SPRING STREET – 1ST STREET TO 12TH STREET

RECOMMENDATIONS

Pavement Maintenance Options (Short-Term)

These options are not available for this street because of structural deficiencies and/or pavement cracking condition.

Pavement Rehabilitation Options (Long-Term)

Overlay Options

For option 1, we recommend 6 inch digouts for base failures, placing a 1/2 inch HMA leveling course and a 2-1/2 inch RHMA overlay.

Estimated Cost: $1,760,000 Estimated Life Expectancy: 10-12 Years

An overlay using HMA is not recommended because the overlay requires the reflective cracking to be 5-1/2 inches, which exceeds the maximum overlay of 3-1/2 inches that is considered feasible to meet geometric constraints.

Recycle and Mill and Replace Options

For option 1, we recommend milling off 6 inches of the existing AC, 4 inch digouts of base failures, placing a 3 inch HMA leveling course and a 3 inch RHMA surface course.

Estimated Cost: $3,008,000 Estimated Life Expectancy: 12-15 Years

For option 2, we recommend milling off 3-1/2 inches of the existing pavement, 4 inch digouts of base failures, placing a 1 inch HMA leveling course and a 2-1/2" RHMA overlay.

Estimated Cost: $1,925,000 Estimated Life Expectancy: 12-15 Years

For option 3, we recommend milling off 2 inches of existing asphalt concrete, cold in-place recycling 5 inches of the existing pavement and placing a 2 inch HMA surface.

Estimated Cost: $1,348,000 Estimated Life Expectancy: 12-15 Years

Reconstruction Options

Reconstructing alternative was not evaluated for this street segment.

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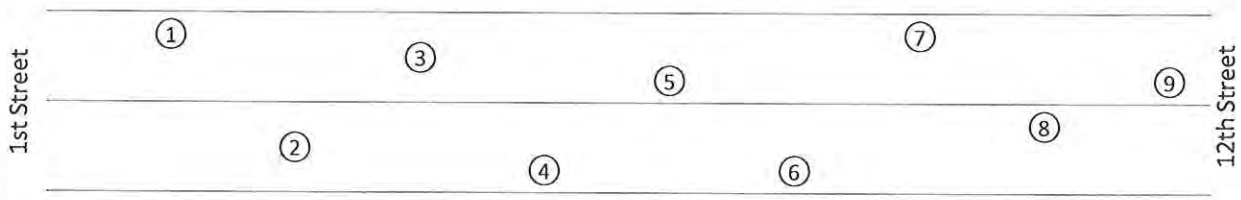

NOTES:
- NTS
- ACTUAL ROAD MAY NOT BE STRAIGHT
- NOT ALL ROADS CONNECTING TO THIS STREET ARE SHOWN
- WIDTH OF ROAD MAY VARY WITHIN THE BOUNDARY SECTION
- ALL LOCATIONS SHOWN ARE APPROXIMATED

Spring Street

[Section of Road ≈ 4200ft]

TRAFFIC LAYOUT:
- 2-WAY STREET
- LANE NUMBER VARIES EACH WAY

VISUAL DESCRIPTION FOR THIS SECTION OF ROAD

The pavement exhibits slight to moderate raveling and block shrinkage cracking progressing to alligator cracking in the wheel paths. The travel lanes are much more distressed and exhibit intermittant base failure.

CORING LOG

Symbol	Location	Core Data		R-value
ㄱ	North of 1st Street 450ft	AC	7.00"	N.A.
ㄴ	North of 1st Street 900ft	AC	10.00"	N.A.
ㄴ	North of 1st Street 1350ft	AC	11.00"	N.A.
ㄱ	North of 1st Street 1800ft	AC	12.50"	N.A.
ㄷ	North of 1st Street 2250ft	AC	13.50"	N.A.
ㄴ	North of 1st Street 2700ft	AC	10.50"	N.A.
ㄱ	North of 1st Street 3150ft	AC PCC	17.00" 6.00"	N.A.
ㅁ	North of 1st Street 3600ft	AC	10.50"	N.A.
ㅁ	North of 1st Street 4050ft	AC	11.00"	N.A.

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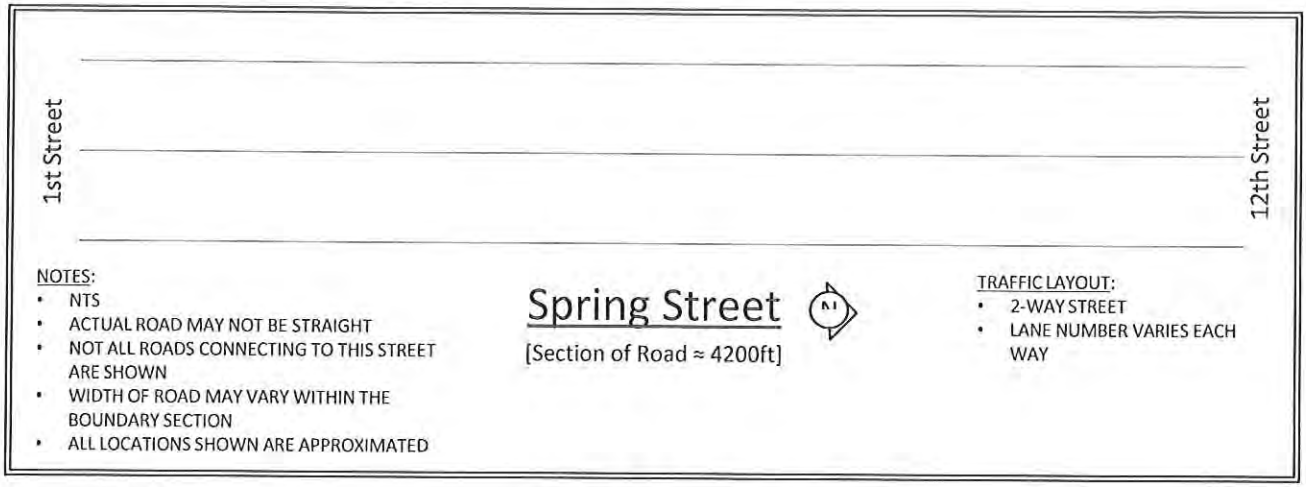

DEFLECTION ANALYSIS					
Lane	Tolerable	TI	80th Percentile	Percent Reduction	HMA Overlay
North Bound	17	8.0	24.48	30.56	1.56 - inches
South Bound	17	8.0	28.54	40.44	2.76 - inches
				Overlay Required by Reflective Cracking	5.50 - inches

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04/01/13

City of Paso Robles

Road: Spring
From: 1st
To: 12th
Lane/Line: NB

Survey Date: 03/15/13
Thickness: 1.20
Traffic Index: 8.00
Project Number: 130065

Deflection Data Analysis

Deflection Readings (Equivalent Deflectometer Units)

No. of Tests	Low	Mean	High	Std. Dev.
40	5.63	66.33	1950.55	305.66

Road Surface

Thickness	Traffic Index
1.20	8.00

Structural Design

Tolerable	80th Percentile	90th Percentile	% Reduction	GE Deficient
17.00	323.08	457.57	94.74	1.60

HMA Overlay
0.84

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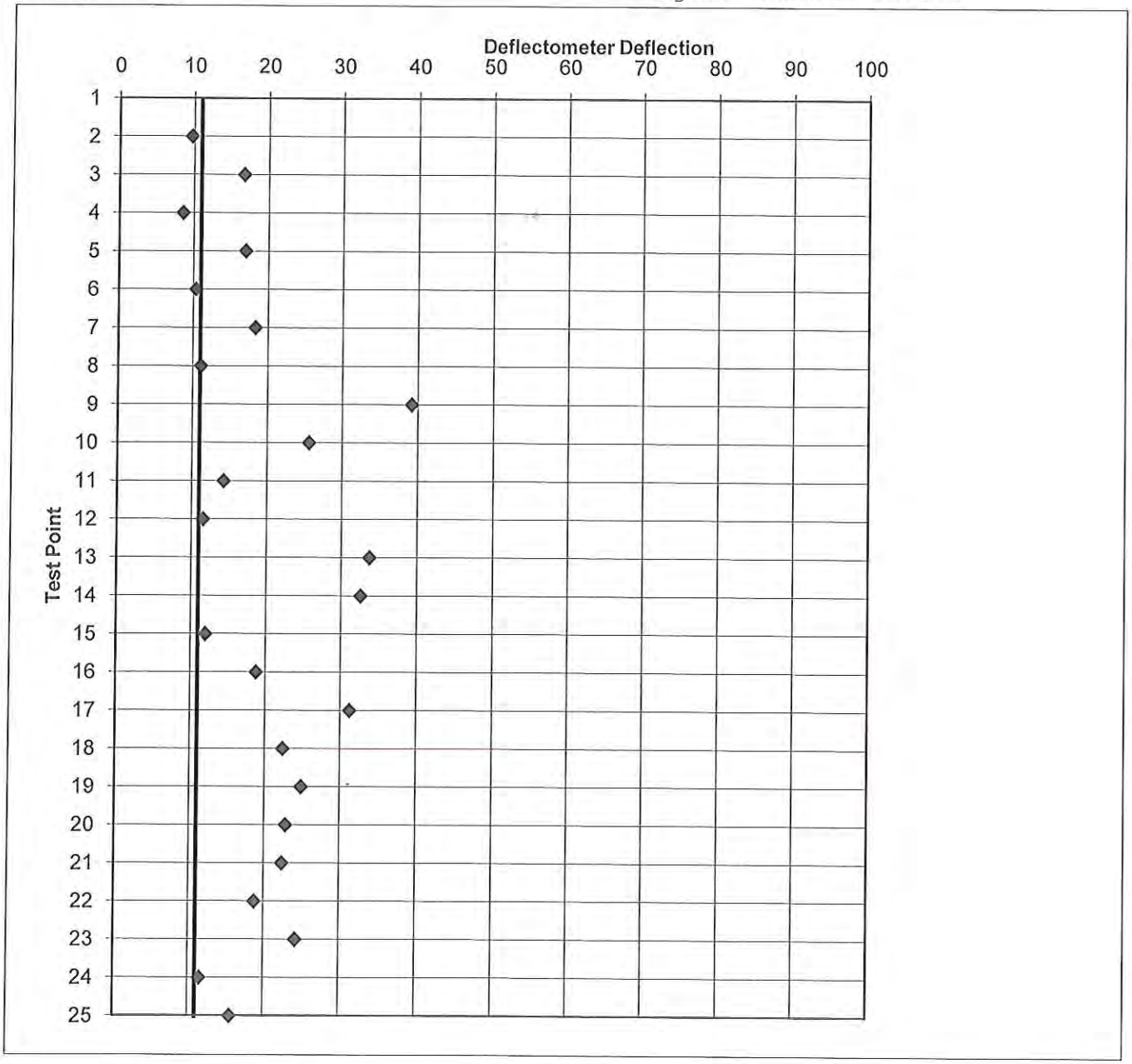
City of Paso Robles

Road: Spring
From: 1st
To: 12th
Lane/Line: NB

Survey Date: 03/15/13
Thickness: 1.20
Traffic Index: 8.00
Project Number: 130065



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Redding (530) 224-4535 **Petaluma** (707) 769-5330 **San Luis Obispo** (805) 781-2265

Date: 4/1/2013

Client:	City of Paso Robles	Interval:	100
Road:	Spring	Survey Date:	3/15/13
From:	1st	Thickness:	1.20
To:	12th	Traffic Index:	8.00
Lane/Line:	NB	Project Number:	130065

Test Points	Dynaflect	Conditions	Comments	Deflection	Exclude
1	86.00		NB 2	1950.547	
2	0.45		NB 1	9.709	
3	0.76		NB 2	16.742	
4	0.40		NB 1	8.575	
5	0.77		NB 2	16.969	
6	0.48		NB 1	10.390	
7	0.83		NB 2	18.330	
8	0.51		NB 1	11.070	
9	1.75		NB 2	39.202	
10	1.15		NB 1	25.590	
11	0.65		4th	14.246	
12	0.53			11.524	
13	1.51			33.757	
14	1.46			32.622	
15	0.55			11.978	
16	0.85			18.784	
17	1.40		6th	31.261	
18	1.01			22.413	
19	1.12			24.909	
20	1.03			22.867	
21	1.01		7th	22.413	
22	0.85			18.784	
23	1.09			24.228	
24	0.53		8th	11.524	
25	0.71			15.608	
26	1.05			23.321	
27	0.87			19.237	
28	0.40		9th	8.575	
29	1.02			22.640	
30	0.89			19.691	
31	0.66			14.473	

32	0.76		10th	16.742	
33	0.30			6.306	
34	0.35			7.440	
35	0.27			5.625	
36	0.71		11th	15.608	
37	0.91			20.145	
38	0.87			19.237	
39	0.65			14.246	
40	0.72			15.834	

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City of Paso Robles

Road: Spring
From: 12th
To: 1st
Lane/Line: SB

Survey Date: 03/15/13
Thickness: 1.20
Traffic Index: 8.00
Project Number: 130065

Deflection Data Analysis

Deflection Readings (Equivalent Deflectometer Units)

No. of Tests	Low	Mean	High	Std. Dev.
40	10.39	22.68	45.10	6.98

Road Surface

Thickness	Traffic Index
1.20	8.00

Structural Design

Tolerable	80th Percentile	90th Percentile	% Reduction	GE Deficient
17.00	28.54	31.61	40.44	0.43

HMA Overlay
0.23

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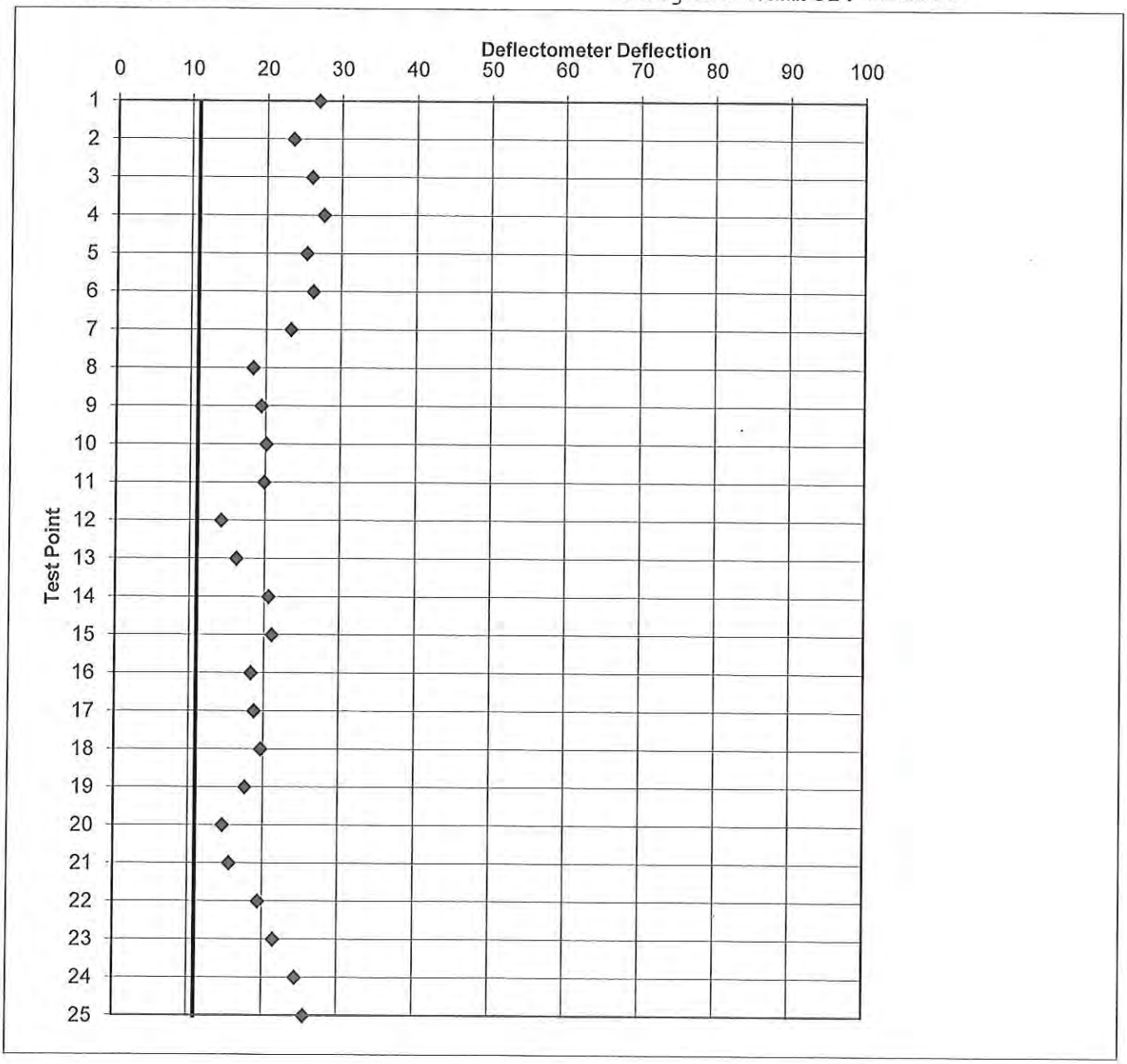
City of Paso Robles

Road: Spring
From: 12th
To: 1st
Lane/Line: SB

Survey Date: 03/15/13
Thickness: 1.20
Traffic Index: 8.00
Project Number: 130065



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Date: 4/1/2013

Client:	City of Paso Robles	Interval:	100
Road:	Spring	Survey Date:	3/15/13
From:	12th	Thickness:	1.20
To:	1st	Traffic Index:	8.00
Lane/Line:	SB	Project Number:	130065

Test Points	Dynaflect	Conditions	Comments	Deflection	Exclude
1	1.21			26.951	
2	1.06			23.548	
3	1.17		11th	26.043	
4	1.24			27.631	
5	1.14			25.363	
6	1.18			26.270	
7	1.05		10th	23.321	
8	0.83			18.330	
9	0.88			19.464	
10	0.91			20.145	
11	0.90		9th	19.918	
12	0.65			14.246	
13	0.74			16.288	
14	0.93			20.599	
15	0.95		8th	21.052	
16	0.83			18.330	
17	0.85			18.784	
18	0.89		7th	19.691	
19	0.80			17.649	
20	0.67			14.700	
21	0.71			15.608	
22	0.88		6th	19.464	
23	0.97			21.506	
24	1.10			24.455	
25	1.15		5th	25.590	
26	1.68			37.613	
27	1.75			39.202	
28	2.01			45.100	
29	1.48		4th	33.076	
30	1.20			26.724	
31	1.16			25.816	

32	1.10			24.455	
33	1.18		3rd	26.270	
34	0.87		SB 2	19.237	
35	0.48		SB 1	10.390	
36	1.10		SB 2	24.455	
37	0.61		SB 1 2nd	13.339	
38	0.87		SB 2	19.237	
39	0.75		SB 1	16.515	
40	0.94		SB 2	20.825	

SPRING STREET – 12TH STREET TO 24TH STREET

RECOMMENDATIONS

Pavement Maintenance Options (Short-Term)

These options are not available for this street because of structural deficiencies and/or pavement cracking condition.

Pavement Rehabilitation Options (Long-Term)

Overlay Options

Overlay options are not recommended due to the 7 inch overlay requirement to meet reflective cracking criteria.

Recycle and Mill and Replace Options

For option 1, we recommend milling off 5 inches of the existing AC, 4 inch digouts of base failures, placing a 2-1/2 inch HMA leveling course and a 2-1/2 inch RHMA surface course.

Estimated Cost: $1,977,000 Estimated Life Expectancy: 12-15 Years

For option 2, we recommend milling off 3-1/2 inches of the existing pavement, placing a 1 inch HMA leveling course and a 2-1/2" RHMA surface course.

Estimated Cost: $1,158,000 Estimated Life Expectancy: 12-15 Years

For option 3, we recommend milling off 2 inches of existing asphalt concrete, cold in-place recycling 5 inches of the existing pavement and placing a 2 inch HMA surface.

Estimated Cost: $1,035,000 Estimated Life Expectancy: 12-15 Years

Reconstruction Options

Reconstructing alternative was not evaluated for this street segment.

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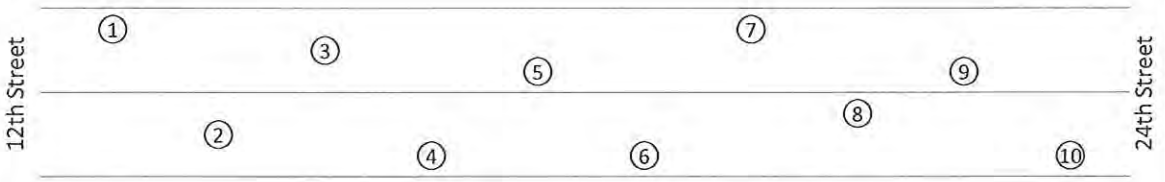

NOTES:
- NTS
- ACTUAL ROAD MAY NOT BE STRAIGHT
- NOT ALL ROADS CONNECTING TO THIS STREET ARE SHOWN
- WIDTH OF ROAD MAY VARY WITHIN THE BOUNDARY SECTION
- ALL LOCATIONS SHOWN ARE APPROXIMATED

Spring Street

[Section of Road ≈ 4500ft]

TRAFFIC LAYOUT:
- 2-WAY STREET
- LANE NUMBER VARIES EACH WAY

VISUAL DESCRIPTION FOR THIS SECTION OF ROAD

The pavement exhibits slight to moderate raveling and block shrinkage cracking progressing to alligator cracking in the wheel paths. The travel lanes are much more distressed and exhibit intermittant base failure.

CORING LOG

Symbol	Location	Core Data		R-value
①	North of 12th Street 300ft	AC	11.00"	N.A.
②	North of 12th Street 750ft	AC PCC	10.00" 4.00"	N.A.
③	North of 12th Street 1200ft	AC	12.00"	N.A.
④	North of 12th Street 1650ft	AC PCC	9.00" 4.50"	N.A.
⑤	North of 12th Street 2100ft	AC	12.50"	N.A.
⑥	North of 12th Street 2550ft	AC PCC	10.50" 4.00"	N.A.
⑦	North of 12th Street 3000ft	AC PCC	11.00" 4.50"	N.A.
⑧	North of 12th Street 3450ft	AC PCC	11.50" 4.75"	N.A.
⑨	North of 12th Street 3900ft	AC PCC	11.50" 4.00"	N.A.
⑩	North of 12th Street 4350ft	AC	11.50"	N.A.

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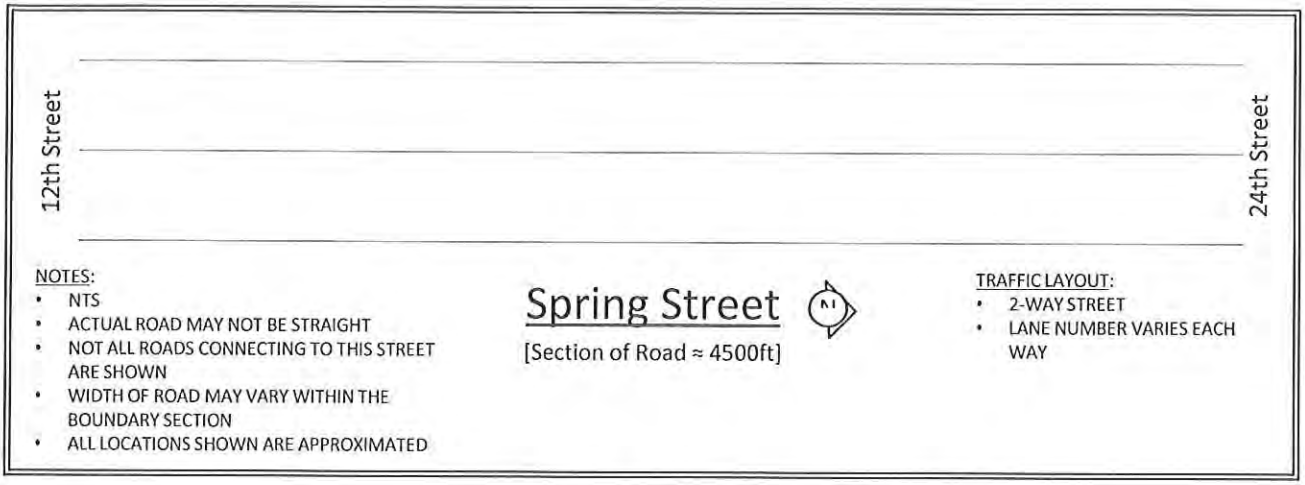

NOTES:
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- NOT ALL ROADS CONNECTING TO THIS STREET ARE SHOWN
- WIDTH OF ROAD MAY VARY WITHIN THE BOUNDARY SECTION
- ALL LOCATIONS SHOWN ARE APPROXIMATED

TRAFFIC LAYOUT:
- 2-WAY STREET
- LANE NUMBER VARIES EACH WAY

DEFLECTION ANALYSIS					
Lane	Tolerable	TI	80th Percentile	Percent Reduction	HMA Overlay
North Bound	17	8.0	24.11	29.48	1.44 - inches
South Bound	17	8.0	21.49	20.89	0.72 - inches
				Overlay Required by Reflective Cracking	7.00 - inches

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City of Paso Robles

Road: Spring
From: 12th
To: 24th
Lane/Line: NB

Survey Date: 03/15/13
Thickness: 1.20
Traffic Index: 8.00
Project Number: 130065

Deflection Data Analysis

Deflection Readings (Equivalent Deflectometer Units)

No. of Tests	Low	Mean	High	Std. Dev.
44	8.12	16.01	55.31	9.64

Road Surface

Thickness	Traffic Index
1.20	8.00

Structural Design

Tolerable	80th Percentile	90th Percentile	% Reduction	GE Deficient
17.00	24.11	28.35	29.48	0.23

HMA Overlay
0.12

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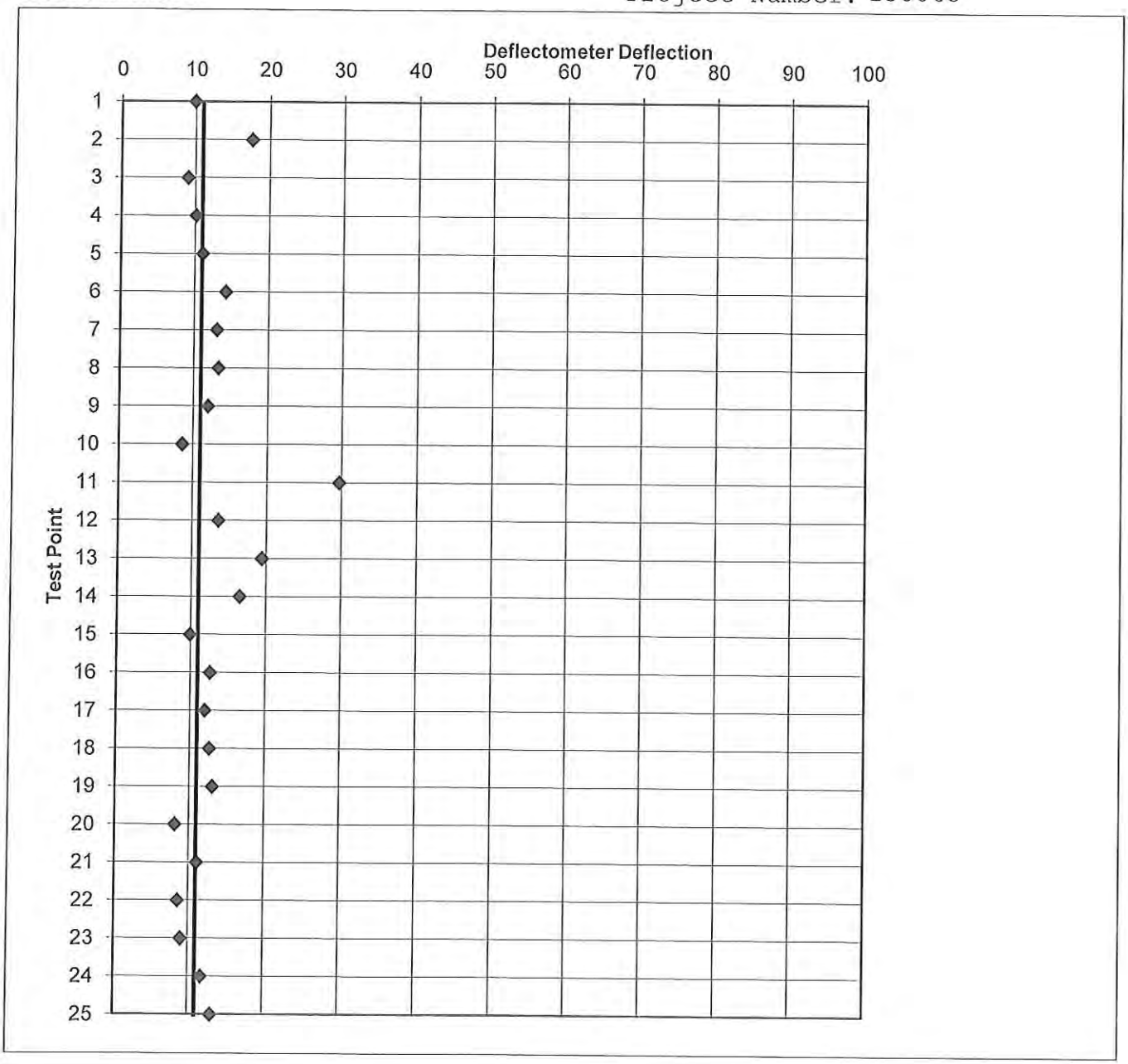
City of Paso Robles

Road: Spring
From: 12th
To: 24th
Lane/Line: NB

Survey Date: 03/15/13
Thickness: 1.20
Traffic Index: 8.00
Project Number: 130065



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Date: 4/1/2013

Client:	City of Paso Robles	Interval:	100
Road:	Spring	Survey Date:	3/15/13
From:	12th	Thickness:	1.20
To:	24th	Traffic Index:	8.00
Lane/Line:	NB	Project Number:	130065

Test Points	Dynaflect	Conditions	Comments	Deflection	Exclude
1	0.46			9.936	
2	0.80			17.649	
3	0.42		13th	9.028	
4	0.47			10.163	
5	0.51			11.070	
6	0.65			14.246	
7	0.60			13.112	
8	0.61		14th	13.339	
9	0.55			11.978	
10	0.40			8.575	
11	1.33			29.673	
12	0.62		15th	13.566	
13	0.88			19.464	
14	0.75			16.515	
15	0.46			9.936	
16	0.58		16th	12.658	
17	0.55			11.978	
18	0.58			12.658	
19	0.60		17th	13.112	
20	0.38			8.121	
21	0.51			11.070	
22	0.40			8.575	
23	0.42		18th	9.028	
24	0.54			11.751	
25	0.60			13.112	
26	0.72			15.834	
27	0.71		19th	15.608	
28	0.55			11.978	
29	0.56			12.205	
30	0.44		20th	9.482	
31	0.56			12.205	

32	0.52			11.297	
33	0.51			11.070	
34	0.64		21st	14.019	
35	0.67			14.700	
36	2.05			46.008	
37	0.74			16.288	
38	1.03		22nd	22.867	
39	2.46			55.309	
40	1.47			32.849	
41	0.81			17.876	
42	0.48		23rd	10.390	
43	0.98			21.733	
44	1.45			32.396	

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04/01/13

City of Paso Robles

Road: Spring
From: 24th
To: 12th
Lane/Line: SB

Survey Date: 03/15/13
Thickness: 1.20
Traffic Index: 8.00
Project Number: 130065

Deflection Data Analysis

Deflection Readings (Equivalent Deflectometer Units)

No. of Tests	Low	Mean	High	Std. Dev.
43	7.44	15.53	36.25	7.10

Road Surface

Thickness	Traffic Index
1.20	8.00

Structural Design

Tolerable	80th Percentile	90th Percentile	% Reduction	GE Deficient
17.00	21.49	24.61	20.89	0.12

HMA Overlay
0.06

PAVEMENT ENGINEERING INCORPORATED

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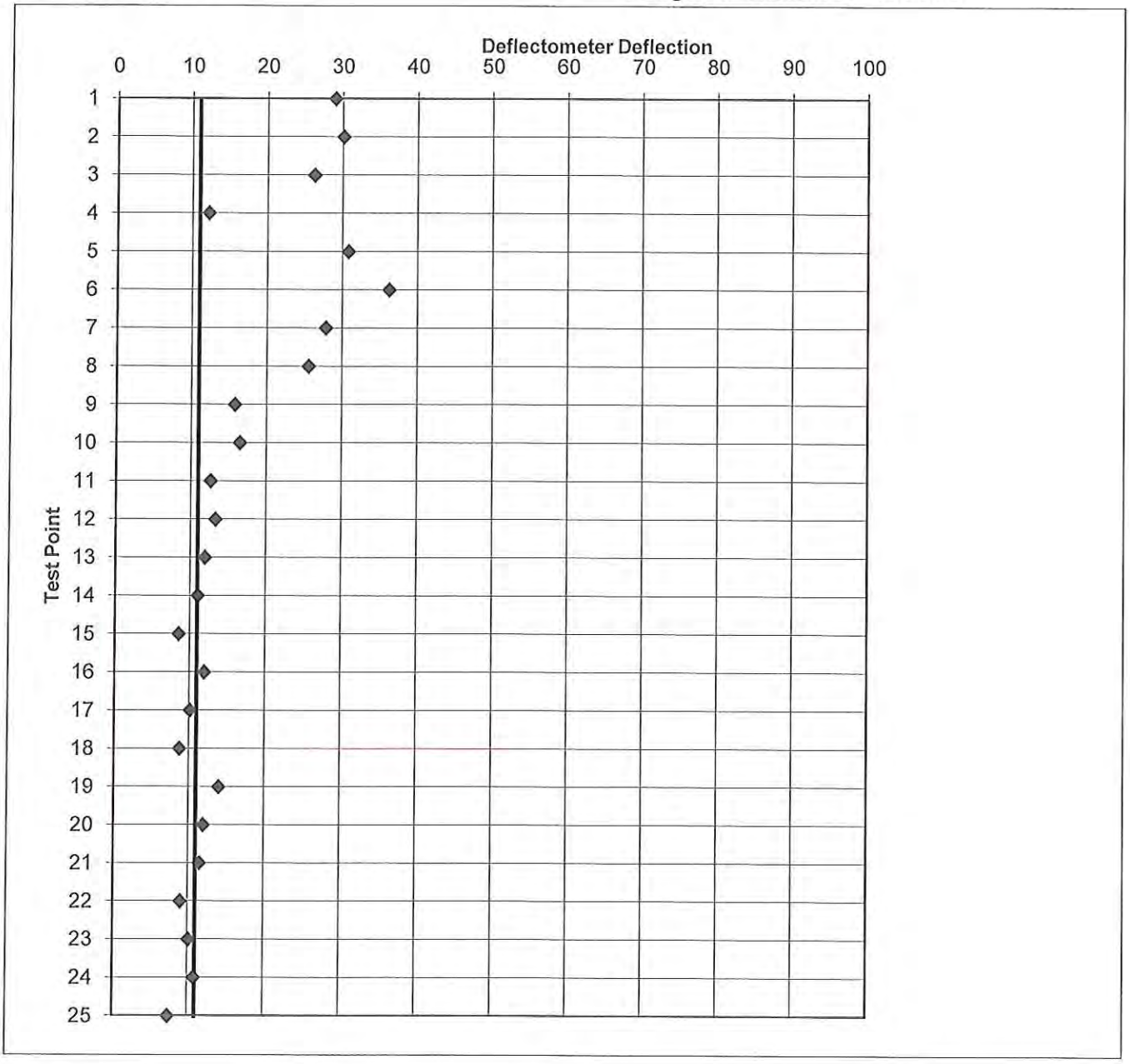
City of Paso Robles

Road: Spring
From: 24th
To: 12th
Lane/Line: SB

Survey Date: 03/15/13
Thickness: 1.20
Traffic Index: 8.00
Project Number: 130065



PAVEMENT ENGINEERING INCORPORATED

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Date: 4/1/2013

Client:	City of Paso Robles	Interval:	100
Road:	Spring	Survey Date:	3/15/13
From:	24th	Thickness:	1.20
To:	12th	Traffic Index:	8.00
Lane/Line:	SB	Project Number:	130065

Test Points	Dynaflect	Conditions	Comments	Deflection	Exclude
1	1.30			28.993	
2	1.35			30.127	
3	1.18			26.270	
4	0.56		23rd	12.205	
5	1.38			30.808	
6	1.62			36.252	
7	1.25		22nd	27.858	
8	1.15			25.590	
9	0.72			15.834	
10	0.75			16.515	
11	0.58		21st	12.658	
12	0.61			13.339	
13	0.55			11.978	
14	0.51			11.070	
15	0.40		20th	8.575	
16	0.55			11.978	
17	0.47			10.163	
18	0.41			8.802	
19	0.64		19th	14.019	
20	0.55			11.978	
21	0.53			11.524	
22	0.42		18th	9.028	
23	0.47			10.163	
24	0.50			10.843	
25	0.35			7.440	
26	0.43		17th	9.255	
27	0.55			11.978	
28	0.64			14.019	
29	0.53		16th	11.524	
30	0.40			8.575	
31	0.50			10.843	

32	0.63			13.793	
33	0.87		15th	19.237	
34	1.01			22.413	
35	0.89			19.691	
36	0.67			14.700	
37	0.63			13.793	
38	0.55			11.978	
39	0.89			19.691	
40	0.66		14th	14.473	
41	0.75		13th	16.515	
42	0.52			11.297	
43	0.46			9.936	

SPRING STREET – 1ST STREET TO 12TH STREET
4th Street looking Southbound

SPRING STREET – 1ST STREET TO 12TH STREET
4th Street looking Northbound

SPRING STREET – 1ST STREET TO 12TH STREET
5th Street looking Northbound

SPRING STREET – 1ST STREET TO 12TH STREET
8th Street looking Northbound

SPRING STREET – 1ST STREET TO 12TH STREET
11th Street looking Northbound

SPRING STREET – 1ST STREET TO 12TH STREET
11th Street looking Northbound

SPRING STREET – 12TH STREET TO 24TH STREET
14th Street looking Southbound

SPRING STREET – 12TH STREET TO 24TH STREET
14th Street looking Northbound

SPRING STREET – 12TH STREET TO 24TH STREET
16th Street looking Northbound

SPRING STREET – 12TH STREET TO 24TH STREET
19th Street looking Northbound

SPRING STREET – 12TH STREET TO 24TH STREET
22nd Street looking Northbound

SPRING STREET – 12TH STREET TO 24TH STREET
24th Street looking Southbound