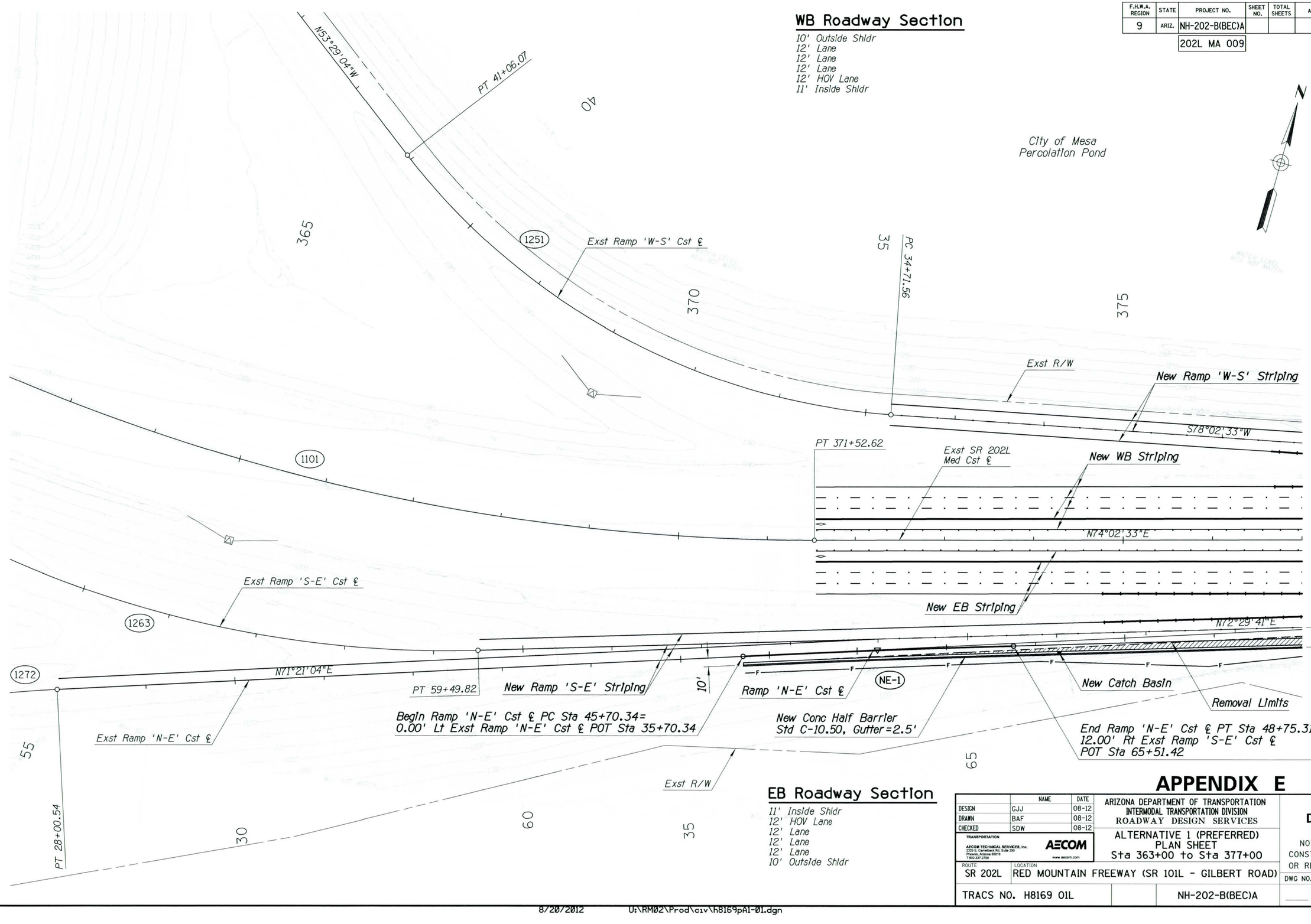
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

10' Outside Shldr
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr



EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
10' Outside Shldr

APPENDIX E

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PLAN SHEET
Sta 363+00 to Sta 377+00

DCR

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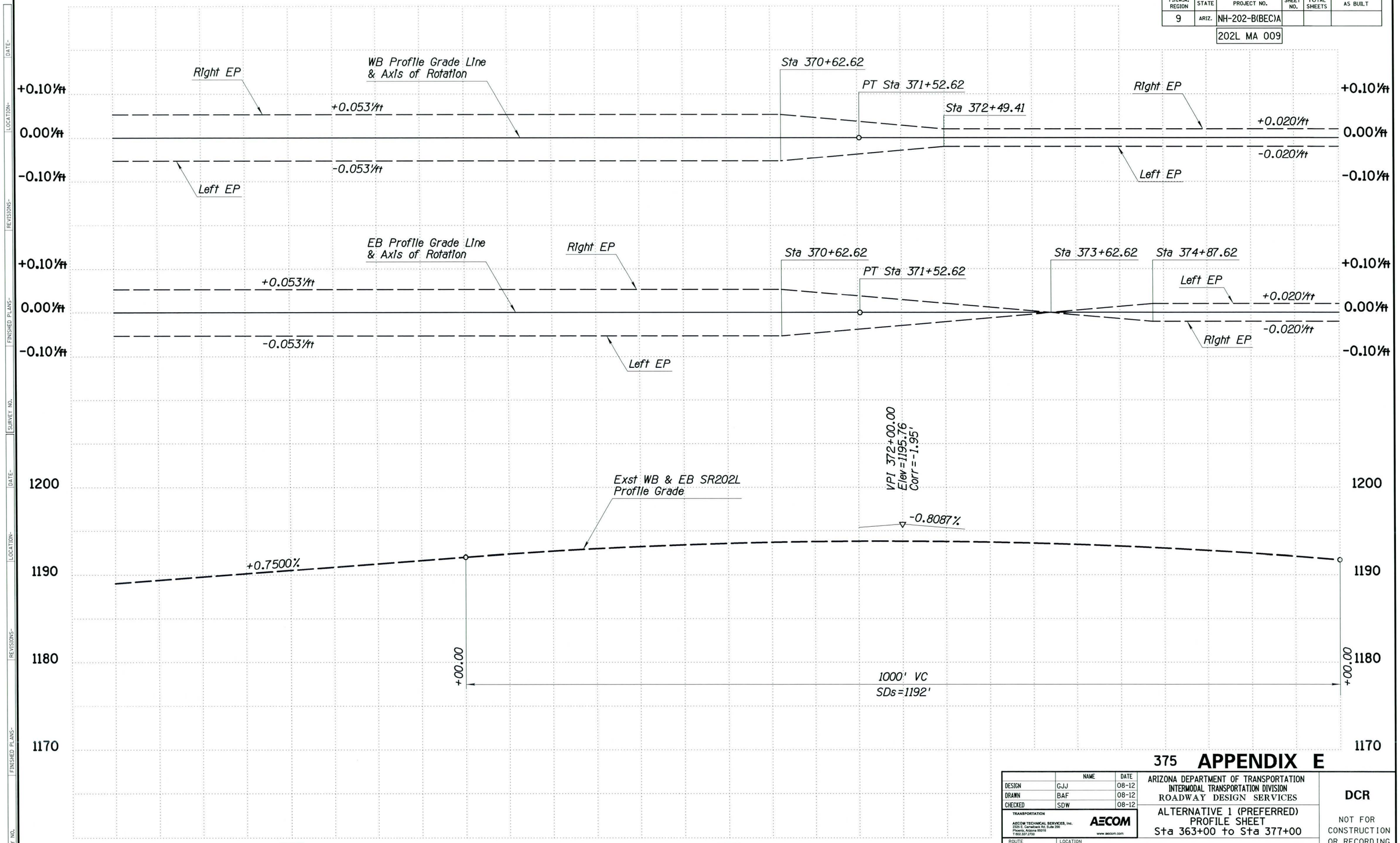
ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.01
TRACS NO. H8169 01L	NH-202-B(BEC)A	OF

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

8/20/2012 U:\RM02\Prod\civ\h8169pA1-01.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 363+00 to Sta 377+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

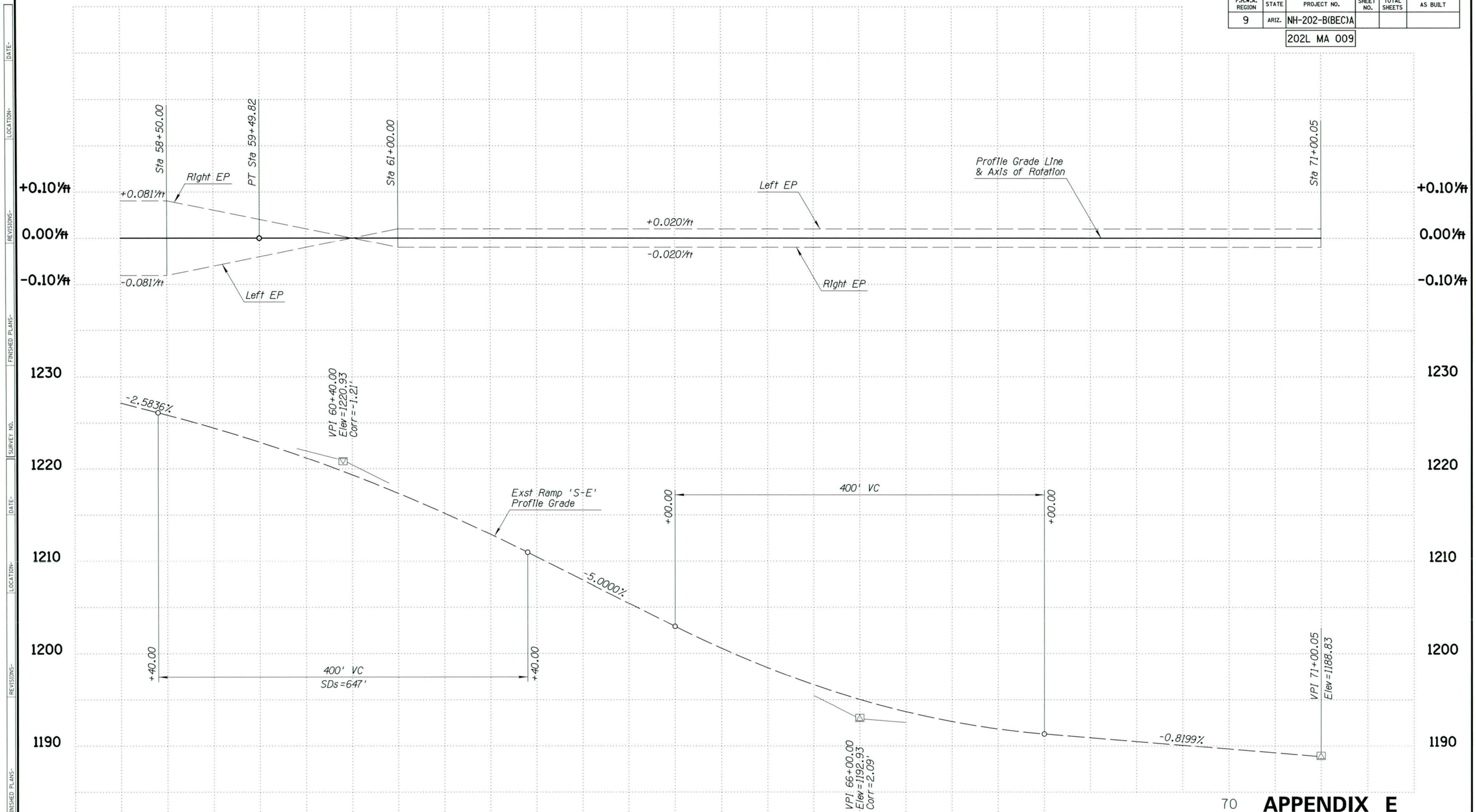
ROUTE	LOCATION	DWG NO. C-2.02
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v02.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
EXST RAMP 'S-E'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.03

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

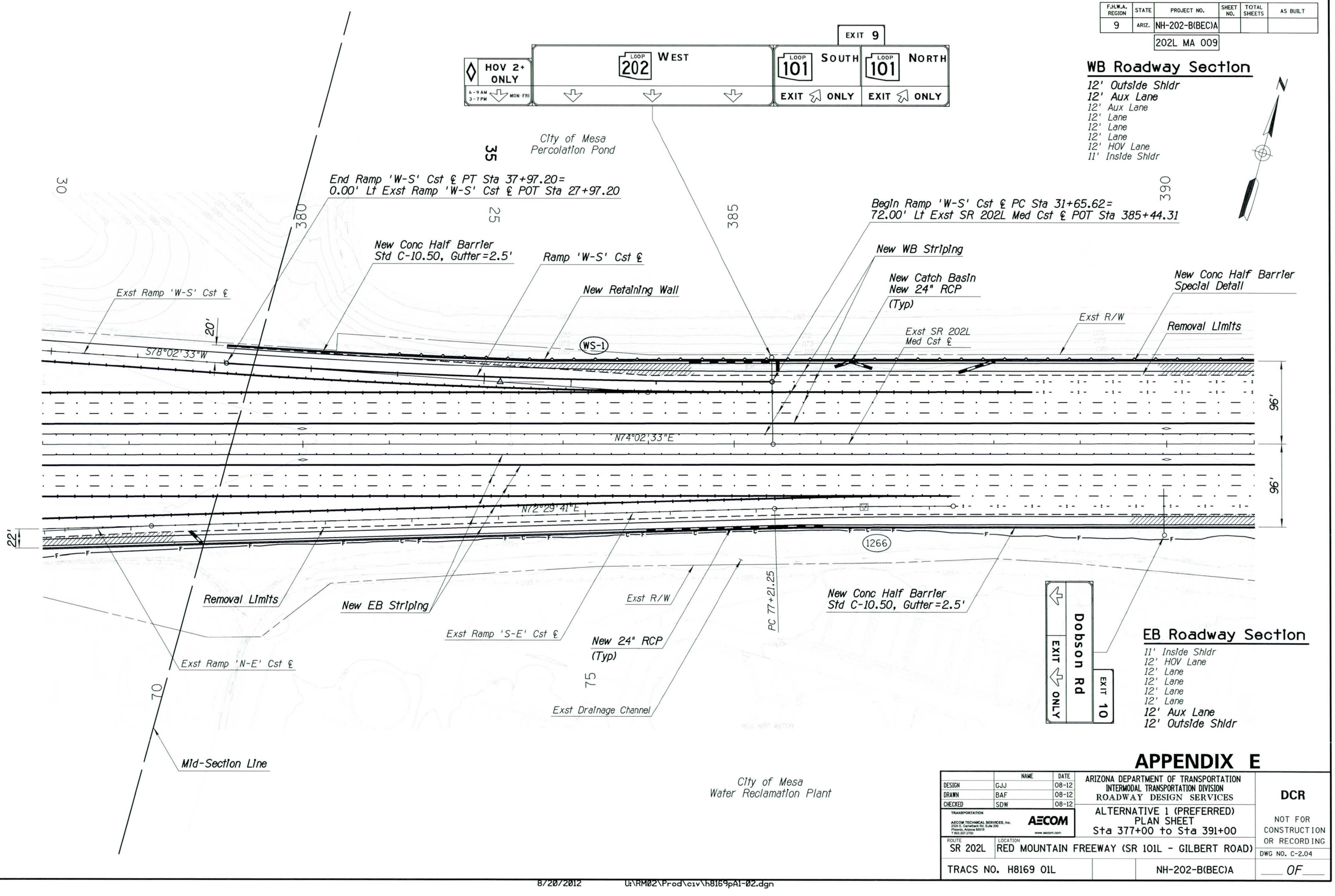
TRACS NO. H8169 01L

NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-23.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



WB Roadway Section

12' Outside Shldr
12' Aux Lane
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Aux Lane
12' Outside Shldr

APPENDIX E

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 377+00 to Sta 391+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.04

ROUTE	LOCATION		
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)		
TRACS NO. H8169 01L		NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-02.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

+0.10%ft
0.00%ft
-0.10%ft

Right EP
Left EP
+0.020%ft
-0.020%ft
WB Profile Grade Line & Axis of Rotation

+0.10%ft
0.00%ft
-0.10%ft

Left EP
Right EP
+0.020%ft
-0.020%ft
EB Profile Grade Line & Axis of Rotation

1200
1190
1180
1170

+00.00
1000' VC
Exst WB & EB SR202L Profile Grade
-0.8087%
+1.5000%
VPI 387+00.00
Elev=1183.63
Corr=2.89'

380
385
390

APPENDIX E

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PROFILE SHEET
Sta 377+00 to Sta 391+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. C-2.05

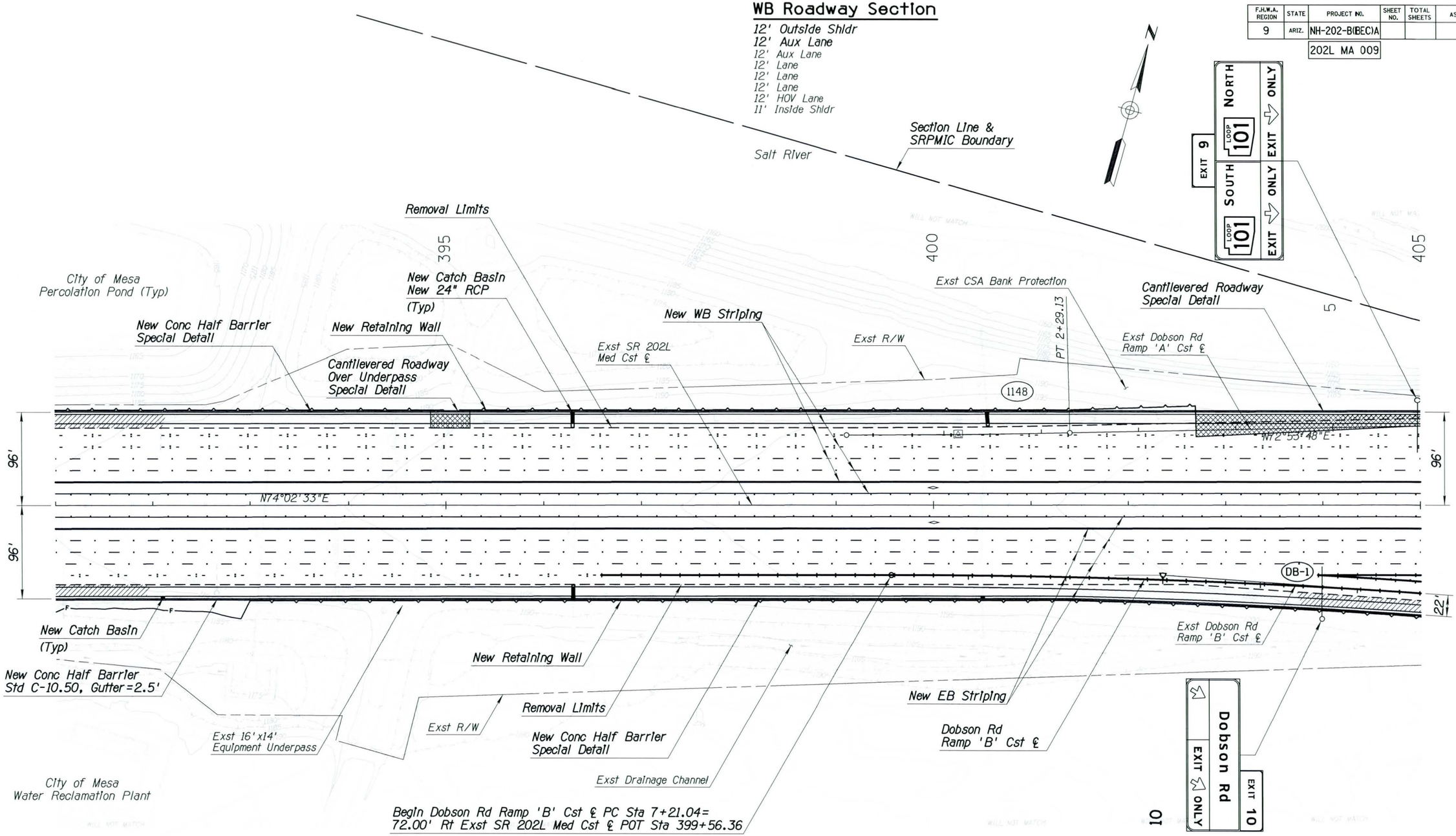
TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v03.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Aux Lane
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr



EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Aux Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 391+00 to Sta 405+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.06

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

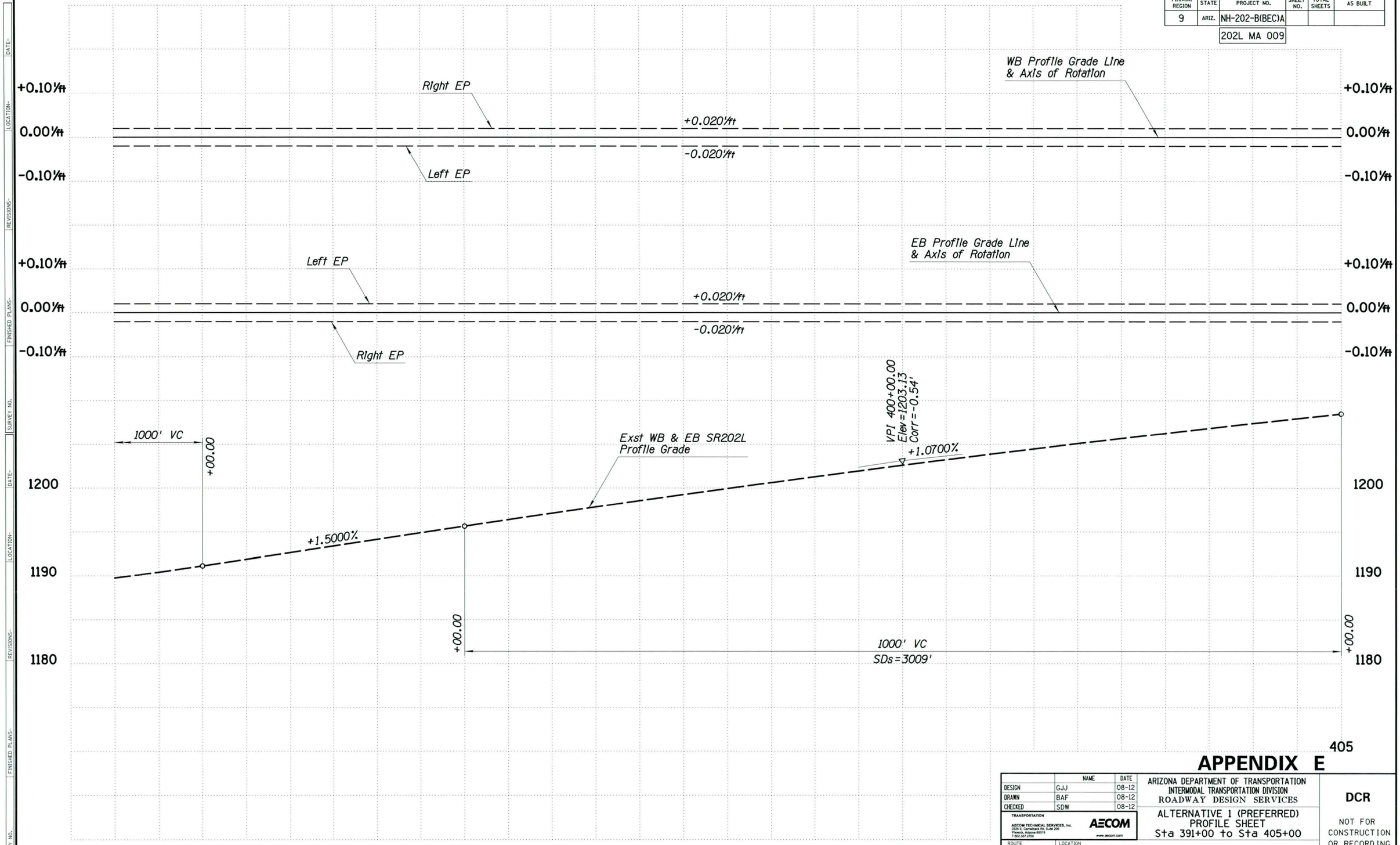
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-03.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
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TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 391+00 to Sta 405+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.07

ROUTE	LOCATION	
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L		NH-202-B(BEC)A

OF

8/20/2012 U:\RM02\Prod\civ\h8169v04.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

Salt River

SRPMIC Boundary

Exst R/W

Exst R/W & SRPMIC Boundary

SRPMIC Boundary

Removal Limits

Dobson Rd Ramp 'A' Cst ℄ Sta 21+90.97 = 101.52' Lt Exst SR 202L Med Cst ℄ Sta 410+99.58

Nose of Gore Control Point

Exst Dobson Rd Ramp 'A' Cst ℄

Dobson Rd Ramp 'A' Cst ℄

Begin Dobson Rd Ramp 'A' Cst ℄ PC Sta 16+91.00 = 84.00' Lt Exst SR 202L Med Cst ℄ POT Sta 406+00.00

Cantilevered Roadway Special Detail

Cantilevered Roadway Special Detail

New Retaining Wall

New Conc Half Barrier Std C-10.50, Gutter=2.5'

Section Line

Exst CSA Bank Protection

PT 20+96.28

PC 13+97.12

New WB Striping

New Conc Half Barrier Special Detail

PC 26+18.08

New Catch Basin New 24" RCP (Typ)

DA-1

DA-2

1151

Removal Limits

50:1 Taper

N70°39'55"E

SC 418+89.31

TS 415+89.31

20004

N72°53'48"E

N74°02'33"E

96'

84'

16'

16'

22'

+95.00
84.00' Rt

Exst SR 202L Med Cst ℄

Removal Limits

N78°02'33"E

New Catch Basin (Typ)

New EB Striping

Removal Limits

22'

25:1 Taper

+30.00
22.00' Rt

+80.00
28.00' Rt

28'

New Retaining Wall

New Conc Half Barrier Special Detail

Exst R/W

New Conc Half Barrier Std C-10.50, Gutter=2.5'

Exst Dobson Rd Ramp 'B' Cst ℄

End Dobson Rd Ramp 'B' Cst ℄ PT Sta 12+79.18 = 0.00' Lt Exst Dobson Rd Ramp 'B' Cst ℄ POT Sta 2+79.18

Dobson Rd Ramp 'B' Cst ℄

Section Line

Alma School Rd
3/4 MILE
EXIT 11

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

8/20/2012 U:\RM02\Prod\civ\h8169pA1-04.dgn

APPENDIX E

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 405+00 to Sta 419+00

DCR

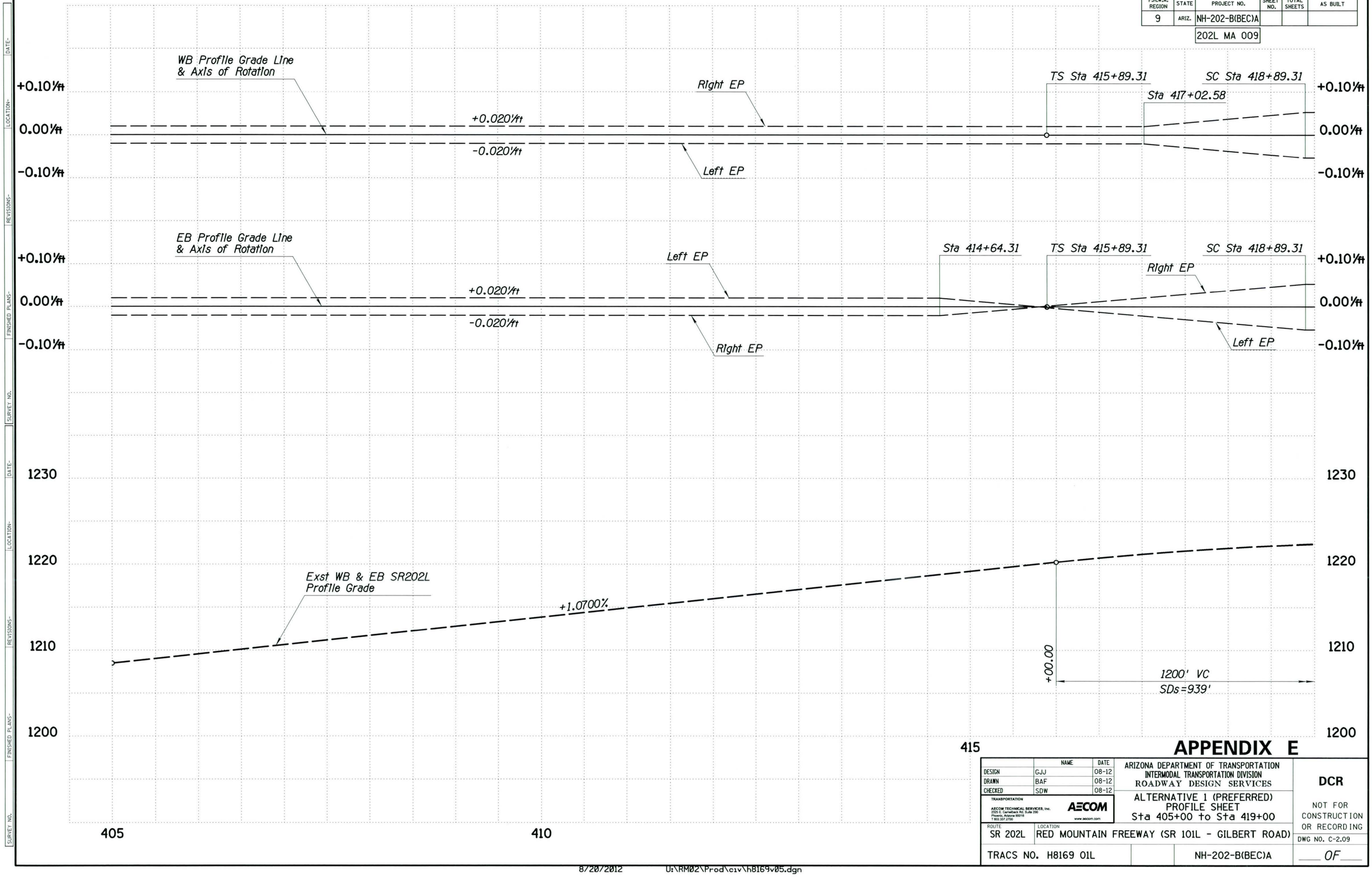
NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.08
TRACS NO. H8169 01L	NH-202-B(BEC)A	OF

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
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TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 405+00 to Sta 419+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.09

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

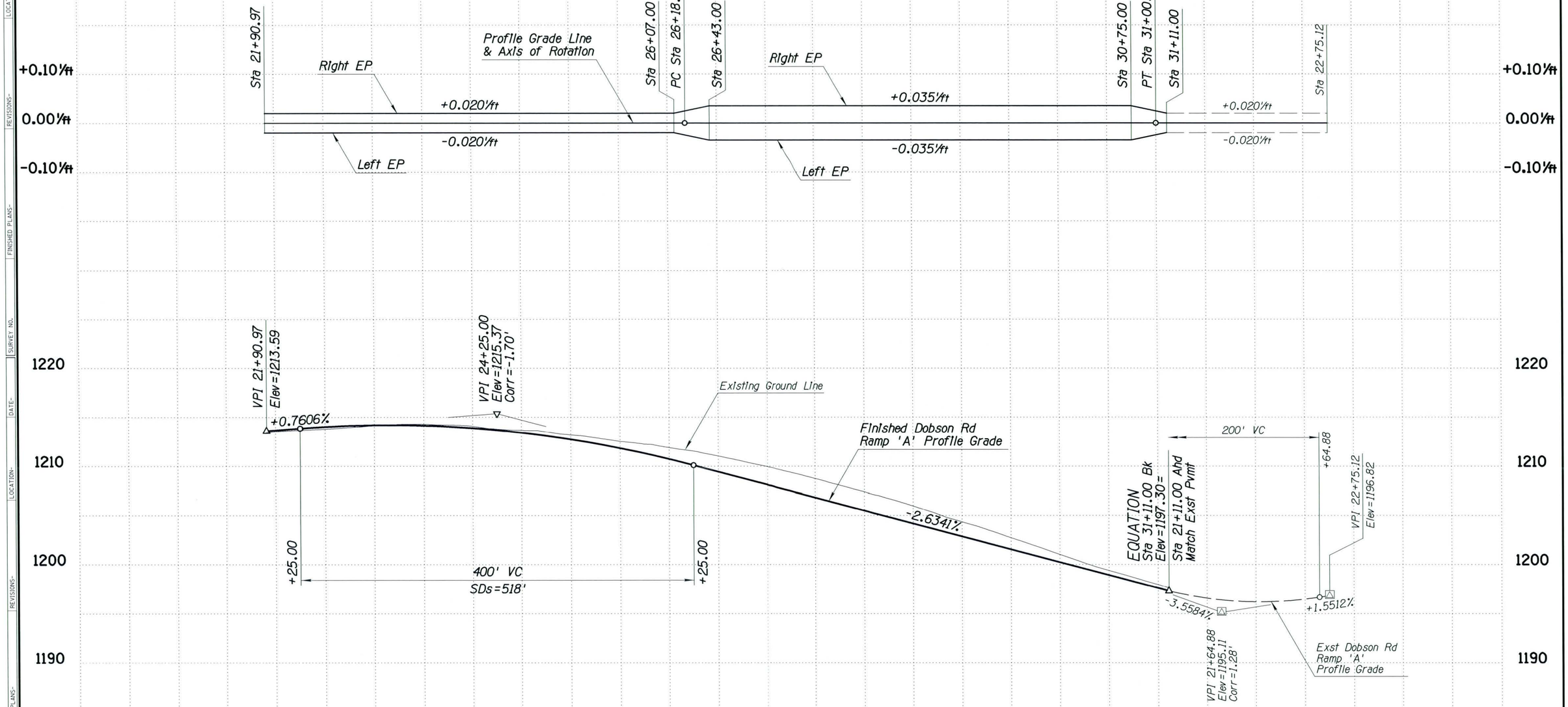
TRACS NO. H8169 01L

NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v05.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



25 30

APPENDIX E

	NAME	DATE
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TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
DOBSON RD RAMP 'A'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

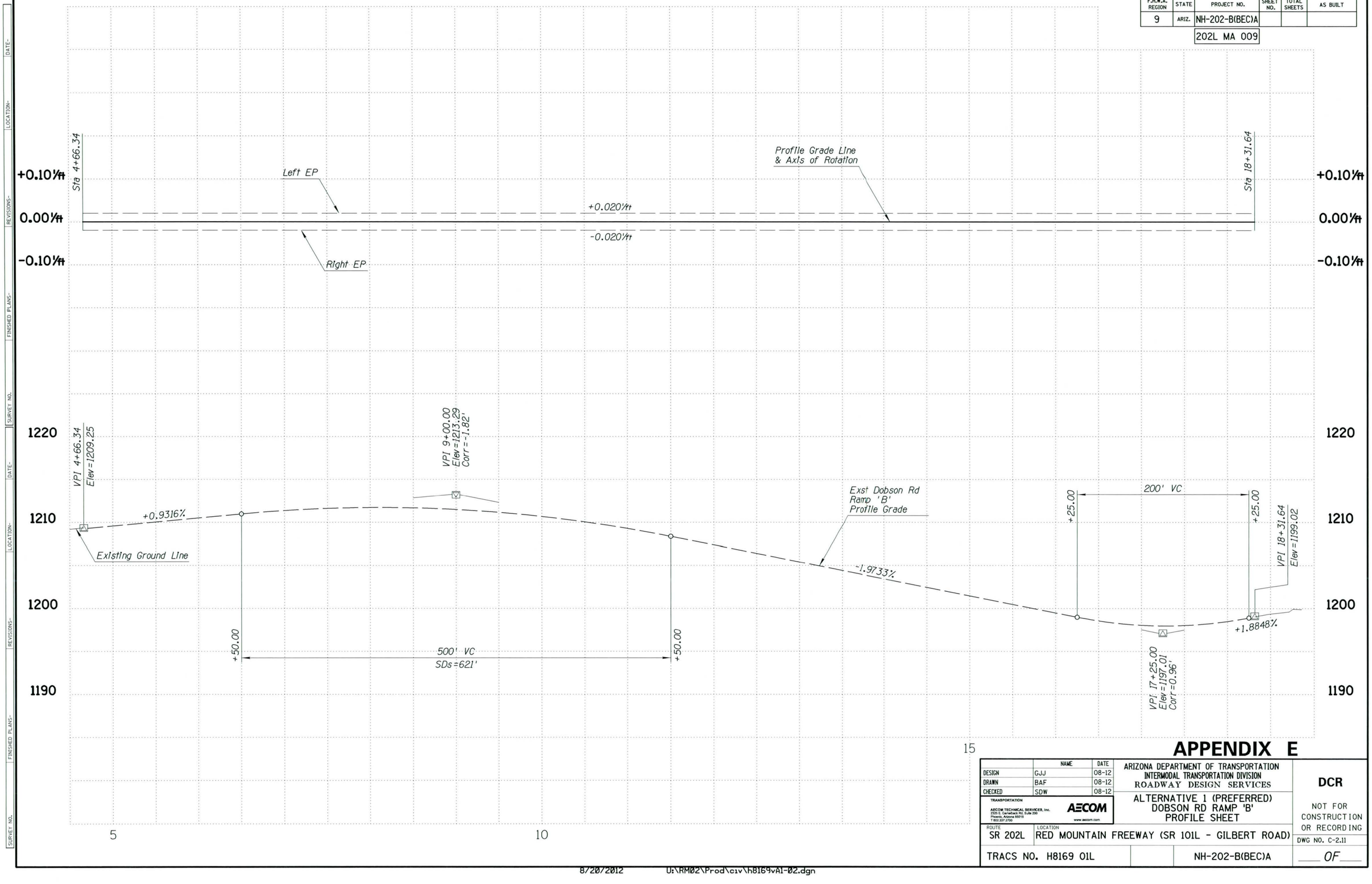
ROUTE	LOCATION	DWG NO. C-2.10
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-01.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
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TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
DOBSON RD RAMP 'B'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.11

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-02.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

Salt River

Exst R/W

Dobson Rd Ramp 'A' Cst ℄

New Conc Half Barrier Std C-10.50, Gutter=2.5'

End Dobson Rd Ramp 'A' Cst ℄ POT Sta 31+11.00= 0.00' Lt Exst Dobson Rd Ramp 'A' ℄ POT Sta 21+11.00

Begin Dobson Rd Ramp 'C' Cst ℄ PC Sta 13+25.00= 0.00' Lt Exst Dobson Rd Ramp 'C' Cst ℄ POC Sta 3+25.00

PT 19+90.63

20

420

PT 31+00.00

16'

16'

DA-2

N61°01'36"E

Exst Dobson Rd Ramp 'A' Cst ℄

Exst Dobson Rd Cst ℄

N61°01'36"E

Widen Exst Dobson Rd Overpass (Typ)

Exst CSA Bank Protection

425

PC 2+15.51

Exst Dobson Rd Ramp 'C' Cst ℄

N58°01'26"E

1158

28'

New Conc Half Barrier Std C-10.50, Gutter=2.5'

15

New Ramp Striping

5

+70.00

28.00' Lt

430

Dobson Rd Ramp 'C' Cst ℄

New Catch Basin New 24" RCP

DC-1

25:1 Taper

PT 17+66.38

PT 7+50.06

New Retaining Wall

New Conc Half Barrier Special Detail

New Conc Curb & Gutter Type C, Std C-05.10

+20.00

10.00' Lt

N44°15'08"E

10'

N44°39'37"E

14'

84'

84'

Exst SR 202L Med Cst ℄

New Conc Half Barrier Std C-10.50, Gutter=2.5'

New WB Striping

Removal Limits

1104

CS 430+10.66

20008

84'

Removal Limits

14'

Exst Dobson Rd Ramp 'B' Cst ℄

S1°58'19"E

N78°02'33"E

N58°01'26"E

New Conc Half Barrier Std C-10.50, Gutter=2.5'

New EB Striping

Exst Dobson Rd Cst ℄ Sta 20+00.00= Exst SR 202L Med Cst ℄ Sta 421+80.81

PT 7+85.84

1164

N34°42'46"E

N34°20'32"E

16'

New Manhole

New 24" RCP

Dobson Rd Ramp 'D' Cst ℄

New Conc Curb & Gutter Type C, Std C-05.10

DD-1

PT 18+78.72

New Ramp Striping

Exst R/W

Exst Dobson Rd Ramp 'D' Cst ℄

Exst Tempe Drain Channel

New Catch Basin (Typ)

Section Line

New Conc Half Barrier Special Detail

PC 3+19.62

PC 14+05.08

Alma School Rd
McKellips Rd
Country Club Dr
87
1 1/2
1 3/4

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

15

Begin Dobson Rd Ramp 'D' Cst ℄ POT Sta 12+71.62= 0.00' Lt Exst Dobson Rd Ramp 'D' ℄ POT Sta 2+71.62

New Conc Half Barrier Std C-10.50, Gutter=2.5'

APPENDIX E

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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 419+00 to Sta 433+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.12

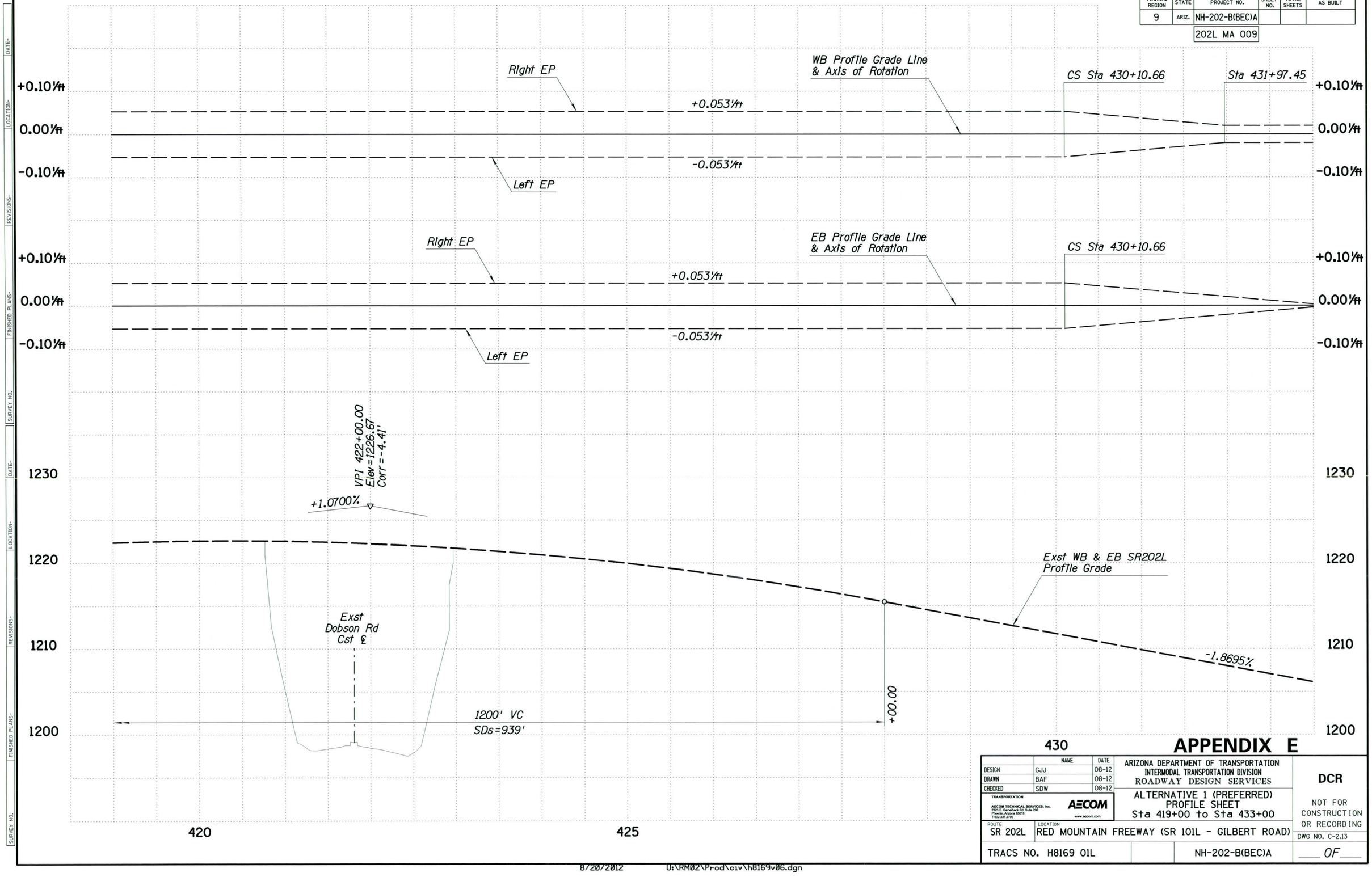
ROUTE	LOCATION	
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L		NH-202-B(BEC)A

OF

8/20/2012 U:\RM02\Prod\civ\h8169pA1-05.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 419+00 to Sta 433+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.13

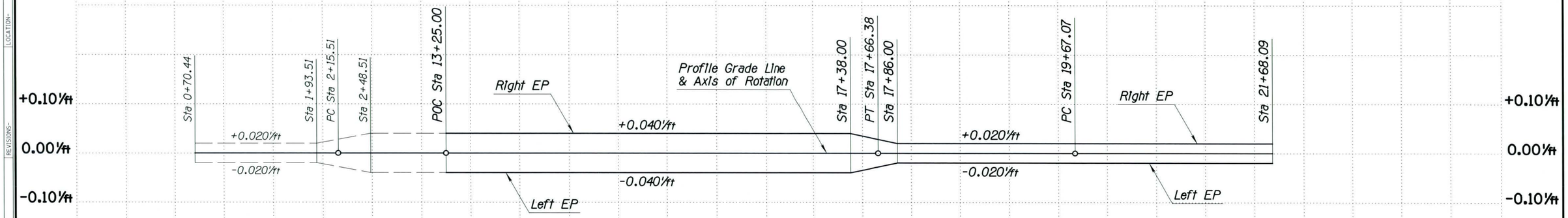
ROUTE	LOCATION	
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L		NH-202-B(BEC)A

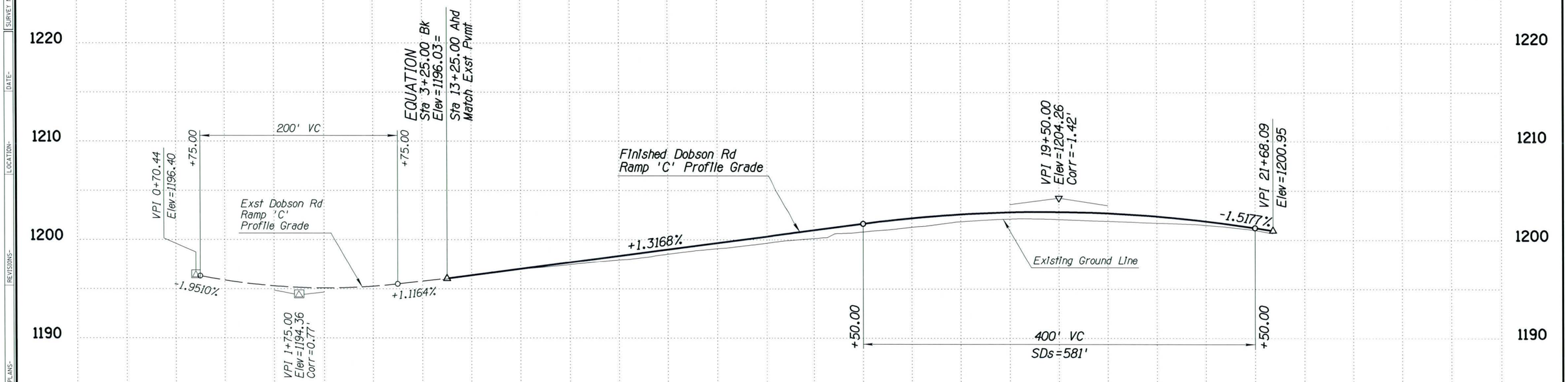
OF

8/20/2012 U:\RM02\Prod\civ\h8169v06.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			





APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
2555 E. Camelback Rd. Suite 200
Phoenix, Arizona 85016
T 602.337.2700
AECOM
www.aecom.com

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
DOBSON RD RAMP 'C'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

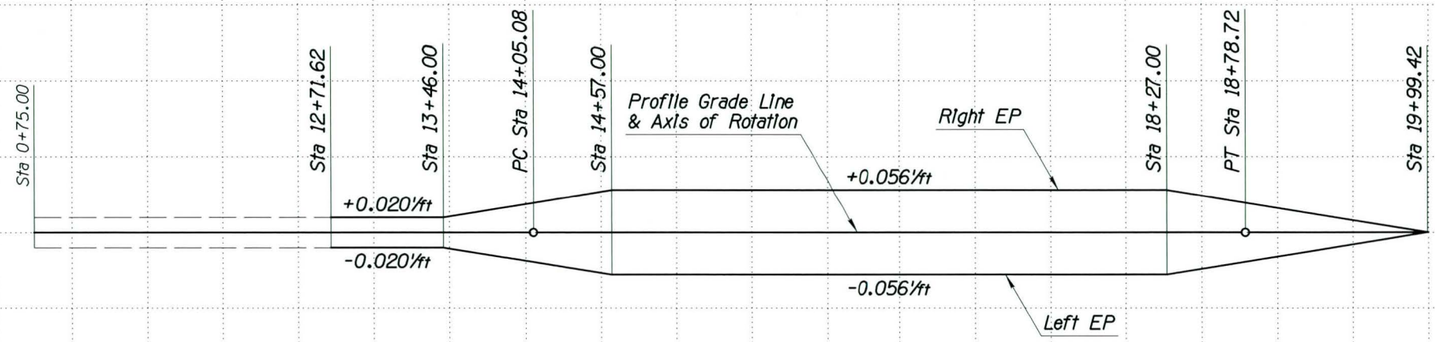
ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.14

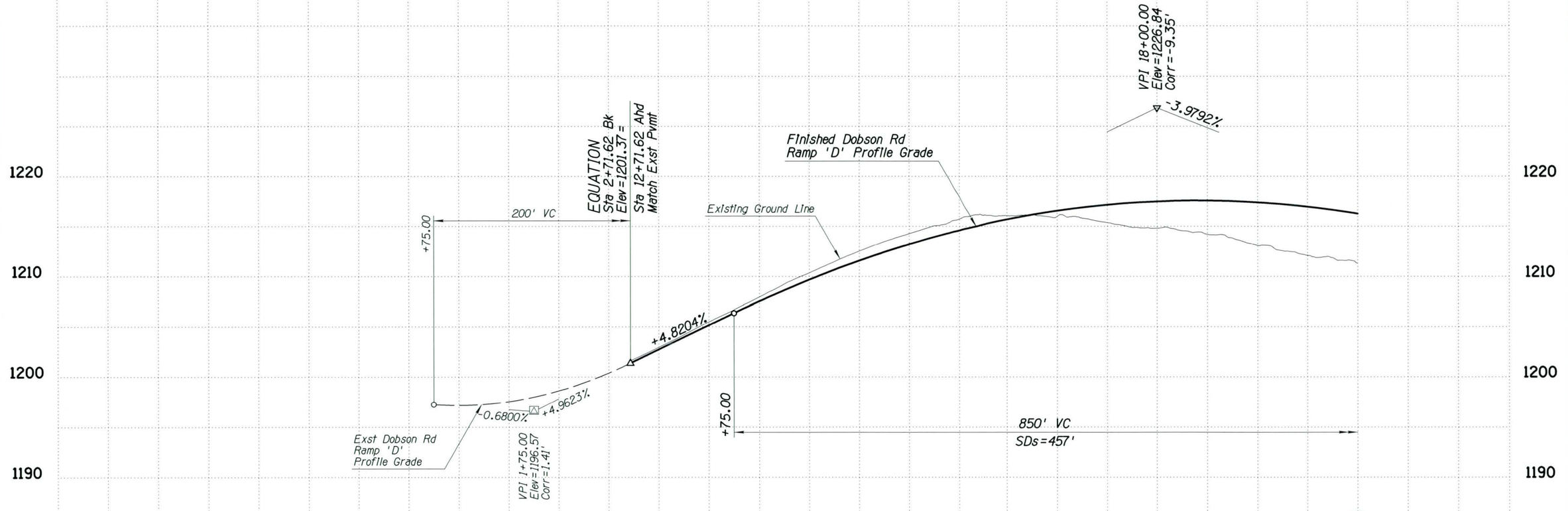
TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-03.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			





APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
DOBSON RD RAMP 'D'
PROFILE SHEET

DCR

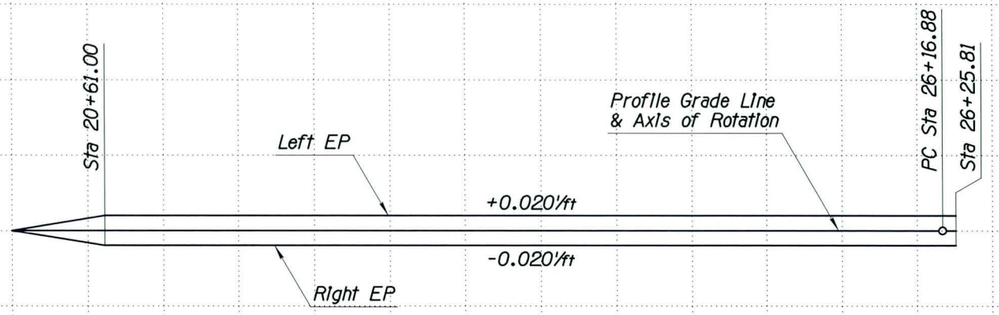
NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO. C-2.15
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

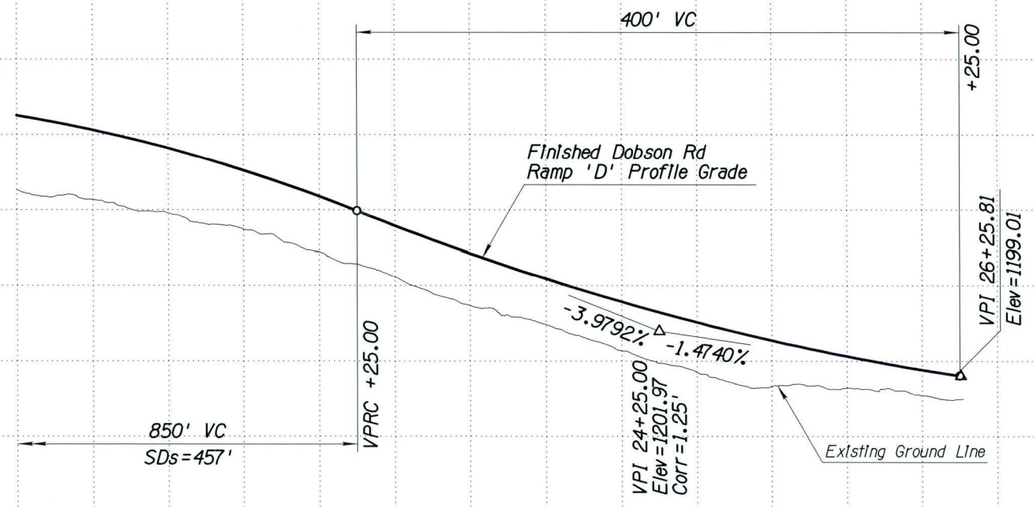
8/20/2012 U:\RM02\Prod\civ\h8169vA1-04.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



+0.10'/ft
0.00'/ft
-0.10'/ft



1220
1210
1200
1190

20
25

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
DOBSON RD RAMP 'D'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.16

TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-05.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

Salt River

EXIT 10 — Dobson Rd — EXIT ONLY

Exst R/W

Dobson Rd Ramp 'C' Cst ℄ Sta 21+68.09=
106.53' Lt Exst SR 202L Med Cst ℄ Sta 435+00.19
Nose of Gore Control Point

PC 19+67.07

New Conc Curb & Gutter
Type C, Std C-05.10

20 | 10 | 435 | 25 | 440 | 15 | 445

Dobson Rd
Ramp 'C' Cst ℄

12' Min FCDMC Maintenance Road

End Dobson Rd Ramp 'C' Cst ℄ PT Sta 27+68.47=
84.00' Lt Exst SR 202L Med Cst ℄ POT Sta 441+00.00

Exst Dobson Rd
Ramp 'C' Cst ℄

PC 11+31.89

New Retaining Wall

New Conc Half Barrier
Special Detail

Removal Limits

New WB Striping

New Safety Rail

Exst SR 202L
Med Cst ℄

Exst CSA Bank Protection

Removal Limits

10'
14'
84'
84'
14'
16'
96'
96'

DC-2

N44°39'37"E

1161

ST 433+10.66

TS 442+61.38

SC 445+61.38

20011

1111

N38°30'32"E

1167

N34°42'46"E

N34°20'32"E

50:1 Taper

DD-2

New EB Striping

New Catch Basin
New 24" RCP
(Typ)

New 24" RCP
(Typ)

New Retaining Wall

Removal Limits

Exst Dobson Rd
Ramp 'D' Cst ℄

Exst R/W

PC 14+38.40

PC 26+16.88

Dobson Rd
Ramp 'D' Cst ℄

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

New Conc Half Barrier
Special Detail

End Dobson Rd Ramp 'D' Cst ℄ PT Sta 31+16.88=
84.00' Rt Exst SR 202L Med Cst ℄ POT Sta 441+00.00

Alma School Rd — EXIT ONLY — EXIT 11

Sand and Gravel Plt

25 | 15 | 25 | 30

New Conc Curb & Gutter
Type C, Std C-05.10

Dobson Rd Ramp 'D' Cst ℄ Sta 26+25.81=
101.53' Rt Exst SR 202L Med Cst ℄ Sta 436+09.35
Nose of Gore Control Point

Mid-Section Line

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Aux Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 433+00 to Sta 447+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.17

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

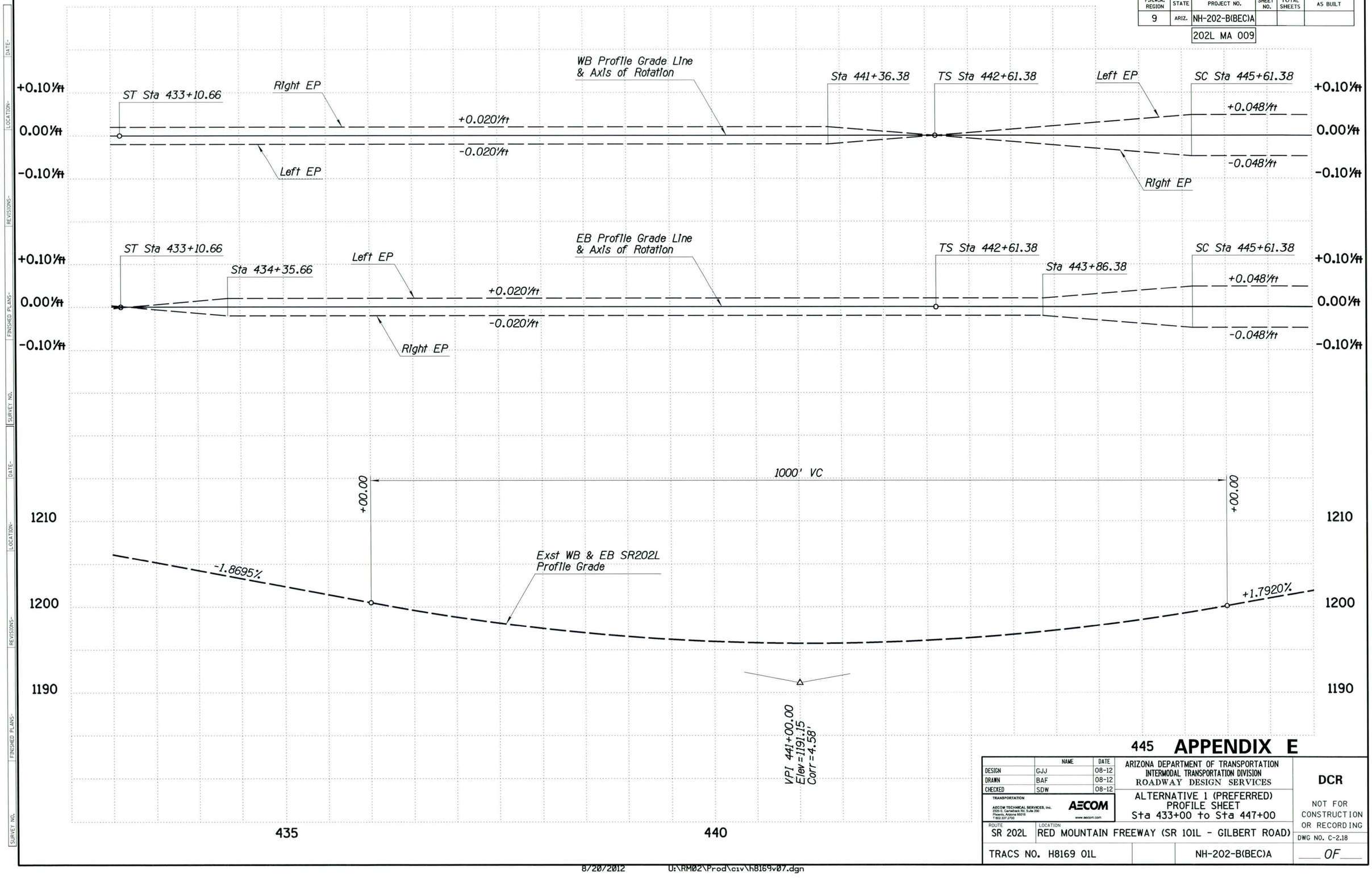
TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-06.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



445 **APPENDIX E**

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 433+00 to Sta 447+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. C-2.18

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\c1v\h8169v07.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

Alma School Rd Ramp 'A' Cst ℄ Sta 11+66.66 =
101.55' Lt Exst SR 202L Med Cst ℄ Sta 460+14.19
Nose of Gore Control Point

Exst R/W

Salt River

Begin Alma School Rd Ramp 'A' Cst ℄ POT Sta 8+41.98 =
84.00' Lt Exst SR 202L Med Cst ℄ POC Sta 457+00.00

450

Mid-Section Line

455

LOOP 101 1½ MILES

EXIT 10 Dobson Rd EXIT ONLY

Alma School Rd Ramp 'A' Cst ℄

10

PC 11+33.05

460

Gravel Pit Haul Road

New Conc Half Barrier Special Detail

Exst CSA Bank Protection

New Retaining Wall

New WB Striping

Removal Limits

Exst SR 202L Med Cst ℄

Exst Alma School Rd Ramp 'A' Cst ℄

N64°16'52"E

50:1 Taper

ASA-1

Varies

96'

1111

1175

N67°18'05"E

New Retaining Wall

Removal Limits

New EB Striping

New Conc Half Barrier Special Detail

Exst R/W

Begin Alma School Rd Ramp 'B' Cst ℄ PC Sta 12+07.26 =
84.00' Rt Exst SR 202L Med Cst ℄ POC Sta 455+75.00

Alma School Rd Ramp 'B' Cst ℄

ASB-1

84'

New Manhole

N79°10'23"E

14'

Varies

Exst 40'x17' Equipment Underpass

Exst Alma School Rd Ramp 'B' Cst ℄

+00.00
10.00' Rt

Alma School Rd Ramp 'B' Cst ℄ Sta 15+72.82 =
106.59' Rt Exst SR 202L Med Cst ℄ Sta 459+51.66
Nose of Gore Control Point

New Conc Curb & Gutter Type C, Std C-05.10

15

PT 16+42.06

New 24" RCP (Typ)

Alma School Rd EXIT 11 EXIT ONLY

Sand and Gravel Pit

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Aux Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION

AECOM TECHNICAL SERVICES, Inc.
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 447+00 to Sta 461+00

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.19

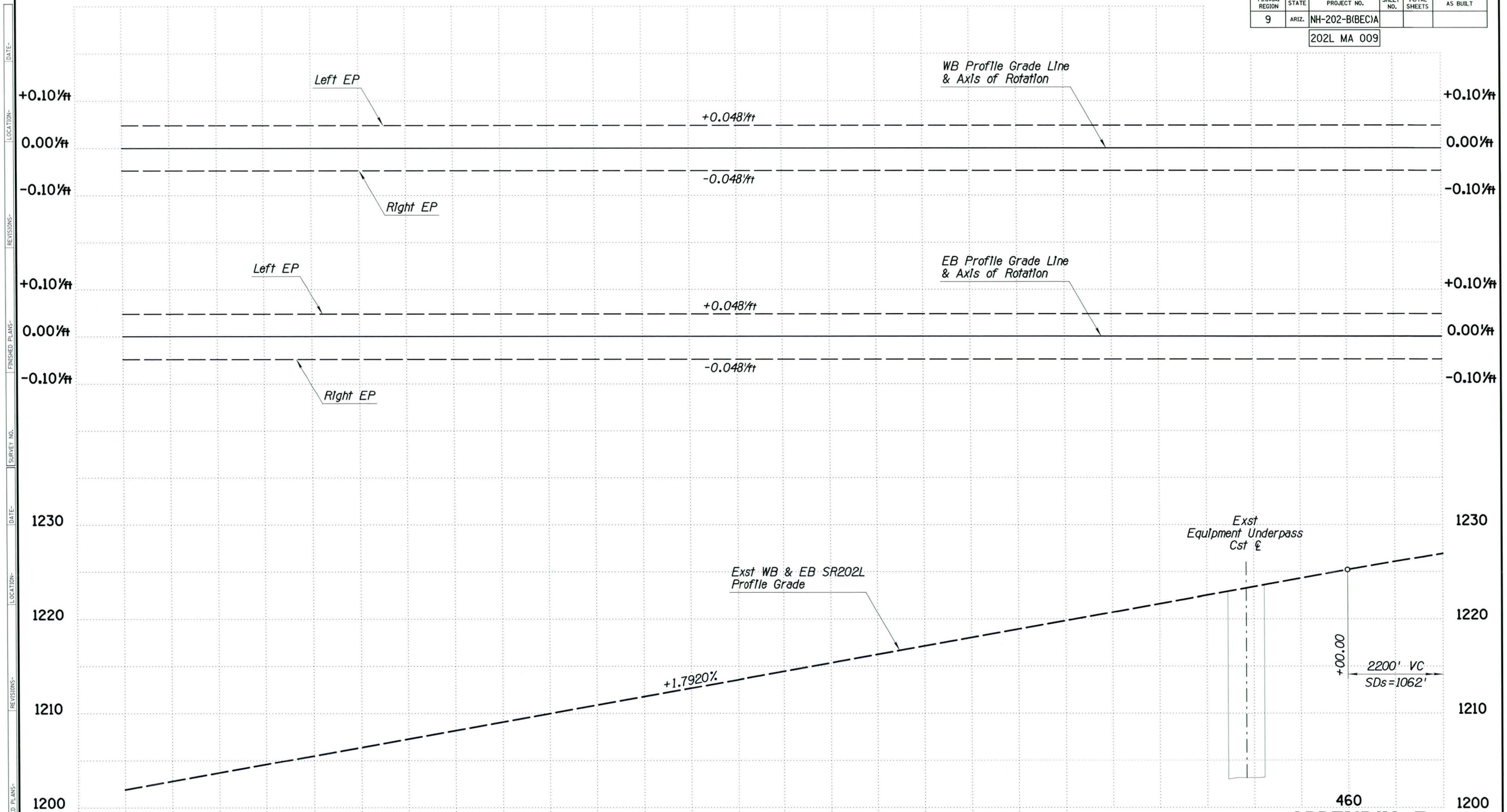
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-07.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 447+00 to Sta 461+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. C-2.20

TRACS NO. H8169 01L

NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v08.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

Exst R/W
Exst Alma School Rd Cst ℄ Sta 20+00.00=
Exst SR 202L Med Cst ℄ Sta 473+01.70
New Conc Half Barrier
Special Detail
Exst Alma School Rd Cst ℄
Exst Alma School Rd
Ramp 'A' Cst ℄
New Conc Half Barrier
Special Detail
New 24" RCP
(Typ)
New Retaining Wall
PT 14+83.69
End Alma School Rd Ramp 'A' Cst ℄ POT Sta 22+35.00=
0.00' Lt Exst Alma School Rd Ramp 'A' Cst ℄ POT Sta 12+35.00
New Conc Curb & Gutter
Type C, Std C-05.10
New WB Striping
New Retaining Wall
New Conc Half Barrier
Std C-10.50, Gutter=2.5'
New Catch Basin
New 24" RCP
(Typ)
Removal Limits
PT 9+21.24
Alma School Rd
Ramp 'A' Cst ℄
Section Line
Widen Exst
Alma School Rd
Overpass (Typ)
PC 2+59.02
Varies
16'
+20.00
84.00' Lt
ASA-1
14'
84'
N73°55'25"E
N55°44'00"E
Exst Alma School Rd
Ramp 'C' Cst ℄
1171
Exst SR 202L
Med Cst ℄
+00.00
96.00' Lt
65:1 Taper
CS 463+09.78
ST 466+09.78
TS 467+22.30
SC 470+82.30
1111
20015
20018
1118
96'
84'
14'
N79°28'36"E
20
N81°11'08"E
N79°10'23"E
25:1 Taper
Alma School Rd
Ramp 'B' Cst ℄
1175
Varies
PT 7+87.14
New EB Striping
ASB-2
1178
PC 9+86.37
+50.00
28.00' Rt
PC 21+87.62
28'
Removal Limits
Exst Alma School Rd
Ramp 'B' Cst ℄
New Retaining Wall
New Conc Half Barrier
Special Detail
McKellips Rd
½ MILE
EXIT 12
N74°04'04"E
PT 16+98.16
N62°24'28"E
N62°24'28"E
Exst Alma School Rd
Ramp 'D' Cst ℄
Varies
Exst R/W
PC 2+38.63
New Conc Curb & Gutter
Type C, Std C-05.10
Begin Alma School Rd Ramp 'B' Cst ℄ POT Sta 11+70.00=
0.00' Lt Exst Alma School Rd Ramp 'B' Cst ℄ POT Sta 1+70.00
Alma School Rd
Ramp 'D' Cst ℄
New Conc Curb & Gutter
Type C, Std C-05.10
New Conc Half Barrier
Special Detail
New Retaining Wall
New Conc Half Barrier
Std C-10.50, Gutter=2.5'
Mid-Section Line
Exst R/W
End Alma School Rd Ramp 'B' Cst ℄ PT Sta 23+00.00=
0.00' Lt Exst Alma School Rd Ramp 'B' Cst ℄ POC Sta 13+00.00

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 461+00 to Sta 475+00

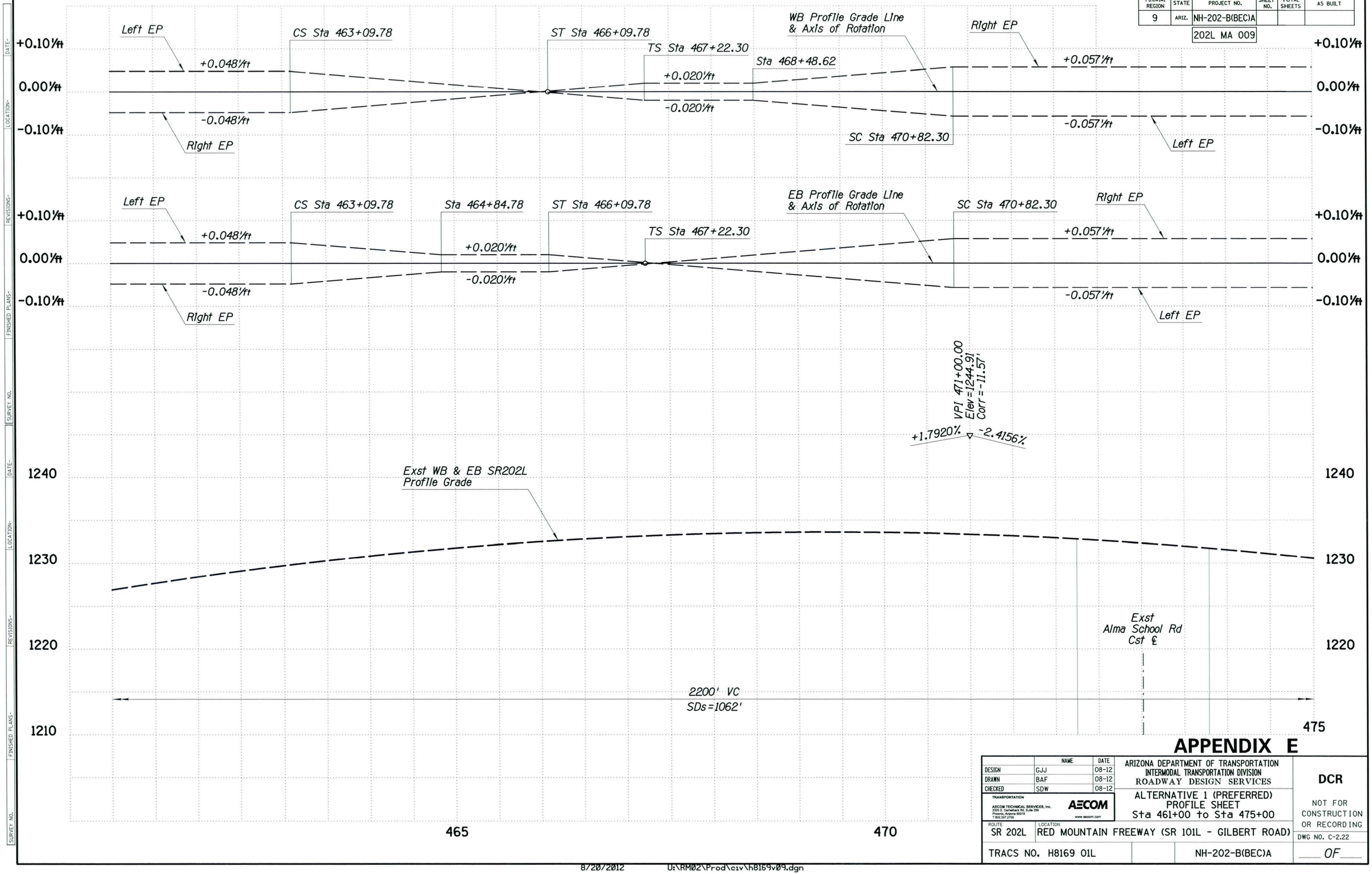
DCR
NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.21
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pal-08.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 461+00 to Sta 475+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.22

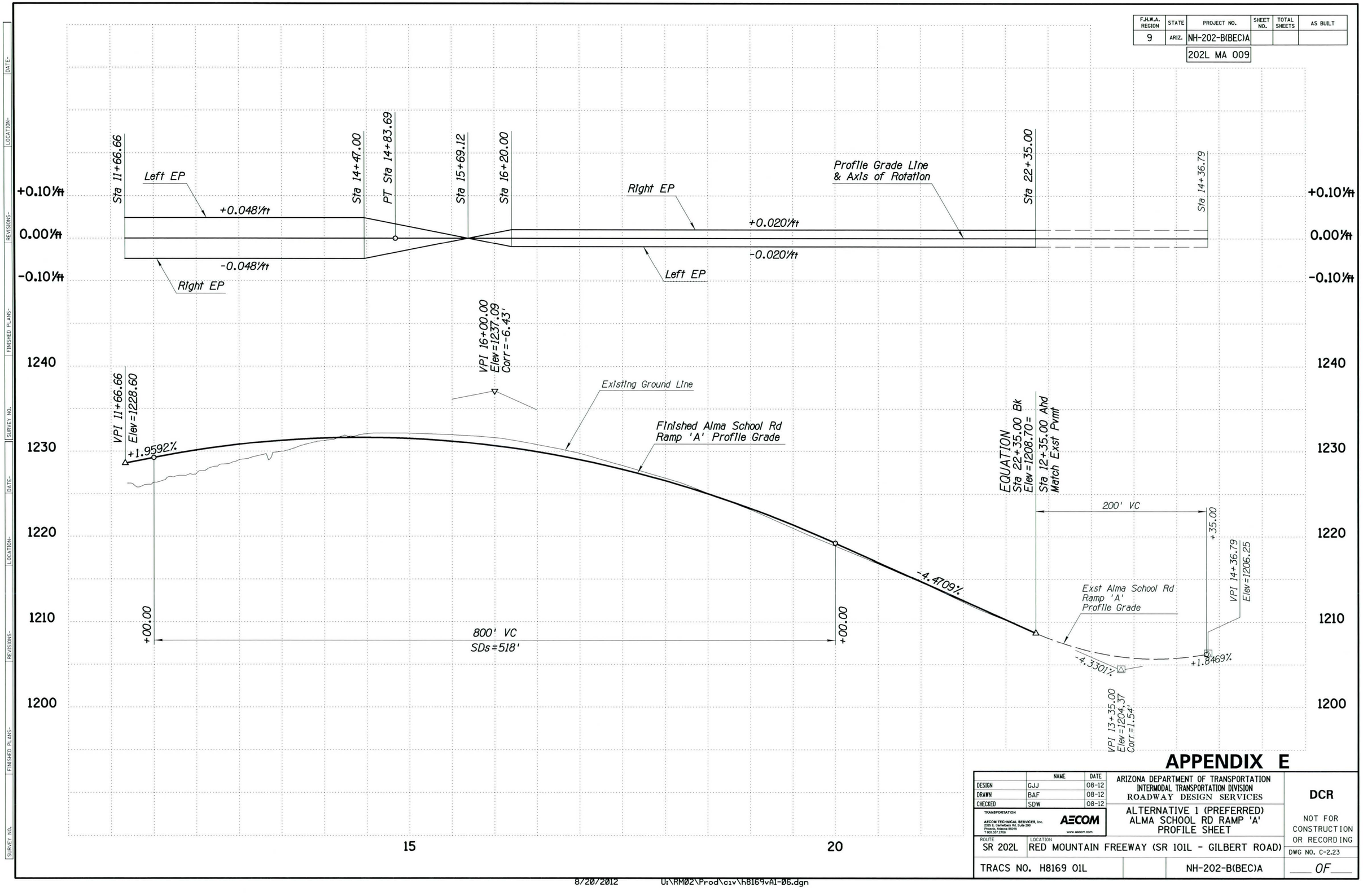
ROUTE	LOCATION
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v09.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
ALMA SCHOOL RD RAMP 'A'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.23

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

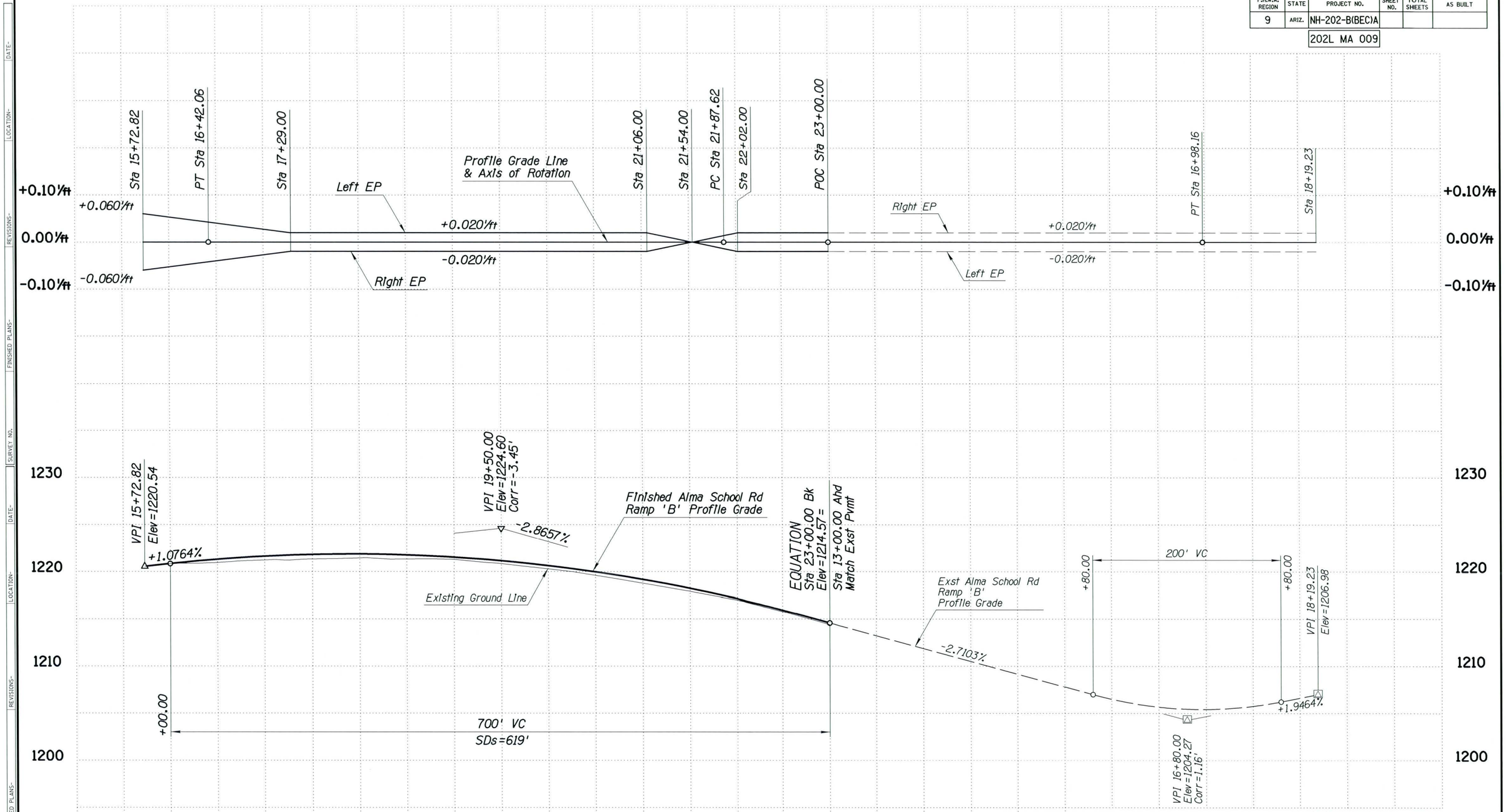
NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-06.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

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DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
ALMA SCHOOL RD RAMP 'B'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.24

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

____ OF ____

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

8/20/2012 U:\RM02\Prod\civ\h8169vA1-07.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

Begin Alma School Rd Ramp 'C' Cst ℄ POT Sta 12+75.00=
0.00' Lt Exst Alma School Rd Ramp 'C' Cst ℄ POT Sta 2+75.00

Alma School Rd Ramp 'C' Cst ℄ Sta 19+19.93=
118.56' Lt Exst SR 202L Med Cst ℄ Sta 483+33.93
Nose of Gore Control Point

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

LANE ENDS MERGE LEFT

EXIT 11 Alma School Rd

Salt River

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

New Conc Half Barrier
Special Detail

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

New Conc Half Barrier
Special Detail

New Retaining Wall

Removal Limits

New Manhole

EXIT 10 Dobson Rd 3/4 MILE

PC 14+35.46

475 480 485

15 20 10

+35.00 28.00' Lt

+85.00 10.00' Lt

PC 8+43.65 10'

N55°44'00"E 28'

14'

N55°44'00"E

25:1 Taper

New Retaining Wall

Exst Alma School Rd
Ramp 'C' Cst ℄

ASC-1

New Conc Curb & Gutter
Type C, Std C-05.10

End Alma School Rd Ramp 'C' Cst ℄ POT Sta 23+62.38=
84.00' Lt Exst SR 202L Med Cst ℄ POT Sta 487+75.00

Alma School Rd
Ramp 'C' Cst ℄

New WB Striping

Exst R/W

New FCDMC
Maintenance Road

PT 21+45.76

New Catch Basin
New 24" RCP
(Typ)

New 24" RCP
(Typ)

Exst SR 202L
Med Cst ℄

N49°48'51"E

96'

84'

14'

Varies

16'

CS 478+44.38

ST 482+04.38

1118

20022

1183

N45°48'51"E

96'

1190

1187

PT 8+40.49

N41°20'34"E

N39°35'33"E

ASD-1

50:1 Taper

ASD-2

New Noise Wall

Removal Limits

PC 13+00.00

New Retaining Wall

Removal Limits

New EB Striping

New Conc Half Barrier
Special Detail

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

Exst Alma School Rd
Ramp 'D' Cst ℄

Alma School Rd
Ramp 'D' Cst ℄

New Conc Curb & Gutter
Type C, Std C-05.10

PT 19+51.86

PC 11+46.69

PC 21+85.35

New Conc Half Barrier
Special Detail

Exst R/W

McKellips Rd
Country Club Dr
Gilbert Rd
87
1/4 1/2 4

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

Alma School Rd Ramp 'D' Cst ℄ Sta 21+78.94=
101.57' Rt Exst SR 202L Med Cst ℄ Sta 483+68.16
Nose of Gore Control Point

End Alma School Rd Ramp 'D' Cst ℄ PT Sta 24+96.44=
84.00' Rt Exst SR 202L Med Cst ℄ POT Sta 486+85.00

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
2225 E. Camelback Rd. Suite 300
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AECOM
www.aecom.com

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 475+00 to Sta 489+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

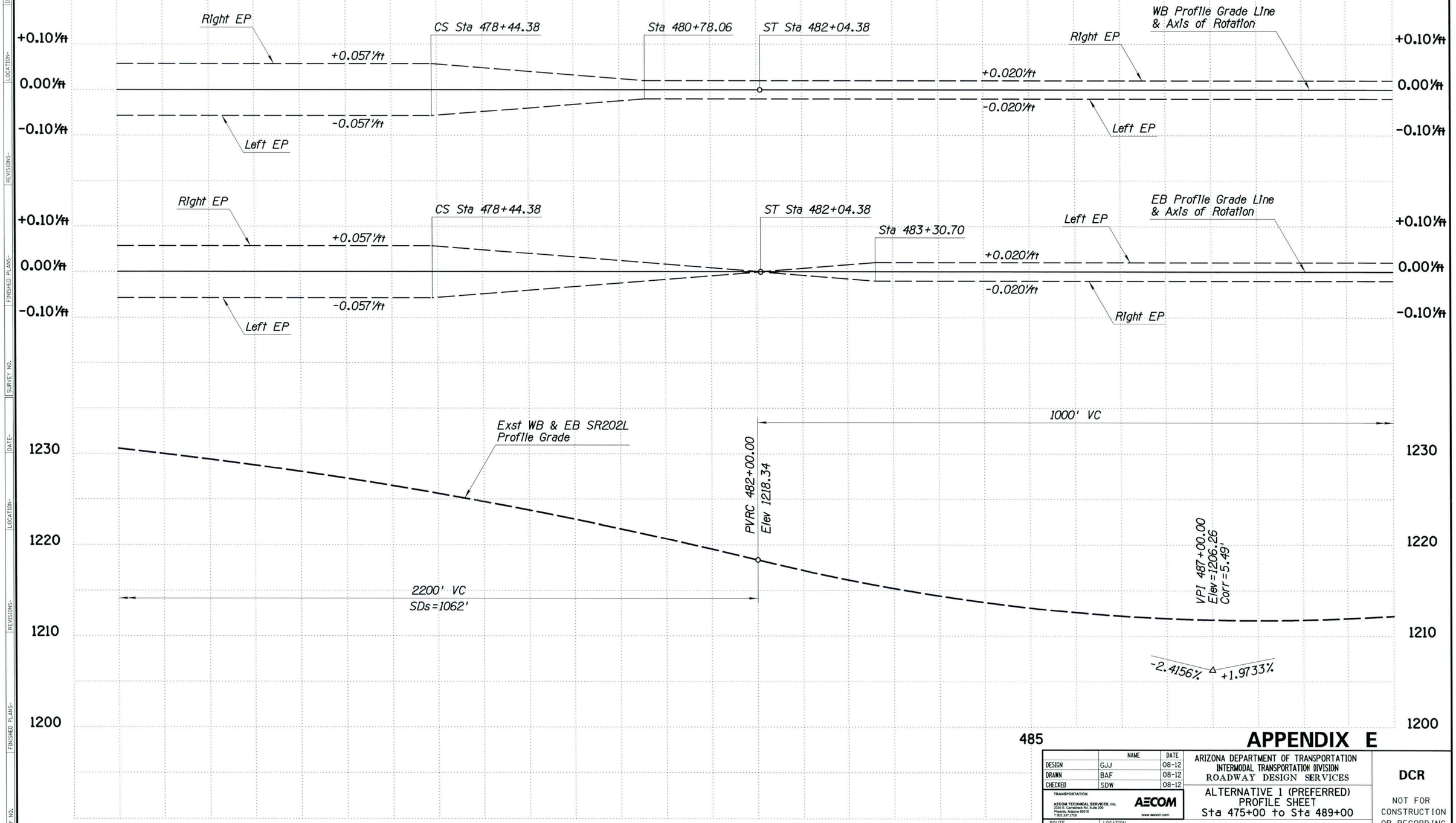
DWG NO. C-2.25

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-09.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 475+00 to Sta 489+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. C-2.26

TRACS NO. H8169 01L

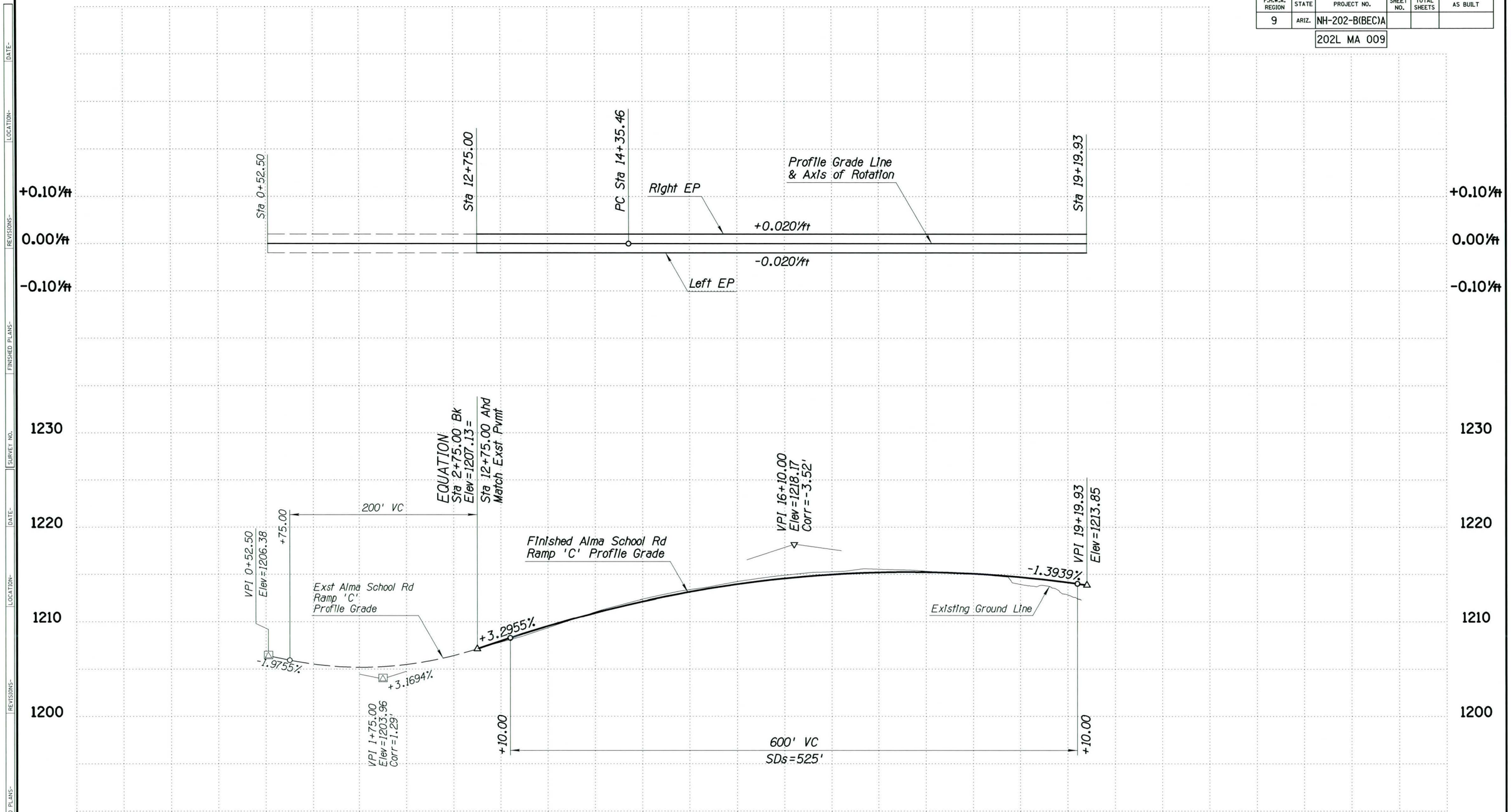
NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v10.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
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TRANSPORTATION

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
ALMA SCHOOL RD RAMP 'C'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

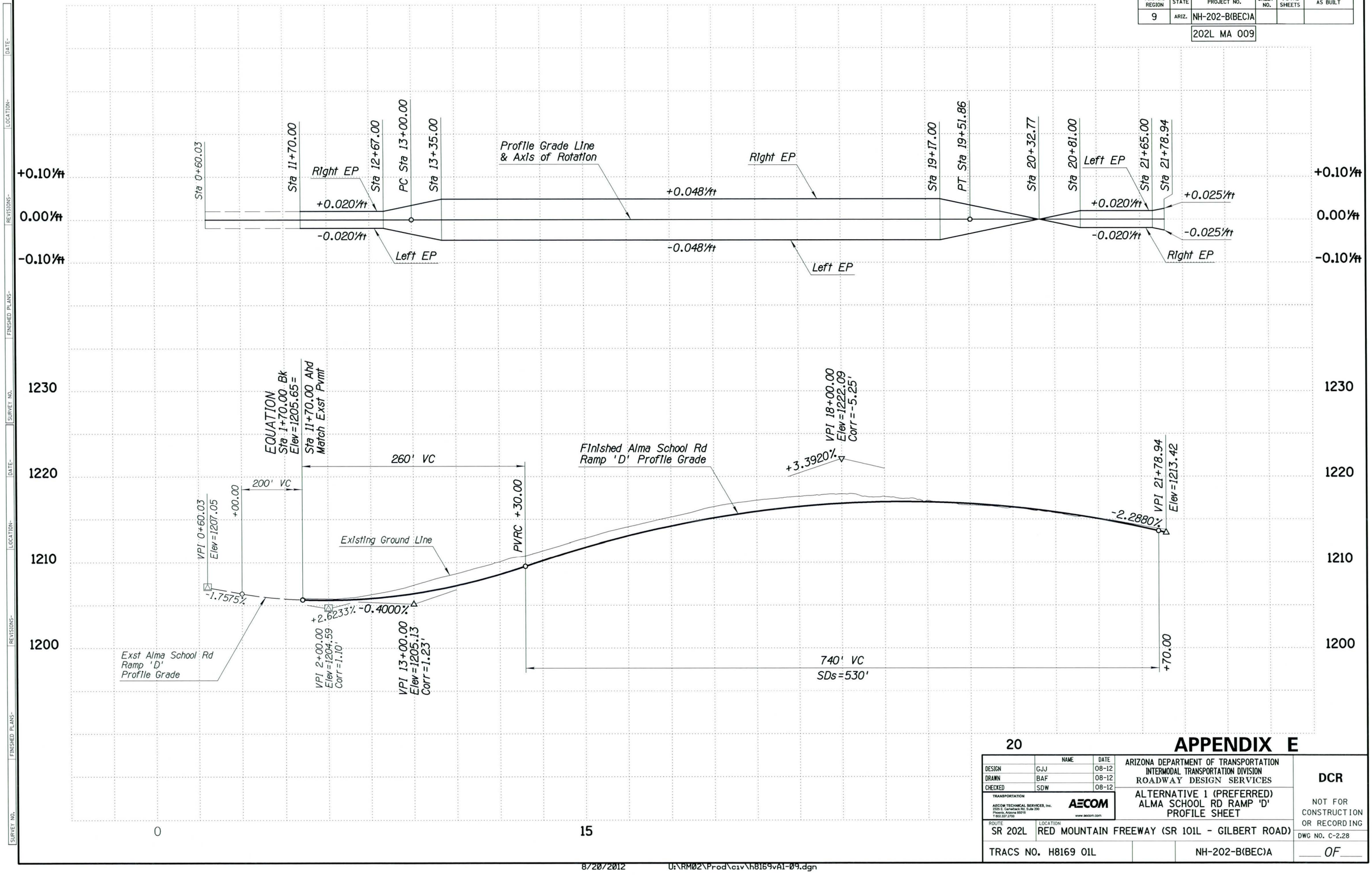
ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.27

TRACS NO. H8169 01L
NH-202-B(BEC)A
____ OF ____

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

8/20/2012 U:\RM02\Prod\civ\h8169vA1-08.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



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APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
ALMA SCHOOL RD RAMP 'D'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.28
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-09.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

Section Line

SRPMIC Boundary

McKellips Rd Ramp 'A' Cst ℄ Sta 13+22.80=
101.54' Lt Exst SR 202L Med Cst ℄ Sta 496+72.89
Nose of Gore Control Point

New Conc Curb & Gutter
Type C, Std C-05.10

New Conc Half Barrier
Special Detail

Exst McKellips Rd
Ramp 'A' Cst ℄

New Retaining Wall

Begin McKellips Rd Ramp 'A' Cst ℄ PC Sta 9+49.37=
84.00' Lt Exst SR 202L Med Cst ℄ POT Sta 493+00.00

Removal Limits

Exst R/W

PT 12+49.37

Exst FCDMC
Maintenance Road

New WB Striping

PT 4+99.99

PC 16+77.77

PC 7+53.76

+00.00
84.00' Lt

McKellips Rd
Ramp 'A' Cst ℄

MA-1

MA-2

1196

1193

1125

1201

50:1 Taper

N41°18'51"E

N40°48'51"E

N45°48'51"E

N49°48'51"E

N43°48'51"E

PC 499+38.42

16'

14'

96'

96'

Varies

Varies

14'

New Combination Noise
and Retaining Wall

New Catch Basin
(Typ)

Begin McKellips Rd Ramp 'B' Cst ℄ POT Sta 7+91.71=
84.00' Rt Exst SR 202L Med Cst ℄ POT Sta 492+00.00

Exst R/W

Removal Limits

Exst McKellips Rd
Ramp 'B' Cst ℄

New Conc Half Barrier
Special Detail

New 24" RCP
(Typ)

Proposed COM 36"
Reclaimed Water Line

McKellips Rd
EXIT 12

McKellips Rd Ramp 'B' Cst ℄ Sta 12+86.69=
118.53' Rt Exst SR 202L Med Cst ℄ Sta 496+93.78
Nose of Gore Control Point

New TCE

New EB Striping

PC 14+27.35

PC 5+91.40

MB-1

10'

N57°31'55"E

25:1 Taper

McKellips Rd
Ramp 'B' Cst ℄

New Conc Curb & Gutter
Type C, Std C-05.10

New R/W

New Noise Wall

New Catch Basin
New 24" RCP
(Typ)

New Conc Half Barrier
Special Detail

Seyenna Vistas
Mobile Home Park

PT 18+13.24

+50.00
10.00' Rt

PT 8+91.39

New Combination Noise
and Retaining Wall

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 489+00 to Sta 503+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

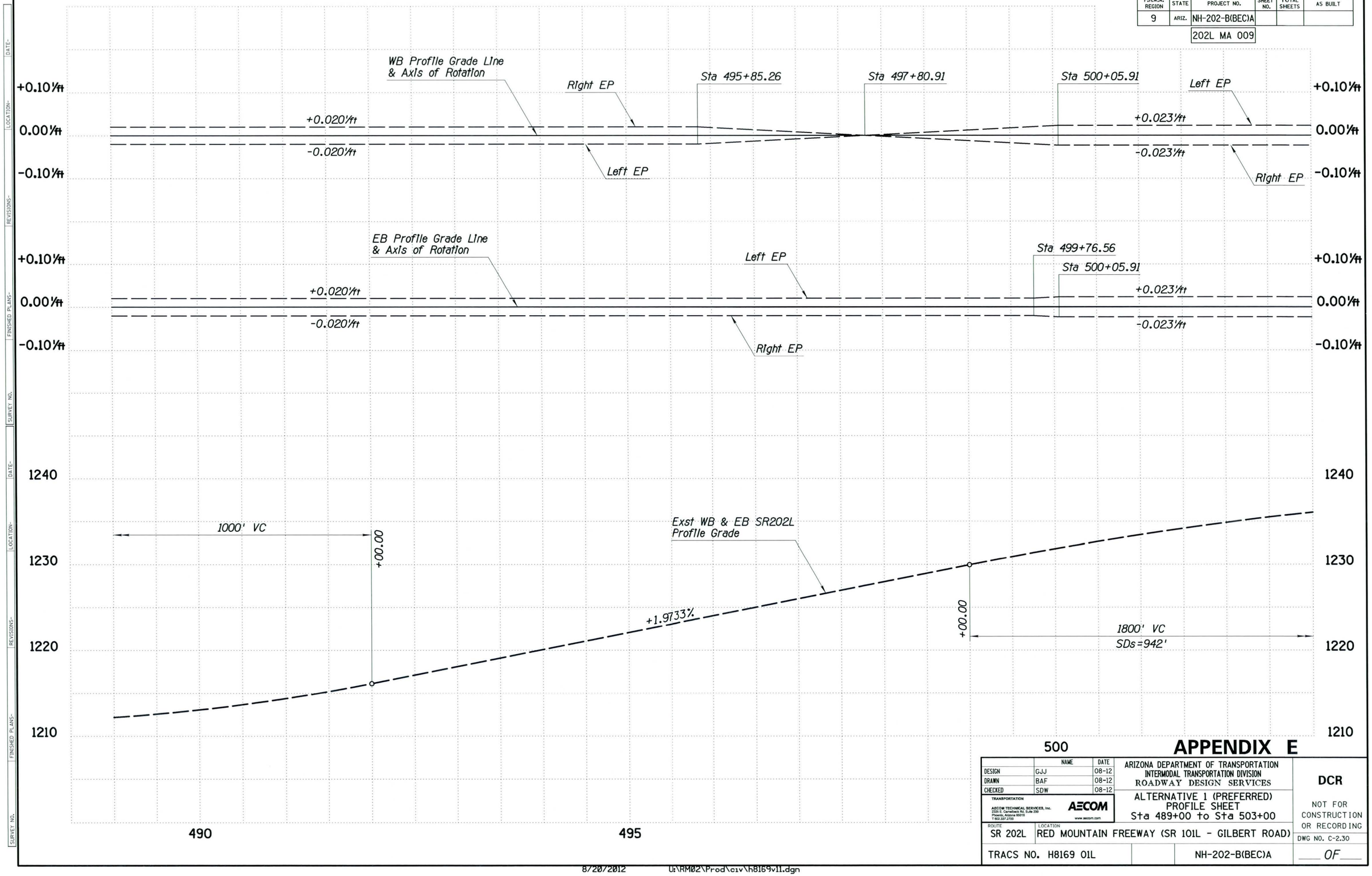
ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.29
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pal-10.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 489+00 to Sta 503+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

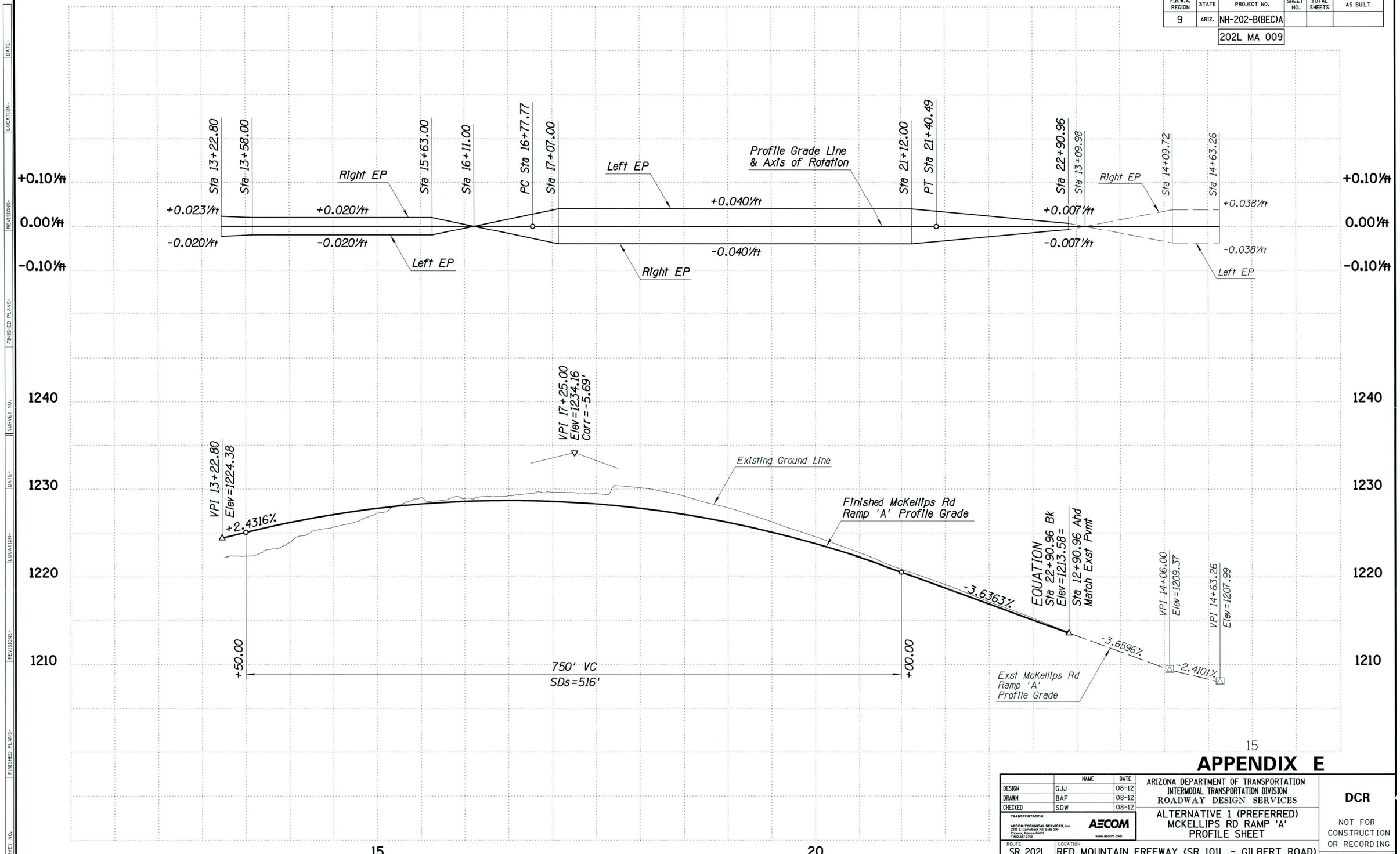
DWG NO. C-2.30

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v11.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
MCKELLIPS RD RAMP 'A'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.31

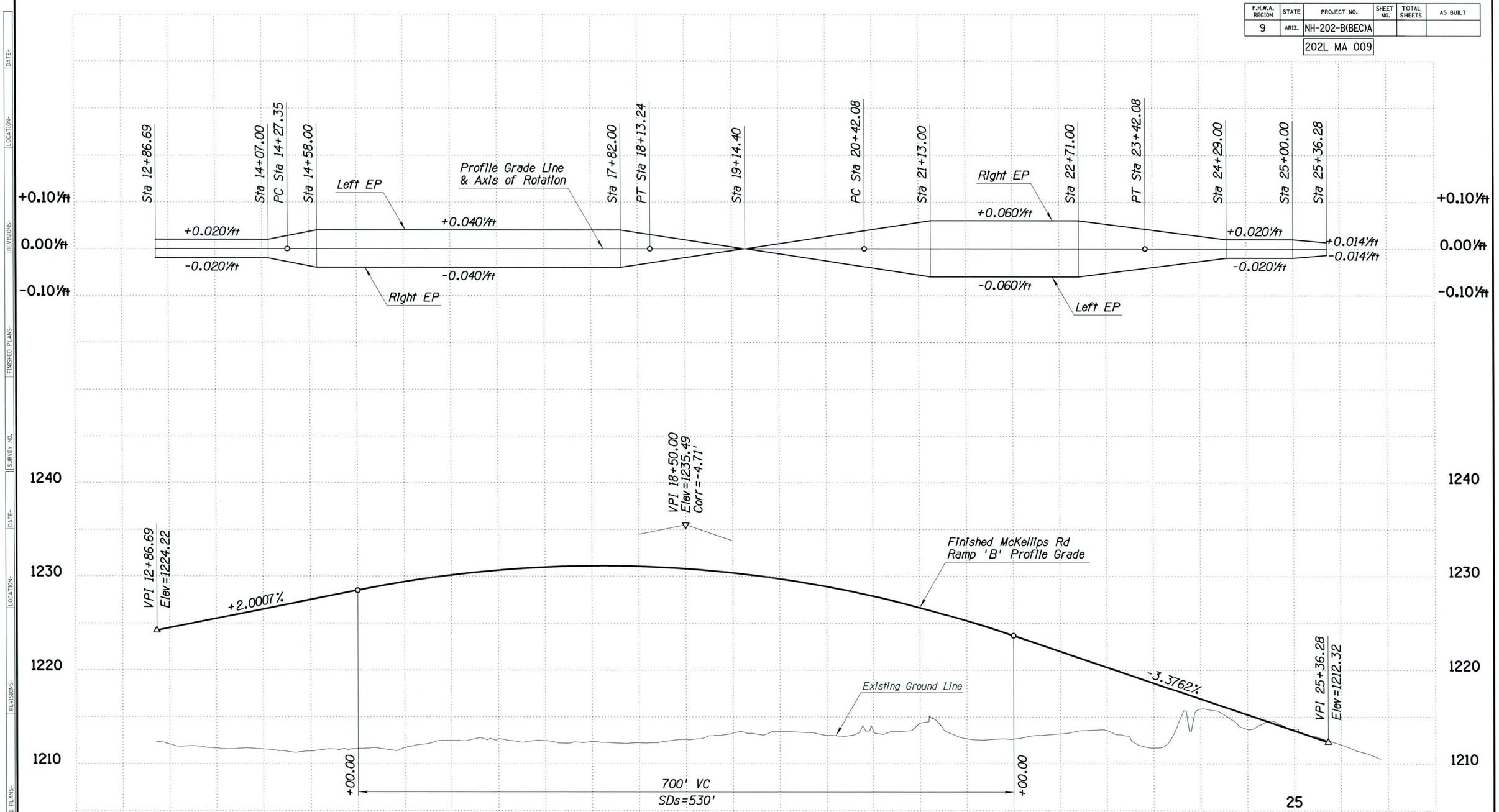
ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-10.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
MCKELLIPS RD RAMP 'B'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.32

ROUTE	LOCATION
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-11.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

SRPMIC Boundary
New Conc Half Barrier Special Detail
New Retaining Wall
New Conc Half Barrier Std C-10.50, Gutter=2.5'
New Conc Curb & Gutter Type C, Std C-05.10
Mid-Section Line
Salt River
Exst R/W
End McKellips Rd Ramp 'A' Cst ℄ POT Sta 22+90.96= 0.00' Lt Exst McKellips Rd Ramp 'A' Cst ℄ POT Sta 12+90.96
McKellips Rd Ramp 'A' Cst ℄
Alma School Rd 1 1/4
Dobson Rd 1 1/4
Jct 101 2 1/2
PT 21+40.49
PT 12+36.48
Exst FCDMC Maintenance Road
New 24" RCP (Typ)
+00.00 96.00' Lt
New Manhole
Exst McKellips Rd Cst ℄
Exst McKellips Rd Ramp 'A' Cst ℄
Exst McKellips Rd Cst ℄ Sta 20+00.00= Exst SR 202L Med Cst ℄ Sta 509+18.99
Exst FCDMC Maintenance Road
Widen Exst McKellips Rd Overpass (Typ)
New Retaining Wall
Removal Limits
Exst SR 202L Med Cst ℄
New Conc Half Barrier Special Detail
New WB Striping
N52°52'56"E
50:1 Taper
Varies
96'
N46°48'52"E
N55°38'44"E
Exst McKellips Rd Ramp 'B' Cst ℄
PT 13+94.64
PC 10+41.39
N57°31'55"E
New Noise Wall
N36°52'55"E
New Combination Noise and Retaining Wall
Removal Limits
New EB Striping
25:1 Taper
New Combination Noise and Retaining Wall
New R/W
New TCE
PC 20+42.08
+00.00 28.00' Rt
PT 23+42.08
Exst R/W
New Catch Basin New 24" RCP (Typ)
Country Club Dr Ramp 'B' Cst ℄
New Retaining Wall
New Conc Half Barrier Special Detail
Proposed COM 36" Reclaimed Water Line
Seyenna Vistas Mobile Home Park
New Retaining Wall
McKellips Rd Ramp 'B' Cst ℄
New Conc Half Barrier Special Detail
New Cul-De-Sac (Typ)
New Conc Curb & Gutter Type C, Std C-05.10
Section Line
Exst SRP Irrigation Ditch
Fountain Hills Downtown Mesa Community Center EXIT 13
Country Club Dr Payson EXIT ONLY 87 EXIT 13
Country Club Dr Payson EXIT ONLY 87 EXIT 13
Begin Country Club Dr Ramp 'B' Cst ℄ PC Sta 7+46.37= 84.00' Rt Exst SR 202L Med Cst ℄ POC Sta 514+20.00
End McKellips Rd Ramp 'B' Cst ℄ POT Sta 25+92.08= 0.00' Lt Exst McKellips Rd Cst ℄ POC Sta 21+50.02

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Aux Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 503+00 to Sta 517+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.33

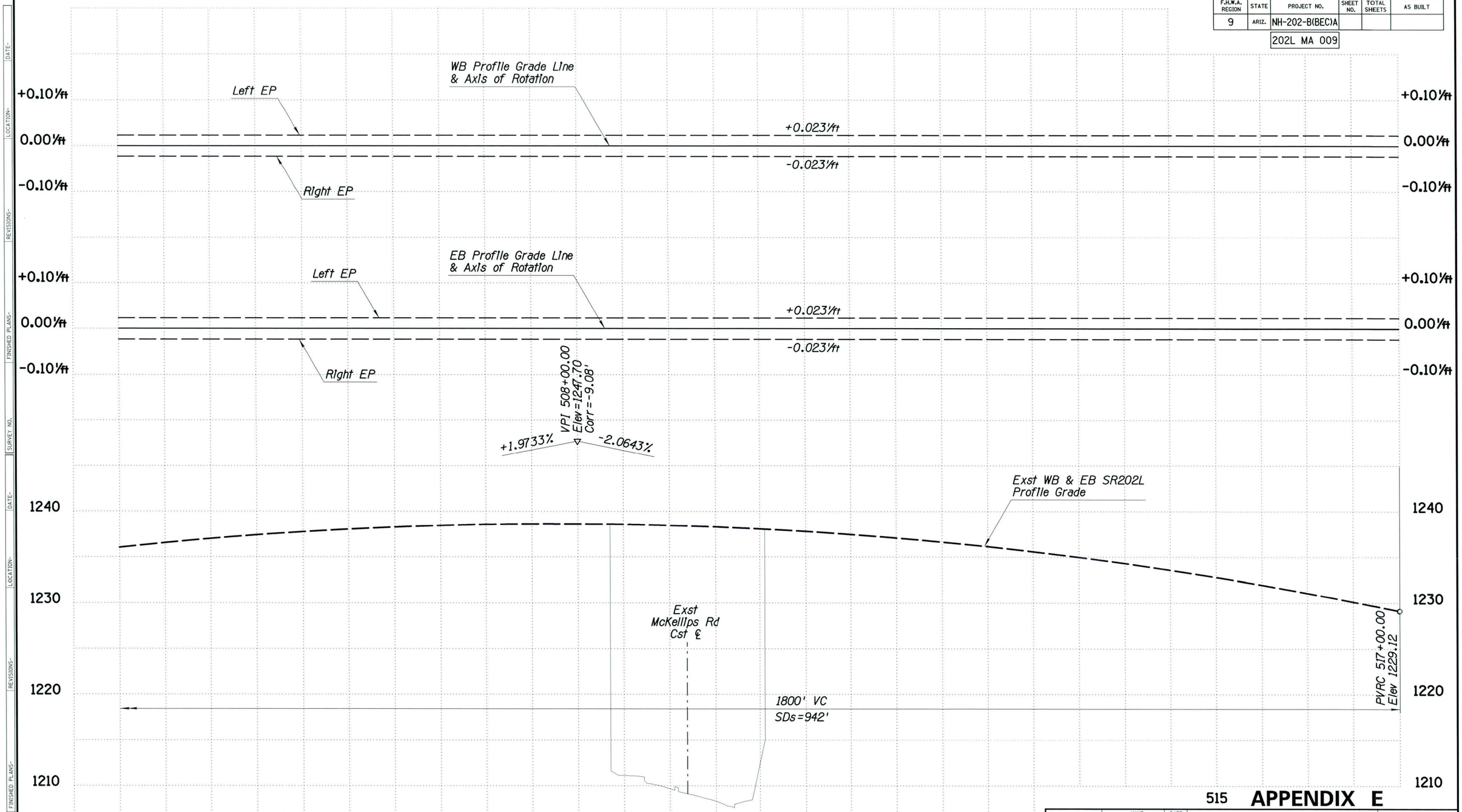
ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-11.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



515 **APPENDIX E**

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 503+00 to Sta 517+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.34

ROUTE	LOCATION	
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L		NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v12.dgn

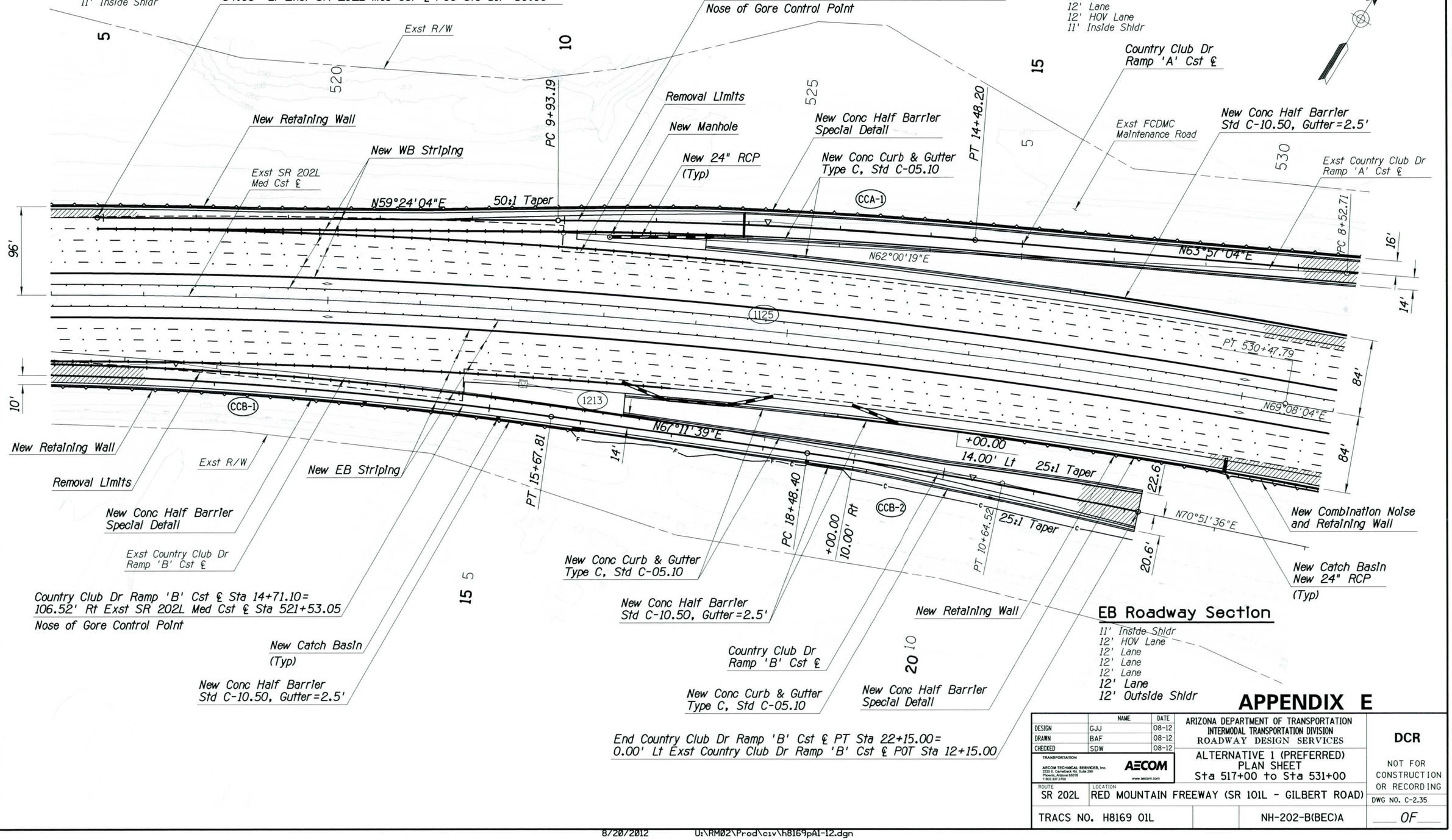
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr



EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 517+00 to Sta 531+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.35

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

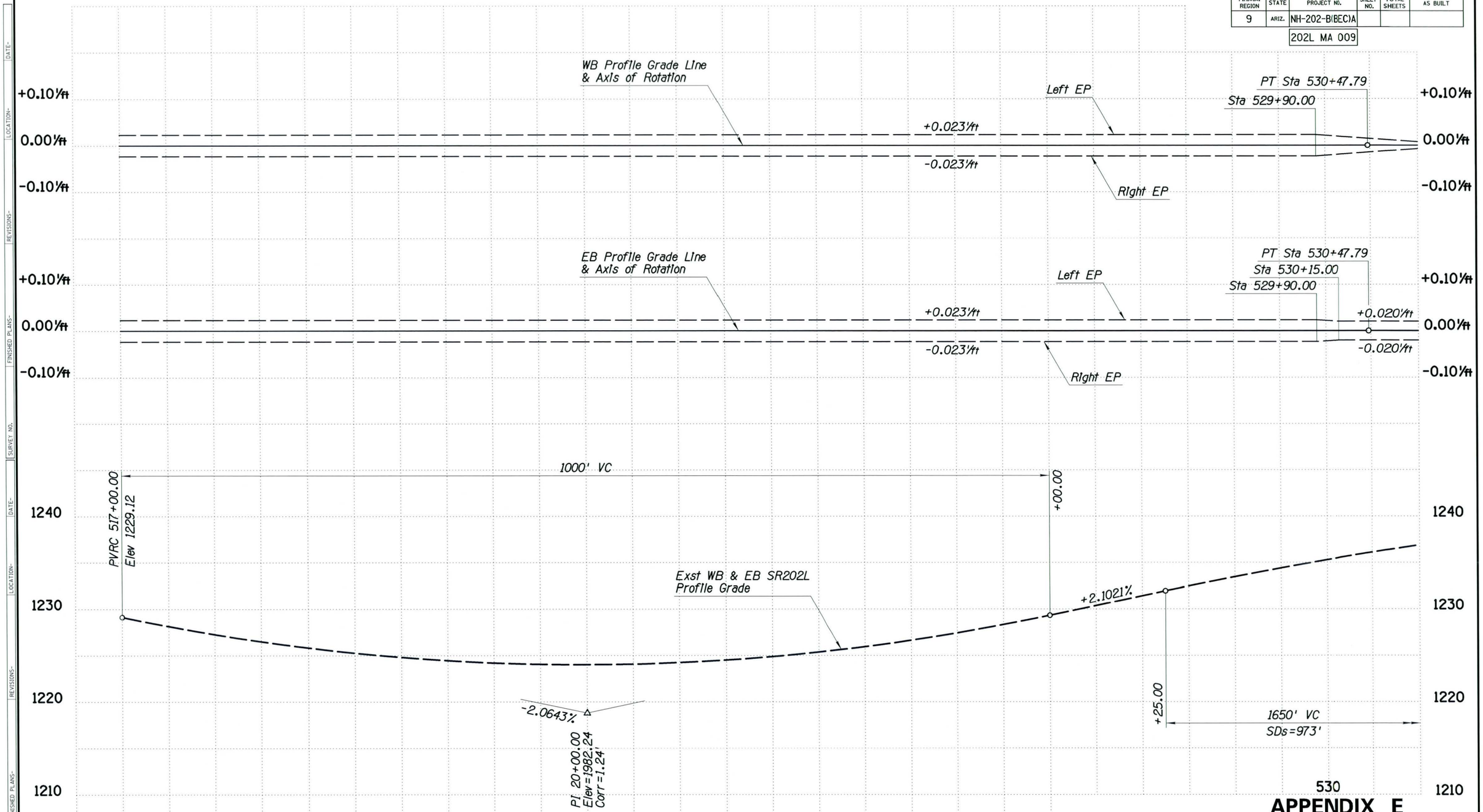
TRACS NO. H8169 01L
NH-202-B(BEC)A
OF

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

8/20/2012 U:\RM02\Prod\civ\h8169pA1-12.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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DCR

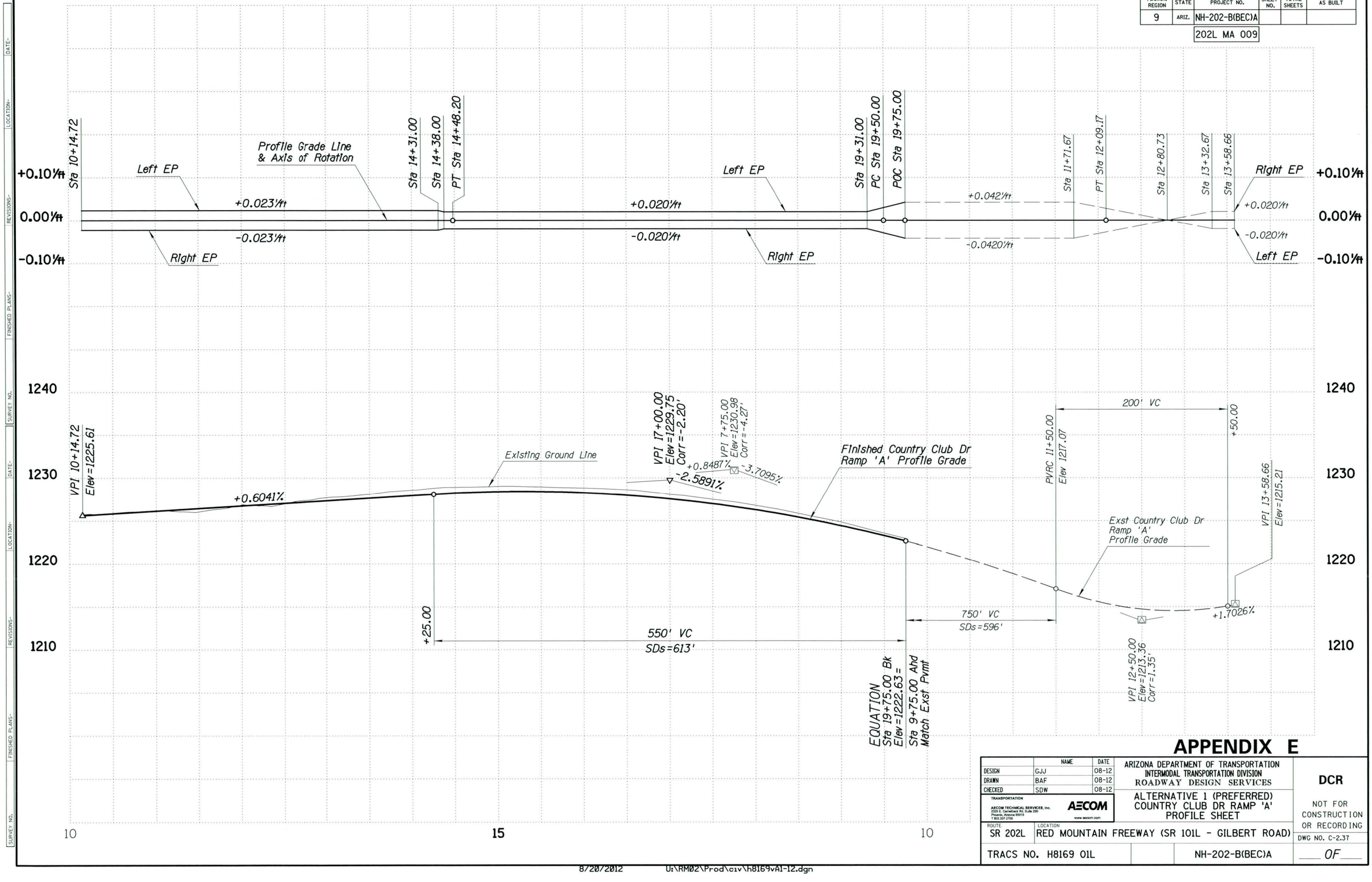
NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.36

TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v13.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



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DRAWN	BAF	08-12
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ALTERNATIVE 1 (PREFERRED)
COUNTRY CLUB DR RAMP 'A'
PROFILE SHEET

DCR

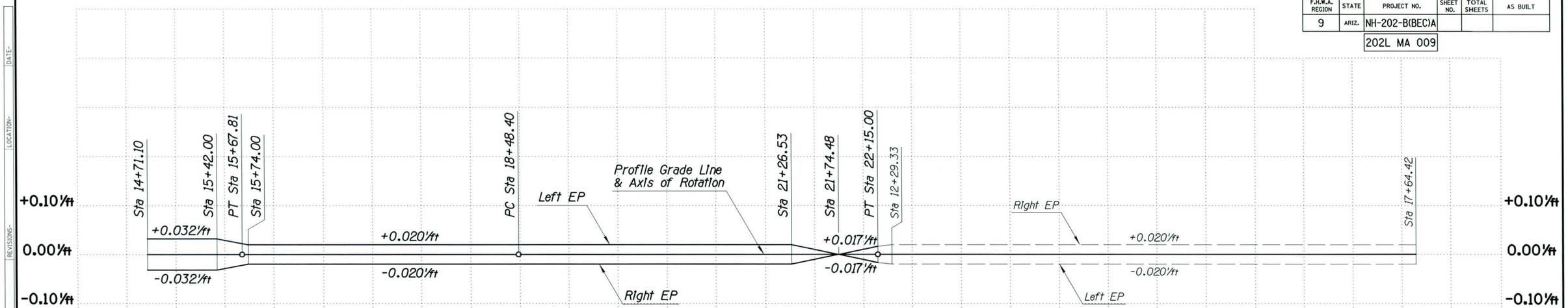
NOT FOR CONSTRUCTION OR RECORDING

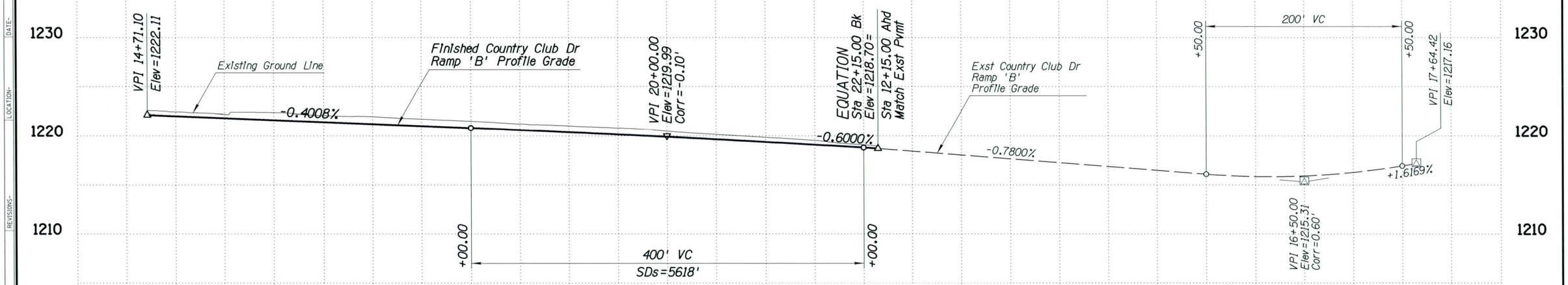
ROUTE	LOCATION	DWG NO. C-2.37
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	OF

8/20/2012 U:\RM02\Prod\civ\h8169vA1-12.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			





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APPENDIX E

	NAME	DATE
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ALTERNATIVE 1 (PREFERRED)
COUNTRY CLUB DR RAMP 'B'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO. C-2.38
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v01-13.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

Section Line
New Conc Half Barrier Std C-10.50, Gutter=2.5'
Country Club Dr Ramp 'B' Cst ℄
End Country Club Dr Ramp 'A' Cst ℄ PT Sta 19+75.00= 0.00' Lt Exst Country Club Dr Ramp 'A' Cst ℄ POC Sta 9+75.00
Exst R/W
Exst FCDMC Maintenance Road
PC 19+50.00
CCA-2
PT 12+09.17
Exst Country Club Dr Ramp 'A' Cst ℄
Widen Exst Country Club Dr Overpass (Typ)
PC 2+00.00
Exst SR 202L Med Cst ℄
Removal Limits
New Catch Basin New 24" RCP (Typ)
New Conc Half Barrier Special Detail
Exst R/W
Exst Country Club Dr Ramp 'C' Cst ℄
New Conc Half Barrier Std C-10.50, Gutter=2.5'
New Retaining Wall
New WB Striping
PT 4+65.59
N51°20'15"E
PT 543+66.67
N50°09'25"E
Varies
84'
16'
14'
N63°57'04"E
New Conc Curb & Gutter Type C, Std C-05.10
New Conc Half Barrier Std C-10.50, Gutter=2.5'
N69°08'04"E
N67°17'52"E
1209
1217
1128
PC 534+17.80
65:1 Taper
+10.00
84.00' Rt
N45°58'55"E
New EB Striping
Country Club Dr Ramp 'D' Cst ℄
New Noise Wall
Removal Limits
Exst Country Club Dr Ramp 'D' Cst ℄
New Combination Noise and Retaining Wall
Exst Country Club Dr Cst ℄ Sta 278+20.64= Exst SR 202L Med Cst ℄ Sta 535+96.72
1224
CCD-1
PT 6+16.88
PT 16+16.88
+50.00
14.00' Rt
+00.00
16.00' Rt
New Conc Half Barrier Special Detail
N70°51'36"E
Exst Country Club Dr Ramp 'B' Cst ℄
N69°08'04"E
Exst Country Club Dr Cst ℄
PC 2+31.00
New Conc Half Barrier Special Detail
Exst R/W
New Conc Curb & Gutter Type C, Std C-05.10
Begin Country Club Dr Ramp 'D' Cst ℄ PC Sta 15+00.00= 0.00' Lt Exst Country Club Dr Ramp 'D' Cst ℄ POC Sta 5+00.00
535
540
545
10
15
5
20

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

EB Roadway Section

11' Inside Shldr
Varies 12'-11' HOV Lane
Varies 12'-11' Lane
Varies 12'-11' Lane
Varies 12'-11' Lane
Varies 12'-11' Lane
Varies 12'-16' Outside Shldr

APPENDIX E

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ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.39
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-13.dgn

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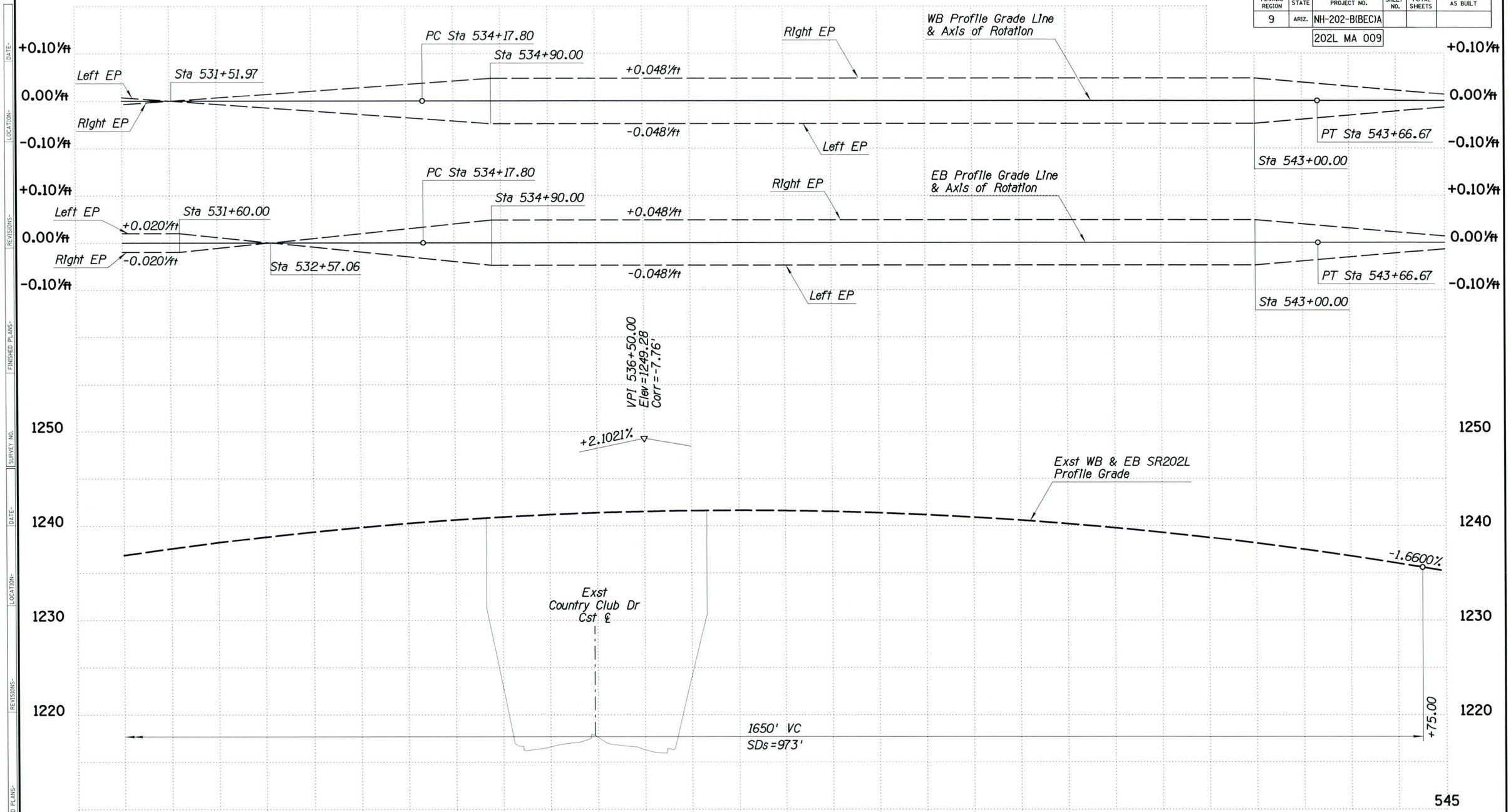
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



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ROADWAY DESIGN SERVICES

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PROFILE SHEET
Sta 531+00 to Sta 545+00

DCR

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ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.40
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v14.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10'-11' Inside Shldr

Begin Country Club Dr Ramp 'C' Cst ℄ POT Sta 19+78.00=
0.00' Lt Exst Country Club Dr Ramp 'C' Cst ℄ POT Sta 9+78.00

+00.00
84.00' Lt
+50.00
83.00' Lt
8'
14'
N51°20'15"E
150:1 Taper
+00.00
8.00' Lt
PC 10+77.01
+00.00
10.00' Lt
PC 21+70.56
Exst Country Club Dr Ramp 'C' Cst ℄
Removal Limits
New Conc Half Barrier Std C-10.50, Gutter=2.5'
New Conc Curb & Gutter Type C, Std C-05.10
CCC-1
1220
1131
1227
CCD-2
84'
Varies
14'
16'
PC 548+07.67
N50°09'25"E
65:1 Taper
N45°58'55"E
+00.00
78.00' Rt
50:1 Taper
New Conc Half Barrier Special Detail
New Noise Wall
New Conc Half Barrier Std C-10.50, Gutter=2.5'
New Conc Curb & Gutter Type C, Std C-05.10
PC 14+16.89
PC 24+06.83
Country Club Dr Ramp 'D' Cst ℄
New Catch Basin (Typ)
Exst Country Club Dr Ramp 'D' Cst ℄
545
10
550
25
15
25
15
Country Club Dr Ramp 'D' Cst ℄ POC Sta 24+41.42=
95.56' Rt Exst SR 202L Med Cst ℄ POC Sta 549+14.44
Nose of Gore Control Point
End Country Club Dr Ramp 'D' Cst ℄ PT Sta 27+92.94=
77.00' Rt Exst SR 202L Med Cst ℄ POC Sta 552+84.10
Exst R/W
Exst Radio Disney, LLC
KMIC Radio Station Towers

EB Roadway Section

Varies 11'-10' Inside Shldr
11' HOV Lane
11' Lane
11' Lane
11' Lane
11' Lane
12' Outside Shldr
Note: PGL Transitions from 36'-35' from Sta 545+00 to 546+50

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

New Conc Curb & Gutter Type C, Std C-05.10
Exst R/W
New Manhole (Typ)
New 24" RCP (Typ)
555
Country Club Dr Ramp 'C' Cst ℄ Sta 29+11.45=
105.53' Lt Exst SR 202L Med Cst ℄ Sta 555+65.88
Nose of Gore Control Point
Country Club Dr Ramp 'C' Cst ℄
Exst SR 202L Med Cst ℄
30
20
New WB Striping
Mid-Section Line
PT 30+84.80
PT 21+21.85
PT 557+71.95
N87°54'25"E
N87°54'24"E
N83°34'25"E
10'
+53.56
83.00' Rt
+00.00
83.00' Rt
25:1 Taper
New EB Striping
Removal Limits
+50.00
89.00' Rt
89'
New Conc Half Barrier Std C-10.50, Gutter=2.5'
New Catch Basin New 24" RCP (Typ)

EB Roadway Section

10' Inside Shldr
11' HOV Lane
11' Lane
11' Lane
11' Lane
11' Lane
11' Lane
Varies 6'-12' Outside Shldr

APPENDIX E

	NAME	DATE
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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 545+00 to Sta 559+00

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NOT FOR CONSTRUCTION OR RECORDING

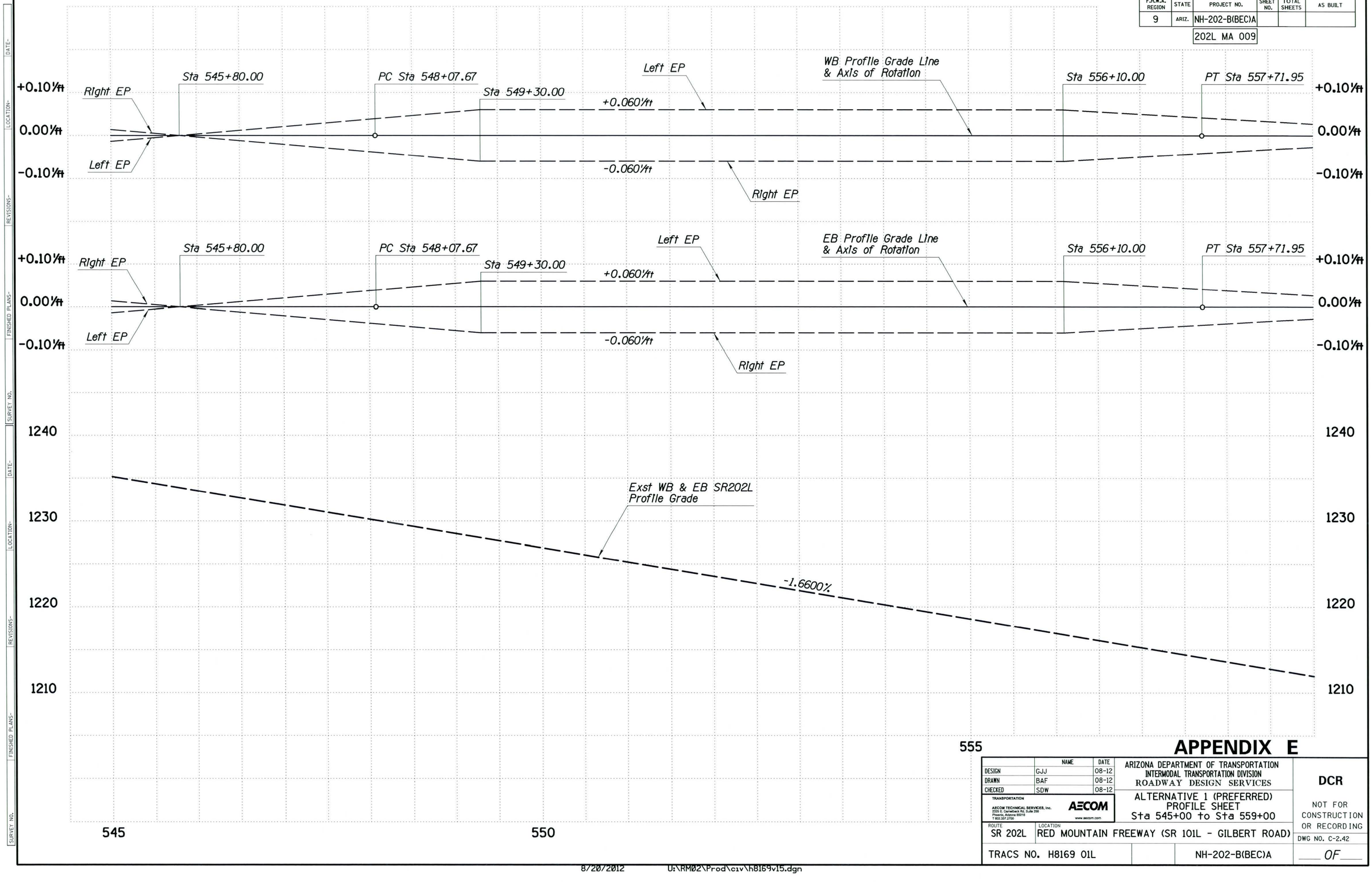
ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.41
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-14.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 545+00 to Sta 559+00

DCR

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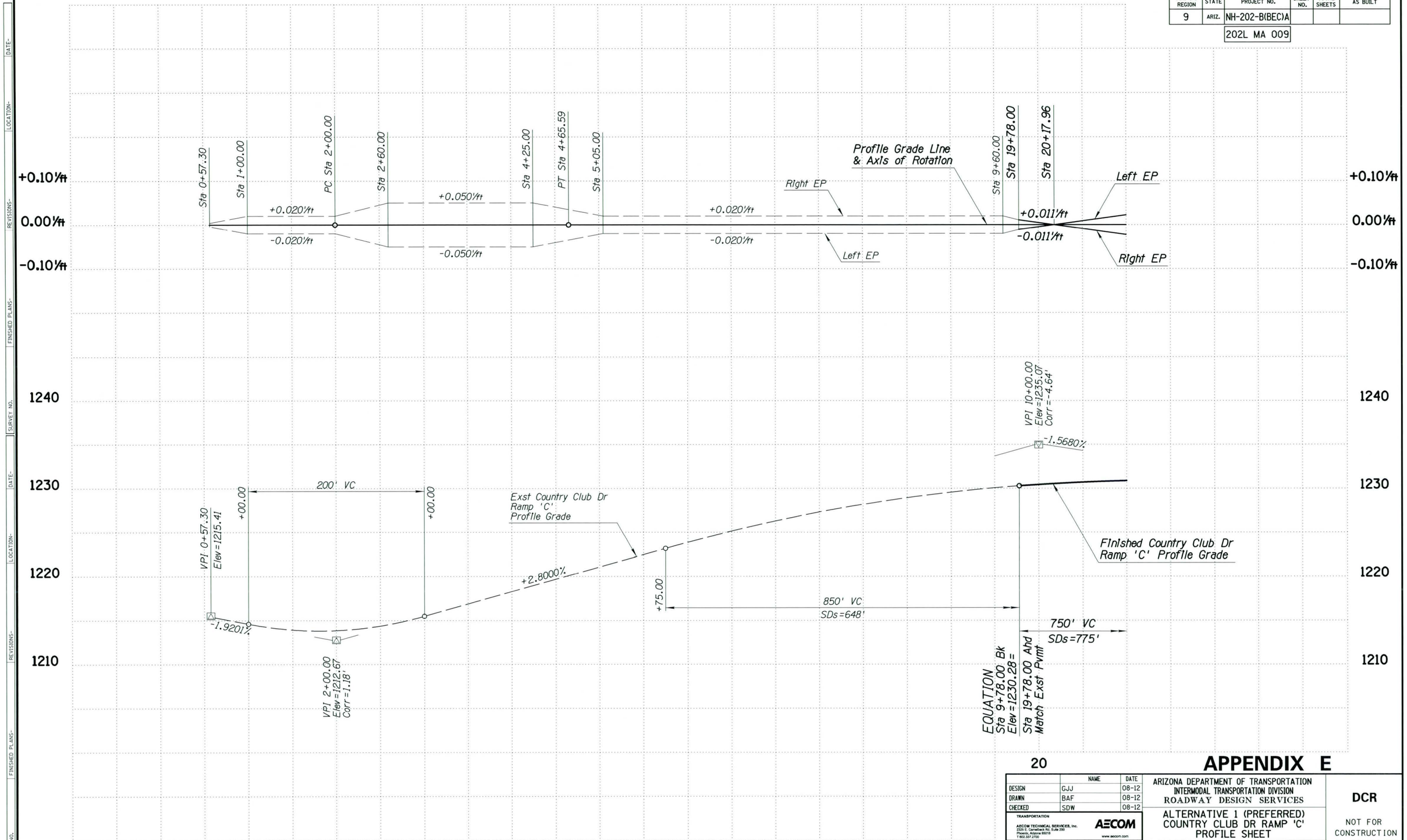
ROUTE	LOCATION	DWG NO. C-2.42
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	____ OF ____

8/20/2012 U:\RM02\Prod\civ\h8169v15.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



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INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
COUNTRY CLUB DR RAMP 'C'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.43

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

____ OF ____

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

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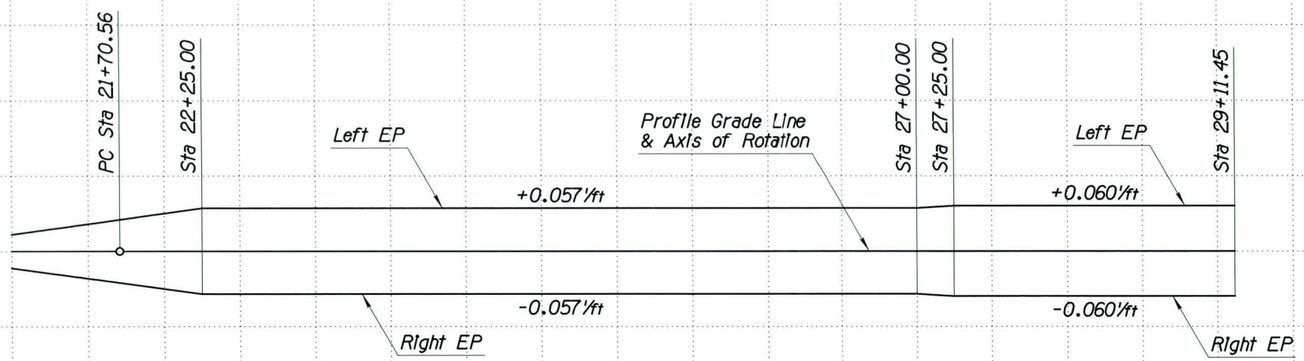
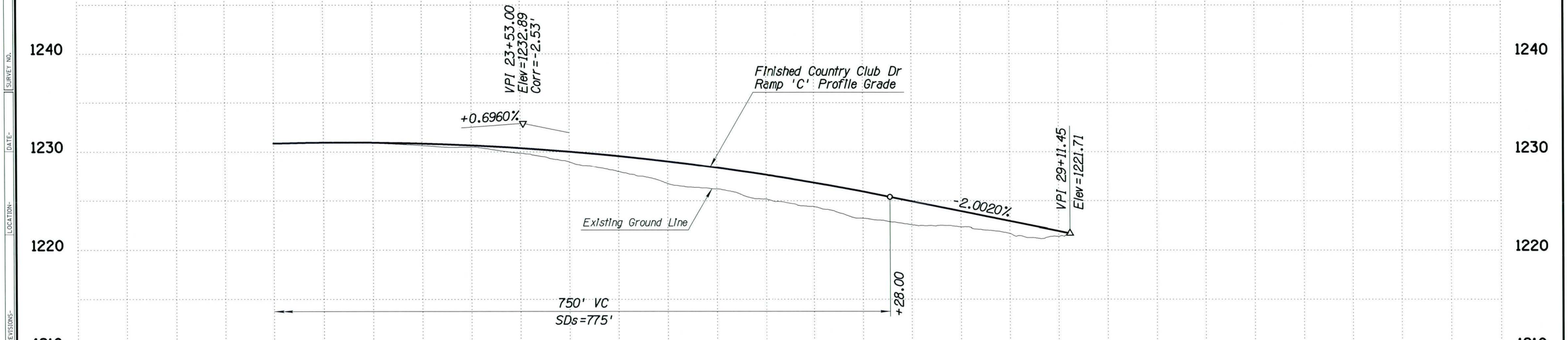
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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





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PROFILE SHEET

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ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.44
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

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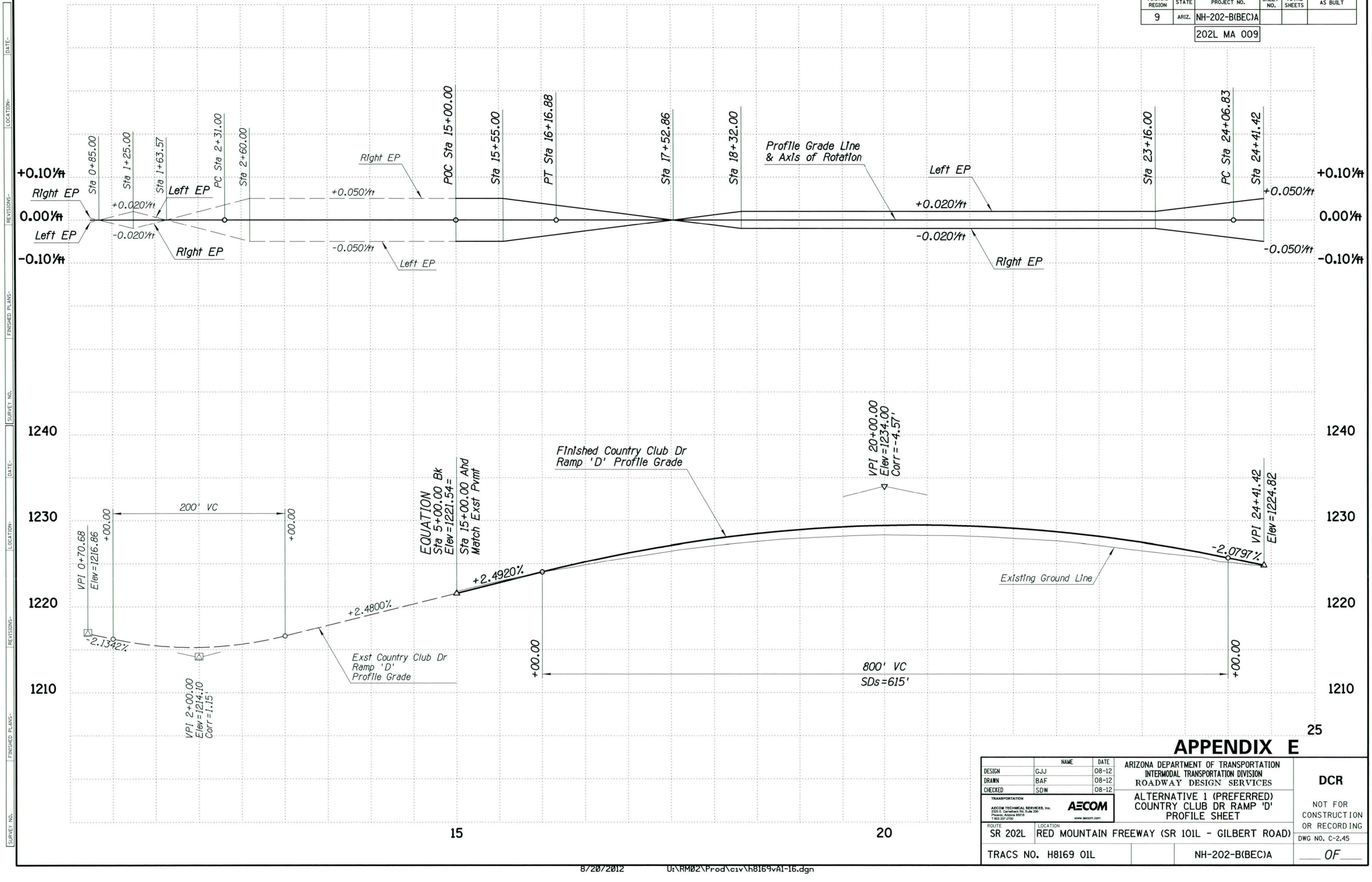
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



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ALTERNATIVE 1 (PREFERRED)
COUNTRY CLUB DR RAMP 'D'
PROFILE SHEET

DCR

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ROUTE	LOCATION	DWG NO. C-2.45
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-16.dgn

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		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

EXIT 13 — 87 — Country Club Dr Payson

Exst Country Club Dr Ramp 'C' Cst ℄

Country Club Dr Ramp 'C' Cst ℄

End Country Club Dr Ramp 'C' Cst ℄ POT Sta 33+59.06= 71.00' Lt Exst SR 202L Med Cst ℄ POT Sta 560+00.00

560

565

570

Center St

EXIT 13 — Fountain Hills Downtown Mesa Community Center

EXIT 13 — 87 — Country Club Dr Payson

Exst R/W

New WB Striping

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

83'

83'

3

10'

Exst SR 202L Med Cst ℄

Removal Limits

PC 565+13.96

N83°54'25"E

1134

Mid-Section Line

89'

New EB Striping

+75.00
83.00' Rt

50:1 Taper

+00.00
83.00' Rt

Removal Limits

New 24" RCP
(Typ)

Lehi Rd

New Manhole
(Typ)

Exst R/W

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

+00.00
89.00' Rt

New Catch Basin
New 24" RCP
(Typ)

Exst Center St Underpass

Exst
Pump
Station

Mid-Section Line

EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

EB Roadway Section

10' Inside Shldr
11' HOV lane
11' Lane
11' Lane
11' Lane
11' Lane
11' Lane
Varies 12'-17' Outside Shldr

EB Roadway Section

10' Inside Shldr
Varies 11'-12' HOV lane
Varies 11'-12' Lane
Varies 11'-12' Lane
Varies 11'-12' Lane
Varies 11'-12' Lane
Varies 17'-12' Outside Shldr

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 559+00 to Sta 573+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

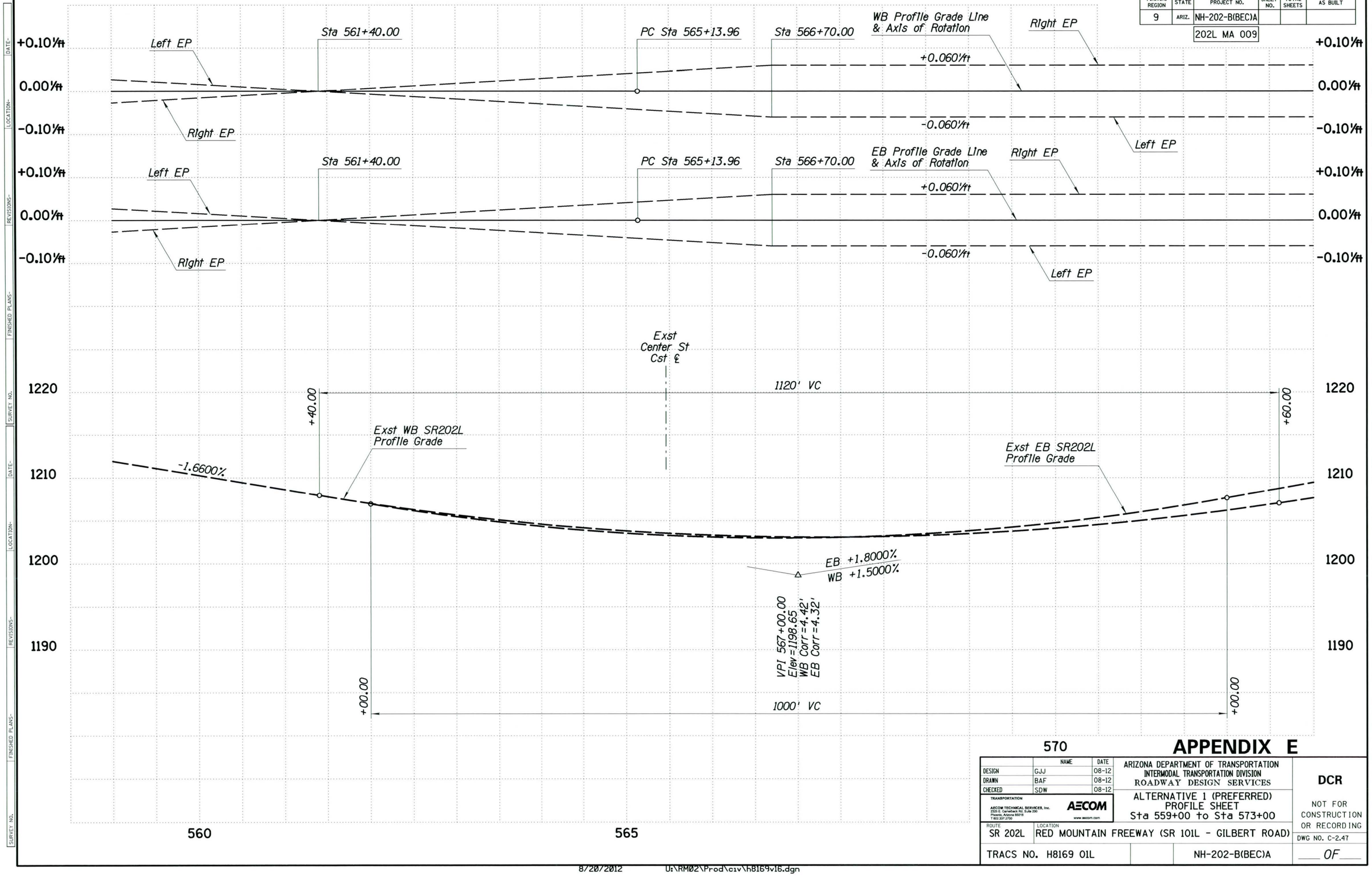
ROUTE	LOCATION	DWG NO. C-2.46
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-15.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 559+00 to Sta 573+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. C-2.47

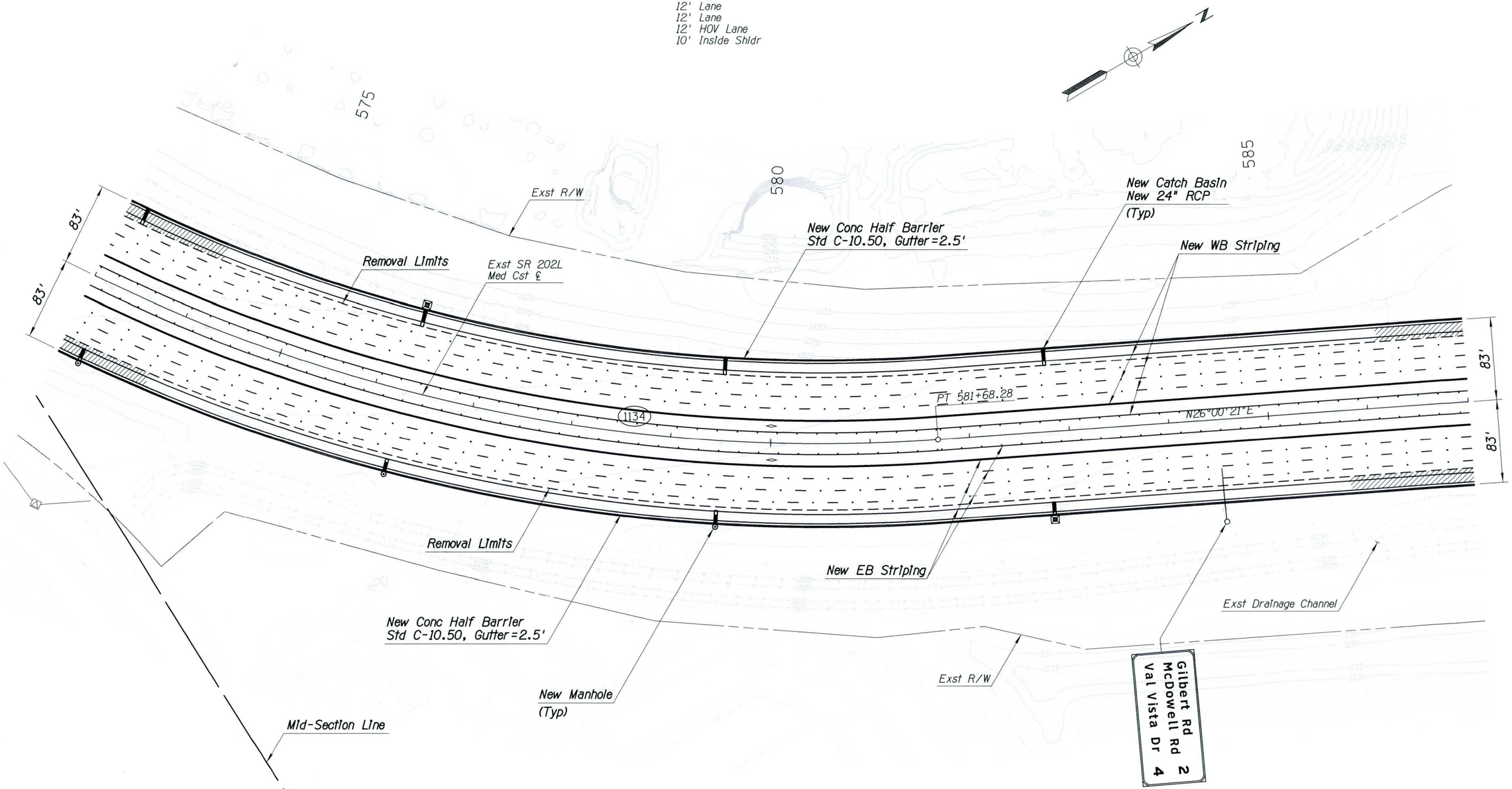
TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v16.dgn

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 573+00 to Sta 587+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.48

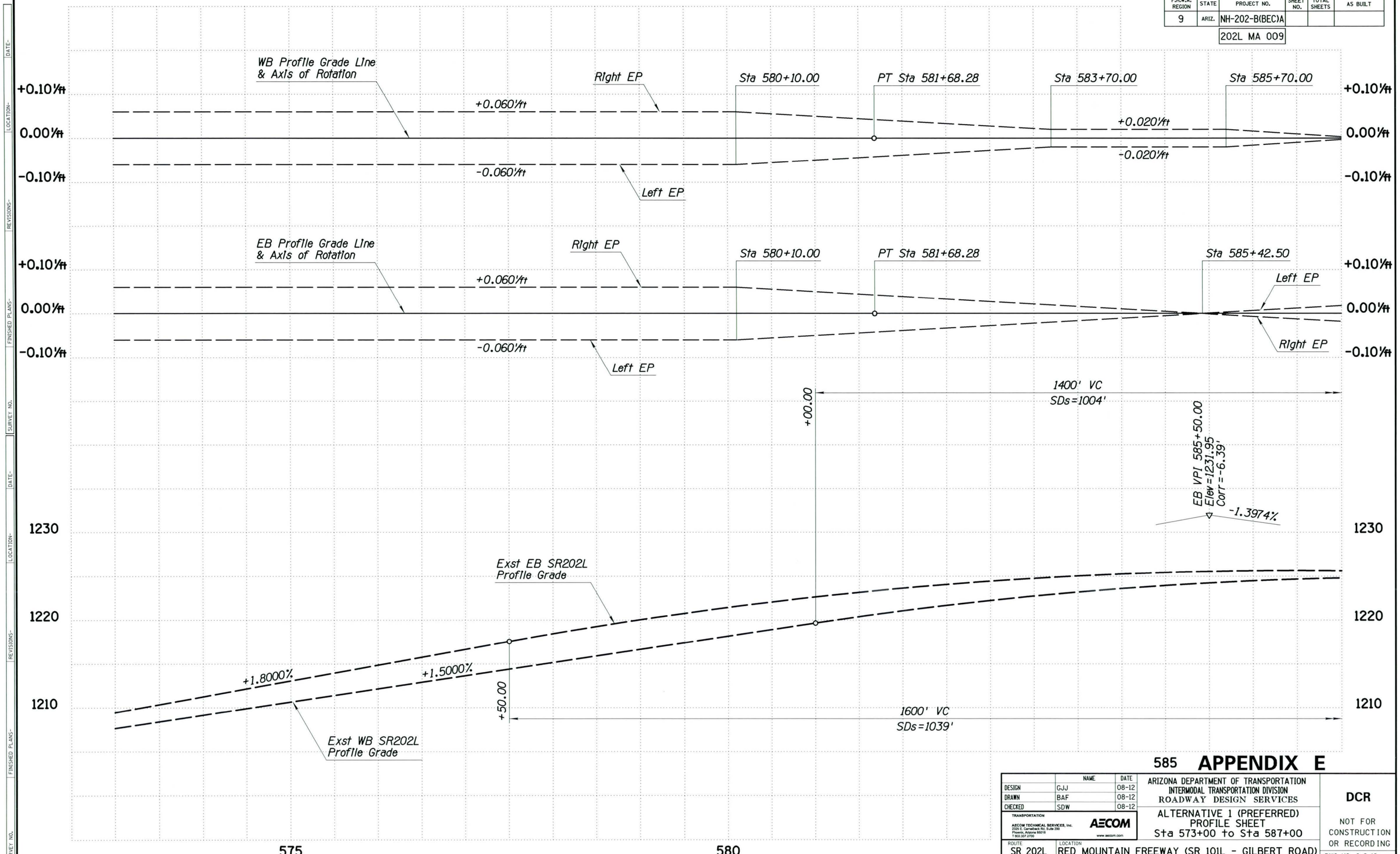
ROUTE	LOCATION		
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)		
TRACS NO. H8169 01L		NH-202-B(BEC)A	___ OF ___

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

8/20/2012 U:\RM02\Prod\civ\h8169pA1-16.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



585 **APPENDIX E**

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 573+00 to Sta 587+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

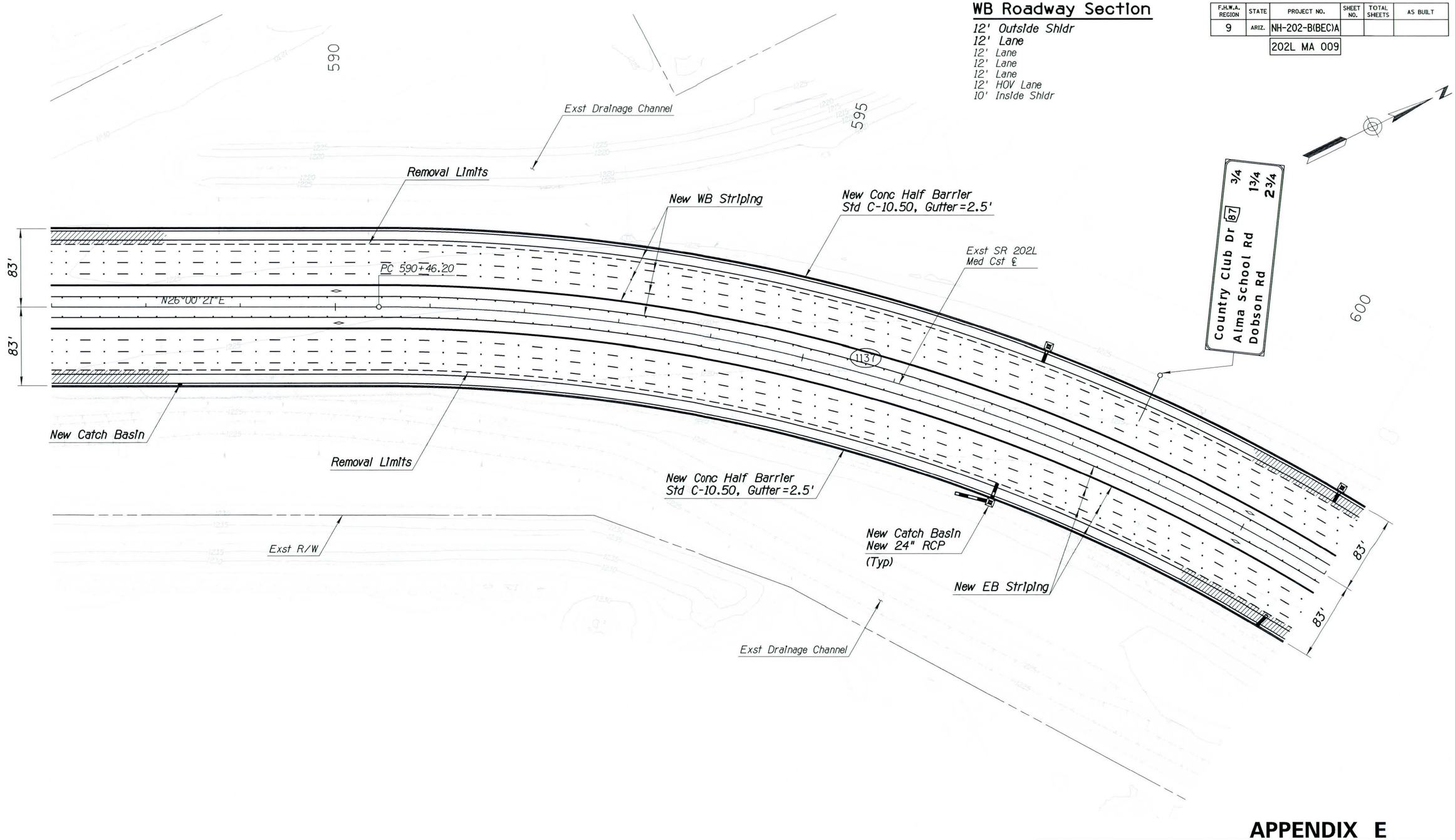
ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.49
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v17.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 587+00 to Sta 601+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.50

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

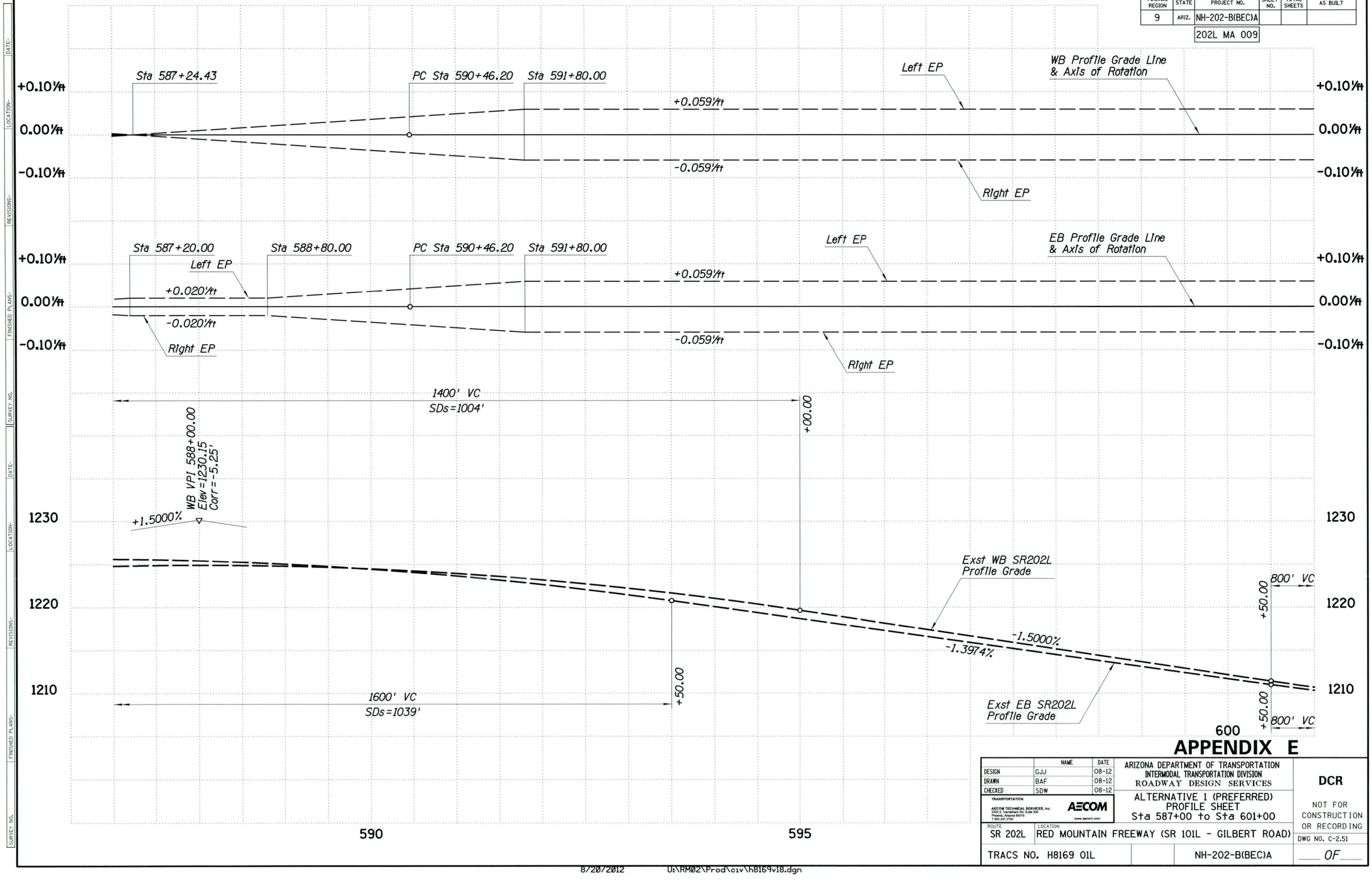
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-17.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 587+00 to Sta 601+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. C-2.51

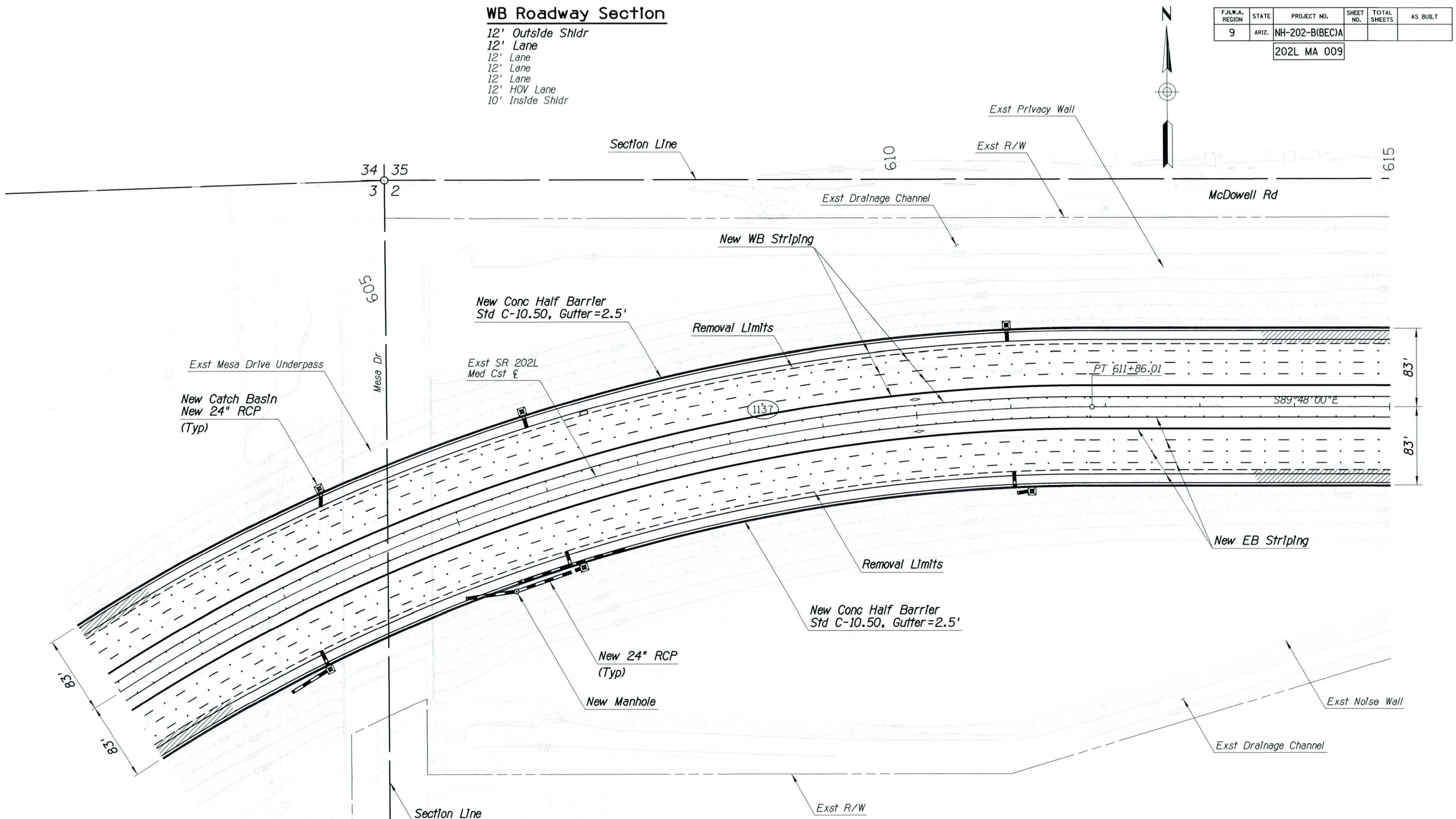
TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v18.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 601+00 to Sta 615+00

DCR

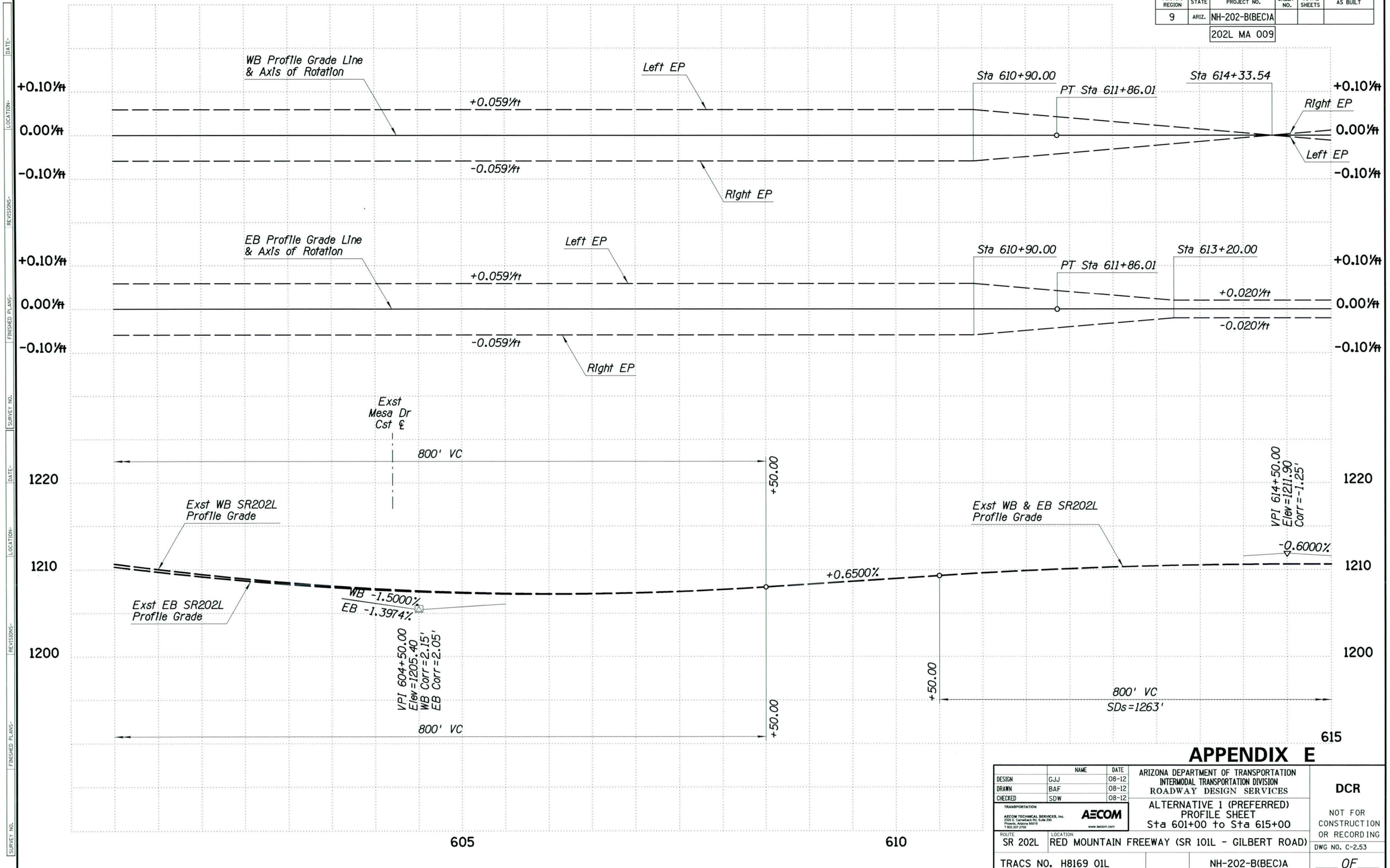
NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.52
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-18.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
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ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 601+00 to Sta 615+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. C-2.53

TRACS NO. H8169 01L

NH-202-B(BEC)A

____ OF ____

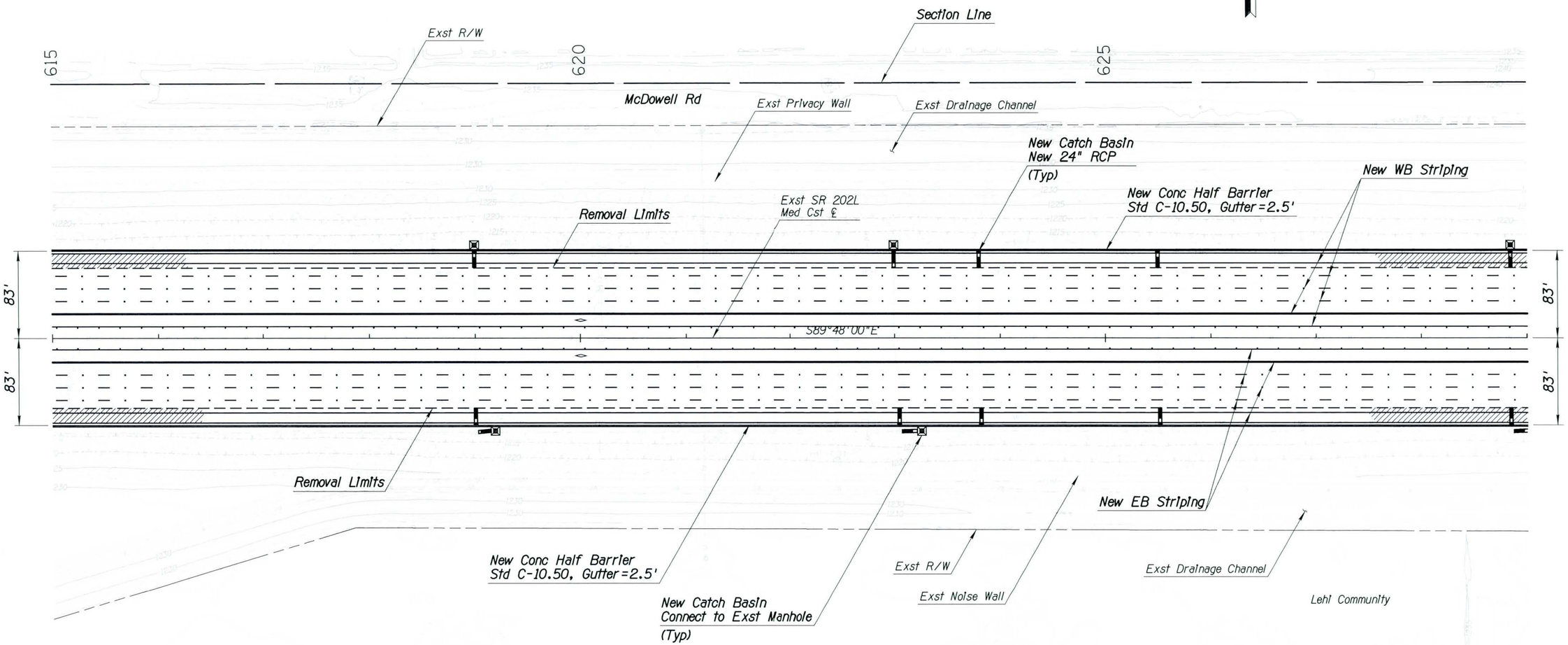
8/20/2012 U:\RM02\Prod\civ\h8169v19.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 615+00 to Sta 629+00

DCR

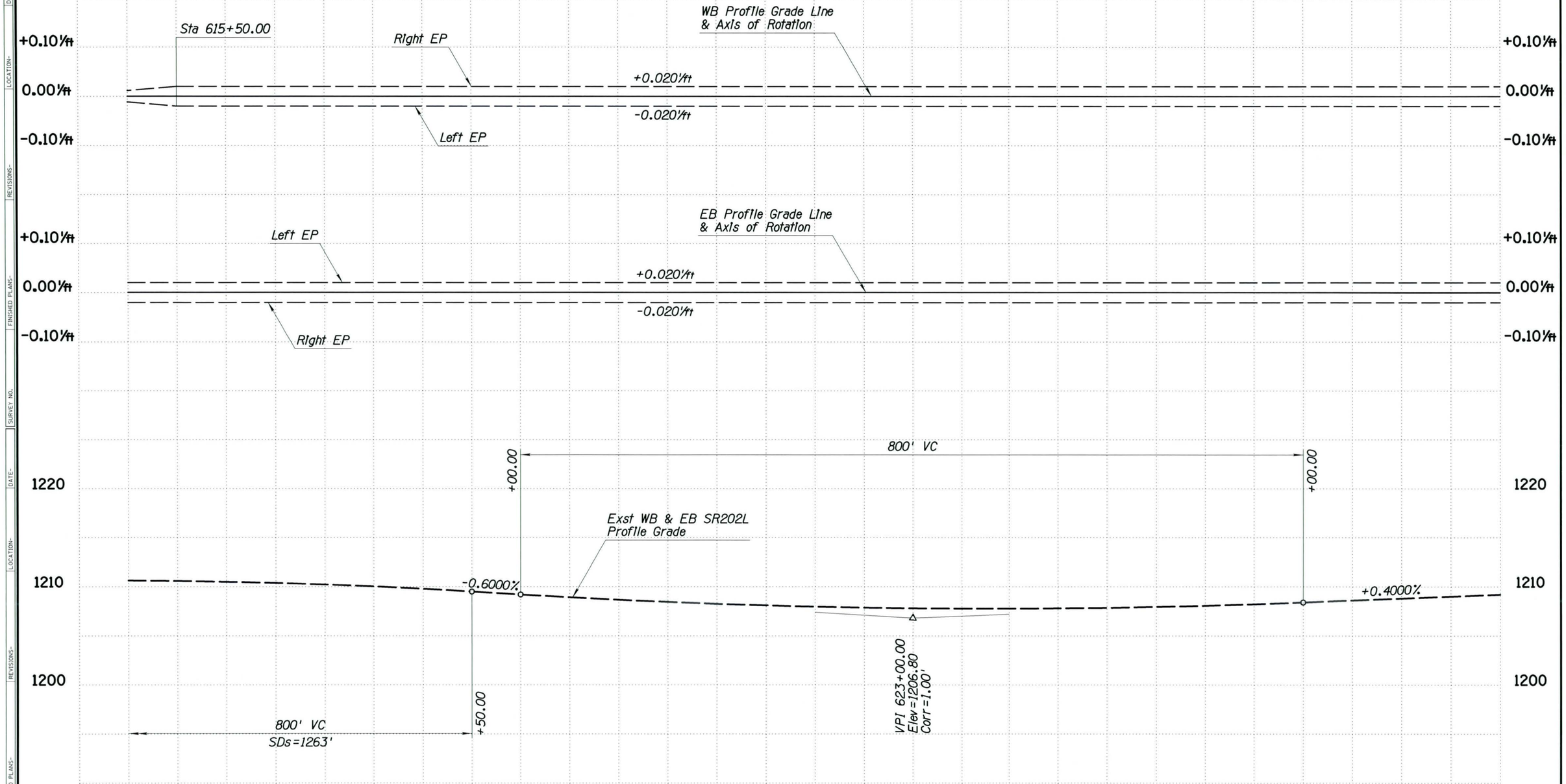
NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.54
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-19.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION

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ARIZONA DEPARTMENT OF TRANSPORTATION
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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 615+00 to Sta 629+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.55

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

___ OF ___

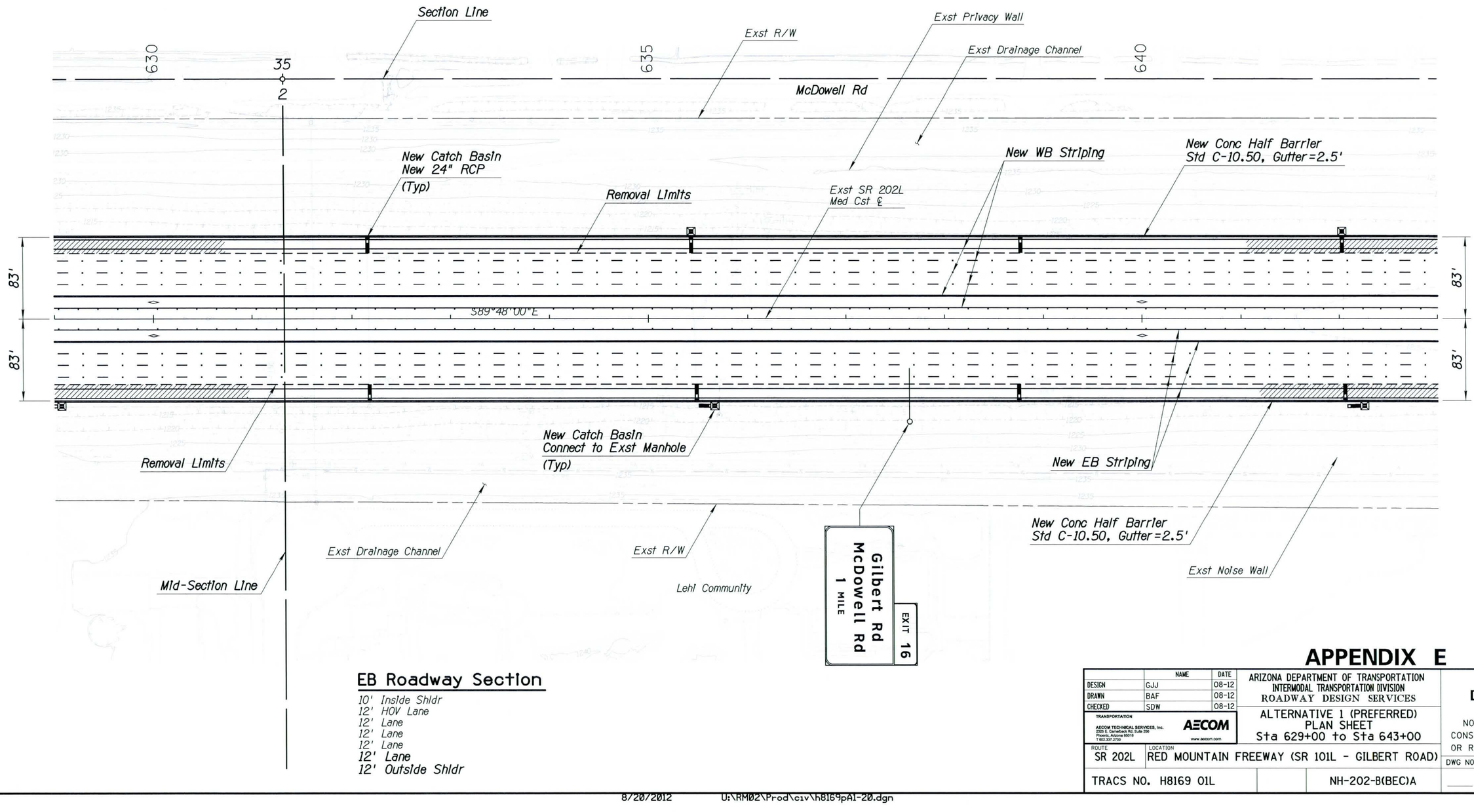
8/20/2012 U:\RM02\Prod\civ\h8169v20.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 629+00 to Sta 643+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.56

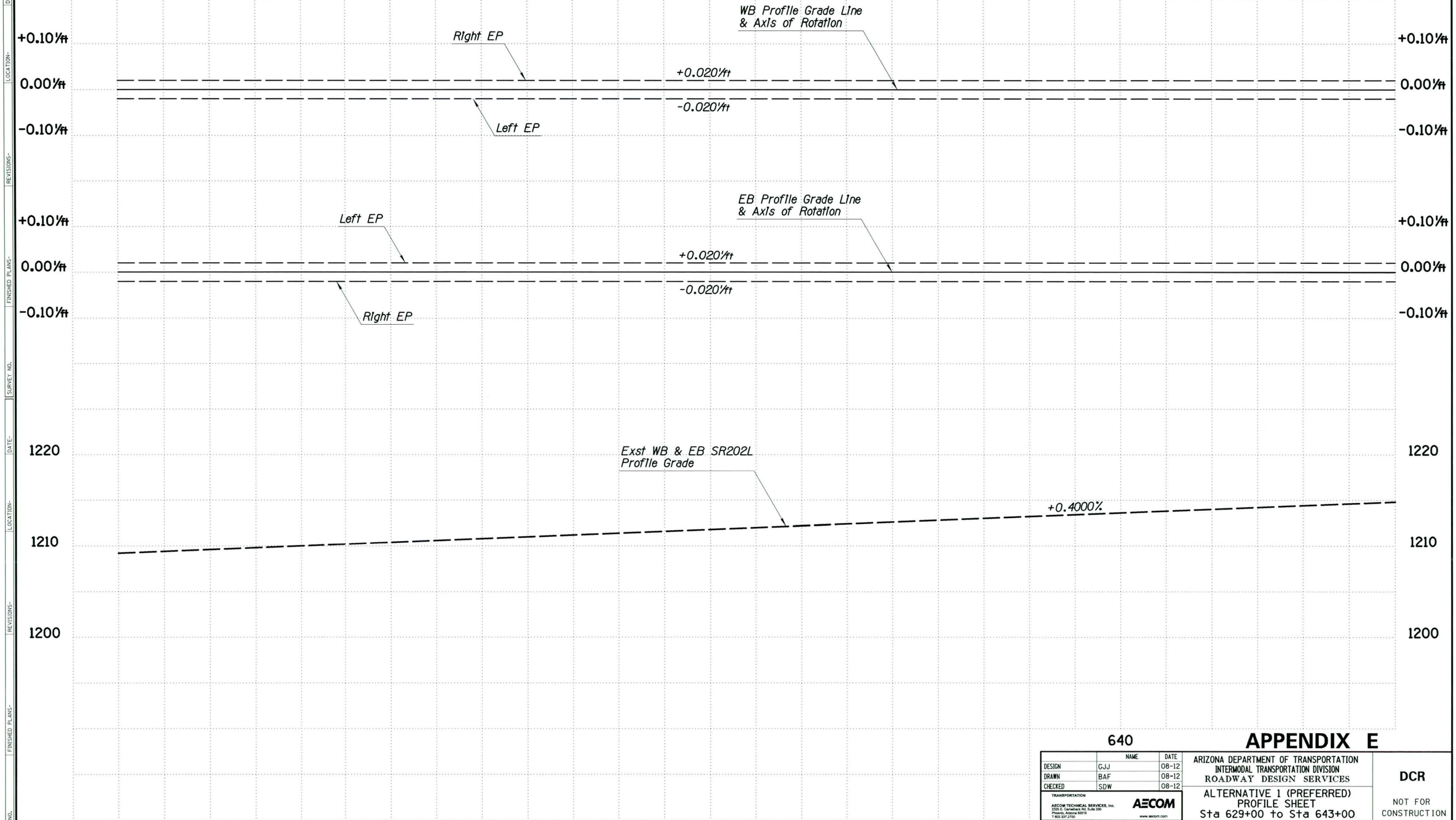
TRACS NO.			SHEET
H8169 01L		NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-20.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 629+00 to Sta 643+00

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.57

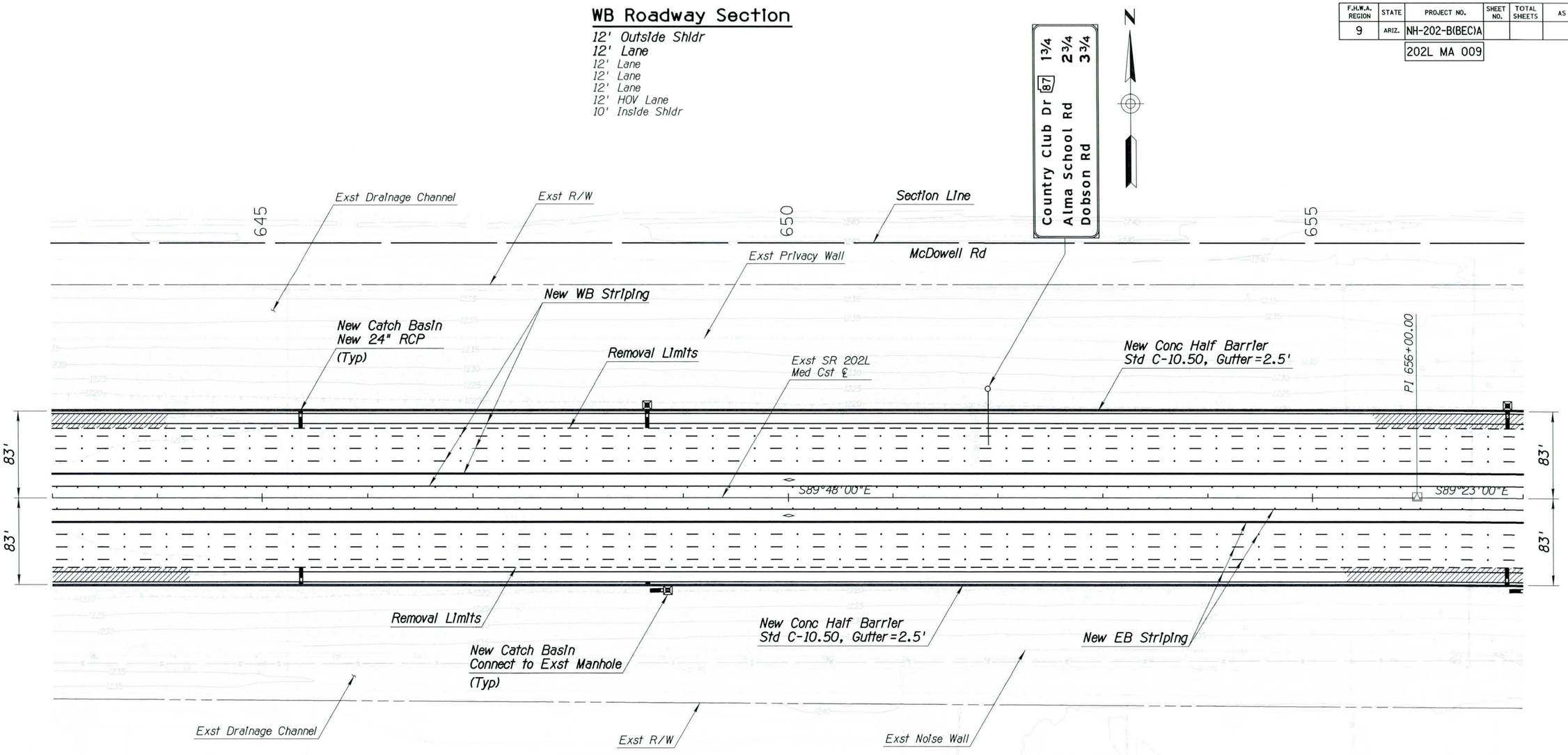
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v21.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

8/20/2012 U:\RM02\Prod\civ\h8169pA1-21.dgn

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
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ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 643+00 to Sta 657+00

DCR

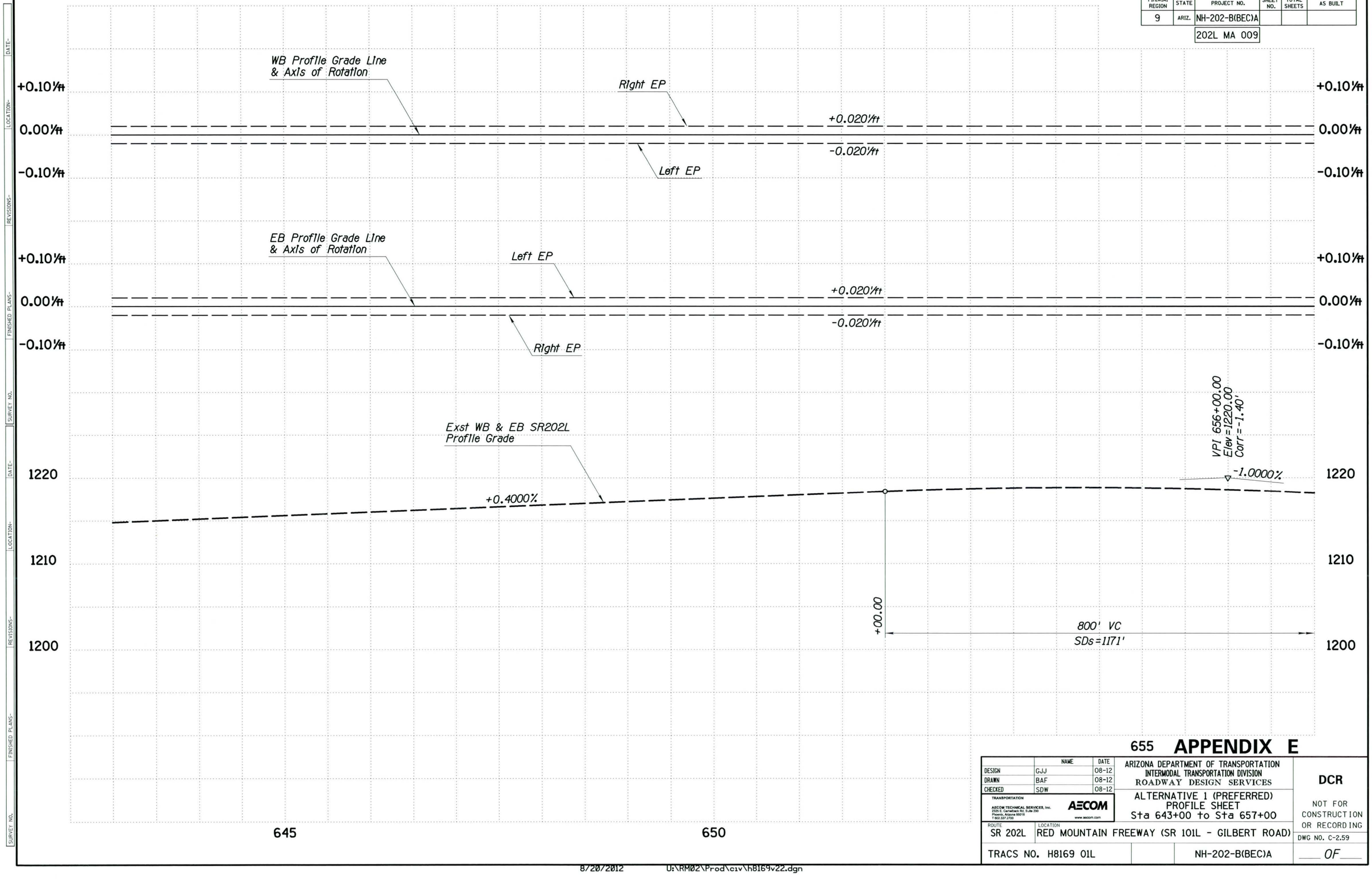
NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO. C-2.58
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



655 **APPENDIX E**

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 643+00 to Sta 657+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO.			DWG NO.
H8169 01L		NH-202-B(BEC)A	C-2.59

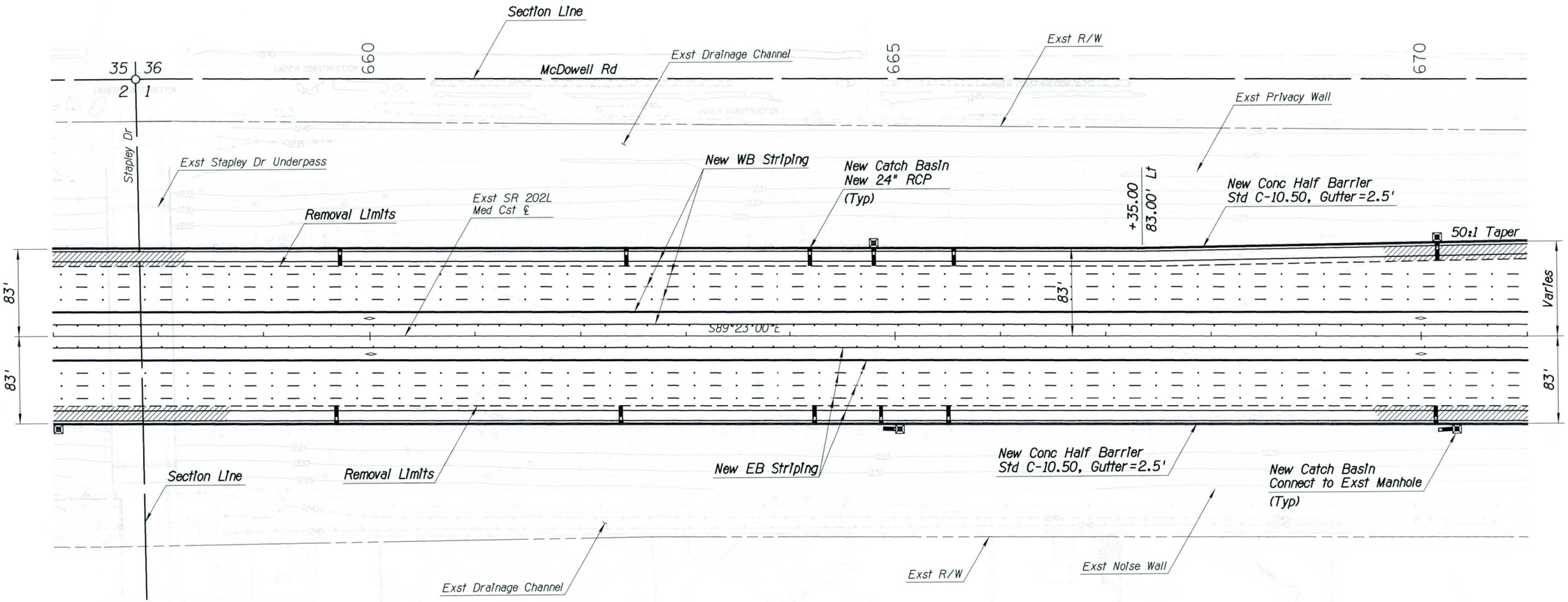
OF

8/20/2012 U:\RM02\Prod\civ\h8169v22.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

8/20/2012 U:\RM02\Prod\civ\h8169pA1-22.dgn

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 657+00 to Sta 671+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO. C-2.60
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

+0.10%ft
0.00%ft
-0.10%ft

Right EP
WB Profile Grade Line
& Axis of Rotation
+0.020%ft
-0.020%ft
Left EP

+0.10%ft
0.00%ft
-0.10%ft

Left EP
EB Profile Grade Line
& Axis of Rotation
+0.020%ft
-0.020%ft
Right EP

800' VC

Exst
Stapley Dr
Cst ℄

PVRC 660+00.00
Elev 1216.00

+00.00

1230
1220
1210
1200

Exst WB & EB SR202L
Profile Grade

+0.6500%

-1.0000%

VPI 664+00.00
Elev=1212.00
Corr=1.65'

800' VC
SDs=1171'

660
665
670

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
2325 E. Camelback Rd. Suite 200
Phoenix, Arizona 85016
T 602.337.2700
AECOM
www.aecom.com

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 657+00 to Sta 671+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.61

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

___ OF ___

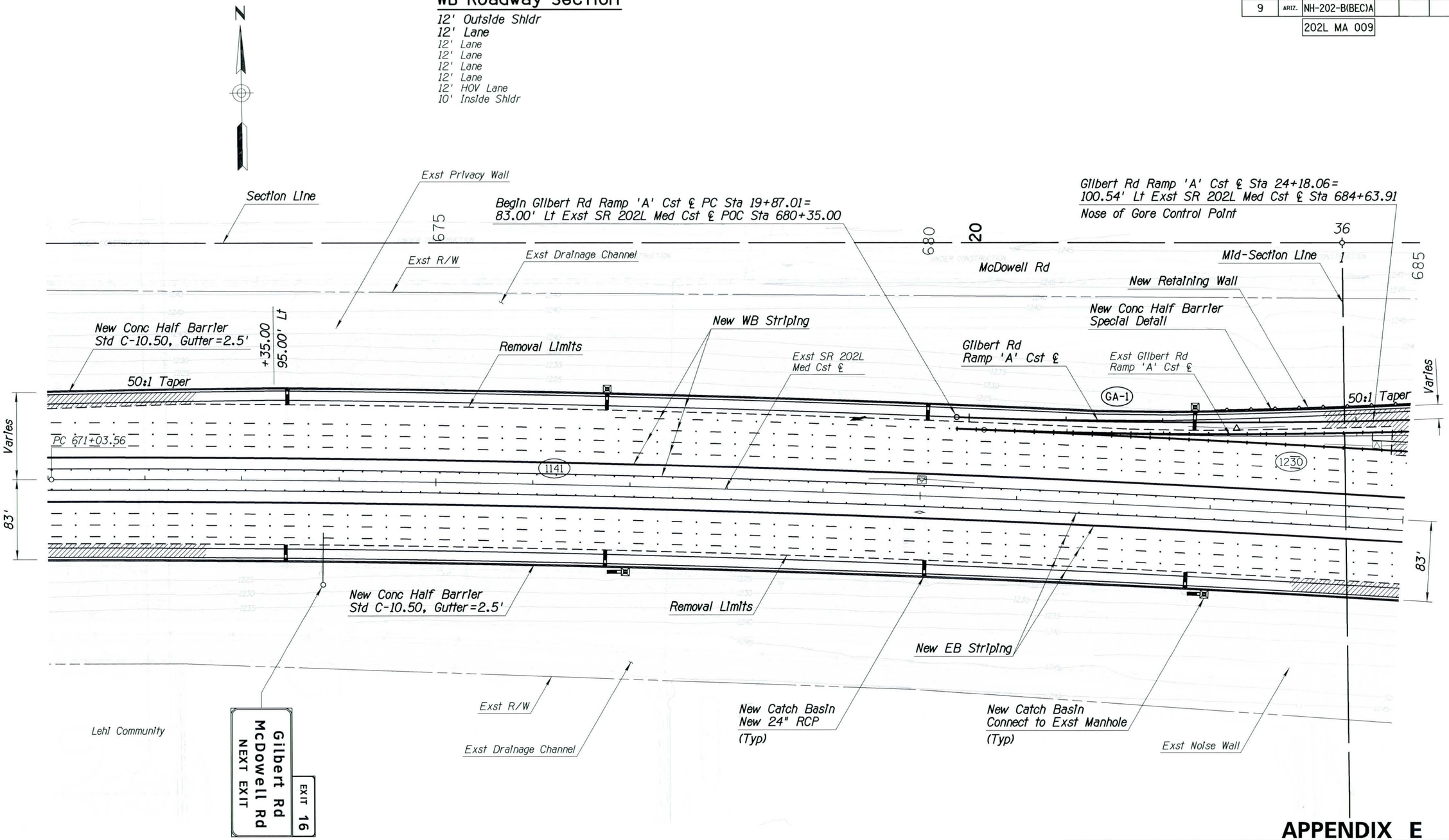
8/20/2012 U:\RM02\Prod\civ\h8169v23.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 671+00 to Sta 685+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.62

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA1-23.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

PC Sta 671+03.56
Right EP
WB Profile Grade Line & Axis of Rotation
+0.10'/ft
0.00'/ft
-0.10'/ft
+0.020'/ft
-0.020'/ft
Left EP

PC Sta 671+03.56
Left EP
EB Profile Grade Line & Axis of Rotation
Right EP

Exst WB & EB SR202L Profile Grade
+0.6500%
-0.4000%
VPI 684+00.00
Elev=1225.00
Corr=-1.05'
+00.00
800' VC
SDs=1428'

1230
1220
1210
675
680
685

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
2520 E. Camelback Rd. Suite 250
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 671+00 to Sta 685+00

DCR
NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.63
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v24.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			

202L MA 009

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

End Gilbert Rd Ramp 'A' Cst ℄ PT Sta 36+50.00=
0.00' Lt Exst Gilbert Rd Ramp 'A' Cst ℄ POC Sta 26+50.00

Section Line

Exst R/W

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

Exst Drainage Channel

PC 36+13.25

McDowell Rd

New Conc Half Barrier
Special Detail

Exst Privacy Wall

Gilbert Rd
Ramp 'A' Cst ℄

PC 25+89.23

New Retaining Wall

PT 25+65.59

PT 18+26.96

Exst Gilbert Rd
Ramp 'A' Cst ℄

N88°07'26"E

N86°55'22"E

GA-1

50:1 Taper

GA-2

New Conc Curb & Gutter
Type C, Std C-05.10

Removal Limits

New WB Striping

New Conc Curb & Gutter
Type B, Std C-05.10

New Catch Basin
New 24" RCP
(Typ)

Exst SR 202L
Med Cst ℄

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

100:1 Taper

PT 688+99.00

+00.00
83.00' Lt

S84°53'41"E

Removal Limits

New EB Striping

Begin Gilbert Rd Ramp 'B' Cst ℄
PC Sta 20+14.26=
71.00' Rt Exst SR 202L Med Cst ℄
POC Sta 688+15.00

New Catch Basin
Connect to Exst Manhole

Exst Drainage Channel

Exst Noise Wall

Lehi Community

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

GB-1

S80°06'17"E

PT 24+14.26

New 24" RCP
(Typ)

Exst Gilbert Rd
Ramp 'B' Cst ℄

PT 16+75.44

+00.00
83.00' Rt

PC 27+57.04

New Conc Curb & Gutter
Type C, Std C-05.10

New Conc Curb & Gutter
Type B, Std C-05.10

GB-2

100:1 Taper

S80°08'06"E

Exst R/W

Gilbert Rd
Ramp 'B' Cst ℄

Gilbert Rd
McDowell Rd
EXIT 16

Gilbert Rd Ramp 'B' Cst ℄ Sta 24+67.73=
105.54' Rt Exst SR 202L Med Cst ℄ Sta 692+67.43
Nose of Gore Control Point

EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 685+00 to Sta 699+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.64
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

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

8/20/2012 U:\RM02\Prod\civ\h8169pA1-24.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

WB Profile Grade Line & Axis of Rotation

PT Sta 688+99.00

Right EP

Left EP

+0.10'/ft
0.00'/ft
-0.10'/ft
+0.020'/ft
-0.020'/ft

EB Profile Grade Line & Axis of Rotation

PT Sta 688+99.00

Left EP

Right EP

800' VC

PVRC 688+00.00
Elev 1223.40

Exst WB & EB SR202L Profile Grade

-0.4000%

VPI 692+00.00
Elev=1221.80
Corr=0.80'

+0.4000%

+00.00

+50.00

800' VC
SDs=1428'

800' VC

1230
1220
1210

685
690
695

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 685+00 to Sta 699+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.65

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

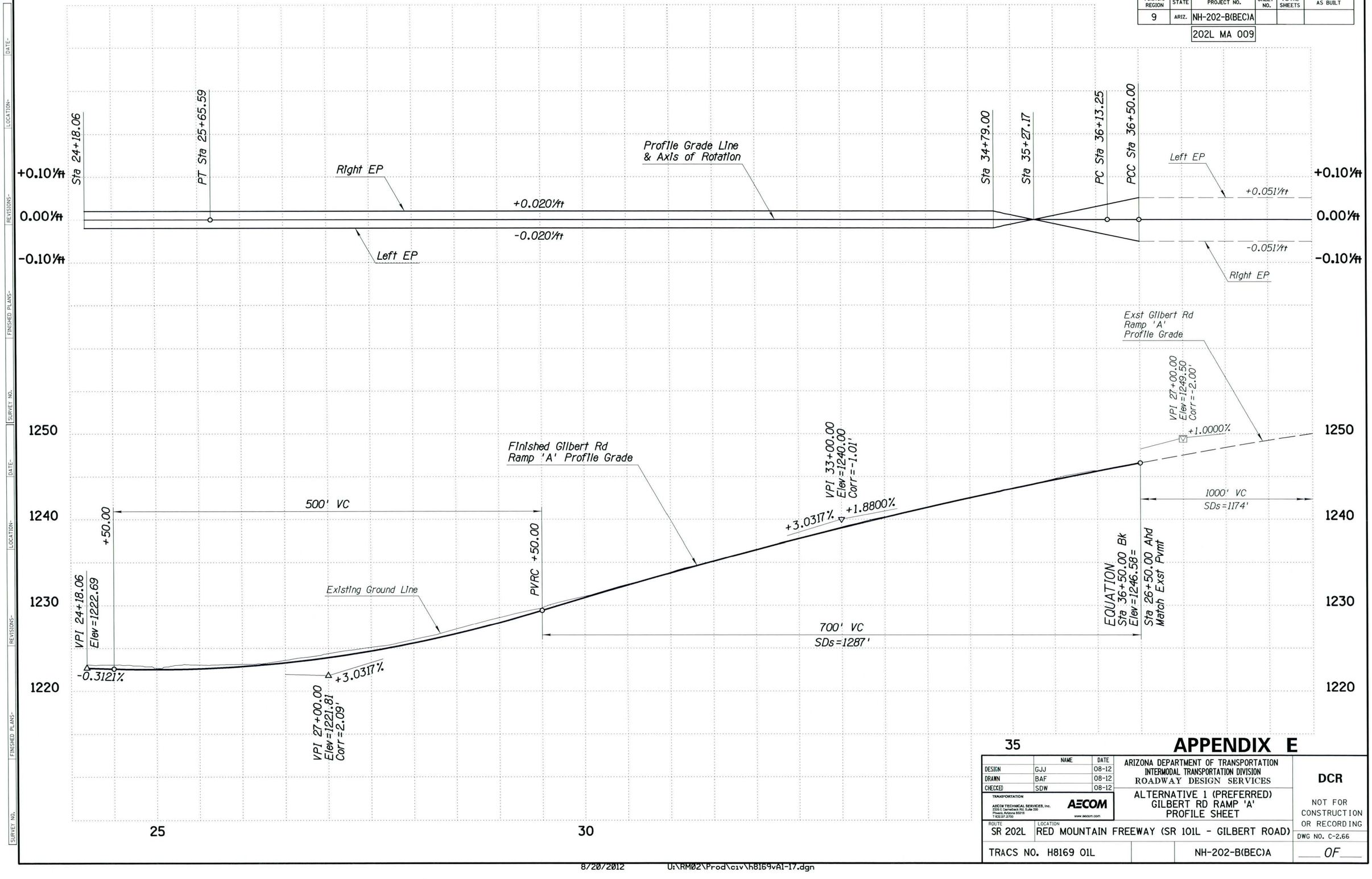
NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v25.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
GILBERT RD RAMP 'A'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

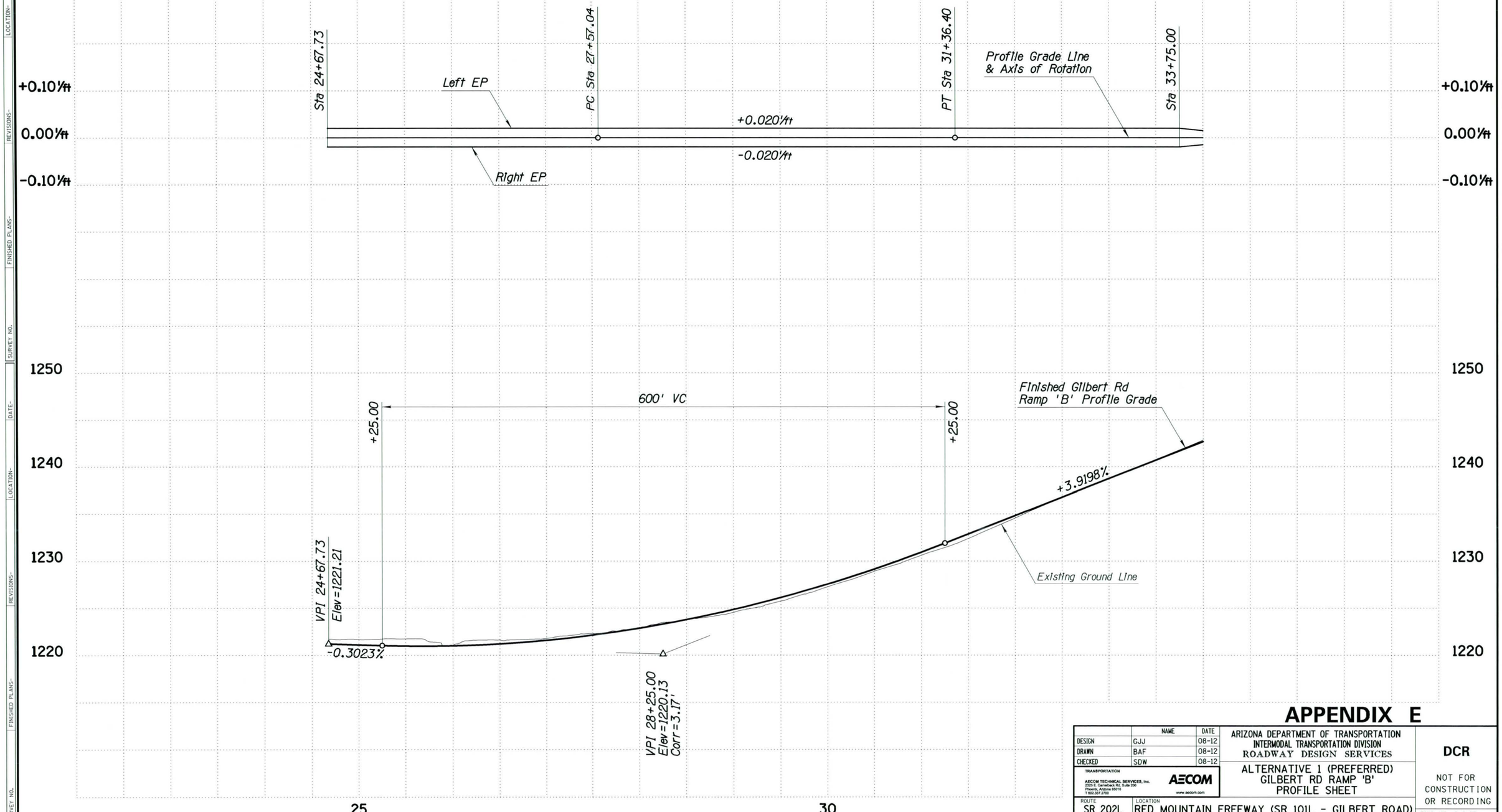
DWG NO. C-2.66

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
TRACS NO. H8169 01L
NH-202-B(BEC)A
____ OF ____

8/20/2012 U:\RM02\Prod\civ\h8169vA1-17.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
GILBERT RD RAMP 'B'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

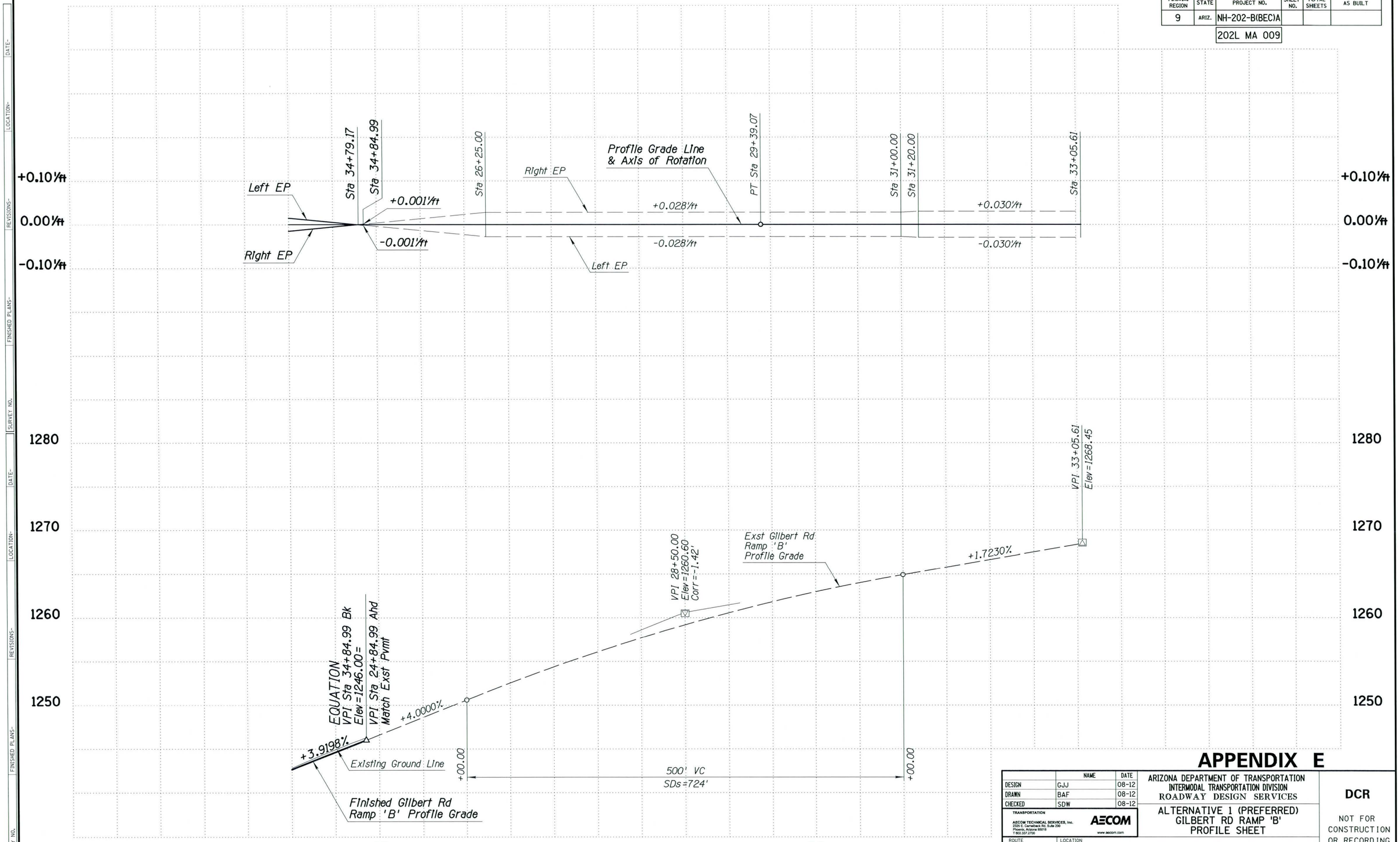
DWG NO. C-2.67

ROUTE: SR 202L | LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA1-19.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
GILBERT RD RAMP 'B'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.68
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

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

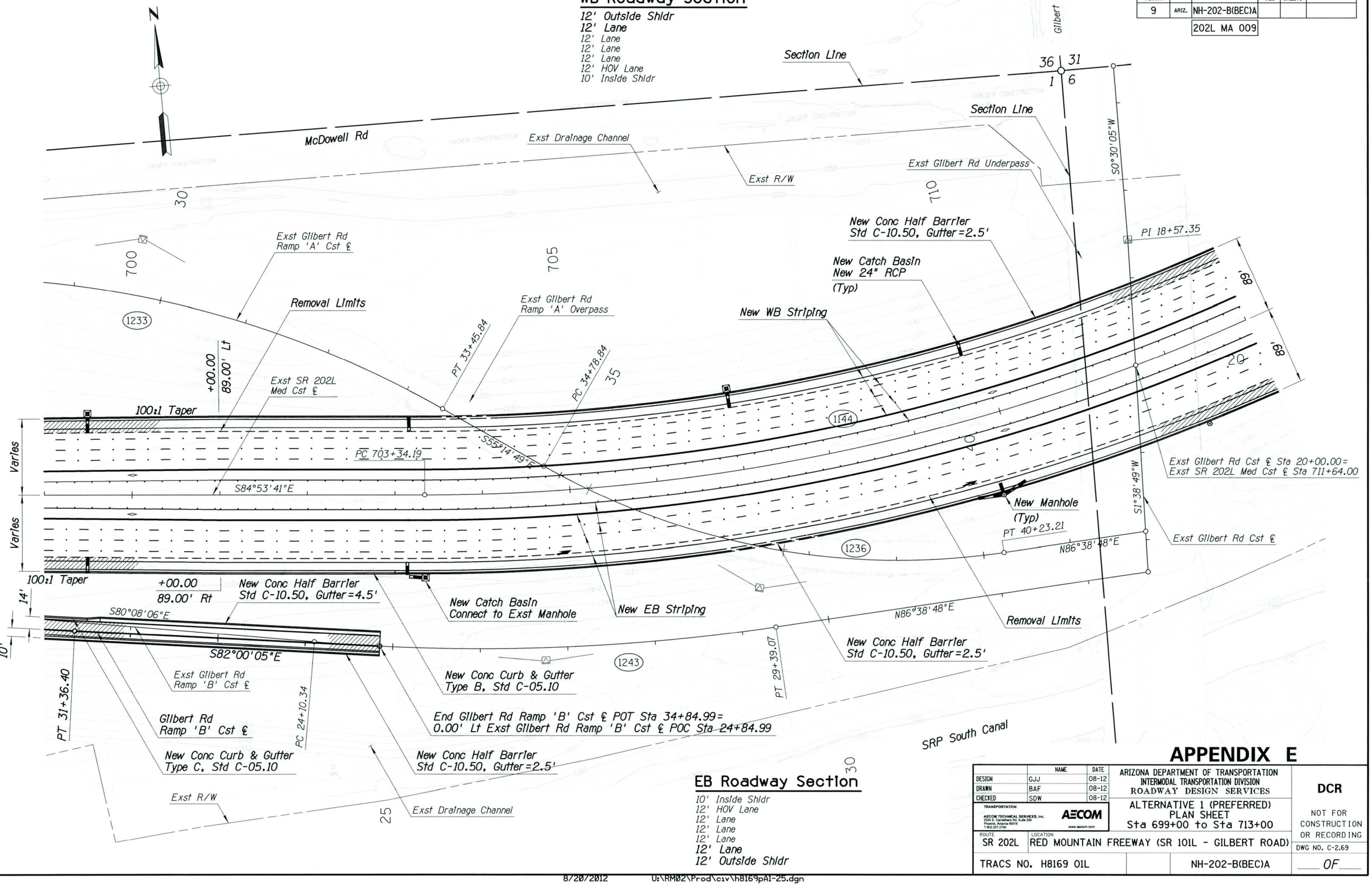
8/20/2012 U:\RM02\Prod\civ\h8169vA1-20.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 699+00 to Sta 713+00

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

DCR
NOT FOR CONSTRUCTION OR RECORDING
DWG NO. C-2.69

8/20/2012 U:\RM02\Prod\civ\h8169pA1-25.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

+0.10'/ft
0.00'/ft
-0.10'/ft

Sta 702+39.00
PC Sta 703+34.19
Sta 704+19.00
+0.020'/ft
-0.020'/ft
+0.056'/ft
-0.056'/ft
Right EP
WB Profile Grade Line & Axis of Rotation
Left EP

Left EP
Sta 700+39.00
Sta 701+39.00
PC Sta 703+34.19
Sta 704+19.00
+0.020'/ft
-0.020'/ft
+0.056'/ft
-0.056'/ft
Right EP
Right EP
EB Profile Grade Line & Axis of Rotation
Left EP

Exst Gilbert Rd Ramp 'A' Cst ℄
Exst Gilbert Rd Cst ℄

1240
1230
1220
1210

Exst EB SR202L Profile Grade
+0.4800%
+0.4000%
Exst WB SR202L Profile Grade

+0.4000%
EB VPI 700+50.00
Elev=1225.20
Corr=0.08'
800' VC
+50.00

700
705
710

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 699+00 to Sta 713+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.70

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169v26.dgn

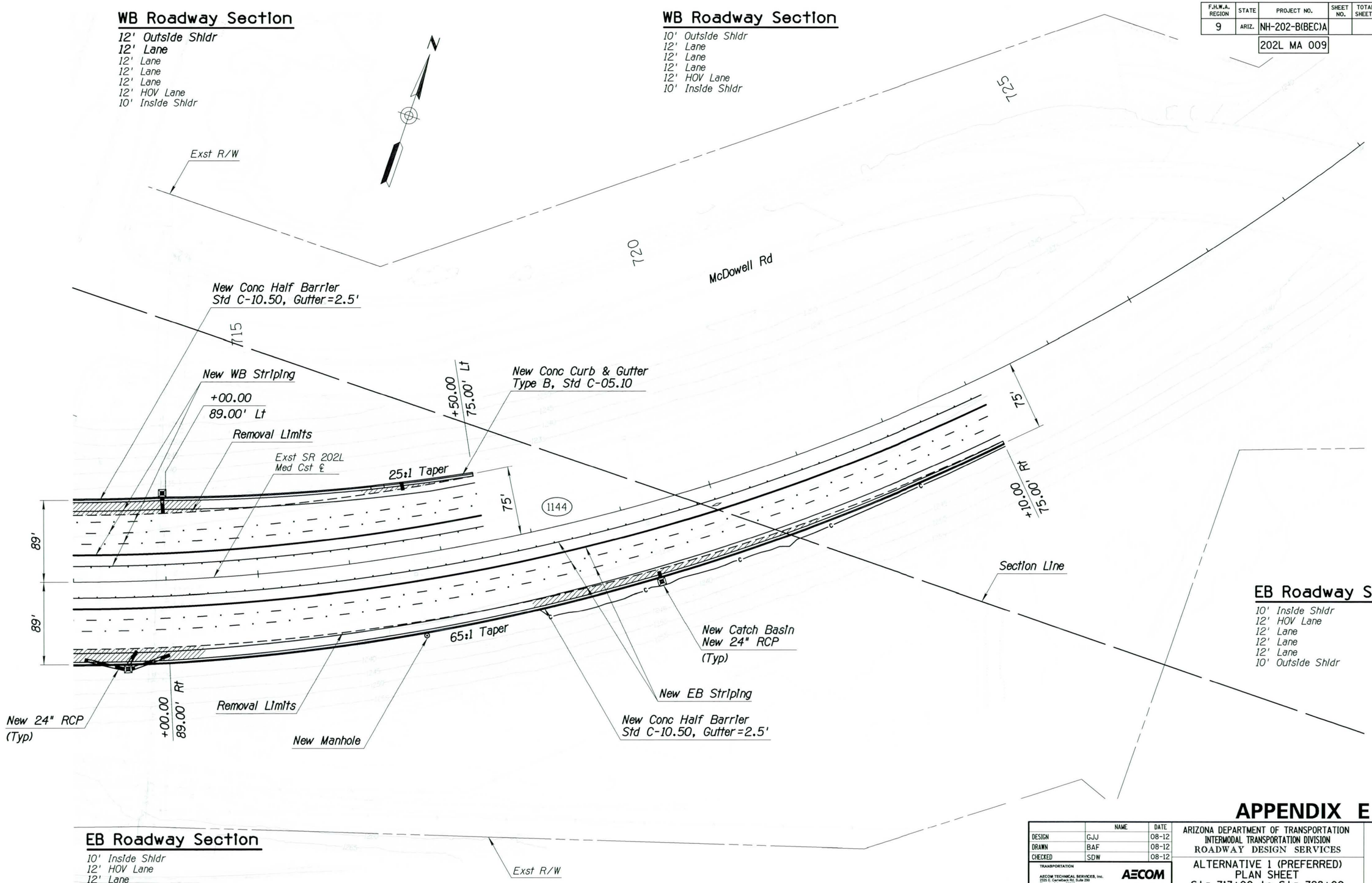
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

WB Roadway Section

10' Outside Shldr
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
10' Outside Shldr

EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PLAN SHEET
Sta 713+00 to Sta 728+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.71

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

OF

8/20/2012 U:\RM02\Prod\civ\h8169pA1-26.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

WB Profile Grade Line & Axis of Rotation

Sta 717+50.00

Right EP

+0.056'/ft

-0.056'/ft

Left EP

+0.10'/ft

0.00'/ft

-0.10'/ft

EB Profile Grade Line & Axis of Rotation

Right EP

Sta 723+10.00

+0.056'/ft

-0.056'/ft

Left EP

+0.10'/ft

0.00'/ft

-0.10'/ft

800' VC

+50.00

1250

1240

1230

1220

Exst EB SR202L Profile Grade

+0.4800%

+0.4000%

Exst WB SR202L Profile Grade

+50.00

800' VC

715

720

725

APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION

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www.aecom.com

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 713+00 to Sta 727+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.72

____ OF ____

ROUTE	LOCATION
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

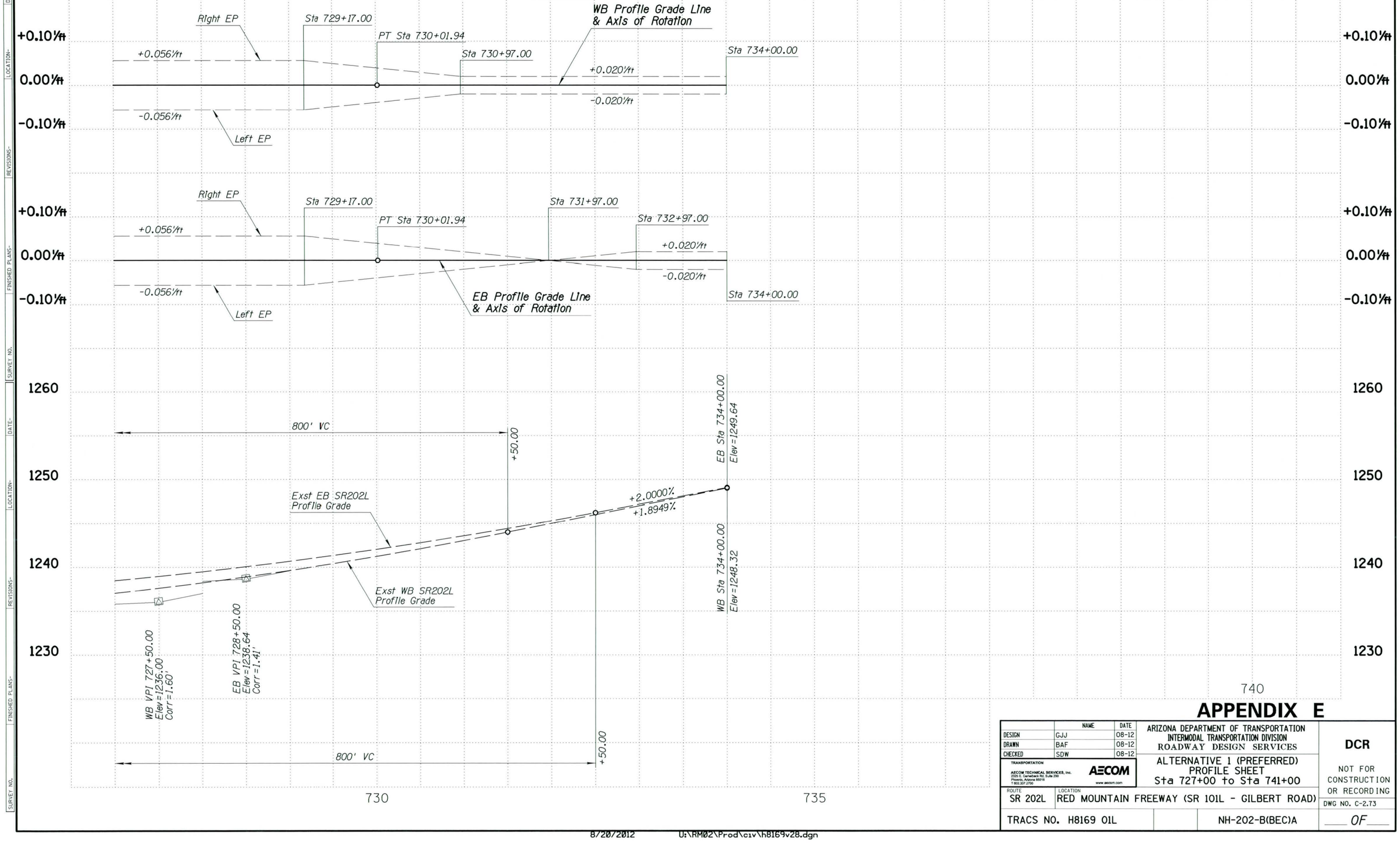
TRACS NO. H8169 01L

NH-202-B(BEC)A

8/20/2012 U:\RM02\Prod\civ\h8169v27.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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



APPENDIX E

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 1 (PREFERRED)
PROFILE SHEET
Sta 727+00 to Sta 741+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.73

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ____ OF ____

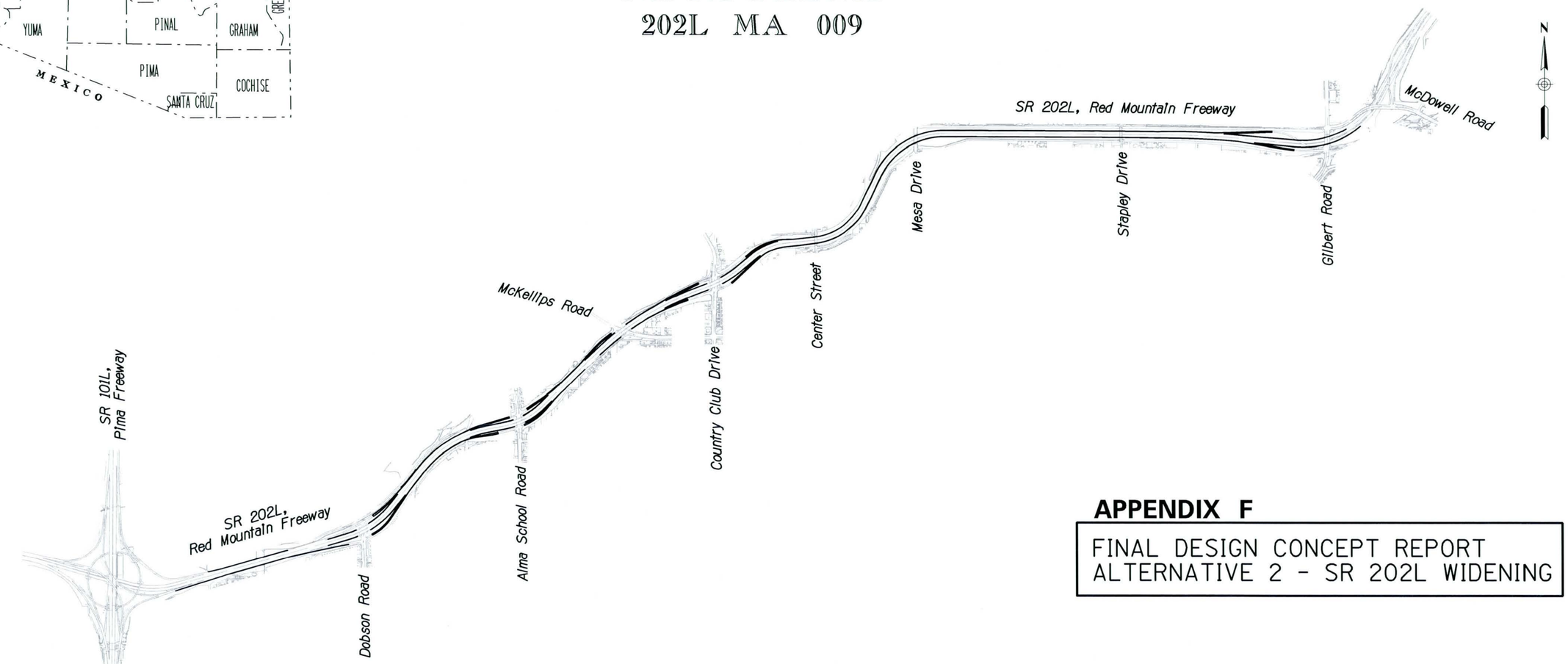
8/20/2012 U:\RM02\Prod\civ\h8169v28.dgn

APPENDIX F

ALTERNATIVE 2 PLANS

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION

PLAN AND PROFILE OF PROPOSED
STATE HIGHWAY
NH-202-B(BEC)A
202L MA 009



APPENDIX F

FINAL DESIGN CONCEPT REPORT
ALTERNATIVE 2 - SR 202L WIDENING

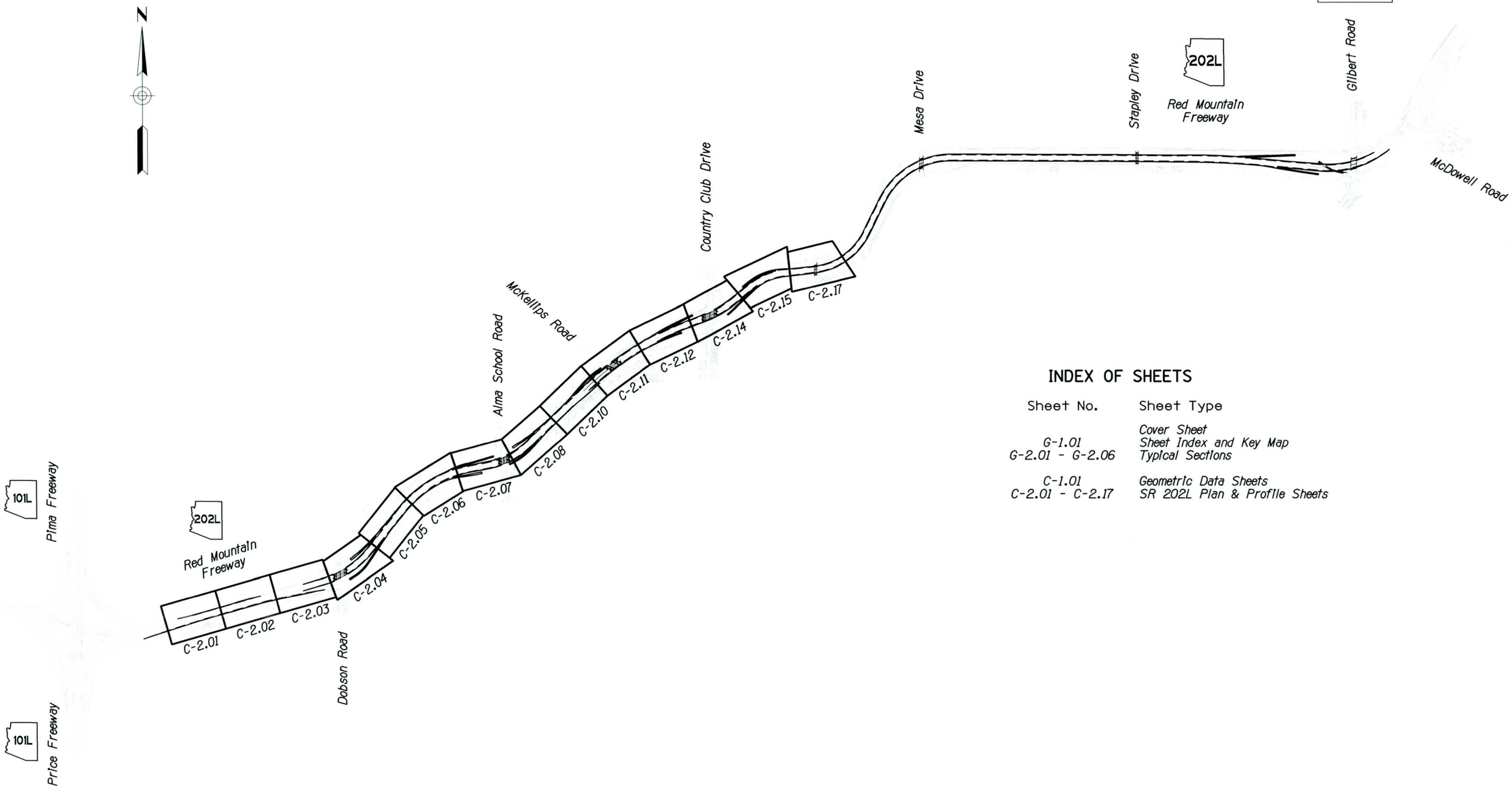
ADOT CONTRACT NO. 2005-026
TRACS NO. H8169 01L
STATE ROUTE 202L
RED MOUNTAIN FREEWAY
(SR 101L - GILBERT ROAD)

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
APPROVED: JENNIFER TOTH
STATE ENGINEER

APPROVED DATE

ASSISTANT STATE ENGINEER

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



INDEX OF SHEETS

Sheet No.	Sheet Type
	Cover Sheet
G-1.01	Sheet Index and Key Map
G-2.01 - G-2.06	Typical Sections
C-1.01	Geometric Data Sheets
C-2.01 - C-2.17	SR 202L Plan & Profile Sheets

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
SR 202L
SHEET INDEX AND KEY MAP

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. G-1.01

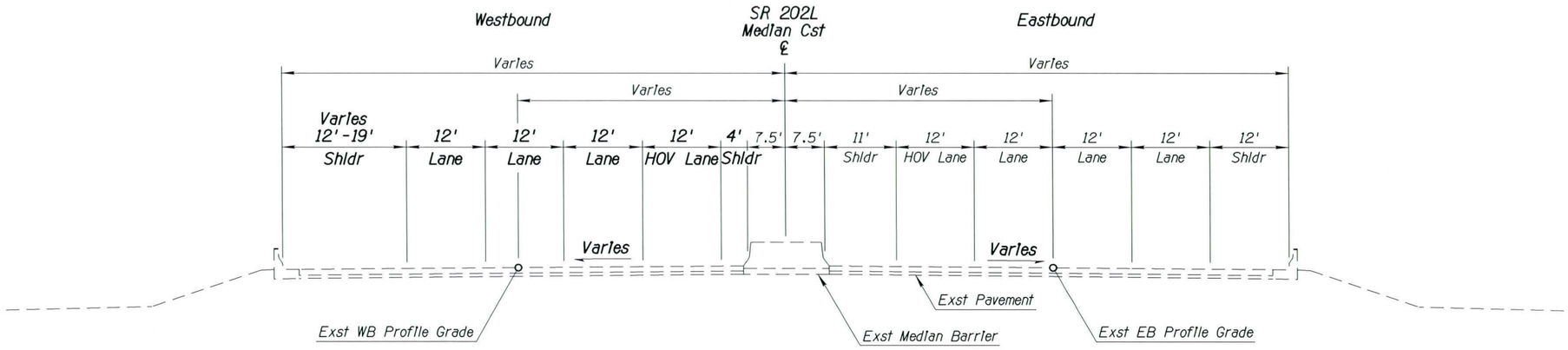
ROUTE	LOCATION	
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L		NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169dsA2-01.dgn

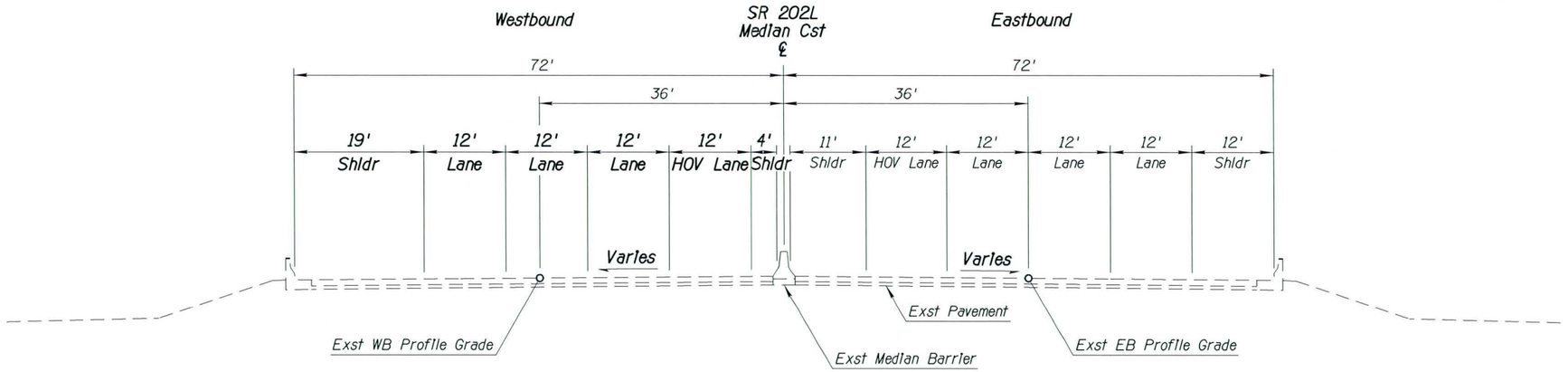
SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



EXISTING TYPICAL SECTION

At SR 101L



PROPOSED TYPICAL SECTION

Between System TI and Ramp 'W-S' Gore

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
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ROADWAY DESIGN SERVICES

ALTERNATIVE 2
DESIGN SHEET
TYPICAL MAINLINE SECTIONS

DCR

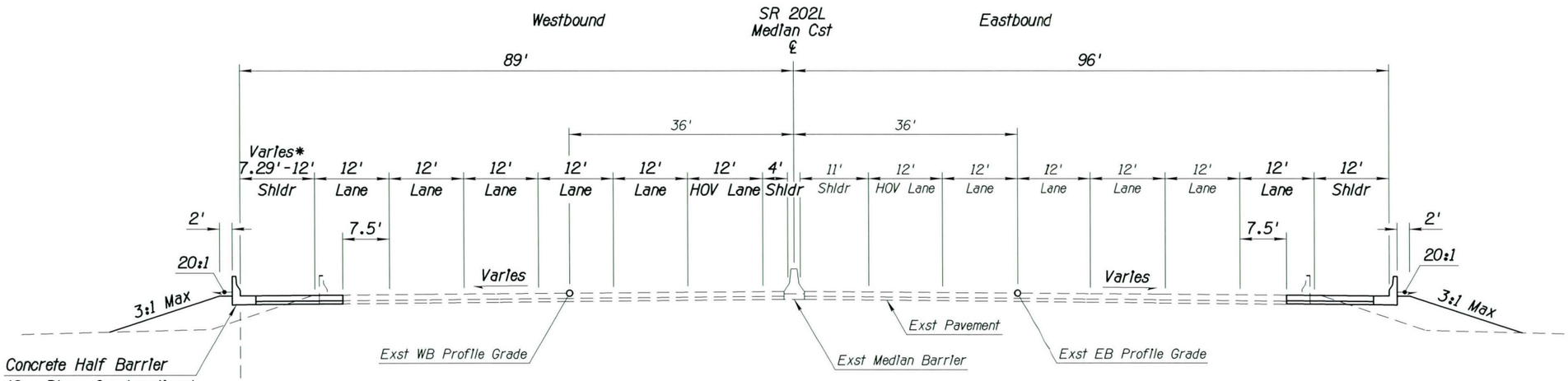
NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	G-2.01
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA2-3.dgn

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

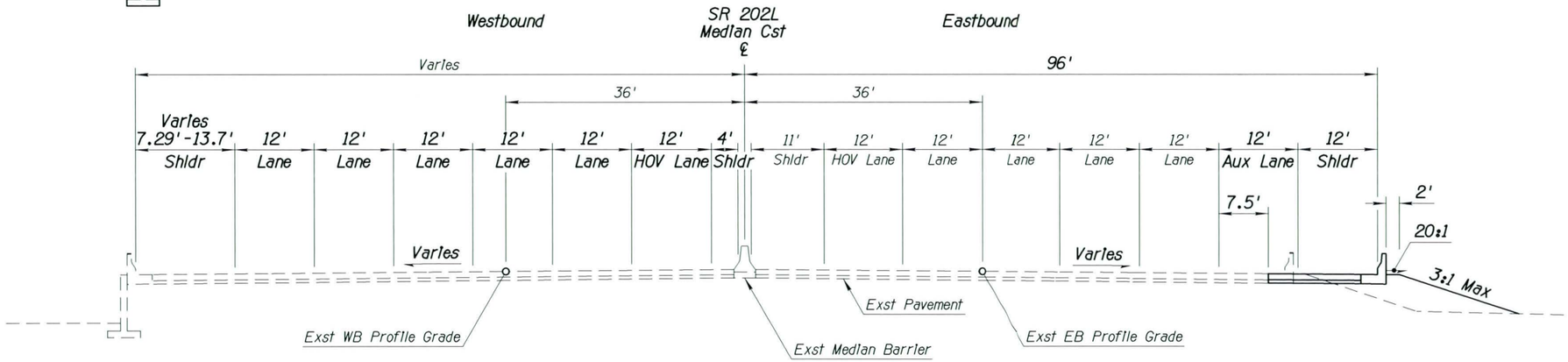
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



EXISTING TYPICAL SECTION

Between Ramp 'W-S' Gore and Sta 401+39.98

** Outside Shoulder Transitions from 12' to 7.29' from Sta 400+20.00 to Sta 401+39.98*



PROPOSED TYPICAL SECTION

Sta 401+39.98 to Sta 408+00.00

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
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ALTERNATIVE 2
DESIGN SHEET
TYPICAL MAINLINE SECTIONS

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. G-2.02

TRACS NO. H8169 01L

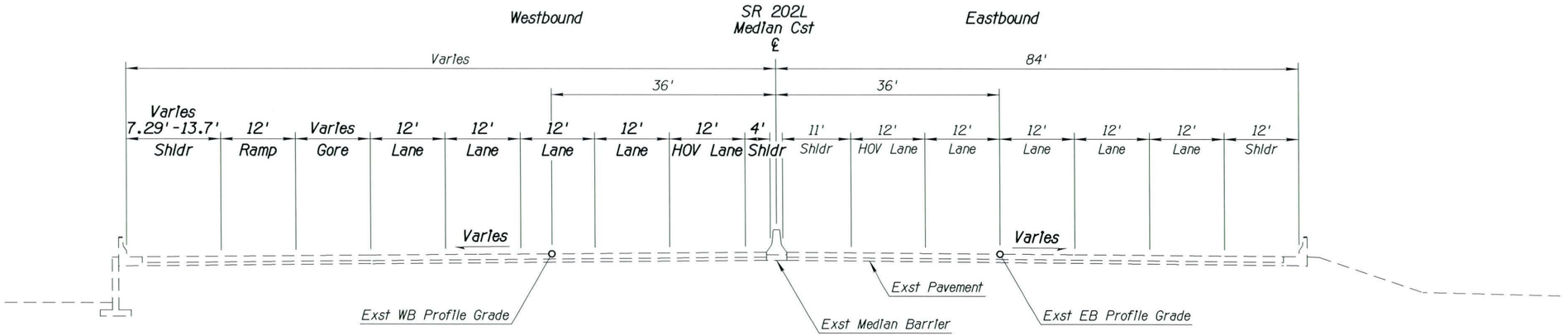
NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA2-2.dgn

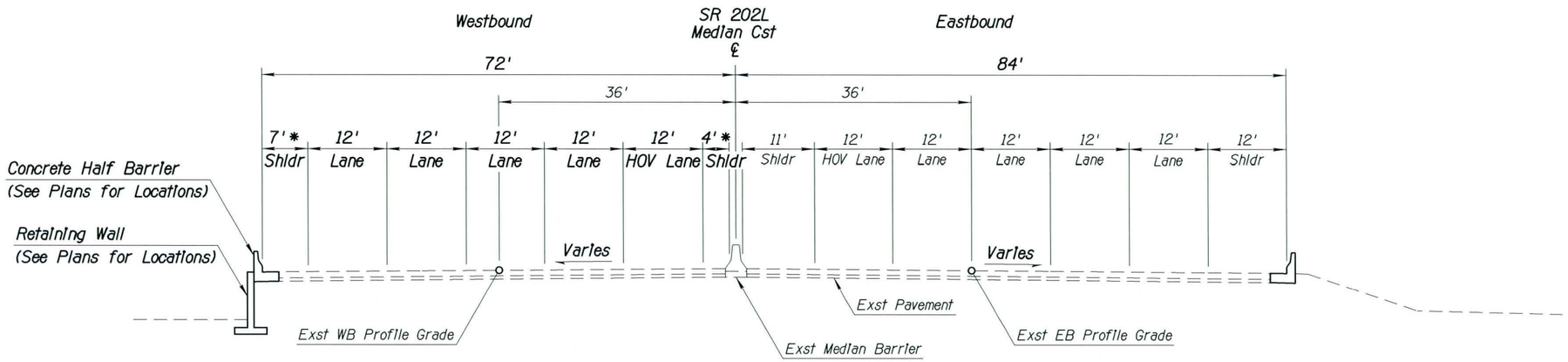
DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



PROPOSED TYPICAL SECTION

Dobson Road Ramp 'A' Gore Area



PROPOSED TYPICAL SECTION

Dobson Road Ramp 'A' Back of Gore

* *Outside Shoulder Transitions from 72' to 84' from Sta 412+35.00 to Sta 420+15.00*
Median Shoulder Transitions from 4' to 11' from Sta 418+89.31 to Sta 430+10.66

APPENDIX F

	NAME	DATE
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CHECKED	SDW	08-12

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ROADWAY DESIGN SERVICES

ALTERNATIVE 2
DESIGN SHEET
TYPICAL MAINLINE SECTIONS

DCR

NOT FOR CONSTRUCTION OR RECORDING

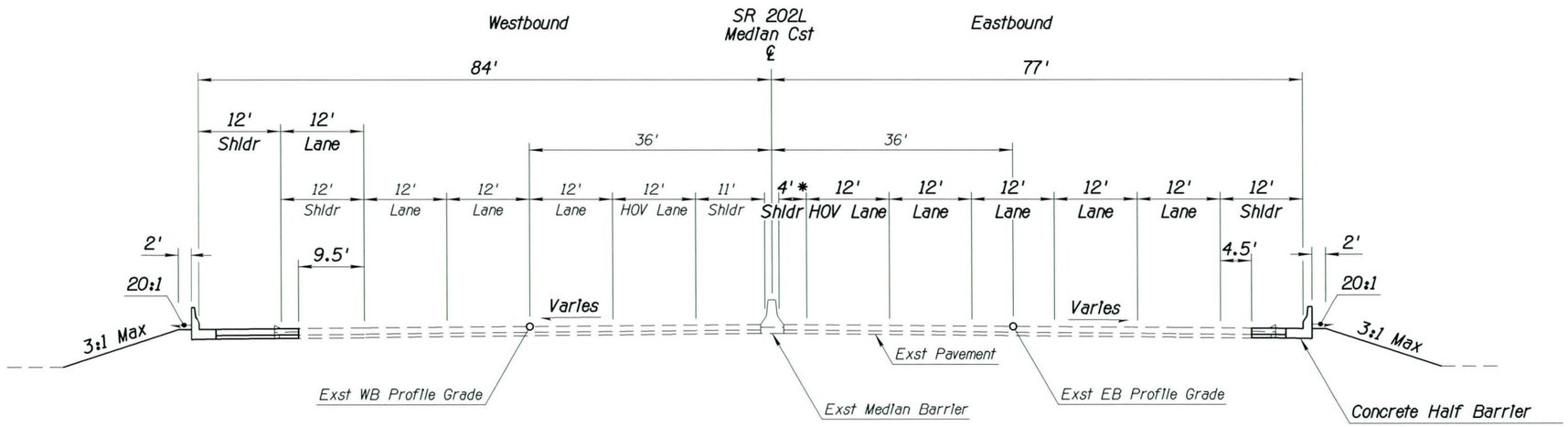
ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	G-2.03
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA2-1.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

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

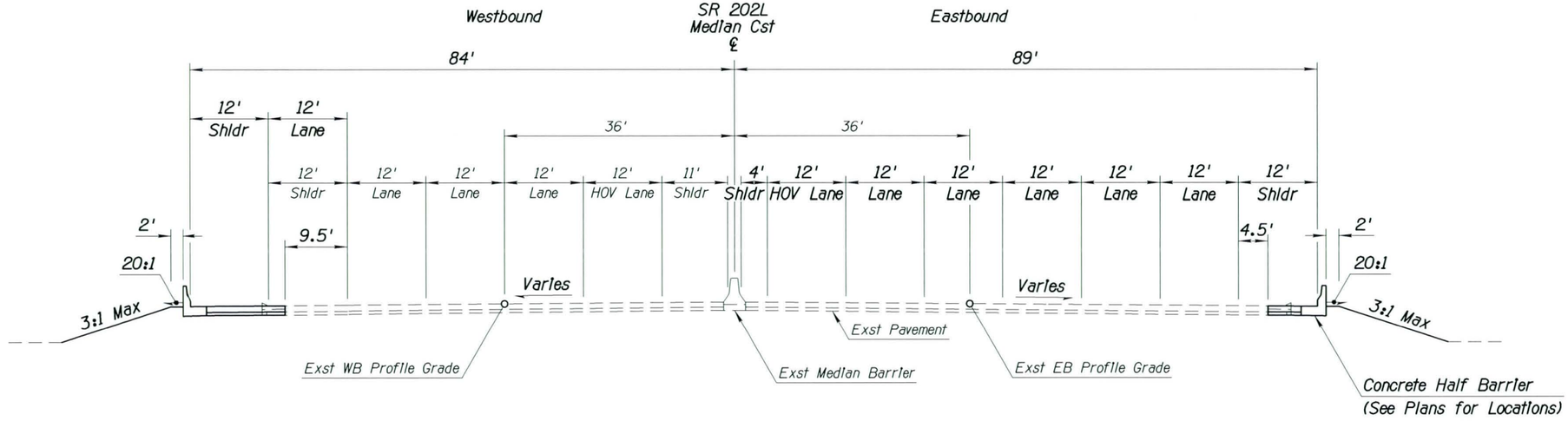


PROPOSED TYPICAL SECTION

Alma School Road Ramp 'D' Back of Gore
Country Club Drive Ramp 'B' Back of Gore

* Median Shoulder Transitions from 11' to 4' from Sta 473+89.38 to Sta 478+44.38

* Median Shoulder Transitions from 4' to 11' from Sta 525+92.79 to Sta 530+47.79



TYPICAL SECTION

Between Alma School Road Ramp 'D' Entrance and McKellips Road Ramp 'B' Exit

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ALTERNATIVE 2
DESIGN SHEET
TYPICAL MAINLINE SECTIONS

DCR

NOT FOR CONSTRUCTION OR RECORDING

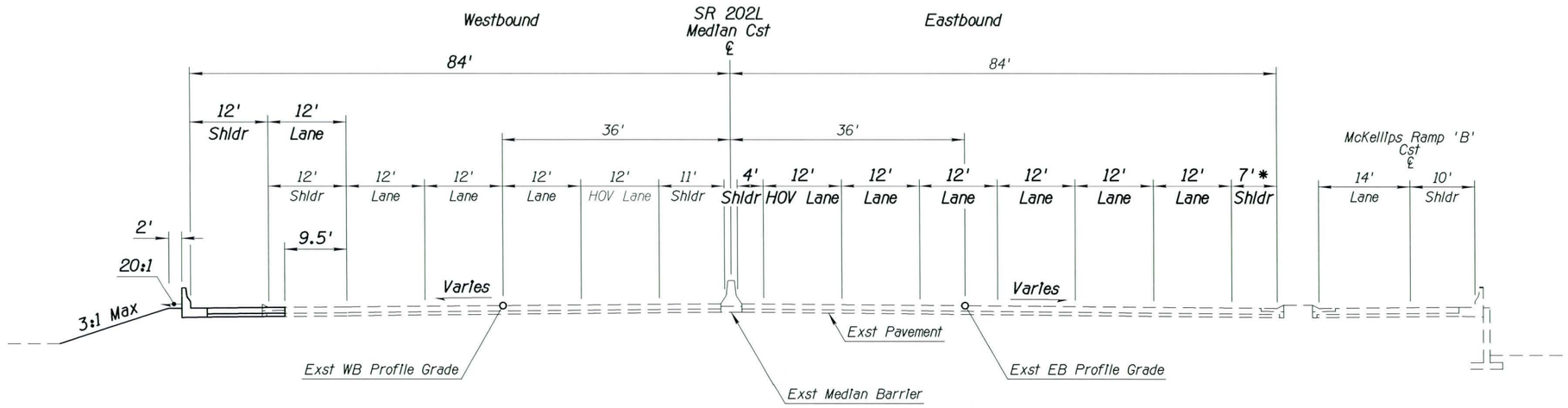
DWG NO. G-2.04

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA2-4.dgn

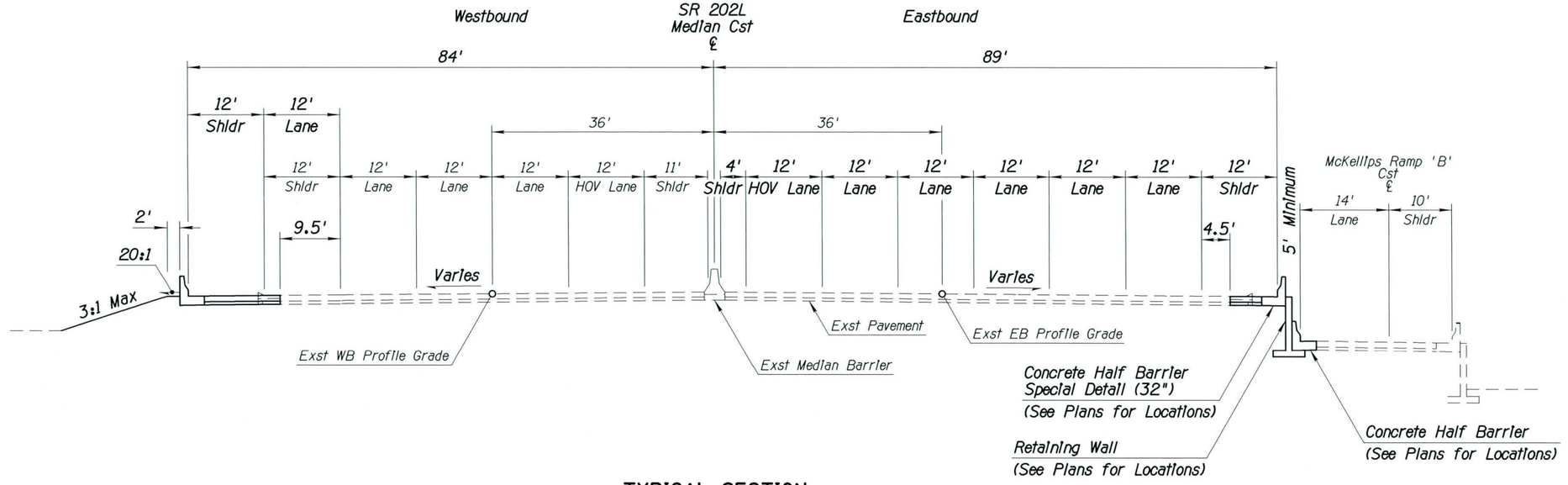
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



PROPOSED TYPICAL SECTION

McKellips Road Ramp 'B' Back of Gore

* *Outside Shoulder Transitions from 7' to 12' from Sta 500+50.00 to Sta 501+75.00*



TYPICAL SECTION

Between McKellips Road Ramp 'B' Back of Gore and Country Club Drive Ramp 'B' Exit

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ALTERNATIVE 2
DESIGN SHEET
TYPICAL MAINLINE SECTIONS

DCR

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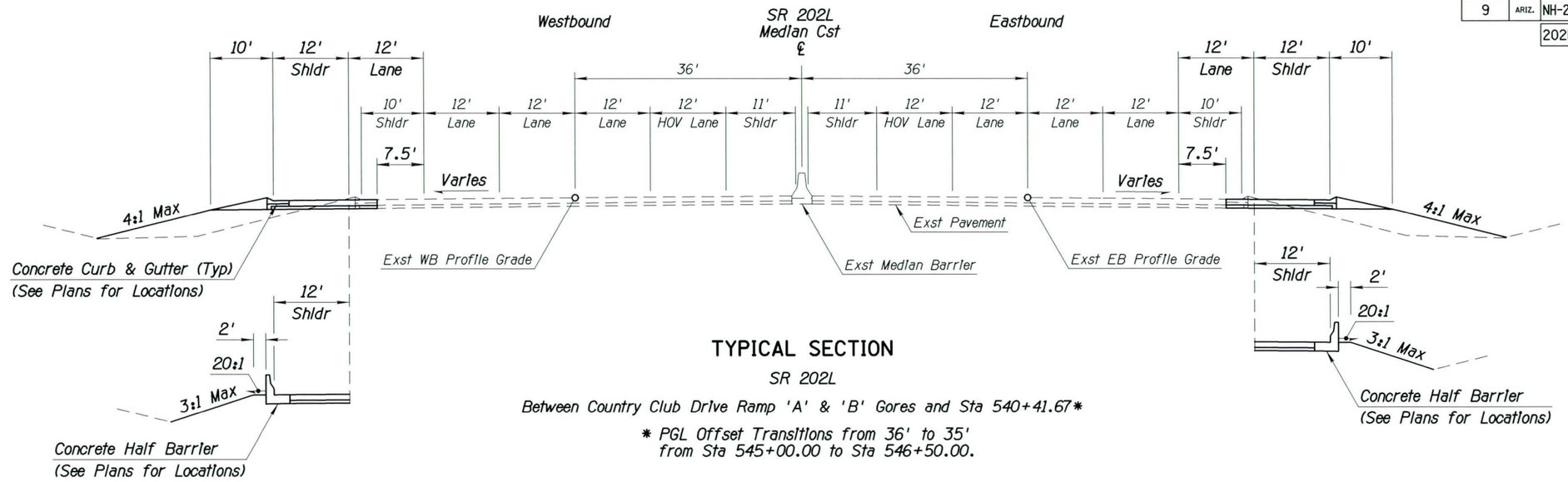
ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	G-2.05
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA2-5.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

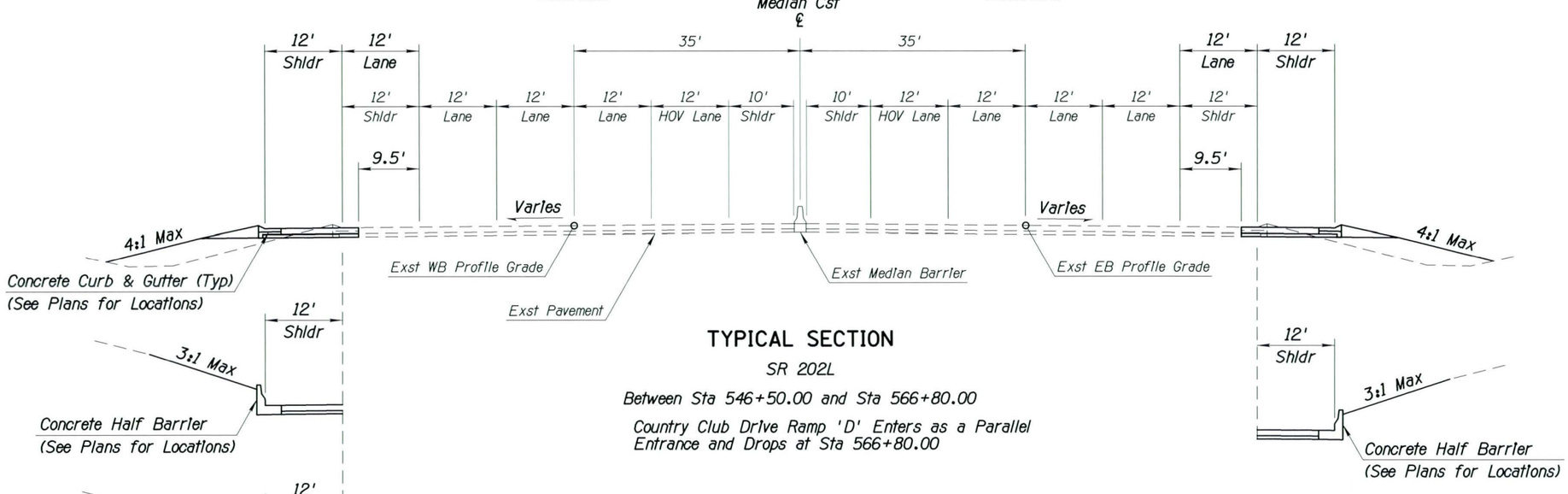


TYPICAL SECTION

SR 202L

Between Country Club Drive Ramp 'A' & 'B' Gores and Sta 540+41.67*

* PGL Offset Transitions from 36' to 35'
from Sta 545+00.00 to Sta 546+50.00.



TYPICAL SECTION

SR 202L

Between Sta 546+50.00 and Sta 566+80.00

Country Club Drive Ramp 'D' Enters as a Parallel
Entrance and Drops at Sta 566+80.00

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ALTERNATIVE 2
DESIGN SHEET
TYPICAL MAINLINE SECTIONS

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. G-2.06

TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169tyA2-6.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

All Coordinates Are Ground Coordinates And All Bearings Are Grid Bearings — G.A.F. = 1.00016

PLAN REF NO		P.I./P.O.T. STATION	COORDINATES											
75102	Ramp 'W-S' Cst ℄	30+65.27	N=885949.068	E=711040.232	PC									
WS-1	Ramp 'W-S' Cst ℄	33+81.19	N=885862.215	E=710736.490	PI	Simple	Δ=4°00'00"	D=0°38'00"	R=9046.70	L=631.58	T=315.92	Ext=5.51	e=NC	SEE SUPERELEVATION DIAGRAM
75100	Ramp 'W-S' Cst ℄	36+96.85	N=885796.762	E=710427.429	PT									
80600	Dobson Dr Ramp 'A' Cst ℄	16+30.80	N=886482.265	E=712861.289	PC									
DA-1	Dobson Dr Ramp 'A' Cst ℄	17+83.08	N=886524.131	E=713007.702	PI	Simple	Δ=1°54'12"	D=0°37'30"	R=9167.33	L=304.54	T=152.28	Ext=1.27	e=NC	SEE SUPERELEVATION DIAGRAM
80603	Dobson Dr Ramp 'A' Cst ℄	24+35.00	N=886724.089	E=713628.233	POC									
81509	New Alma School Rd Ramp 'D' Cst ℄	11+50.00	N=889631.079	E=718651.048	POT									
ASD-1	New Alma School Rd Ramp 'D' Cst ℄	15+59.33	N=889820.670	E=719013.820	PI	Simple	Δ=21°35'37"	D=3°30'00"	R=1637.02	L=616.96	T=312.18	Ext=29.50	e=0.048⅛ft	SEE SUPERELEVATION DIAGRAM
ASD-2	New Alma School Rd Ramp 'D' Cst ℄	22+94.31	N=890382.533	E=719499.050	PI	Simple	Δ=5°00'00"	D=0°50'00"	R=6875.49	L=600.00	T=300.19	Ext=6.55	e=NC	SEE SUPERELEVATION DIAGRAM
81505	New Alma School Rd Ramp 'D' Cst ℄	25+94.12	N=890591.763	E=719714.312	PT									
82500	McKellips Rd Ramp 'B' Cst ℄	10+71.68	N=891069.653	E=720205.983	PI									
42200	McKellips Rd Ramp 'B' Cst ℄	15+91.40	N=891405.014	E=720603.028	PI									
83700	Country Club Dr Ramp 'B' Cst ℄	7+44.90	N=892309.313	E=721684.798	PC									
CCB-1	Country Club Dr Ramp 'B' Cst ℄	11+54.76	N=892532.983	E=722028.251	PI	Simple	Δ=10°13'10"	D=1°15'00"	R=4583.66	L=817.55	T=409.86	Ext=18.29	e=0.032⅛ft	SEE SUPERELEVATION DIAGRAM
CCB-2	Country Club Dr Ramp 'B' Cst ℄	19+19.34	N=892830.783	E=722734.806	PI	Simple	Δ=3°42'52"	D=1°00'00"	R=5729.58	L=371.46	T=185.79	Ext=3.01	e=NC	SEE SUPERELEVATION DIAGRAM
83705	Country Club Dr Ramp 'B' Cst ℄	21+05.00	N=892891.700	E=722910.329	PT									
83400	Country Club Dr Ramp 'D' Cst ℄	15+00.00	N=893342.371	E=724048.531	POC									
CCD-1	Country Club Dr Ramp 'D' Cst ℄	15+50.33	N=893377.590	E=724095.258	PI	Simple	Δ=6°02'01"	D=6°00'00"	R=954.93	L=100.56	T=50.33	Ext=1.33	e=0.059⅛ft	SEE SUPERELEVATION DIAGRAM
CCD-2	Country Club Dr Ramp 'D' Cst ℄	26+62.00	N=894102.823	E=724845.785	PI	Simple	Δ=23°13'39"	D=5°15'00"	R=1091.35	L=442.43	T=224.29	Ext=22.81	e=0.060⅛ft	SEE SUPERELEVATION DIAGRAM
83404	Country Club Dr Ramp 'D' Cst ℄	28+80.13	N=894179.627	E=725025.257	PT									

CURVE DATA TABLE

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
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INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
GEOMETRIC DATA SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-1.01

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

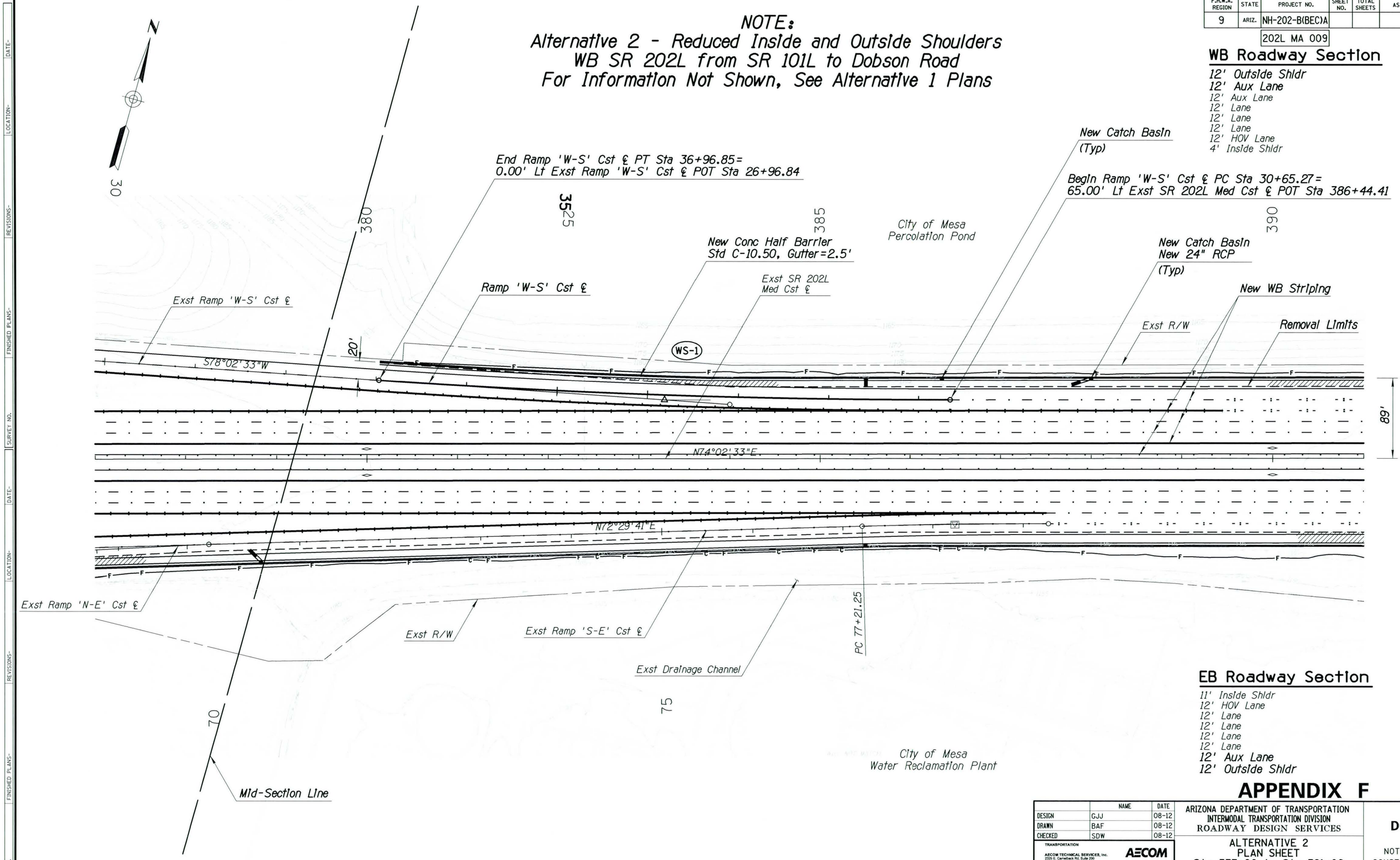
OF

8/20/2012 U:\RM02\Prod\civ\h8169gA2-1.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
WB SR 202L from SR 101L to Dobson Road
For Information Not Shown, See Alternative 1 Plans



WB Roadway Section

12' Outside Shldr
12' Aux Lane
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
4' Inside Shldr

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Aux Lane
12' Outside Shldr

APPENDIX F

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INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 377+00 to Sta 391+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.01

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA2-01.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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		202L MA 009			

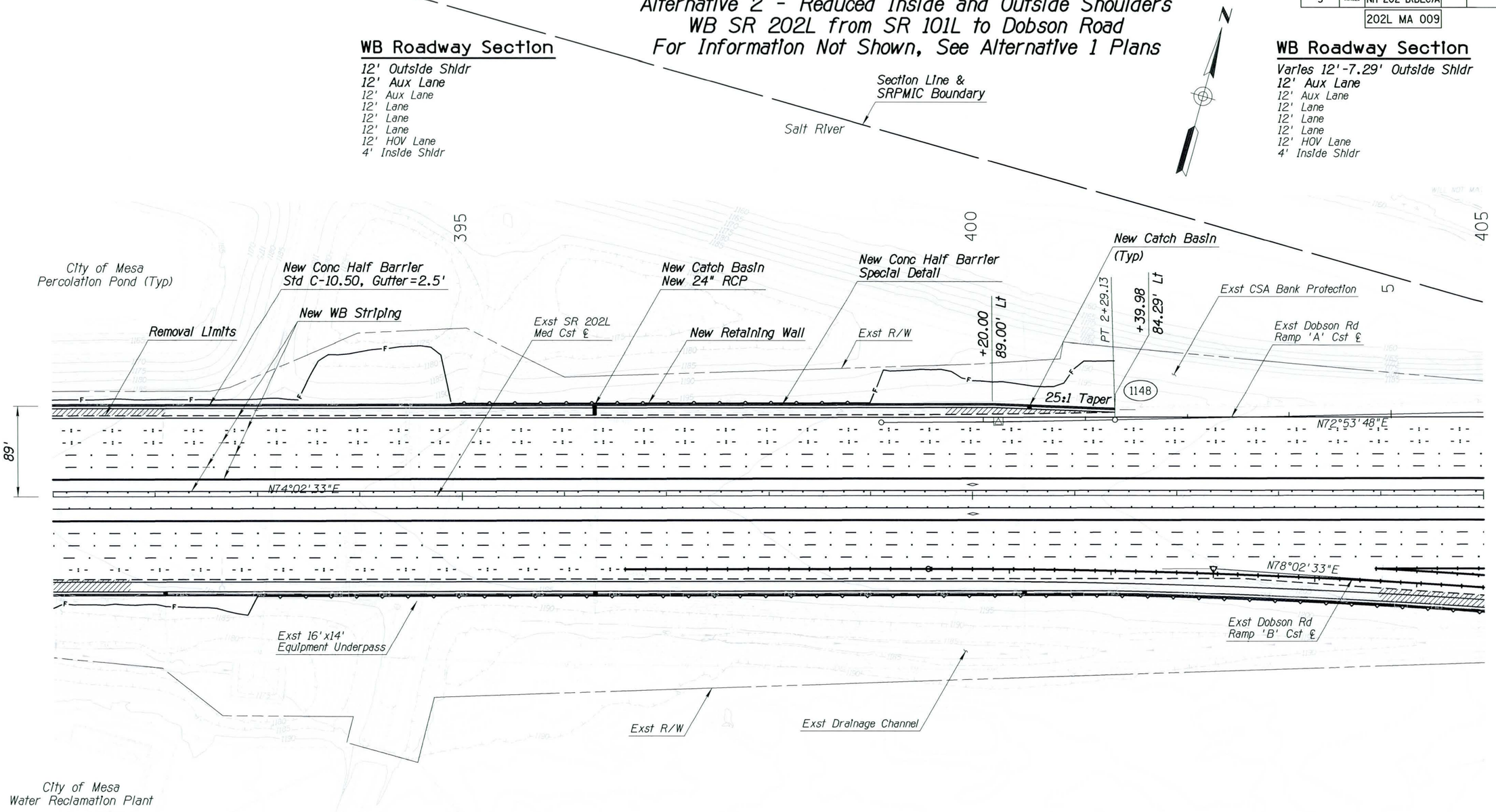
NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
WB SR 202L from SR 101L to Dobson Road
For Information Not Shown, See Alternative 1 Plans

WB Roadway Section

12' Outside Shldr
12' Aux Lane
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
4' Inside Shldr

WB Roadway Section

Varies 12'-7.29' Outside Shldr
12' Aux Lane
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
4' Inside Shldr



EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Aux Lane
12' Outside Shldr

10

APPENDIX F

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

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AECOM TECHNICAL SERVICES, Inc.
2325 E. Camelback Rd, Suite 200
Phoenix, Arizona 85016
T 602.337.2700
AECOM
www.aecom.com

ALTERNATIVE 2
PLAN SHEET
Sta 391+00 to Sta 405+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.02
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA2-02.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

Varies 12'-7.29' Outside Shldr
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
4' Inside Shldr

NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
WB SR 202L from SR 101L to Dobson Road
For Information Not Shown, See Alternative 1 Plans

N

Salt River

SRPMIC Boundary

Exst R/W

Exst R/W & SRPMIC Boundary

SRPMIC Boundary

WB Roadway Section

Varies 12'-7' Outside Shldr
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
4' Inside Shldr

Begin Dobson Rd Ramp 'A' Cst ℄ PC Sta 16+30.80=
77.00' Lt Exst SR 202L Med Cst ℄ POT Sta 405+41.88

End Dobson Rd Ramp 'A' Cst ℄ POT Sta 24+35.00=
0.00' Lt Exst Dobson Rd Ramp 'A' Cst ℄ POC Sta 14+35.00

405 20 410 10 415 15

Dobson Rd Ramp 'A' Cst ℄

New Conc Half Barrier
Std C-10.50, Gutter=2.5'

New Catch Basin
New 24" RCP

Section Line

Exst CSA Bank Protection

PT 19+35.33

+35.00 72.00' Lt

PC 13+97.12

New WB Striping

Exst Dobson Rd Ramp 'A' Cst ℄

Removal Limits

SC 418+89.31

1151

DA-1

7 8 18 17

N72°53'48"E

N72°08'21"E

65:1 Taper

TS 415+89.31

20004

Varies

N74°02'33"E

N78°02'33"E

Exst SR 202L Med Cst ℄

Exst Dobson Rd Ramp 'B' Cst ℄

Exst R/W

New Catch Basin (Typ)

5 10 15

Section Line

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 405+00 to Sta 419+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.03

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

OF

8/20/2012 U:\RM02\Prod\civ\h8169pA2-03.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

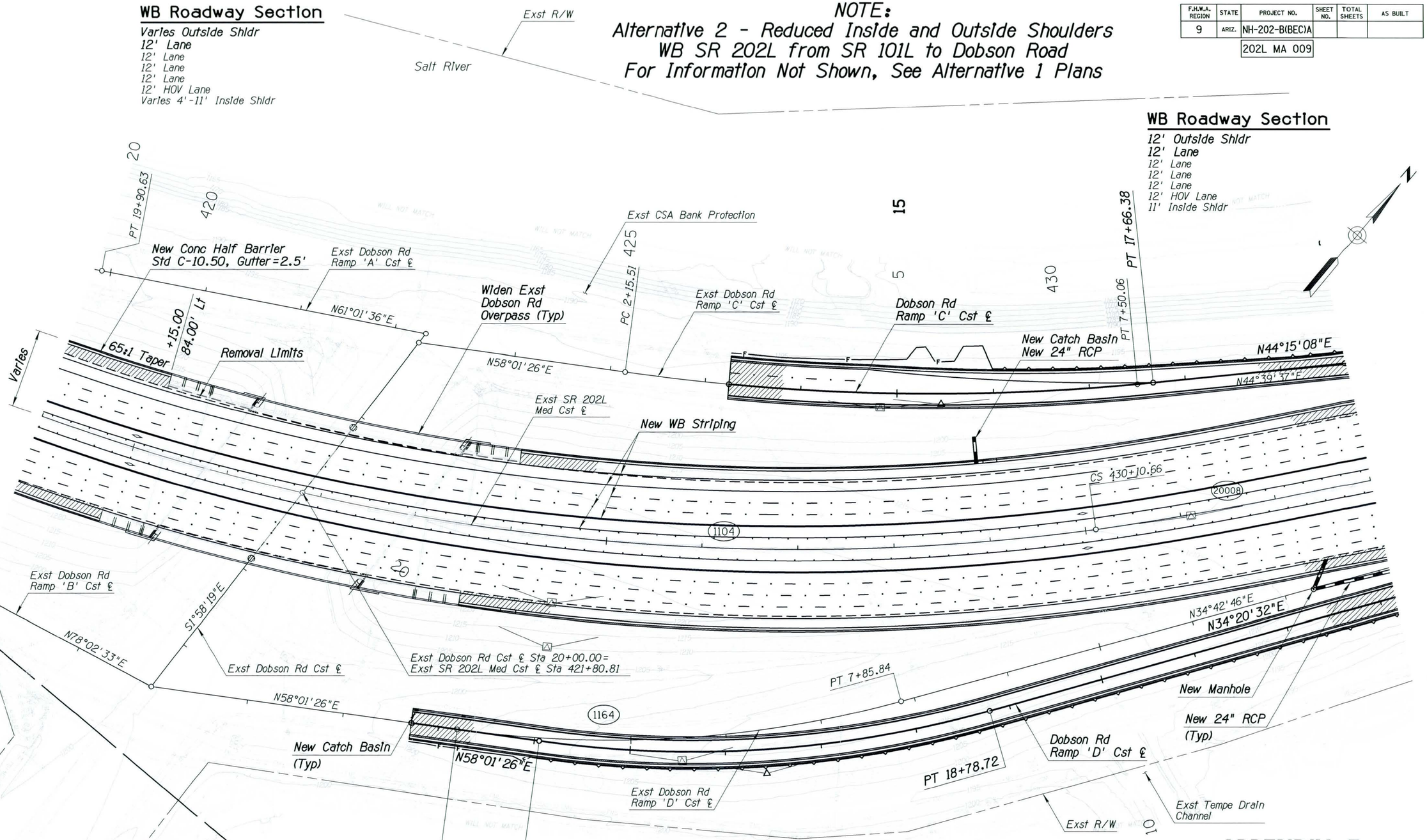
NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
WB SR 202L from SR 101L to Dobson Road
For Information Not Shown, See Alternative 1 Plans

WB Roadway Section

Varies Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
Varies 4'-11' Inside Shldr

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr



EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 419+00 to Sta 433+00

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L
NH-202-B(BEC)A

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.04

___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA2-04.dgn

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

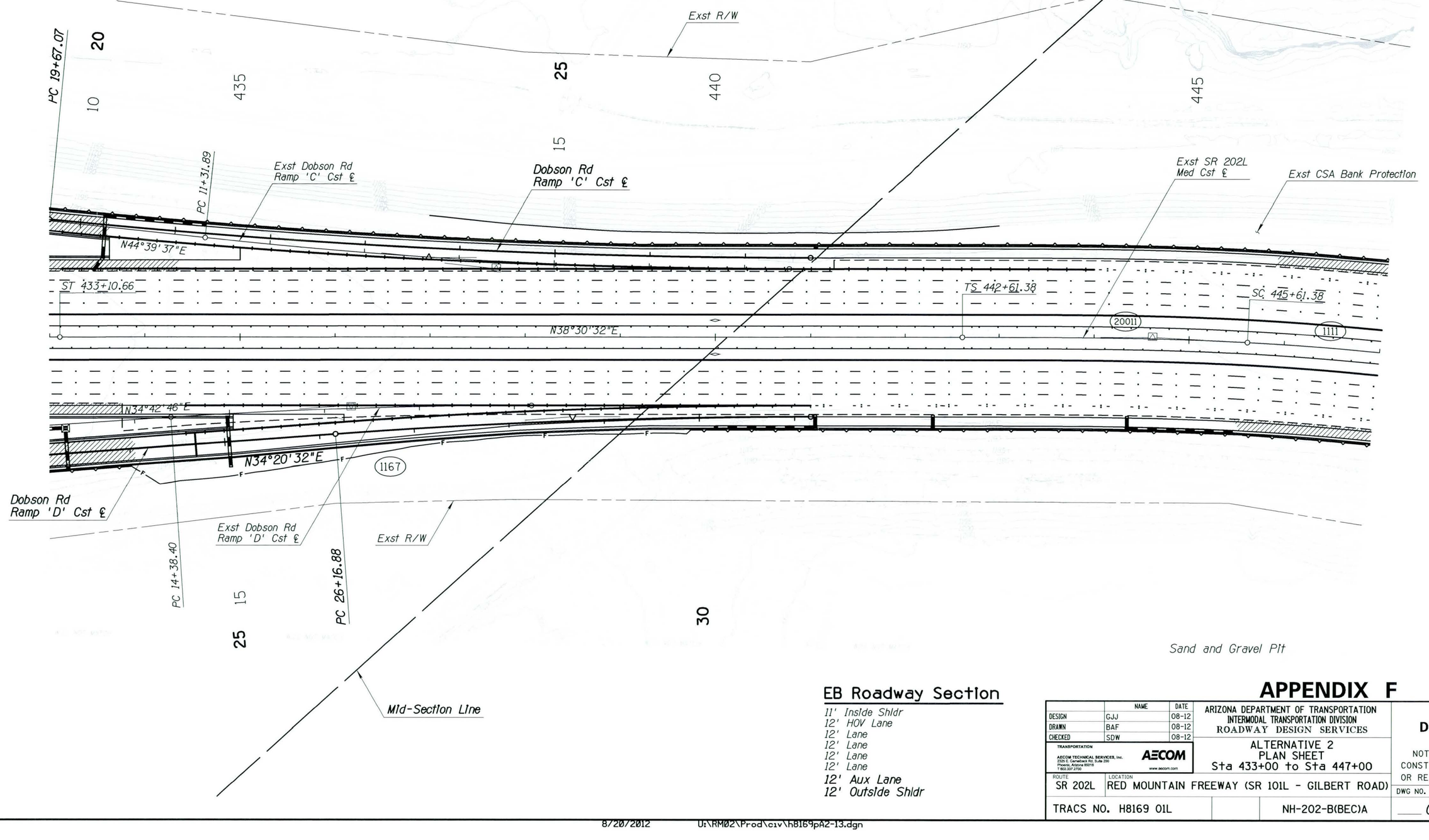
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

Salt River

NOTE:
Alternative 2 Same as Alternative 1
For Information Not Shown, See Alternative 1 Plans

WB Roadway Section

12' Outside Shldr
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr



EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Aux Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
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ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 433+00 to Sta 447+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.05

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA2-13.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Aux Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

Exst R/W

Mid-Section Line

Salt River

NOTE:
Alternative 2 Same as Alternative 1
For Information Not Shown, See Alternative 1 Plans

450

455

10

460

Exst CSA Bank Protection

PC 11+33.05

Gravel Pit Haul Road

Alma School Rd
Ramp 'A' Cst ℄

N64°16'52"E

Exst Alma School Rd
Ramp 'A' Cst ℄

1111

N67°18'05"E

Exst SR 202L
Med Cst ℄

Alma School Rd
Ramp 'B' Cst ℄

1175

Exst Alma School Rd
Ramp 'B' Cst ℄

Exst R/W

N79°10'23"E

Exst 40'x17'
Equipment Underpass

Sand and Gravel Pit

15

5

PT 16+42.06

EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Aux Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 447+00 to Sta 461+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.06

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ____ OF ____

8/20/2012 U:\RM02\Prod\civ\h8169pA2-14.dgn

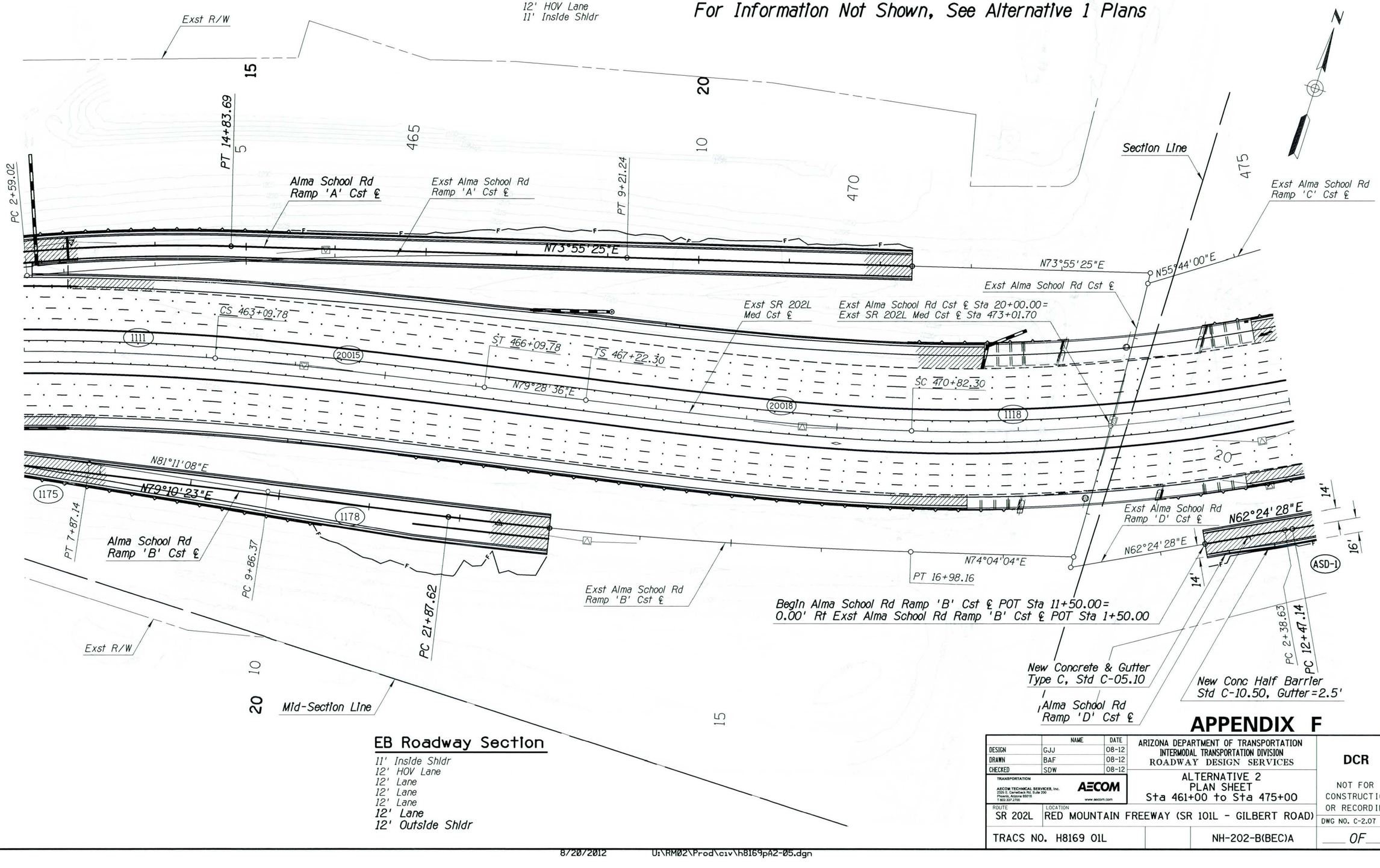
SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

NOTE:
Alternative 2 Same as Alternative 1
For Information Not Shown, See Alternative 1 Plans



EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
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CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 461+00 to Sta 475+00

DCR
NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO. C-2.07
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA2-05.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr

NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
EB SR 202L from Alma School Road to Center Street
For Information Not Shown, See Alternative 1 Plans

Salt River

Exst R/W
PC 14+35.46
N55°44'00"E
Exst Alma School Rd Ramp 'C' Cst ℄
PC 8+43.65
Alma School Rd Ramp 'C' Cst ℄
PT 21+45.76
Exst SR 202L Med Cst ℄
N49°48'51"E
CS 478+44.38
ST 482+04.38
N45°48'51"E
84'
14'
16'
+20.00
84.00' Rt
65:1 Taper
PT 8+40.49
N41°20'34"E
50:1 Taper
New Noise Wall
New Conc Half Barrier Special Detail
Removal Limits
New Conc Curb & Gutter Type C, Std C-05.10
N40°48'51"E
+75.00
77.00' Rt
PC 11+46.69
New Retaining Wall
Alma School Rd Ramp 'D' Cst ℄
New Conc Half Barrier Special Detail
Exst Alma School Rd Ramp 'D' Cst ℄
PT 18+64.10
New Conc Half Barrier Std C-10.50, Gutter=2.5'
New Conc Curb & Gutter Type C, Std C-05.10
PC 19+94.12
Exst R/W
New Catch Basin
New EB Striping
New Catch Basin New 24" RCP (Typ)
89'

1118 · 20022 · 1187 · ASD-1 · ASD-2 · 1190

475 · 5 · 480 · 20 · 10 · 485 · 5 · 15 · 20 · 10 · 25 · 15

EB Roadway Section

Varies 11'-4' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

Alma School Rd Ramp 'D' Cst ℄ POC Sta 21+03.06= 94.53' Rt Exst SR 202L Med Cst ℄ POT Sta 482+95.14
Nose of Gore Control Point

End Alma School Rd Ramp 'D' Cst ℄ PT Sta 25+94.12= 77.00' Rt Exst SR 202L Med Cst ℄ POT Sta 487+85.78

EB Roadway Section

4' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

EB Roadway Section

4' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 475+00 to Sta 489+00

DCR

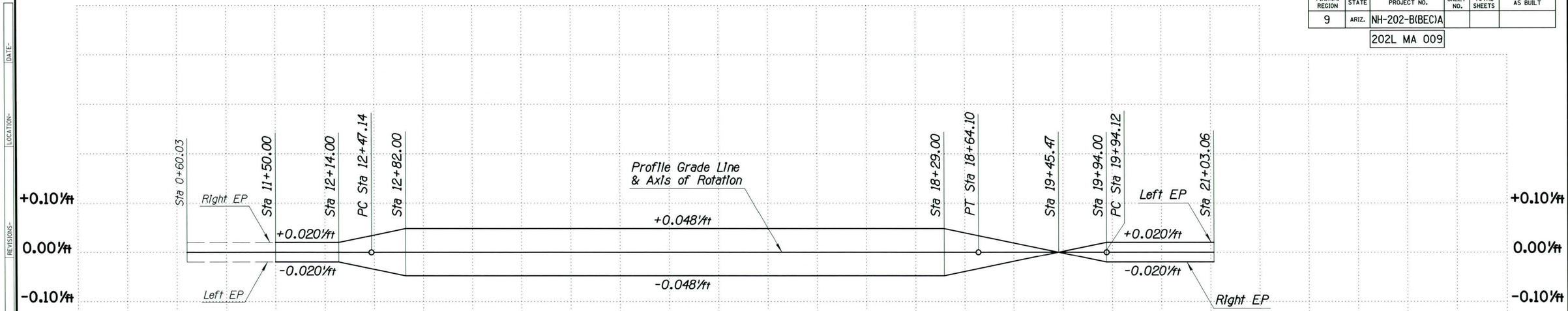
NOT FOR CONSTRUCTION OR RECORDING

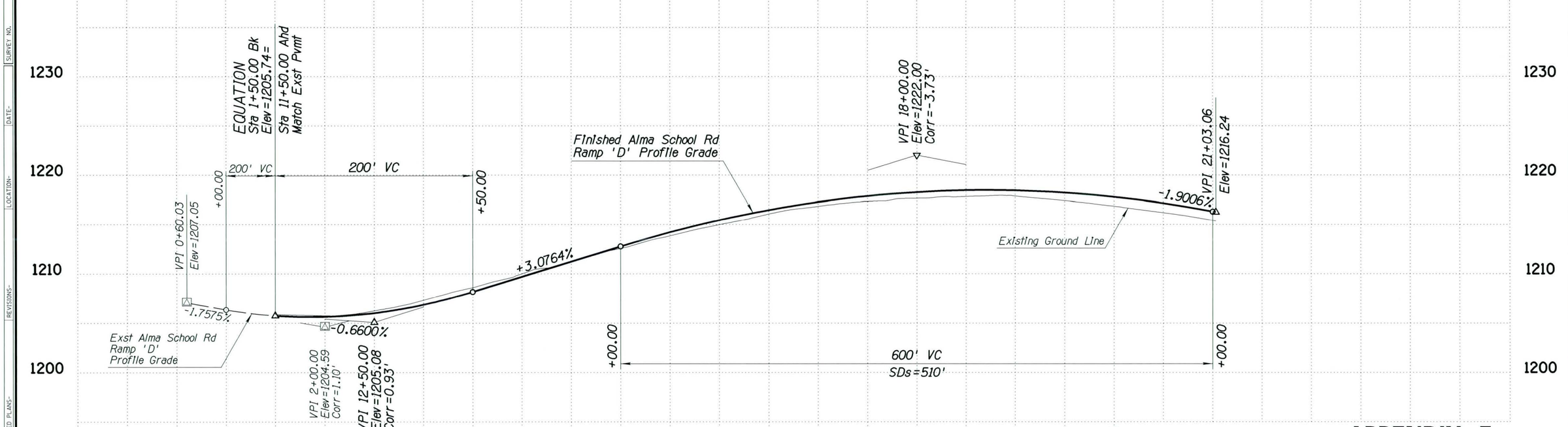
ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.08
TRACS NO. H8169 01L
NH-202-B(BEC)A
___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA2-06.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			





APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
ALMA SCHOOL RD RAMP 'D'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.09

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

OF

8/20/2012 U:\RM02\Prod\civ\h8169vA2-01.dgn

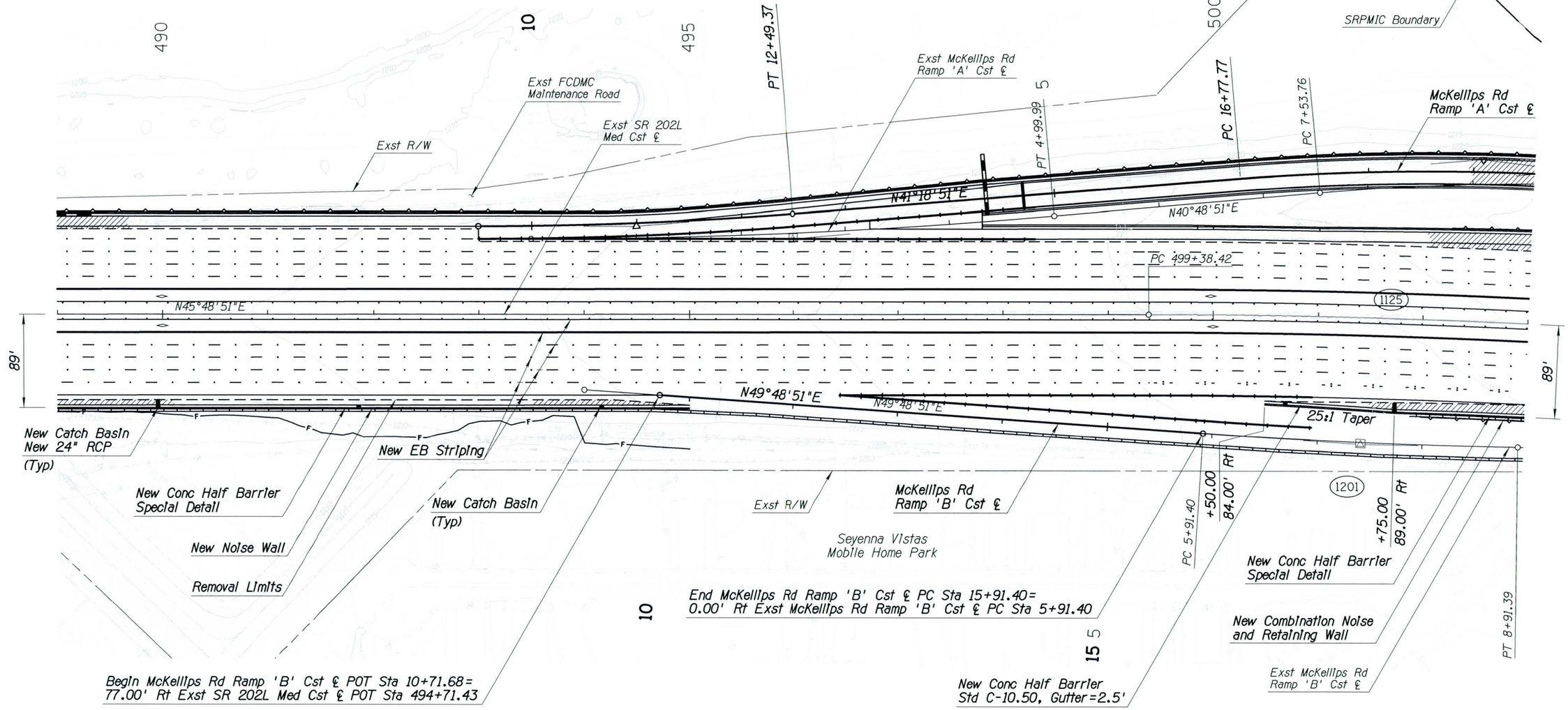
DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
EB SR 202L from Alma School Road to Center Street
For Information Not Shown, See Alternative 1 Plans

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr



EB Roadway Section

4' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 489+00 to Sta 503+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

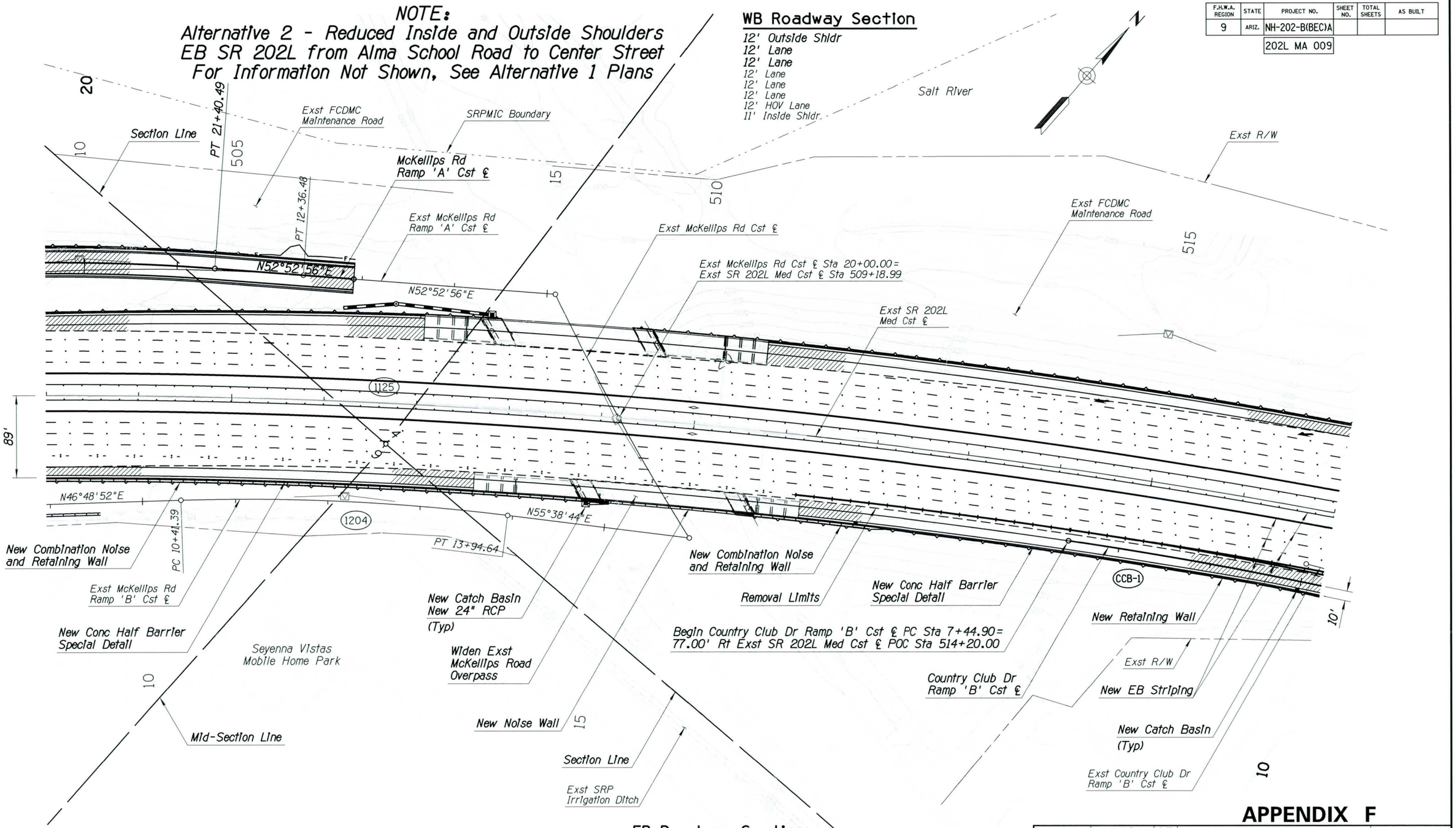
ROUTE	LOCATION	DWG NO. C-2.10
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	
TRACS NO. H8169 01L	NH-202-B(BEC)A	OF

8/20/2012 U:\RM02\Prod\civ\h8169pA2-07.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
EB SR 202L from Alma School Road to Center Street
For Information Not Shown, See Alternative 1 Plans



APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 503+00 to Sta 517+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

DWG NO. C-2.11

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

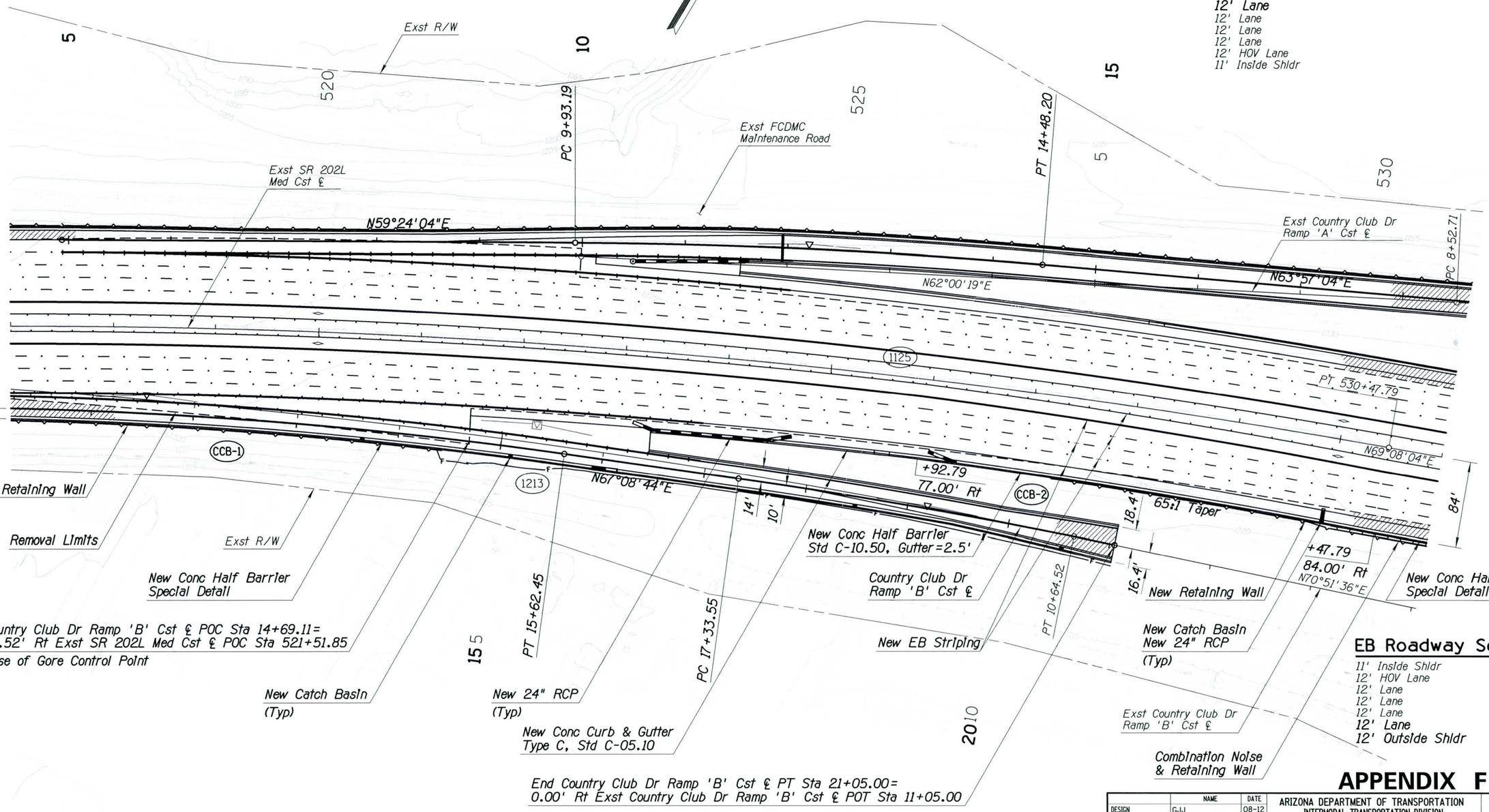
8/20/2012 U:\RM02\Prod\civ\h8169pA2-08.dgn

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
EB SR 202L from Alma School Road to Center Street
For Information Not Shown, See Alternative 1 Plans

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr



EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 517+00 to Sta 531+00

DCR

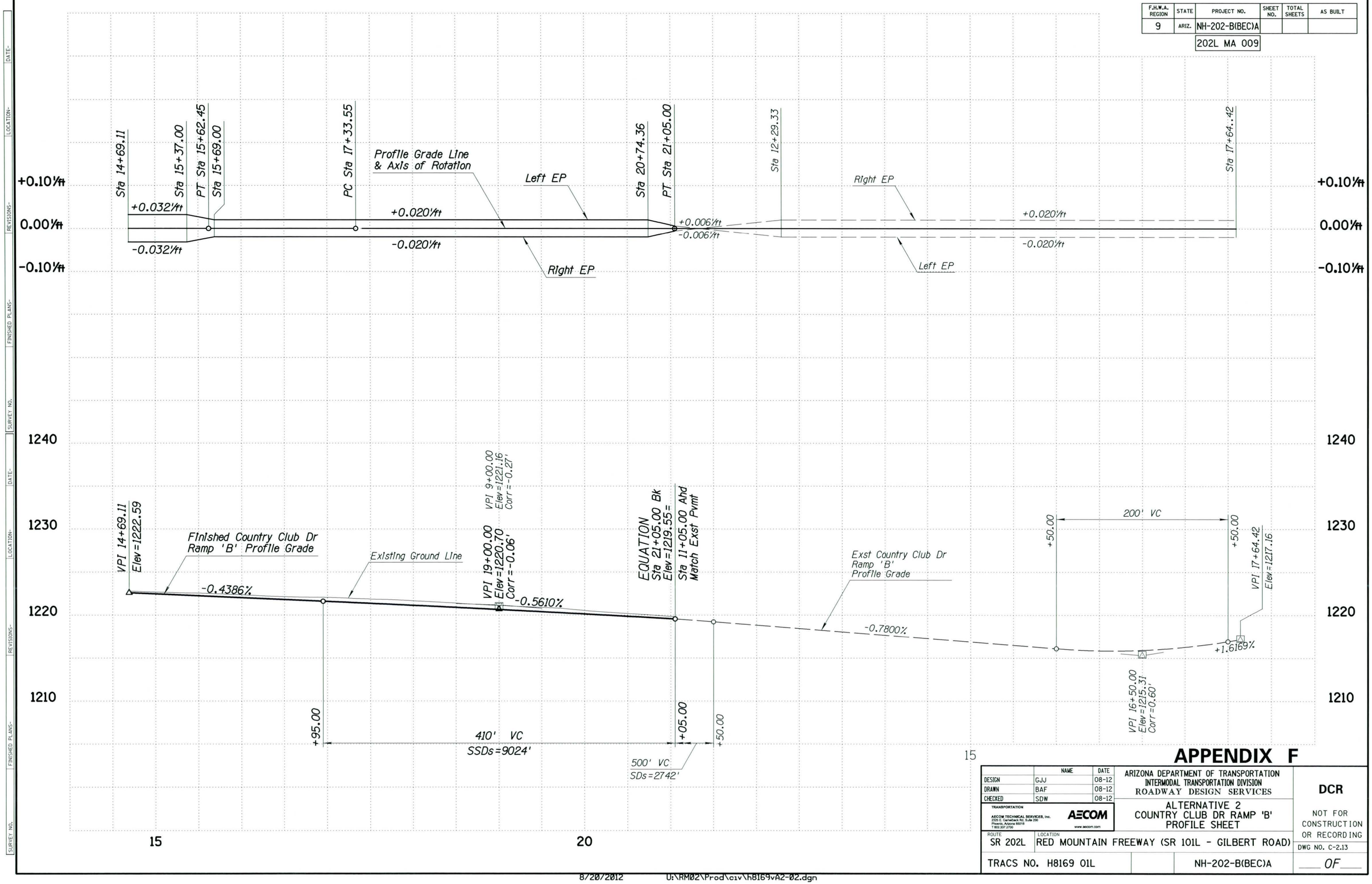
NOT FOR CONSTRUCTION OR RECORDING

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)
DWG NO. C-2.12
TRACS NO. H8169 01L
NH-202-B(BEC)A
____ OF ____

8/20/2012 U:\RM02\Prod\civ\h8169pA2-09.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION

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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
COUNTRY CLUB DR RAMP 'B'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.13

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

____ OF ____

8/20/2012 U:\RM02\Prod\civ\h8169vA2-02.dgn

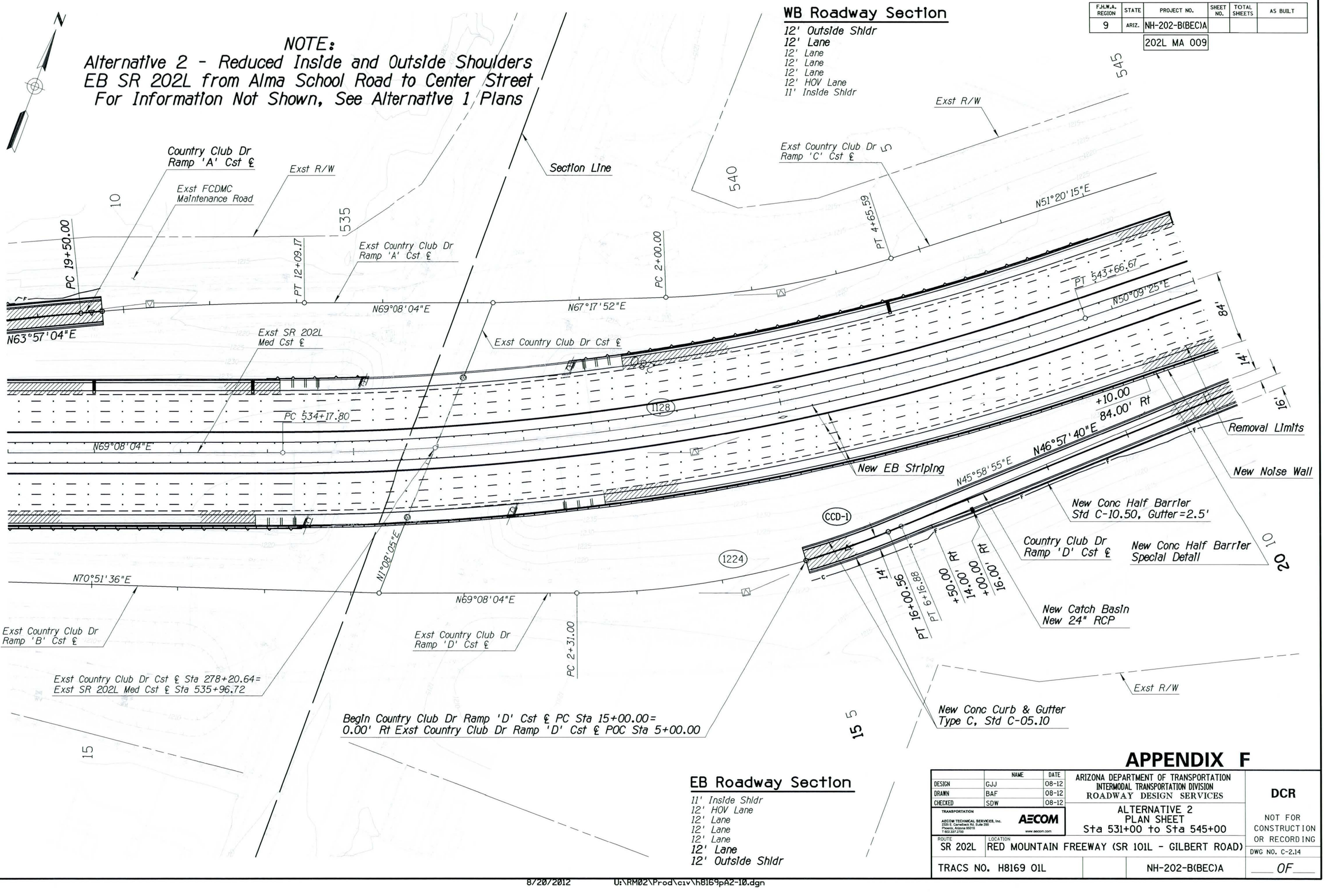
SURVEY NO. | FINISHED PLANS- | LOCATION- | REVISIONS- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
EB SR 202L from Alma School Road to Center Street
For Information Not Shown, See Alternative 1 Plans

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
11' Inside Shldr



EB Roadway Section

11' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

TRANSPORTATION
AECOM TECHNICAL SERVICES, Inc.
2555 E. Camelback Rd. Suite 200
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T 602.337.2700
AECOM
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ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

ALTERNATIVE 2
PLAN SHEET
Sta 531+00 to Sta 545+00

DCR

NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.14

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L

NH-202-B(BEC)A

___ OF ___

8/20/2012 U:\RM02\Prod\civ\H8169pA2-10.dgn

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

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
EB SR 202L from Alma School Road to Center Street
For Information Not Shown, See Alternative 1 Plans

WB Roadway Section
12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10'-11' Inside Shldr

WB Roadway Section
12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

545 10 550 25 15 555 30 20

PC 10+77.01
PC 21+70.56
Exst Country Club Dr Ramp 'C' Cst ℄
N51°20'15"E
N51°20'15"E
Exst R/W
Mid-Section Line
Exst SR 202L Med Cst ℄
PC 548+07.67
N50°09'25"E
84'
+00.00 84.00' Rt
+50.00 83.00' Rt
14'
16'
150:1 Taper
N45°58'55"E
N46°57'40"E
50:1 Taper
1131
1227
CCD-2
PT 30+84.80
PT 21+21.85
PT 557+71.95
N87°54'25"E
N87°54'24"E
N85°34'25"E
95'
New Conc Half Barrier Special Detail
New Noise Wall
New Conc Half Barrier Std C-10.50, Gutter=2.5'
New Conc Curb & Gutter Type C, Std C-05.10
New Catch Basin New 24" RCP (Typ)
PC 14+16.89
PC 24+37.71
Exst Country Club Dr Ramp 'D' Cst ℄
Exst R/W
New R/W
New EB Striping
Removal Limits
25 15
Country Club Dr Ramp 'D' Cst ℄
New Conc Half Barrier Std C-10.50, Gutter=2.5'
Country Club Dr Ramp 'D' Cst ℄ Sta 25+20.79= 100.55' Rt Exst SR 202L Med Cst ℄ Sta 550+00.63
Nose of Gore Control Point
End Country Club Dr Ramp 'D' Cst ℄ PT Sta 28+80.13= 83.00' Rt Exst SR 202L Med Cst ℄ POC Sta 553+80.00
Exst Radio Disney, LLC KMIC Radio Station Towers

EB Roadway Section
10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

EB Roadway Section
10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

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

8/20/2012 U:\RM02\Prod\civ\h8169pA2-11.dgn

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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PLAN SHEET
Sta 545+00 to Sta 559+00

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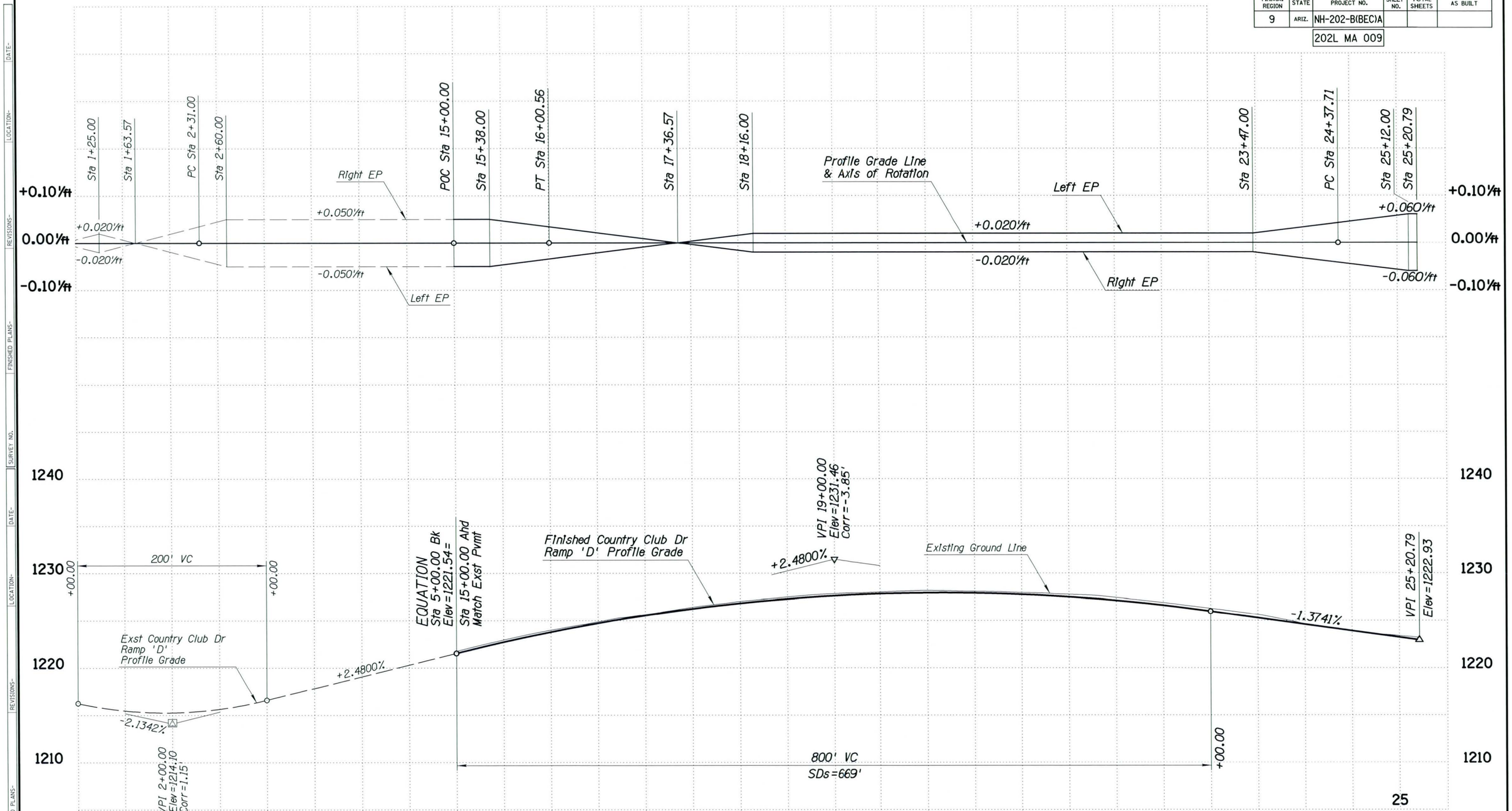
DWG NO. C-2.15

ROUTE	LOCATION		
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)		
TRACS NO. H8169 01L		NH-202-B(BEC)A	___ OF ___

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			



APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
CHECKED	SDW	08-12

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ROADWAY DESIGN SERVICES

ALTERNATIVE 2
COUNTRY CLUB DR RAMP 'D'
PROFILE SHEET

DCR

NOT FOR CONSTRUCTION OR RECORDING

ROUTE	LOCATION	DWG NO.
SR 202L	RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)	C-2.16
TRACS NO. H8169 01L	NH-202-B(BEC)A	___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169vA2-03.dgn

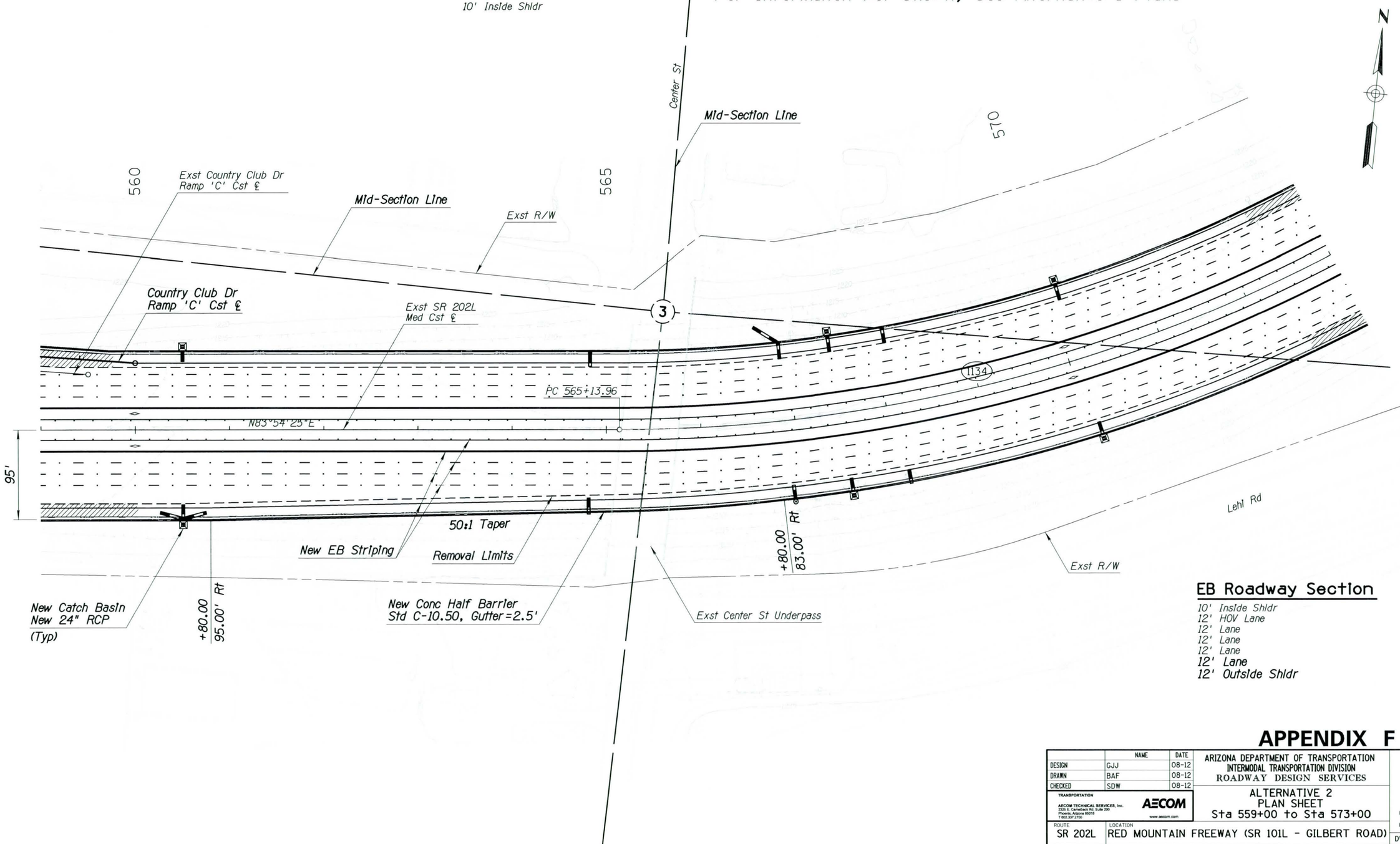
SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	NH-202-B(BEC)A			
		202L MA 009			

WB Roadway Section

12' Outside Shldr
12' Lane
12' Lane
12' Lane
12' Lane
12' HOV Lane
10' Inside Shldr

NOTE:
Alternative 2 - Reduced Inside and Outside Shoulders
EB SR 202L from Alma School Road to Center Street
For Information Not Shown, See Alternative 1 Plans



EB Roadway Section

10' Inside Shldr
12' HOV Lane
12' Lane
12' Lane
12' Lane
12' Lane
12' Outside Shldr

APPENDIX F

	NAME	DATE
DESIGN	GJJ	08-12
DRAWN	BAF	08-12
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ALTERNATIVE 2
PLAN SHEET
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NOT FOR CONSTRUCTION OR RECORDING

DWG NO. C-2.17

ROUTE: SR 202L
LOCATION: RED MOUNTAIN FREEWAY (SR 101L - GILBERT ROAD)

TRACS NO. H8169 01L | NH-202-B(BEC)A | ___ OF ___

8/20/2012 U:\RM02\Prod\civ\h8169pA2-12.dgn

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