MEMORANDUM

DATE: Thursday, October 20, 2022

PROJECT: I-75 (SR 93) from MP 33.826 to MP 46.000 (Collier County)

FPID: 444008-4-52-01

SUBJECT: Requesting Day-Time and Multi-Day Lane Closure

I. Background

This is a RRR project along I-75 (SR 93) for over 12 miles, from MP 33.826 to MP 46.000, in Collier County. I-75 is an existing four-lane limited access facility with 12-foot travel lanes, ten-foot paved outside shoulders and four-foot paved inside shoulders. This section of I-75 is a long remote stretch that is high speed and dark at nighttime. Additionally, this corridor frequently has low visibility in the early morning hours due to fog. The corridor is low volume with an estimated AADT of 26,000 at the begin construction in 2022.

The scope of work includes cross slope correction through variable milling and constant depth resurfacing of the travel lanes, milling and resurfacing the paved shoulders, and widening the inside paved shoulders from four to ten-feet.

Proposed improvements also include:

i. Median and outside guardrail replacement at the existing bridge approaches
ii. Enhanced wildlife crossings

Replacement of the existing median guardrail will require the use of temporary barrier wall as requested by the Department to maintain the project's required clear zone until the new guardrail is fully installed and to provide a safe work zone. Existing guardrail runs along the outside shoulders throughout the entire project corridor. Based on discussions with four Contractors, the width needed from the guardrail to the temporary barrier wall for post driving trucks ranges from 11 to 16-feet. To provide flexibility, a 14-foot minimum operating space will be provided. To provide space for the Contractor to off-load delivery truck materials and equipment, as well as a sufficient work area for removing and installing new guardrail, the temporary barrier wall will need to be placed within one of the two existing travel lanes. To accommodate this, lane closures are proposed to reduce the two-lane traffic to a single lane to install the temporary barrier wall. Each of the 21 guardrail replacement sections is expected to exceed more than a single workday and will therefore involve a multi-day operation. Traffic volumes were reviewed and used to perform lane closure calculations. Due to the historically low traffic volumes along this remote section of I-75, no impacts to existing operations are anticipated due to the proposed day-time and multi-day lane closures.

I-75 is an Emergency Shoulder Use (ESU) corridor requiring the existing outside paved shoulder to be used during a major hurricane evacuation. The Traffic Control Plan includes a General Note directing the Contractor to remove the barrier wall upon a declaration of emergency.

The milling and resurfacing operation will be performed utilizing lane closures with no lane closure restrictions, other than no lane closures are allowed during non-working periods. The first segment of the I-75 (SR 93) RRR project (444008-2) that is currently in construction, experienced traffic delays during the day-time lane closure when a 3-mile lane closure (allowed per Standard Plans Index 102-600) was implemented for the milling and resurfacing operation. Based on coordination meetings with the Construction Project Administrator and FDOT Construction, the contributing causes for the delays are believed to be due to the length of the lane closure and slow-moving truck traffic. Passenger vehicles were observed to be taking advantage of this slow-moving truck traffic by queue jumping, causing additional delays. To reduce the delays, an enhanced advance warning sign diagram for the lane closure has been developed and accepted by FDOT Construction that includes double sets of lane closure signs and motorists awareness system (MAS) signs and devices (Standard Plans Index 102-613). Additionally, the channelizing devices and traffic control officer at the beginning of the work area will be moved in a two-step process based on observed traffic queueing during construction. To further help reduce delays, the overhead DMS signs entering Alligator Alley will provide messages to motorists of the lane closure and to seek an alternate route.

This memorandum documents the justification for day-time closures for milling/resurfacing and other work and multi-day lane closures for the bridge approach guardrail connection. A copy of the project's straight line diagram (SLD) and lane closure calculations have been included in the attached Appendix for reference.

II. FDOT Lane Closure Criteria

- The 2022 FDOT Design Manual (FDM) Section 240.2.1.6 states that "A lane closure duration of more than one calendar day on limited access facilities is prohibited. If a lane closure duration of more than one calendar day on limited access facilities is unavoidable, approval by the District Secretary is required."

III. Conclusion and Recommendation

After a review of the corridor, it was determined that both day-time and multi-day lane closures would be necessary to accommodate the proposed median guardrail replacements in an efficient manner. This will provide room for shielding the existing roadside hazards with temporary barrier wall while providing sufficient space for the Contractor to access and perform the proposed guardrail replacement work.

These findings were discussed with Sean Pugh (FDOT Design PM) and Dennis Day (FDOT Construction PM) during the project's MOT and Constructability Review meeting, which took place on October 1, 2020 following the original Phase II submittal.

Recommended by:

Mark Anthony Bayer, P.E.
Consultant EOR

Date 10/28/2022

Approved by:

L.K. Nandam, P.E.
District One Secretary

Date _____

Appendix

Lane Closure Calculations

Straight Line Diagram

LANE CLOSURE WORKSHEET

DATE: **October 20, 2022**

FINANCIAL PROJECT ID: ***444008-4-52-01*** FEDERAL AID PROJECT NO: ***0***

COUNTY: ***Collier*** DESIGNER: ***Mark Bayer, PE***

NO. OF EXISTING LANES: ***4*** LOCATION: ***03173 East of SR 29***

SCOPE OF WORK: ***I-75 (SR 93) RRR from MP 33.826 to MP 46.000***

Calculate the peak hour traffic volume (V):

V = ATC ***26898*** X P/D ***0.067*** X D ***0.55*** X PSCF ***1.01*** X RTF ***1.00*** = ***1003***

LANE CLOSURE CAPACITY TABLE

Capacity (C) of an Existing 2-Lane – Converted to 2-Way, 1-Lane = 1400 VPH
Capacity (C) of an Existing 4-Lane – Converted to 1-Way, 1-Lane = 1800 VPH
Capacity (C) of an Existing 6-Lane – Converted to 1-Way, 2-Lane = 3600 VPH
Capacity (C) of an Existing 8-Lane – Converted to 1-Way, 3-Lane = 5400 VPH
User Defined Capacity (C) of Existing 2-Lane - Converted to 2-Way, 1-Lane =
User Defined Capacity (C) of an Existing Multi-Lane - Converted to 1-Way, 1-Lane =

Factors restricting Capacity:

TLW ***12*** LC ***2*** WZL ***15,840*** G/C ***1***

Calculate the Restricted Capacity (RC) at the Lane Closure Site by multiplying the appropriate 2L, 4L, or 6L Capacity (C) from the Table above by the Obstruction Factor (OF) and the Work Zone Factor (WZF). If the Lane Closure is through or within 600 ft. of a signalized intersection, multiply the RC by the G/C Ratio.

RC (Open Road) = C ***1800*** X OF ***0.94*** X WZF ***1.00*** = ***1692***

RC (Signalized) = RC (Open Road) ***1692*** X G/C ***1*** = ***1692***

If V ≤ RC, there is no restriction on Lane Closure
If V > RC, calculate the hourly percentage of ADT at which Lane Closure will be permitted

$$\text{Open Road } \% = \frac{\text{RC (Open Road) } 1692}{(\text{ATC } 26898 \times \text{D } 0.55 \times \text{PSCF } 1.01 \times \text{RTF } 1)} = 11.32\ \%$$

Signalized % = Open Road % ***11.32*** X G/C ***1.00*** = ***11.32 %***

Plot 24 hour traffic to determine when Lane Closure permitted.

NOTE: For Existing 2-Lane Roadways, D = 1.00.
Work Zone Factor (WZF) applies only to 2-Lane Roadways.

For RTF< 1.00, briefly describe alternate route:

LANE CLOSURES

24 HOUR COUNTS

	AM Hourly Volume	ATC %	PM Hourly Volume	ATC %
12 - 1	337	1.3	1758	6.5
1 - 2	279	1.0	1806	6.7
2 - 3	223	0.8	1749	6.5
3 - 4	306	1.1	1706	6.3
4 - 5	448	1.7	1660	6.2
5 - 6	849	3.2	1506	5.6
6 - 7	1100	4.1	1386	5.2
7 - 8	1368	5.1	1211	4.5
8 - 9	1475	5.5	906	3.4
9 - 10	1629	6.1	679	2.5
10 - 11	1754	6.5	587	2.2
11 - 12	1761	6.5	415	1.5
TOTAL			26,898	100

P/D = 0.067

COUNT DATE:

November 2, 2021

Designer:

Mark Bayer, PE

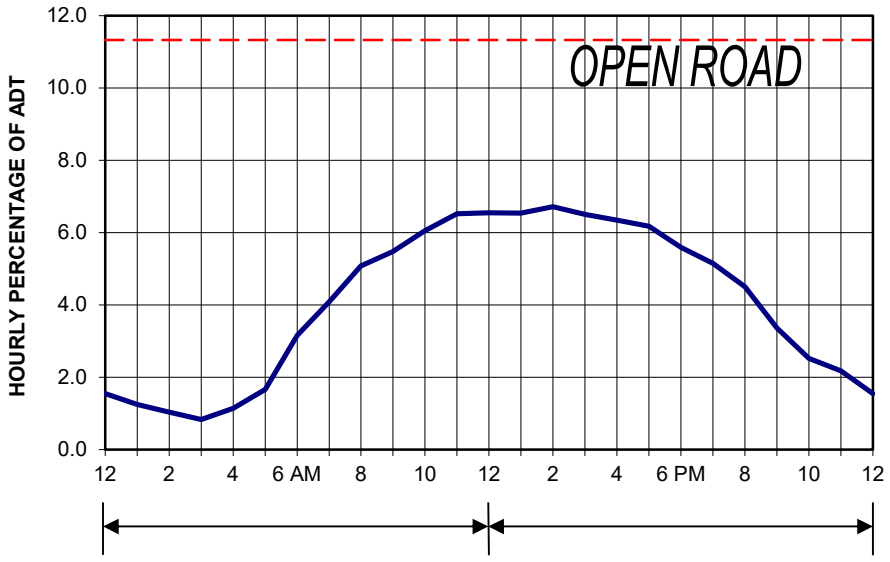
Financial Project ID No.:

444008-4-52-01

Location:

03173 East of SR 29

HOURLY VARIATION OF DAILY TRAFFIC



- CONCLUSION -

ROUND TO THE NEAREST 1/2 HOUR CONSERVATIVELY

OPEN ROAD LANE CLOSURE

No Restrict

SIGNALIZED LANE CLOSURE

N/A

COUNTY: 03
STATION: 0173
DESCRIPTION: SR 93/I 75, EAST OF SR 29 COLLIER COUNTY
START DATE: 11/02/2021
START TIME: 0000

	DIRECTION: E					DIRECTION: W					COMBINED
TIME	1ST	2ND	3RD	4TH	TOTAL	1ST	2ND	3RD	4TH	TOTAL	TOTAL
0000	65	45	64	36	210	31	37	36	23	127	337
0100	62	40	31	35	168	24	34	25	28	111	279
0200	34	43	35	27	139	21	18	26	19	84	223
0300	49	44	39	52	184	18	31	34	39	122	306
0400	52	49	66	44	211	53	72	48	64	237	448
0500	49	96	114	133	392	73	115	141	128	457	849
0600	116	124	142	148	530	140	147	145	138	570	1100
0700	143	158	198	175	674	134	183	200	177	694	1368
0800	161	176	160	191	688	183	167	227	210	787	1475
0900	163	183	169	195	710	240	225	242	212	919	1629
1000	222	235	198	217	872	233	183	223	243	882	1754
1100	224	209	206	195	834	227	244	237	219	927	1761
1200	222	236	210	191	859	230	231	230	208	899	1758
1300	227	260	217	201	905	213	233	233	222	901	1806
1400	212	198	230	213	853	236	178	241	241	896	1749
1500	231	241	173	218	863	193	195	251	204	843	1706
1600	199	212	191	186	788	223	206	210	233	872	1660
1700	190	209	178	214	791	185	185	156	189	715	1506
1800	176	187	197	176	736	192	167	135	156	650	1386
1900	192	165	159	179	695	132	127	142	115	516	1211
2000	129	134	94	93	450	120	132	103	101	456	906
2100	85	108	88	79	360	84	76	68	91	319	679
2200	81	104	71	77	333	54	62	75	63	254	587
2300	70	41	71	66	248	59	50	28	30	167	415
24-HOUR TOTALS:					13493					13405	26898

PEAK VOLUME INFORMATION

	DIRECTION: E		DIRECTION: W		COMBINED DIRECTIONS	
	HOUR	VOLUME	HOUR	VOLUME	HOUR	VOLUME
A.M.	730	710	845	917	845	1623
P.M.	1430	915	1315	924	1315	1814
DAILY	1430	915	1045	951	1315	1814

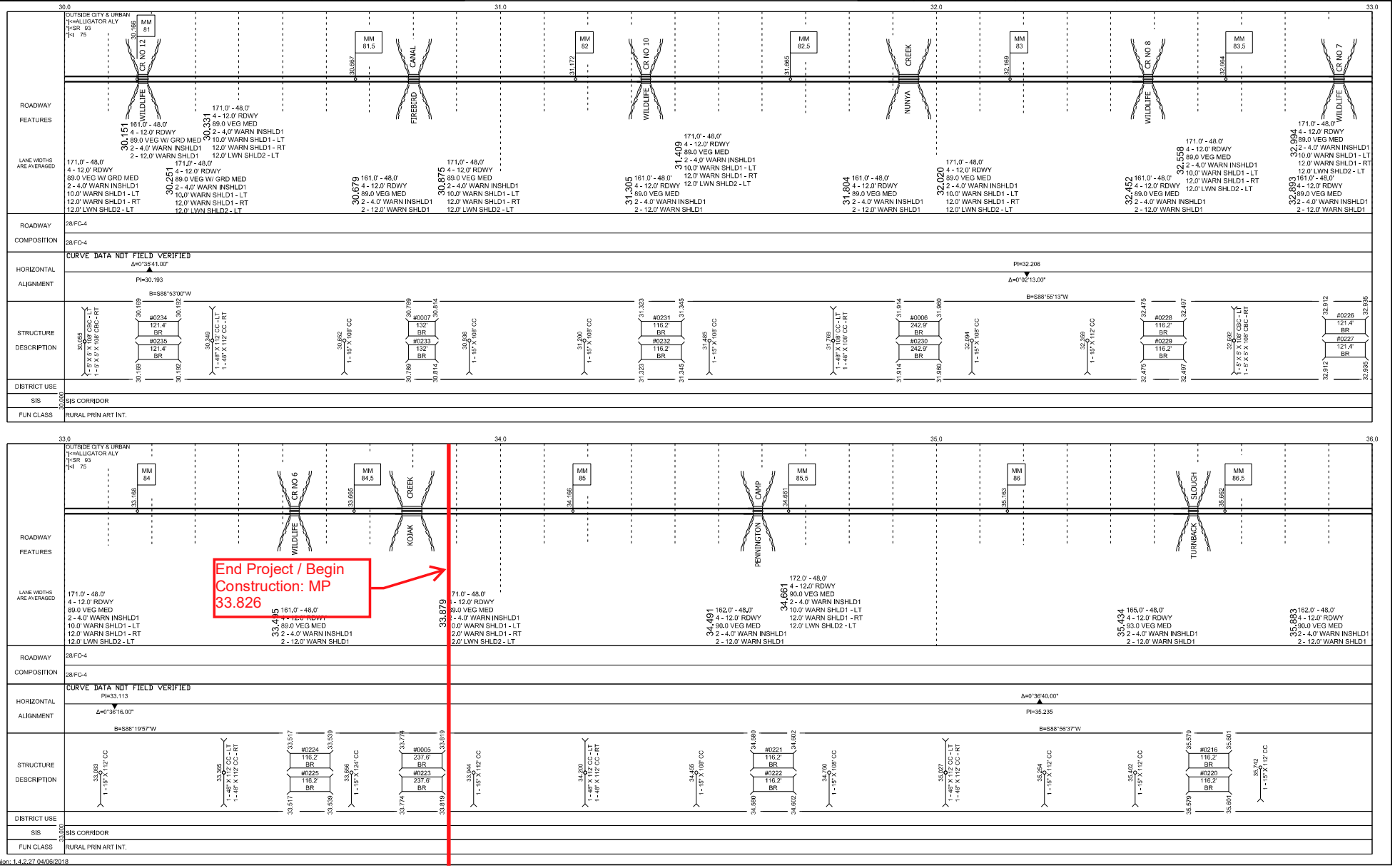
GENERATED BY SPS 5.0.55P

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	03/29/2018	04/13/2018	00.063	63.676		12/05/2019 (F241)
BY	FTE	FTE				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO.
02	I 75	SR 93	COLLIER	01	03175000	4 OF 9



Version: 1.4.2.27 04/06/2018

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BY	FTE	FTE				

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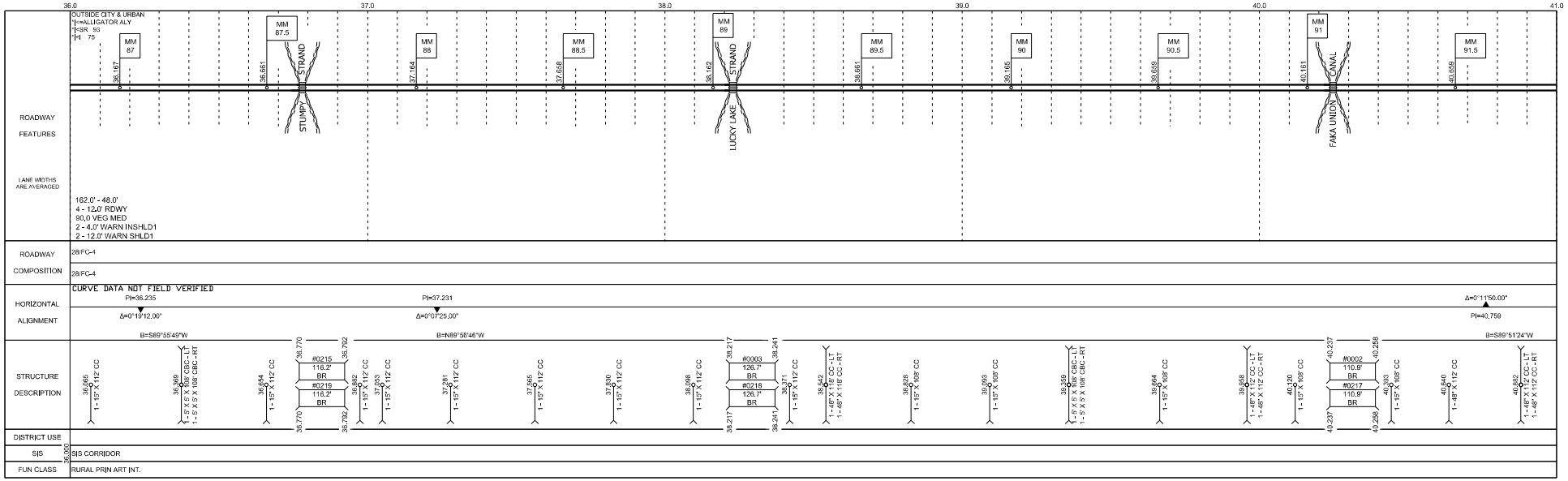

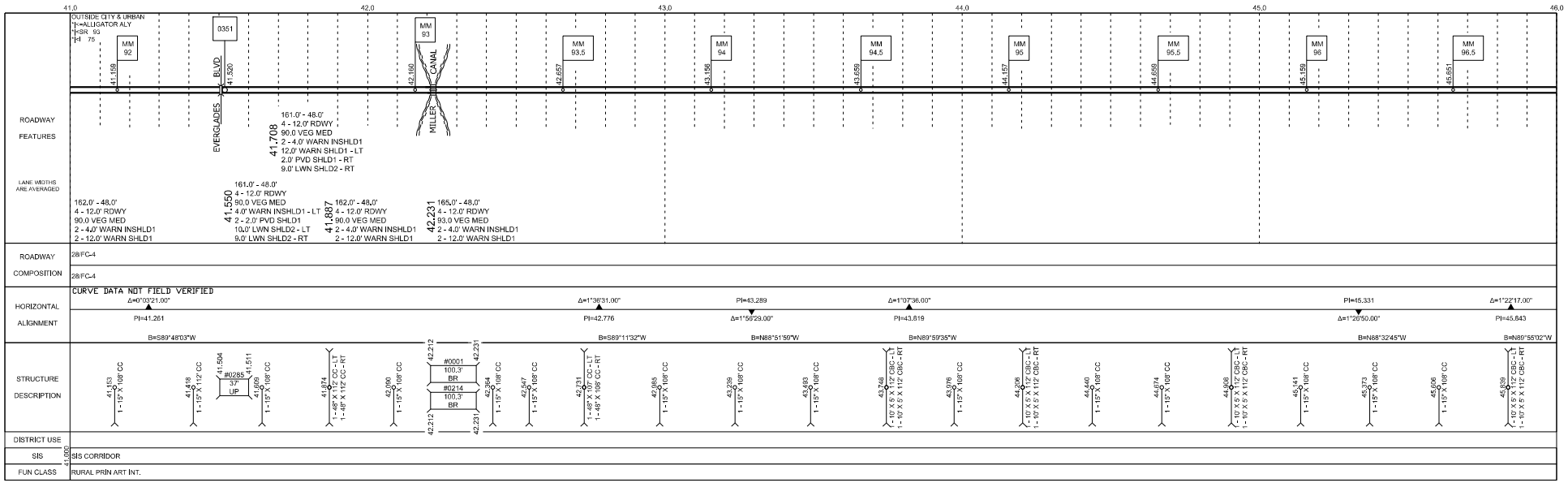

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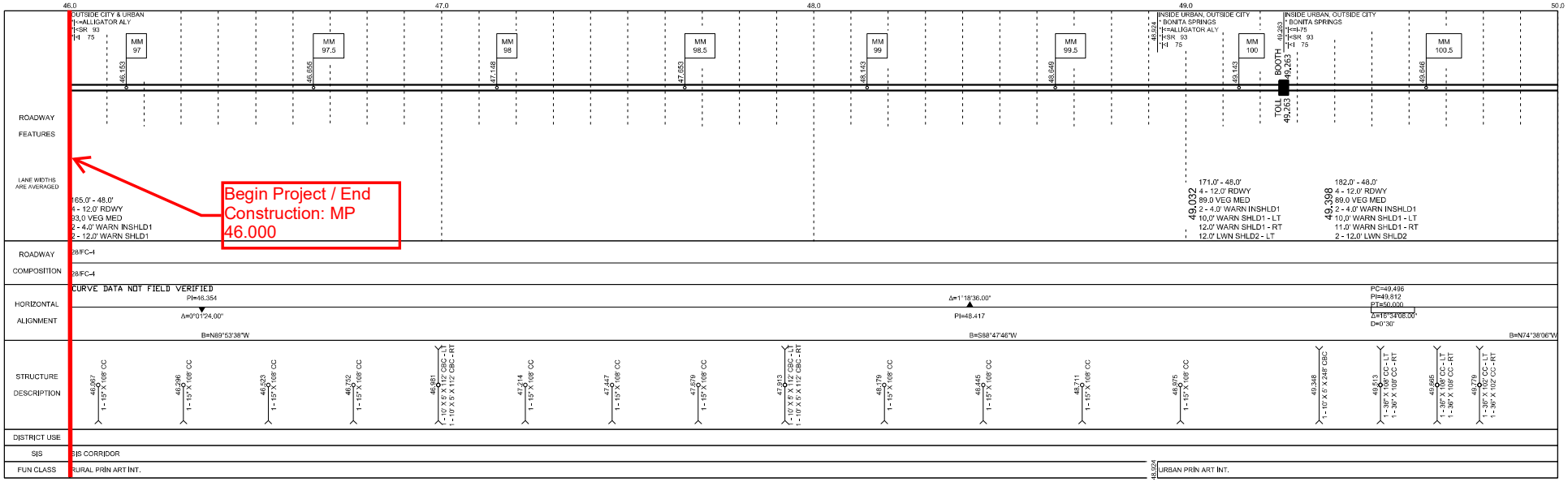

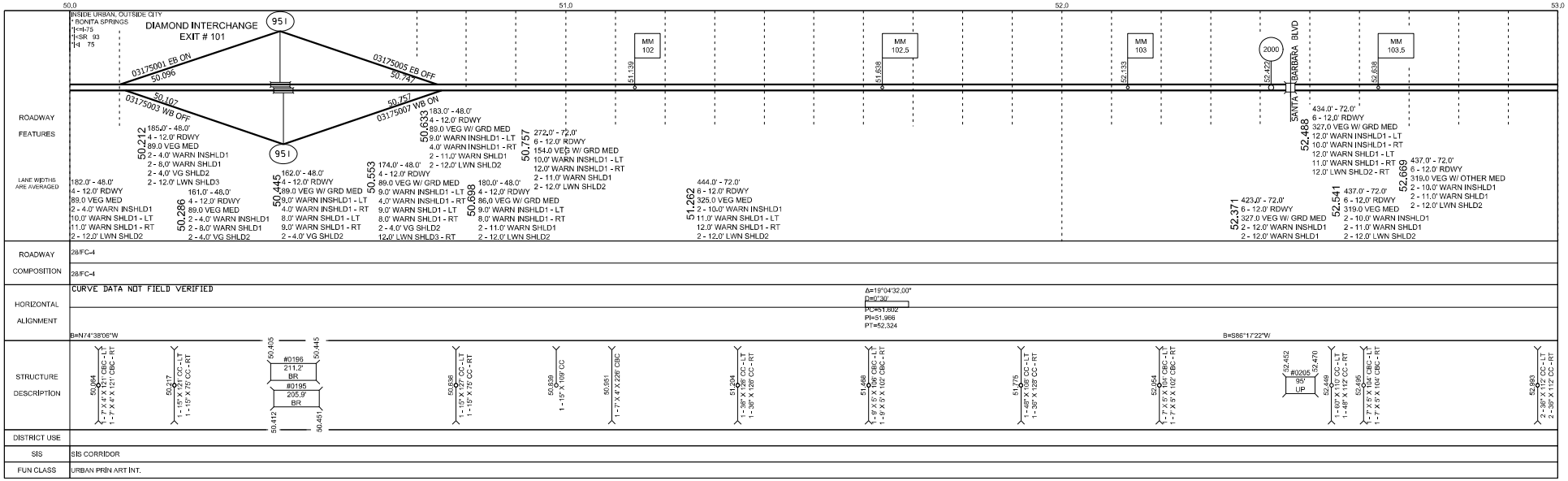

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