SUBSIDENCE MONITORING REPORT
1998
STAR POINT MINE
ACT/007/006

for:
Cyprus Plateau Mining Corporation
847 Northwest Highway 191
Helper, Utah 84526

May 1999

INTRODUCTION

During the months June through September, subsidence monitoring was conducted on surface lands above underground mining. The land surface above all full extraction mining was visually searched for evidence of surface disturbance. Monitoring points G-1 through G-19 have reached maximum effective subsidence and therefore not surveyed in 1998. Monitoring points G-20 through G-114 (Map 521.121f and 521.121g1) were surveyed for vertical movement (attached spreadsheet).

Mining during 1998 was conducted in the areas shown on Map T- 1 located at the end of this report.

SURFACE EFFECTS

Longwall Mining Panels 18 through 30

Monitoring points G-1 through G-19 were not surveyed in 1998; Cross Section D-D, Figure 11 shows the subsidence profile. As can be seen on Figure 11, subsidence appears to have reached maximum extent in this area. Monitoring points G-20 through G-49 as shown on Map 521.121f were surveyed for vertical movement. Cross Sections D-D (Figure 11), E-E (Figure 12), G-G (Figure 13), H-H (Figure 14), I-I' (Figure 15), and J-J' (Figure 16) were plotted from the data at these monitoring points. As can be seen on the cross sections, maximum subsidence is 5.33 feet at monitoring station G-15. Subsidence at the Fox points is greatest at Fox 3, at 5.74 feet.

As shown on Cross Sections D-D and E-E, Figures 11 and 12 respectively, the angle of draw at these locations is 26 degrees and 24 degrees. The angle of draw at Cross Sections G-G and H-H, Figures 13 and 14 respectively are 25 degrees and 5 degrees, respectively. It appears that the angle of draw is affected by faulting or jointing of the strata. No conclusions can be reached about the angle of draw at Cross Sections I-I' and J-J' because subsidence is felt to be within surveying accuracy.

Longwall Mining Panels 31 through 42 - Castle Valley Ridge Lease

Mining in 1998 did not include any mining in this region. Mining in this area concluded in November 1997, at which time a portion of Panel 38, all of Panel 39, 40, 41, and 42 were mined. It should be noted that, due to geologic conditions, the 3rd North Mains were developed more northward than previously presented. Subsidence monitoring has been established to detect any vertical movement.

Monitoring points G-50 through G-104, as shown of Map 521.121g1, were surveyed for vertical movement. Cross sections K-K' (Figure 17), L-L' (Figure 18), M-M' (Figure 19), N-N' (Figure 20), O-O' (Figure 21), and P-P' (Figure 22) were plotted from data at these monitoring points. Maximum subsidence during the 1998 monitoring is 6.59 feet (1996) at station G-58 above Longwall Panel Number 32.

Mining of the entries beneath the Little Park channel was not conducted. Even though subsidence Cross Sections N-N', and O-O' indicate minor subsidence (0.28 feet) beneath the channel, it is not clear

that subsidence actually occurred. The channel is outside of the angle of draw expected when comparing the angle of draws experienced elsewhere in the area west of the graben. There is no physical evidence of subsidence at the ground surface in the channel. Further monitoring will document any ground surface movement or cracking in this area.

Some minor cracking was observed above Longwall Panel 41 consisting of openings in the range of 4 to 6 inches. These cracks were observed during the 1998 subsidence monitoring and showed signs of healing and did not exhibit any signs of worsening. These cracks do not pose a threat to livestock or wildlife. These cracks will be observed in 1999 to evaluate the natural healing process and hazard potential. If any hazards exist CPMC will take the appropriate actions.

MITIGATION

A portion of the surface cracks near monitoring points U1 and U2 in Section 18 have been repaired to reduce the likelihood of accidents. The cracks were backfilled and the area fenced. Signs are in place in the area warning the public of the potential danger of the unstable ground. This area is fee land owned by the U.S. Fuel Company; Cyprus Plateau Mining Corporation has an agreement with U.S. Fuel which allows mining impacts. In the fall of 1995, the cracks were plugged with foam to provide additional protection to the public and provide a base for future backfilling.

The cracks in the northwest quarter of Section 12 are fenced and danger signs placed to warn the public of the hazards. They are in a very rugged area where very few people travel.

The cracks above Longwall Panel 41 will be mitigated if necessary to prevent any hazards.

VEGETATION

Vegetation via color infrared photography was performed in 1998, and based on the report generated by Mt. Nebo Scientific, it does not appear that mining and subsidence has significantly affected the major plant community types within the permit

SURFACE WATER AND GROUND WATER

The Section 18 is the subject of a study of the effects of longwall mining on ground water and surface water. The study ran through 1992, with the final report completed in 1995. The study was undertaken in conjunction with the U.S. Geological Survey and the Division of Oil, Gas and Mining, the U.S. G. S. published the final report.

Biannual stream monitoring of the North Fork of the Right Fork of Miller Creek was conducted in 1998, with stream flow present throughout the entire monitoring stream segment. This was the first year since mining in this region that flows existed along the entire monitoring segment.

SURFACE STRUCTURES

There does not appear to be any impact to surface structures resulting from subsidence

MONITORING

Monitoring in 1999 will include the following:

1. Survey monitoring points G-64 through G-114 above longwall panels 34 through 42, as shown on Map 521.121g1. Since longwall mining is complete at the Star Point Mine no further monitoring points will be established.

2. Visual observations of the ground surface above all mined areas for surface effects of mining.

3. Monitoring of areas mined by continuous miner methods will be conducted.

1998 MINING

Mining conducted during 1998 is shown on Map T-1 -Star Point No. 2 Mine, 1998 Production Map, located at the end of this report.

CYPRUS-PLATEAU MINING CORPORATION

SUBSIDENCE MONITORING ELEVATIONS

ELEVATIONS

STATION	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Gentry Ridge																
G1									9935.44	9935.44	9935.44	9935.44	9935.50			
G2									9899.58	9899.54	9899.55	9899.48	9899.59			
G3									9857.66	9857.60	9857.52	9857.50	9857.58			
G4									9819.37	9819.26	9819.14	9819.13	9819.19			
G5									9795.90	9795.68	9795.52	9795.45	9795.56			
G6									9777.95	9777.35	9776.98	9776.87	9776.98			
G7									9767.64	9765.58	9764.59	9764.44	9764.55			
G8									9763.47	9760.43	9759.01	9758.88	9759.00			
G9									9760.85	9758.73	9756.36	9756.25	9756.35			
G10									9776.22	9774.97	9771.56	9771.37	9771.52			
G11									9786.81	9785.90	9781.99	9781.80	9781.92			
G12									9814.63	9814.30	9809.87	9809.52	9809.64			
G13									9747.45	9747.03	9742.80	9742.22	9742.32			
G14									9711.85	9711.95	9707.81	9706.77	9706.77			
G15									9740.52	9740.63	9736.86	9735.16	9735.19			
G16									9905.61	9905.26	9905.29	9905.29	9905.36			
G17									9906.11	9905.89	9905.93	9905.93	9906.01			
G18									9896.98	9896.85	9896.91	9896.91	9897.00			
G19									9863.97	9863.98	9863.98	9863.98	9863.98			
G20											9950.60	9946.66	9946.66	9946.48	9946.48	9946.22
G21											9946.96	9942.43	9942.36	9942.20	9942.18	9941.94
G22											9941.26	9936.49	9936.38	9936.21	9936.19	9935.96
G23											9927.26	9922.20	9922.02	9921.84	9921.82	9921.60
G24											9847.75	9845.31	9845.04	9844.75	9844.69	9844.54
G25											9795.88	9795.14	9795.00	9794.84	9794.75	9794.65
G26											9771.01	9771.14	9771.04	9770.96	9770.89	9770.82
G27											9732.52	9732.91	9732.84	9732.77	9732.66	9732.62
G28											9735.84	9736.39	9736.32	9736.32	9736.32	9736.32
G29											9534.48	9533.53	9533.93	9533.92	9533.87	9533.83
G30											9457.55	9457.11	9457.39	9457.38	9457.30	9457.20
G31											9377.03	9376.82	9377.06	9377.05	9376.99	9376.87
G32											9309.41	9309.32	9309.48	9309.46	9309.46	9309.36
G33											9242.76	9242.76	9242.95	9242.94	9242.89	9242.75
G34											9164.21	9164.13	9164.30	9164.30	9164.21	9164.18
G35											9078.66	9078.72	9078.86	9078.88	9078.77	9078.62

SUBSIDENCE IN FEET INDICATES DROP IN GROUND SURFACE

STATION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR13
Gentry Ridge													
G1	0.00	0.00	0.00	0.06									
G2	-0.04	-0.03	-0.10	0.01									
G3	-0.06	-0.14	-0.16	-0.08									
G4	-0.11	-0.23	-0.24	-0.18									
G5	-0.22	-0.38	-0.45	-0.34									
G6	-0.60	-0.97	-1.08	-0.97									
G7	-2.06	-3.05	-3.20	-3.09									
G8	-3.04	-4.46	-4.59	-4.47									
G9	-2.12	-4.49	-4.60	-4.50									
G10	-1.25	-4.66	-4.85	-4.70									
G11	-0.91	-4.82	-5.01	-4.89									
G12	-0.33	-4.76	-5.11	-4.99									
G13	-0.42	-4.65	-5.23	-5.13									
G14	0.10	-4.04	-5.08	-5.08									
G15	0.11	-3.66	-5.36	-5.33									
G16	-0.35	-0.32	-0.32	-0.25									
G17	-0.22	-0.18	-0.18	-0.10									
G18	-0.13	-0.07	-0.07	0.02									
G19	0.01	0.01	0.01	0.01									
G20	-3.94	-3.94	-4.12	-4.12	-4.38								
G21	-4.53	-4.60	-4.76	-4.78	-5.02								
G22	-4.77	-4.88	-5.05	-5.07	-5.30								
G23	-5.06	-5.24	-5.42	-5.44	-5.66								
G24	-2.44	-2.71	-3.00	-3.06	-3.21								
G25	-0.74	-0.88	-1.04	-1.13	-1.23								
G26	0.13	0.03	-0.05	-0.12	-0.19								
G27	0.39	0.32	0.25	0.14	0.10								
G28	0.55	0.48	0.48	0.48	0.48								
G29	-0.95	-0.55	-0.56	-0.61	-0.65								
G30	-0.44	-0.16	-0.17	-0.25	-0.35								
G31	-0.21	0.03	0.02	-0.04	-0.16								
G32	-0.09	0.07	0.05	0.05	-0.05								
G33	0.00	0.19	0.18	0.13	-0.01								
G34	-0.08	0.09	0.09	0.00	-0.03								
G35	0.06	0.20	0.22	0.11	-0.04								

05/10/99

CYPRUS-PLATEAU MINING CORPORATION
SUBSIDENCE MONITORING ELEVATIONS

ELEVATIONS

STATION	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
G36											9004.10	9004.15	9004.31	9004.31	9004.18	9004.02
G37											9045.63	9045.69	9045.73	9045.72	9045.60	9045.50
G38											9154.56	9154.38	9154.48	9154.47	9154.40	9154.37
G39											9078.99	9078.91	9079.01	9079.00	9078.92	9078.89
G40											8986.00	8985.96	8986.11	8986.12	8986.00	8985.98
G41											8879.72	8879.74	8879.90	8879.91	8879.78	8879.68
G42											8903.57	8903.59	8903.75	8903.78	8903.63	8903.52
G43											8996.08	8996.03	8996.13	8996.12	8995.98	8995.96
G44												9063.03	9063.03	9063.03	9063.03	9063.03
G45												8965.48	8965.58	8965.55	8965.54	8965.60
G46												8875.95	8876.04	8876.00	8875.92	8875.89
G47												8804.53	8804.61	8804.60	8804.50	8804.47
G48												8757.32	8757.37	8757.35	8757.25	8757.22
G49												8845.44	8845.50	8845.47	8845.40	8845.38
G50												9967.36	9967.18	9965.80	9966.30	9966.30
G51												9989.85	9989.68	9983.68	lost	lost
G52												10011.33	10011.37	10005.04	10005.55	10005.60
G53												10032.26	10032.39	10026.26	10026.66	10026.70
G54												10042.87	10043.05	10036.98	10037.20	10037.25
G55												10065.51	10065.72	10060.44	10060.19	10060.25
G56												10074.03	10074.20	10069.30	10068.65	10068.71
G57												9985.23	9985.19	9979.19	9979.38	9979.40
G58												9943.89	9943.76	9937.30	9937.82	9937.86
G59												9862.16	9861.94	9855.96	9856.46	9856.50
G60												9750.39	9750.23	9747.36	9747.82	9747.84
G61												9625.96	9625.88	9624.07	9624.48	9624.50
G62												9527.41	9527.47	9526.89	9527.27	9527.31
G63												9507.53	9507.56	9507.09	9507.46	9507.48
G64													9714.00	9713.72	9714.02	9714.10
G65													9724.49	9724.19	9724.55	9724.70
G66													9735.34	9734.93	9735.30	9735.42
G67													9798.09	9797.14	9797.79	9797.35
G68													9900.42	9899.49	9899.79	9899.95
G69													9982.32	9979.54	9979.12	9979.22
G70													10017.24	10011.66	10011.21	10011.31
G71													10034.89	10029.58	10029.12	10029.21

SUBSIDENCE IN FEET INDICATES DROP IN GROUND SURFACE

STATION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR13
G36	0.05	0.21	0.21	0.08	-0.08								
G37	0.06	0.10	0.09	-0.03	-0.13								
G38	-0.18	-0.08	-0.09	-0.16	-0.19								
G39	-0.08	0.02	0.01	-0.07	-0.10								
G40	-0.04	0.11	0.12	0.00	-0.02								
G41	0.02	0.18	0.19	0.06	-0.04								
G42	0.02	0.18	0.21	0.06	-0.05								
G43	-0.05	0.05	0.04	-0.10	-0.12								
G44	0.00	0.00	0.00	0.00									
G45	0.10	0.07		0.12									
G46	0.09	0.05	-0.03	-0.06									
G47	0.08	0.07	-0.03	-0.06									
G48	0.05	0.03	-0.07	-0.10									
G49	0.06	0.03	-0.04	-0.06									
G50	-0.18	-1.56	-1.06	-1.06									
G51	-0.17	-6.17											
G52	0.04	-6.29	-5.78	-5.73									
G53	0.13	-6.00	-5.60	-5.56									
G54	0.18	-5.89	-5.67	-5.62									
G55	0.21	-5.07	-5.32	-5.26									
G56	0.17	-4.73	-5.38	-5.32									
G57	-0.04	-6.04	-5.85	-5.83									
G58	-0.13	-6.59	-6.07	-6.03									
G59	-0.22	-6.20	-5.70	-5.66									
G60	-0.16	-3.03	-2.57	-2.55									
G61	-0.08	-1.89	-1.48	-1.46									
G62	0.06	-0.52	-0.14	-0.10									
G63	0.03	-0.44	-0.07	-0.05									
G64	-0.28	0.02	0.10										
G65	-0.30	0.06	0.21										
G66	-0.41	-0.04	0.08										
G67	-0.95	-0.30	-0.74										
G68	-0.93	-0.63	-0.47										
G69	-2.78	-3.20	-3.10										
G70	-5.58	-6.03	-5.93										
G71	-5.31	-5.77	-5.68										

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CYPRUS-PLATEAU MINING CORPORATION

SUBSIDENCE MONITORING ELEVATIONS

	ELEVATIONS																SUBSIDENCE IN FEET INDICATES DROP IN GROUND SURFACE												
STATION	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR13
G72													10087.95	10084.07	10083.04	10083.09	-3.88	-4.91	-4.86										
G73													10094.64	10093.26	10093.07	10093.15	-1.38	-1.57	-1.49										
G74													10088.47	10087.80	10088.18	10088.27	-0.67	-0.29	-0.20										
G75													10053.92	10053.39	10053.86	10053.93	-0.53	-0.06	0.01										
G76													9961.83	9961.35	9961.83	9961.85	-0.48	0.00	0.02										
G77													9428.24	9428.22	9428.20	9428.20	-0.02	-0.04	-0.04										
G78													9339.91	9339.90	9339.88	9339.89	-0.01	-0.03	-0.02										
G79													9263.54	9263.55	9263.55	9263.55	0.01	0.01	0.01										
G80													9209.23	9209.22	9209.20	9209.20	-0.01	-0.03	-0.03										
G81													9112.65	9112.66	9112.59	9112.72	0.01	-0.06	0.07										
G82													9106.54	9106.57	9106.56	9106.67	0.03	0.02	0.13										
G83													9228.31	9228.35	9228.47	9228.46	0.04	0.16	0.15										
G84													9338.30	9338.31	9338.58	9338.53	0.01	0.28	0.23										
G85													9522.75	9522.75	9522.75	9522.75	0.00	0.00	0.00										
G86													9061.33	9061.29	9061.27	9061.30	-0.04	-0.06	-0.03										
G87													9094.08	9094.06	9094.04	9094.05	-0.02	-0.04	-0.03										
G88													9205.69	9205.66	9205.63	9205.65	-0.03	-0.06	-0.04										
G89													9323.88	9323.87	9323.85	9323.86	-0.01	-0.03	-0.02										
G90													9420.70	9420.68	9420.65	9420.66	-0.02	-0.05	-0.04										
G91													9520.41	9520.40	9520.38	9520.38	-0.01	-0.03	-0.03										
G92													8984.72	8984.70	8984.70	8984.12	-0.02	-0.02	-0.60										
G93													8972.11	8972.10	8972.12	8972.12	-0.01	0.01	0.01										
G94													8921.19	8921.17	8921.16	8921.16	-0.02	-0.03	-0.03										
G95														9749.09	9749.09	9749.08	0.00	-0.01											
G96														9854.67	9854.60	9854.69	-0.07	0.02											
G97														9915.95	9913.79	9913.73	-2.16	-2.22											
G98														9943.51	9938.86	9938.68	-4.65	-4.83											
G99														9941.76	9936.87	9936.68	-4.89	-5.08											
G100														9902.08	9898.53	9898.35	-3.55	-3.73											
G101														9868.02	9866.33	9866.26	-1.69	-1.76											
G102														9833.78	9832.84	9832.82	-0.94	-0.96											
G103														9844.34	9844.15	9844.19	-0.19	-0.15											
G104														9863.51	9863.45	9863.45	-0.06	-0.06											
G105															9752.68	9752.70	0.02												
G106															9584.66	9584.65	-0.01												
															9458.77	9458.78	0.01												

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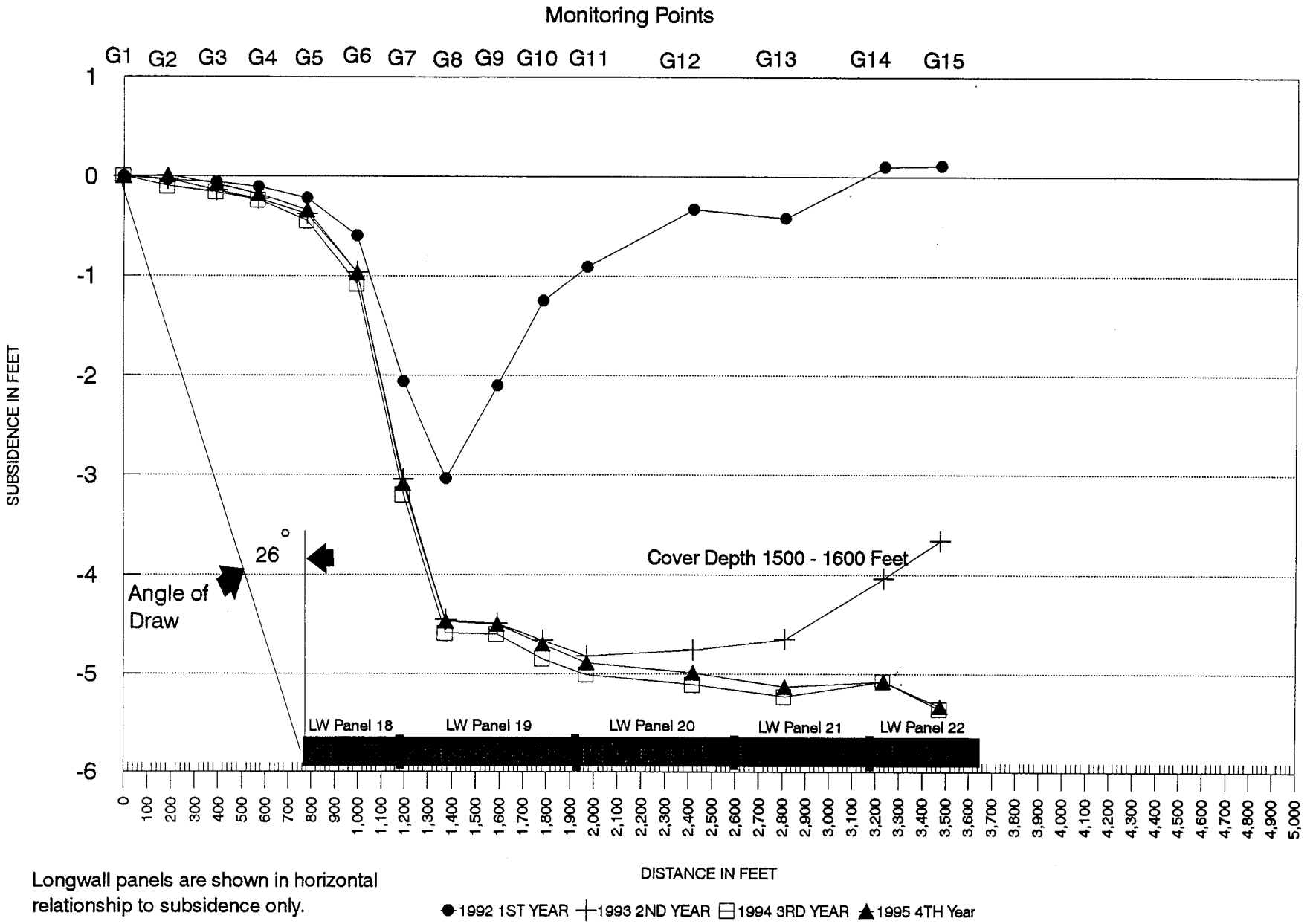
CYPRUS-PLATEAU MINING CORPORATION

SUBSIDENCE MONITORING ELEVATIONS

	ELEVATIONS																SUBSIDENCE IN FEET INDICATES DROP IN GROUND SURFACE											
STATION	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR13
G108															9684.86	9684.70	-0.16											
G109															9628.38	9628.29	-0.09											
G110															9599.76	9599.73	-0.03											
G111															9541.67	9541.70	0.03											
G112															9609.52	9609.49	-0.03											
G113															9676.72	9676.68	-0.04											
G114															9662.10	9662.10	0.00											

FIGURE 11
CROSS SECTION D-D



Longwall panels are shown in horizontal relationship to subsidence only.

FIGURE 12
CROSS SECTION E-E

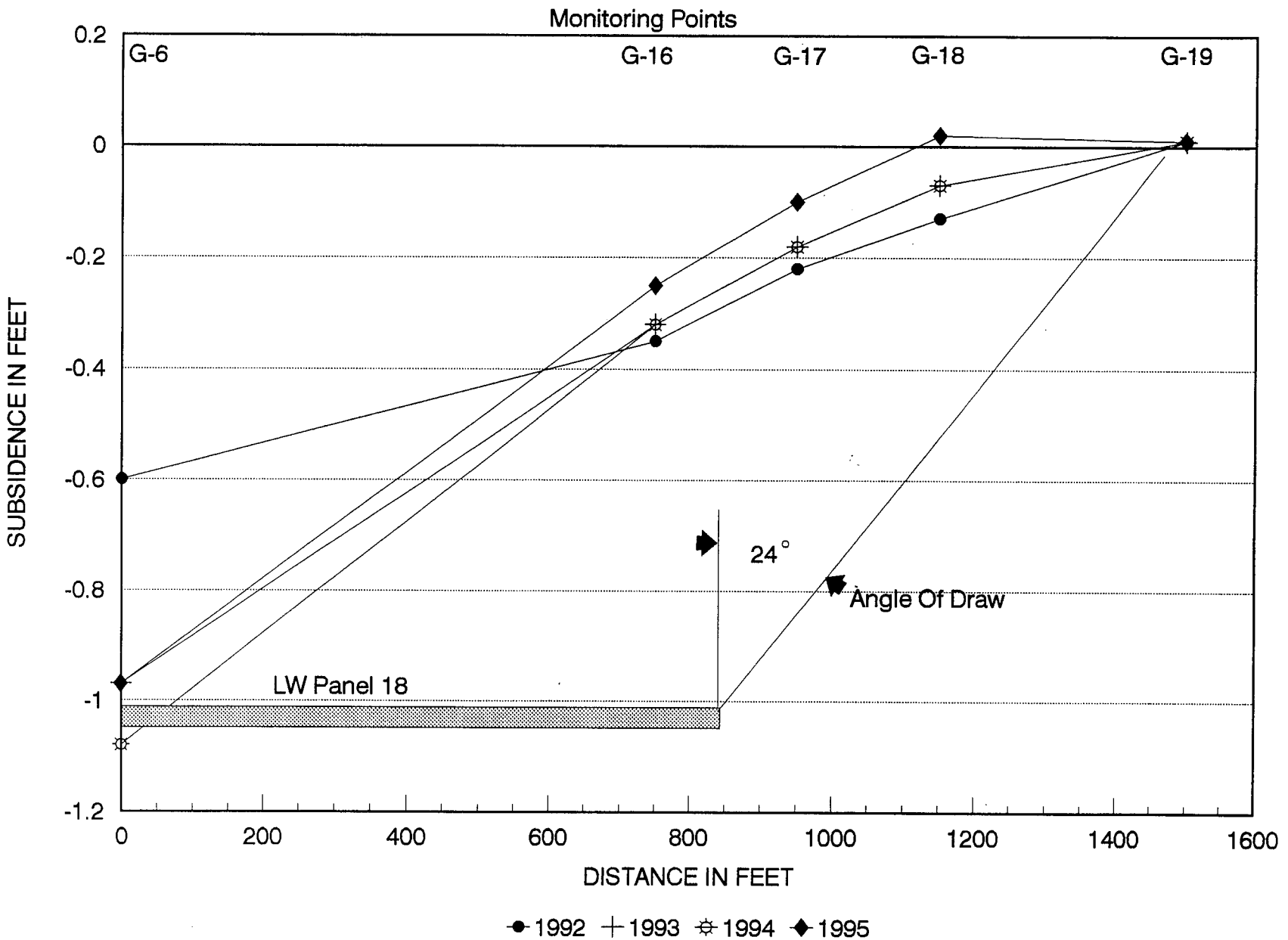


FIGURE 13
CROSS SECTION G - G

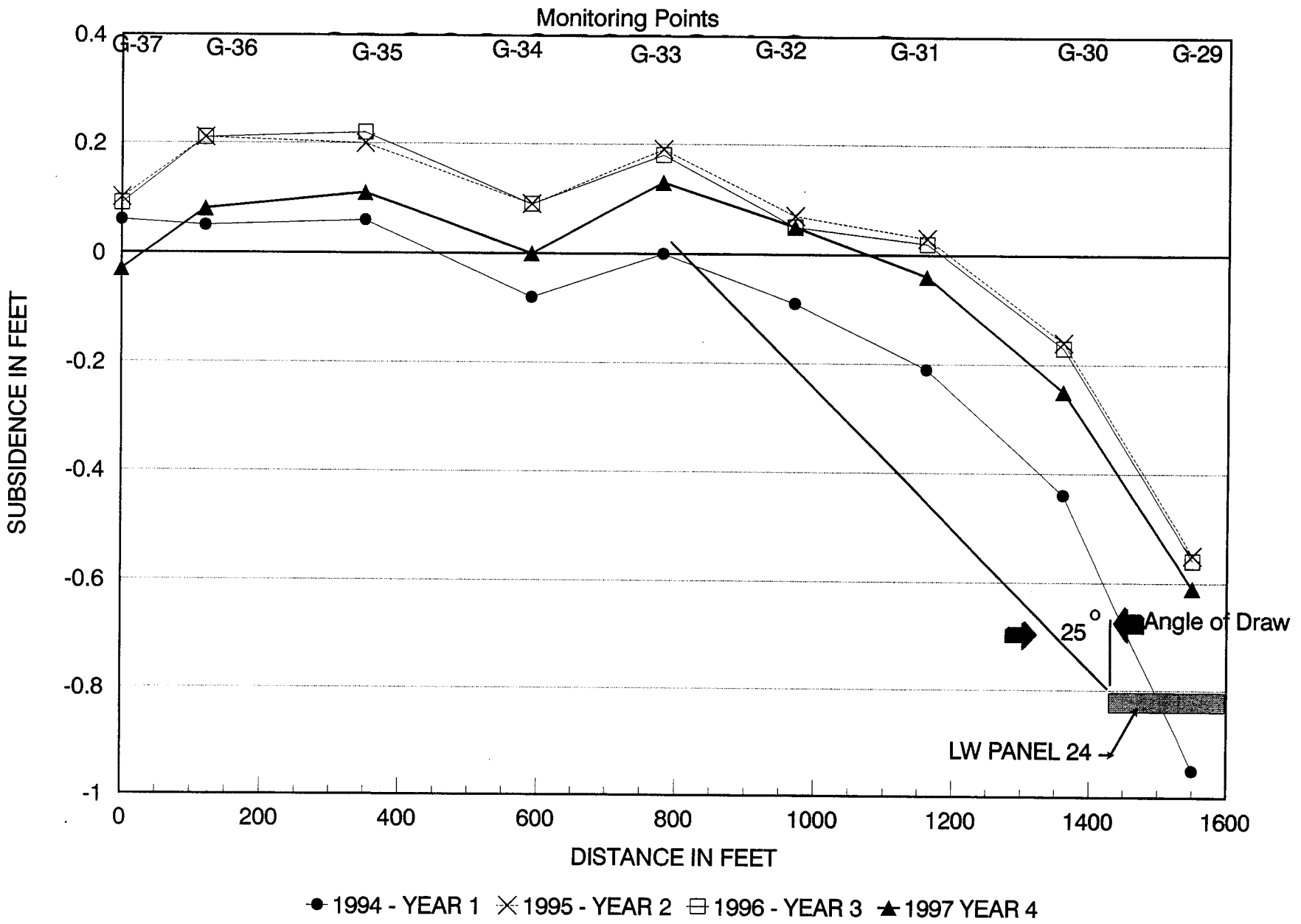


FIGURE 14
CROSS SECTION H-H

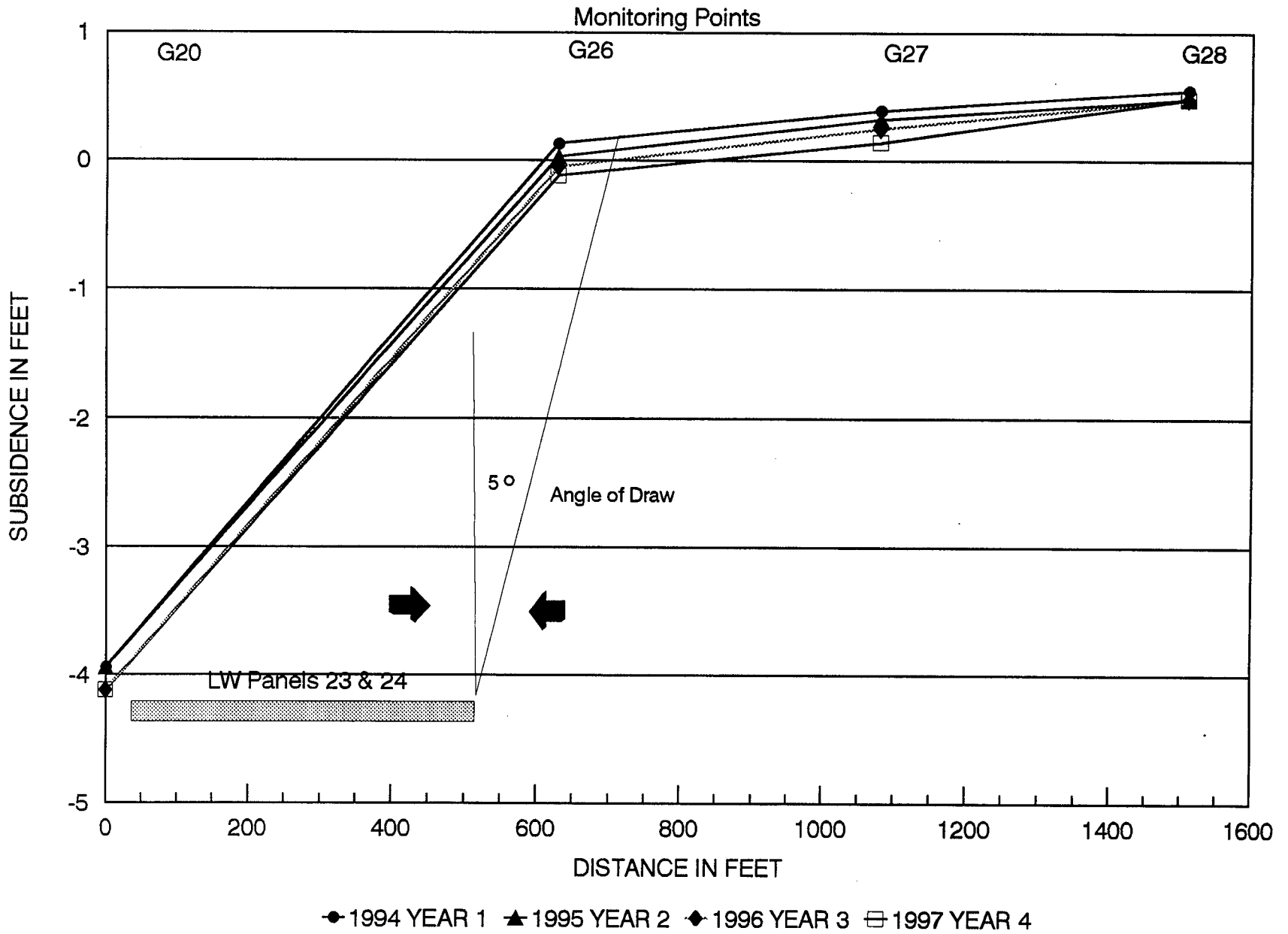


FIGURE 15
CROSS SECTION I-I'

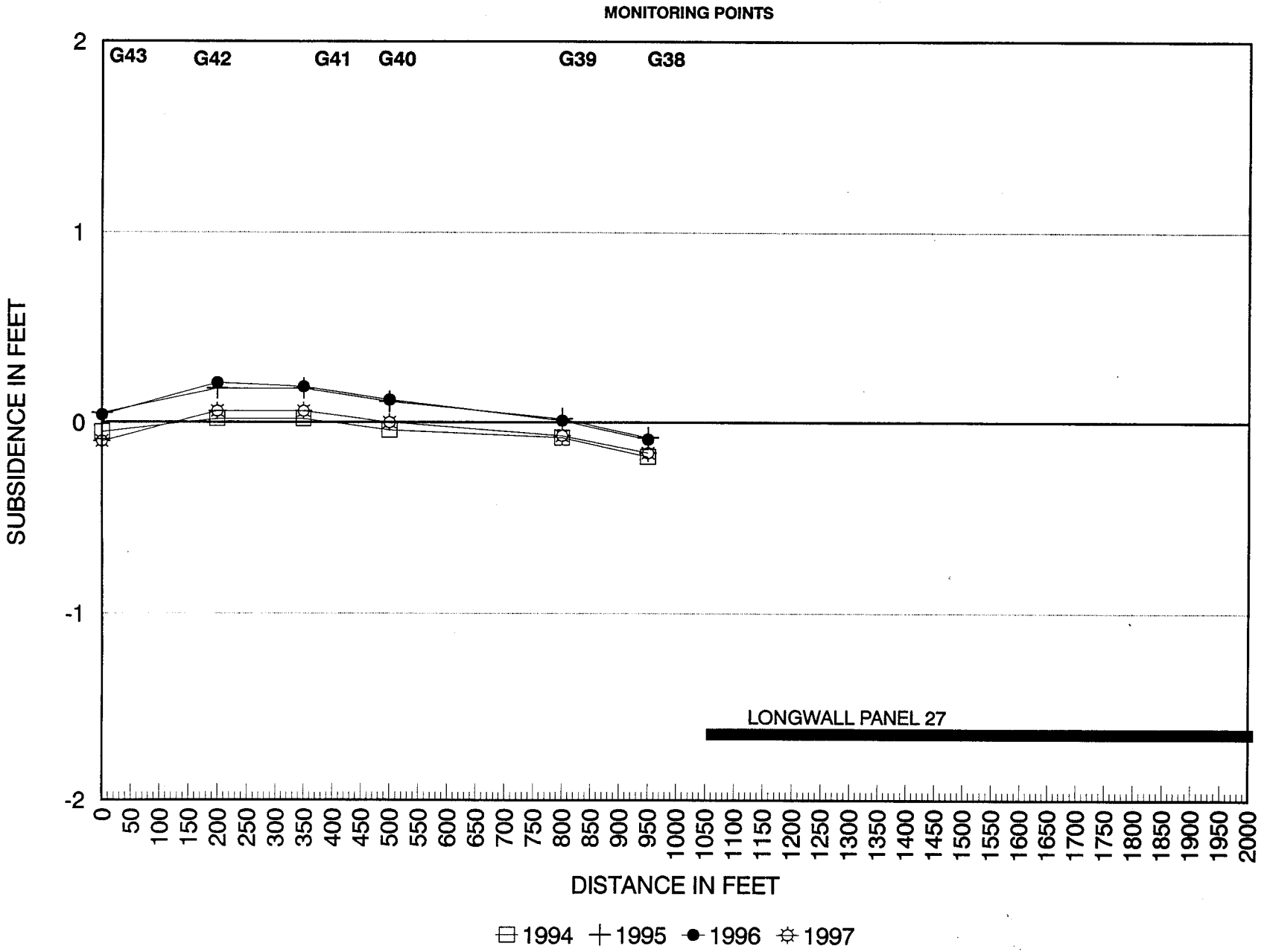


FIGURE 16
CROSS SECTION J-J'

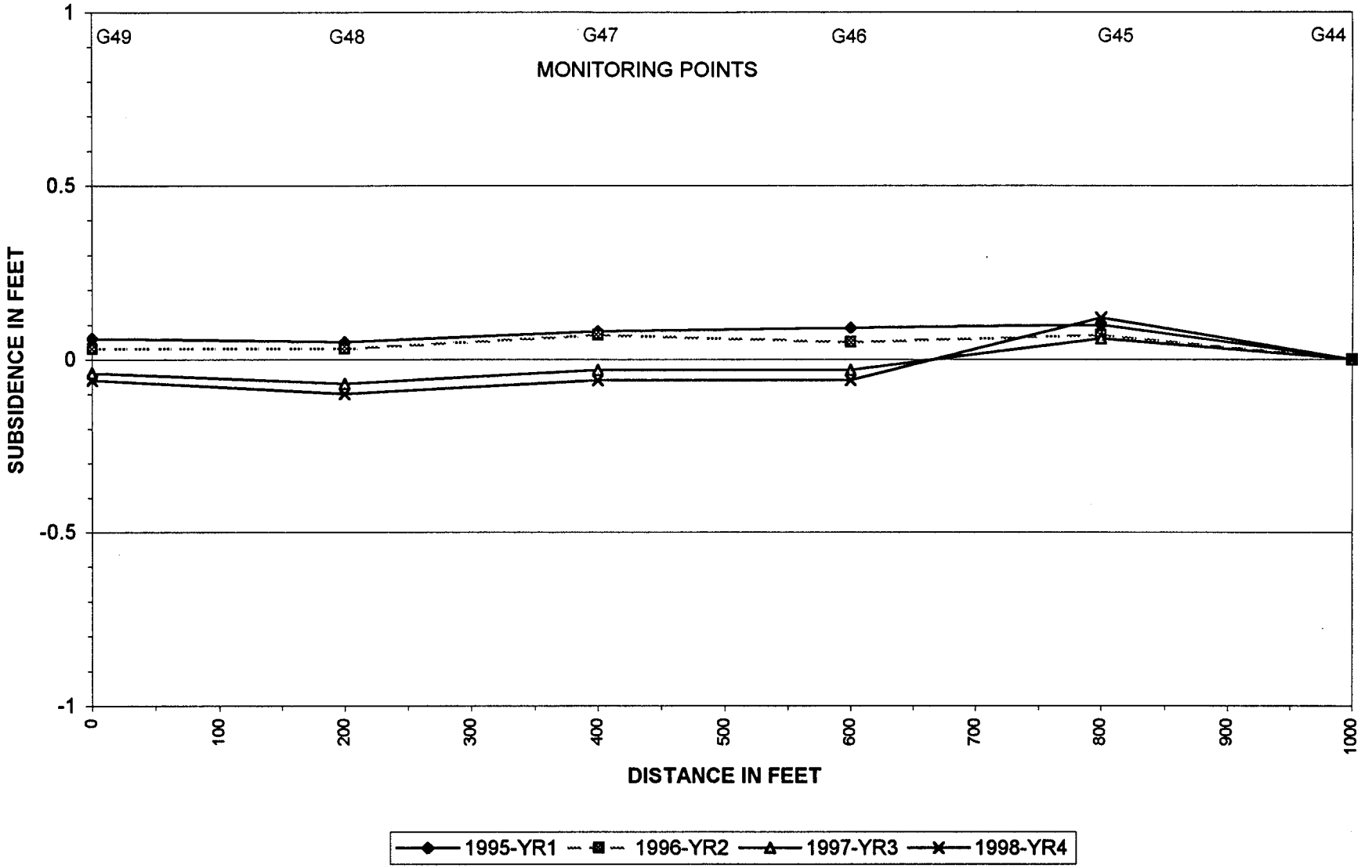


FIGURE 17
CROSS SECTION K-K'

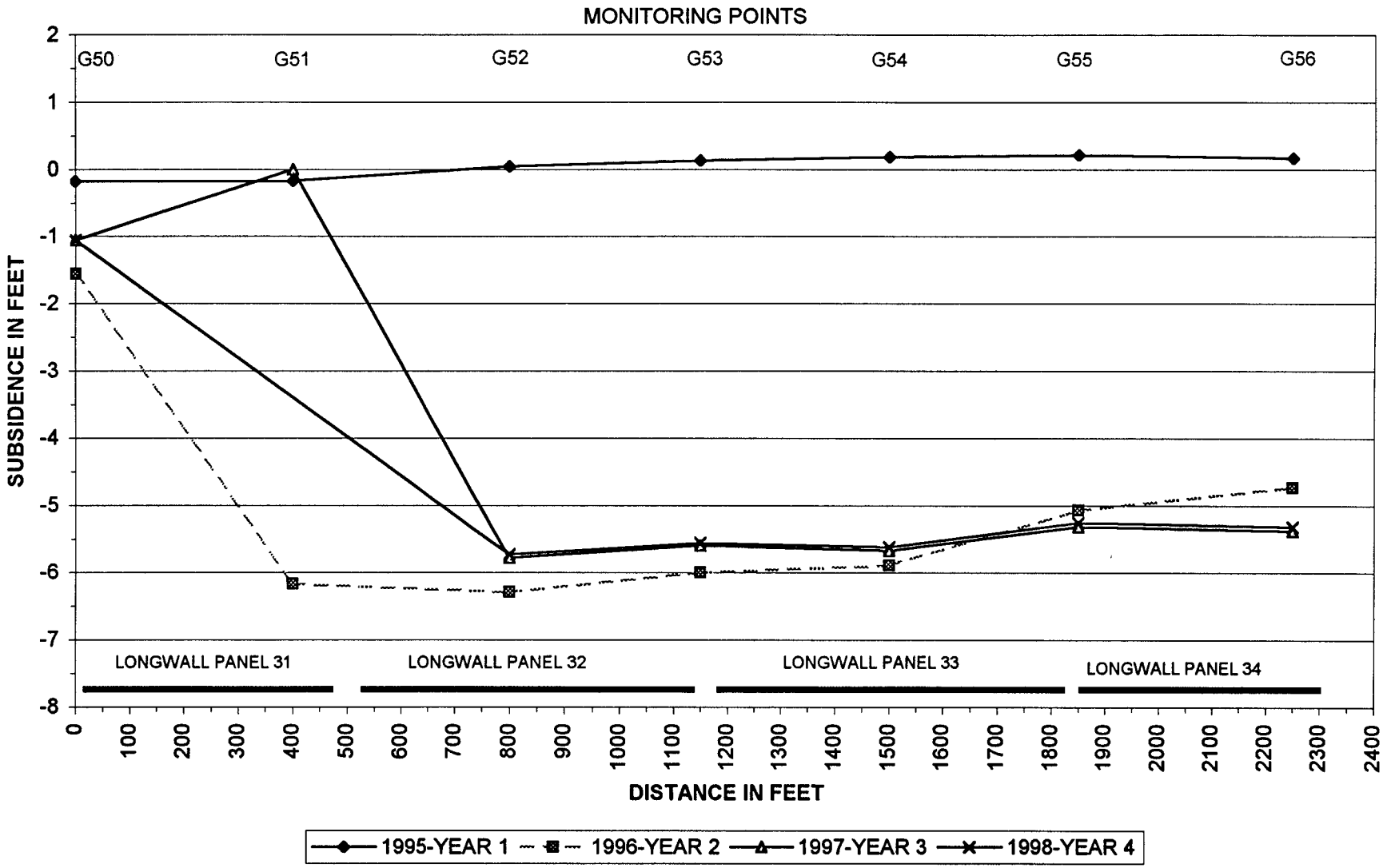
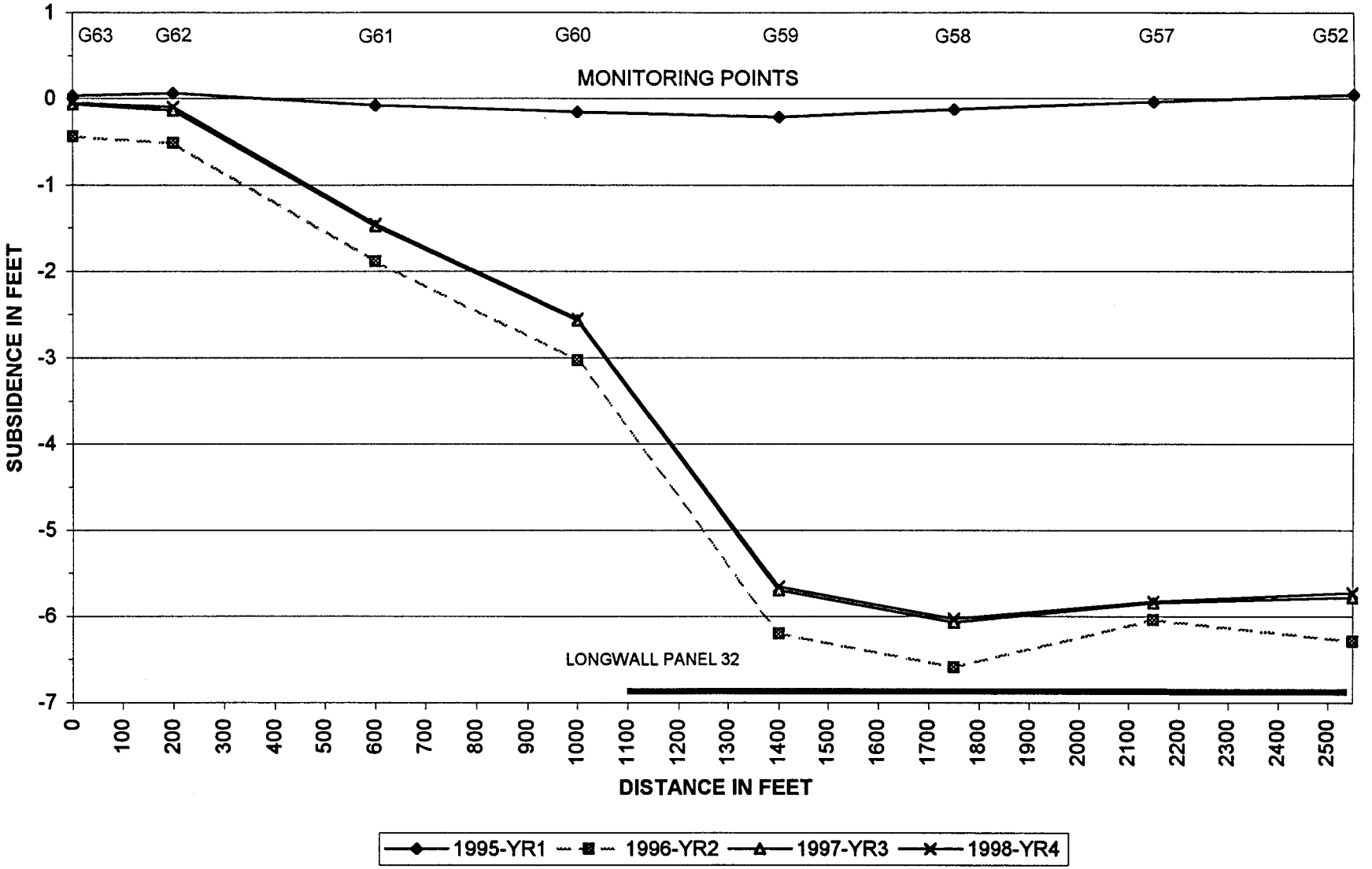
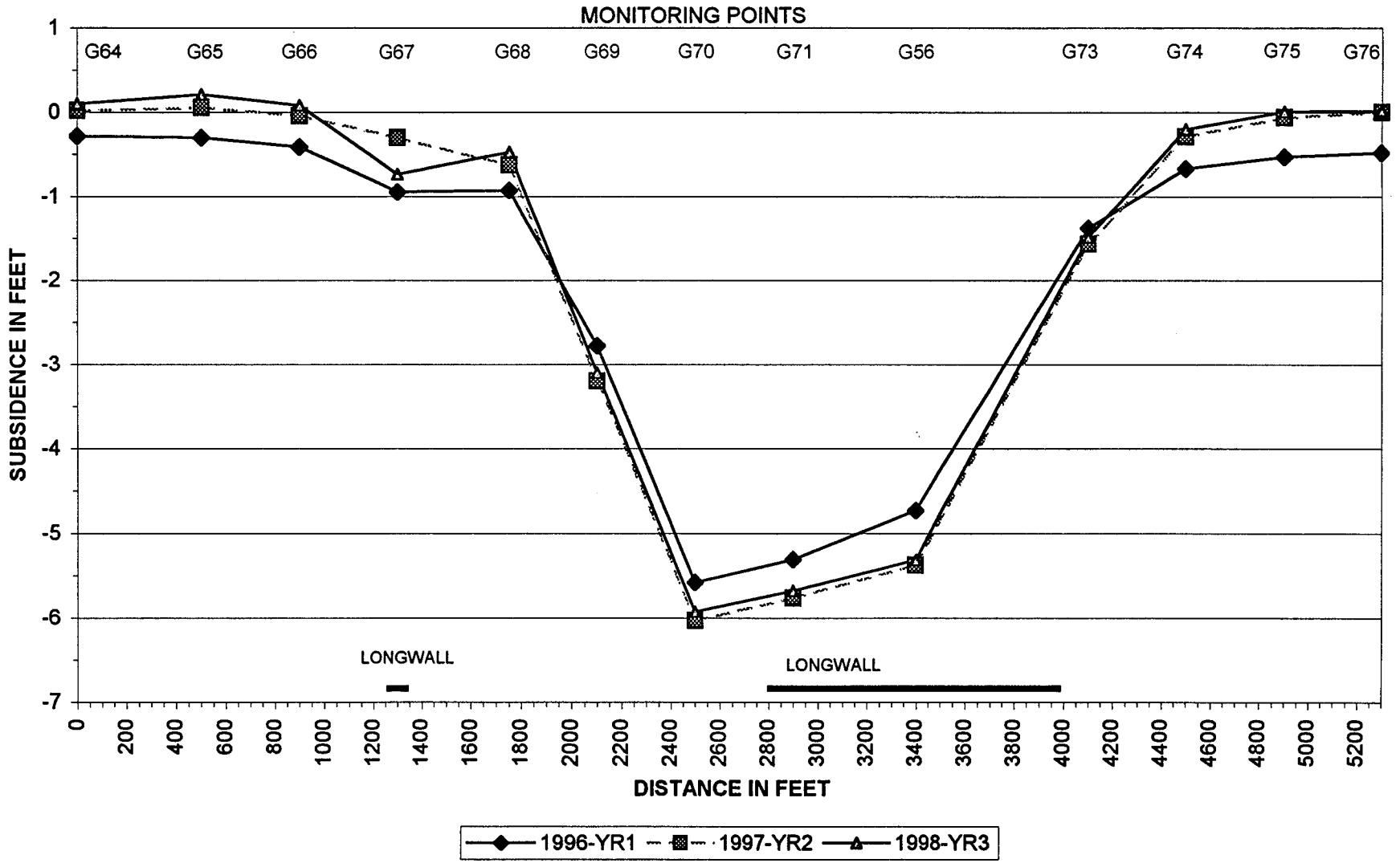


FIGURE 18
CROSS SECTION L-L'



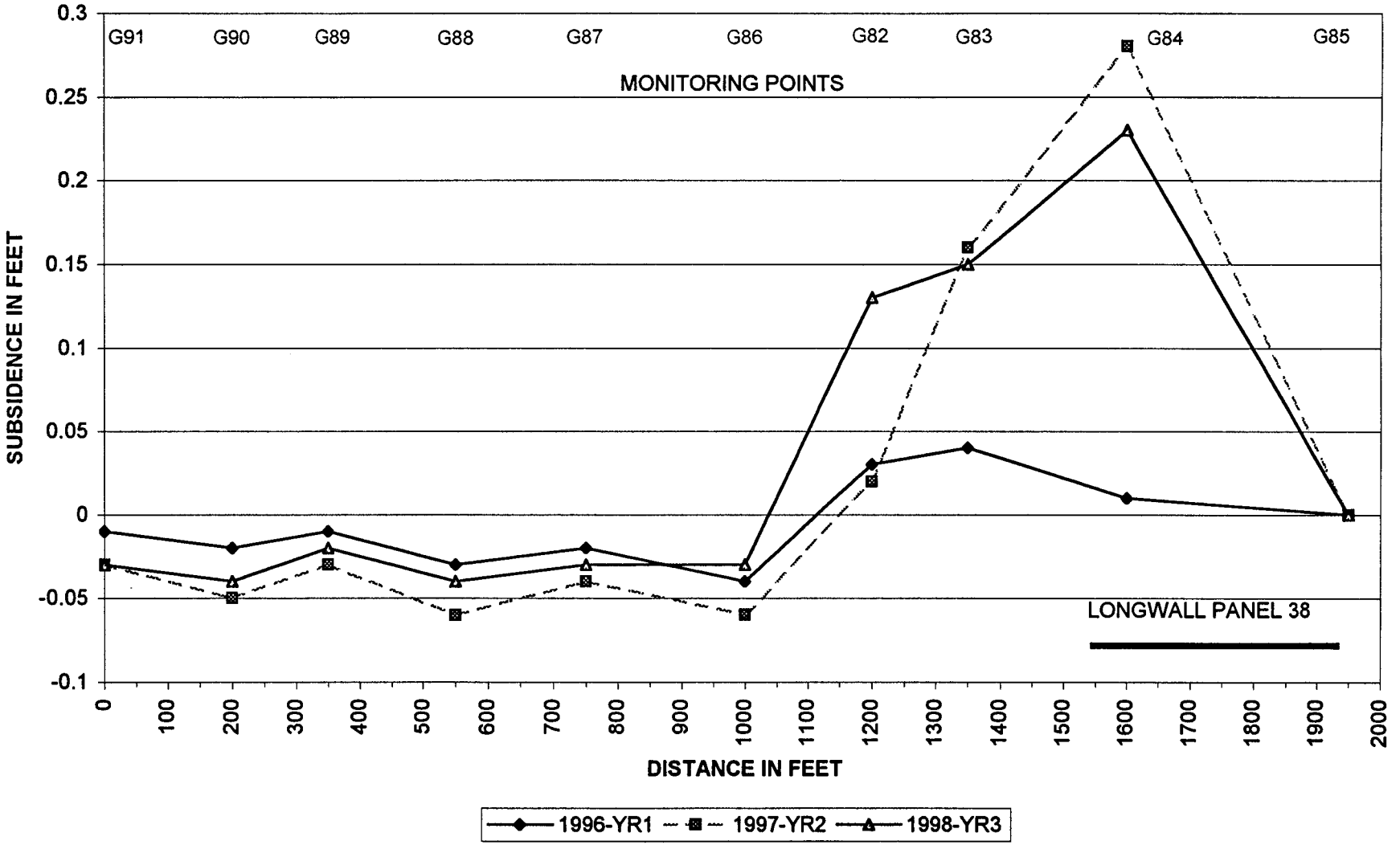
LONGWALL PANEL IS SHOWN IN HORIZONTAL RELATIONSHIP TO SUBSIDENCE ONLY, VERTICAL LOCATION IS NOT TO SCALE

FIGURE 19
CROSS SECTION M-M'



LONGWALL PANEL IS SHOWN IN HORIZONTAL RELATIONSHIP TO SUBSIDENCE ONLY, VERTICAL LOCATION IS NOT TO SCALE.

FIGURE 20
CROSS SECTION N-N'



LONGWALL PANEL IS SHOWN IN HORIZONTAL RELATIONSHIP TO SUBSIDENCE ONLY, VERTICAL LOCATION IS NOT TO SCALE

FIGURE 21
CROSS SECTION O-O'

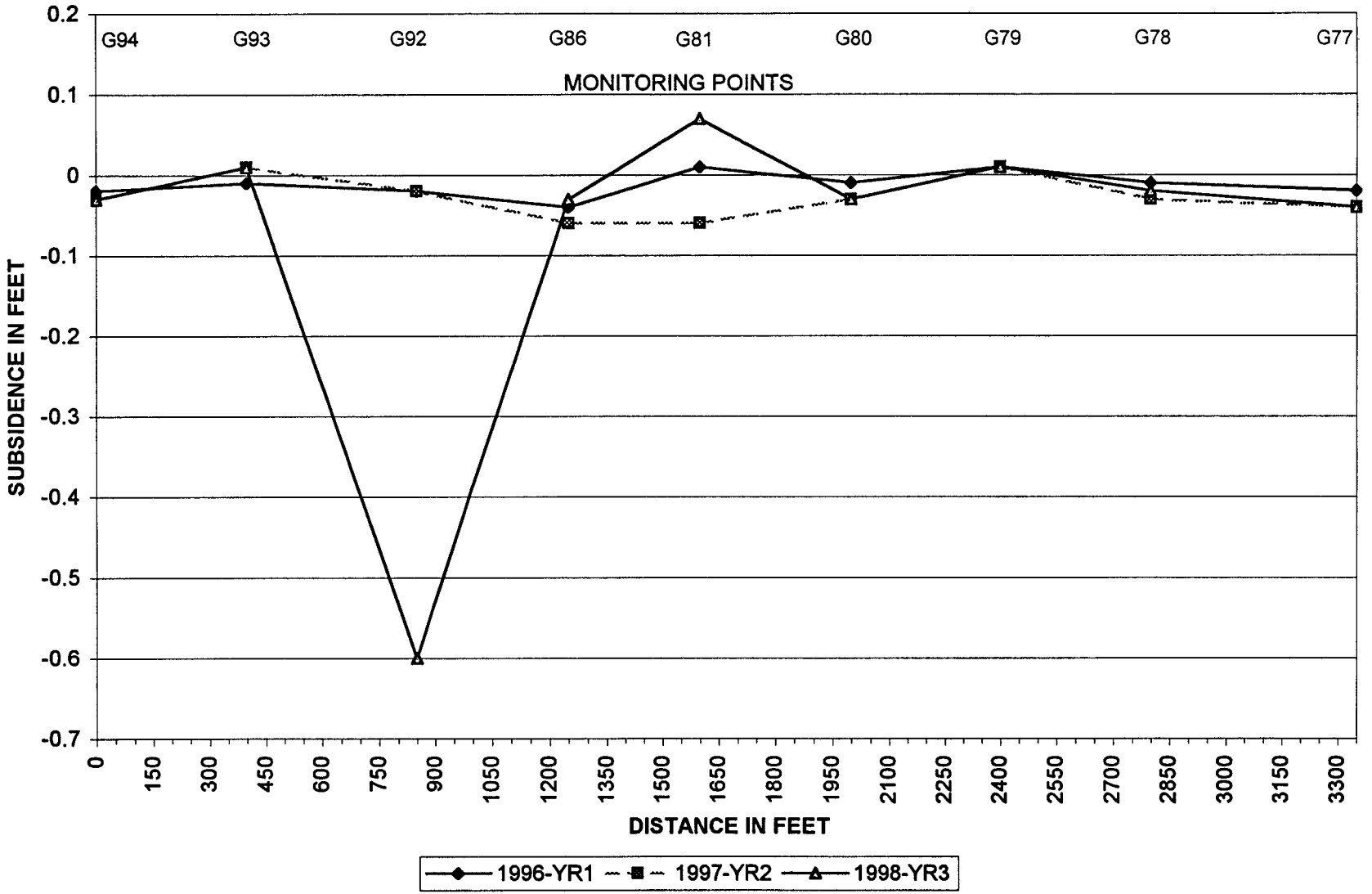
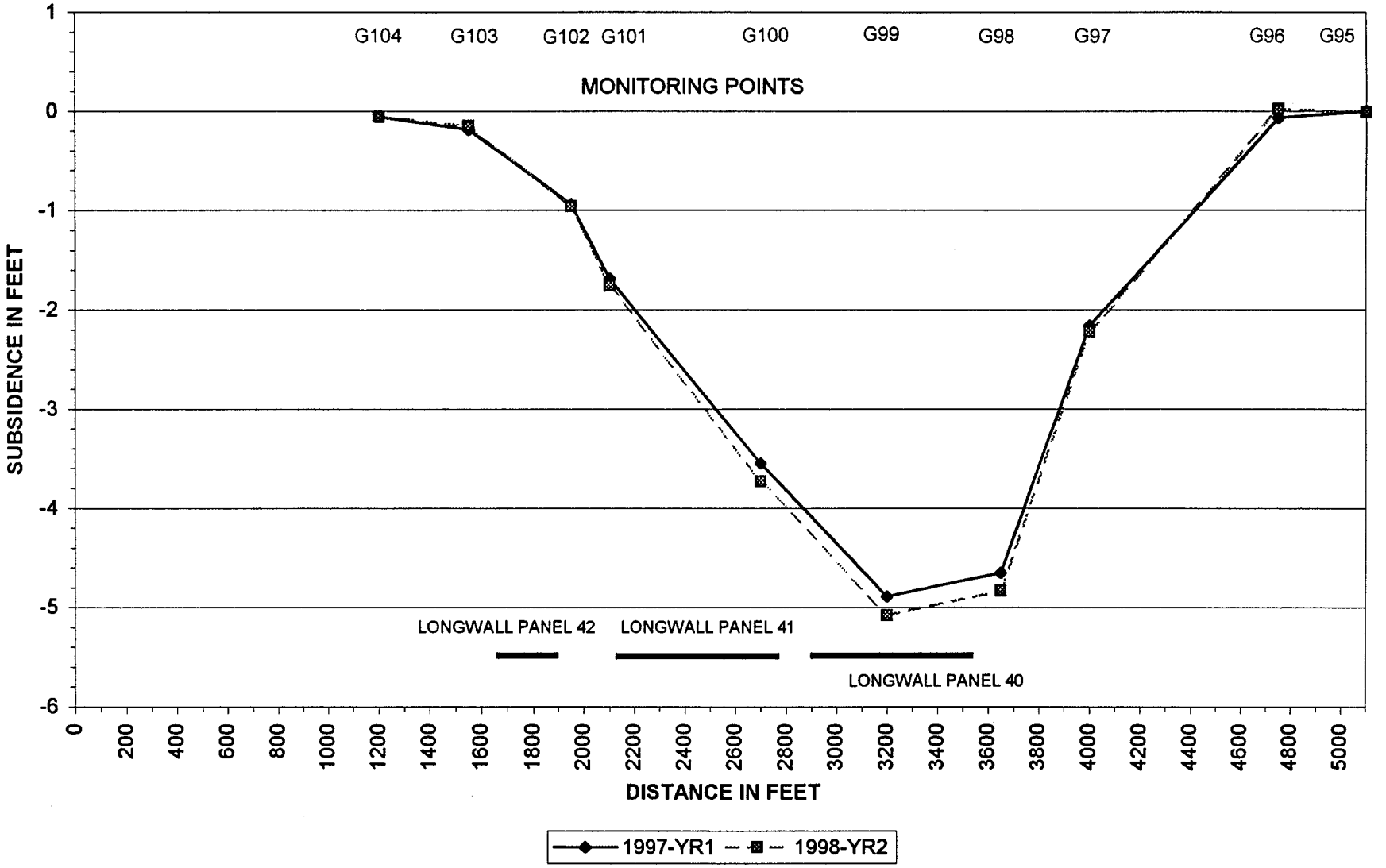


FIGURE 22
CROSS SECTION P-P'



LONGWALL PANEL IS SHOWN IN HORIZONTAL RELATIONSHIP TO SUBSIDENCE ONLY, VERTICAL LOCATION IS NOT TO SCALE.