LOCATION HYDRAULIC STUDY AND SUMMARY FLOODPLAIN ENROACHMENT REPORT

FOR THE

REPLACEMENT OF FOUR CHUCKWALLA VALLEY ROAD BRIDGES PROJECT

Over Aztec Ditch (Br. No. 56C0102)
(Federal Aid Project No.BRLO-5956(239)

Over Tarantula Ditch (Br. No. 56C0103)
(Federal AidProject No. BRLO-5956(227)

Over Sutro Ditch (Br. No. 56C0104)
(Federal Aid Project No. BRLO-5956(226)

Over Acari Ditch (Br. No. 56C0108)
(Federal Aid Project No. BRLO-5956(225)

Submitted to:
CALIFORNIA DEPARTMENT OF TRANSPORTATION, DISTRICT 8
464 W. 4th Street
San Bernardino, CA 92401

Prepared for:
COUNTY OF RIVERSIDE DEPARTMENT OF TRANSPORTATION
3525 14th Street
Riverside, CA 92501

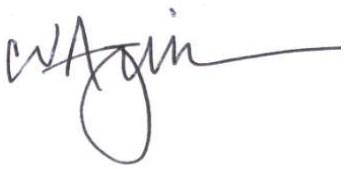
Prepared by:
AGUILAR CONSULTING, INC.
2155 Chicago Avenue, Suite 304
Riverside, CA 92507
(951) 300-1431

September 2019

LOCATION HYDRAULIC STUDY AND SUMMARY FLOODPLAIN ENROACHMENT REPORT FOR THE REPLACEMENT OF FOUR CHUCKWALLA VALLEY ROAD BRIDGES PROJECT RIVERSIDE COUNTY, CALIFORNIA

This report has been prepared by or under the direction of the following registered civil engineer who attests to the technical information contained herein. The registered civil engineer has also judged the qualifications of any employees that have provided data and calculations upon which the recommendations, conclusions, and decisions are based.

Ceazar V. Aguilar, PE 41679



State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Making Conservation a California Way of Life.

To: AARON P. BURTON
Senior Environmental Planner
Local Assistance-Environmental Support, MS 760

Date: December 16, 2019

File: FPN: 5956(239) (227) (226) (225)
LHS-SFER Report for Chuckwalla Valley Road Bridges Project

From: **ALAN BISI** AB
Office Chief, Hydraulics – MS 1065

Subject: **LOCATION HYDRAULIC STUDY REPORT WITH SUMMARY FLOODPLAIN ENCROACHMENT REPORT**

We have reviewed the above Location Hydraulic Study Report with Summary Floodplain Encroachment Report and concur with the findings of this report.

If you have any questions or require further information, do not hesitate to call Michael Huynh of my staff at (909) 806-2524 or myself at (909) 383-4624.

TABLE OF CONTENTS

EXHIBITS

ATTACHMENTS

I. INTRODUCTION

Aguilar Consulting Inc. has prepared the Location Hydraulic Study (LHS) and Summary Floodplain Encroachment Report (SFER) in support of the proposed Replacement of Four Chuckwalla Valley Road Bridges Project.

The County of Riverside (The County), in cooperation with California Department of Transportation (Caltrans), is proposing to replace the following four existing structurally deficient bridges along Chuckwalla Valley Road near the Desert Center in Riverside County, California (see Exhibit "A" and Exhibit "B"):

1. Chuckwalla Valley Road Bridge over Aztec Ditch (State Br. No. 56C0102) (Federal Aid Project No. BRLO-5956(239)
2. Chuckwalla Valley Road Bridge over Tarantula Ditch (State Br. No. 56C0103) (Federal Aid Project No. BRLO-5956(227)
3. Chuckwalla Valley Road Bridge over Sutro Ditch (State Br. No. 56C0104) (Federal Aid Project No. BRLO-5956(226)
4. Chuckwalla Valley Road Bridge over Acari Ditch (State Br. No. 56C0108) (Federal Aid Project No. BRLO-5956(225)

II. PROJECT DESCRIPTION

Chuckwalla Valley Road is an approximately 16-mile stretch of frontage road that runs parallel to Interstate 10 (I-10). It connects Corn Springs Road and I-10 at the west end and Paled Dunes Drive and I-10 at the east end. Classified as a Local Rural Road, it mostly serves vehicles accessing local utilities and off-road recreation. The average daily traffic (ADT) volume is approximately 40 vehicles. Periodically, the road carries detoured traffic from the heavily traveled I-10 when the freeway is temporarily closed for construction or emergency incidents. Therefore, it is important to maintain this frontage road in sound condition at all times.

The existing timber bridges carry two lanes (one lane in each direction) of traffic over Aztec, Tarantula, Sutro and Acari ditches. The timber bridges range from 41 feet to 60 feet in length and are approximately 24 feet and 8 inches wide from curb-to-curb. Currently, load restrictions posted on the four bridges limit the vehicular load-carrying capacity below normal standards.

The bridges are listed in the federal Eligible Bridge List (EBL) as "Structurally Deficient (SD)" with a low Sufficiency Rating (SR) between 39.3 and 49.2. A sufficiency rating is essentially an overall rating of a bridge's fitness for the duty that it performs. The rating is based on a bridge's structural evaluation, functional/geometric obsolescence, and its essentiality to the public. A low sufficiency rating may be due to structural defects, narrow lanes, low vertical clearance, or any of many possible issues. A bridge is healthy when its SR is more than 80.0. Bridges with SR equal to or less than 80.0 and more than 50.0 require

rehabilitation or widening. When the SR falls below 50.0, bridge replacement shall be considered for public safety.

The proposed project will replace the existing 2-lane timber bridges with new 2-lane modern bridges with a curb-to-curb roadway width of 32 feet at the same locations. The proposed road width would consist of two 12-foot-wide travel lanes, one lane in each direction, and a 4-foot-wide shoulder on each side. Modern traffic barriers/railings meeting current CALTRANS safety design standards would be constructed. The proposed bridges would be approximately 60 to 80 feet long depending on the channel hydraulic capacity and water surface freeboard requirements. Raising the elevation of the bridges is not anticipated. However, if raising the bridge elevation is found to be necessary to meet freeboard requirements, the total vertical increase is not anticipated to exceed one foot. Additionally, approach roadway improvements would be provided, and channel improvements would be administered to avoid future scour problems. It is envisioned that the channel bottom will remain earthen.

The existing bridges do not carry any utilities and the proposed bridge construction is not expected to include new utilities. A telephone line runs along the north side of the project area and may be near bridge wing walls. Further coordination with the utility provider will determine whether relocation will be required.

All construction activities would be conducted within the existing roadway right of way with construction staging and material laydown areas on the roadway itself. Chuckwalla Valley Road between the Corn Springs Road intersection to 6.3 miles east of the intersection would be closed during construction. The construction duration will be further determined during the project development. It is envisioned that all four bridges will be either constructed at the same time or staged in sequence depending on the finding of available access to adjacent utilities and properties. A Traffic Management Plan (TMP) would be prepared to address closure of the road and access to local utilities and properties.

III. FLOODPLAIN ENCROACHMENT

The FEMA definition of **encroachment** states that "construction, placement of fill, or similar alteration of topography in the floodplain that reduces the area available to convey floodways." The Federal Highway Administration (FHWA) defines it as "an action within the limits of the base floodplain". From review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06065C2475G, it is indicated that the bridges along Chuckwalla Valley Road are in an area has not been formally mapped by FEMA and the area has been designated as Zone "D" (see Exhibit D), which means that the area may have flood hazards that have yet to be determined, therefore the four bridges **do not encroach** into any defined floodplains or floodways.

IV. REFERENCES

1. Federal Emergency Management Agency (FEMA) Map Services

EXHIBITS

EXHIBIT “A”: REGIONAL LOCATION MAP

EXHIBIT "A" - REGIONAL LOCATION MAP

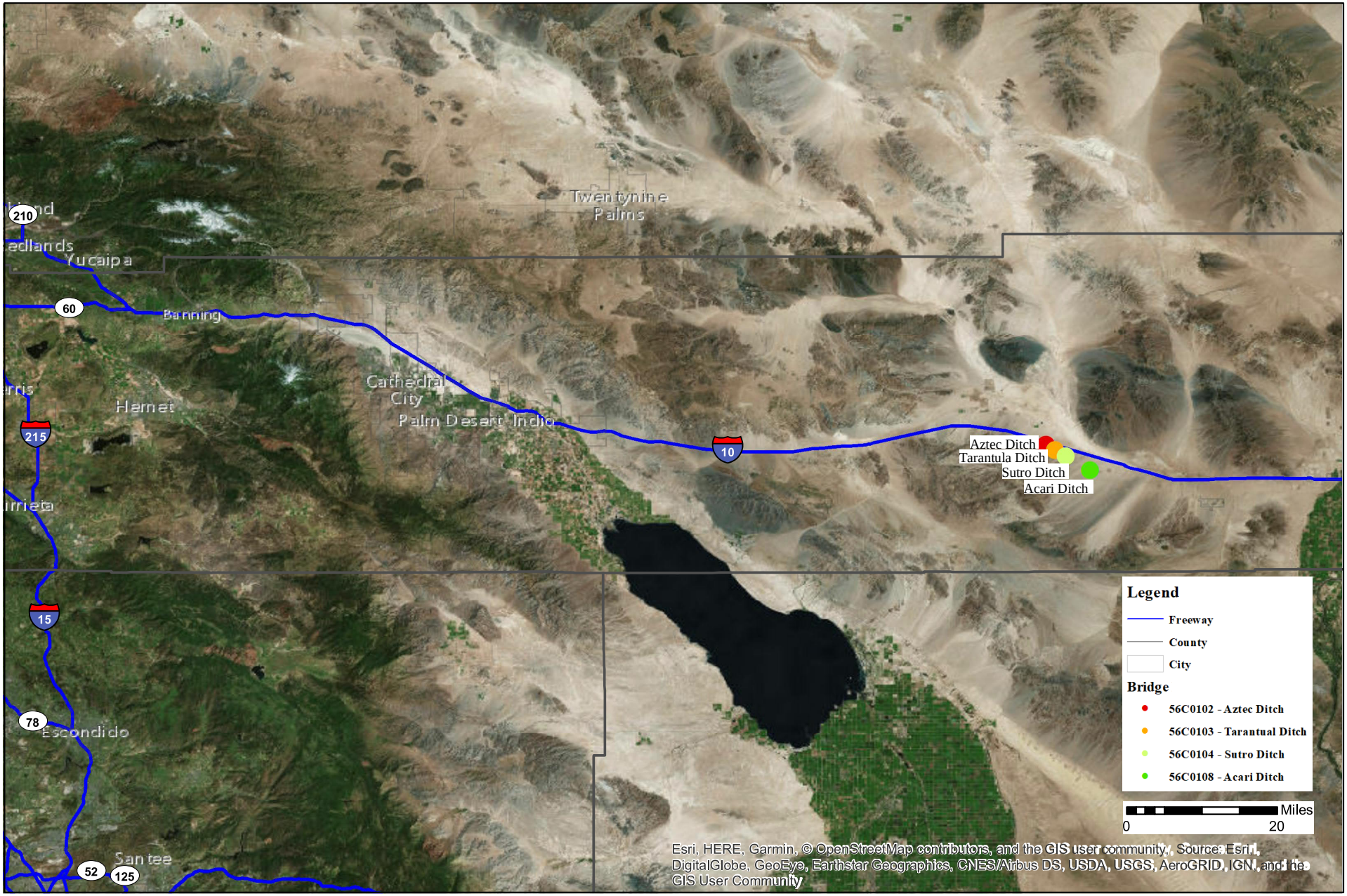


EXHIBIT “B”: PROJECT LOCATION MAP

EXHIBIT "B" - PROJECT LOCATION MAP

EXHIBIT "C": BRIDGE GENERAL PLANS AND BRIDGE GEOMETRIC APPROVAL DRAWINGS FOR THE PROPOSED CHUCKWALLA VALLEY ROAD BRIDGES

COUNTY OF RIVERSIDE

DEPARTMENT OF TRANSPORTATION

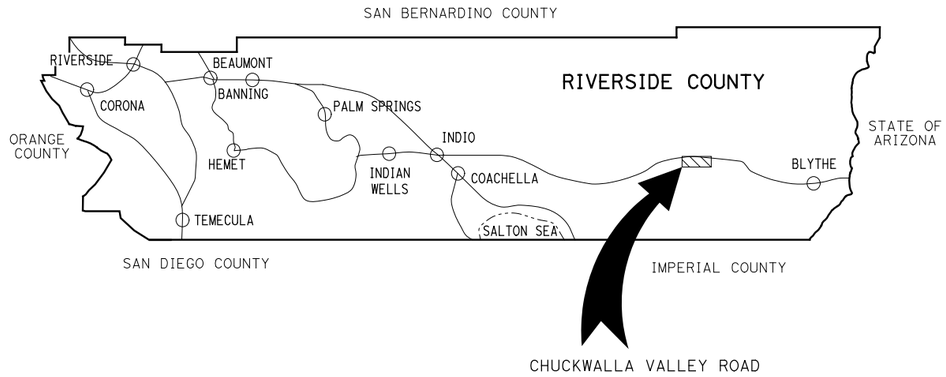
PROJECT PLANS FOR CONSTRUCTION ON

REPLACEMENT OF FOUR TIMBER BRIDGES ON CHUCKWALLA VALLEY ROAD

(BRIDGE NOS. 56C0102, 56C0103, 56C0104, 56C0108)

TO BE SUPPLEMENTED BY CALTRANS STANDARD PLANS DATED 2010 AND
COUNTY OF RIVERSIDE ROAD IMPROVEMENT STANDARDS DATED 12-20-2007

INDEX OF SHEETS



30% CONCEPTUAL DESIGN

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Steve Hosford, No. C 042280, Exp. 03/31/20, CIVIL, REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA PROJECT ENGINEER DATE 11870 PIERCE ST., Ste 265 RIVERSIDE, CA 92505	REPLACEMENT OF FOUR TIMBER BRIDGES ON CHUCKWALLA VALLEY ROAD **TITLE SHEET**	**T-1** SHEET 1 OF 6

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REVISED 05/01/2013

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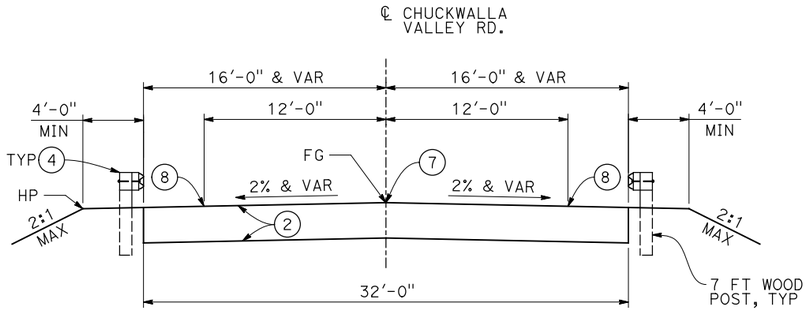
WO 45-19190102

COUNTY FILE No.



TYPICAL SECTION CHUCKWALLA VALLEY ROAD

STA 535+00 TO STA 538+75
STA 602+00 TO STA 605+25
STA 677+50 TO STA 681+50
STA 851+25 TO STA 854+50

CONSTRUCTION NOTES:

- [P] PROTECT IN PLACE
- [R] RELOCATE
- [A] ADJUST TO GRADE BY OTHERS
- (1) REMOVE PER PLAN
- (2) LIMITS OF PAVEMENT RECONSTRUCTION
- (3) HEADER CUT EXISTING ASPHALT
- (4) CONSTRUCT MIDWEST GUARDRAIL SYSTEM WITH TYPE WB-31 TRANSITION RAILING
- (5) CONSTRUCT FLARED TERMINAL SYSTEM END TREATMENT
- (6) INSTALL 1/4 TON RIP RAP
- (7) APPLY "NO PASSING" DOUBLE YELLOW TRAFFIC STRIPE PER CALTRANS 2018 STANDARD PLANS A20A, DETAIL 22
- (8) APPLY 6" WHITE RIGHT EDGE LINE TRAFFIC STRIPE PER CALTRANS 2018 STANDARD PLANS A20B, DETAIL 27B
- (9) INSTALL TYPE P OBJECT MARKER (TYPE 3) 2018 STANDARD PLANS A73B (OM-3L OR OM-3R PER PLAN)

30% CONCEPTUAL DESIGN

CNS ENGINEERS, INC	TYPICAL SECTION AND DETAILS	SHEET No.
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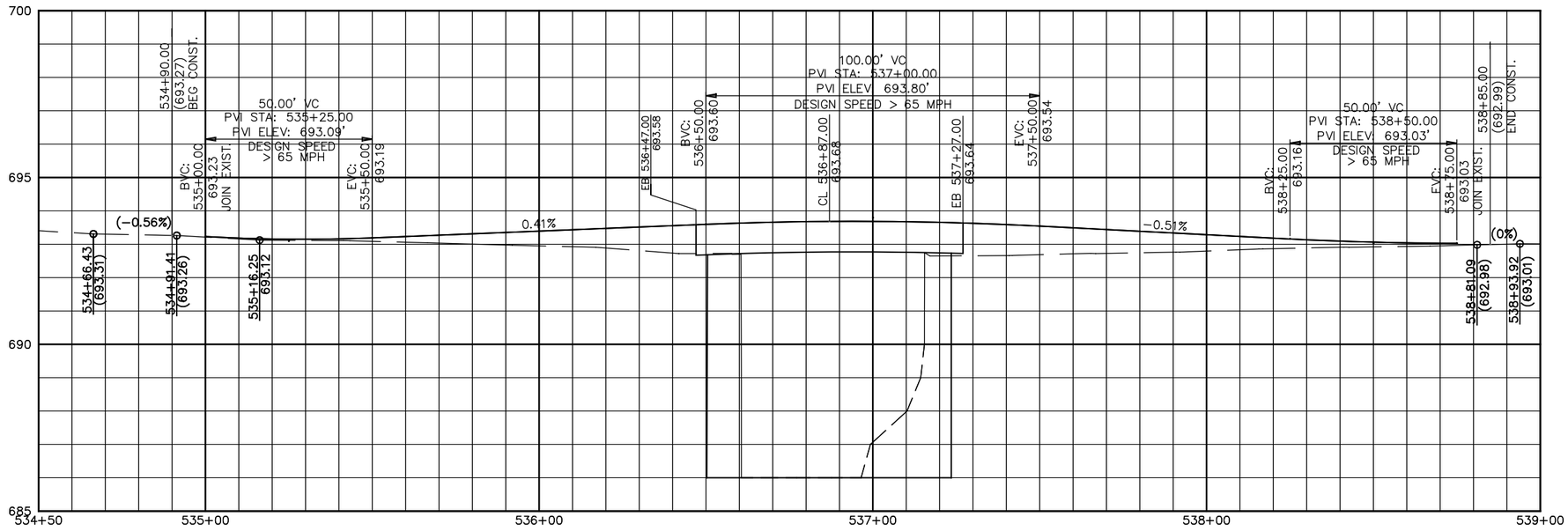

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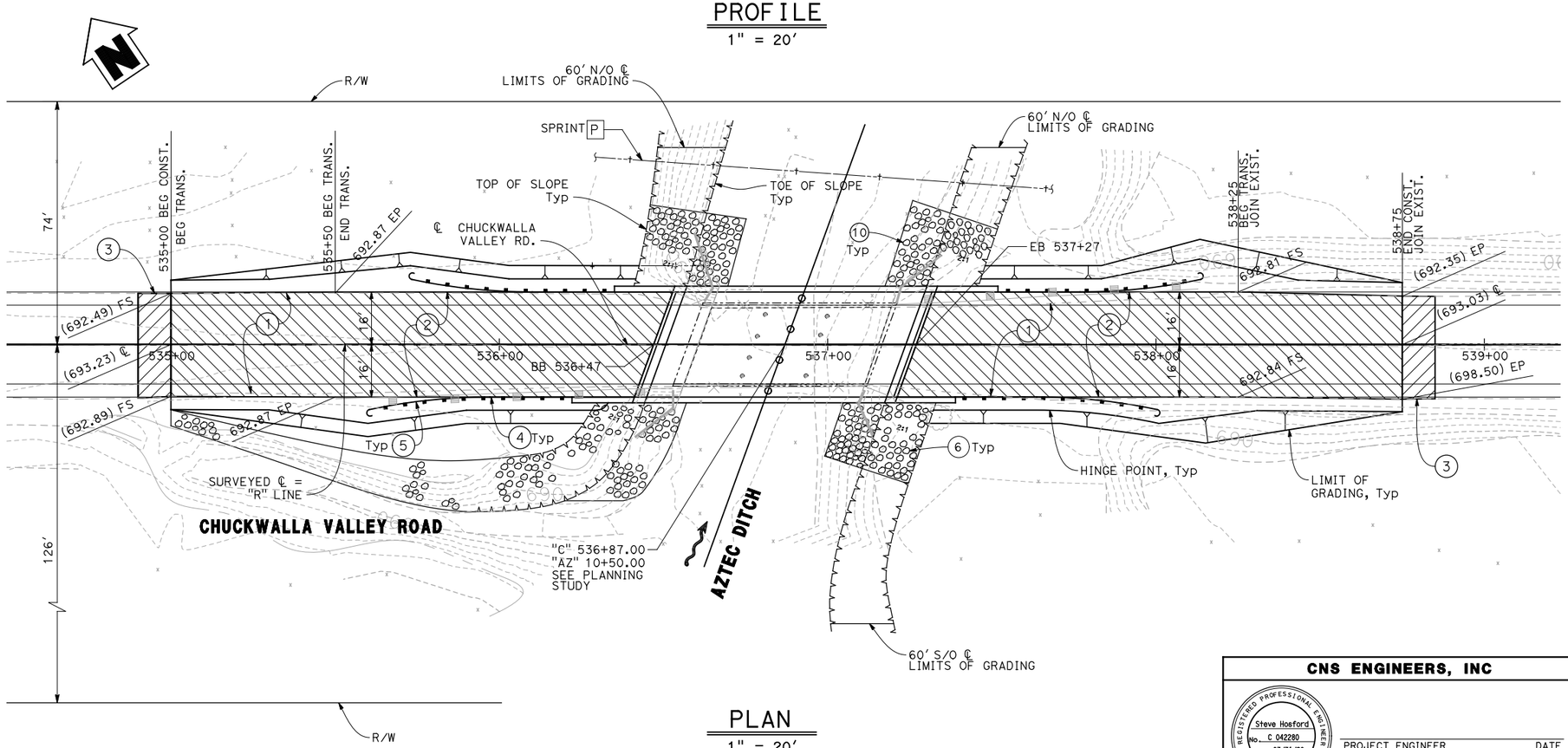

PLAN
1" = 20'

CONSTRUCTION NOTES:

- [P] PROTECT IN PLACE
- (1) REMOVE PER PLAN
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LEGEND:

- LIMITS OF PAVEMENT REMOVAL AND RECONSTRUCTION
- INSTALL RIP RAP
- HEADER CUT

30% CONCEPTUAL DESIGN

CNS ENGINEERS, INC	PLAN AND PROFILE	SHEET No.
Steve Hosford, No. C 042280, Exp. 03/31/20, CIVIL, REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA PROJECT ENGINEER DATE 11870 PIERCE ST., Ste 265 RIVERSIDE, CA 92505	CHUCKWALLA VALLEY RD BRIDGE OVER AZTEC DITCH BR. NO. 56C0102, FPN BRLO-5956(239)	L-1 SHEET 3 OF 6

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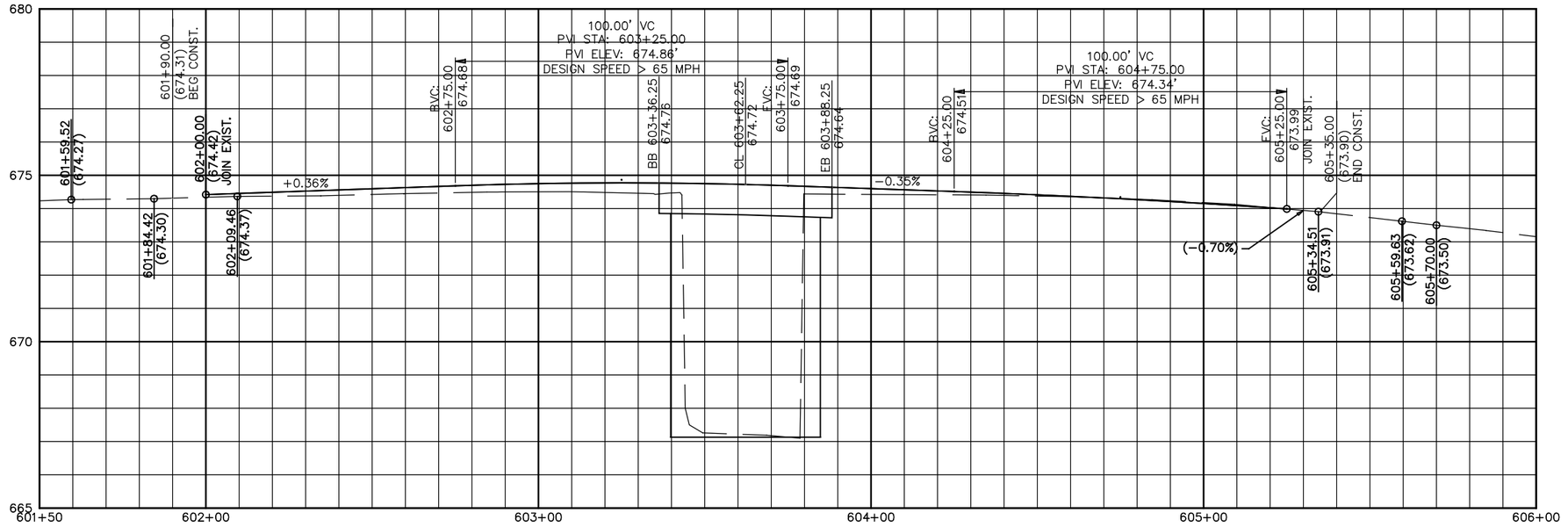

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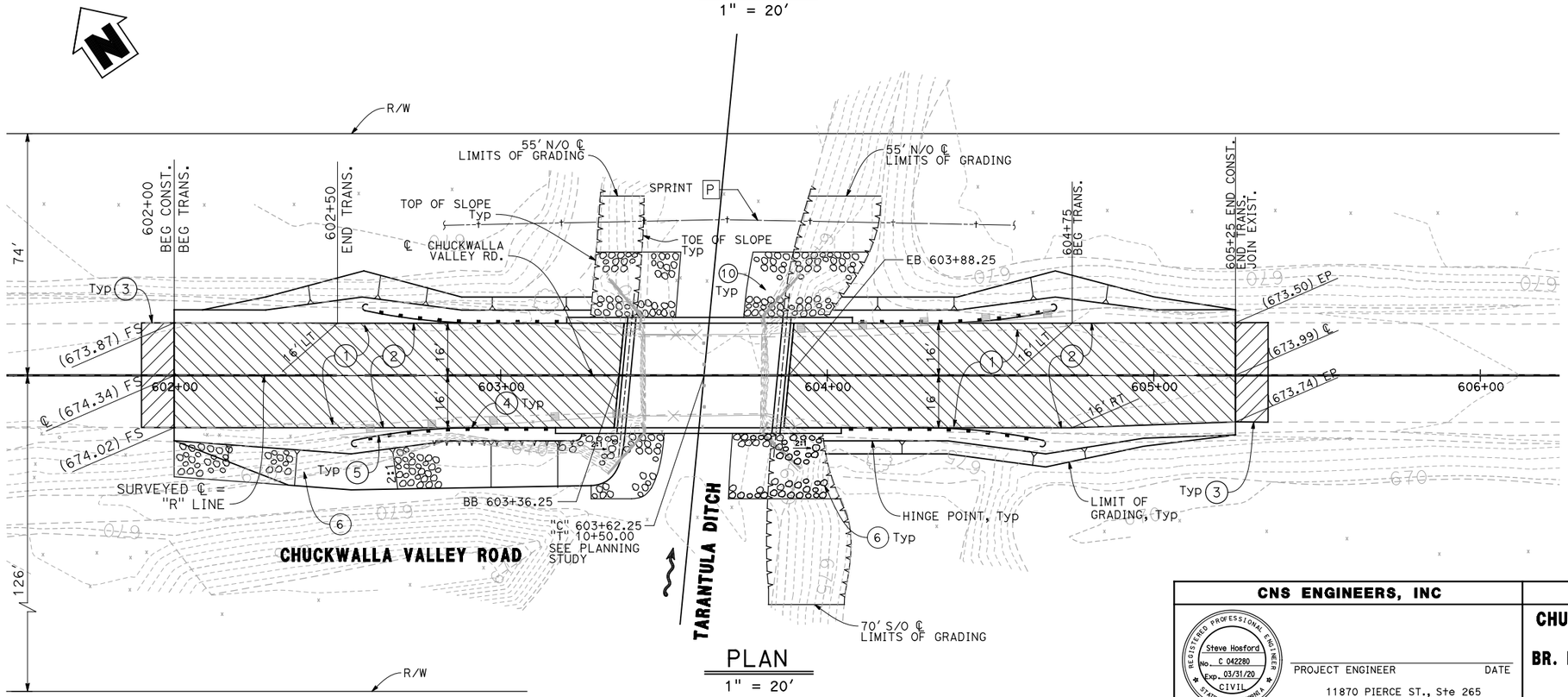

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CNS ENGINEERS, INC		SHEET No.
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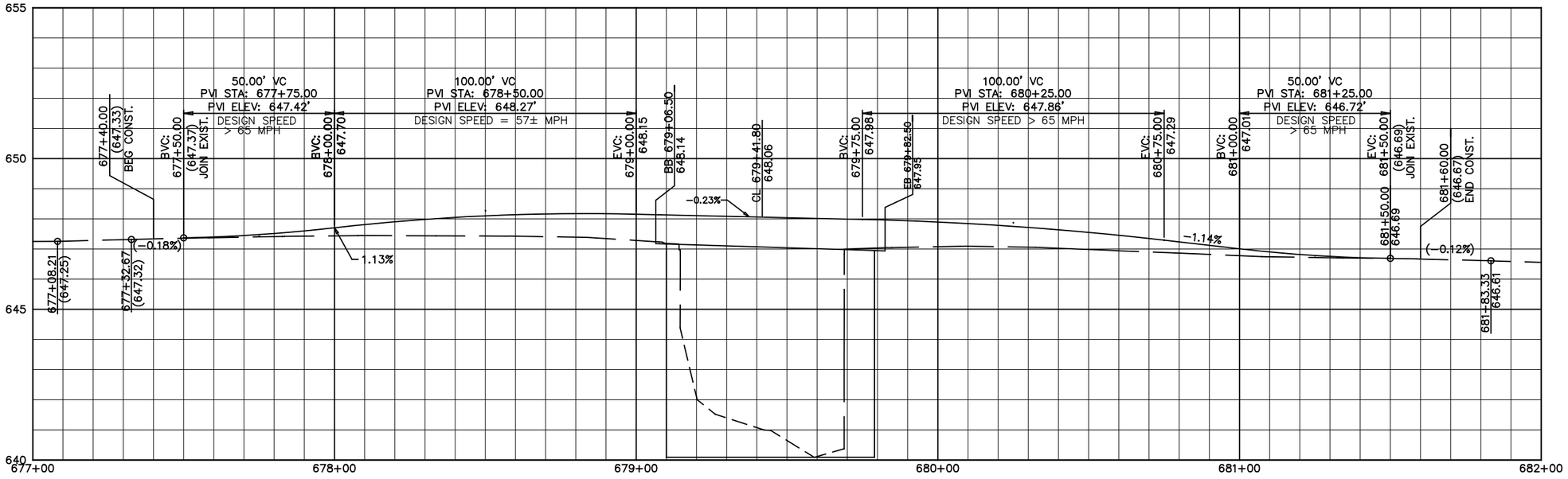

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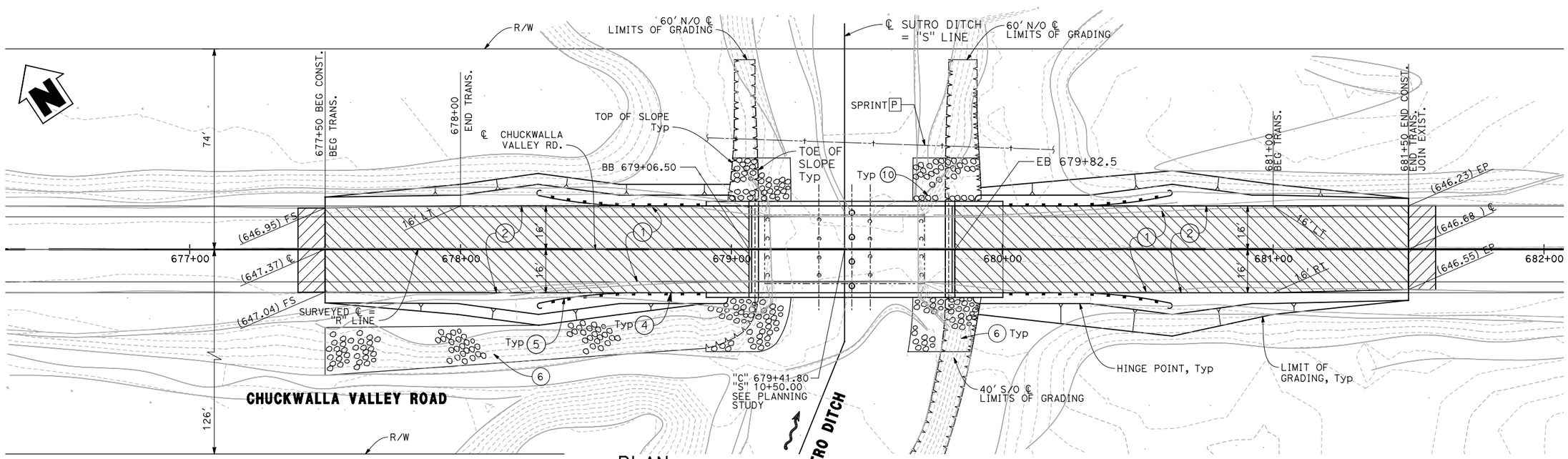

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30% CONCEPTUAL DESIGN

CNS ENGINEERS, INC

REGISTERED PROFESSIONAL ENGINEER
Steve Hosford
No. C 042280
Exp. 03/31/20
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

11870 PIERCE ST., Ste 265
RIVERSIDE, CA 92505

CHUCKWALLA VALLEY RD BRIDGE OVER SUTRO DITCH BR. NO. 56C0104, FPN BRLO-5956(226)

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L-3

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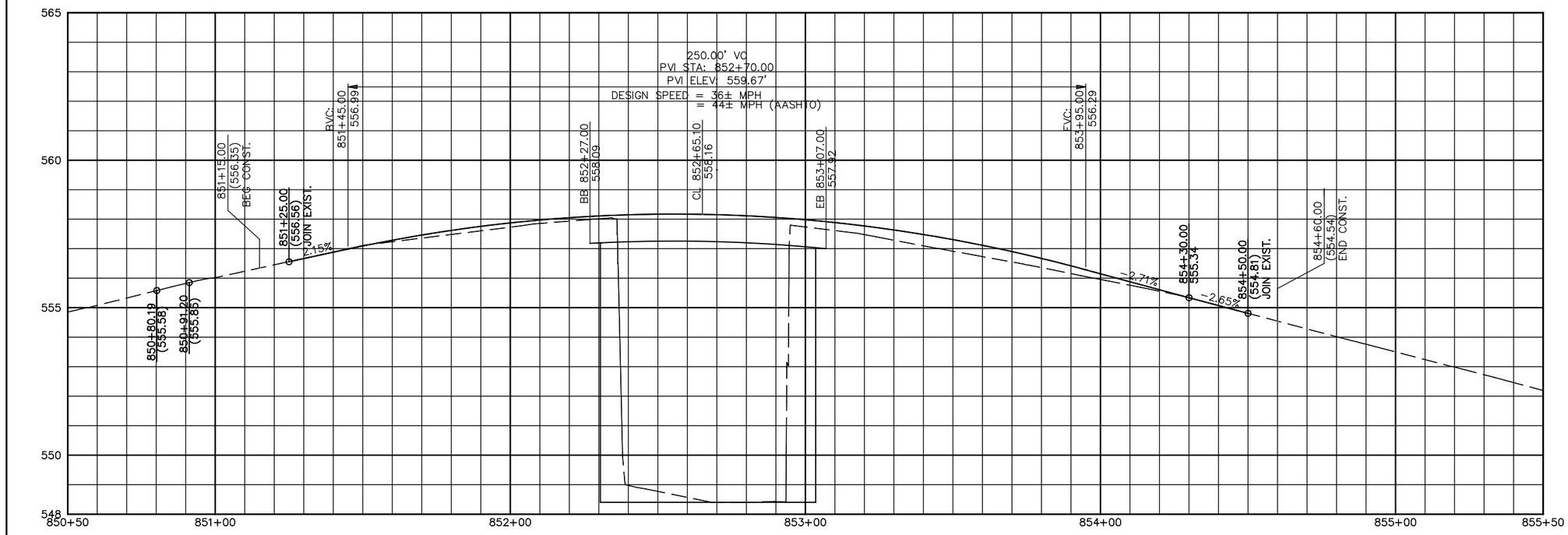

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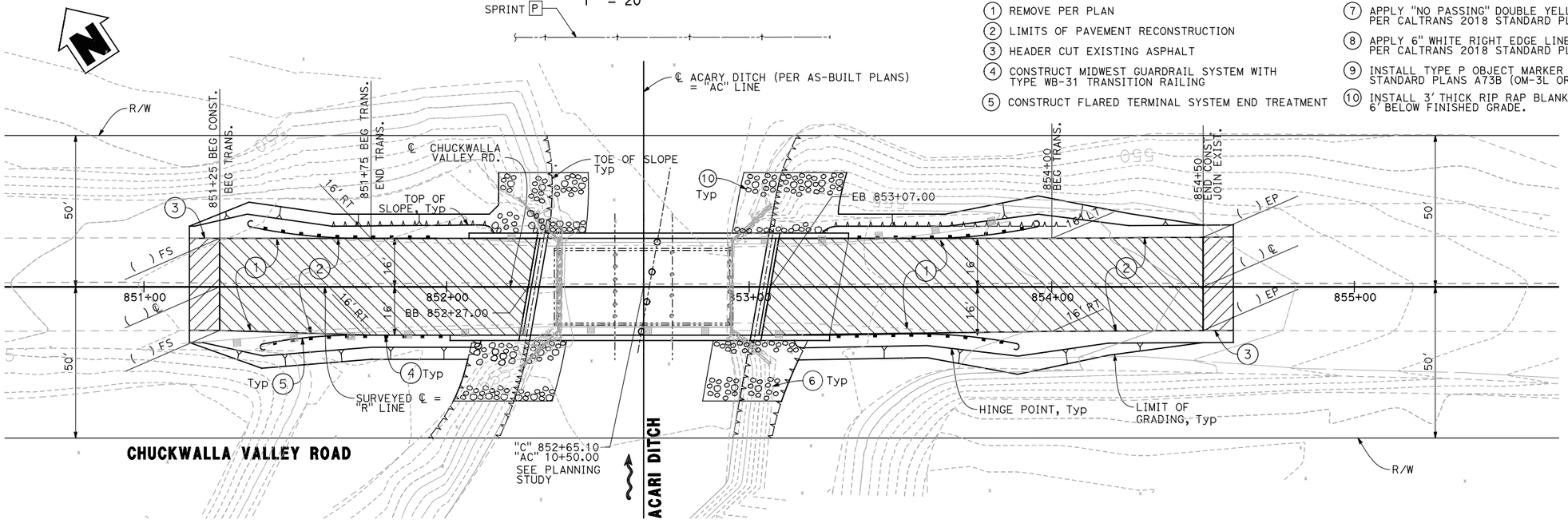

PLAN

1" = 20'

CONSTRUCTION NOTES:

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- HEADER CUT

30% CONCEPTUAL DESIGN

CNS ENGINEERS, INC

REGISTERED PROFESSIONAL ENGINEER
Steve Hosford
No. C 042280
Exp. 03/31/20
CIVIL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

11870 PIERCE ST., Ste 265
RIVERSIDE, CA 92505

CHUCKWALLA VALLEY RD BRIDGE OVER ACARI DITCH
BR. NO. 56C0108, FPN BRLO-5956(225)

SHEET No.

L-4

SHEET 6 OF 6

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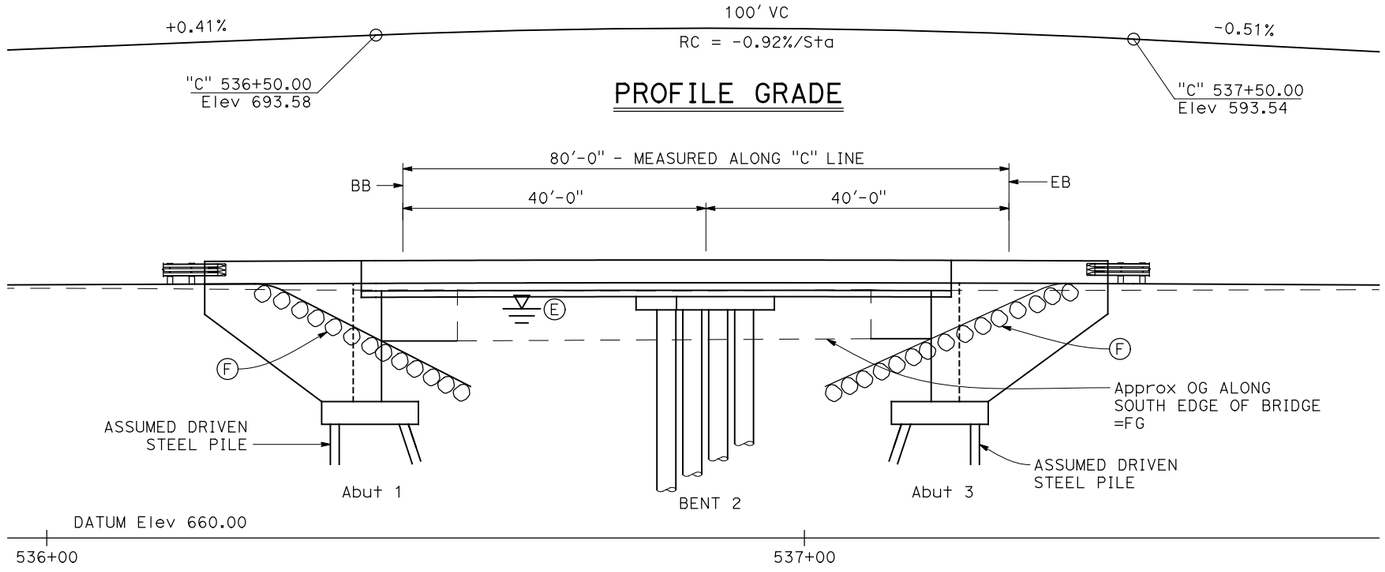
WO 45-19190102

COUNTY
FILE No.

PREPARED FOR THE COUNTY OF RIVERSIDE - DEPARTMENT OF TRANSPORTATION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
8	RIV	RR AVE	

CNS ENGINEERS, INC.
11870 PIERCE ST, STE 265
RIVERSIDE, CA 92505



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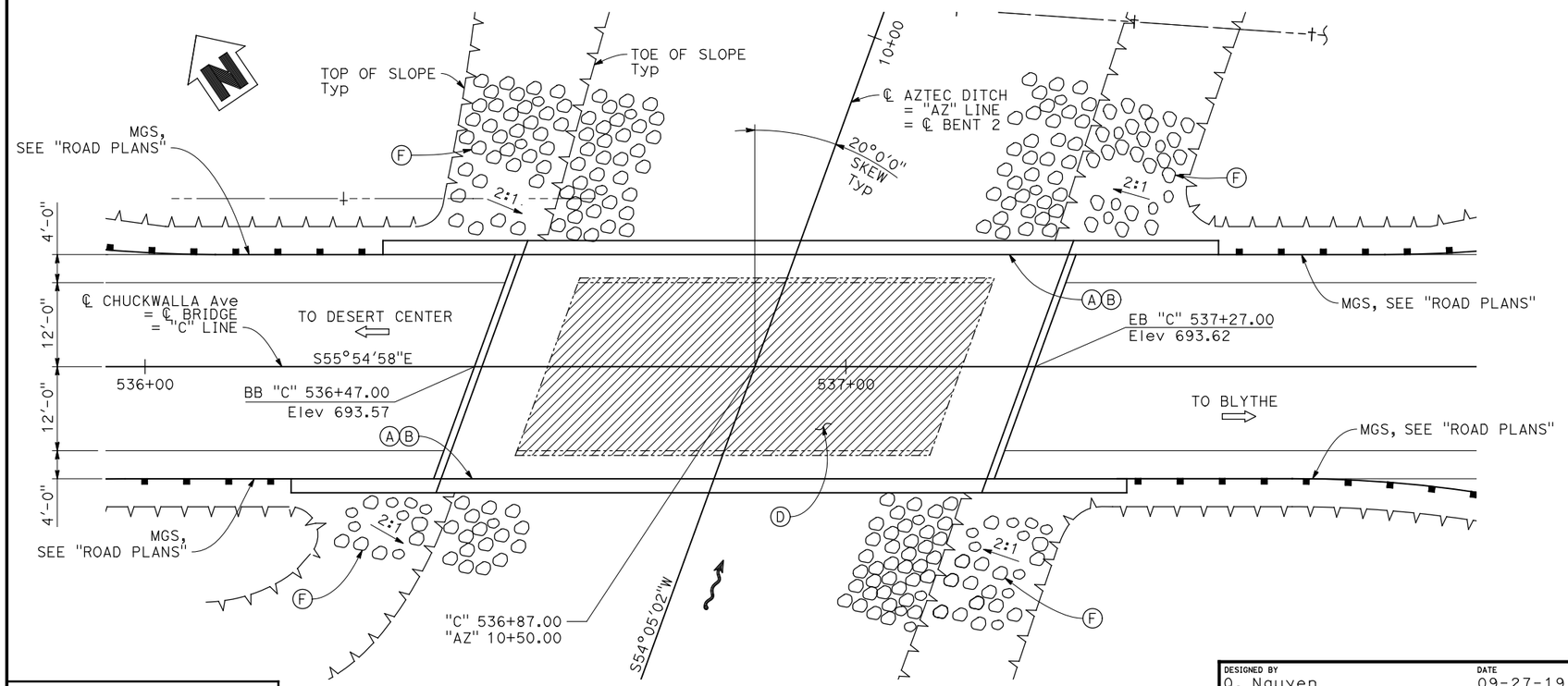

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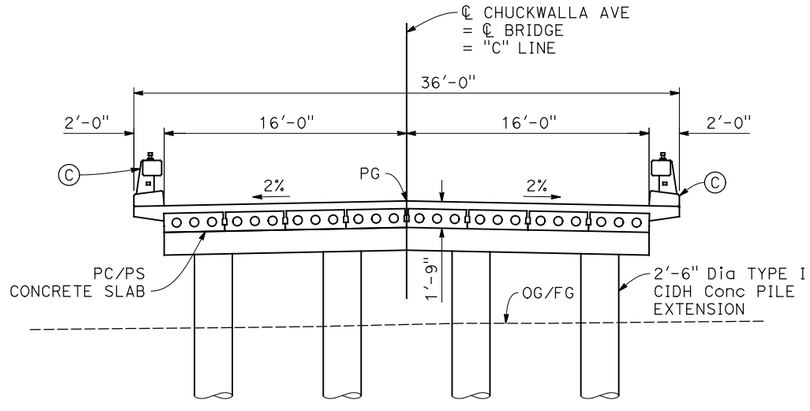

TYPICAL SECTION
1" = 5'

LEGEND:

- Existing Structure
- New Construction
- Bridge removal
- Direction of flow
- Direction of traffic

KEY NOTES:

- (A) Paint "Bridge No. XX-XXXX"
- (B) Paint "Aztec Ditch Bridge"
- (C) Concrete Barrier Type 85 (Mod) with architectural treatment
- (D) Remove Existing Bridge (Bridge No. 56C0102)
- (E) Water surface elevation, see "FOUNDATION PLAN"
- (F) Rock slope protection, see "ROAD PLANS"

NOTE:

Traffic will be routed around construction site

Date of estimate		09/27/2019
Str Depth	=	1'-9"
Length	=	80'-0"
Width	=	36'-0"
Area	=	2,880 sqft
Avg Cost per Sq Ft Including 10% Mobilization & 25% Contingency	=	TBD
Total Cost	=	TBD

X
DESIGN OVERSIGHT

X
SIGN OFF DATE

DESIGNED BY Q. Nguyen	DATE 09-27-19
DRAWN BY N. Li	DATE 09-27-19
CHECKED BY J. Nguyen	DATE 09-27-19
APPROVED J. Lu	DATE 09-27-19

Quyet Nguyen
PROJECT ENGINEER

PLANNING STUDY

AZTEC DITCH BRIDGE (REPLACE)

UNIT: X	BRIDGE No.: X
CONTRACT No.: X	PROJECT No. & PHASE: X

DATE PLOTTED => 9/30/2019 TIME PLOTTED => 8:34:20 AM
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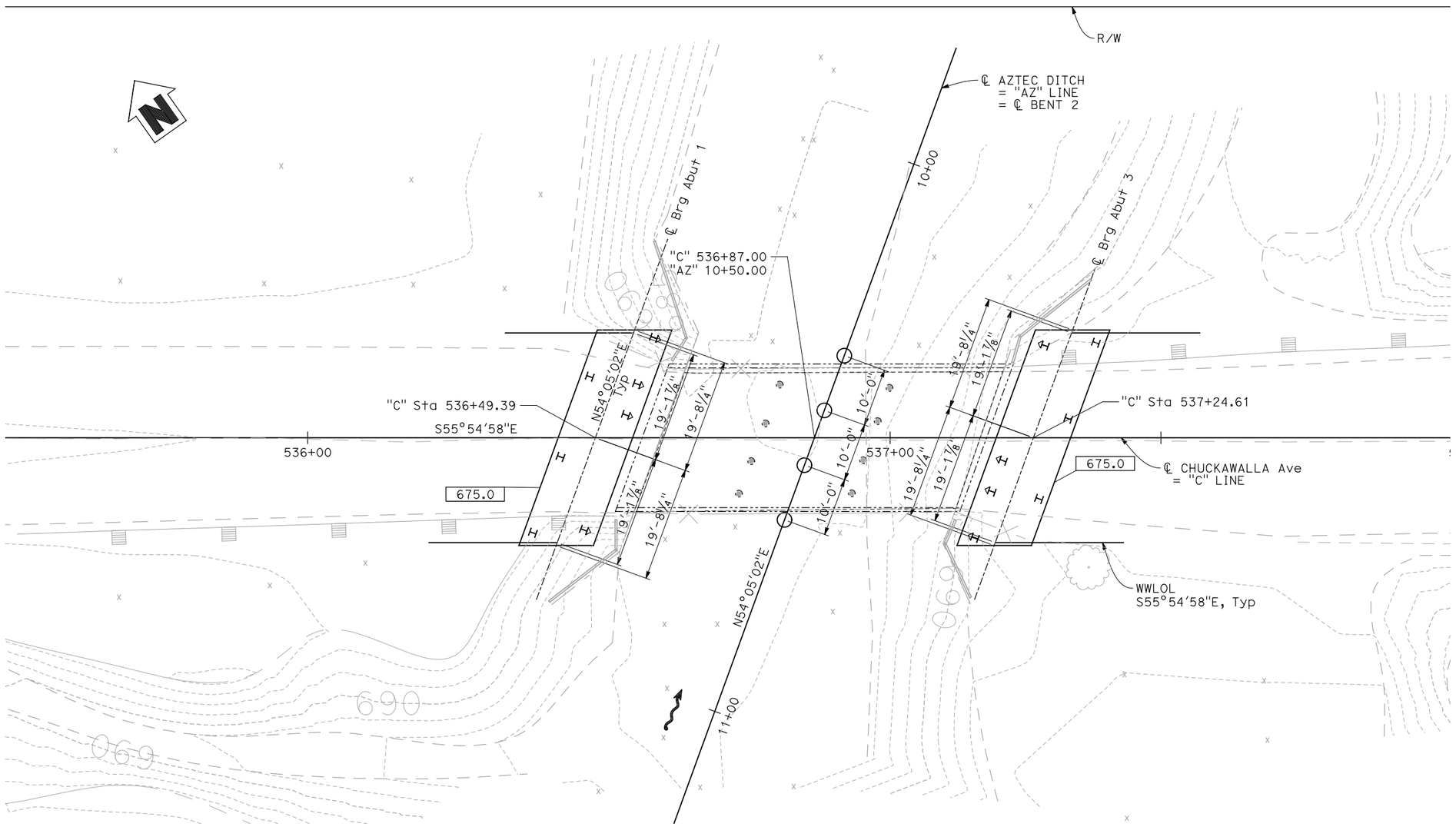
PREPARED FOR THE COUNTY OF RIVERSIDE - DEPARTMENT OF TRANSPORTATION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
8	RIV	RR AVE	

CNS ENGINEERS, INC.
11870 PIERCE ST, STE 265
RIVERSIDE, CA 92505



LEGEND:

- Existing Structure
- New Construction
- Direction of Flow
- XXXX.X — Bottom of Footing Elevation
- Plumb Pile
- 3:1 Battered Pile
- 30" Dia CIDH Conc PILE

NOTE:

1. Not all piles shown.

HYDROLOGIC SUMMARY

DRAINAGE AREA: X.XXX ACRES

	DESIGN FLOOD
FREQUENCY (YEARS)	100
DISCHARGE (CUBIC FEET PER SECOND)	XXXX
WATER SURFACE (ELEVATION AT BRIDGE)	XXXX

FLOOD PLAIN DATA ARE BASED UPON INFORMATION AVAILABLE WHEN THE PLANS WERE PREPARED AND ARE SHOWN TO MEET FEDERAL REQUIREMENTS. THE ACCURACY OF SAID INFORMATION IS NOT WARRANTED BY THE STATE AND INTERESTED OR AFFECTED PARTIES SHOULD MAKE THEIR OWN INVESTIGATION.

X
DESIGN OVERSIGHT

X
SIGN OFF DATE

ADVANCE PLANNING STUDY SHEET
(ENGLISH) (REVISION 4/19/2018)

DATE PLOTTED => 9/30/2019 TIME PLOTTED => 8:34:26 AM
FILE => RR and Chuckwalla Avenue Bridge.dgn USERNAME => QuyetNguyen

DESIGNED BY Q. Nguyen	DATE 09-27-19	
DRAWN BY N. Li	DATE 09-27-19	Quyet Nguyen
CHECKED BY J. Nguyen	DATE 09-27-19	PROJECT ENGINEER
APPROVED J. Lu	DATE 09-27-19	

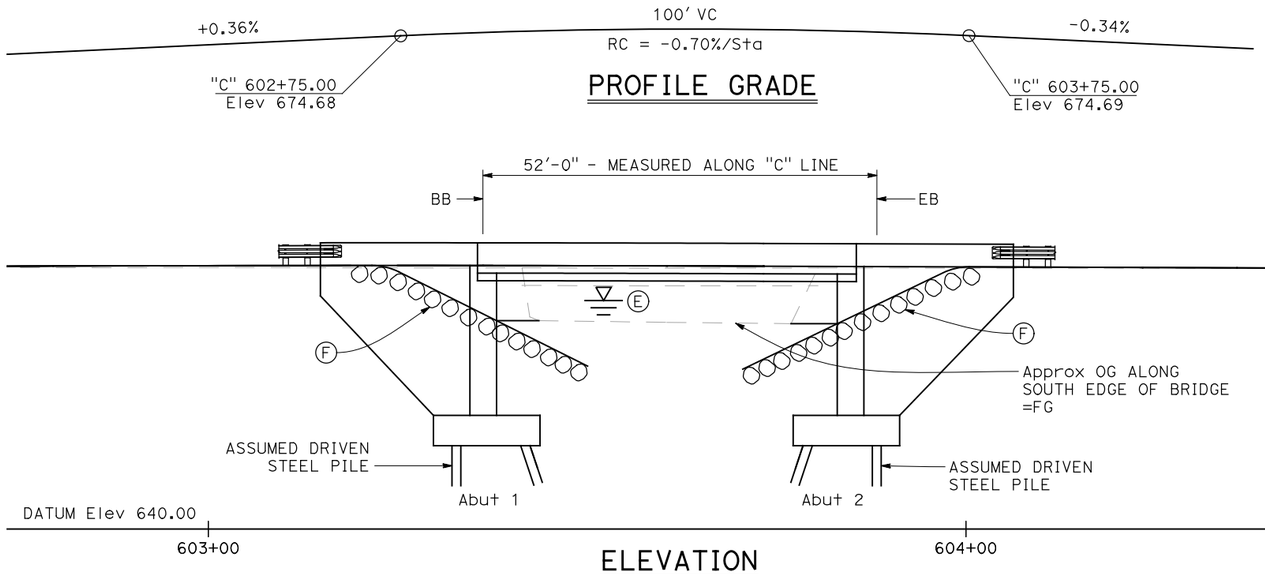
FOUNDATION PLAN
PLANNING STUDY
AZTEC DITCH BRIDGE (REPLACE)

UNIT: X	BRIDGE No.: X
CONTRACT No.: X	PROJECT No. & PHASE: X

PREPARED FOR THE COUNTY OF RIVERSIDE - DEPARTMENT OF TRANSPORTATION

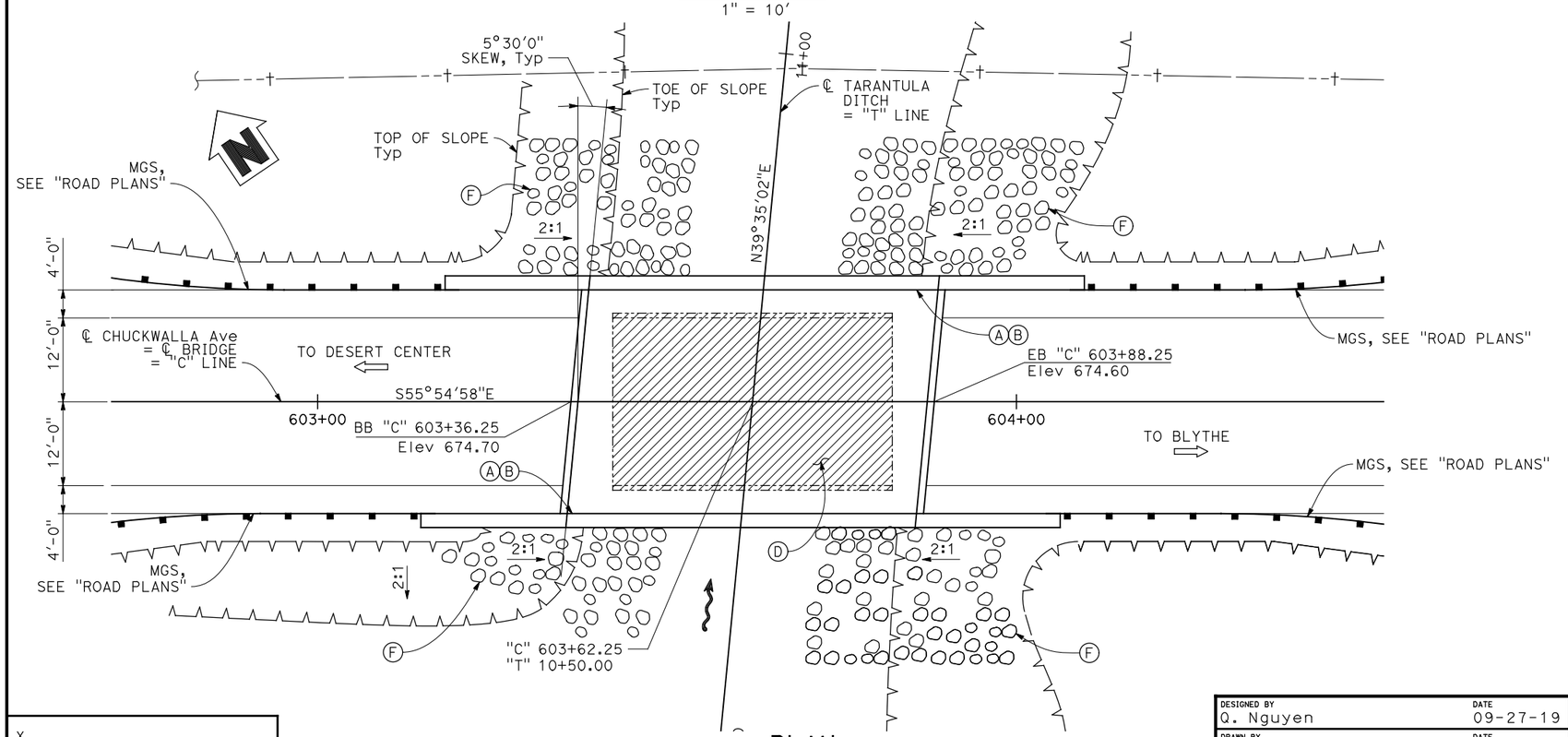
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
8	RIV	RR AVE	

CNS ENGINEERS, INC.
11870 PIERCE ST, STE 265
RIVERSIDE, CA 92505



PROFILE GRADE

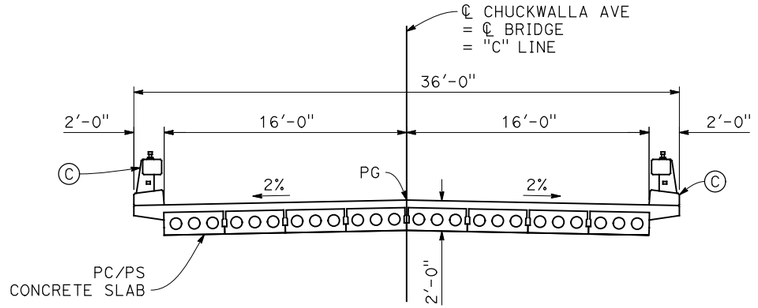
ELEVATION
1" = 10'



PLAN
1" = 10'

LEGEND:

- Existing Structure
- New Construction
- Bridge removal
- Direction of flow
- Direction of traffic



TYPICAL SECTION
1" = 5'

KEY NOTES:

- (A) Paint "Bridge No. XX-XXXX"
- (B) Paint "Tarantula Ditch Bridge"
- (C) Concrete Barrier Type 85 (Mod) with architectural treatment
- (D) Remove Existing Bridge (Bridge No. 56C0103)
- (E) Water surface elevation, see "FOUNDATION PLAN"
- (F) Rock slope protection, see "ROAD PLANS"

NOTE:

Traffic will be routed around construction site

Date of estimate		09/27/2019
Str Depth	=	2'-0"
Length	=	52'-0"
Width	=	36'
Area	=	1,872 sqft
Avg Cost per Sq Ft Including 10% Mobilization & 25% Contingency	=	TBD
Total Cost	=	TBD

X
DESIGN OVERSIGHT

X
SIGN OFF DATE

ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 4/19/2018)

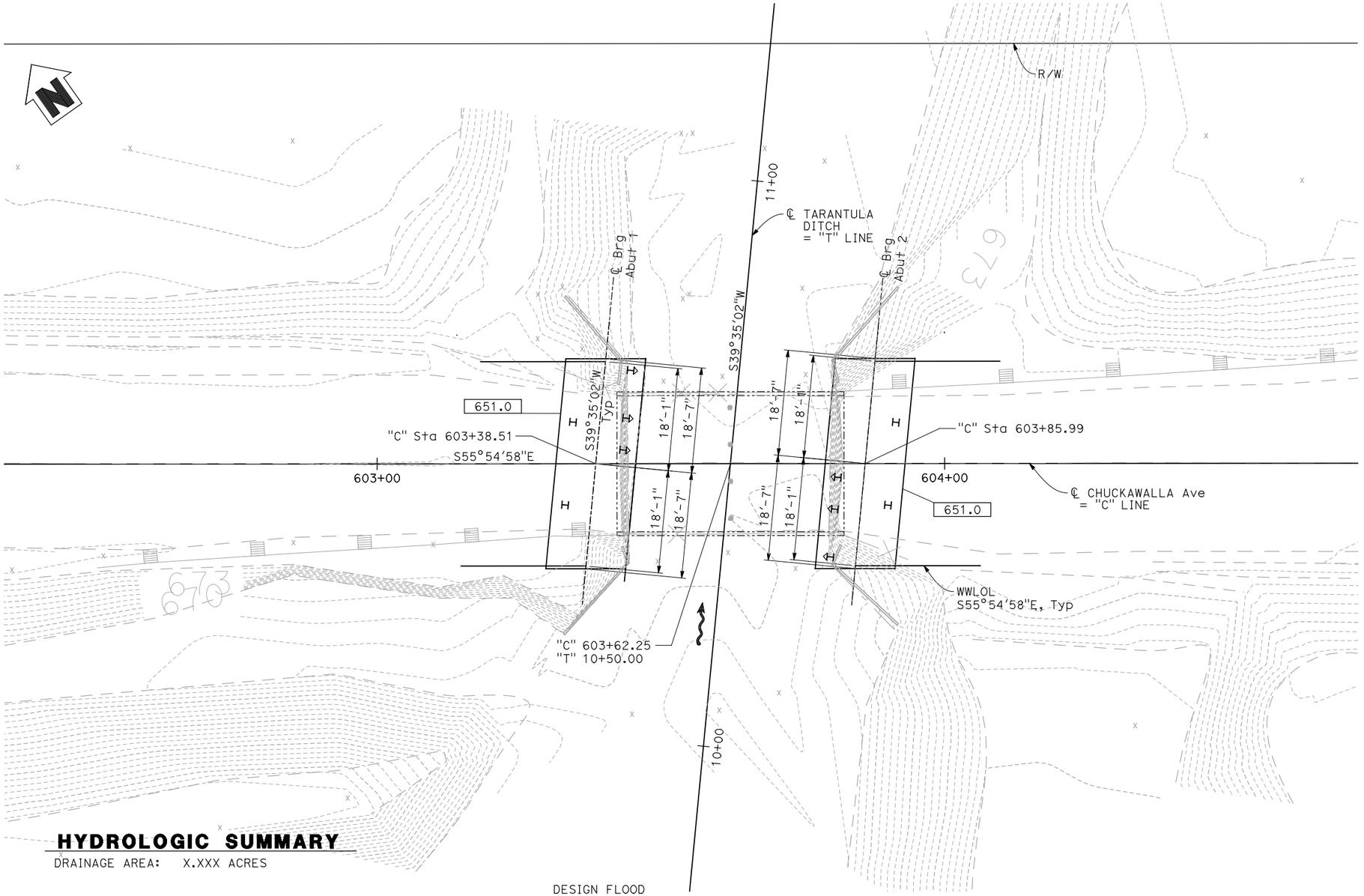
DATE PLOTTED => 9/30/2019 TIME PLOTTED => 8:34:33 AM
FILE => RR and Chuckwalla Avenue Bridge.dgn USER NAME => QuyetNguyen

DESIGNED BY Q. Nguyen	DATE 09-27-19	Quyet Nguyen PROJECT ENGINEER	**PLANNING STUDY**
DRAWN BY N. Li	DATE 09-27-19		**TARANTULA DITCH BRIDGE (REPLACE)**
CHECKED BY J. Nguyen	DATE 09-27-19		UNIT: X / BRIDGE No.: X
APPROVED J. Lu	DATE 09-27-19		CONTRACT No.: X / PROJECT No. & PHASE: X

PREPARED FOR THE COUNTY OF RIVERSIDE - DEPARTMENT OF TRANSPORTATION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
8	RIV	RR AVE	

CNS ENGINEERS, INC.
11870 PIERCE ST, STE 265
RIVERSIDE, CA 92505



LEGEND:

- Existing Structure
- New Construction
- Direction of Flow
- XXXX.X Bottom of Footing Elevation
- Plumb Pile
- 3:1 Battered Pile

NOTE:

1. Not all piles shown.

HYDROLOGIC SUMMARY

DRAINAGE AREA: X.XXX ACRES

	DESIGN FLOOD
FREQUENCY (YEARS)	100
DISCHARGE (CUBIC FEET PER SECOND)	XXXX
WATER SURFACE (ELEVATION AT BRIDGE)	XXXX

FLOOD PLAIN DATA ARE BASED UPON INFORMATION AVAILABLE WHEN THE PLANS WERE PREPARED AND ARE SHOWN TO MEET FEDERAL REQUIREMENTS. THE ACCURACY OF SAID INFORMATION IS NOT WARRANTED BY THE STATE AND INTERESTED OR AFFECTED PARTIES SHOULD MAKE THEIR OWN INVESTIGATION.

X
DESIGN OVERSIGHT

X
SIGN OFF DATE

DESIGNED BY Q. Nguyen	DATE 09-27-19	Quyet Nguyen PROJECT ENGINEER
DRAWN BY N. Li	DATE 09-27-19	
CHECKED BY J. Nguyen	DATE 09-27-19	
APPROVED J. Lu	DATE 09-27-19	

FOUNDATION PLAN

PLANNING STUDY

TARANTULA DITCH BRIDGE (REPLACE)

UNIT: X	BRIDGE No.: X
CONTRACT No.: X	PROJECT No. & PHASE: X

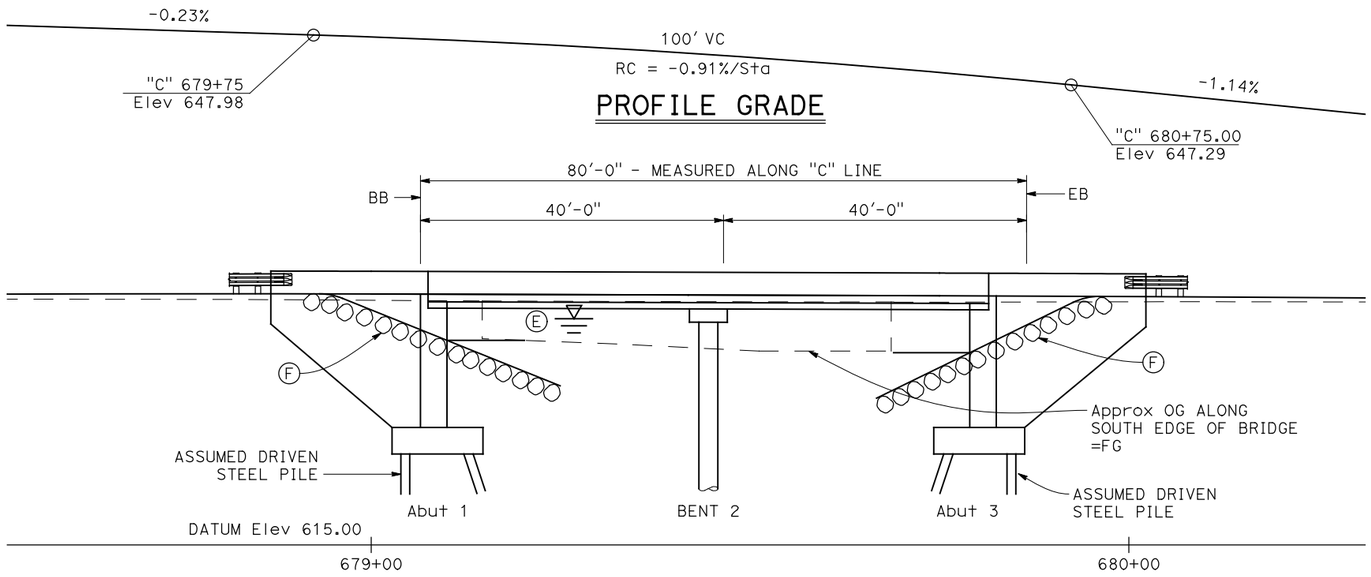
ADVANCE PLANNING STUDY SHEET
(ENGLISH) (REVISION 4/19/2018)

DATE PLOTTED => 9/30/2019 TIME PLOTTED => 8:34:41 AM
FILE => RR and Chuckwalla Avenue Bridge.dgn USER NAME => QuyetNguyen

PREPARED FOR THE COUNTY OF RIVERSIDE - DEPARTMENT OF TRANSPORTATION

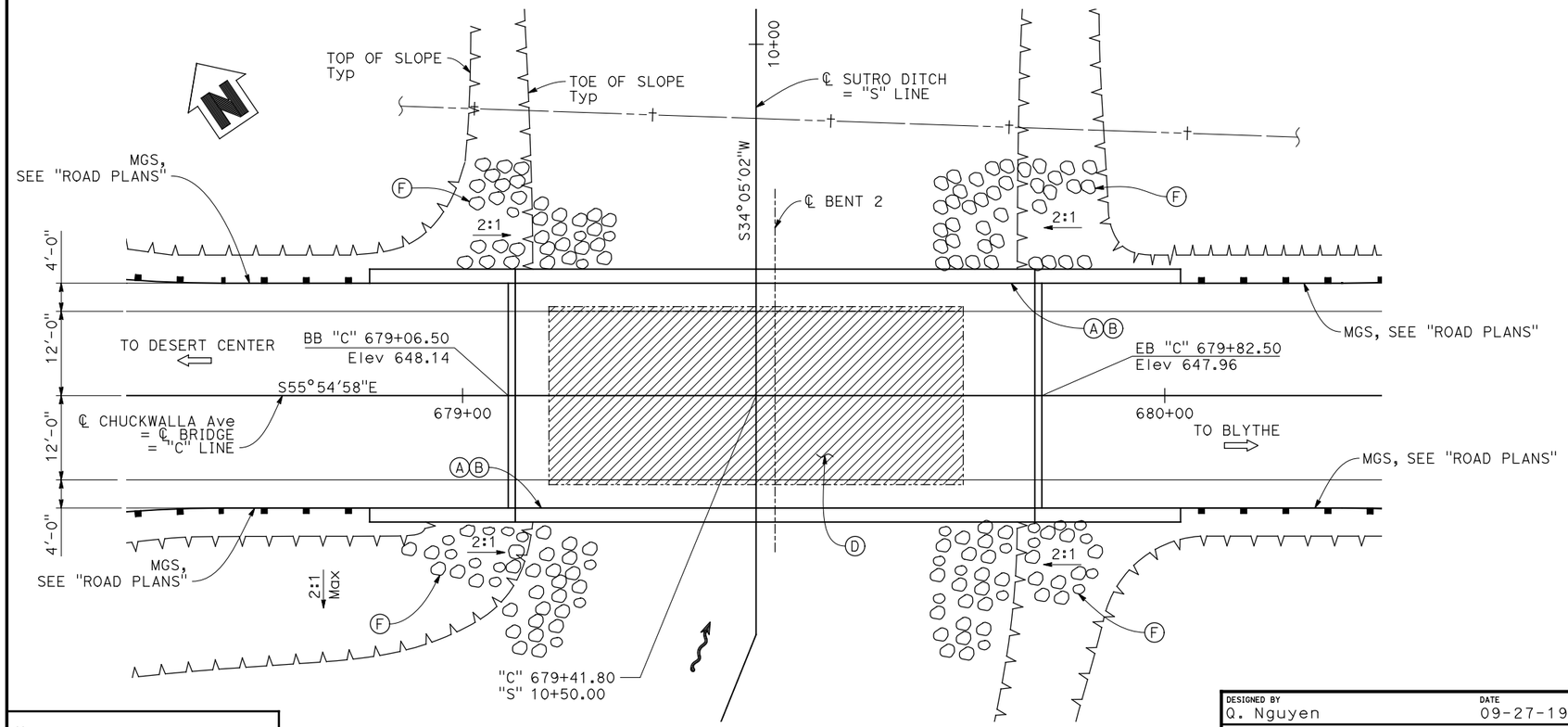
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
8	RIV	RR AVE	

CNS ENGINEERS, INC.
11870 PIERCE ST, STE 265
RIVERSIDE, CA 92505

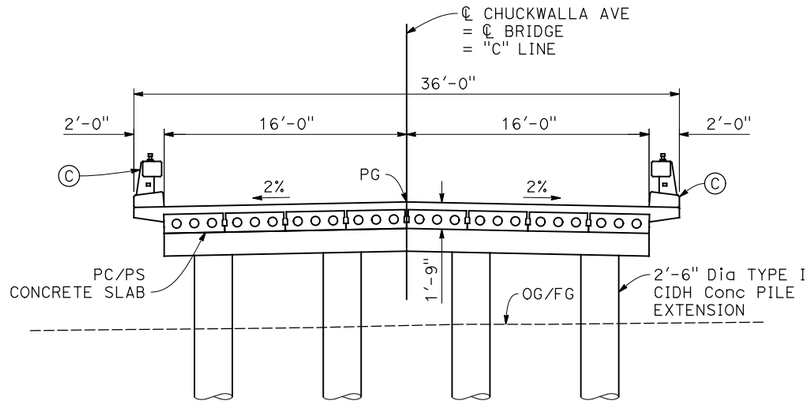


PROFILE GRADE

ELEVATION
1" = 10'



PLAN
1" = 10'



TYPICAL SECTION
1" = 5'

LEGEND:

- Existing Structure
- New Construction
- Bridge removal
- Direction of flow
- Direction of traffic

KEY NOTES:

- (A) Paint "Bridge No. XX-XXXX"
- (B) Paint "Sutro Ditch Bridge"
- (C) Concrete Barrier Type 85 (Mod) with architectural treatment
- (D) Remove Existing Bridge (Bridge No. 56C0104)
- (E) Water surface elevation, see "FOUNDATION PLAN"
- (F) Rock slope protection, see "ROAD PLANS"

NOTE:

Traffic will be routed around construction site

Date of estimate		09/27/2019
Str Depth	=	1'-9"
Length	=	80'-0"
Width	=	36'-0"
Area	=	2,880 sqft
Avg Cost per Sq Ft Including 10% Mobilization & 25% Contingency	=	TBD
Total Cost	=	TBD

X
DESIGN OVERSIGHT

X
SIGN OFF DATE

ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 4/19/2018)

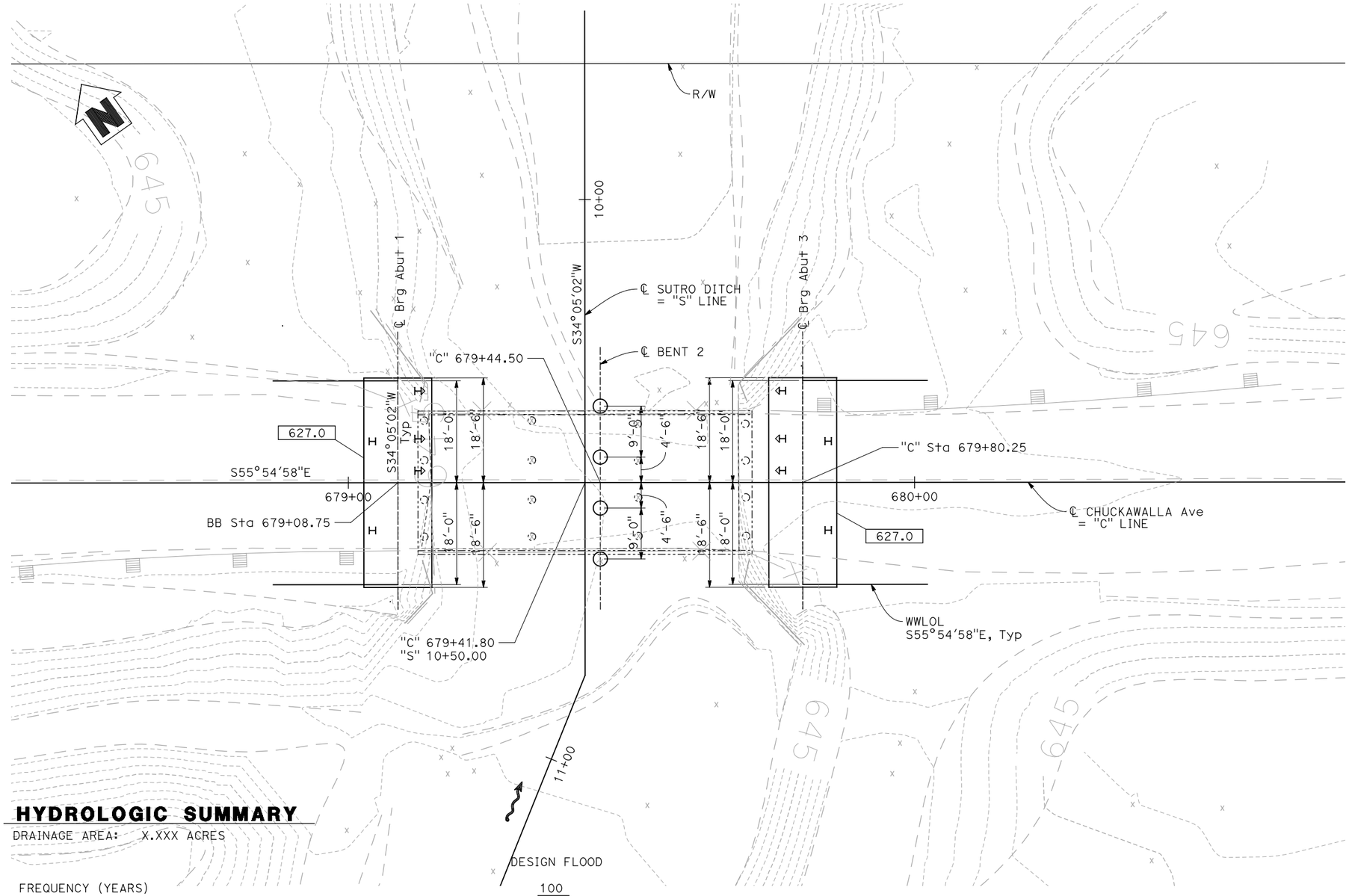
DATE PLOTTED => 9/30/2019 TIME PLOTTED => 8:34:49 AM
FILE => RR and Chuckwalla Avenue Bridge.dgn USERNAME => QuyetNguyen

DESIGNED BY Q. Nguyen	DATE 09-27-19	Quyet Nguyen PROJECT ENGINEER	PLANNING STUDY
DRAWN BY N. Li	DATE 09-27-19		SUTRO DITCH BRIDGE (REPLACE)
CHECKED BY J. Nguyen	DATE 09-27-19		UNIT: X / BRIDGE No.: X
APPROVED J. Lu	DATE 09-27-19		CONTRACT No.: X / PROJECT No. & PHASE: X

PREPARED FOR THE COUNTY OF RIVERSIDE - DEPARTMENT OF TRANSPORTATION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
8	RIV	RR AVE	

CNS ENGINEERS, INC.
11870 PIERCE ST, STE 265
RIVERSIDE, CA 92505



LEGEND:

- Existing Structure
- New Construction
- Direction of Flow
- XXXX.X — Bottom of Footing Elevation
- H — Plumb Pile
- H — 3:1 Battered Pile
- ○ — 30" Dia CIDH Conc PILE

NOTE:

1. Not all piles shown.

HYDROLOGIC SUMMARY

DRAINAGE AREA: X.XXX ACRES

	DESIGN FLOOD
FREQUENCY (YEARS)	100
DISCHARGE (CUBIC FEET PER SECOND)	XXXX
WATER SURFACE (ELEVATION AT BRIDGE)	XXXX

FLOOD PLAIN DATA ARE BASED UPON INFORMATION AVAILABLE WHEN THE PLANS WERE PREPARED AND ARE SHOWN TO MEET FEDERAL REQUIREMENTS. THE ACCURACY OF SAID INFORMATION IS NOT WARRANTED BY THE STATE AND INTERESTED OR AFFECTED PARTIES SHOULD MAKE THEIR OWN INVESTIGATION.

X
DESIGN OVERSIGHT

X
SIGN OFF DATE

ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 4/19/2018)

DATE PLOTTED => 9/30/2019 TIME PLOTTED => 8:34:56 AM
FILE => RR and Chuckwalla Avenue Bridge.dgn USERNAME => QuyetNguyen

DESIGNED BY Q. Nguyen	DATE 09-27-19	
DRAWN BY N. Li	DATE 09-27-19	Quyet Nguyen
CHECKED BY J. Nguyen	DATE 09-27-19	PROJECT ENGINEER
APPROVED J. Lu	DATE 09-27-19	

FOUNDATION PLAN

PLANNING STUDY

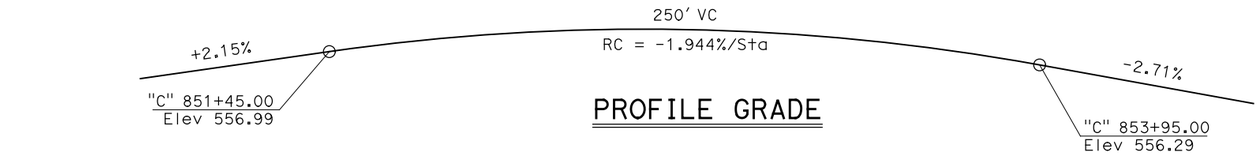
SUTRO DITCH BRIDGE (REPLACE)

UNIT: X	BRIDGE No.: X
CONTRACT No.: X	PROJECT No. & PHASE: X

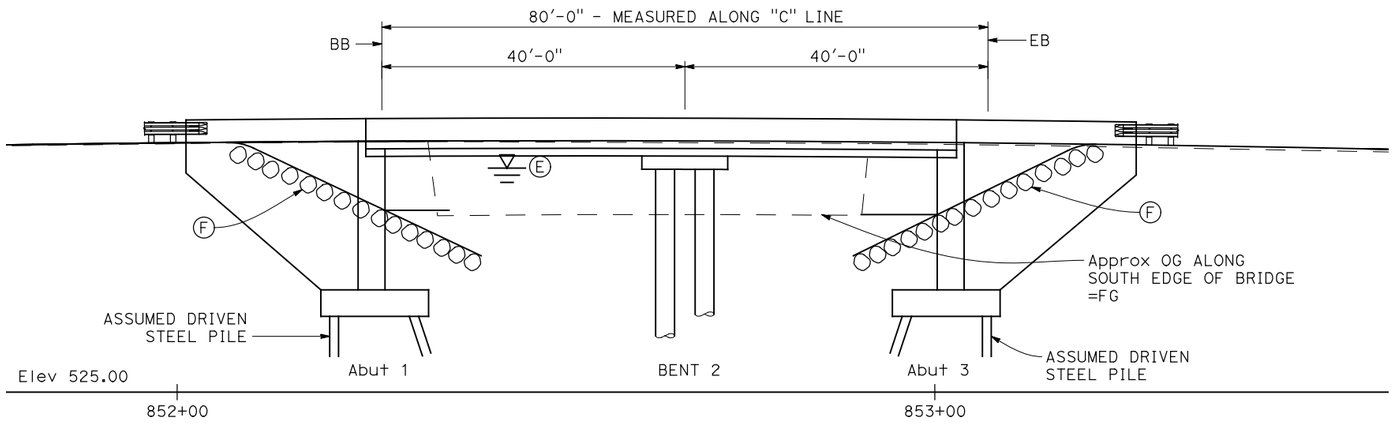
PREPARED FOR THE COUNTY OF RIVERSIDE - DEPARTMENT OF TRANSPORTATION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
8	RIV	RR AVE	

CNS ENGINEERS, INC.
11870 PIERCE ST, STE 265
RIVERSIDE, CA 92505

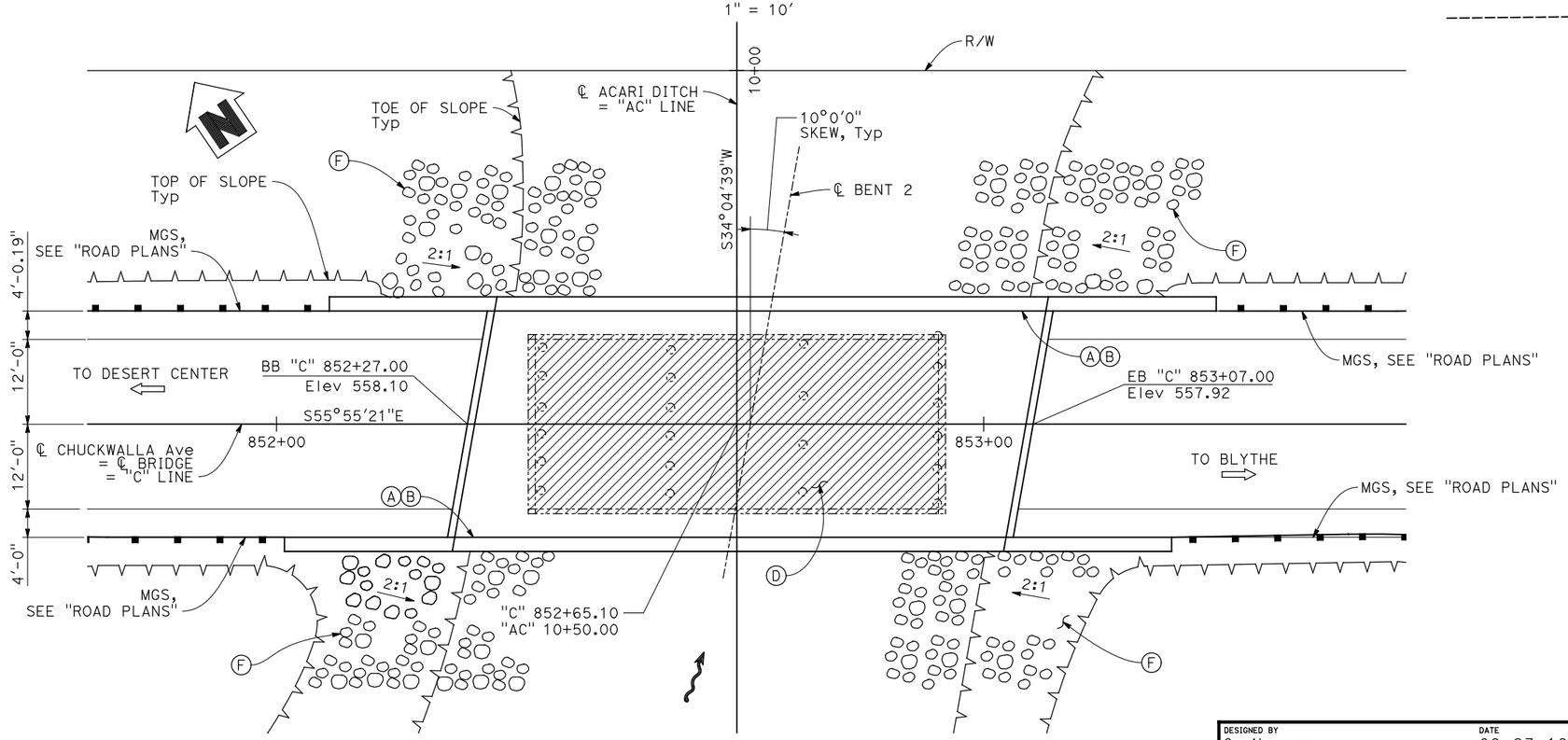


PROFILE GRADE



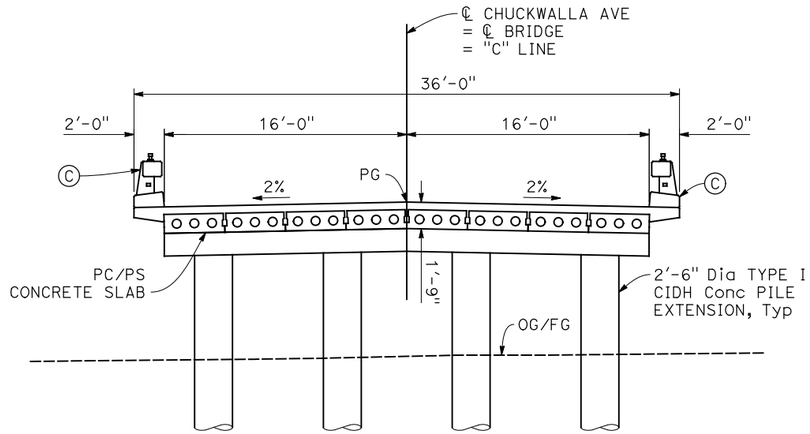
ELEVATION

1" = 10'



PLAN

1" = 10'



TYPICAL SECTION

1" = 5'

LEGEND:

- Existing Structure
- New Construction
- Bridge removal
- Direction of flow
- Direction of traffic

KEY NOTES:

- (A) Paint "Bridge No. XX-XXXX"
- (B) Paint "Acari Ditch Bridge"
- (C) Concrete Barrier Type 85 (Mod) with architectural treatment
- (D) Remove Existing Bridge (Bridge No. 56C0101)
- (E) Water surface elevation, see "FOUNDATION PLAN"
- (F) Rock slope protection, see "ROAD PLANS"

NOTE:

Traffic will be routed around construction site

Date of estimate		09/27/2019
Str Depth	=	1'-9"
Length	=	80'-0"
Width	=	36'-0"
Area	=	2,800 sqft
Avg Cost per Sq Ft Including 10% Mobilization & 25% Contingency	=	TBD
Total Cost	=	TBD

X
DESIGN OVERSIGHT

X
SIGN OFF DATE

ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 4/19/2018)

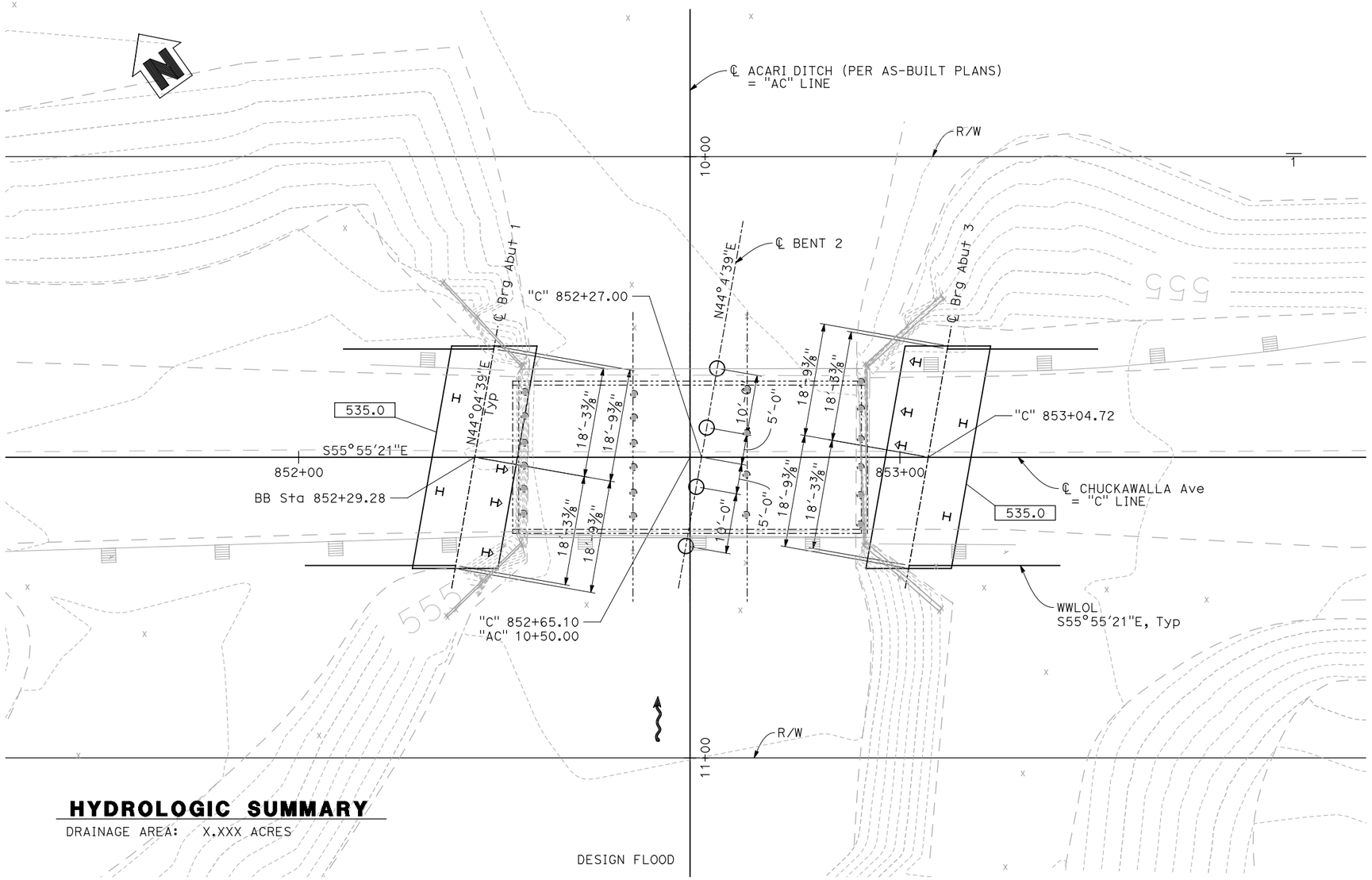
DATE PLOTTED => 9/30/2019 TIME PLOTTED => 8:35:03 AM
FILE => RR and Chuckwalla Avenue Bridge.dgn USER NAME => QuyetNguyen

DESIGNED BY Q. Nguyen	DATE 09-27-19	Quyet Nguyen PROJECT ENGINEER	**PLANNING STUDY**
DRAWN BY N. Li	DATE 09-27-19		**ACARI DITCH BRIDGE (REPLACE)**
CHECKED BY J. Nguyen	DATE 09-27-19		UNIT: X / BRIDGE No.: X
APPROVED J. Lu	DATE 09-27-19		CONTRACT No.: X / PROJECT No. & PHASE: X

PREPARED FOR THE COUNTY OF RIVERSIDE - DEPARTMENT OF TRANSPORTATION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
8	RIV	RR AVE	

CNS ENGINEERS, INC.
11870 PIERCE ST, STE 265
RIVERSIDE, CA 92505



LEGEND:

- Existing Structure
- New Construction
- Direction of Flow
- XXXX.X Bottom of Footing Elevation
- H Plumb Pile
- H 3:1 Battered Pile
- ○ 30" Dia CIDH Conc PILE

NOTE:

1. Not all piles shown.

HYDROLOGIC SUMMARY

DRAINAGE AREA: X.XXX ACRES

	DESIGN FLOOD
FREQUENCY (YEARS)	100
DISCHARGE (CUBIC FEET PER SECOND)	XXXX
WATER SURFACE (ELEVATION AT BRIDGE)	XXXX

FLOOD PLAIN DATA ARE BASED UPON INFORMATION AVAILABLE WHEN THE PLANS WERE PREPARED AND ARE SHOWN TO MEET FEDERAL REQUIREMENTS. THE ACCURACY OF SAID INFORMATION IS NOT WARRANTED BY THE STATE AND INTERESTED OR AFFECTED PARTIES SHOULD MAKE THEIR OWN INVESTIGATION.

X
DESIGN OVERSIGHT

X
SIGN OFF DATE

ADVANCE PLANNING STUDY SHEET
(ENGLISH) (REVISION 4/19/2018)

DATE PLOTTED => 9/30/2019 TIME PLOTTED => 8:35:09 AM
FILE => RR and Chuckwalla Avenue Bridge.dgn USERNAME => QuyetNguyen

DESIGNED BY Q. Nguyen	DATE 09-27-19	Quyet Nguyen PROJECT ENGINEER
DRAWN BY N. Li	DATE 09-27-19	
CHECKED BY J. Nguyen	DATE 09-27-19	
APPROVED J. Lu	DATE 09-27-19	

FOUNDATION PLAN

PLANNING STUDY

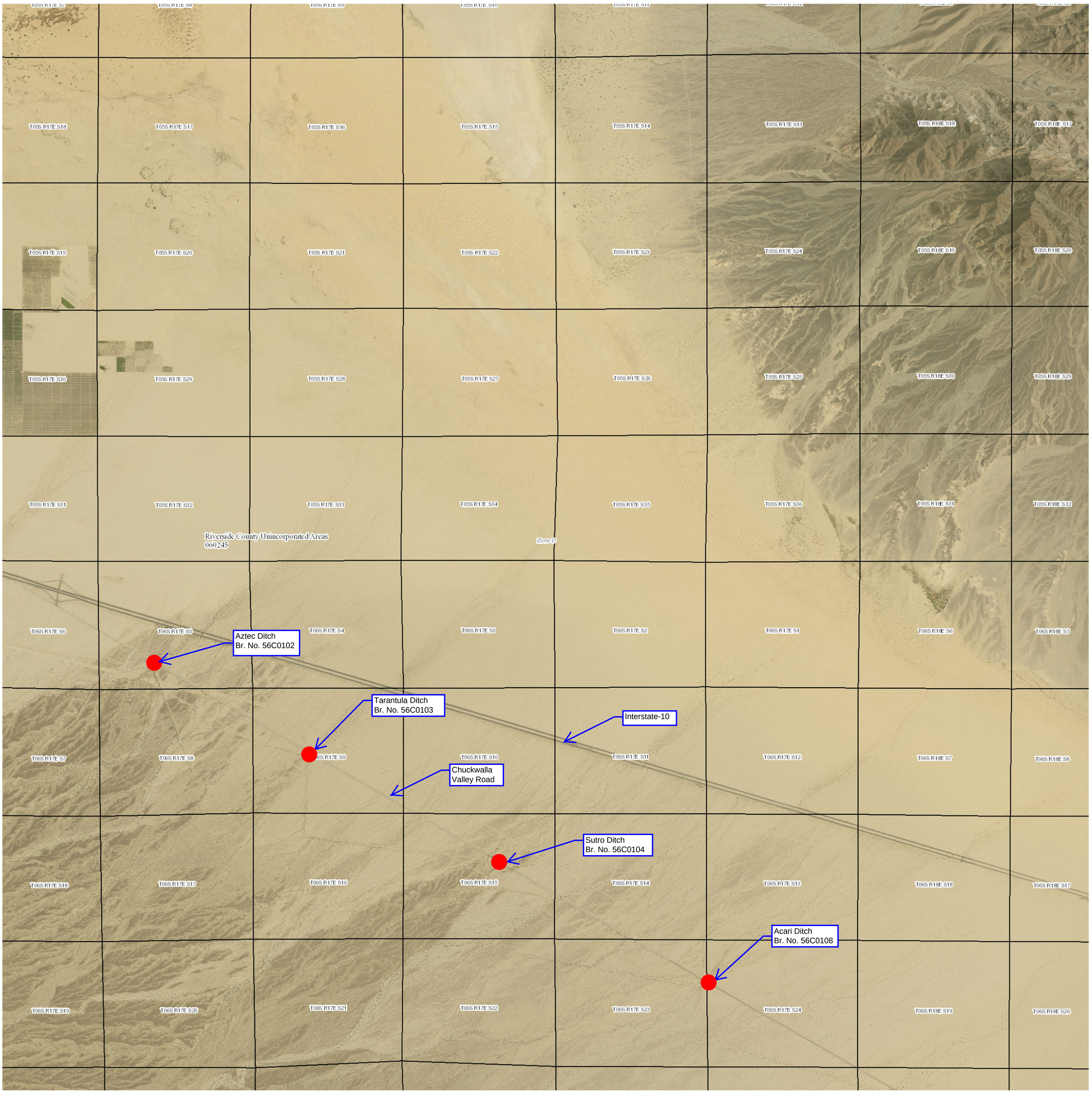
ACARI DITCH BRIDGE (REPLACE)

UNIT: X	BRIDGE No.: X
CONTRACT No.: X	PROJECT No. & PHASE: X

EXHIBIT “D”: FEDERAL INSURANCE RATE MAP NO. 06065C2475G

33°45'26.65"N

115°15'2.01"W



115°7'28.07"W

USGS The National Map: Orthoimagery. Data refreshed October, 2017.

33°37'3.38"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can beordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **4/1/2019 7:10:28 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

N

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: No elevation features on this FIRM
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map please see the Flood Insurance Study(FIS) Report for your community at https://msc.fema.gov

1 inch = 2,000 feet 1:24,000

0 1,000 2,000 4,000 6,000 8,000 Feet

0 210 420 840 1,260 1,680 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

RIVERSIDE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 2475 OF 3805

Panel Contains:

COMMUNITY	NUMBER	PANEL
RIVERSIDE COUNTY UNINCORPORATED AREAS CALIFORNIA	060245	2475

MAP NUMBER
06065C2475G
EFFECTIVE DATE
09/09/9999

EXHIBIT "D"

ATTACHMENTS

ATTACHMENT A: LOCATION HYDRAULIC STUDY FORM

LOCATION HYDRAULIC STUDY FORM*

Dist. 8 Co. Riverside Rte. ____ P.M. _____
Project No.: BRLO-5956(239) – Aztec Ditch , BRLO-5956(227) – Tarantula Ditch, BRLO-5956(226) – Sutro Ditch, BRLO-5956(225) – Acari Ditch
Bridge No.: No. 56C0102 – Aztec Ditch, No. 56C0103 – Tarantula Ditch, No. 56C0104 – Sutro Ditch, No. 56C0108 – Acari Ditch
Limits: Along Chuckwalla Valley Road with the northerly limit of the project starting approximately 0.2-miles east of Corn Springs Road and the southerly limit of the project approximately 6.3 miles east of Corn Springs Road.

Floodplain Description:

From review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06065C2475G, it is indicated that the bridges along Chuckwalla Valley Road has have been formally mapped by FEMA and the project area is designated as Zone "D" (see Exhibit D), which means that the area may have flood hazards that have yet to be determined, therefore the project does not encroach into any defined existing floodplains.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts):

Chuckwalla Valley Road is an approximately 16-mile stretch of frontage road that runs parallel to Interstate 10 (I-10). It connects Corn Springs Road and I-10 at the west end and Paled Dunes Drive and I-10 at the east end. Classified as a Local Rural Road, it mostly serves vehicles accessing local utilities and off-road recreation. The average daily traffic (ADT) volume is approximately 40 vehicles. Periodically, the road carries detoured traffic from the heavily traveled I-10 when the freeway is temporarily closed for construction or emergency incidents. Therefore, it is important to maintain this frontage road in sound condition at all times.

The existing timber bridges carry two lanes (one lane in each direction) of traffic over Aztec, Tarantula, Sutro and Acari ditches. The timber bridges range from 41 feet to 60 feet in length and are approximately 24 feet and 8 inches wide from curb-to-curb. Currently, load restrictions posted on the four bridges limit the vehicular load-carrying capacity below normal standards.

The bridges are listed in the federal Eligible Bridge List (EBL) as "Structurally Deficient (SD)" with a low Sufficiency Rating (SR) between 39.3 and 49.2. A sufficiency rating is essentially an overall rating of a bridge's fitness for the duty that it performs. The rating is based on a bridge's structural evaluation, functional/geometric obsolescence, and its essentiality to the public. A low sufficiency rating may be due to structural defects, narrow lanes, low vertical clearance, or any of many possible issues. A bridge is healthy when its SR is more than 80.0. Bridges with SR equal to or less than 80.0 and more than 50.0 require rehabilitation or widening. When the SR falls below 50.0, bridge replacement shall be considered for public safety.

The proposed project will replace the existing 2-lane timber bridges with new 2-lane modern bridges with a curb-to-curb roadway width of 32 feet at the same locations. The proposed road width would consist of two 12-foot-wide travel lanes, one lane in each direction, and a 4-foot-wide shoulder on each side. Modern traffic barriers/railings meeting current CALTRANS safety design standards would be constructed. The proposed bridges would be approximately 60 to 80 feet long depending on the channel hydraulic capacity and water surface freeboard

requirements. Raising the elevation of the bridges is not anticipated. However, if raising the bridge elevation is found to be necessary to meet freeboard requirements, the total vertical increase is not anticipated to exceed one foot. Additionally, approach roadway improvements would be provided and channel improvements would be administered to avoid future scour problems. It is envisioned that the channel bottom will remain earthen.

The existing bridges do not carry any utilities and the proposed bridge construction is not expected to include new utilities. A telephone line runs along the north side of the project area and may be near bridge wing walls. Further coordination with the utility provider will determine whether relocation will be required.

All construction activities would be conducted within the existing roadway right of way with construction staging and material laydown areas on the roadway itself. Chuckwalla Valley Road between the Corn Springs Road intersection to 6.3 miles east of the intersection would be closed during construction. The construction duration will be further determined during the project development. It is envisioned that all four bridges will be either constructed at the same time or staged in sequence depending on the finding of available access to adjacent utilities and properties. A Traffic Management Plan (TMP) would be prepared to address closure of the road and access to local utilities and properties.

2. ADT: Current 40 Projected 60

3. Hydraulic Data: Base Flood Q_{100}= N/A CFS
WSE_{100}: Downstream Encroachment = N/A
Upstream Encroachment = N/A

The flood of record, if greater than Q_{100}:
Q= N/A CFS WSE= N/A
Overtopping flood Q= N/A CFS WSE= N/A
Are NFIP maps and studies available? YES X FIRM No. 06065C2475G (see Exhibit "D")
NO

4. Is the highway location alternative within a regulatory floodway?
YES NO X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q_{100} backwater damages:

A.	Residences?	NO X	YES
B.	Other Bldgs?	NO X	YES
C.	Crops?	NO X	YES
D.	Natural and beneficial	NO X	YES
E.	Floodplain values?	NO X	YES

6. Type of Traffic:

A. Emergency supply or evacuation route? NO___X_____YES_____
B. Emergency vehicle access? NO_____YES__X_____
C. Practicable detour available? NO_____YES__X_____
D. School bus or mail route? NO___X_____YES _____

7. Estimated duration of traffic interruption for 100-year event hours:____N/A___

8. Estimated value of Q_{100} flood damages (if any) – moderate risk level.

A. Roadway $\_\_\_\_N/A\_\_\_$
B Property $\_\_\_\_N/A\_\_\_$
Total $\_\_\_\_N/A\_\_\_$

9. Assessment of Level of Risk Low__X_____
Moderate____
High_____

For High Risk projects, during design phase, additional Design Study Risk Analysis May be necessary to determine design alternative.

Signature – Consulting Hydraulics Engineer_____Date: 09/26/19
(Item numbers 3,4,5,7,9) Ceazar Aguilar, P.E.,
Aguilar Consulting, Inc

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO___X_____YES_____

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature – County Project Engineer_____Date_____
(Item numbers 1,2,6,8)

* Same as Figure 804.7A Technical Information for Location Hydraulic Study located in Chapter 804 of the Highway Design Manual

ATTACHMENT B: SUMMARY FLOODPLAIN ENCROACHMENT REPORT

SUMMARY FLOODPLAIN ENCROACHMENT REPORT*

Dist. 8 Co. Riverside Rte. _____P.M. _____
Project No.: BRLO-5956(239) – Aztec Ditch , BRLO-5956(227) – Tarantula Ditch, BRLO-5956(226) – Sutro Ditch, BRLO-5956(225) – Acari Ditch
Bridge No.: No. 56C0102 – Aztec Ditch, No. 56C0103 – Tarantula Ditch, No. 56C0104 – Sutro Ditch, No. 56C0108 – Acari Ditch
Limits: Along Chuckwalla Valley Road with the northerly limit of the project starting approximately 0.2-miles east of Corn Springs Road and the southerly limit of the project approximately 6.3 miles east of Corn Springs Road.

Floodplain Description: From review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06065C2475G, it is indicated that the bridges along Chuckwalla Valley Road has not been formally mapped by FEMA and the project area is designated as Zone "D" (see Exhibit D), which means that the area may have flood hazards that have yet to be determined, therefore the project does not encroach into any defined existing floodplains.

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	x	
2.	Are the risks associated with the implementation of the proposed action significant?	x	
3.	Will the proposed action support probable incompatible floodplain development?	x	
4.	Are there any significant impacts on natural and beneficial floodplain values?	x	
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	x	
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	x	
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.		x

PREPARED BY:

Signature – Consulting Hydraulics Engineer_____Date: 09/26/19
Ceazar Aguilar, P.E.,
Aguilar Consulting, Inc

* Same as Figure 804.7B Floodplain Evaluation Report Summary located in Chapter 804 of the Highway Design Manual