

Appendix D: Ground Deformation in the Very Near Fault Region



Figure D-1: Observation and measurement segments of ground strain (red lines) & approximate observed fault trace (yellow line); produced in Google Earth; [NSF-GEER; Napa, CA; N 38.3040 W 122.3443; 8/26/14 - 8/28/14]



Figure D-2: Observed and measured tension (orange) and compression (green) locations; produced in AutoCAD; [NSF-GEER; Luque, R.; Wagner, N.; processed 9/5/14]



Figure D-3: Typical buckled compression zone in pavement perpendicular to fault, near observed fault trace [NSF-GEER; N 38.3039 W 122.3430; 8/26/2014 15:24]



Figure D-4: Overlapping compression zone in pavement parallel to fault, near road crossing [NSF-GEER; N 38.3054 W 122.3455; 8/26/2014 17:20]



Figure D-5: Buckled and crushed compression zone in pavement parallel to fault [NSF-GEER; N 38.3048 W 122.3460; 8/26/2014 18:52]



Figure D-6: Overlapping compression zone in pavement perpendicular and adjacent to fault [NSF-GEER; N 38.3025 W 122.3436; 8/27/2014 12:01]



Figure D-7: Lateral offset of overlapping compression zone in pavement perpendicular and adjacent to fault; offset is parallel to fault [NSF-GEER; N 38.3026 W 122.3437; 8/27/2014 12:02]



Figure D-8: Slight uplift in compressed zone of pavement perpendicular and near fault [NSF-GEER; N 38.3037 W 122.3430; 8/26/2014 15:48]



Figure D-9: Typical extension cracks in thermal joints of sidewalk pavement parallel to fault; ~13mm gap (left), ~7mm gap (right) [NSF-GEER; N 38.3067 W 122.3464; 8/28/2014 15:18]



Figure D-10: Extension crack in sidewalk pavement parallel to fault; ~3mm gap [NSF-GEER; N 38.3055 W 122.3454; 8/26/2014 18:30]



Figure D-11: Example of extension crack not considered due to shaved concrete [[NSF-GEER; N 38.3021 W 122.3430; 8/28/2014 09:17]



Figure D-12: Crushed section in pavement parallel to fault with compression features in curb strip perpendicular to fault, across from creek [NSF-GEER; N 38.3055 W 122.3467; 8/28/2014 14:30]



Figure D-13: Buckled section in pavement perpendicular to fault with compression features in curb strip and lawn parallel to fault, near observed fault trace [NSF-GEER; N 38.3018 W 122.3439; 8/25/2014 10:38]



Figure D-14: Compression feature in curb strip perpendicular to fault, across from creek [NSF-GEER; N 38.3065 W 122.3455; 8/28/2014 13:52]



Figure D-15: Cracks in asphalt perpendicular to fault trace near manhole covers [NSF-GEER; N 38.3063 W 122.3458; 8/28/2014 14:15 (left); N 38.3068 W 122.3465; 8/28/2014 15:19 (right)]



Figure D-16: Crushed curb perpendicular to fault trace [NSF-GEER; N 38.3035 W 122.3411; 8/25/2014 14:47]



Figure D-17: Extension crack in curb parallel to fault trace [NSF-GEER; N 38.3066 W 122.3465; 8/28/2014 15:08]



Figure D-18: Buckled curb parallel to fault trace [NSF-GEER; N 38.3073 W 122.3443; 8/28/2014 13:41]



Figure D-19: Buckled curb adjacent to pavement perpendicular to fault trace; visible cracking in soil aligns with cracks in curb [NSF-GEER; N 38.3027 W 122.3407; 8/28/2014 10:25]



Figure D-20: Buckled section of fence for strain measurements [NSF-GEER; N 38.3015 W 122.3442; 8/25/2014 09:57]

Table D-1: Summary of strain measurements in parallel trending roads [NSF-GEER; Wagner, N.; processed 9/3/2014]

N-S (PARALLEL) TRENDING ROADS				
	East Side		West Side	
	Total Length (m)	Average Strain (%)	Total Length (m)	Average Strain (%)
West of Fault				
Estates Dr	90.0	-0.01	77.5	-0.07
White Cliff Cir (West)	71.4	0.05	71	-0.02
Stonybrook Dr	459.2	-0.04	508.0	-0.03
Tall Grass Dr	N/A	N/A	199.0	-0.05
Casper Way	203.9	0.01	220.2	-0.01
Weighted Average Strain		-0.01		-0.03
East of Fault				
Twin Oaks Ct	69.8	0.00	69.8	0.00
Dellbrook Dr	75	0.00	44.15	0.00
Weighted Average Strain		0.00		0.00
Crossing Fault				
White Cliff Cir (East)	50.7	0.01	50.7	0.36

Table D-2: Summary of strain measurements in perpendicular trending roads [NSF-GEER; Wagner, N.; processed 9/3/2014]

E-W (PERPENDICULAR) TRENDING ROADS				
	North Side		South Side	
	Total Length (m)	Average Strain	Total Length (m)	Average Strain
West of Fault				
Twin Oaks Dr	297.3	-0.02	274.1	0.01
White Cliff Cir	163.0	-0.05	164.5	0.04
Meadowbrook Dr	221.7	0.00	221.7	0.00
Weighted Average Strain		-0.02		0.01
East of Fault				
Twin Oaks Dr	212.1	0.00	208.9	0.00
Meadowbrook Dr	209.4	0.00	N/A	N/A
Weighted Average Strain		0.00		0.00
Crossing Fault				
Meadowbrook Dr	40	-0.24	30	-0.17

Table D-3: Strain measurements for Estates Drive [NSF-GEER; Cohen-Waeber, J.; Gardner, M.; Lanzafame, R.; Wagner, N.; measured 8/26/2014]

Location:	Estates Drive
Approximate orientation relative to fault trace:	Parallel & West

EAST SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Lowry Ct & Twin Oaks Dr	1	21.5	25.0	25.0	0	0.25	-0.03
	2	21.5	25.0	25.0	0	0	0.00
	3	21.0	25.0	25.0	0	0	0.00
	4	21.5	15.0	15.01	0	0.25	-0.04
Total			90.00	90.01	Average Strain		-0.01
					Average Disp. (m)		-0.01

WEST SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Twin Oaks Dr & Lowry Ct	1	201.5	25.00	25.05	0	2	-0.20
	2	201.0	25.00	25.00	0	0	0.00
	3	200.5	25.00	25.00	0	0	0.00
	4	201.0	2.45	2.45	0	0	0.00
Total			77.45	77.50	Average Strain		-0.07
					Average Disp. (m)		-0.05

Table D-4: Strain measurements for White Cliff Circle (continued on next page) [NSF-GEER; Carlosama, H.; Gardner, M.; Wagner, N.; measured 8/27/2014]

Location:

White Cliffs Cir

WESTERN NORTH-SOUTH LEG

EAST SIDE MEASUREMENTS:

Approximate orientation relative to fault trace: Parallel & West

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Twin Oaks Dr & White Cliffs Cir	1	226.0	71.4	71.4	1.5	0	0.05
Total			71.4	71.4	Average Strain		0.05
			Average Disp. (m)				0.04

WEST SIDE MEASUREMENTS:

Approximate orientation relative to fault trace: Parallel & West

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Twin Oaks Dr & White Cliffs Cir	1	28.0	25	25.0	0	0	0.00
	2	40.5	25	25.0	12.25	13	-0.08
	3	40.5	21	21.0	0.24	0	0.03
Total			71	71.01	Average Strain		-0.02
			Average Disp. (m)				-0.01

EASTERN NORTH-SOUTH LEG

EAST SIDE MEASUREMENTS:

Approximate orientation relative to fault trace: Parallel & East

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Twin Oaks Dr & White Cliffs Cir	1	355.5	25.7	25.7	0.125	0	0.01
	2	357.0	25	25.0	0.125	0	0.01
Total			50.7	50.7	Average Strain		0.01
			Average Disp. (m)				0.01

Approximate orientation relative to fault trace: Parallel & West (gage#1) and East(rest)

NOTE: *Fault trace runs through portion of gage #1, sidewalk very distorted*

NORTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
White Cliffs Cir & White Cliffs Cir	1	275.5	13	13.0	0	1.75	-0.34
	2	291.5	25	25.0	0	0	0.00
	3	290.5	25	25.0	0	0	0.00
	4	291.0	25	25.0	0.125	0	0.01
	5	291.0	25	25.0	0.25	2	-0.18
	6	291.0	25	25.0	0.125	0	0.01
	7	291.5	25	25.0	0.20	0	0.02
Total			163	163.08	Average Strain		-0.05
Average Disp. (m)						-0.08	

Approximate orientation relative to fault trace: Perpendicular & West

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
White Cliffs Cir & White Cliffs Cir	1	111.0	25	25.0	0.625	0	0.06
	2	112.0	25	25.0	0.29	0.5	-0.02
	3	111.5	25	25.0	0.125	0	0.01
	4	111.0	25	25.0	0	0	0.00
	5	111.5	25	25.0	0.25	0	0.03
	6	110.5	25	25.0	0.41	0	0.04
	7	111.0	14.5	14.5	1.125	0	0.20
Total			164.5	164.44	Average Strain		0.04
Average Disp. (m)						0.05	

Table D-5: Strain measurements for Stonybrook Drive (continued on next page) [NSF-GEER; Cohen-Waeber, J.; Gardner, M.; Lanzafame, R.; Wagner, N.; measured 8/26/2014]

Location: Stonybrook Drive
Approximate orientation relative to fault trace: Parallel & West

EAST SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Timberhill Ln & Twin Oaks Dr	1	60.5	25	25.0	0	0	0.00
	2	60.0	25	25.0	0	0	0.00
	3	65.5	25	25.0	0	0	0.00
	4	59.0	17.9	17.92	0	0.625	-0.09
Twin Oaks Dr & Meadowbrook Dr	5	46.0	15.8	15.8	0	1	-0.16
	6	42.5	25	25.0	0	0	0.00
	7	32.5	25	25.1	0	5.5	-0.56
	8	25.5	25	25.0	0	0.25	-0.03
	9	20.0	25	25.0	0	0.75	-0.08
	10	21.0	2.05	2.1	0	0	0.00
Meadowbrook Dr & Sandybrook Ln	11	23.5	6	6.0	0	0	0.00
	12	20.5	25	25.0	0.25	1.75	-0.15
	13	23.0	25	25.0	0.25	0.25	0.00
	14	21.0	25	25.0	0	0	0.00
	15	50.5	15	14.9	0	-4.5	0.77
Sandybrook Ln & Glenbrook Ln	16	52.5	17.45	17.5	0	0	0.00
	17	53.0	25	24.0	0	1.5	-0.15
	18	52.5	25	25.0	0	0.25	-0.03
	19	52.5	6.8	6.8	0	0	0.00
Glenbrook Ln & Woodbrook Dr	20	46.5	3.2	3.2	0	0	0.00
	21	44.0	25	25.0	0	0	0.00
	22	42.5	25	25.0	0	0	0.00
	23	42.0	25	25.0	0	0	0.00
Total			459.20	459.37	Average Strain		-0.04
			Average Disp. (m)				-0.17

NOTE: Twin Oaks Dr intesection width 16.3m
Meadowbrook Dr intesection width 16.95m
Sandybrook Ln intesection width 17.55m
Glenbrook Ln intesection width 15.0m

WEST SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Woodbrook Dr & Meadowbrook Dr	1	221.5	25	25.0	0	0	0.00
	2	223.0	25	25.0	0	0	0.00
	3	223.5	25	25.0	0.25	0	0.03
	4	229.5	25	25.0	0.375	0.75	-0.04
	5	233.0	25	25.0	0.125	0	0.01
	6	233.5	25	25.1	0.75	6	-0.53
	7	233.5	25	25.0	1.5	0	0.15
	8	228.0	25	25.0	0.75	0	0.08
	9	204.5	25	25.0	0	1.75	-0.18
	10	200.5	25	25.0	0	0	0.00
	11	200.5	25	25.0	0	1.125	-0.11
	12	204.0	6.35	6.4	0	0	0.00
MeadowbrookDr & Timberhill Ln	13	205.0	1.6	1.6	0	0	0.00
	14	200.5	25	25.0	0	-1	0.10
	15	204.0	25	25.0	0	0	0.00
	16	212.0	25	25.0	0.25	0.75	-0.05
	17	221.5	25	25.0	0	0	0.00
	18	230.0	25	25.0	0	0	0.00
	19	239.5	25	25.0	0	0	0.00
	20	248.5	25	25.0	0	0.75	-0.08
	21	248.0	25	25.0	0	0	0.00
	22	237.5	25	25.0	0	0	0.00
Total			507.95	508.10	Average Strain		-0.03
					Average Disp. (m)		-0.15

NOTE: Meadowbrook Dr intesection width 17.05m

Table D-6: Strain measurements for Tall Grass Drive [NSF-GEER; Carlosama, H.; Lanzafame, R.; Luque, R.; Wagner, N.; measured 8/28/2014]

Location: Tall Grass Dr
Approximate orientation relative to fault trace: Parallel & West

WEST SIDE MEASUREMENTS:

Positive strain is extension, negative is compression

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
North Bridge & Skylark Way	1	221.5	25	25.0	0	1.25	-0.13
	2	221.0	25	25.0	0	0	0.00
	3	229.5	25	25.0	0	0	0.00
	4	241.0	25	25.0	0	0	0.00
	5	245.5	23.95	24.0	0	0	0.00
Skylark Way & Beartooth Lane	6	217.5	25	25.1	0	5.25	-0.53
	7	218.5	25	25.0	1.625	0.25	0.14
	8	235.0	25	25.0	1.375	0	0.14
	9	235.0	25	25.0	1	0	0.10
	10	226.5	25	25.0	0.25	0	0.03
	11	216.5	25	25.0	0.125	0	0.01
	12	209.0	25	25.0	0.375	0	0.04
	13	219.5	17	17.0	0.5	0	0.07
Total			198.95	199.04	Average Strain		-0.05
Average Disp. (m)						-0.04	

- NOTE:**
- Crushed curb in Section 2
 - Asphalt crack in Section 7
 - Crushed curb / displacement toward creek and asphalt crack in Section 8
 - Most of deformation toward creek (transverse to pavement) in Section 13
 - Skylark Way Intersection width 14.80m

Location:	Casper Way
Approximate orientation relative to fault trace:	Parallel & West

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Beartooth Lane & Skylark Way	1	29.0	22.50	22.5	0.0625	0	0.01
	2	40.0	24.75	24.8	0	0	0.00
	3	40.0	25.00	25.0	0	0.5	-0.05
	4	38.0	25.70	25.7	1	0	0.06
	5	39.0	24.15	24.1	0.625	0.5	0.01
	6	44.0	24.15	24.1	0.4375	0	0.05
	7	52.5	23.60	23.6	0.0625	0	0.01
	8	60.0	34.00	34.0	0.125	0	0.01
Total		203.85	203.83	Average Strain		0.012	
Average Disp. (m)						0.008	

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Beartooth Lane & Skylark Way	1	29.0	27.25	27.3	0	0	0.00
	2	40.5	25.8	25.8	0	1	-0.10
	3	40.5	29.8	29.8	0.06	0	0.01
	4	38.5	24.25	24.2	0.06	0	0.01
	5	38.5	26	26.0	0.4375	0	0.04
	6	45.0	25.8	25.8	0.1875	0	0.02
	7	51.5	26	26.0	0.0625	0.25	-0.02
	8	59.0	35.25	35.3	0	0	0.00
Total		220.15	220.16	Average Strain		-0.005	
Average Disp. (m)						-0.004	

Table D-8: Strain measurements for Twin Oaks Court [NSF-GEER; Carlosama, H.; Lanzafame, R.; Luque, R.; Wagner, N.; measured 8/28/2014]

Location: Twin Oaks Court
Approximate orientation relative to fault trace: Parallel & East

EAST SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Twin Oaks Ct & Twin Oaks Dr	1	175.5	25	25.0	0	0	0.00
	2	175.5	25	25.0	0	0	0.00
	3	175.5	19.8	19.8	0	0	0.00
Total			69.8	69.80	Average Strain		0.000
					Average Disp. (m)		0.00

NOTE: - Symmetric to west side measurements; no cracks

WEST SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Twin Oaks Ct & Twin Oaks Dr	1	357.0	25	25.0	0.125	0	0.01
	2	355.5	25	25.0	0	0	0.00
	3	356.5	19.8	19.8	0	0	0.00
Total			69.8	69.80	Average Strain		0.005
					Average Disp. (m)		0.003

NOTE: - Gage 3 has ~1/8" gaps in sidewalk corresponding to expansion joints every 3.7m; not included since debris inside crack suggested they existed prior to earthquake

Table D-9: Strain measurements for Dellbrook Drive [NSF-GEER; Carlosama, H.; Lanzafame, R.; Luque, R.; Wagner, N.; measured 8/28/2014]

Location: Dellbrook Dr
Approximate orientation relative to fault trace: Parallel & East

EAST SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Meadowbrook Dr & Woodbrook Dr	1	21.5	25	25.0	0	0	0.00
	2	21.0	25	25.0	0	0	0.00
	3	21.0	25	25.0	0	0	0.00
	4	21.0	25	25.0	0	0	0.00
	5	21.0	25	25.0	0	0.125	-0.01
	6	20.5	25	25.0	0	0	0.00
	7	21.0	25	25.0	0	0	0.00
	8	21.5	30	30.0	0	0	0.00
Total			75	75.00	Average Strain		0.000
			Average Disp. (m)				0.000

NOTE: - West side of street not measured, no cracks or pavement buckles observed
 - On west side, Glenbrook crossing is 15.35m and Sandybrook crossing is 15.50m

Table D-10: Strain measurements for Twin Oaks Drive west of fault (continued on next page) [NSF-GEER; Carlosama, H.; Gardner, M.; Wagner, N.; measured 8/27/2014]

Location: Twin Oaks Drive
Approximate orientation relative to fault trace: Perpendicular & West

NORTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
~8.4m east of fault trace & White Cliffs Cir	1	269.0	25	25.1	1.75	5	-0.33
	2	276.0	25	25.0	0.16	0	0.02
	3	282.0	25	25.0	0	0	0.00
	4	290.5	25	25.0	0.25	0.5	-0.03
	5	291.5	25	25.0	0	0	0.00
	6	290.5	25	25.0	0.04	0	0.00
	7	291.5	25	25.0	0	0	0.00
	8	290.5	25	25.0	0.125	0	0.01
	9	291.0	15.82	15.8	0.125	0	0.02
White Cliffs Cir & Stonybrook Dr	10	301.0	25	25.0	0	0	0.00
	11	309.0	25	25.0	0.125	0	0.01
	12	321.0	31.5	31.5	0.04	0	0.00
Total			297.32	297.39	Average Strain		-0.02
			Average Disp. (m)				-0.07

NOTE: - Gage 1 starts east of fault rupture and continues west. Fault trace intersects gauge length at ~ 8.4m. 2 inches of north-south offset noted 18.0m along gage length
 - White Cliffs Cir intersection width 10.80m

SOUTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Stonybrook Dr & Estates Dr	1	141.0	25	25.0	0.75	0.375	0.04
	2	133.0	25	25.0	0.5	0	0.05
	3	124.0	25	25.0	0	0	0.00
	4	115.0	25	25.0	0	0	0.00
	5	111.0	25	25.0	0	0	0.00
	6	111.0	25	25.0	0	0	0.00
	7	111.5	25	25.0	0	0	0.00
	8	112.0	28.1	28.1	0	0	0.00
Estates Dr & ~fault trace	9	110.0	25	25.0	0	0	0.00
	10	103.0	25	25.0	0.25	0	0.03
	11	96.0	21	21.0	0.25	0	0.03
Total			274.1	274.07	Average Strain		0.01
Average Disp. (m)							0.03

NOTE:

- Gage 11 ends ~3m west of estimated fault trace
- Repairs to road & sidewalk on Twin Oaks Drive in vicinity of fault trace made it impossible to take strain reading of the sidewalk
- Compression perpendicular to Gage #3 in driveway of 3587 Twin Oaks Drive
- Estates Dr intersection width 15.77m

Table D-11: Strain measurements for Meadowbrook Drive west of fault [NSF-GEER; Carlosama, H.; Lanzafame, R.; Luque, R.; Wagner, N.; measured 8/28/2014]

Location:	Meadowbrook Dr
Approximate orientation relative to fault trace:	Perpendicular & West

NORTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
~37.5m west of fault trace & Stonybrook Dr	1	291.0	25	25.0	0	0	0.00
	2	291.0	25	25.0	0	0	0.00
	3	291.5	25	25.0	0	0	0.00
	4	291.0	25	25.0	0.13	0	0.01
	5	291.5	25	25.0	0	0.5	-0.05
	6	291.5	25	25.0	0	0	0.00
	7	290.5	25	25.0	0	0	0.00
	8	290.0	25	25.0	0	0	0.00
	9	291.0	21.7	21.7	0	0	0.00
Total		221.7	221.71	Average Strain		-0.004	
Average Disp. (m)						-0.003	

SOUTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
~37.5m west of fault trace & Stonybrook Dr	1	291.0	25	25.0	0	0	0.00
	2	291.0	25	25.0	0	0	0.00
	3	291.0	25	25.0	0	0.125	-0.01
	4	292.5	25	25.0	0.563	0.5	0.01
	5	291.5	25	25.0	0	0	0.00
	6	290.5	25	25.0	0	0	0.00
	7	291.0	25	25.0	0	0	0.00
	8	291.5	25	25.0	0	0	0.00
	9	291.5	21.7	21.7	0	0	0.00
Total		221.7	221.70	Average Strain		-0.001	
Average Disp. (m)						-0.001	

Table D-12: Strain measurements for Twin Oaks Drive east of fault [NSF-GEER; Carlosama, H.; Lanzafame, R.; Luque, R.; Wagner, N.; measured 8/28/2014]

Location: Twin Oaks Drive
Approximate orientation relative to fault trace: Perpendicular & East

NORTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
White Cliff Cir & Quail Ct	1	85.0	25	25.0	0	0	0.00
	2	85.0	25	25.0	0	0	0.00
	3	87.0	21.3	21.3	0	0	0.00
Quail Ct & Sunburst Ct	4	85.5	25	25.0	0.125	0	0.01
	5	85.5	25	25.0	0	0	0.00
	6	84.5	17.1	17.1	0	0	0.00
Sunburst Ct & Buhman Ave	7	88.0	25	25.0	0	0	0.00
	8	96.5	25	25.0	0	0	0.00
	9	108.0	23.7	23.7	0	0	0.00
Total			212.10	212.10	Average Strain		0.001
					Average Disp. (m)		0.003

SOUTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Twin Oaks Ct & Buhman Ave	1	287.5	23.7	23.7	0	0	0.00
	2	275.5	25	25.0	0	0	0.00
	3	266.0	25	25.0	0	0	0.00
	4	266.0	25	25.0	0	0	0.00
	5	265.5	25	25.0	0	0.25	-0.03
	6	265.5	25	25.0	0	0	0.00
	7	265.0	25	25.0	0	0	0.00
	8	266.5	25	25.0	0	0	0.00
	9	266.5	10.2	10.2	0	0	0.00
Total			208.9	208.9	Average Strain		-0.003
					Average Disp. (m)		-0.01

NOTE: - Lengths on south side inferred from gage numbers and lengths on north side
- South side is 38.8m shorter at western end, but does not include the gaps due to street crossings at Quail Ct (16.4m) and Sunburst Ct (26.50m)
- No noticeable cracks except for single compression zone

Table D-13: Strain measurements for Meadowbrook Drive east of fault [NSF-GEER; Cohen-Waeber, J.; Gardner, M.; Lanzafame, R.; Wagner, N.; measured 8/26/2014]

Location: Meadowbrook Dr
Approximate orientation relative to fault trace: Perpendicular & East

NORTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Twin Oaks Ct & Twin Oaks Dr	1	291.5	100	100.0	0.75	0.75	0.00
	2	291.5	100	100.0	0.25	0.5	-0.01
	3	291.5	9.35	9.4	0	0	0.00
Total			209.35	209.36	Average Strain		-0.003
					Average Disp. (m)		-0.006

NOTE: - First segment measured, so the gage lengths are very long before we realized that a shorter gage would be better suited for this task

Table D-14: Strain measurements for Meadowbrook Drive across the fault [NSF-GEER; Cohen-Waeber, J.; Gardner, M.; Lanzafame, R.; Wagner, N.; measured 8/26/2014]

Location: Meadowbrook Dr
Approximate orientation relative to fault trace: Perpendicular & Across

NORTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Across fault	1	73.5	10.6	10.7	0	3.75	-0.89
	2	74.0	29.4	29.4	0	0	0.00
Total			40	40.09	Average Strain		-0.235
						Average Disp. (m)	-0.09

SOUTH SIDE MEASUREMENTS:

Bounding Streets	Gage Number	Heading (deg)	Length (m)	Orig. Length (m)	Total Ext (in)	Total Comp (in)	Strain (%)
Across fault	1	88.0	18	18.0	0.25	1.5	-0.18
	2	75.0	12	12.0	0	0.75	-0.16
Total			30	30.05	Average Strain		-0.169
						Average Disp. (m)	-0.051

Table D-15: Strain measurements for fence adjacent to fault trace [NSF-GEER; Lanzafame, R; Wagner, N.; measured 8/25/2014]

Section Number (Top)	Length (m)	Section Number (Bottom)	Length (m)
1	1.5	1	11.9
2	4.8		
3	2.4		
4	2.4		
5	4.9	2	9.8
6	4.9		
7	2.4		
8	2.4		
9	2.4	3	11.2
10	2.4		
11	2.4		
Total	33.0		32.9
Average Strain			-0.36
Average Disp. (m)			-0.12