



# I-40/CC Westbound On- Ramp and Right-Turn Lane



CENE-486C  
60% Update Presentation

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Ramon Lopez



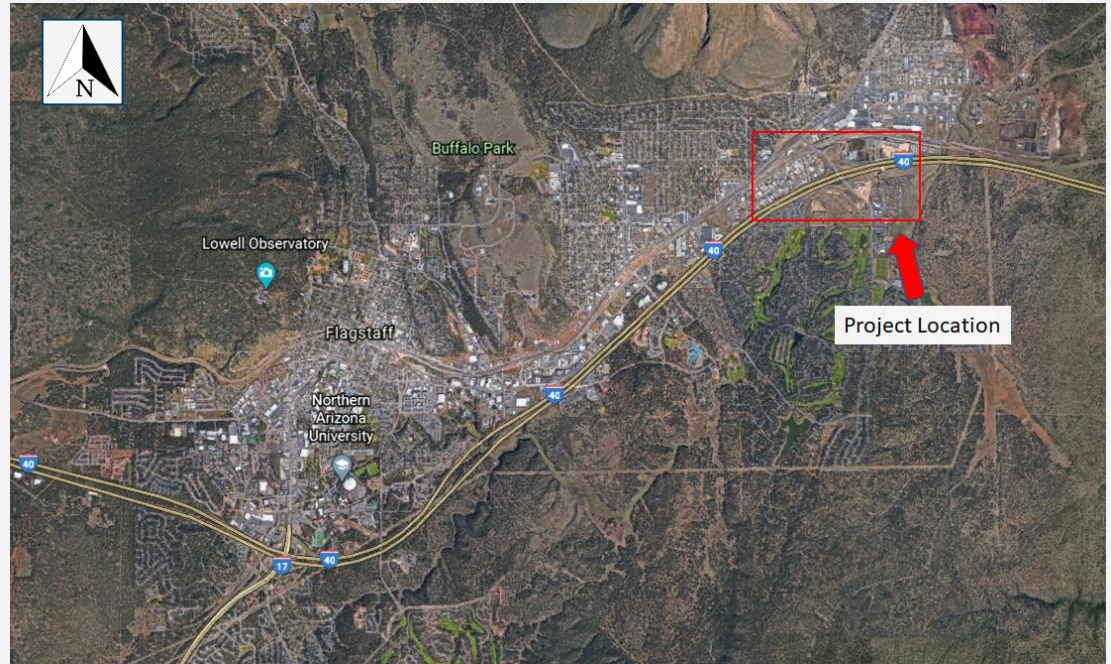
# Project Overview

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- **Client:** Arizona Department of Transportation (ADOT)
- **Location:** I-40 and Country Club Drive Traffic Interchange (Flagstaff, AZ)
- **Final Product:** 30% Design Concept Report



# Project Location and Vicinity Map



*From Left to Right: Map of Arizona (NTS); Project Vicinity Map (NTS) [2][3]*

# Milestones

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- 30% Report



- **Milestone 1:** Process Survey Data
- **Milestone 2:** Input Existing Geometry
- **Milestone 3:** Create Construction Alignments
- **Milestone 4:** Create Existing Cross Sections
- **Milestone 5:** Complete Existing Runoff Calculations

- 60% Report

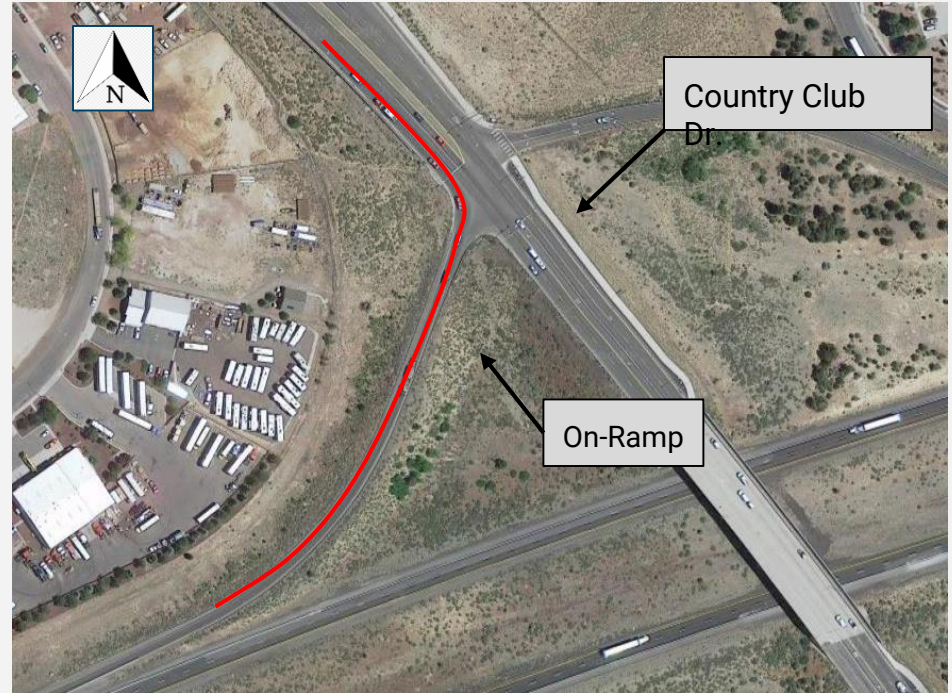
- **Milestone 6:** Create Proposed Cross Sections
- **Milestone 7:** Preliminary Intersection Design
- **Milestone 8:** Preliminary On-Ramp Design

- 90% Report

- **Milestone 9:** Final Intersection Design
- **Milestone 10:** Final On-Ramp Design
- **Milestone 11:** Final Drainage Design
- **Milestone 12:** Synchro Analysis
- **Milestone 13:** Impact Assessment

# Milestone 6: Create Proposed Cross-Sections

- 24" Saw Cut Offset from Existing Edge of Pavement
- Match Existing
  - Slopes
  - Embankments
  - Pavement Structure
  - Lane Width
- Plan and Profile sheets created



Site Location with Right Turn Lane and On-Ramp Highlighted (NTS) [3]

Proposed Additional  
Roadway

DATE 03/09/20

REV 1

REV 2

I-40/CC  
IMPROVEMENT PROJECT

LOCATION  
FLAGSTAFF, AZ

DESIGN

MT

DRAWN

MT

SHEET TITLE

OV01

CHECK

ZJ

NO.

5

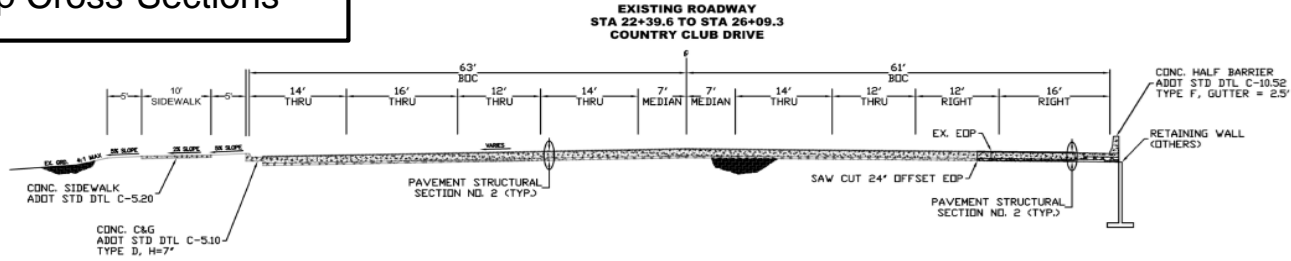
OF

16

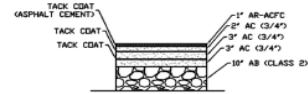
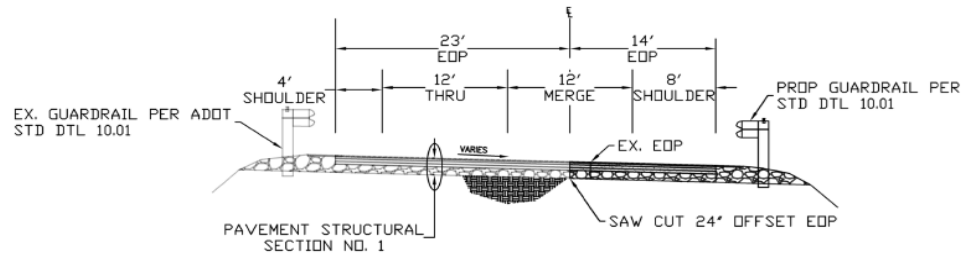
SCALE 1" = 150'



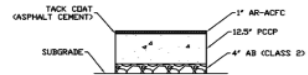
# Proposed Roadway & On-Ramp Cross-Sections



## EXISTING ROADWAY STA 06+03.75 TO STA 21+11.75 I-40 WESTBOUND ON-RAMP



## PAVEMENT STRUCTURAL SECTION NO. 1



## PAVEMENT STRUCTURAL SECTION NO. 2

DATE	02/09/20
REV 1:	
REV 2:	
I-40/CC IMPROVEMENT PROJECT	
FLAGSTAFF, AZ	
DESIGN	MT
DRAWN	MT
CHECK	ZJ
SHEET TITLE	
TX01	
NO.	06
OF	16

# Milestone 7 Preliminary Intersection Design

- FHWA Lane Taper [4] Recommendations
  - Taper Length = 96'
  - Taper Slope = 8:1
- Right-Turn Lane Extends 512' to Existing Bridge Structure
- 12' Lane Width
- 4' Shoulder Width

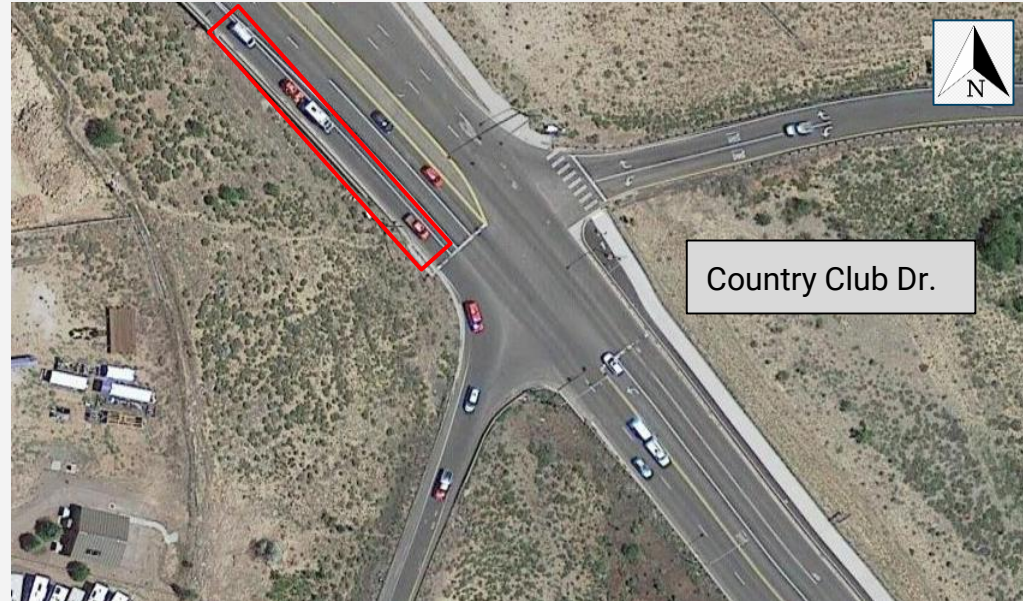
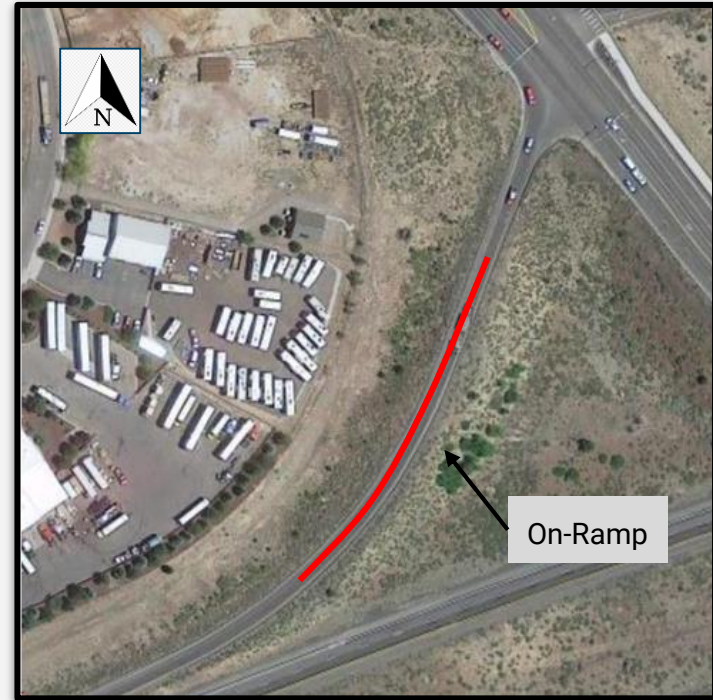


Figure 3: Intersection Plan View (NTS)



# Milestone 8 Preliminary On-Ramp Design

- Federal Highway Administration (FHWA) Lane Taper Recommendations [4]:
  - Taper Length = 300'
  - Taper Slope = 25:1
- Total Lane Length is 800'
- Match Existing Superelevation
- Guardrail Per ADOT STD DTL 10.01 [5]



[3]

Figure 4: On-Ramp Plan View (NTS)

# Overview of Plan and Profile Sheets

PV01  
PV02  
PV03  
PV04  
PV05  
PV06  
PV07  
PV08

03/09/20

REV 1

REV 2

I-40/CC  
IMPROVEMENT PROJECT

FLAGSTAFF, AZ

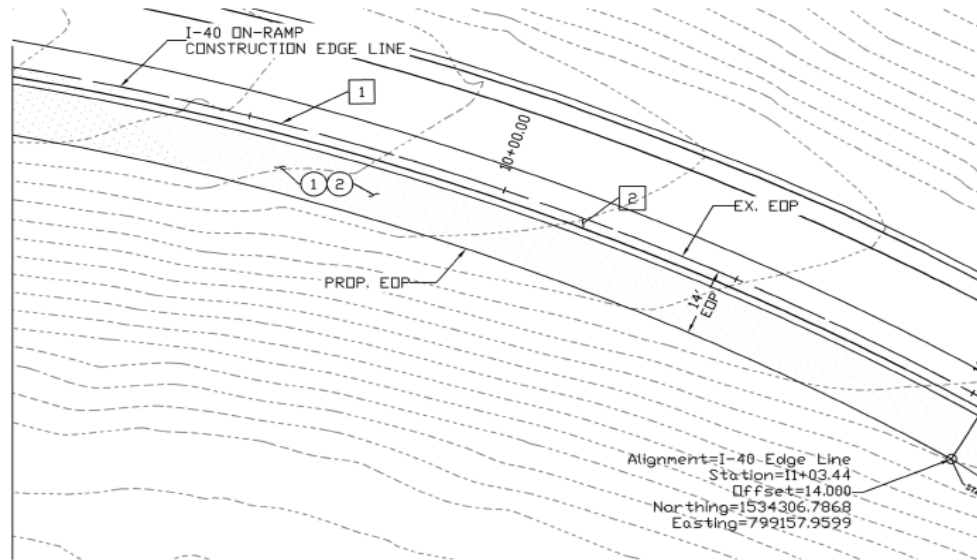
Location

DESIGN MT  
DRAWN MT  
CHECK ZJ

SHEET TITLE  
OV01  
NO. 5 OF 16

SCALE 1" = 150'

MATCH LINE I-40 EL STA. 9+00



MATCH LINE I-40 EL STA. 11+00

CONSTRUCTION			
NO.	DESCRIPTION	QTY.	UN.
①	AB	2808	SF
②	ABC	2808	SF
③	CONCRETE HALF BARRIER PER ADOT STD DTL C-10.52, TYPE F, GUTTER = 2.5'	201	LF
④	RETAINING WALL	0	LF

REMOVAL			
NO.	DESCRIPTION	QTY.	UN.
①	SAW CUT	200	LF
②	AB & ABC	402	SF
③	CONC HALF BARRIER	0	LF
④	CATCH BASIN	0	EA

TO BE INCLUDED WITH 90%

DATE 01/29/20  
REV 1: 01/30/20  
REV 2: 03/06/20

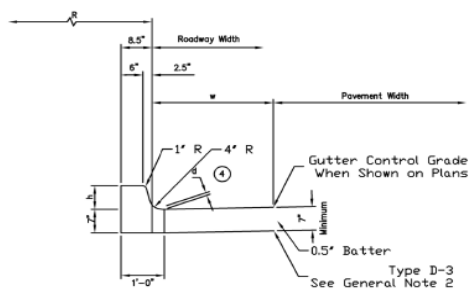
I-40/CC  
IMPROVEMENT PROJECT

LOCATION  
FLAGSTAFF, AZ

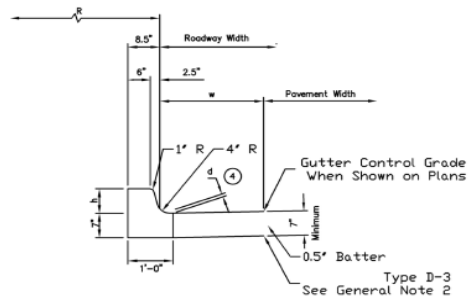
DESIGN MT  
DRAWN MT  
CHECK MT

SHEET TITLE  
PV06  
NO. 12 OF 16

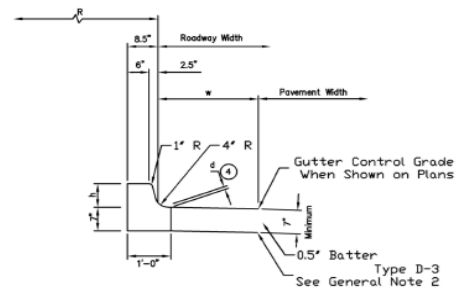
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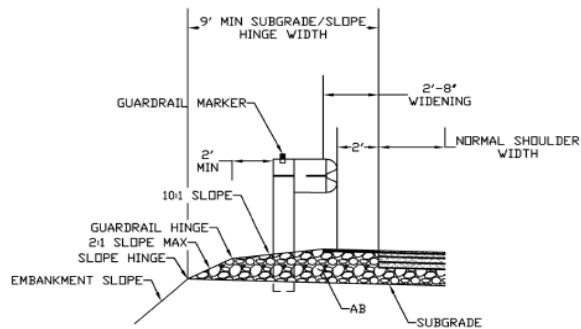
ADD STD DTL C-5.10  
TYPE D-1, H=7'



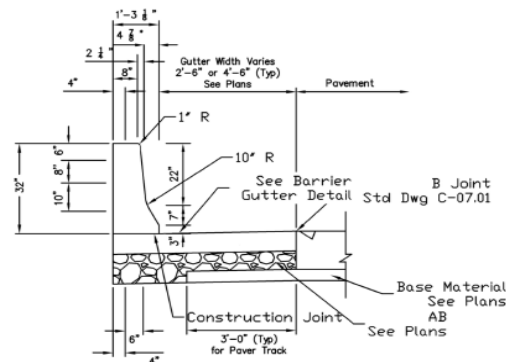
ADD STD DTL C-5.10  
TYPE D, H=7'



ADD STD DTL C-5.10  
TYPE D-3, H=7'



ADD STD DTL  
C-10.01  
NO EMBANKMENT CURB  
GUARDRAIL



ADD STD DTL C-10.52  
TYPE F, GUTTER = 2.5'  
CONCRETE HALF BARRIER

DATE	03/09/20	REV 1		REV 2	
DESIGN	RL	SHEET TITLE	I-40/CC IMPROVEMENT PROJECT		
DRAWN	MT		FLAGSTAFF, AZ		
CHECK	ZJ		LOCATION		
			DT01		
			NO. 03 OF 16		



# Stormwater Pollution Prevention Plan

WATTLE  
ALONG  
FARCEL  
BOUNDARY

WATTLE AT  
END OF  
STORM PIPE

WATTLES  
OFFSET 20'  
(TYP.)

WATTLE FOR  
BOX CULVERT

DATE: 03/03/20

REV 1:

REV 2:

I-40/CC  
IMPROVEMENT PROJECT

WB ON RAMP

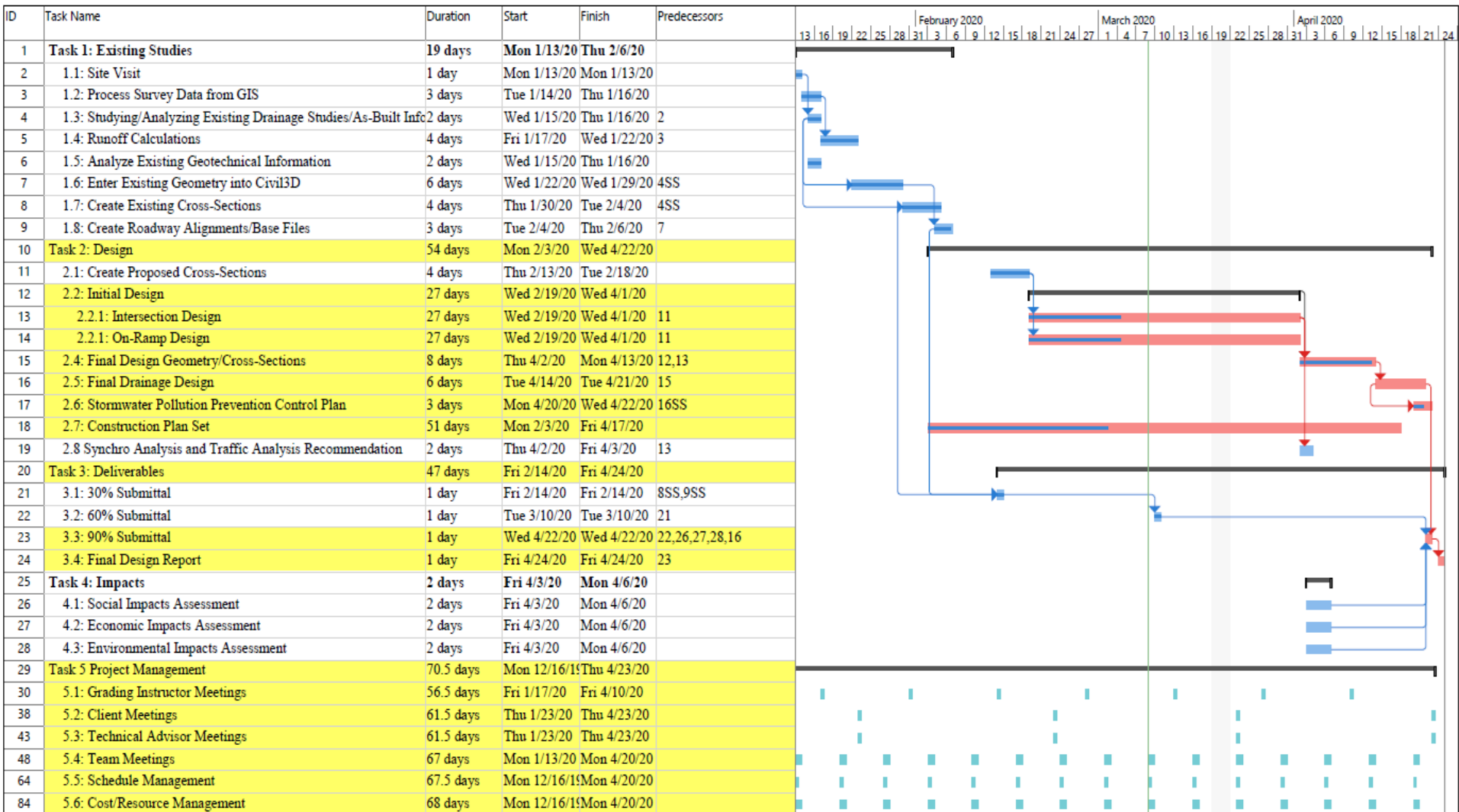
LOCATION

DESIGN: RL  
DRAWN: RL  
CHECK: MT

SHEET TITLE: SWFPP01  
NO. 16 OF 16

SCALE: 1" = 150'





# References

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- **[1]** "Arizona Department of Transportation Logo", *En.wikipedia.org*, 2020. [Online]. Available: [https://en.wikipedia.org/wiki/Arizona\\_Department\\_of\\_Transportation](https://en.wikipedia.org/wiki/Arizona_Department_of_Transportation). [Accessed: 12- Mar- 2020].
- **[2]** "County Map of Arizona", *Mapsales.com*, 2020. [Online]. Available: <https://www.mapsales.com/county-wall-maps/arizona.aspx>. [Accessed: 12- Mar- 2020].
- **[3]** "Map of Project Site", *Google Maps*, 2020. [Online]. Available: <https://www.google.com/maps/@35.2173383,-111.5841945,457m/data=!3m1!1e3>. [Accessed: 12- Mar- 2020].
- **[4]** Federal Highway Administration, 2013. *Guide For Highway Capacity And Operations Analysis Of Active Transportation And Demand Management Strategies*. United States Department of Transportation, p.55.
- **[5]** Arizona Department of Transportation (2020). *Roadway Design Guidelines*. Arizona Department of Transportation, pp.600-6, Appendix C.

Questions?