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Supporting Data

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Waste Isolation Pilot Plant

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1.0 Introduction

This report is a compilation of geotechnical data presented as plots for each active instrument installed in the underground at the Waste Isolation Pilot Plant (WIPP) through June 30, 2012. A summary of the geotechnical analyses that were performed using the enclosed data is provided in Volume 1 of the Geotechnical Analysis Report (GAR).

1.1 Instrumentation

Geomechanical instrument data included in this report reflect the measurements of the geomechanical response of the underground and shafts. The instruments consist of convergence points, borehole extensometers, rockbolt load cells, pressure cells, strain gages, piezometers, and joint meters.

Closure measurements are taken at convergence points. Rock displacement is calculated by measuring the distance between two opposing points. Displacement is monitored over time and is plotted as closure versus time. Annual rates of closure are calculated for the convergence data and are compared with annual closure rates from previous reporting periods.

Borehole extensometers are used to determine the absolute movements of the ground around the openings. With these instruments, rods or wires are placed into a hole and anchored at various depths. The displacement at the extensometer head (located near the excavation face) is measured relative to each of the fixed anchors. These data are used in the extensometer *displacement* plots presented here. As part of the post-processing of acquired extensometer data a *relative displacement* value is calculated. The deepest anchor is assumed to be fixed in undisturbed ground and a displacement for the remaining anchors relative to the deepest anchor is calculated. Annual rates of collar displacement are calculated for each extensometer and are compared with the annual displacement rate reported during the previous reporting period.

Rockbolt load cells are used to determine the ground loading and the effectiveness of rockbolts. Plots consist of load versus time for each instrumented bolt.

Earth pressure cells and strain gages are used in and around the shaft liners to determine their loads. These are also depicted in time-based plots. Monitoring of these instruments indicates whether there is any stress buildup in the shaft lining systems.

Piezometers are used to measure the gauge pressure of groundwater. They have been installed in the shafts at varying elevations to monitor the hydraulic head acting on the shaft liners. Plots from piezometers are presented as pressure versus time.

Joint meters are installed perpendicular to a crack and monitor any changes in separation of the crack which may occur over time.

1.2 Data Plot Explanation

Data are presented in graphical form for ease in interpretation. Time-based plots are used in this report. Each plot generally consists of a legend in the upper right-hand corner that gives the array name and specific location of the instrument or point evaluated. The legend ties the graphical cross-sectional representation of the drift or shaft typically presented in the lower right-hand corner to the symbols on the curve in the graph. For extensometers, each anchor is designated with an alpha character "A" closest to the collar and "B," "C," "D," or "E" for the furthest point from the collar (the deepest anchor). For convergence points, the horizontal and vertical sections of the drift are referred to as chords. Breaks in the graph for convergence data and a numeric designator added to the legend typically indicate that the convergence point was lost due to normal mine maintenance activities and later reinstalled.

1.3 Report Organization

Chapter 1.0 provides an introduction to this Supporting Data volume of the GAR. Chapter 2.0 provides instrument data analysis for the Salt Handling Shaft, Waste Shaft, and Exhaust Shaft followed by data plots for the extensometers, piezometers, earth pressure cells, spot welded strain gages, and embedment strain gages installed in the shafts. Chapter 3.0 provides instrument data analysis for the Salt Handling Shaft Station and Waste Shaft Station, an instrument data summary only for the area immediately surrounding the Air Intake Shaft, and data plots for extensometers, convergence points, and rockbolt load cells for all three locations. Chapter 4.0 provides instrument data analysis for the access drifts followed by data plots for the extensometers, convergence points, joint meters and rock bolt load cells. Chapter 5.0 provides instrument data analysis for the Waste Disposal Area followed by data plots for the extensometers, rock bolt load cells and convergence points. Chapter 6.0 provides convergence point instrument data analysis for the Salt Disposal Investigations (SDI) area. Chapter 7.0 provides geologic data collected through the mapping of fractures, stratigraphic mapping and the observed displacements in vertical boreholes.

2.0 Instrumentation Summary for Shafts

Instrumentation data analysis for three of the four shafts at the WIPP follows. Table 2-1 presents data and analysis of the Salt Shaft. Plots of the instrument data are presented as Figures 2-1 through 2-12.

Table 2-2 presents data and analysis of the Waste Shaft. The instrument data plot is presented in Figures 2-13.

Table 2-3 presents data and analysis of the Exhaust Shaft. Plots of the instrument data are presented as Figures 2-14 through 2-20.

Table 2-1
Salt Handling Shaft Data Analysis

Piezometers

Field Tag	Level feet	Figure Number	Date of 2011-2012 Max. Reading	2011-2012 Maximum Pressure Readings (psi)	Date of 2010-2011 Max. Reading	2010-2011 Maximum Pressure Readings (psi)	Change in Maximum Pressure From Previous Year (psi)	Comments
37X-PE-00201	580	2-1	03/05/12	81	08/02/10	79	2	
37X-PE-00202	580	2-1	03/05/12	87	08/02/10	86	1	
37X-PE-00203	620	2-2	03/05/12	151	08/02/10	154	-3	
37X-PE-00204	620	2-2	03/05/12	142	08/02/10	157	-15	
37X-PE-00205	691	2-3	03/05/12	135	06/06/11	188	-53	
37X-PE-00206	691	2-3	03/05/12	132	06/06/11	182	-50	
37X-PE-00209	802	2-4	10/17/11	62	09/07/10	61	1	
37X-PE-00210	802	2-4	10/17/11	63	09/07/10	60	3	
37X-PE-00211	850	2-5	10/17/11	45	06/06/11	91	-46	
37X-PE-00212	850	2-5	03/05/12	57	06/06/11	108	-51	

Earth Pressure Cells

Field Tag	Level feet	Figure Number	Date of 2011-2012 Max. Reading	2011-2012 Maximum Pressure Readings (psi)	Date of 2010-2011 Max. Reading	2010-2011 Maximum Pressure Readings (psi)	Change in Maximum Pressure From Previous Year (psi)	Comments
37X-WE-00201	860	2-6	10/17/11	-9	08/02/10	-7	-2	
37X-WE-00202	860	2-6	10/17/11	-27	08/02/10	-25	-2	
37X-WE-00203	860	2-6	03/05/12	4	04/04/11	7	-3	

Table 2-1
Salt Handling Shaft Data Analysis (Continued)

Spot-Welded Strain Gages								
Field Tag	Level Feet	Figure Number	Date of 2011-2012 Max. Reading	2011-2012 Maximum Strain Readings (με)	Date of 2010-2011 Max. Reading	2010-2011 Maximum Strain Readings (με)	Change in Maximum Strain From Previous Year (με)	Comments
37X-ZE-00206	856.3	2-7	10/17/11	590	08/02/10	653	-63	
37X-ZE-00220	862.4	2-8	10/17/11	942	10/04/10	906	36	
37X-ZE-00223	862.4	2-8	10/17/11	687	08/02/10	705	-18	

Embedment Strain Gages								
Field Tag	Level feet	Figure Number	Date of 2011-2012 Max. Reading	2011-2012 Maximum Strain Readings (με)	Date of 2010-2011 Max. Reading	2010-2011 Maximum Strain Readings (με)	Change in Maximum Strain From Previous Year (με)	Comments
37X-ZE-00209	856.3	2-9	01/04/12	-543	03/08/11	-540	-3	
37X-ZE-00210	856.3	2-9	10/17/11	970	08/02/10	998	-28	
37X-ZE-00211	856.3	2-9	10/17/11	336	06/06/11	338	-2	
37X-ZE-00212	856.3	2-9	12/05/11	-914	02/07/11	-891	-23	
37X-ZE-00213	856.3	2-9	10/17/11	369	06/06/11	376	-7	
37X-ZE-00214	856.3	2-9	12/05/11	-85	06/06/11	106	-191	
37X-ZE-00215	856.3	2-9	10/17/11	123	06/06/11	131	-8	
37X-ZE-00216	856.3	2-9	10/17/11	618	06/06/11	660	-42	
37X-ZE-00235	856.3	2-10	01/04/12	-414	02/07/11	-413	-1	
37X-ZE-00236	856.3	2-10	12/05/11	-156	02/07/11	-145	-11	
37X-ZE-00237	856.3	2-10	10/17/11	81	06/06/11	124	-43	
37X-ZE-00238	856.3	2-10	10/17/11	522	06/06/11	545	-23	
37X-ZE-00225	862.4	2-11	10/17/11	280	06/06/11	271	9	
37X-ZE-00239	862.4	2-12	10/17/11	397	09/07/10	391	6	

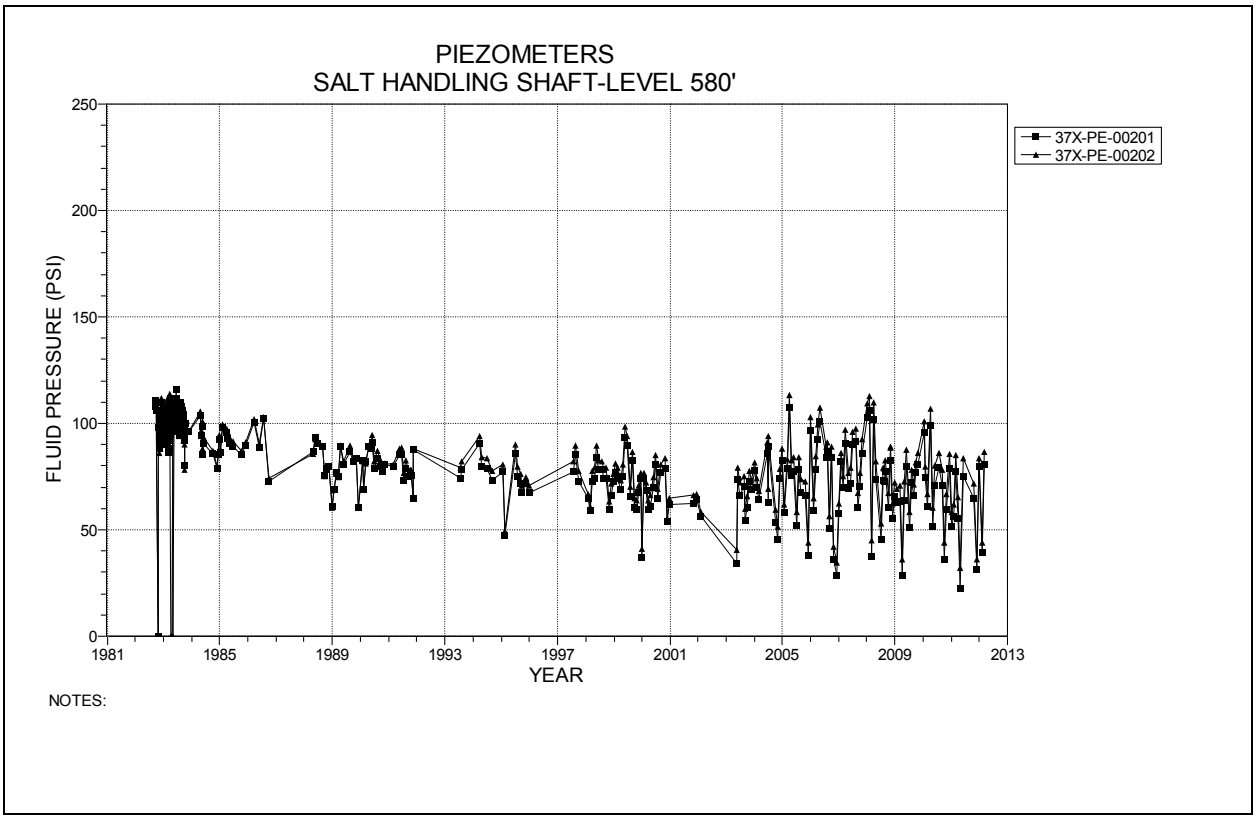


Figure 2-1 Piezometers 37X-PE-00201 and 37X-PE-00202
Salt Handling Shaft – Level 580 at the Forty-niner Member

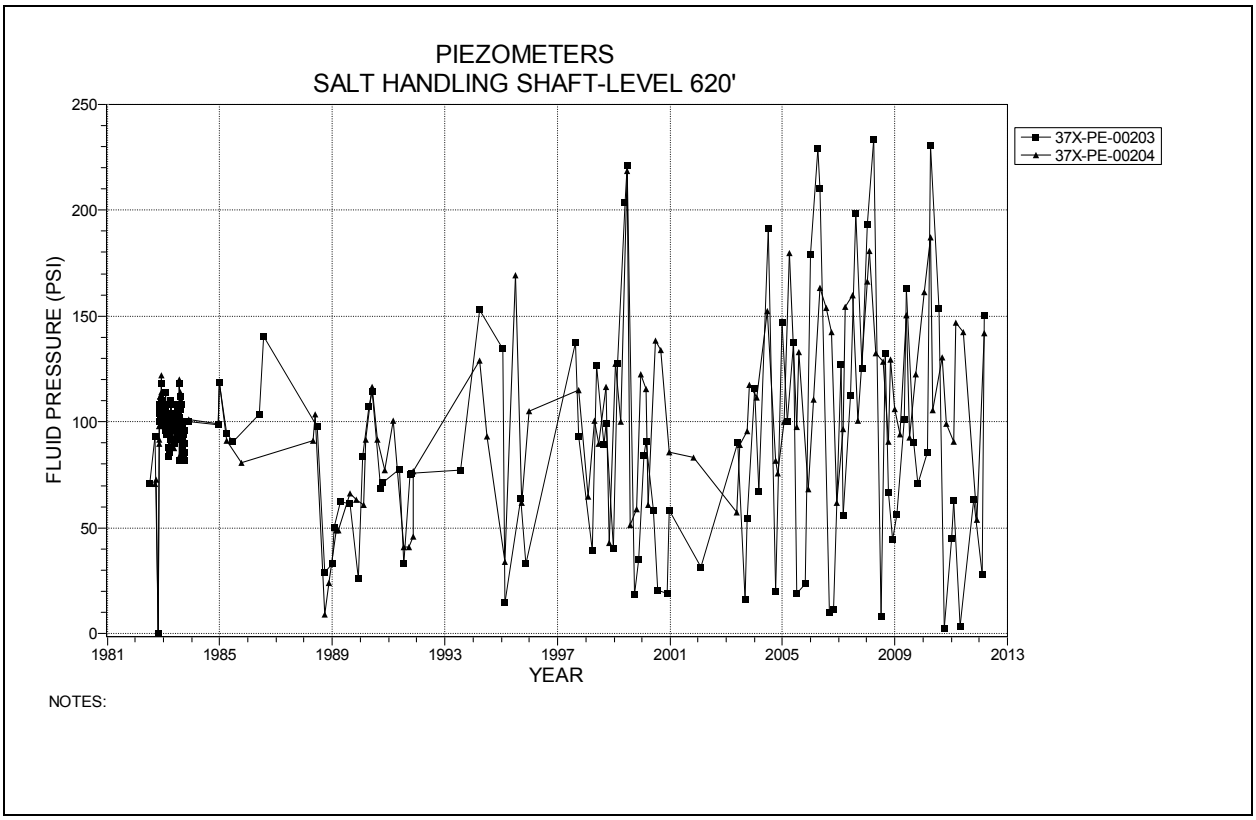


Figure 2-2 Piezometers 37X-PE-00203 and 37X-PE-00204
Salt Handling Shaft – Level 620 at the Magenta Dolomite Member

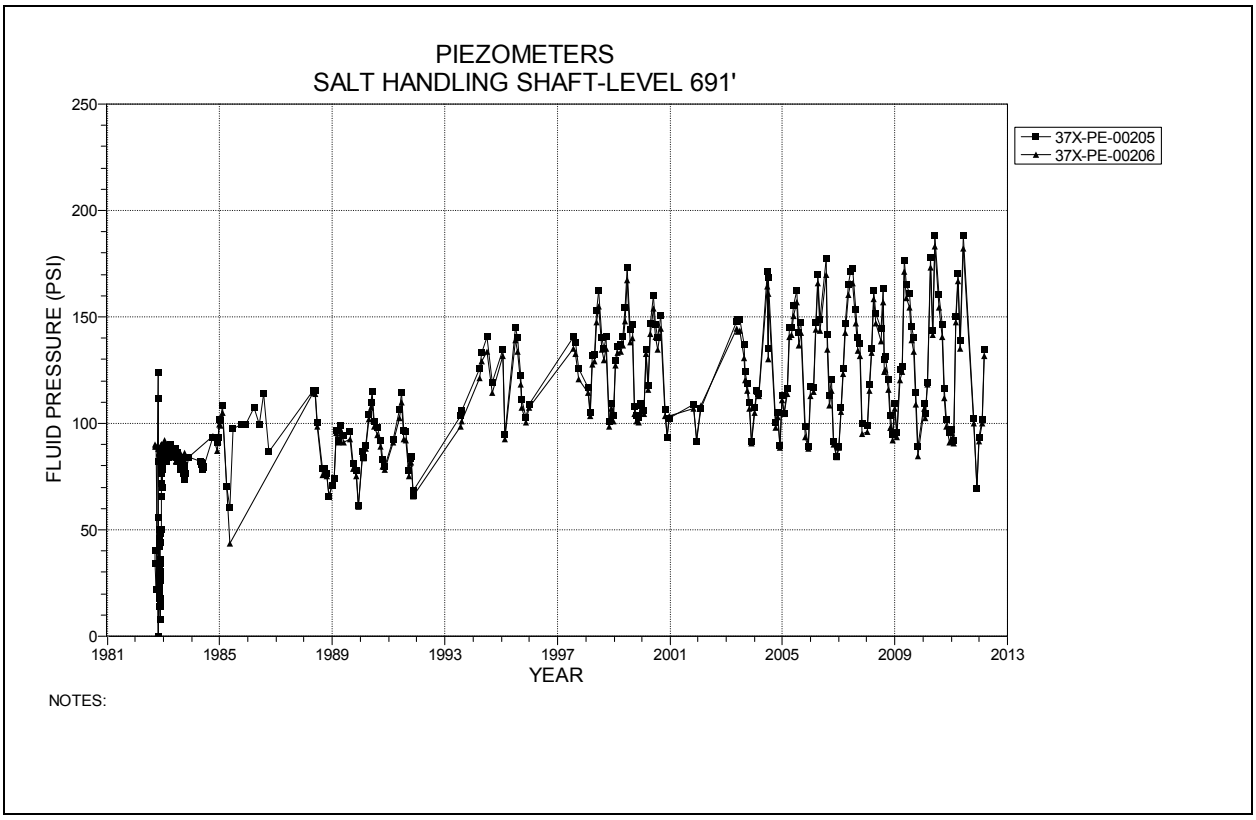


Figure 2-3 Piezometers 37X-PE-00205 and 37X-PE-00206
Salt Handling Shaft – Level 691 at the Tamarisk Member

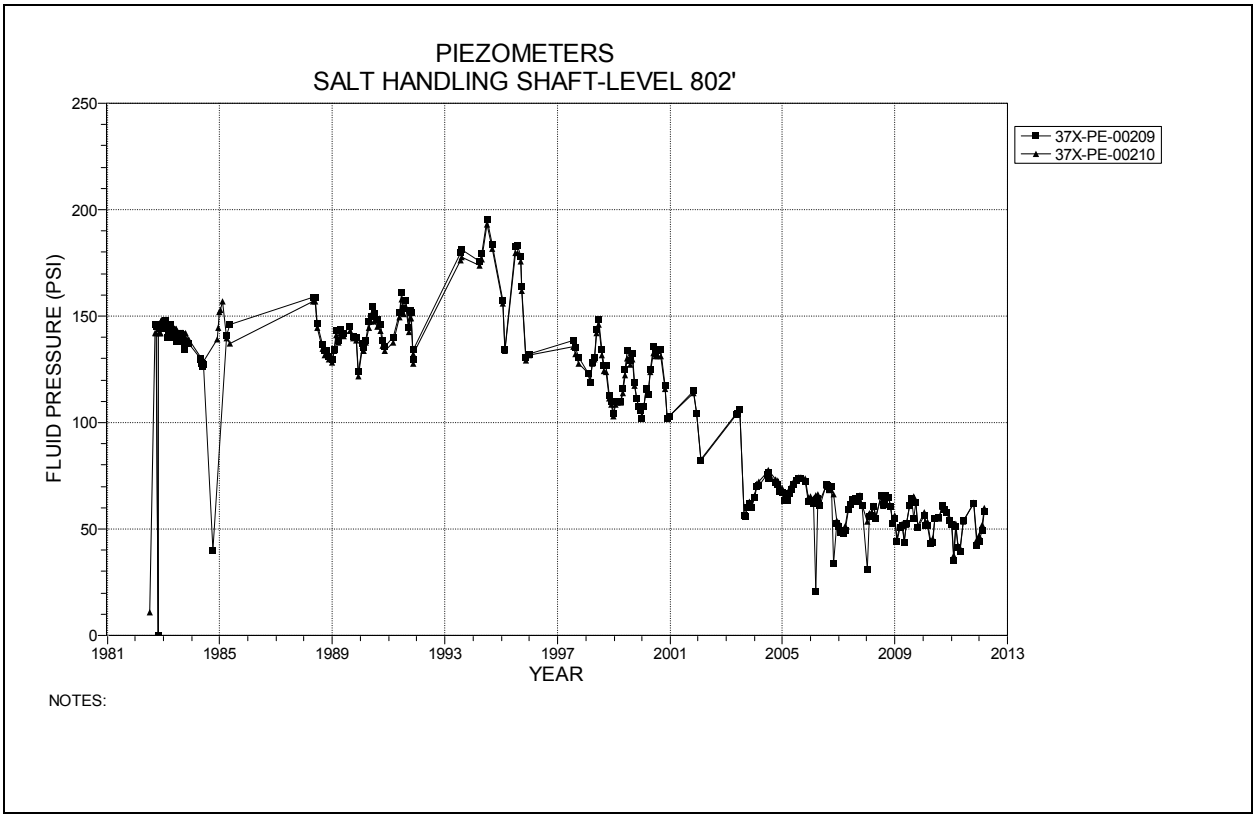


Figure 2-4 Piezometers 37X-PE-00209 and 37X-PE-00210
Salt Handling Shaft – Level 802 at the Los Medaños Member

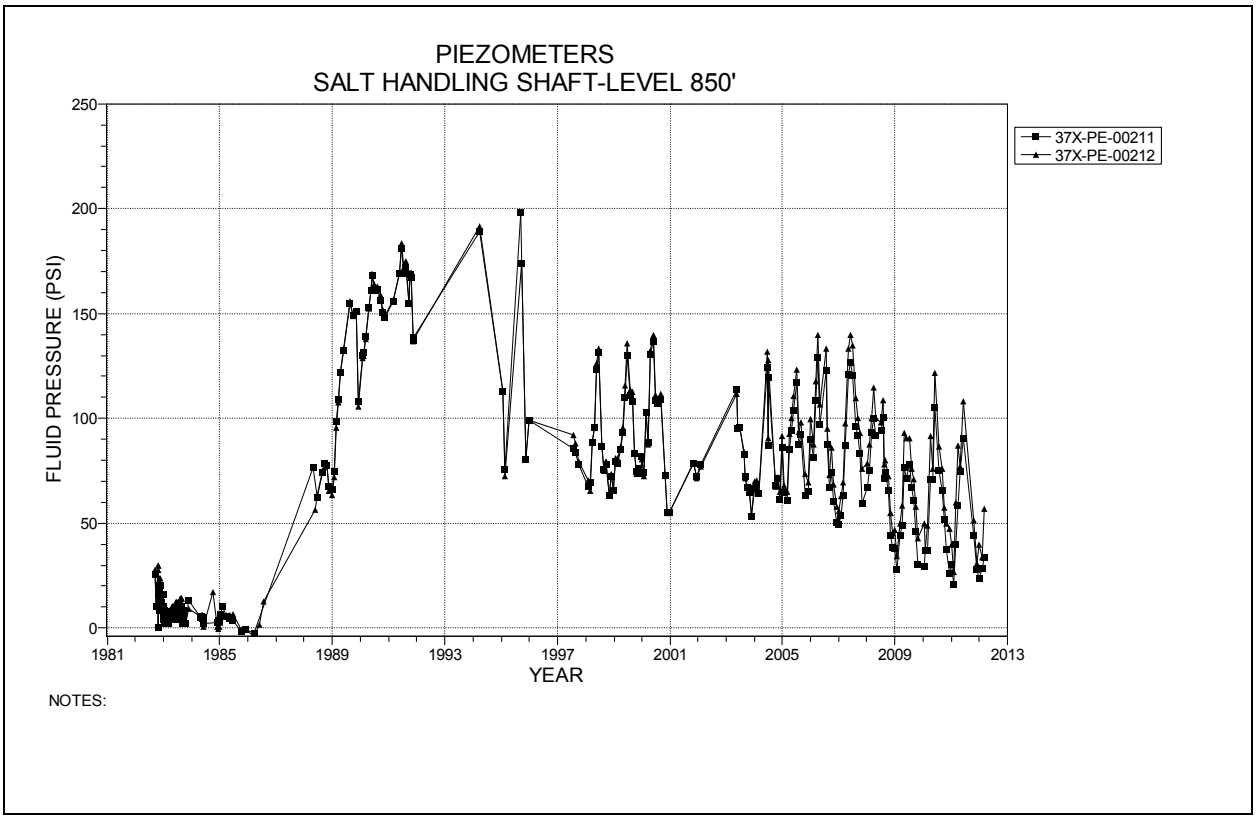


Figure 2-5 Piezometers 37X-PE-00211 and 37X-PE-00212
Salt Handling Shaft – Level 850 at the Rustler-Salado Contact

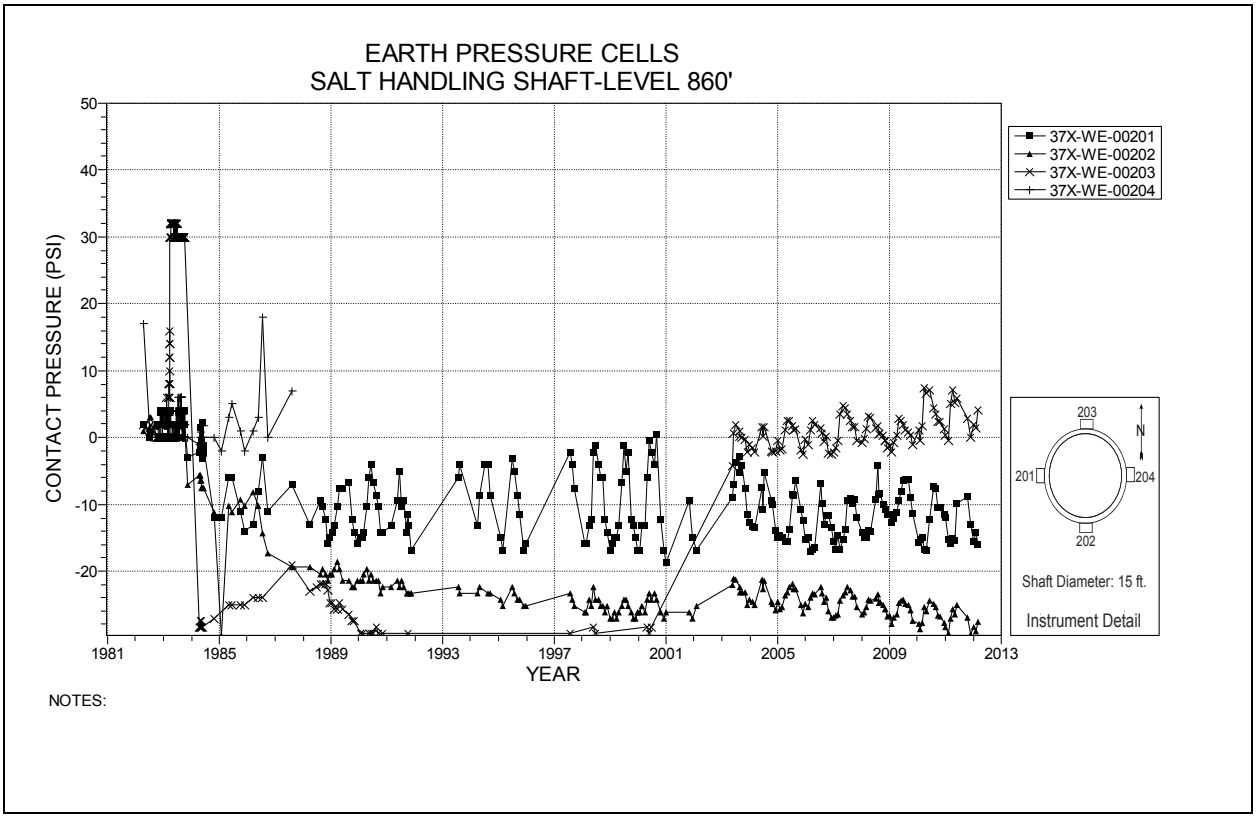


Figure 2-6 Earth Pressure Cells Behind Shaft Key
Salt Handling Shaft Key – Level 860

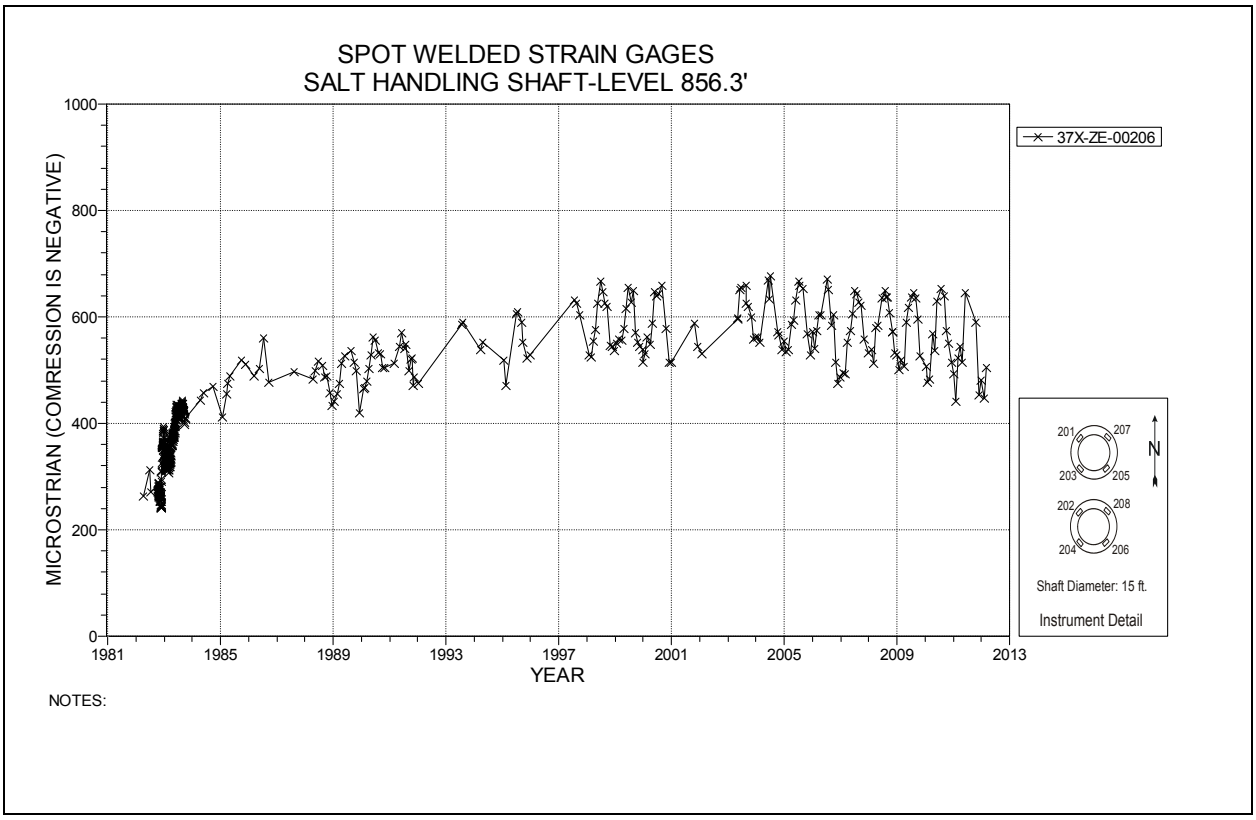


Figure 2-7 Spot-Welded Strain Gages
Salt Handling Shaft Key – Level 856.3

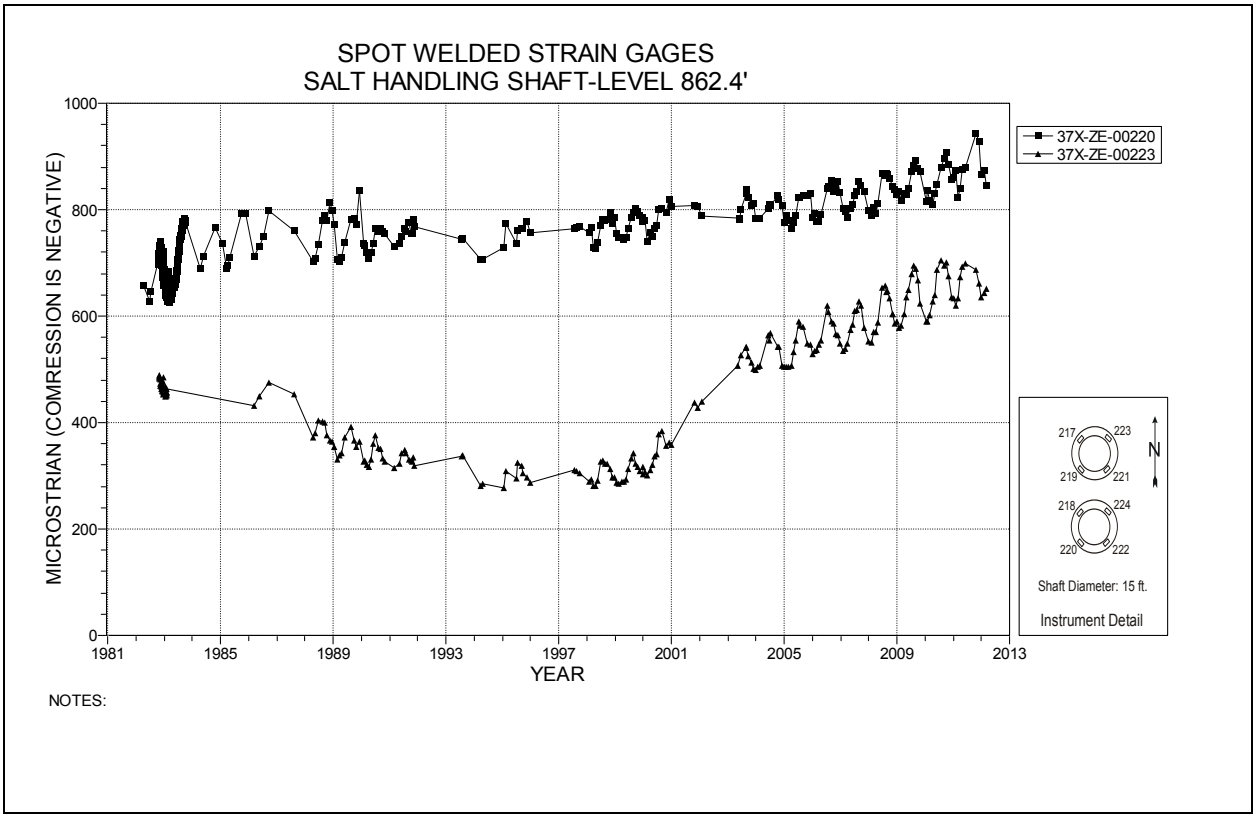


Figure 2-8 Spot-Welded Strain Gages
Salt Handling Shaft Key – Level 862.4

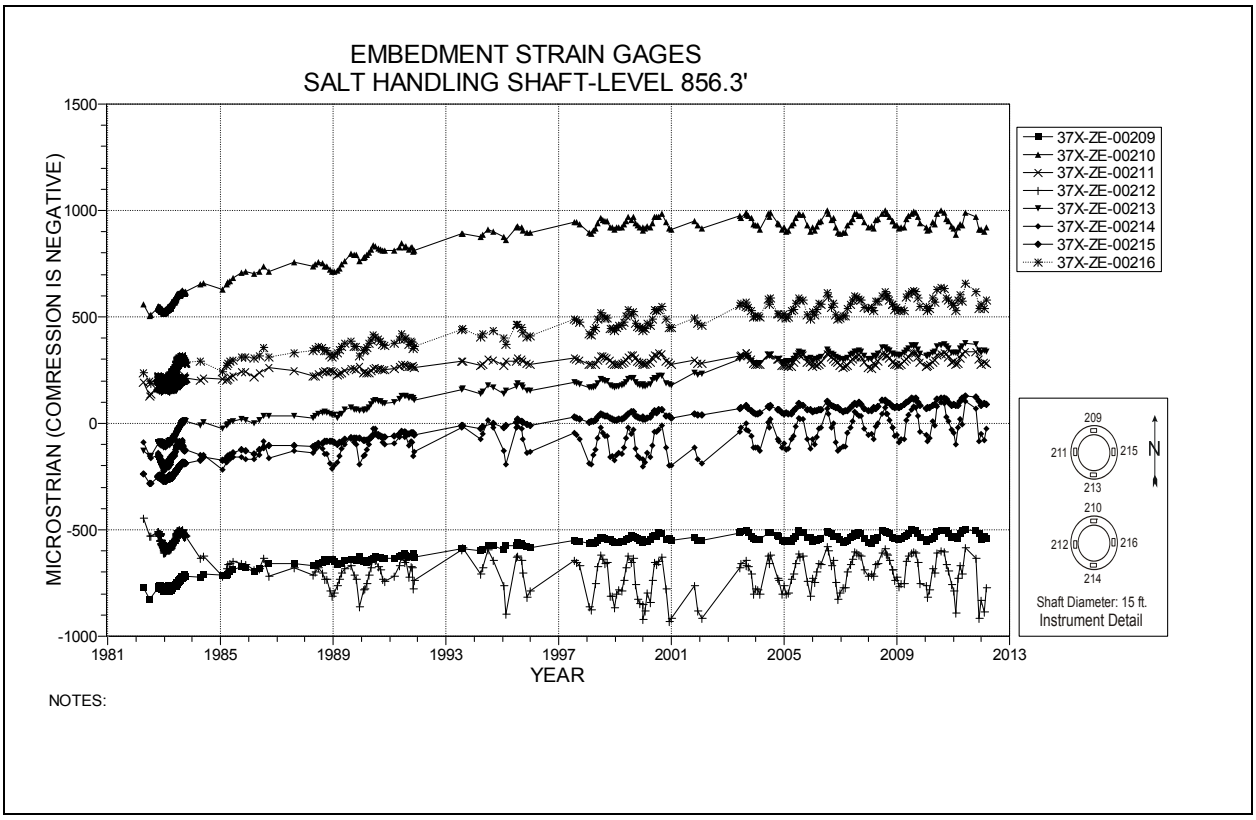


Figure 2-9 Embedment Strain Gages
Salt Handling Shaft Key – Level 856.3

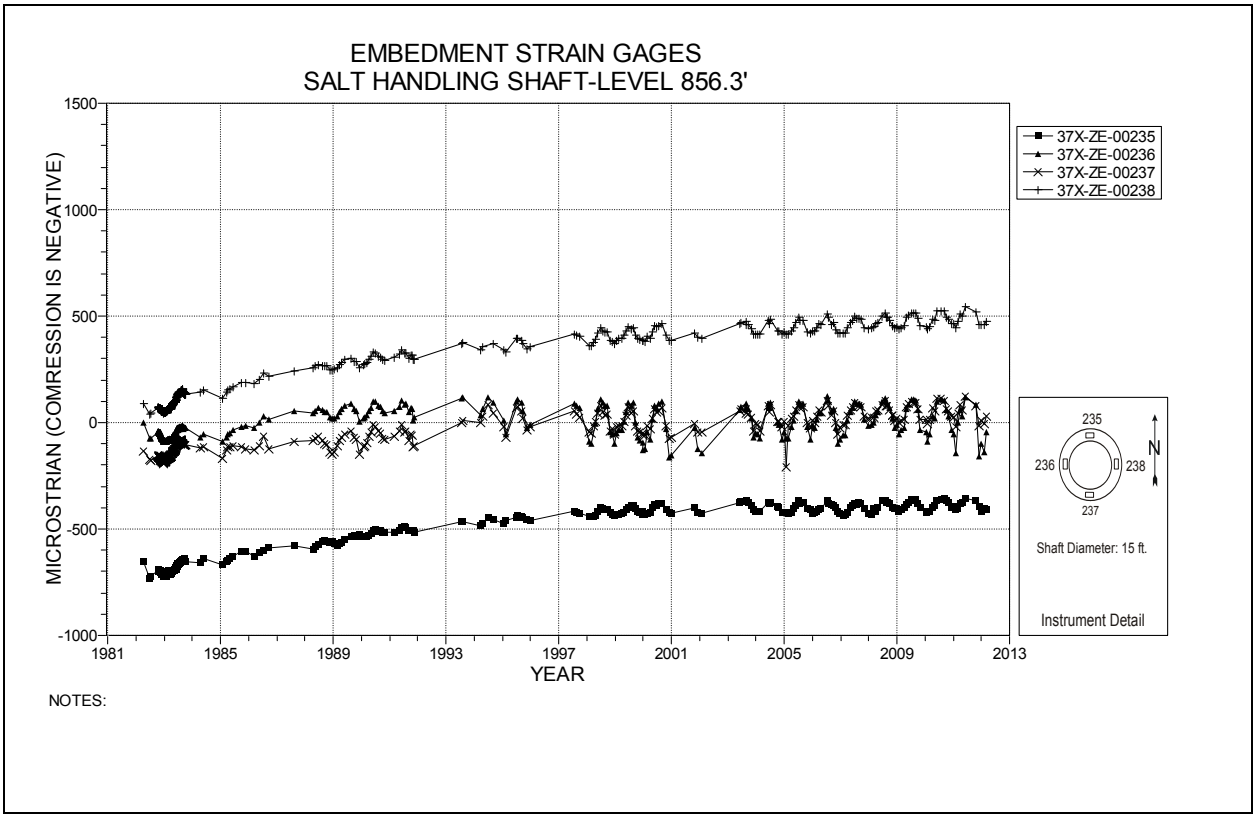


Figure 2-10 Embedment Strain Gage
Salt Handling Shaft Key Level 856.3

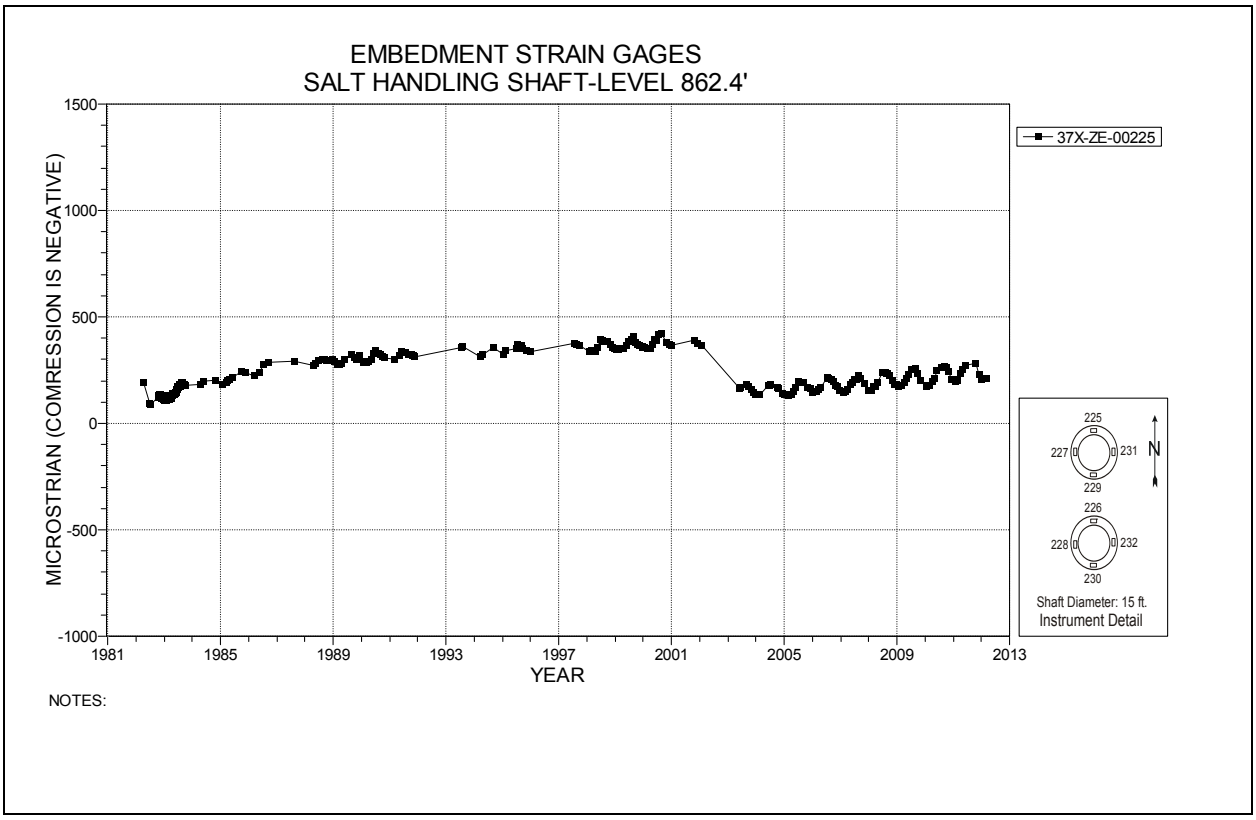


Figure 2-11 Embedment Strain Gages
Salt Handling Shaft Key Level 862.4

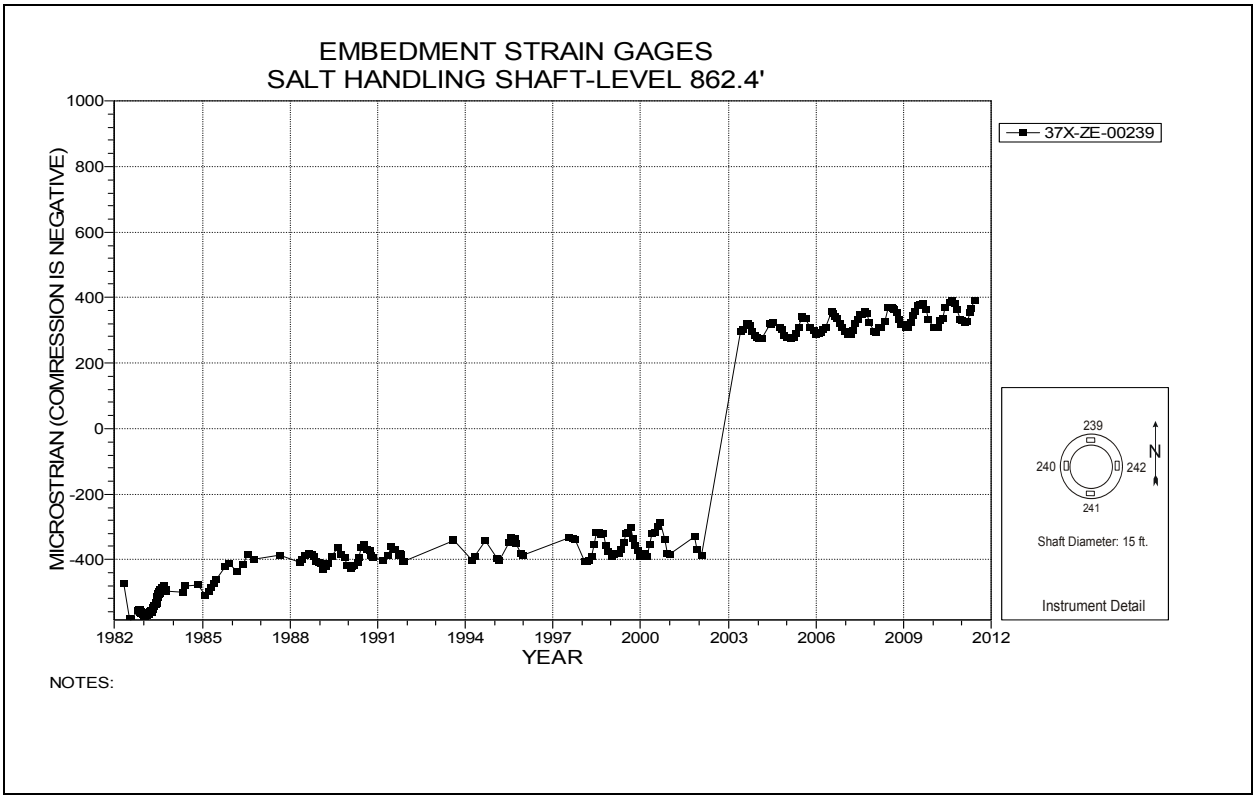


Figure 2-12 Embedment Strain Gage
Salt Handling Shaft Key – Level 862.4

Table 2-2
Waste Shaft Data Analysis

Earth Pressure Cell								
Field Tag	Level feet	Figure Number	Date of 2011-2012 Max. Reading	2011-2012 Maximum Pressure Readings (psi)	Date of 2010-2011 Max. Reading	2010-2011 Maximum Pressure Reading (psi)	Change in Maximum Pressure From Previous Year (psi)	Comments
31X- WE-00203	866	2-13	08/12/11	134	06/16/11	118	16	

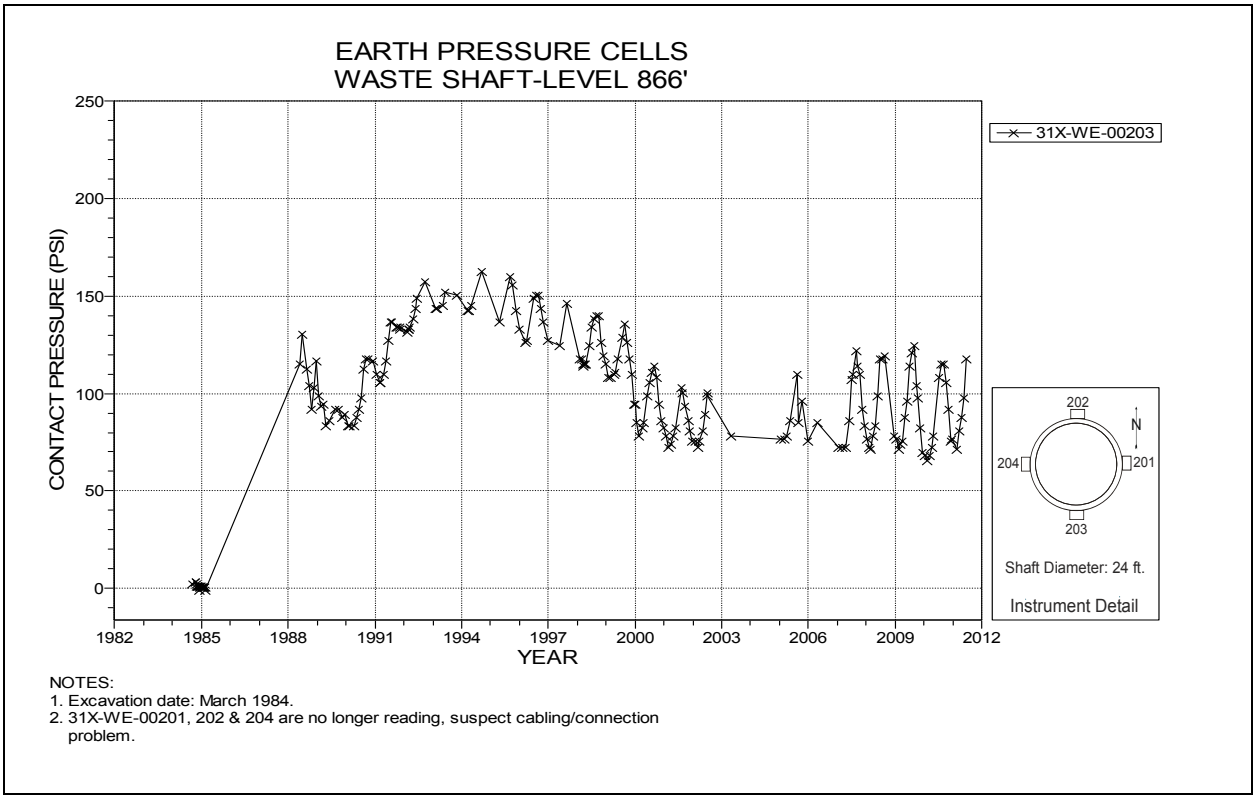


Figure 2-13 Earth Pressure Cell 31X-WE-00203
Waste Shaft Key – Level 866

Table 2-3
Exhaust Shaft Data Analysis

Piezometers								
Field Tag	Level feet	Figure Number	Date of 2011-2012 Max. Reading	2011-2012 Maximum Pressure Readings (psi)	Date of 2010-2011 Max. Reading	2010-20110 Maximum Pressure Readings (psi)	Change in Maximum Pressure From Previous Year (psi)	Comments
35X-PE-00202	544	2-14	05/01/12	1064	06/06/11	-3	1067	
35X-PE-00204	615	2-15	05/01/12	1112	06/06/11	125	987	
35X-PE-00208	673	2-16	10/31/11	6	06/06/11	5	1	
35X-PE-00210	721	2-17	10/10/11	141	06/06/11	141	0	
35X-PE-00213	768	2-18	10/10/11	9	06/06/11	8	1	
35X-PE-00214	768	2-18	10/31/11	6	06/06/11	6	0	
35X-PE-00218	850	2-19	12/05/11	75	05/02/11	46	29	
35X-PE-00219	887	2-20	10/10/11	27	06/06/11	25	2	

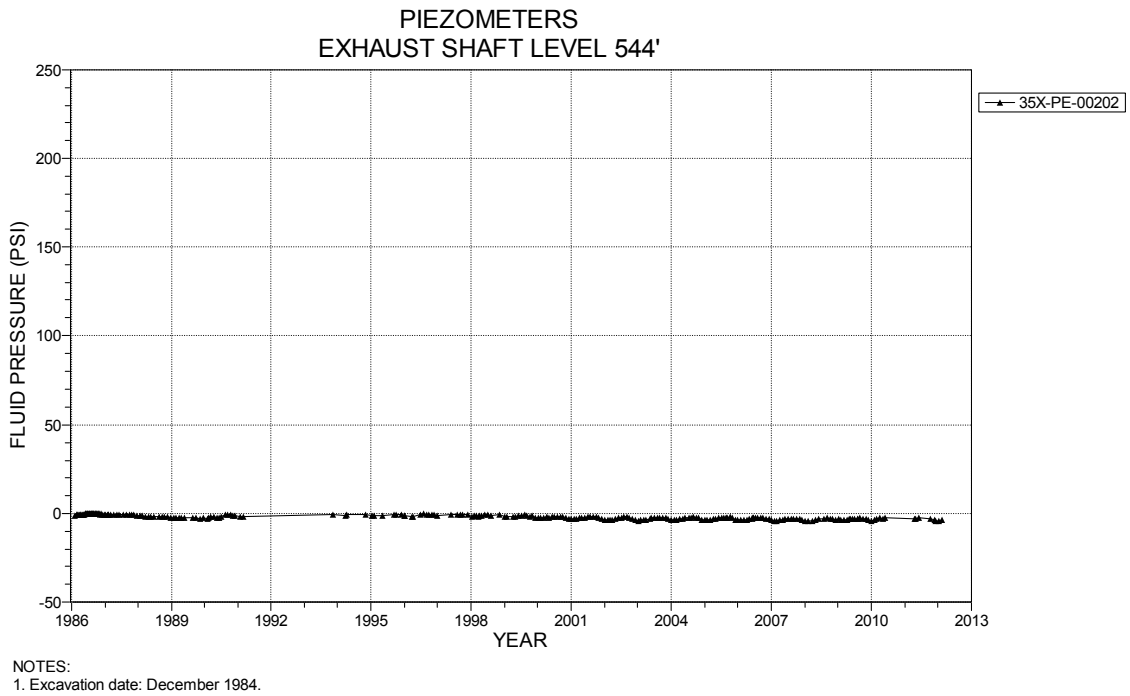


Figure 2-14 Piezometer 35X-PE-00202
Exhaust Shaft – Level 544 at the Base of Dewey Lake Redbeds

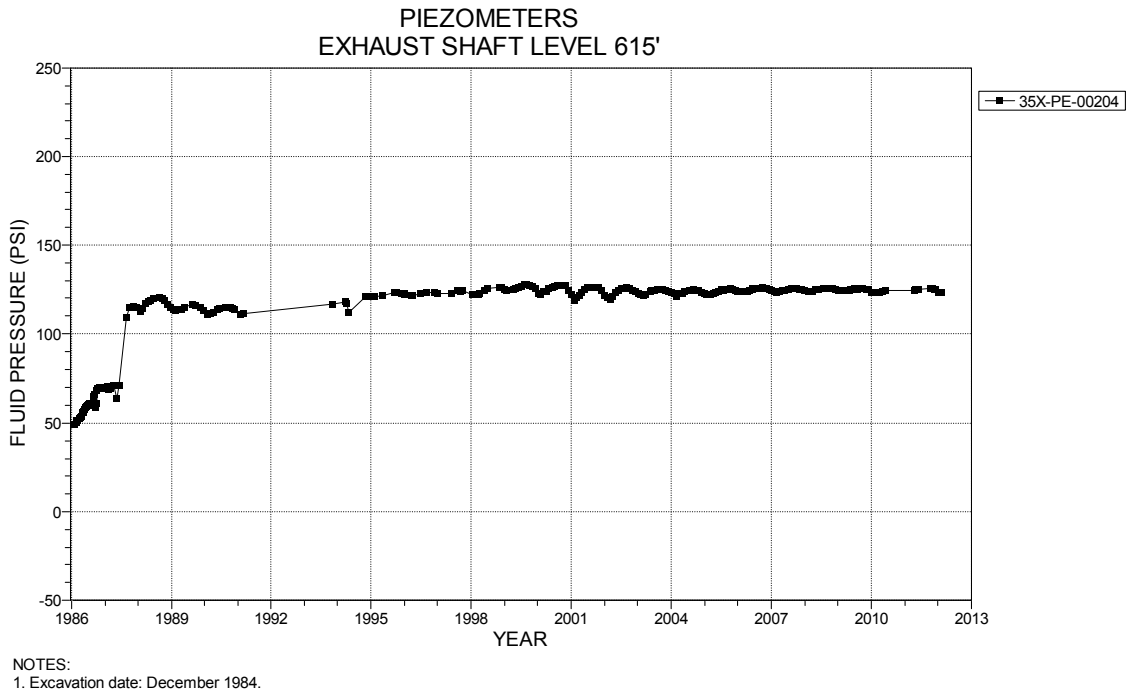


Figure 2- 15 Piezometer 35X-PE-00204
Exhaust Shaft – Level 615 at the Magenta Dolomite Member

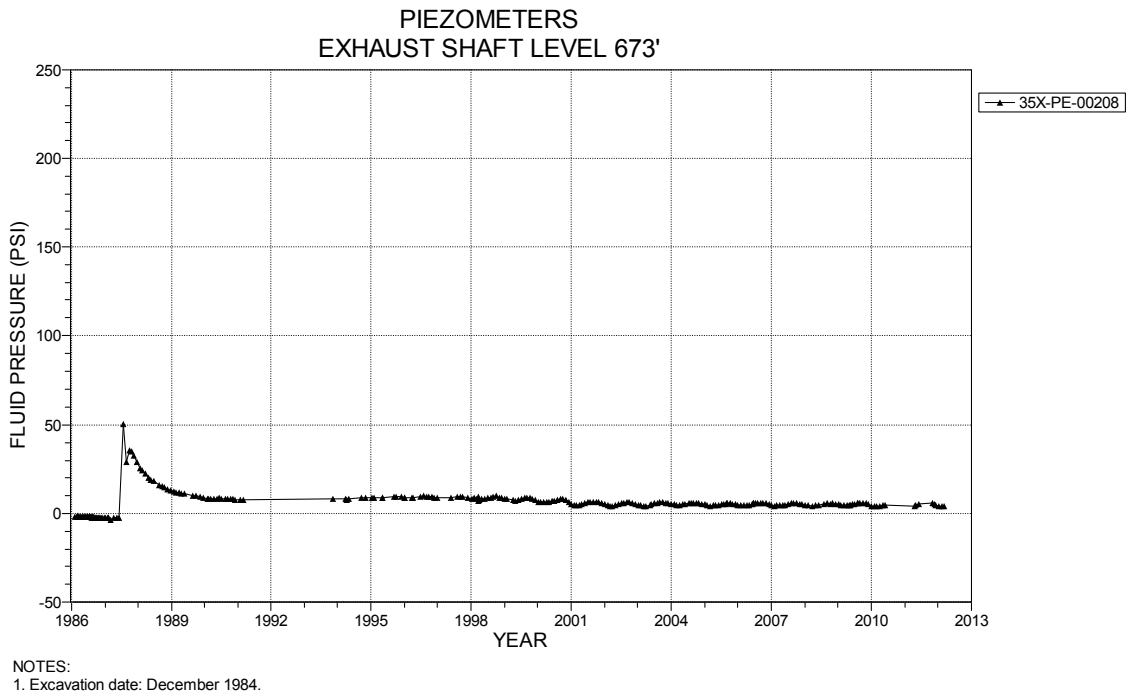


Figure 2-16 Piezometer 35X-PE-00208
Exhaust Shaft – Level 673 at the Tamarisk Member

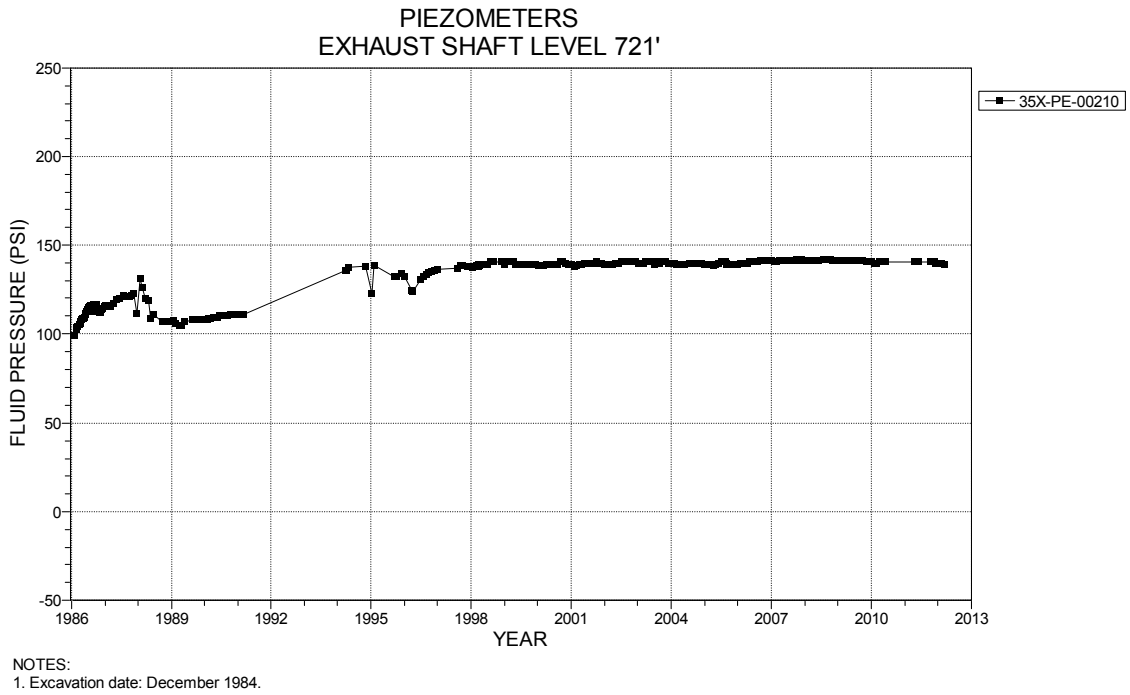


Figure 2-17 Piezometer 35X-PE-00210
Exhaust Shaft – Level 721 at the Culebra Dolomite Member

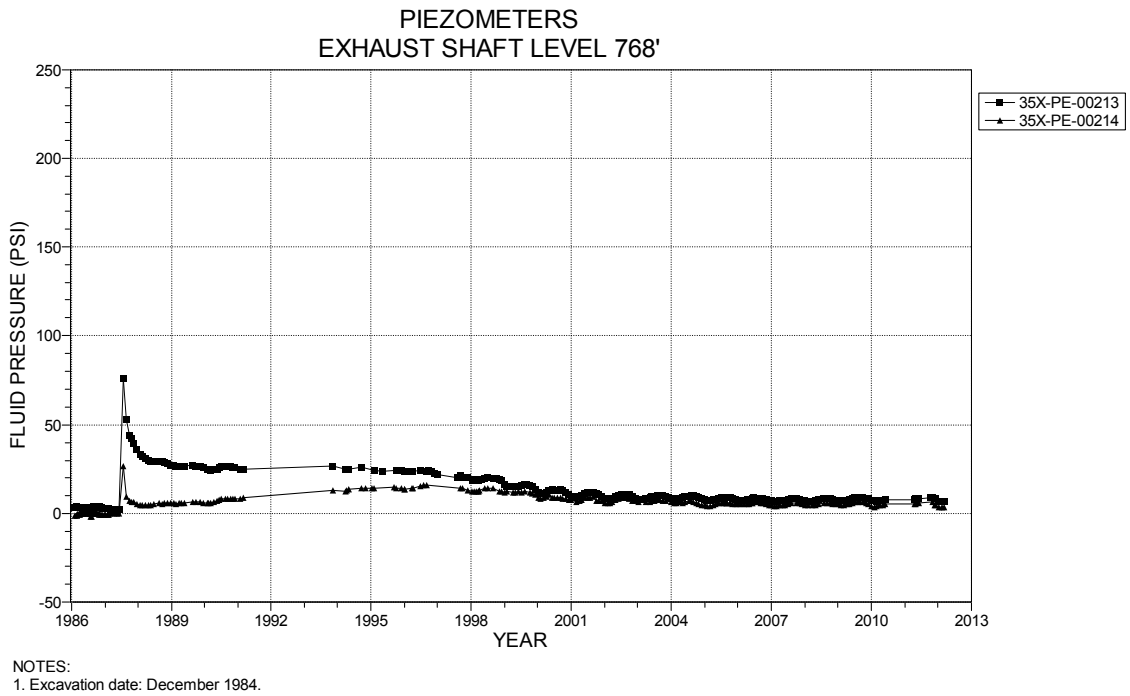


Figure 2-18 Piezometers 35X-PE-00213 and 35X-PE-00214
Exhaust Shaft – Level 768 at the Los Medaños Member

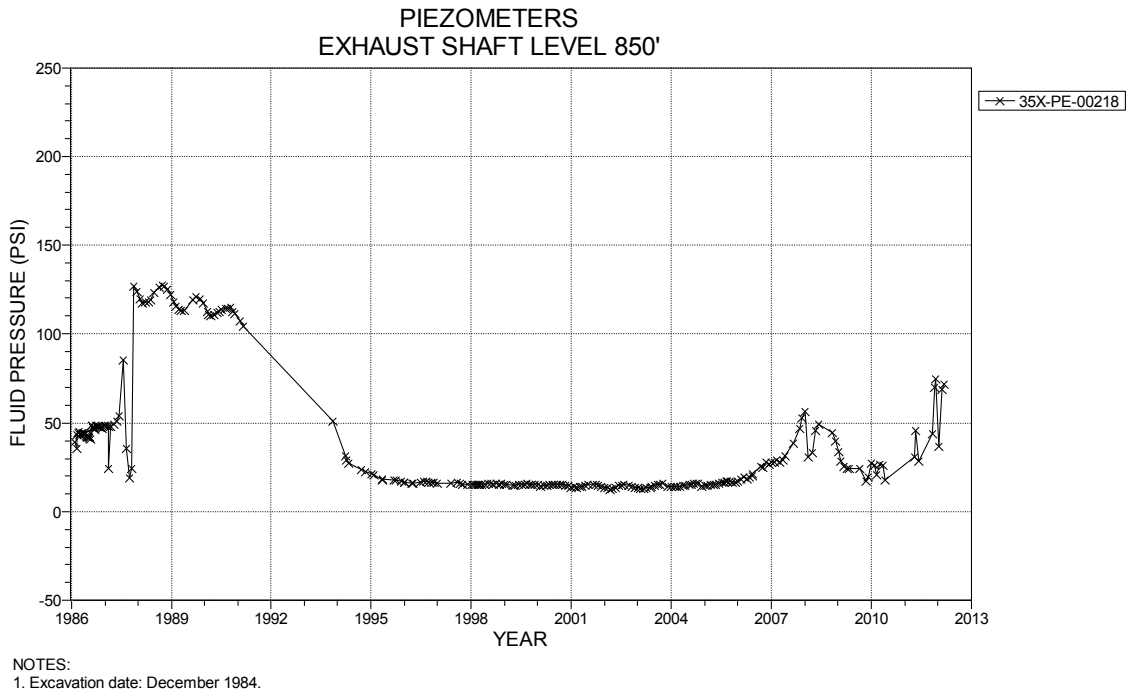


Figure 2-19 Piezometer 35X-PE-00218
Exhaust Shaft – Level 850 at the Rustler-Salado Contact

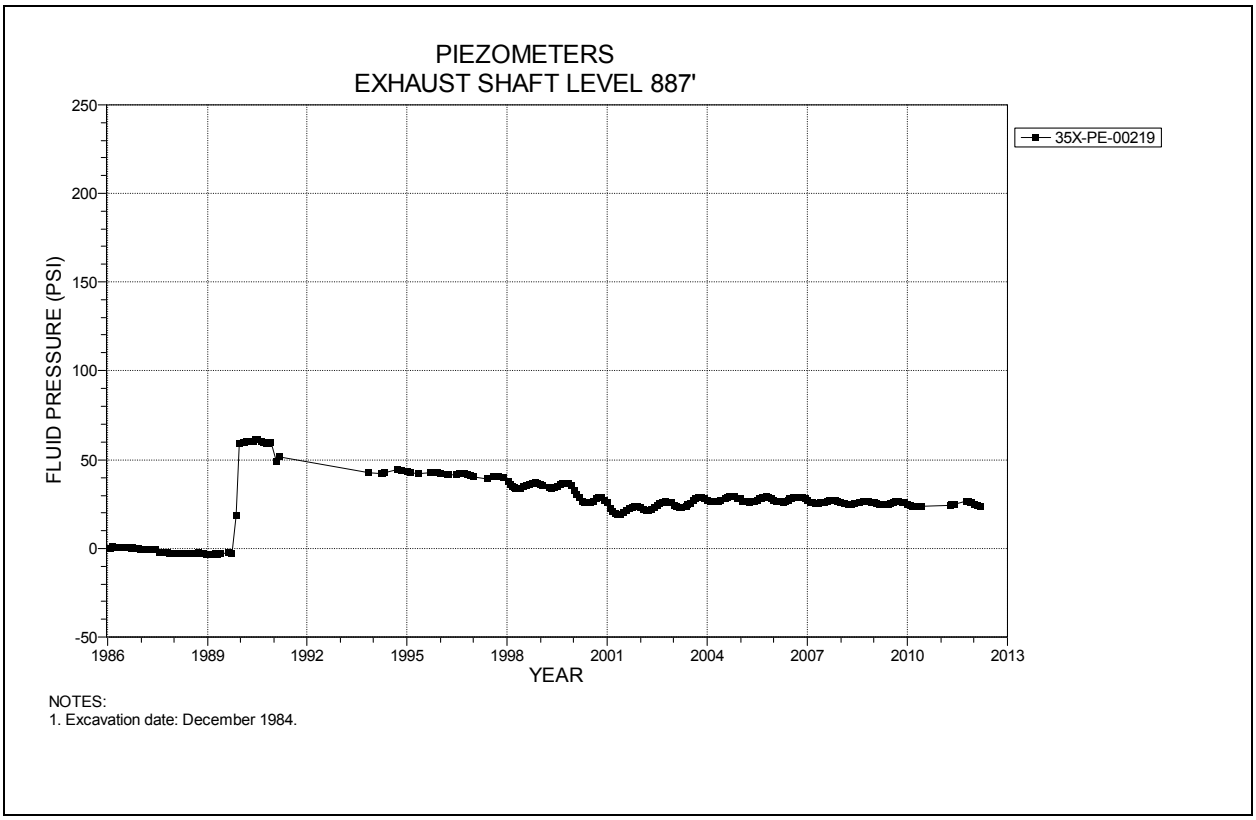


Figure 2-20 Piezometer 35X-PE-00219
Exhaust Shaft – Level 887 below the Lower Chemical Seal

3.0 Instrumentation Summary for Shaft Stations

Instrumentation data analysis for the Salt Handling Shaft Station, Waste Shaft Station, and the area around the Air Intake Shaft follow. Table 3-1 presents data analyses for each of the Salt Handling Shaft Station instruments. Figures 3-1 through 3-5 present plots of the instrumentation data for the Salt Handling Shaft Station.

Table 3-2 presents data and analysis for the Waste Shaft Station. Plots from the instrumentation in the Waste Shaft Station are presented as Figures 3-6 through 3-9.

Table 3-3 and Figures 3-10 through 3-15 present the data from rock bolt load cells and borehole extensometers located in the immediate area around the Air Intake Shaft.

Table 3-1
Salt Handling Shaft Station Data Analysis

Convergence Points

Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E0-S18-8 A-E	E0 Drift-S18	3-1	06/06/12	0.597	21.749	2.5	1.9	32%	
E0-S18-6 B-D	E0 Drift-S18	3-1a	06/06/12	0.629	23.728	2.6	2.0	28%	
E0-S18-5 H-F	E0 Drift-S18	3-1a	06/06/12	0.373	14.834	1.5	1.3	22%	
E0-S30-6 A-C	E0 Drift-S30	3-2	06/06/12	0.554	22.585	2.3	1.9	21%	
E0-S65-5 A-C	E0 Drift-S65	3-3	06/06/12	0.366	15.726	1.5	1.2	28%	

Extensometers

Field Tag	Location	Figure Number	Date of Last Reading	Collar Displacement Relative to Deepest Anchor (inches)	Displacement Rate 2011 to 2012 (in/year)	Displacement Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
51X-GE-01026-2	E0-S30 Roof	3-4	06/6/12	0.759	0.4	0.4	0%	
51X-GE-01027-2	E0-S60 Roof	3-5	06/6/12	0.507	0.2	0.2	0%	

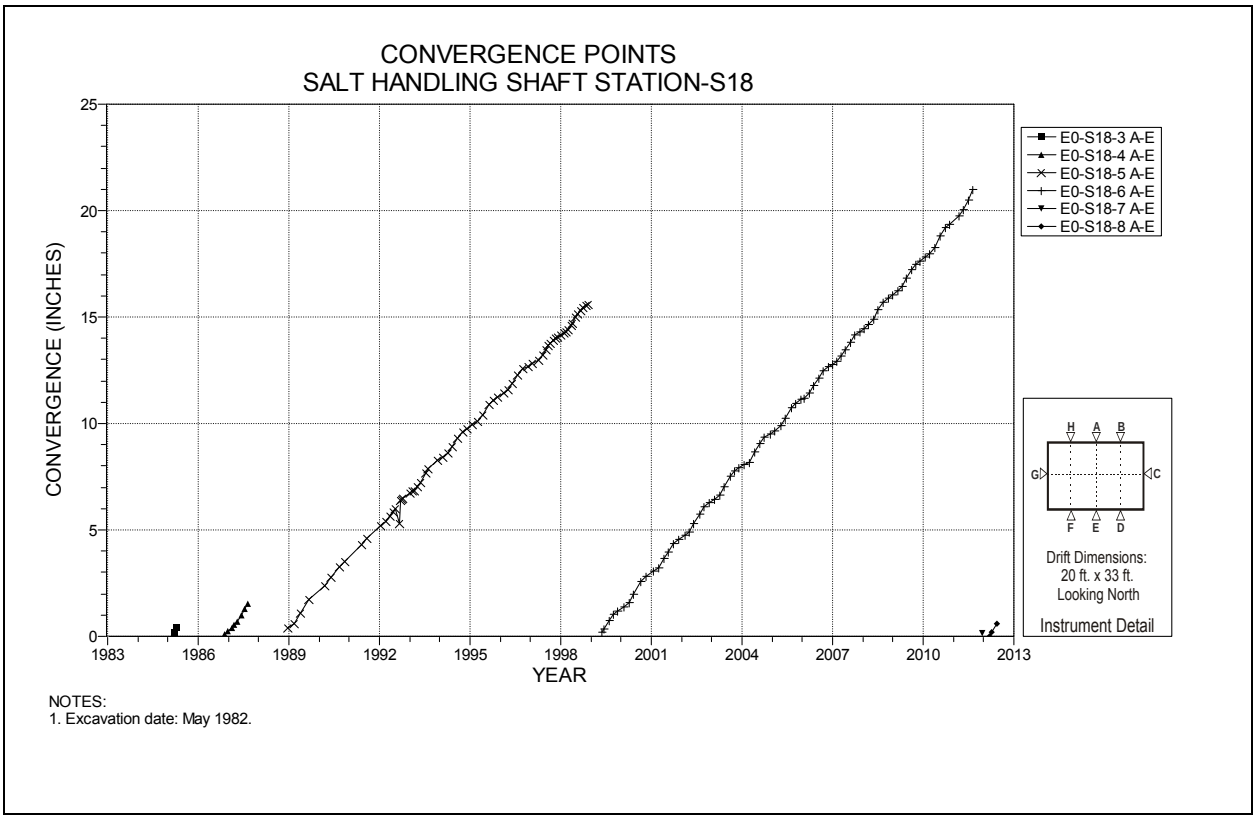


Figure 3-1 Convergence Point Array
Salt Handling Shaft Station at S18 – Centerline

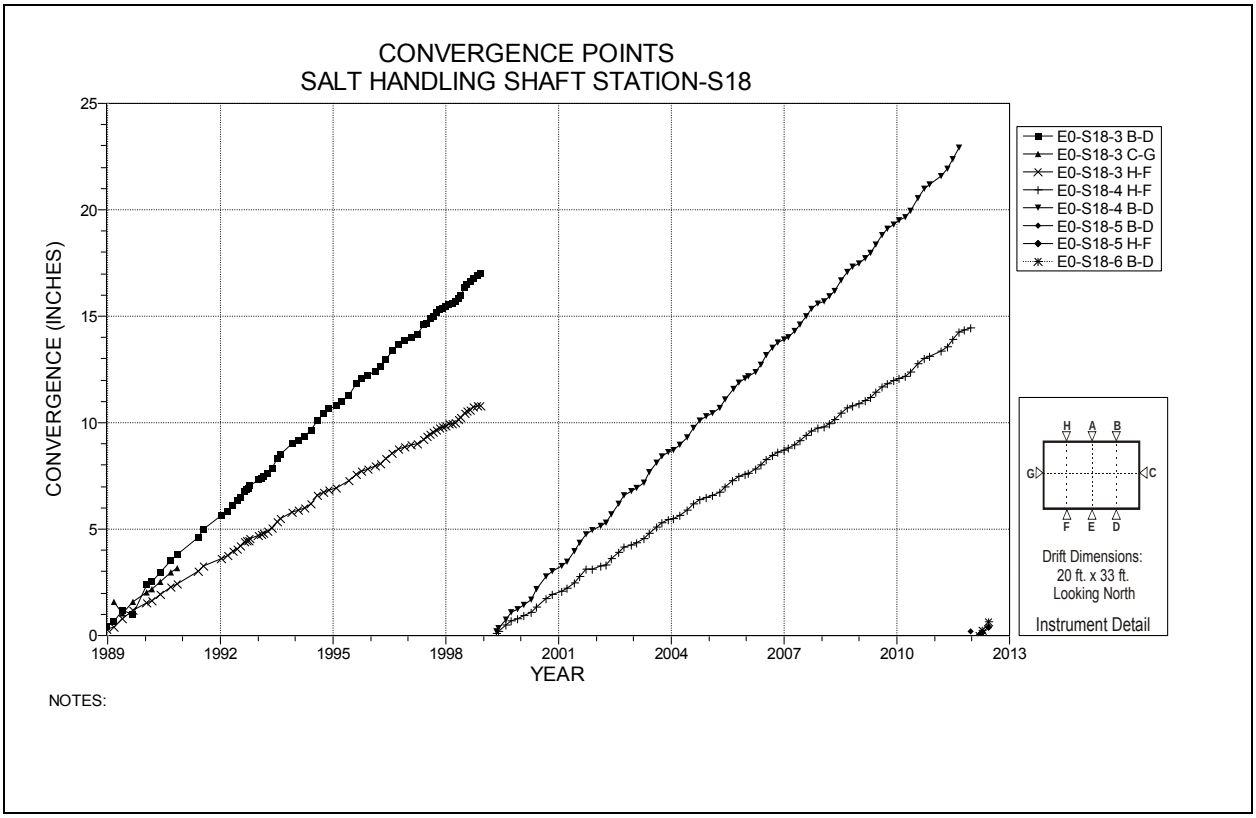


Figure 3-1a Convergence Point Array
Salt Handling Shaft Station at S18 – Quarter-Points

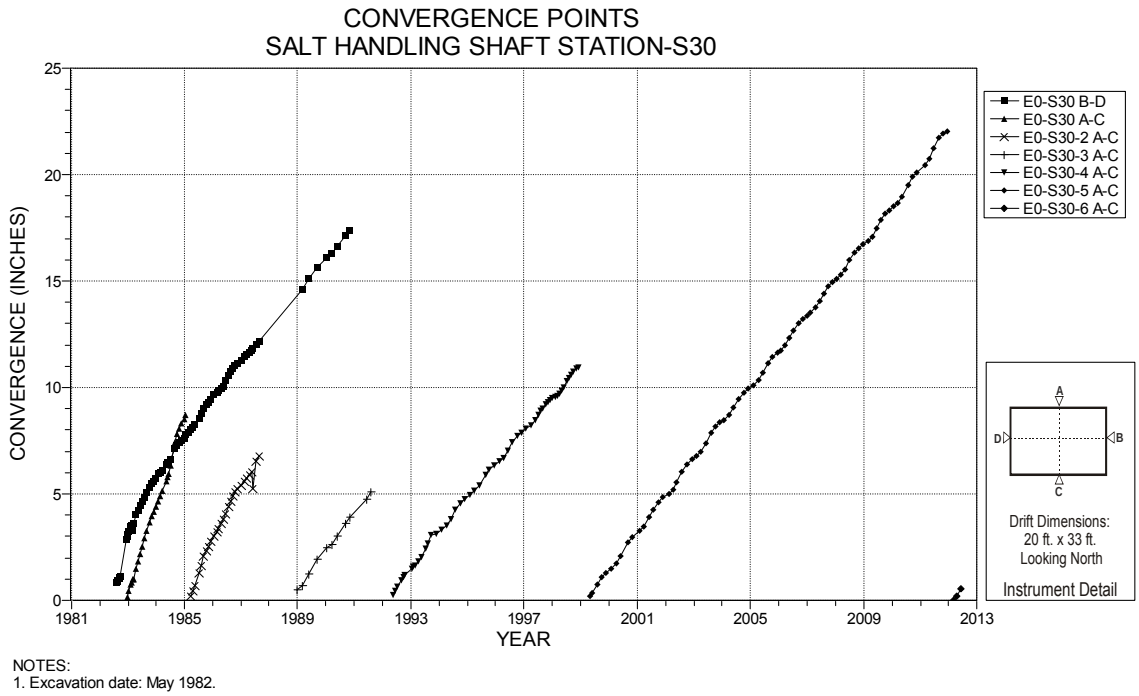


Figure 3-2 Convergence Point Array
Salt Handling Shaft Station at S30 – Roof to Floor

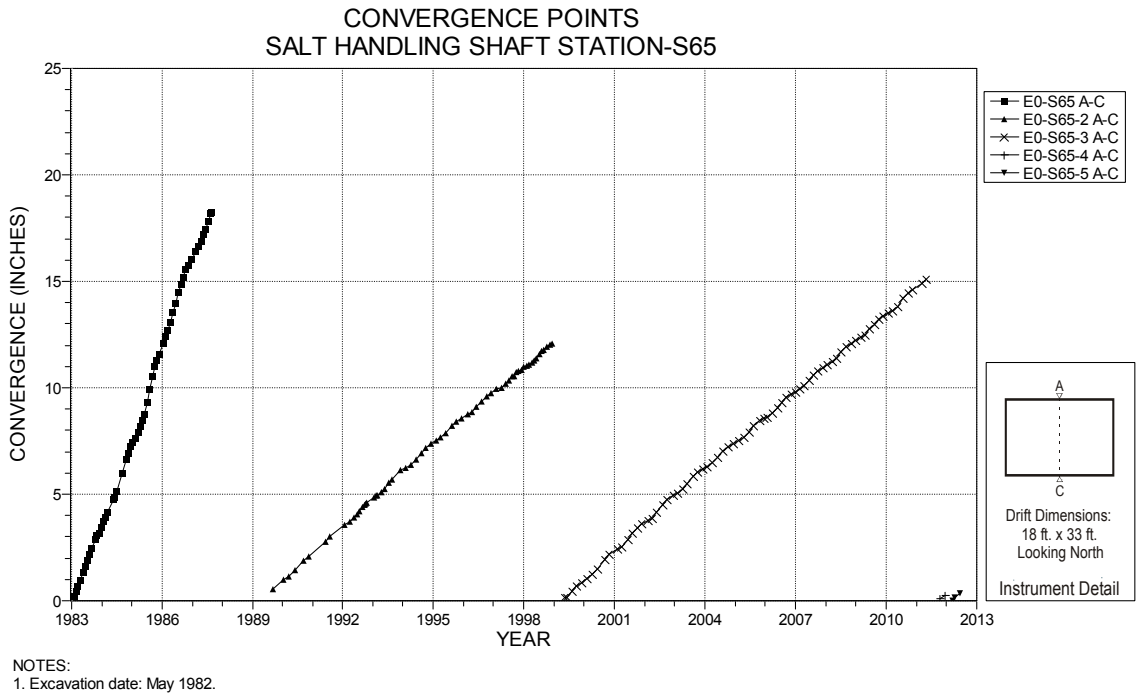


Figure 3-3 Convergence Point Array
Salt Handling Shaft Station at S65 – Roof to Floor

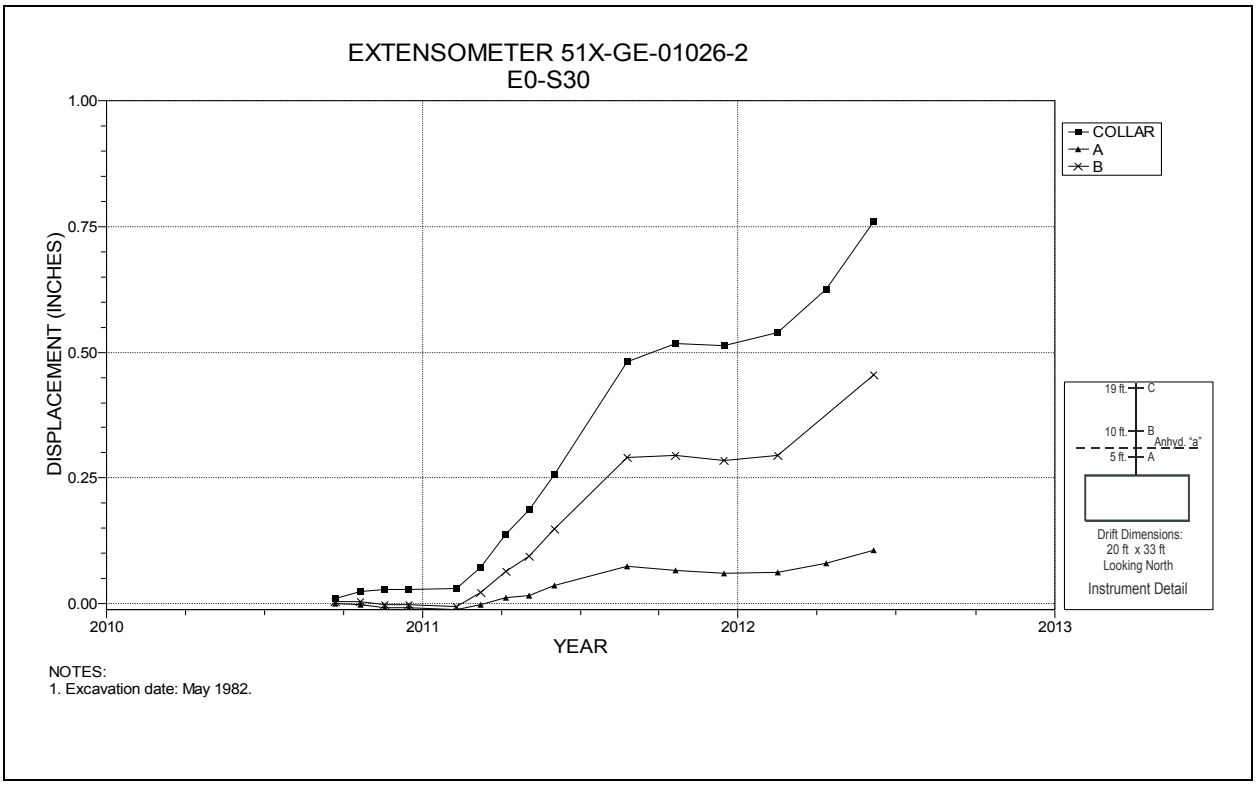


Figure 3-4 Extensometer 51X-GE-001026-2
Salt Handling Shaft Station at S30 – Roof

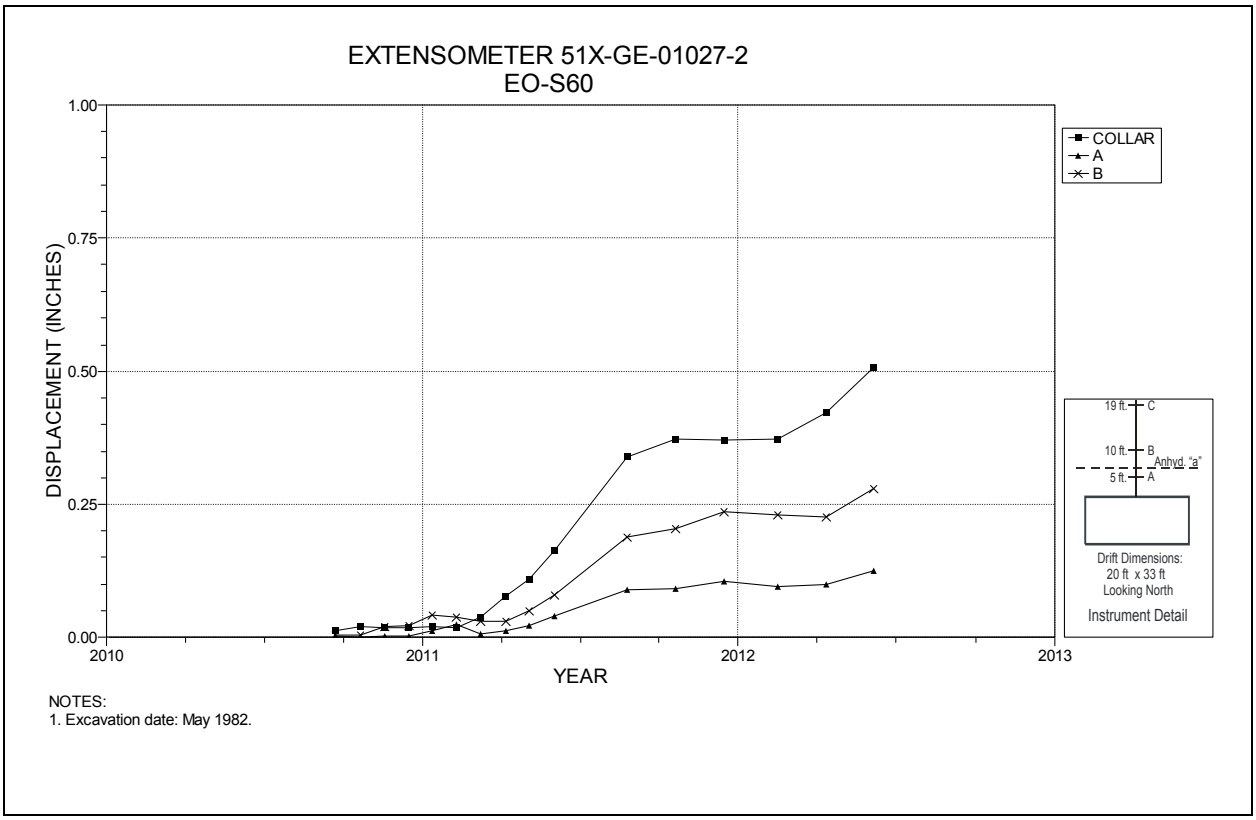


Figure 3-5 Extensometer 51X-GE-001027-2
Salt Handling Shaft Station at S60 – Roof

Table 3-2
Waste Shaft Station Data Analysis

Extensometers

Fieldtag	Location	Figure Number	Date of Last Reading	Collar Displacement Relative to Deepest Anchor (inches)	Displacement Rate 2011 to 2012 (in/year)	Displacement Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
51X-GE-00268	Waste Shaft Station - W30	3-6	06/06/12	11.003	0.1	0.1	0%	
51X-GE-00404-2	Waste Shaft Station	3-7	06/28/12	0.611	0.3	0.3	0%	

Convergence Points

Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S400-E32 B-D	Waste Shaft Station - E32	3-8	5/22/2012	4.173	4.173	1.2	1.2	0%	
S400-E85 B-D	Waste Shaft Station - E85	3-9	5/22/2012	4.233	4.233	1.2	1.3	-8%	

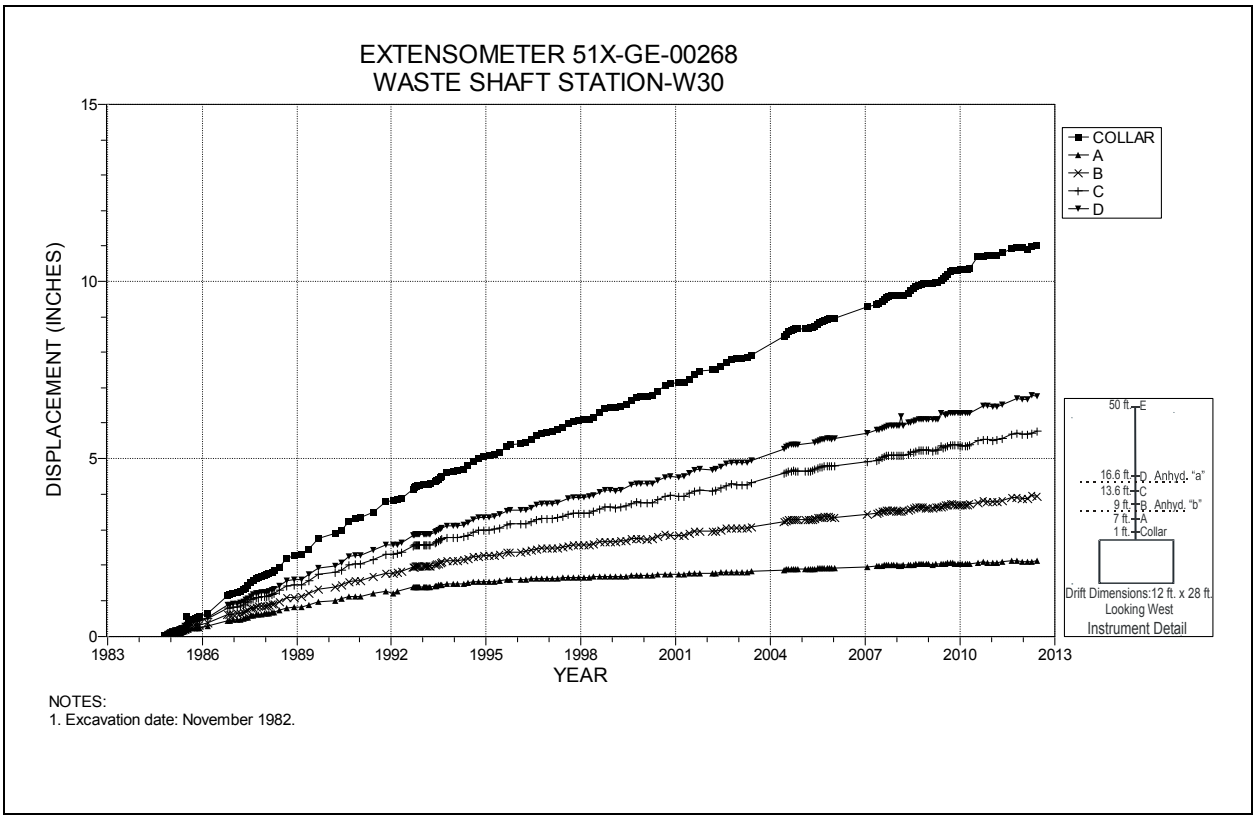


Figure 3-6 Extensometer 51X-GE-00268
Waste Shaft Station at W30 – Roof

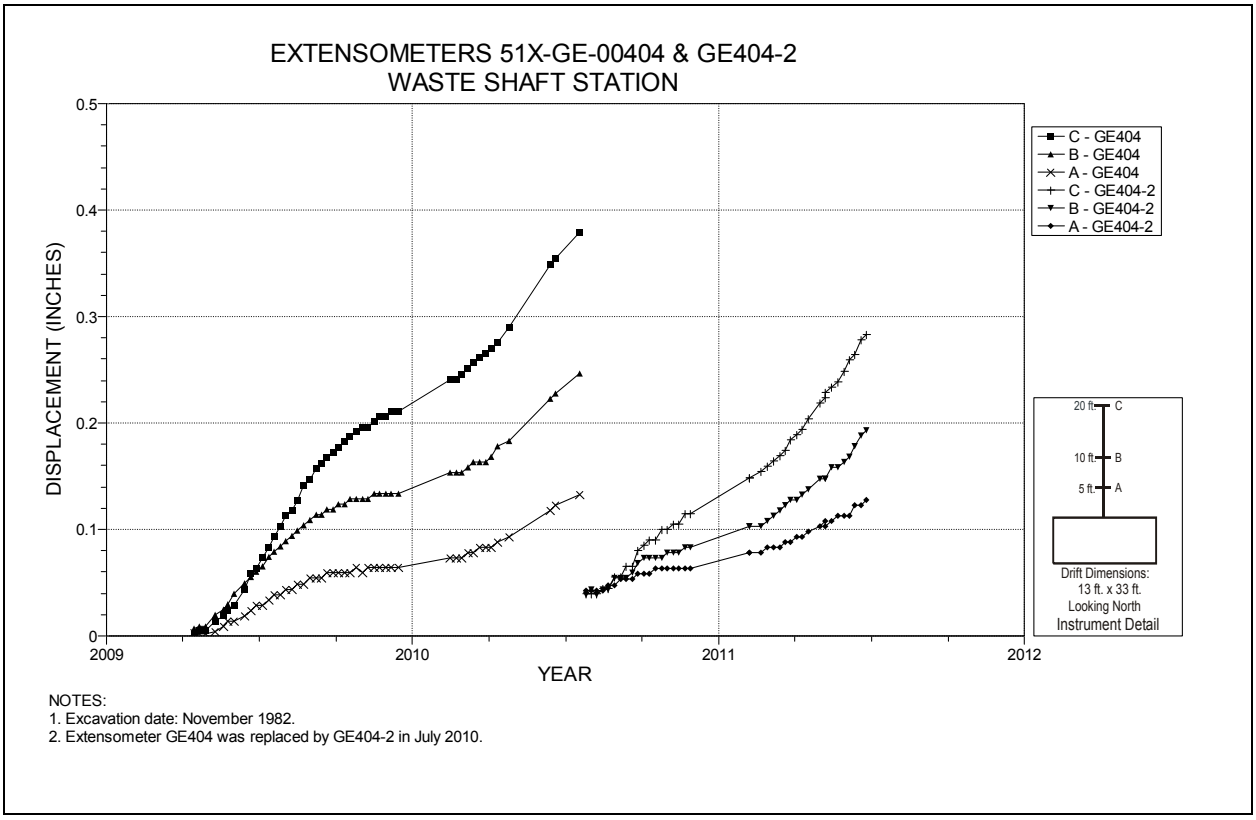


Figure 3-7 Extensometer 51X-GE-00404-2
Waste Shaft Station – Roof

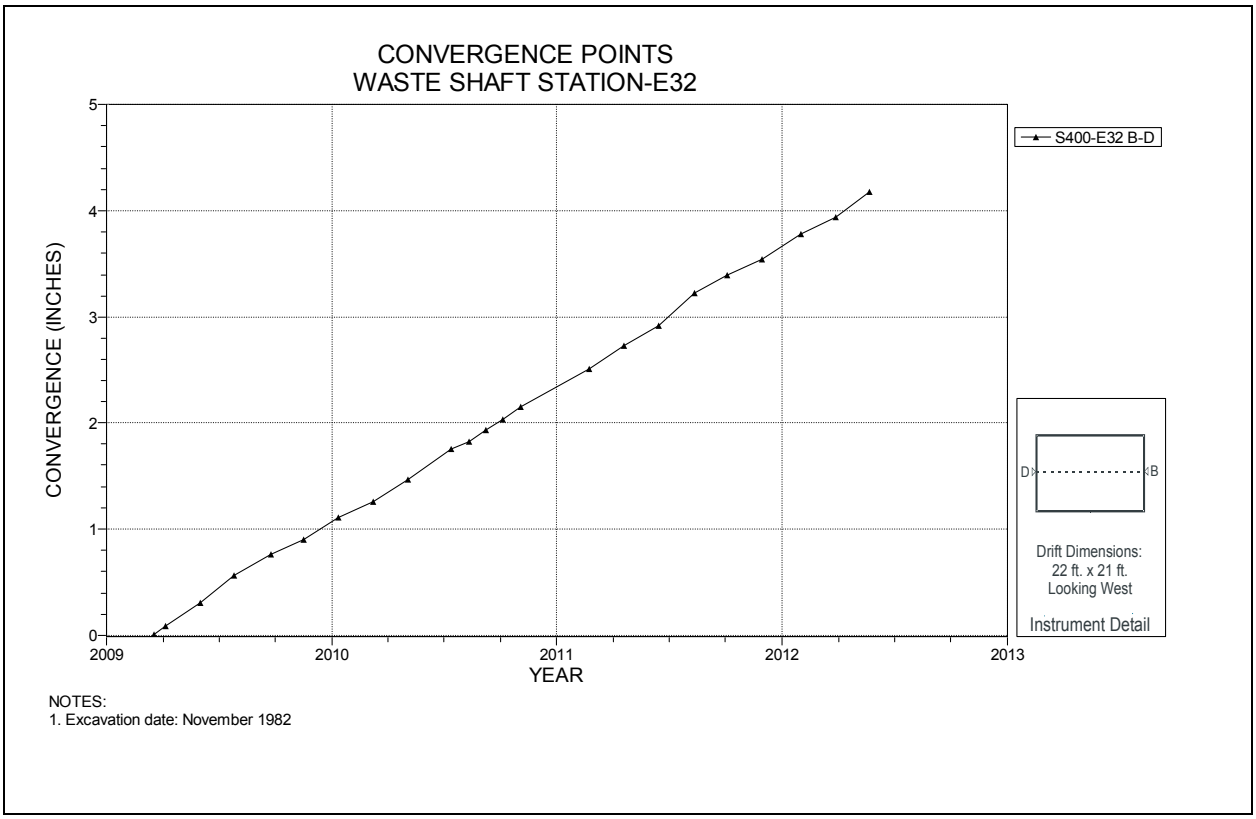


Figure 3-8 Convergence Point Array
Waste Shaft Station at E32 – Rib to Rib

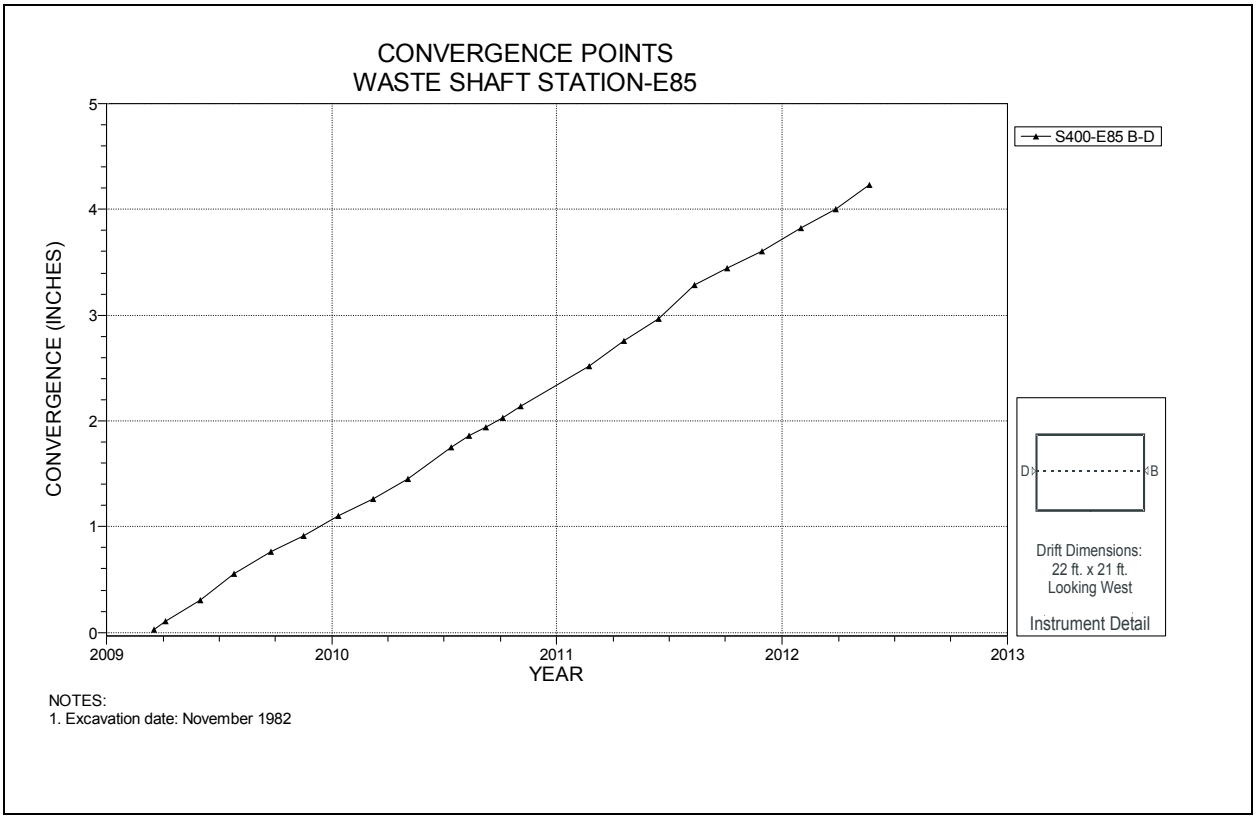


Figure 3-9 Convergence Point Array
Waste Shaft Station at E85 – Rib to Rib

Table 3-3
Air Intake Shaft Station Data Analysis

Extensometers

Field Tag	Location	Figure Number	Date of Last Reading	Collar Displacement Relative to Deepest Anchor (Inches)	Displacement Rate 2011 to 2012 in/year	Displacement Rate 2010 to 2011 in/year	Rate Change Percent	Comments
41X-GE-00122	S65-W620	3-10	03/12/12	3.189	0.20	0.25	-20%	Anchor 'D' has reached its maximum range. Anchor 'B' was used for comparison purposes to 41X-GE-00123.
41X-GE-00123	N93-W620	3-11	03/12/12	4.251	0.22	0.33	-33%	The Collar and 'C' anchors have reached their maximum range. Anchor 'B' readings were used.

Rockbolt Load Cells

Field Tag	Location	Figure Number	Date of Initial Reading	Date of Last Reading	Load (kips)	Comments
51X-WG-00236	AIS Station Brow - South	3-12	01/19/93	03/12/12	64.5	
51X-WG-00237	AIS Station Brow - South	3-12	01/19/93	03/12/12	1.4	
51X-WG-00238	AIS Station Brow - South	3-12	01/19/93	03/12/12	2.2	
51X-WG-00239	AIS Station Brow - South	3-12	01/19/93	03/12/12	30.5	
51X-WG-00240	AIS Station Brow - South	3-12	01/19/93	03/12/12	4.3	
51X-WG-00241	AIS Station Brow - South	3-13	01/19/93	03/12/12	66.5	
51X-WG-00242	AIS Station Brow - South	3-13	01/19/93	03/12/12	17.3	
51X-WG-00243	AIS Station Brow - South	3-13	01/19/93	03/12/12	14.1	
51X-WG-00244	AIS Station Brow - South	3-13	12/24/94	03/12/12	23.7	
51X-WG-00245	AIS Station Brow - South	3-13	01/19/93	03/12/12	0.7	
51X-WG-00246	AIS Station Brow - North	3-14	01/19/93	03/12/12	22.4	
51X-WG-00247	AIS Station Brow - North	3-14	01/19/93	03/12/12	57.9	
51X-WG-00248	AIS Station Brow - North	3-14	01/19/93	03/12/12	9.5	
51X-WG-00249	AIS Station Brow - North	3-14	01/19/93	03/12/12	36.1	
51X-WG-00250	AIS Station Brow - North	3-14	12/24/94	03/12/12	11.3	
51X-WG-00251	AIS Station Brow - North	3-15	01/19/93	03/12/12	28.0	
51X-WG-00252	AIS Station Brow - North	3-15	01/19/93	03/12/12	0.6	
51X-WG-00253	AIS Station Brow - North	3-15	01/19/93	03/12/12	55.4	
51X-WG-00254	AIS Station Brow - North	3-15	01/19/93	03/12/12	9.4	
51X-WG-00255	AIS Station Brow - North	3-15	01/19/93	03/12/12	24.0	

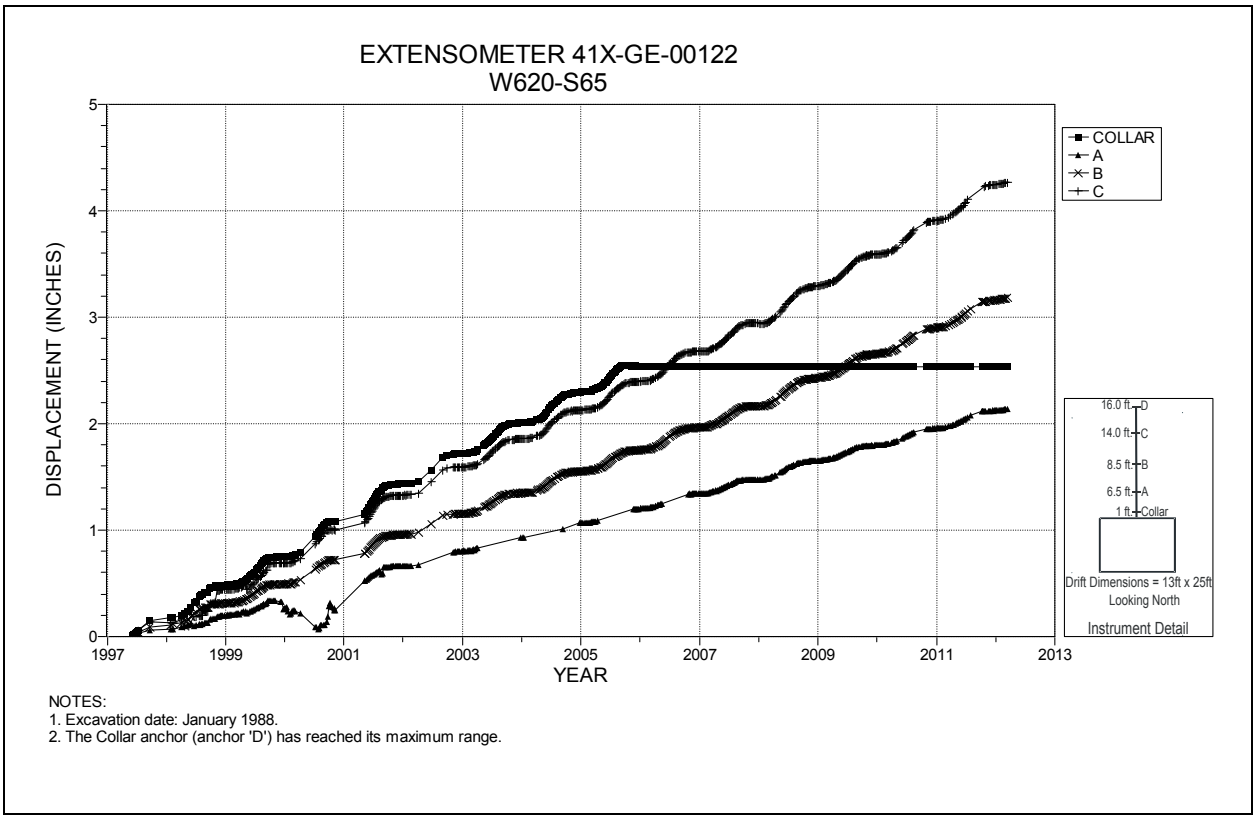


Figure 3-10 Extensometer 41X-GE-00122
Air Intake Shaft Station at S65 – Roof

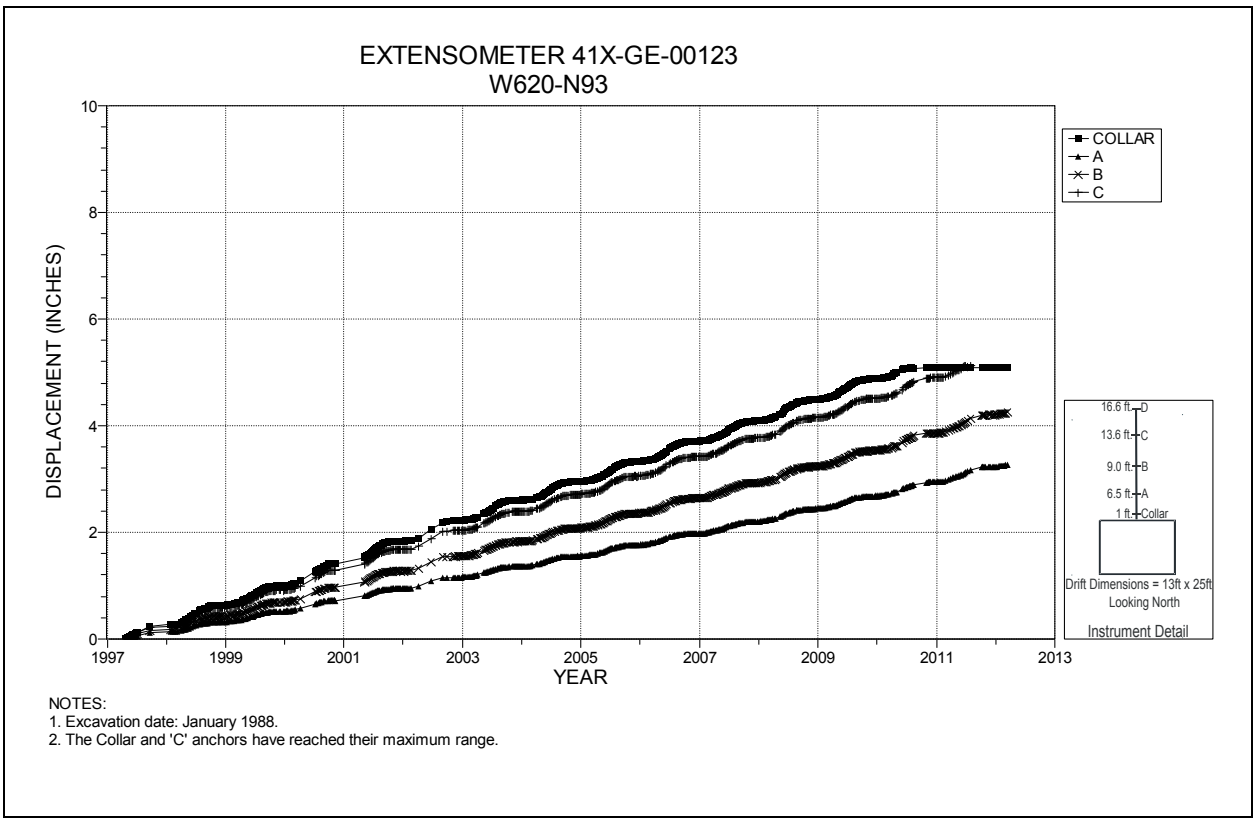


Figure 3-11 Extensometer 41X-GE-00123
Air Intake Shaft Station at N93 – Roof

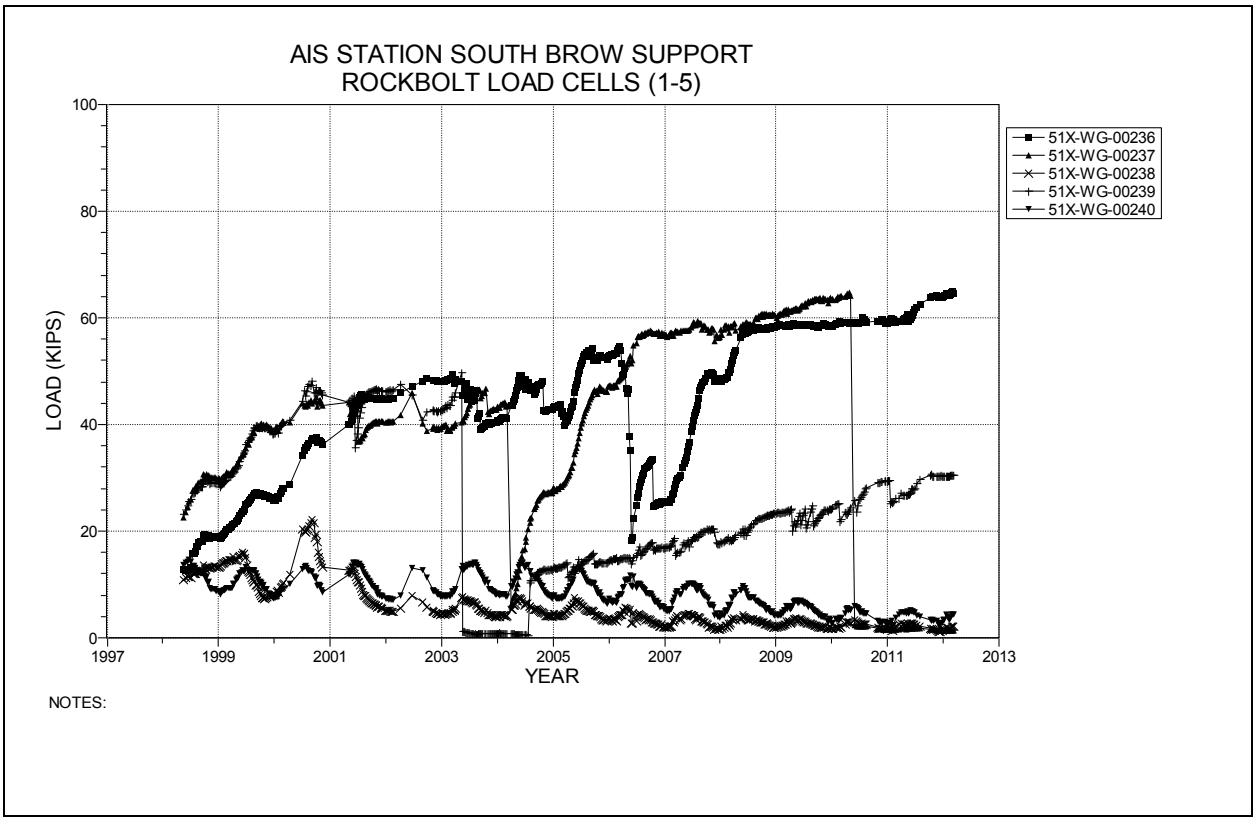


Figure 3-12 Rock Bolt Load Cells
Air Intake Shaft Station Brow – South Side Roof Bolts Set 1

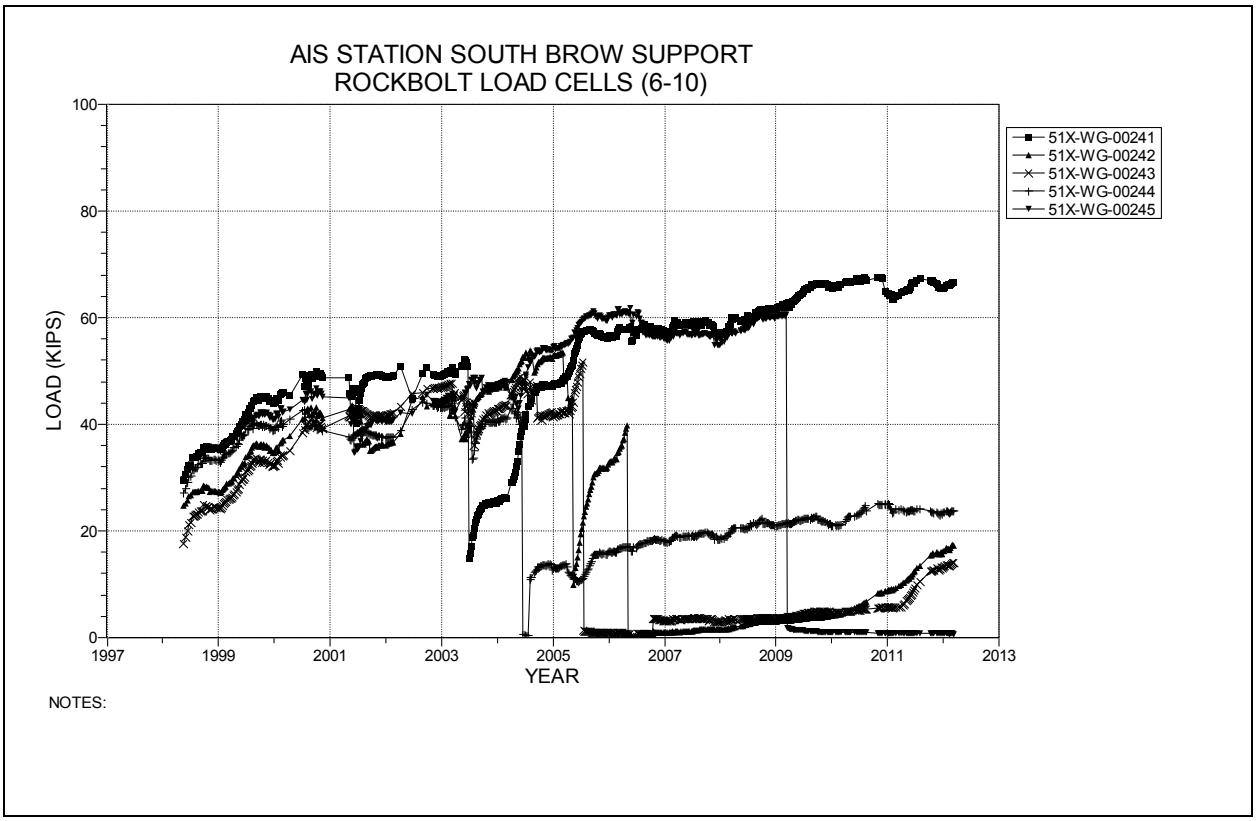


Figure 3-13 Rock Bolt Load Cells
Air Intake Shaft Station Brow – South Side Roof Bolts Set 2

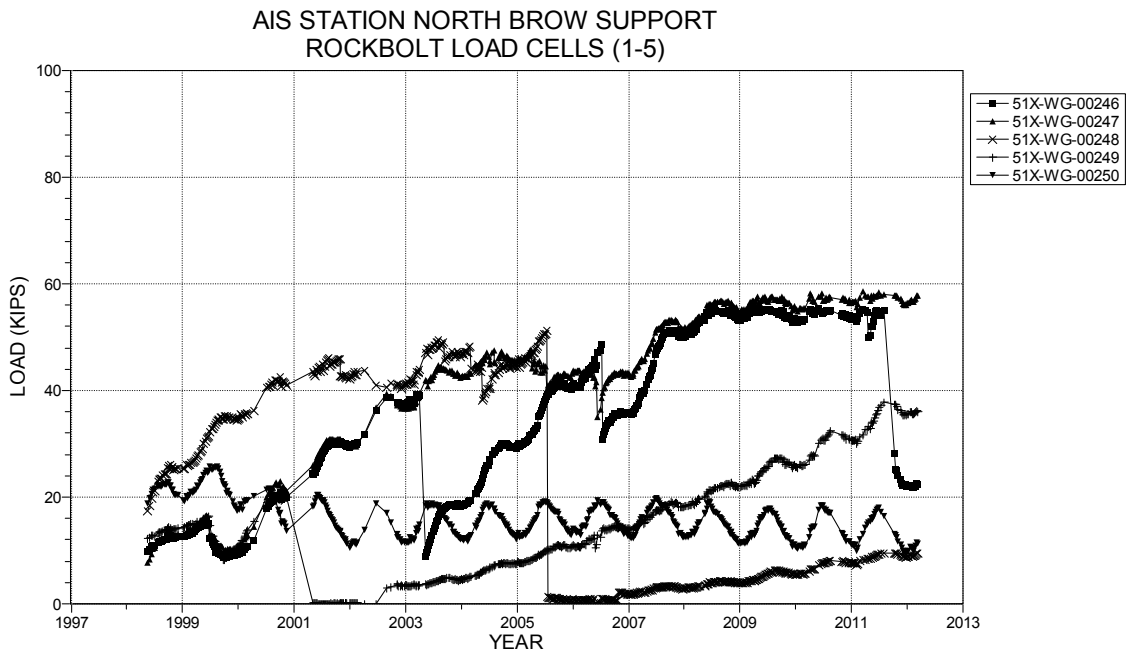


Figure 3-14 Rock Bolt Load Cells
Air Intake Shaft Station Brow – North Side Roof Bolts Set 1

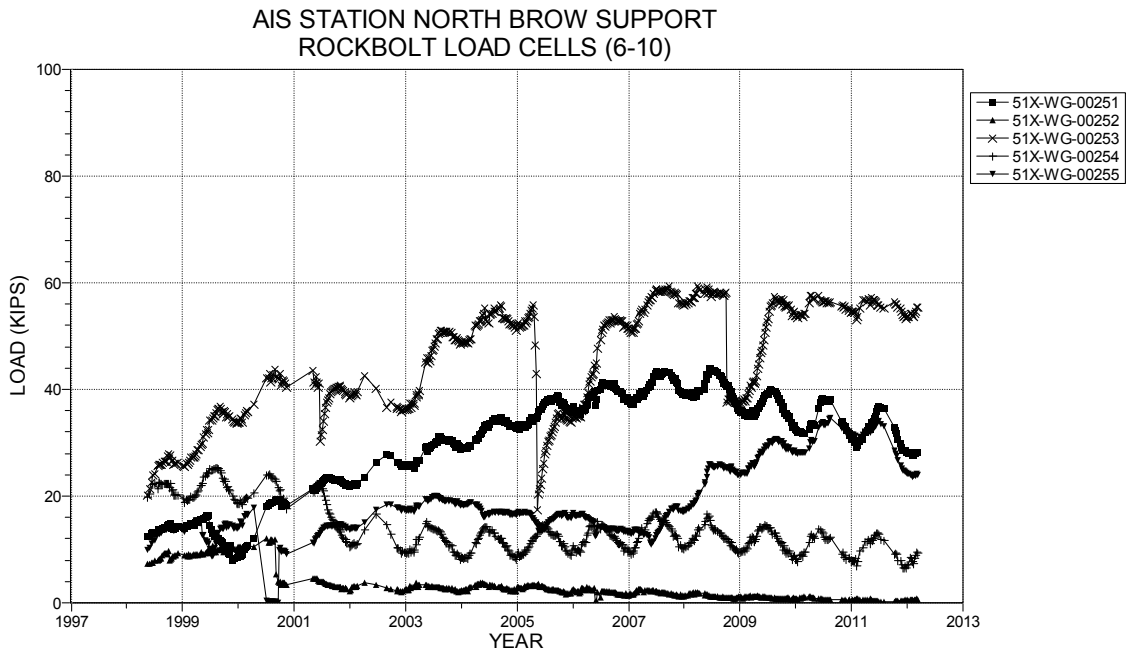


Figure 3-15 Rock Bolt Load Cells
Air Intake Shaft Station Brow – North Side Roof Bolts Set 2

4.0 Instrumentation Summary for the Access Drifts

This chapter presents the instrumentation data and data analyses for the access drifts throughout the WIPP underground. Table 4-1 provides the results of analyses performed on the instrument data including displacement, convergence rates, and rock bolt loading.

Figures 4-1 through 4-34 present data from borehole extensometers installed in the access drifts while Figures 4-35 through 4-257 present the convergence point data.

Figure 4-258 through 4-267 presents data from joint meters installed at the S1950/E300 overcast and the access drifts. Figure 4-268 through 4-276 presents the data from rock bolt load cells installed in the E140 drift, the adjacent brows in E140-S1300 and at the E140-S1300 east brow.

Table 4-1
Access Drifts Data Analysis

Extensometers								
Field Tag	Location	Figure Number	Date of Last Reading	Collar Displacement Relative to Deepest Anchor (inches)	Displacement Rate 2011 to 2012 (in/year)	Displacement Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
51X-GE-00355	E0-N300	4-1	06/28/12	5.297	0.6	0.6	7%	
51X-GE-00353	E0-N626	4-2	06/28/12	6.925	1.9	1.1	74%	
51X-GE-00352	E0-N940	4-3	06/28/12	6.651	1.2	1.4	-18%	
51X-GE-00361	E0-N1266	4-4	06/28/12	10.745	1.5	1.0	57%	
51X-GE-00105-3	E140-N150	4-5	06/13/12	3.829	-0.13	N/A	N/A	
51X-GE-00364	E140-N1266	4-6	06/28/12	5.503	0.57	0.69	-18%	
51X-GE-00372	E140-S146	4-7	06/28/12	3.743	0.36	0.50	-28%	
51X-GE-00472	E140-S1000	4-8	05/22/12	5.670	0.36	0.40	-9%	
51X-GE-00464	E140-S1025	4-9	05/21/12	4.958	0.36	0.40	-10%	
51X-GE-00333	E140-S1075	4-10	06/28/12	6.511	0.00	0.34	-101%	
51X-GE-00428	E140-S1150	4-11	05/02/12	0.881	2.3	N/A	N/A	
51X-GE-00428-2	E140-S1150	4-11	06/25/12	0.342	3.2	N/A	N/A	
51X-GE-00335	E140-S1300	4-12	06/28/12	4.386	0.34	0.34	-2%	
51X-GE-00429	E140-S1450	4-13	06/25/12	1.041	1.9	N/A	N/A	
51X-GE-00430	E140-S1669	4-14	06/25/12	1.116	2.1	N/A	N/A	
51X-GE-00431	E140-S1775	4-15	06/25/12	0.694	1.3	N/A	N/A	
51X-GE-00432	E140-S1850	4-16	06/25/12	1.187	2.2	N/A	N/A	
51X-GE-00433	E140-S2065	4-17	05/02/12	1.202	3.1	N/A	N/A	
51X-GE-00433-2	E140-S2065	4-17	06/25/12	0.477	4.5	N/A	N/A	
51X-GE-00434	E140-S2265	4-18	06/25/12	0.978	2.5	N/A	N/A	
51X-GE-00435	E140-S2350	4-19	06/25/12	1.191	3.5	N/A	N/A	
51X-GE-00437	E140-S2635	4-20	06/25/12	0.144	0.51	N/A	N/A	
51X-GE-00492	E140-S2750	4-21	06/18/12	3.590	0.31	0.34	-7%	
51X-GE-00367-2	E140-S2916	4-22	03/05/12	9.356	1.7	2.1	-16%	
51X-GE-00439	E140-S2916	4-22	06/25/12	0.158	0.9	N/A	N/A	
51X-GE-00396	E140-S3493	4-23	06/28/12	6.847	2.1	1.7	24%	
51X-GE-00374	E300-N1186	4-24	06/28/12	5.288	0.62	0.57	10%	
51X-GE-00388	E300-N1266	4-25	06/28/12	3.462	0.66	0.60	10%	
51X-GE-00373	E300-N1341	4-26	06/28/12	4.653	0.75	1.0	-25%	
51X-GE-00474	S1000-E120	4-27	06/25/12	1.402	0.07	0.08	-5%	

Table 4-1
Access Drifts Data Analysis (Continued)

Extensometers (continued)

Field Tag	Location	Figure Number	Date of Last Reading	Collar Displacement Relative to Deepest Anchor (inches)	Displacement Rate 2011 to 2012 (in/year)	Displacement Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
51X-GE-00473	S1000-E160	4-28	06/25/12	1.206	0.07	0.06	20%	
51X-GE-00462	S1300-E120	4-29	06/26/12	0.810	0.04	0.05	-17%	
51X-GE-00463	S1300-E160	4-30	06/26/12	5.160	0.44	0.56	-22%	
51X-GE-00442	S1600-E120	4-31	06/26/12	1.149	0.06	0.07	-15%	
51X-GE-00500	S2750-W93	4-32	06/18/12	1.941	2.9	N/A	N/A	
51X-GE-00415	W170-S2998	4-33	06/28/12	8.293	4.2	3.5	19%	
51X-GE-00490	W30-S2750	4-34	06/04/12	3.794	0.66	0.67	0%	

[1] N/A – Insufficient data available to perform the calculation. This is usually due to the inability to read the instruments because of activities such as: the temporary removal of an instrument due to floor, rib or back trimming; locations blocked by equipment or waste disposal, etc.

Convergence Points

Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
CORE-W10 A-C	Core Storage W10	4-35	05/10/12	22.813	22.813	0.9	0.9	0%	
CORE-W20 A-C	Core Storage W20	4-35	05/10/12	21.632	21.632	0.9	0.9	0%	
CORE-W30 A-C	Core Storage W30	4-35	05/10/12	22.808	22.808	1.0	1.1	-9%	
CORE-W51 A-C	Core Storage W51	4-35	05/10/12	26.465	26.465	1.3	1.4	-7%	
CORE-W62 A-C	Core Storage W62	4-35	05/10/12	27.742	27.742	1.4	1.5	-7%	
CORE-W73 A-C	Core Storage W73	4-35	05/10/12	28.009	28.009	1.4	1.5	-7%	
CORE-W101 A-C	Core Storage W101	4-35	05/10/12	27.008	27.008	1.3	N/A	N/A	
CORE-W117 A-C	Core Storage W117	4-35	05/10/12	24.224	24.224	1.1	1.1	0%	
CORE-W133 A-C	Core Storage W133	4-35	05/10/12	20.247	20.247	0.9	0.9	0%	
E0-N75 A-C	E0-N75	4-36	06/06/12	19.634	19.634	1.8	2.0	-10%	
E0-N75 B-D	E0-N75	4-36	06/06/12	13.703	13.703	1.1	1.4	-21%	
E0-N225-2 A-C	E0-N225	4-37	06/05/12	19.430	19.477	1.7	2.0	-15%	
E0-N225-2 B-D	E0-N225	4-37	06/05/12	2.882	15.187	1.3	1.6	-19%	
E0-N300-6 A-C	E0-N300	4-38	06/05/12	2.993	19.330	1.7	2.8	-39%	Cumulative is from N300 only (N290 not included).

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)

Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E0-N460-3 A-C	E0-N460	4-39	06/05/12	23.014	43.103	2.2	2.4	-8%	
E0-N562 A-C	E0-N562	4-40	06/05/12	17.485	17.485	2.2	2.0	10%	
E0-N562 B-D	E0-N562	4-40	06/05/12	14.815	14.815	1.5	1.6	-6%	
E0-N626-4 A-C	E0-N626	4-41	06/06/12	22.053	63.012	3.1	2.0	55%	
E0-N686 A-C	E0-N686	4-42	06/06/12	24.337	24.337	4.0	2.0	100%	
E0-N686 B-D	E0-N686	4-42	06/06/12	13.743	13.743	1.3	1.3	0%	
E0-N780-2 A-C	E0-N780	4-43	06/06/12	18.928	39.350	2.0	2.3	-13%	
E0-N940-5 A-C	E0-N940	4-44	06/06/12	19.395	67.447	2.4	3.2	-25%	
E0-N1110-5 A-C	E0-N1110	4-45	06/06/12	13.078	47.502	1.4	1.8	-22%	
E0-N1266-4 A-C	E0-N1266	4-46	06/06/12	21.300	58.207	2.1	2.2	-5%	
E140-N5-6 A-C	E140-N5	4-47	06/12/12	13.262	45.104	2.4	2.3	4%	
E140-N5-3 B-D	E140-N5	4-47	06/12/12	17.392	32.633	1.1	1.2	-8%	
E140-N220-3 A-C	E140-N220	4-48	06/12/12	14.580	40.379	2.5	2.5	0%	
E140-N355-2 A-C	E140-N355	4-49	06/12/12	11.910	20.454	2.4	2.2	9%	
E140-N355 B-D	E140-N355	4-49	06/12/12	17.186	17.186	1.6	1.7	-6%	
E140-N460-3 A-C	E140-N460	4-50	06/12/12	21.470	42.301	2.1	2.3	-9%	
E140-N150-4 A-C	E140-N150	4-51	06/12/12	11.066	30.124	1.8	1.7	6%	
E140-N562-2 A-C	E140-N562	4-52	06/12/12	20.739	32.556	2.6	2.5	4%	
E140-N562-2 B-D	E140-N562	4-52	06/12/12	14.714	22.910	1.6	1.7	-6%	
E140-N626-3 A-C	E140-N626	4-53	06/12/12	28.560	61.130	3.8	3.4	12%	
E140-N626-4 B-D	E140-N626	4-53	06/12/12	14.072	35.379	1.5	1.6	-6%	
E140-N686-2 A-C	E140-N686	4-54	06/12/12	22.895	36.034	3.1	2.8	11%	
E140-N686-2 B-D	E140-N686	4-54	06/12/12	14.148	22.982	1.6	1.6	0%	
E140-N780-2 A-C	E140-N780	4-55	06/12/12	27.118	58.875	3.1	2.9	7%	
E140-N940-2 A-C	E140-N940	4-56	06/12/12	25.613	25.613	4.6	3.6	28%	Initial installations were at N952.
E140-N940-2 B-D	E140-N940	4-56	02/22/12	9.278	9.278	1.2	1.3	-8%	
E140-N1100-2 A-C	E140 -N1100	4-57	06/12/12	12.255	36.123	1.7	1.7	0%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)

Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
E140-N1266-3 A-C	E140-N1266	4-58	06/12/12	19.944	57.699	2.5	2.4	4%	
E140-N1266-4 B-D	E140-N1266	4-58	06/12/12	9.977	31.982	1.3	1.3	0%	
E140-N1420-2 A-C	E140-N1420	4-59	06/13/12	13.529	29.999	1.9	1.7	12%	
E140-S90-4 A-C	E140-S90	4-60	05/22/12	9.246	26.959	1.5	1.6	-6%	
E140-S262-4 A-C	E140-S262	4-61	05/22/12	15.685	36.596	2.1	2.3	-9%	
E140-S262-3 B-D	E140-S262	4-61	05/22/12	20.866	22.219	1.0	1.2	-17%	
E140-S460-6 A-C	E140-S460	4-62	05/22/12	2.731	53.467	2.1	2.2	-5%	
E140-S460-2 B-D	E140-S460	4-62	05/22/12	26.948	32.892	1.2	1.3	-8%	
E140-S550-6 A-C	E140-S550	4-63	05/22/12	2.567	44.534	1.9	2.2	-14%	
E140-S550-4 B-D	E140-S550	4-63	05/22/12	29.418	38.060	1.5	1.7	-12%	
E140-S700-8 A-D	E140-S700	4-64	05/22/12	3.111	33.151	2.2	2.8	-21%	
E140-S700-6 B-C	E140-S700	4-65	05/22/12	5.595	35.627	2.8	2.7	4%	
E140-S700-6 E-F	E140-S700	4-66	05/22/12	3.077	23.074	1.4	1.6	-13%	
E140-S850-9 A-C	E140-S850	4-67	05/22/12	4.942	56.455	2.5	2.6	-4%	
E140-S850-4 B-D	E140-S850	4-68	05/22/12	19.621	35.568	1.3	1.3	0%	
E140-S1000-3 A-C	E140-S1000	4-69	05/22/12	3.565	39.213	1.4	1.9	-26%	
E140-S1025-4 A-C	E140-S1025	4-70	06/19/12	4.137	26.314	2.0	2.0	0%	
E140-S1075-4 A-E	E140-S1075	4-71	06/19/12	5.262	27.492	2.5	2.5	0%	
E140-S1075-4 B-D	E140-S1075	4-72	06/19/12	2.566	21.475	1.2	1.2	0%	
E140-S1075-4 F-H	E140-S1075	4-72	06/19/12	3.585	20.444	1.7	1.7	0%	
E140-S1075-2 C-G	E140-S1075	4-73	06/19/12	18.187	19.009	1.4	1.5	-7%	
E140-S1150-4 A-G	E140-S1150	4-74	06/19/12	8.773	66.803	4.2	4.4	-5%	
E140-S1150-2 D-J	E140-S1150	4-75	06/19/12	19.721	37.642	1.6	1.6	0%	
E140-S1150 C-K	E140-S1150	4-75	06/19/12	18.517	18.517	1.3	1.4	-7%	
E140-S1150-2 E-I	E140-S1150	4-75	06/19/12	17.841	18.702	1.5	1.5	0%	
E140-S1150-6 B-F	E140-S1150	4-76	06/19/12	1.633	31.370	2.1	N/A	N/A	
E140-S1150-5 L-H	E140-S1150	4-76	06/19/12	4.564	24.757	2.1	2.3	-9%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
E140-S1225-4 A-E	E140-S1225	4-77	06/19/12	7.830	34.527	4.0	3.6	11%	
E140-S1225-2 C-G	E140-S1225	4-77	06/19/12	25.601	26.508	2.3	2.4	-4%	
E140-S1225-4 B-D	E140-S1225	4-78	06/19/12	1.531	34.132	3.7	N/A	N/A	
E140-S1225-3 H-F	E140-S1225	4-78	06/19/12	4.661	24.095	2.5	2.3	9%	
E140-S1300-4 A-C	E140-S1300	4-79	06/19/12	20.468	37.051	1.7	1.7	0%	
E140-S1378-3 A-E	E140-S1378	4-80	06/19/12	6.270	40.707	3.5	2.9	21%	
E140-S1378-3 B-D	E140-S1378	4-81	06/19/12	3.490	28.592	1.9	1.7	12%	
E140-S1378-3 H-F	E140-S1378	4-81	06/19/12	6.090	43.860	3.8	2.6	46%	
E140-S1378 C-G	E140-S1378	4-82	06/19/12	22.195	26.365	1.7	1.7	0%	
E140-S1450-5 A-G	E140-S1450	4-83	06/19/12	7.698	79.068	3.8	4.1	-7%	
E140-S1450-3 B-F	E140-S1450	4-84	06/19/12	6.131	46.115	3.2	3.1	3%	
E140-S1450-3 L-H	E140-S1450	4-84	06/19/12	6.036	40.304	3.0	3.2	-6%	
E140-S1456 K-C	E140-S1456	4-85	06/19/12	21.075	21.075	1.5	1.5	0%	
E140-S1450-3 I-E	E140-S1450	4-85	06/19/12	2.654	20.746	1.5	1.5	0%	
E140-S1456-2 D-J	E140-S1456	4-86	06/19/12	23.675	44.970	1.9	2.0	-5%	
E140-S1534-3 A-E	E140-S1534	4-87	06/19/12	5.870	52.033	3.1	3.1	0%	
E140-S1534-2 C-G	E140-S1534	4-87	06/19/12	21.020	22.491	1.7	1.7	0%	
E140-S1534-4 B-D	E140-S1534	4-88	06/19/12	4.593	33.468	2.5	2.3	9%	
E140-S1534-3 H-F	E140-S1534	4-88	06/19/12	4.985	36.544	2.6	2.6	0%	
E140-S1600-6 A-C	E140-S1600	4-89	06/19/12	4.063	40.800	2.1	2.0	5%	
E140-S1687-3 A-E	E140-S1687	4-90	06/19/12	7.148	47.404	3.6	3.8	-5%	
E140-S1687-3 B-D	E140-S1687	4-90	06/19/12	4.725	35.586	2.4	2.5	-4%	
E140-S1687 C-G	E140-S1687	4-90	06/19/12	23.318	23.318	1.9	1.9	0%	
E140-S1687-3 H-F	E140-S1687	4-90	06/19/12	5.344	35.401	2.9	2.6	12%	
E140-S1775-3 A-G	E140-S1775	4-91	06/19/12	8.139	66.197	4.3	4.4	-2%	
E140-S1775-4 B-F	E140-S1775	4-91	06/19/12	7.401	55.489	3.9	4.0	-3%	
E140-S1775-3 L-H	E140-S1775	4-91	06/19/12	4.497	31.480	2.3	2.3	0%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
E140-S1775 C-K	E140-S1775	4-92	06/19/12	22.317	22.317	1.7	1.7	0%	
E140-S1775-2 D-J	E140-S1775	4-92	06/19/12	23.867	25.118	2.2	2.1	5%	
E140-S1775-3 I-E	E140-S1775	4-92	06/19/12	9.333	23.554	1.9	2.1	-10%	
E140-S1862-3 A-E	E140-S1862	4-93	06/19/12	7.407	51.090	3.9	4.0	-3%	
E140-S1862-3 C-G	E140-S1862	4-93	06/19/12	17.236	23.541	2.2	2.1	5%	
E140-S1862-3 B-D	E140-S1862	4-94	06/19/12	7.517	46.606	4.1	4.0	2%	
E140-S1862-3 H-F	E140-S1862	4-94	06/19/12	3.829	25.288	2.0	2.1	-5%	
E140-S1950-6 A-C	E140-S1950	4-95	06/19/12	6.343	54.527	3.3	3.2	3%	
E140-S2007-7 A-C	E140-S2007	4-96	06/19/12	2.318	41.836	4.6	N/A	N/A	
E140-S2065-6 A-C	E140-S2065	4-97	06/19/12	2.775	49.770	5.5	N/A	N/A	
E140-S2065-2 B-D	E140-S2065	4-97	06/19/12	17.272	23.920	2.2	2.2	0%	
E140-S2122-5 A-C	E140-S2122	4-98	06/19/12	2.499	47.353	5.0	N/A	N/A	
E140-S2275-6 A-C	E140-S2275	4-99	06/18/12	1.987	75.702	7.2	N/A	N/A	
E140-S2275 B-D	E140-S2275	4-99	06/18/12	25.737	25.737	2.4	2.5	-4%	
E140-S2350-6 A-C	E140-S2350	4-100	06/18/12	3.186	79.516	6.5	N/A	N/A	
E140-S2350-2 B-D	E140-S2350	4-100	06/18/12	27.188	34.079	2.6	2.6	0%	
E140-S2425-5 A-C	E140-S2425	4-101	06/18/12	1.340	52.874	4.8	N/A	N/A	
E140-S2425 B-D	E140-S2425	4-101	06/18/12	26.760	26.760	2.6	2.6	0%	
E140-S2520-3 A-C	E140-S2520	4-102	06/18/12	6.965	38.986	3.6	3.7	-3%	
E140-S2634 A-C	E140-S2634	4-103	06/18/12	53.737	53.737	5.8	6.5	-11%	
E140-S2634 B-D	E140-S2634	4-103	06/18/12	20.787	20.787	2.6	2.6	0%	
E140-S2750-3 A-C	E140-S2750	4-104	06/18/12	5.352	24.523	3.1	2.8	11%	
E140-S2833-3 A-C	E140-S2833	4-105	06/18/12	16.073	36.872	5.1	5.0	2%	
E140-S2833 B-D	E140-S2833	4-105	06/18/12	18.305	18.305	2.2	2.3	-4%	
E140-S2915-3 A-C	E140-S2915	4-106	06/18/12	12.195	38.411	3.1	3.6	-14%	
E140-S2915 B-D	E140-S2915	4-106	06/18/12	19.819	19.819	2.4	2.4	0%	
E140-S2998-3 A-C	E140-S2998	4-107	06/18/12	12.581	39.736	3.7	3.9	-5%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E140-S2998 B-D	E140-S2998	1-107	06/18/12	18.238	18.238	2.1	2.1	0%	
E140-S3080-2 A-C	E140-S3080	4-108	06/18/12	10.984	27.123	3.5	3.3	6%	
E140-S3195-2 A-C	E140-S3195	4-109	06/18/12	13.090	39.345	4.1	3.8	8%	
E140-S3195 B-D	E140-S3195	4-109	06/18/12	18.083	18.083	2.1	2.0	5%	
E140-S3295-2 A-C	E140-S3295	4-110	06/18/12	8.286	15.991	2.5	2.5	0%	
E140-S3325 A-C	E140-S3325	4-111	06/18/12	15.592	15.592	2.4	2.4	0%	
E140-S3395-2 A-C	E140-S3395	4-112	06/18/12	12.438	27.596	3.6	3.7	-3%	
E140-S3395 B-D	E140-S3395	4-112	06/18/12	12.717	12.717	1.7	1.8	-6%	
E140-S3480-2 A-C	E140-S3480	4-113	06/18/12	13.474	27.774	4.2	4.0	5%	
E140-S3480 B-D	E140-S3480	4-113	06/18/12	13.052	13.052	1.8	1.8	0%	
E140-S3565-2 A-C	E140-S3565	4-114	04/23/12	9.409	20.737	3.1	2.9	7%	
E140-S3565 B-D	E140-S3565	4-114	04/23/12	12.047	12.047	1.6	1.8	-11%	
E140-S3650-2 A-C	E140-S3650	4-115	06/11/12	6.873	13.493	1.9	2.1	-10%	
E300-N45 A-E	E300-N45	4-116	05/30/12	31.637	31.637	1.3	1.5	-13%	
E300-N45 H-F	E300-N45	4-116	04/02/12	28.155	28.155	1.2	1.4	-14%	
E300-N45 C-G	E300-N45	4-116	05/30/12	23.468	23.468	1.2	1.3	-8%	
E300-N170-2 A-E	E300-N170	4-117	05/30/12	9.462	31.956	1.7	1.8	-6%	
E300-N170-2 C-G	E300-N170	4-117	05/30/12	10.093	24.937	1.3	1.5	-13%	
E300-N170-2 H-F	E300-N170	4-117	05/30/12	8.732	28.792	1.6	1.7	-6%	
E300-N250-3 A-C	E300-N250	4-118	05/30/12	9.290	38.244	1.6	1.7	-6%	
E300-S45-2 A-E	E300-S45	4-119	05/30/12	25.819	25.819	1.2	1.4	-14%	
E300-S45-2 B-D	E300-S45	4-119	05/30/12	23.465	23.465	1.5	1.7	-12%	
E300-S45 C-G	E300-S45	4-119	05/30/12	19.501	19.501	0.8	1.0	-20%	
E300-S45-2 H-F	E300-S45	4-119	05/30/12	22.190	22.190	1.0	1.1	-9%	
E300-S90 A-C	E300-S90	4-120	06/04/12	18.854	18.854	0.7	0.9	-22%	
E300-S250-2 A-C	E300-S250	4-121	06/04/12	9.202	13.587	0.7	0.7	0%	
E300-S250-2 B-D	E300-S250	4-121	06/04/12	9.847	13.893	0.6	0.7	-14%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E300-S700-2 A-C	E300-S700	4-122	06/04/12	1.999	21.729	1.4	1.8	-22%	
E300-S850-2 A-E	E300-S850	4-123	06/04/12	1.024	16.106	0.8	0.9	-11%	
E300-S850-2 B-D	E300-S850	4-123	06/04/12	0.876	12.177	0.6	0.6	0%	
E300-S850-2 C-G	E300-S850	4-123	06/04/12	9.115	18.393	0.7	1.0	-30%	
E300-S850-2 H-F	E300-S850	4-123	06/04/12	0.764	11.227	0.5	0.6	-17%	
E300-S1000-2 A-C	E300-S1000	4-124	06/04/12	1.420	20.965	1.0	1.3	-23%	
E300-S1150-4 A-E	E300-S1150	4-125	06/04/12	3.663	20.742	2.5	3.3	-24%	
E300-S1150-4 B-D	E300-S1150-4	4-126	06/04/12	1.119	13.364	0.8	1.0	-20%	
E300-S1150-4 H-F	E300-S1150	4-126	06/04/12	1.259	13.015	0.9	1.1	-18%	
E300-S1150-2 C-G	E300-S1150	4-127	06/04/12	11.168	21.624	1.0	1.4	-29%	
E300-S1300-2 A-C	E300-S1300	4-128	06/04/12	2.633	16.167	1.8	2.5	-28%	
E300-S1450-2 A-C	E300-S1450	4-129	06/04/12	2.595	11.577	1.9	2.1	-10%	
E300-S1450 B-D	E300-S1450	4-129	06/04/12	12.788	12.788	1.3	1.6	-19%	
E300-S1687-2 A-C	E300-S1687	4-130	06/04/12	1.744	11.601	1.3	1.5	-13%	
E300-S1687 B-D	E300-S1687	4-130	06/04/12	12.675	12.675	1.2	1.4	-14%	
E300-S1775-2 A-C	E300-S1775	4-131	06/01/12	2.119	10.914	1.6	1.8	-11%	
E300-S1775 B-D	E300-S1775	4-131	06/01/12	12.898	12.898	1.2	1.5	-20%	
E300-S1862-2 A-C	E300-S1862	4-132	06/01/12	2.681	12.134	2.1	2.4	-13%	
E300-S1862 B-D	E300-S1862	4-132	06/01/12	14.080	14.080	1.4	1.8	-22%	
E300-S2065-2 A-C	E300-S2065	4-133	06/01/12	2.450	13.561	1.9	1.9	0%	
E300-S2065 B-D	E300-S2065	4-133	06/01/12	18.147	18.147	2.0	2.3	-13%	
E300-S2275-2 A-C	E300-S2275	4-134	06/01/12	4.176	17.602	3.1	3.8	-18%	
E300-S2275 B-D	E300-S2275	4-134	06/01/12	21.236	21.236	2.3	2.6	-12%	
E300-S2350-2 A-C	E300-S2350	4-135	06/01/12	5.776	21.340	4.3	5.1	-16%	
E300-S2350 B-D	E300-S2350	4-135	06/01/12	21.802	21.802	2.2	2.6	-15%	
E300-S2425-2 A-C	E300-S2425	4-136	06/01/12	4.767	20.989	3.4	4.4	-23%	
E300-S2425 B-D	E300-S2425	4-136	06/01/12	21.829	21.829	2.1	2.4	-13%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E300-S2634-2 A-C	E300-S2634	4-137	06/01/12	2.948	16.333	2.3	2.4	-4%	
E300-S2634 B-D	E300-S2634	4-137	06/01/12	16.783	16.783	2.1	2.4	-13%	
E300-S2833-2 A-C	E300-S2833	4-138	06/01/12	2.458	18.750	1.9	2.0	-5%	
E300-S2833 B-D	E300-S2833	4-138	06/01/12	17.444	17.444	2.1	2.4	-13%	
E300-S2916-4 A-C	E300-S2916	4-139	06/01/12	2.978	28.048	2.4	2.2	9%	
E300-S2916 B-D	E300-S2916	4-139	06/01/12	19.430	19.430	2.4	2.5	-4%	
E300-S2998-4 A-C	E300-S2998	4-140	06/01/12	4.224	38.974	3.0	4.5	-33%	
E300-S2998 B-D	E300-S2998	4-140	06/01/12	19.295	19.295	2.7	2.5	8%	
E300-S3195 A-C	E300-S3195	4-141	06/01/12	22.342	22.342	3.4	2.9	17%	
E300-S3195 B-D	E300-S3195	4-141	06/01/12	17.614	17.614	2.0	1.8	11%	
E300-S3480 A-C	E300-S3480	4-142	12/08/11	11.166	11.166	2.2	2.4	-8%	
E300-S3480 B-D	E300-S3480	4-142	12/08/11	8.414	8.414	1.7	1.7	0%	
N140-E90-2 A-C	N140-E90	4-143	06/13/12	3.354	17.491	0.8	0.7	14%	
N140-E90 B-D	N140-E90	4-143	06/13/12	18.856	18.856	0.9	0.9	0%	
N215-W500-2 A-C	N215-W500	4-144	06/13/12	12.204	30.533	1.4	1.3	8%	
N215-W500-2 B-D	N215-W500	4-144	06/13/12	13.013	19.831	0.9	0.9	0%	
N150-W620-2 A-C	N150-W620	4-145	06/13/12	9.243	25.461	1.2	1.0	20%	
N250-E220-2 A-E	N250-E220	4-146	05/30/12	14.477	38.104	2.4	2.6	-8%	
N250-E220-2 B-D	N250-E220	4-146	05/30/12	9.945	34.887	1.6	1.8	-11%	
N250-E220 C-G	N250-E220	4-146	05/30/12	25.940	25.940	1.3	1.6	-19%	
N250-E220-2 H-F	N250-E220	4-146	05/30/12	8.718	27.143	1.5	1.5	0%	
N300-W170-2 A-C	N300-W170	4-147	06/13/12	14.527	36.787	1.7	1.6	6%	
N300-W170-2 B-D	N300-W170	4-147	06/13/12	17.070	25.265	1.3	1.3	0%	
N460-E70-3 A-C	N460-E70	4-148	06/05/12	15.126	31.572	1.6	1.5	7%	
N460-E70-2 B-D	N460-E70	4-148	06/05/12	16.099	27.797	1.4	1.6	-13%	
N780-E70 A-C	N780-E70	4-149	06/06/12	12.897	12.897	1.3	1.4	-7%	
N780-E70 B-D	N780-E70	4-149	02/16/12	12.231	12.231	1.0	1.4	-29%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
S90-W120 A-C	S90-W120	4-150	05/09/12	8.049	8.049	0.7	0.6	17%	
S90-W120 B-D	S90-W120	4-150	05/07/12	8.580	8.580	0.6	0.7	-14%	
S90-W400-2 A-C	S90-W400	4-151	05/10/12	4.656	18.005	0.6	0.5	20%	
S90-W400-2 B-D	S90-W400	4-151	05/10/12	9.574	17.468	0.6	0.5	20%	
S90-W590-2 A-C	S90-W590	4-152	05/10/12	4.472	13.801	0.6	0.7	-14%	
S90-W590-2 B-D	S90-W590	4-152	05/10/12	9.113	12.920	0.5	0.6	-17%	
S90-W620 A-C	S90-W620	4-153	05/10/12	26.138	26.138	1.1	1.2	-8%	
S90-W770 A-C	S90-W770	4-154	05/10/12	18.154	18.154	0.9	0.9	0%	
S90-W770-3 B-D	S90-W770	4-154	05/10/12	3.303	16.624	0.8	0.9	-11%	
S90-W905 A-C	S90-W905	4-155	05/10/12	14.960	14.960	1.1	1.2	-8%	
S105-W920 A-C	S105-W920	4-156	05/10/12	3.970	3.970	1.0	1.1	-9%	
S700-E180 A-C	S700-E180	4-157	06/26/12	11.837	11.837	2.0	2.0	0%	
S700-E180 B-D	S700-E180	4-157	06/26/12	6.861	6.861	1.1	1.2	-8%	
S700-E205-3 A-C	S700-E205	4-158	06/26/12	11.722	29.151	2.0	2.0	0%	
S700-E55-2 A-C	S700-E55	4-159	06/26/12	4.225	8.359	2.0	2.1	-5%	
S700-E55-2 B-D	S700-E55	4-159	06/26/12	2.721	6.863	1.2	1.4	-14%	
S700-W98-3 A-C	S700-W98	4-160	06/26/12	0.820	25.161	2.7	N/A	N/A	
S1000-E120-3 A-C	S1000-E120	4-161	06/25/12	8.465	16.905	1.2	1.2	0%	
S1000-E160 -3 A-C	S1000-E160	4-162	06/25/12	4.134	4.134	0.9	1.0	-10%	
S1000-E58-4 A-C	S1000-E58	4-163	06/25/12	9.533	24.999	1.4	1.4	0%	
S1000-E58-2 B-D	S1000-E58	4-163	06/25/12	18.757	18.757	1.2	1.2	0%	
S1000-W98-2 A-C	S1000-W98	4-164	06/26/12	15.737	34.485	2.0	2.0	0%	
S1300-E120 A-C	S1300-E120	4-165	06/26/12	15.168	15.168	1.1	1.1	0%	
S1300-E160 A-C	S1300-E160	4-166	06/26/12	23.907	23.907	2.0	2.0	0%	
S1300-E24 A-C	S1300-E24	4-167	06/26/12	22.933	22.933	1.4	1.4	0%	
S1300-W100-3 A-C	S1300-W100	4-168	06/26/12	13.800	37.803	2.5	2.3	9%	
S1600-E110 A-C	S1600-E110	4-169	06/26/12	16.145	16.145	1.1	1.1	0%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
S1600-E170 A-C	S1600-E170	4-170	06/26/12	17.638	17.638	1.2	1.2	0%	
S1950-E113-4 A-C	S1950-E113	4-171	06/26/12	9.724	13.600	1.3	1.3	0%	
S1950-E281-3 A-C	S1950-E281	4-172	06/28/12	15.560	22.102	1.3	1.3	0%	
S1950-E284-3 A-C	S1950-E284	4-173	06/28/12	15.864	22.476	1.3	1.4	-7%	
S2180-E220 A-C	S2180-E220	4-174	06/14/12	15.947	15.947	1.7	1.6	6%	
S2180-E220 B-D	S2180-E220	4-174	06/14/12	17.520	17.520	1.9	2.0	-5%	
S2180-E55-3 A-C	S2180-E55	4-175	06/12/12	6.699	17.546	2.2	2.1	5%	
S2180-E55 B-D	S2180-E55	4-175	06/12/12	15.783	15.783	1.9	2.0	-5%	
S2180-W100-3 A-C	S2180-W100	4-176	06/12/12	5.554	23.737	3.4	3.1	10%	
S2180-W100-2 B-D	S2180-W100	4-176	06/12/12	14.826	14.967	2.1	2.3	-9%	
S2520-E220 A-C	S2520-E220	4-177	06/14/12	20.502	20.502	1.8	1.8	0%	
S2520-E220 B-D	S2520-E220	4-177	06/14/12	21.210	21.210	2.0	2.1	-5%	
S2520-W100-2 A-C	S2520-W100	4-178	06/11/12	1.614	21.294	3.2	N/A	N/A	
S2520-W100-2 B-D	S2520-W100	4-178	06/11/12	4.464	20.087	2.9	2.6	12%	
S2750-E55-2 A-C	S2750-E55	4-179	06/11/12	7.530	24.211	4.7	3.1	52%	
S2750-E55 B-D	S2750-E55	4-179	06/11/12	17.416	17.416	3.0	2.7	11%	
S2750-E220-2 A-C	S2750-E220	4-180	06/11/12	1.393	22.790	2.6	N/A	N/A	
S2750-E220 B-D	S2750-E220	4-180	06/11/12	15.949	15.949	2.0	2.0	0%	
S2750-E410 A-C	S2750-E410	4-181	06/14/12	25.807	25.807	4.5	4.5	0%	
S2750-E410 B-D	S2750-E410	4-181	06/14/12	17.789	17.789	2.4	2.4	0%	
S2750-W93-2 A-C	S2750-W93	4-182	06/13/12	12.265	30.733	5.7	7.1	-20%	
S2750-W93 B-D	S2750-W93	4-182	06/13/12	14.435	14.435	2.3	2.5	-8%	
S3080-E220-2 A-C	S3080-E220	4-183	06/11/12	18.011	20.716	3.5	2.8	25%	
S3080-E220 B-D	S3080-E220	4-183	06/11/12	15.557	15.557	1.8	1.8	0%	
S3080-W100 A-C	S3080-W100	4-184	06/11/12	25.696	25.696	4.4	4.5	-2%	
S3080-W100 B-D	S3080-W100	4-184	06/11/12	16.068	16.068	2.3	2.2	5%	
S3310-E220 A-C	S3310-E220	4-185	06/14/12	29.145	29.145	6.5	5.8	12%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
S3310-E220 B-D	S3310-E220	4-185	06/14/12	17.576	17.576	1.9	1.9	0%	
S3310-E55 A-C	S3310-E55	4-186	04/16/12	20.467	20.467	2.6	2.3	13%	
S3310-E55 B-D	S3310-E55	4-186	04/16/12	14.985	14.985	1.8	1.8	0%	
S3310-W100-3 A-C	S3310-W100	4-187	06/11/12	18.393	24.671	3.6	3.2	13%	
S3310-W100 B-D	S3310-W100	4-187	06/11/12	15.861	15.861	1.8	1.9	-5%	
S3650-E220-2 A-C	S3650-E220	4-188	06/11/12	6.789	10.146	2.4	2.0	20%	
S3650-E55-2 A-C	S3650-E55	4-189	06/11/12	6.719	10.052	2.6	1.8	44%	
S3650-W100-2 A-C	S3650-W100	4-190	06/11/12	9.223	15.240	4.0	2.6	54%	
S3650-W100 B-D	S3650-W100	4-190	06/11/12	10.627	10.627	1.5	1.7	-12%	
W30-S120-2 A-C	W30-S120	4-191	06/05/12	5.948	25.942	1.0	1.0	0%	
W30-S250-5 A-C	W30-S250	4-192	06/05/12	7.061	33.294	1.1	1.4	-21%	
W30-S250-5 B-D	W30-S250	4-192	06/05/12	17.655	28.609	0.9	1.1	-18%	
W30-S400-2 A-C	W30-S400	4-193	04/10/12	5.621	23.449	0.5	1.2	-58%	
W30-S500-2 A-C	W30-S500	4-194	06/05/12	6.133	28.643	1.1	1.1	0%	
W30-S500 B-D	W30-S500	4-194	06/05/12	27.179	27.179	1.0	1.1	-9%	
W30-S700-5 A-C	W30-S700	4-195	06/05/12	4.298	38.575	1.7	2.2	-23%	
W30-S850-5 A-E	W30-S850	4-196	06/05/12	0.955	26.859	3.9	N/A	N/A	
W30-S850-4 B-D	W30-S850	4-197	06/05/12	3.024	18.854	1.5	1.5	0%	
W30-S850-3 H-F	W30-S850	4-197	06/05/12	4.397	19.965	2.1	2.1	0%	
W30-S850-4 C-G	W30-S850	4-198	06/05/12	0.367	25.844	1.5	N/A	N/A	
W30-S1000-5 A-C	W30-S1000	4-199	06/05/12	3.108	41.287	1.8	2.0	-10%	
W30-S1150-2 A-C	W30-S1150	4-200	06/05/12	6.675	8.176	3.0	3.5	-14%	
W30-S1300-2 A-C	W30-S1300	4-201	06/05/12	4.209	25.447	1.7	2.2	-23%	
W30-S1453-2 A-C	W30-S1453	4-202	06/05/12	5.207	19.274	2.3	2.7	-15%	
W30-S1453-3 B-D	W30-S1453	4-202	06/05/12	3.047	17.009	1.4	1.6	-13%	
W30-S1600-3 A-C	W30-S1600	4-203	06/05/12	4.966	24.096	2.1	2.6	-19%	
W30-S1775-3 A-C	W30-S1775	4-204	06/05/12	0.826	18.072	3.4	N/A	N/A	
W30-S1775-3 B-D	W30-S1775	4-204	06/05/12	3.684	16.360	1.6	2.0	-20%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
W30-S1950-2 A-C	W30-S1950	4-205	06/05/12	6.406	26.854	2.7	3.4	-21%	
W30-S2067-3 A-C	W30-S2067	4-206	06/05/12	1.046	23.160	4.3	N/A	N/A	
W30-S2067-4 B-D	W30-S2067	4-206	06/05/12	0.423	19.017	2.1	N/A	N/A	
W30-S2275-4 A-C	W30-S2275	4-207	06/05/12	2.145	22.825	4.3	N/A	N/A	
W30-S2275-2 B-D	W30-S2275	4-207	06/05/12	4.481	15.661	2.0	2.6	-23%	
W30-S2350-4 A-C	W30-S2350	4-208	06/05/12	3.072	22.381	6.2	N/A	N/A	
W30-S2350-2 B-D	W30-S2350	4-208	06/05/12	5.012	17.507	2.3	2.7	-15%	
W30-S2425-4 A-C	W30-S2425	4-209	06/05/12	2.126	20.414	4.3	N/A	N/A	
W30-S2425-2 B-D	W30-S2425	4-209	06/05/12	4.984	18.468	2.4	2.8	-14%	
W30-S2520-3 A-C	W30-S2520	4-210	06/05/12	5.920	25.078	3.1	3.1	0%	
W30-S2685-3 A-C	W30-S2685	4-211	06/05/12	4.752	23.642	2.3	2.7	-15%	
W30-S2685-3 B-D	W30-S2685	4-211	06/05/12	4.274	18.544	2.0	2.4	-17%	
W30-S2750-2 A-C	W30-S2750	4-212	06/04/12	4.913	17.263	2.6	2.6	0%	
W30-S2833-3 A-C	W30-S2833	4-213	06/18/12	5.803	21.476	3.7	3.8	-3%	
W30-S2833-2 B-D	W30-S2833	4-213	06/18/12	4.940	16.946	2.6	2.6	0%	
W30-S2916 A-C	W30-S2916	4-214	06/18/12	38.881	38.881	6.2	7.2	-14%	
W30-S2916-2 B-D	W30-S2916	4-214	06/18/12	4.222	14.606	2.2	2.2	0%	
W30-S2998 A-C	W30-S2998	4-215	06/18/12	22.302	22.302	5.1	3.9	31%	
W30-S2998-2 B-D	W30-S2998	4-215	06/18/12	3.684	14.401	2.0	1.9	5%	
W30-S3080 A-C	W30-S3080	4-216	06/04/12	24.005	24.005	2.1	2.2	-5%	
W30-S3195 A-C	W30-S3195	4-217	06/04/12	19.874	19.874	3.6	2.4	50%	
W30-S3195 B-D	W30-S3195	4-217	06/04/12	14.264	14.264	1.6	1.6	0%	
W30-S3310 A-C	W30-S3310	4-218	06/04/12	17.127	17.127	1.8	1.8	0%	
W30-S3395 A-C	W30-S3395	4-219	06/04/12	12.524	12.524	1.8	1.9	-5%	
W30-S3395 B-D	W30-S3395	4-219	06/04/12	10.411	10.411	1.4	1.5	-7%	
W30-S3480 A-C	W30-S3480	4-220	04/09/12	14.721	14.721	2.4	2.7	-11%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)

Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (Inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
W30-S3480 B-D	W30-S3480	4-220	06/04/12	10.112	10.112	1.4	1.4	0%	
W30-S3565-2 A-C	W30-S3565	4-221	06/04/12	5.010	10.835	1.7	1.6	6%	
W30-S3565 B-D	W30-S3565	4-221	06/04/12	10.218	10.218	1.5	1.4	7%	
W30-S3650-2 A-C	W30-S3650	4-222	06/11/12	6.555	12.207	2.1	2.0	5%	
W170-N150-3 A-C	W170-N150	4-223	05/09/12	2.629	10.981	0.6	0.7	-14%	
W170-S5 A-C	W170-S5	4-224	05/09/12	15.263	15.263	0.5	0.4	25%	
W170-S5-2 B-D	W170-S5	4-224	05/09/12	9.800	17.566	0.7	0.6	17%	
W170-S90-3 A-C	W170-S90	4-225	05/09/12	9.241	16.443	0.9	0.9	0%	
W170-S232-2 A-C	W170-S232	4-255a	05/09/12	6.880	12.469	0.6	0.6	0%	
W170-S232-2 B-D	W170-S232	4-225a	05/07/12	10.169	12.811	0.6	0.6	0%	
W170-S400 A-C	W170-S400	4-226	05/09/12	15.209	15.209	0.7	0.8	-13%	
W170-S560-4 A-C	W170-S560	4-227	05/09/12	2.891	13.710	0.8	0.6	33%	
W170-S560-3 B-D	W170-S560	4-227	05/07/12	1.885	14.713	0.7	0.7	0%	
W170-S700-2 A-C	W170-S700	4-228	05/09/12	3.754	23.547	1.3	0.6	117%	
W170-S850-7 A-E	W170-S850	4-229	05/08/12	2.860	19.849	0.7	0.6	17%	
W170-S850-6 B-D	W170-S850	4-230	05/08/12	2.501	15.241	0.6	0.5	20%	
W170-S850-7 H-F	W170-S850	4-231	05/08/12	2.070	13.691	0.5	0.4	25%	
W170-S850-3 C-G	W170-S850	4-232	05/08/12	12.127	22.940	0.9	0.7	29%	
W170-S1000-3 A-C	W170-S1000	4-233	05/08/12	4.196	27.109	1.1	1.0	10%	
W170-S1150-4 A-E	W170-S1150	4-234	05/08/12	3.380	23.809	0.8	0.7	14%	
W170-S1150-4 B-D	W170-S1150	4-234	05/08/12	2.748	16.945	0.7	0.6	17%	
W170-S1150-2 H-F	W170-S1150	4-234	05/08/12	2.746	16.152	0.7	0.6	17%	
W170-S1150-2 C-G	W170-S1150	4-235	05/08/12	13.702	25.279	1.1	0.9	22%	
W170-S1300-4 A-C	W170-S1300	4-236	05/08/12	7.677	28.635	1.8	1.7	6%	
W170-S1445-4 A-C	W170-S1445	4-237	05/08/12	6.136	17.428	1.7	1.6	6%	
W170-S1445-2 B-D	W170-S1445	4-237	05/07/12	12.932	15.590	1.1	1.2	-8%	
W170-S1600-4 A-C	W170-S1600	4-238	05/07/12	5.025	19.790	1.7	1.6	6%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)

Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
W170-S1779-3 A-C	W170-S1779	4-239	05/08/12	6.028	20.999	1.6	1.6	0%	
W170-S1779-2 B-D	W170-S1779	4-239	05/07/12	15.633	18.768	1.4	1.5	-7%	
W170-S1950-3 A-C	W170-S1950	4-240	05/08/12	4.818	17.999	1.5	1.4	7%	
W170-S2060-3 A-C	W170-S2060	4-241	05/08/12	0.454	18.698	1.5	N/A	N/A	
W170-S2060-2 B-D	W170-S2060	4-241	05/07/12	17.215	20.539	2.0	2.0	0%	
W170-S2180-3 A-C	W170-S2180	4-242	06/07/12	0.665	24.229	1.7	N/A	N/A	
W170-S2275 A-C	W170-S2275	4-243	05/08/12	15.259	15.259	1.9	2.0	-5%	
W170-S2275 B-D	W170-S2275	4-243	05/07/12	17.418	17.418	2.5	2.5	0%	
W170-S2350 A-C	W170-S2350	4-244	05/08/12	20.238	20.238	2.6	2.7	-4%	
W170-S2350 B-D	W170-S2350	4-244	05/07/12	17.386	17.386	2.4	2.4	0%	
W170-S2425 A-C	W170-S2425	4-245	06/05/12	17.888	17.888	2.0	2.2	-9%	
W170-S2425 B-D	W170-S2425	4-245	06/05/12	19.608	19.608	2.6	2.7	-4%	
W170-S2520-2 A-C	W170-S2520	4-246	06/05/12	1.882	22.477	3.8	N/A	N/A	
W170-S2685-2 A-C	W170-S2685	4-247	06/05/12	22.186	24.032	2.0	2.1	-5%	
W170-S2685-2 B-D	W170-S2685	4-247	06/05/12	18.197	20.060	2.4	2.5	-4%	
W170-S2833 A-C	W170-S2833	4-248	06/05/12	30.217	30.217	5.5	6.1	-10%	
W170-S2833 B-D	W170-S2833	4-248	06/05/12	17.712	17.712	3.0	3.0	0%	
W170-S2916 A-C	W170-S2916	4-249	06/04/12	27.586	27.586	3.5	3.9	-10%	
W170-S2916 B-D	W170-S2916	4-249	06/04/12	16.603	16.603	2.4	2.6	-8%	
W170-S2998 A-C	W170-S2998	4-250	06/04/12	37.773	37.773	6.6	6.6	0%	
W170-S2998-2 B-D	W170-S2998	4-250	06/04/12	5.563	18.256	3.1	3.1	0%	
W170-S3080 A-C	W170-S3080	4-251	06/04/12	23.552	23.552	3.3	3.6	-8%	
W170-S3195 A-C	W170-S3195	4-252	06/04/12	22.481	22.481	3.0	3.6	-17%	
W170-S3195 B-D	W170-S3195	4-252	06/04/12	15.527	15.527	1.9	2.0	-5%	
W170-S3310 A-C	W170-S3310	4-253	06/04/12	19.793	19.793	1.9	2.3	-17%	
W170-S3395 A-C	W170-S3395	4-254	06/04/12	20.019	20.019	3.6	3.7	-3%	
W170-S3395 B-D	W170-S3395	4-254	06/04/12	12.069	12.069	1.9	1.9	0%	
W170-S3480 A-C	W170-S3480	4-255	06/04/12	21.722	21.722	4.0	3.6	11%	

Table 4-1
Access Drifts Data Analysis (Continued)

Convergence Points (Continued)

Field Tag	Location	Figure Number	Last Reading 2011-2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
W170-S3480 B-D	W170-S3480	4-255	06/04/12	15.500	15.500	2.3	2.3	0%	
W170-S3565 A-C	W170-S3565	4-256	06/04/12	13.313	13.313	2.2	2.1	5%	
W170-S3565 B-D	W170-S3565	4-256	06/04/12	10.915	10.915	1.5	1.5	0%	
W170-S3650-2 A-C	W170-S3650	4-257	06/11/12	6.233	13.878	1.8	1.9	-5%	

[1] N/A – Insufficient data available to perform the calculation. This is usually due to the inability to read the instruments because of activities such as: the temporary removal of an instrument due to floor, rib or back trimming; locations blocked by equipment or waste disposal, etc.

Joint Meters

Field Tag	Location	Figure Number	Date	Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
51X-CG-02706	S1950-E300	4-258	06/20/12	2.011	0.26	0.16	63%	
51X-CG-02707	S1950-E300	4-258	06/20/12	2.052	0.29	0.17	71%	
51X-CG-02876-2	E140-S1505	4-259	05/23/12	0.060	0.00	0.02	-100%	
51X-CG-02883-2	E140-S1529	4-260	05/23/12	0.590	0.26	0.16	63%	
51X-CG-02885-2	E140-S1545	4-261	05/23/12	0.735	0.13	0.29	-55%	
51X-CG-02875-2	E140-S1795	4-262	05/23/12	0.402	0.19	0.13	46%	
51X-CG-02713	E140-S2964	4-263	05/23/12	-0.006	-0.37	-0.26	42%	
51X-CG-02716	W170-S2678	4-264	12/28/11	0.299	0.20	0.15	33%	The W170 and W30 joint meters were removed midway in the reporting period.
51X-CG-02717	W170-S2687	4-265	12/28/11	0.888	0.04	0.28	-86%	
51X-CG-02715-2	W30-S2920	4-266	12/28/11	0.694	0.56	1.1	-49%	
51X-CG-02714-2	W30-S2932	4-267	12/28/11	2.830	2.8	3.5	-20%	

Table 4-1
Access Drifts Data Analysis (Continued)

Rockbolt Load Cells						
Field Tag	Location	Figure Number	Date of Initial Reading	Date of Last Reading	Load (klps)	Comments
51X-WG-00325	E140-N1266	4-268	09/23/10	06/12/12	34.5	
51X-WG-00326	E140-N1266	4-268	09/23/10	06/12/12	30.7	
51X-WG-00327	E140-N1266	4-268	09/23/10	06/12/12	27.7	
51X-WG-00328	E140-N1266	4-268	09/23/10	06/12/12	40.5	
51X-WG-00329	E140-N1266	4-268	09/23/10	06/12/12	24.8	
51X-WG-00330	E140-N1266	4-269	09/23/10	06/12/12	35.2	
51X-WG-00331	E140-N1266	4-269	09/23/10	06/12/12	35.0	
51X-WG-00322	E140-N1266	4-269	09/23/10	06/12/12	31.1	
51X-WG-00333	E140-N1266	4-269	09/23/10	06/12/12	36.1	
51X-WG-00214	E140-S910 East Center	4-270	06/26/97	06/28/12	0.0	
51X-WG-00215-2	E140-S901	4-270	10/21/09	06/28/12	48.3	
51X-WG-00216	E140-S910 East Rib	4-270	06/26/97	06/28/12	13.2	
51X-WG-00217	E140-S910 West Rib	4-270	06/26/97	06/28/12	1.1	
51X-WG-00218	E140-S774	4-271	06/26/97	06/28/12	0.6	
51X-WG-00219	E140-S975	4-271	06/26/97	06/28/12	40.3	
51X-WG-00220	E140-S1023	4-271	10/23/96	06/28/12	9.3	
51X-WG-00293	E140-S1550	4-272	03/17/04	06/20/12	55.3	
51X-WG-00294	E140-S1775	4-273	03/17/04	06/20/12	59.4	
51X-WG-00296-2	E140-S2916	4-274	03/18/10	06/20/12	45.8	
51X-WG-00295-2	E140-S2916	4-274	03/18/10	06/20/12	36.3	
51X-WG-00221	S1300-E120	4-275	10/23/96	06/28/12	5.0	
51X-WG-00222	S1600-E150	4-275	02/18/96	06/18/12	7.1	
51X-WG-00223	S1300-E160	4-276	10/23/96	06/28/12	45.6	

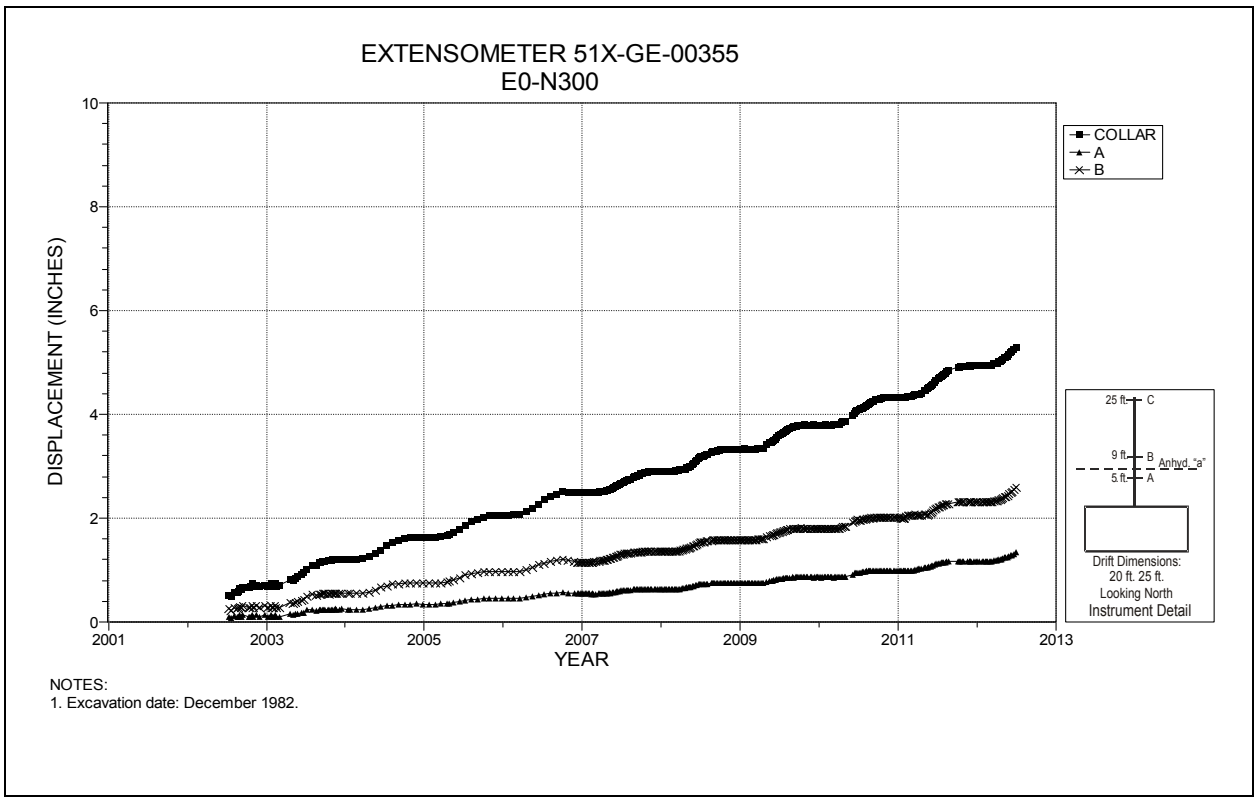


Figure 4-1 Extensometer 51X-GE-00355
E0 N300 – Roof

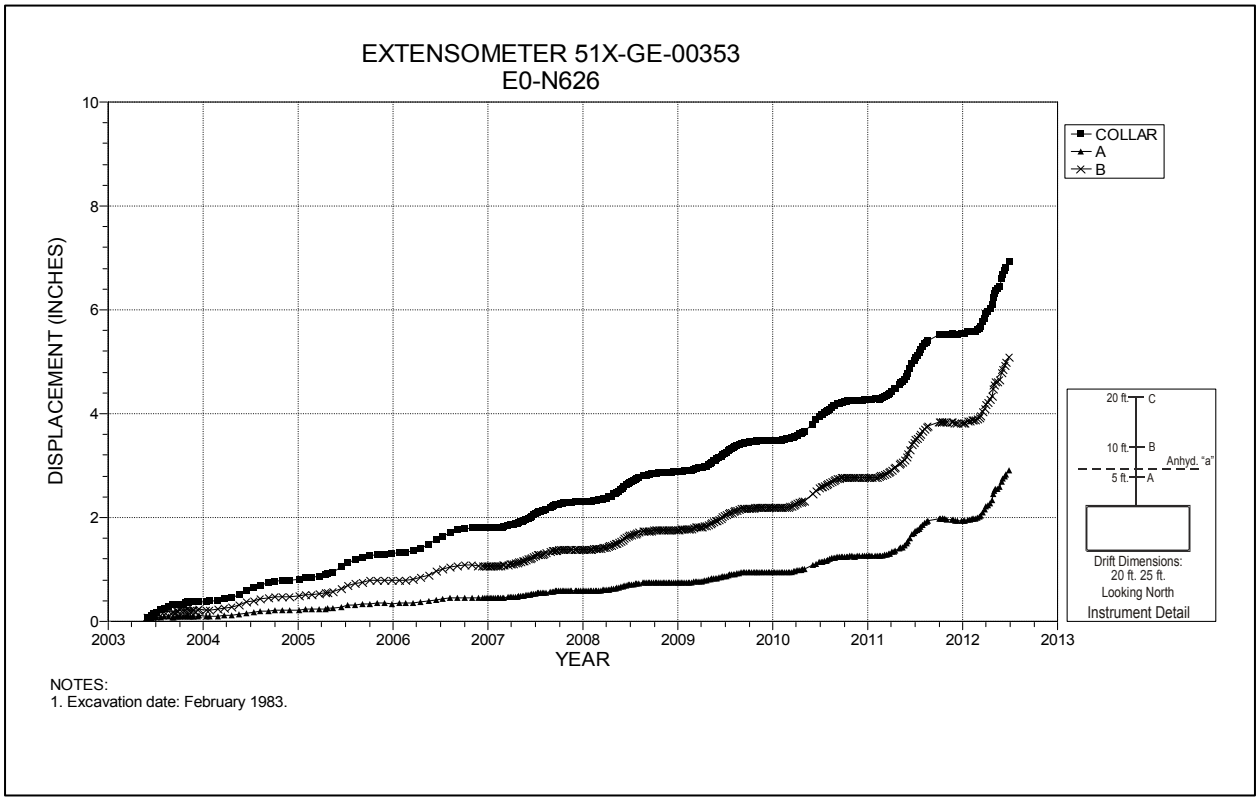


Figure 4-2 Extensometer 51X-GE-00353
E0 N626 – Roof

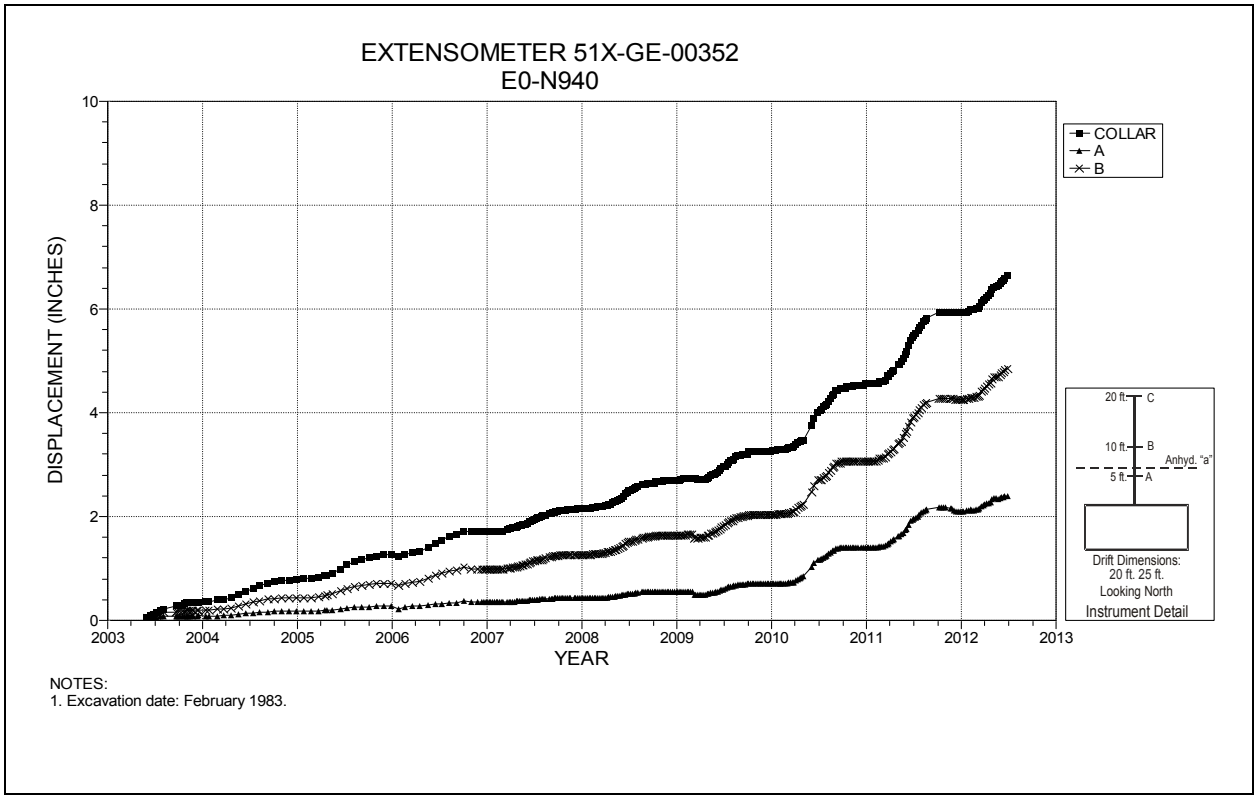


Figure 4-3 Extensometer 51X-GE-00352
E0 N940 – Roof

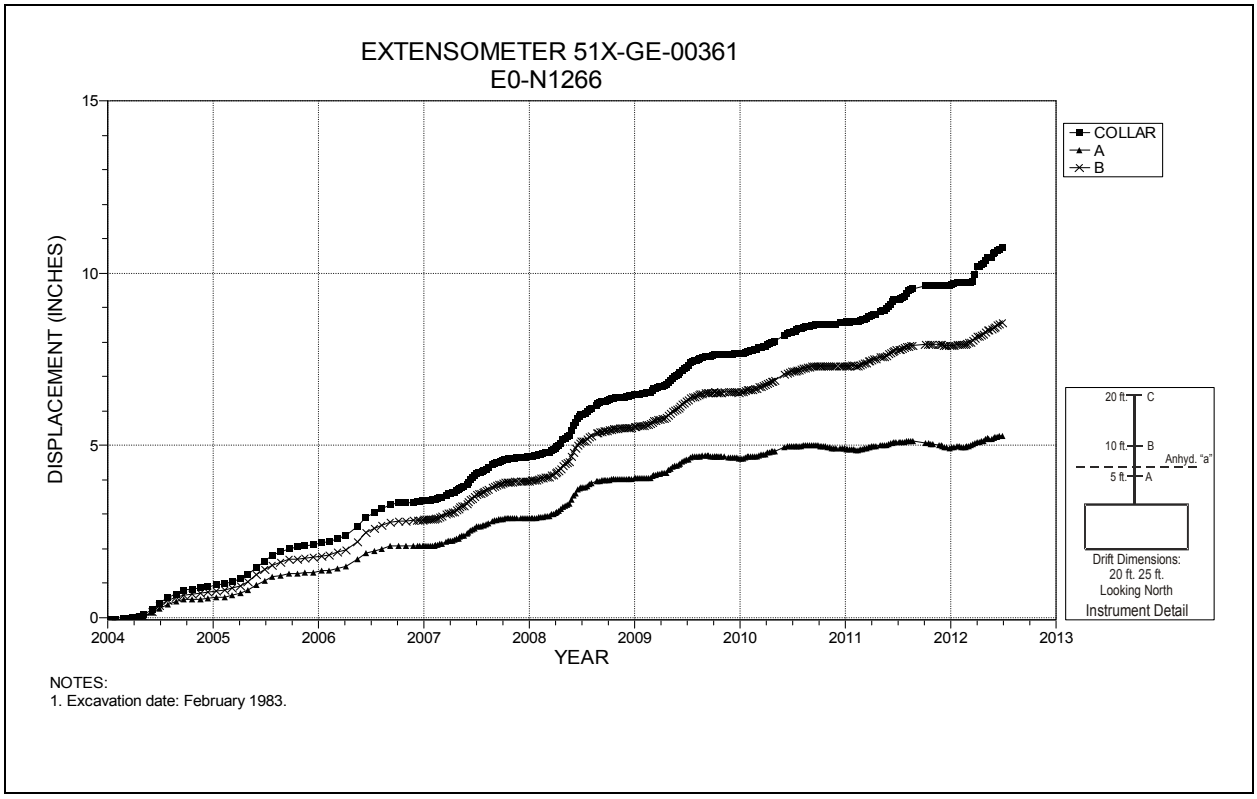
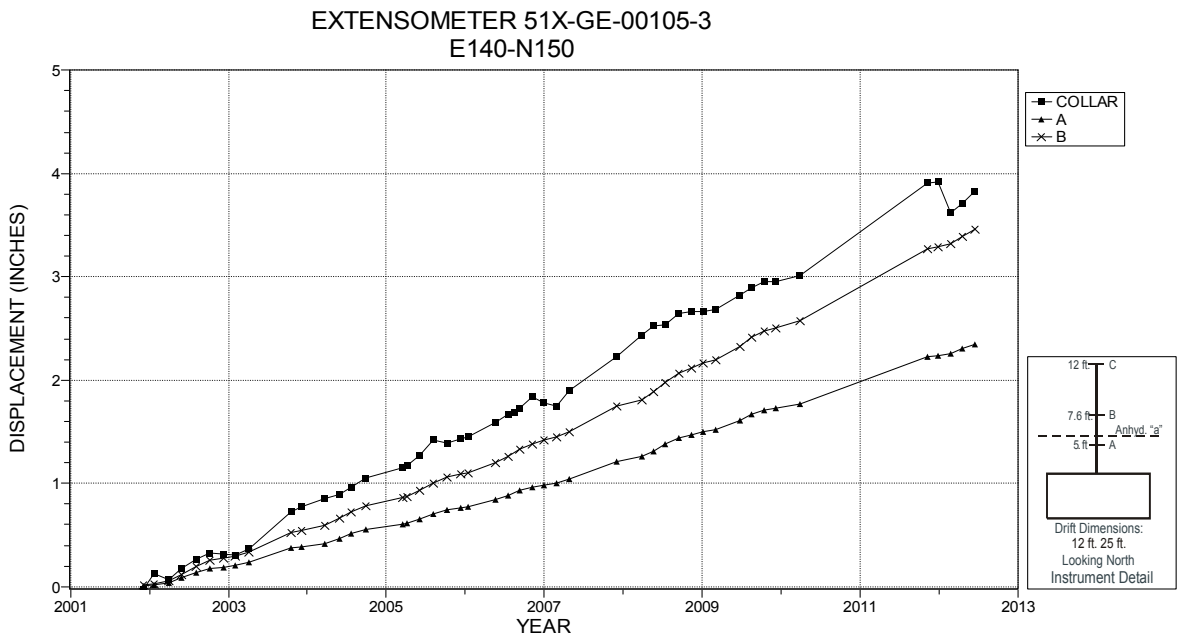
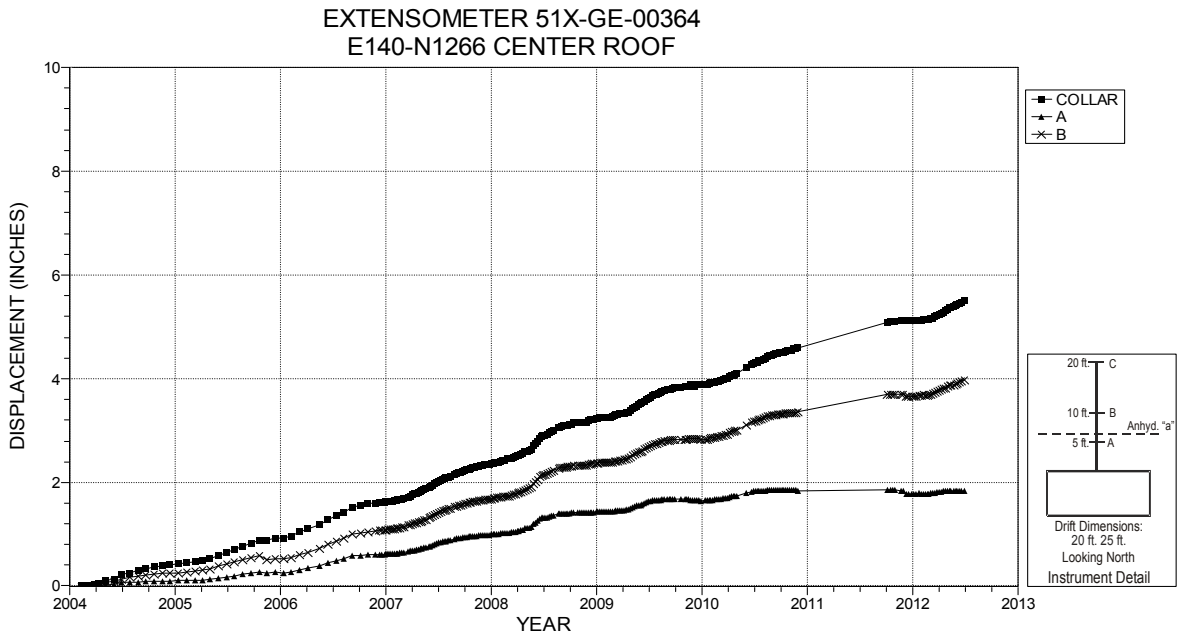


Figure 4-4 Extensometer 51X-GE-00361
E0-N1266 – Roof



NOTES:
1. Excavation date: November 1982.
2. The reading offset in late 2011 was due to the instrument being hit by equipment.

Figure 4-5 Extensometer 51X-GE-00105-3
E140 N150 – Roof



NOTES:
1. Excavation date: February 1983.

Figure 4-6 Extensometer 51X-GE-00364
E140 N1266 – Roof

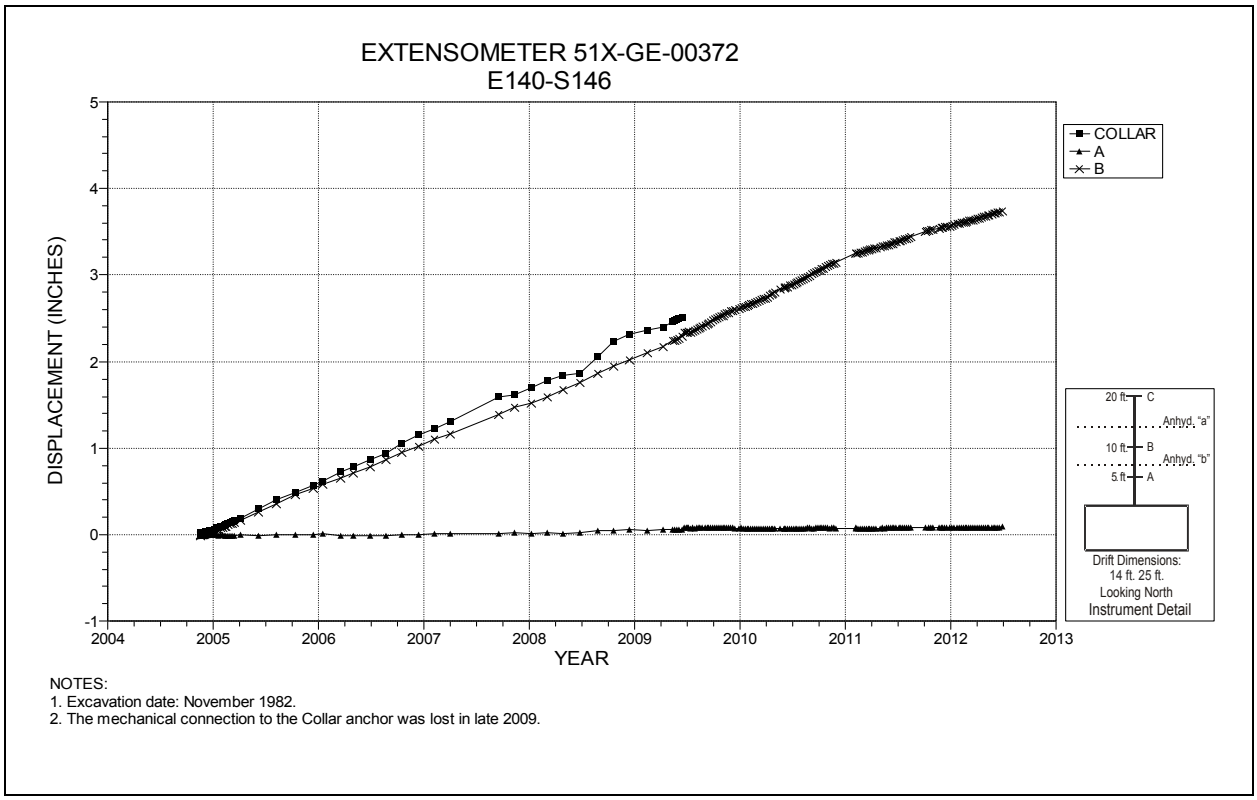


Figure 4-7 Extensometer 51X-GE-00372
E140 S146 – Roof

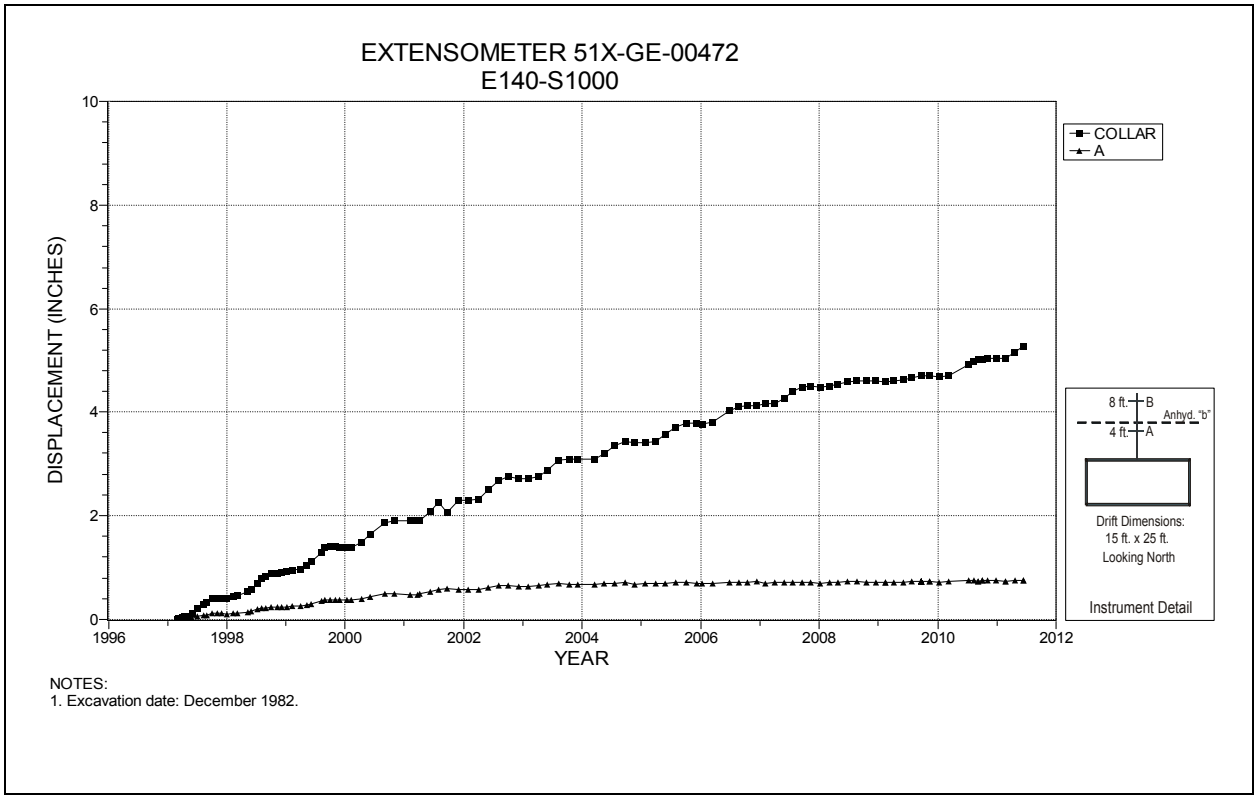


Figure 4-8 Extensometer 51X-GE-00472
E140 S1000 – Roof

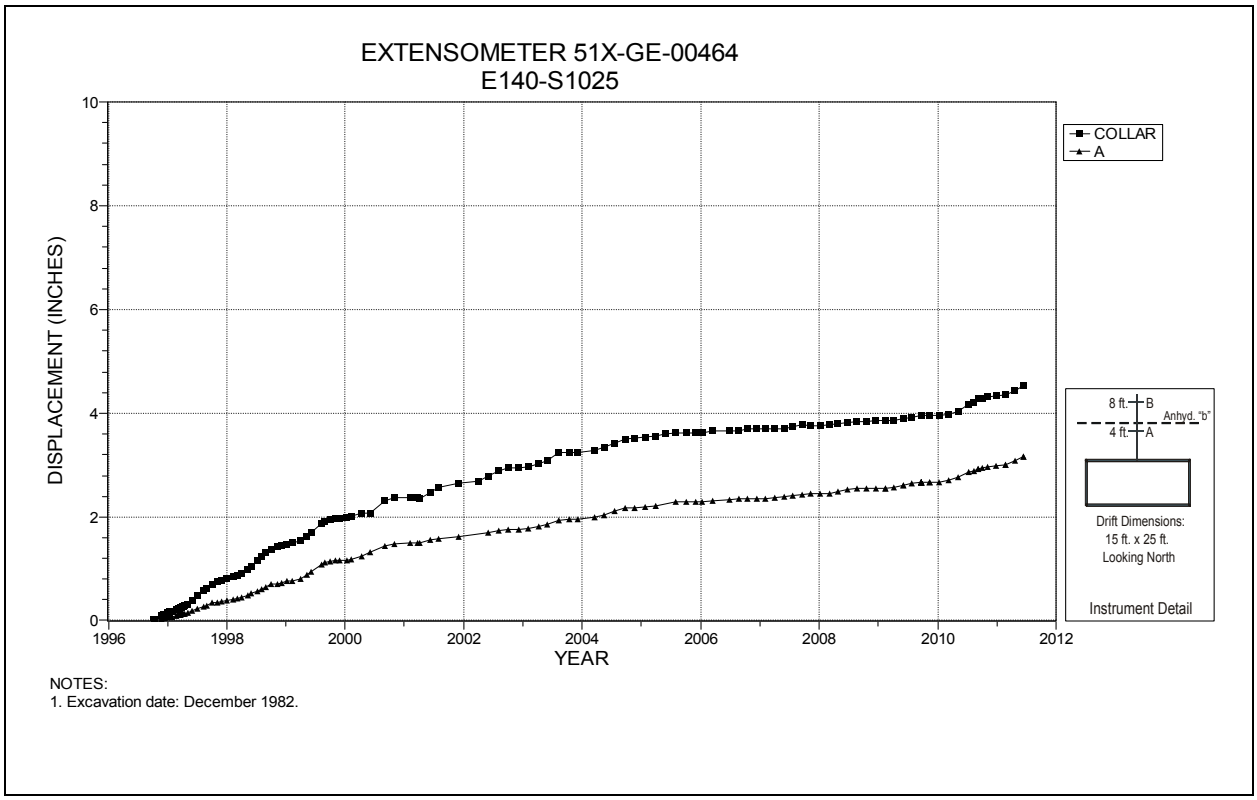


Figure 4-9 Extensometer 51X-GE-00464
E140 S1025 – Roof

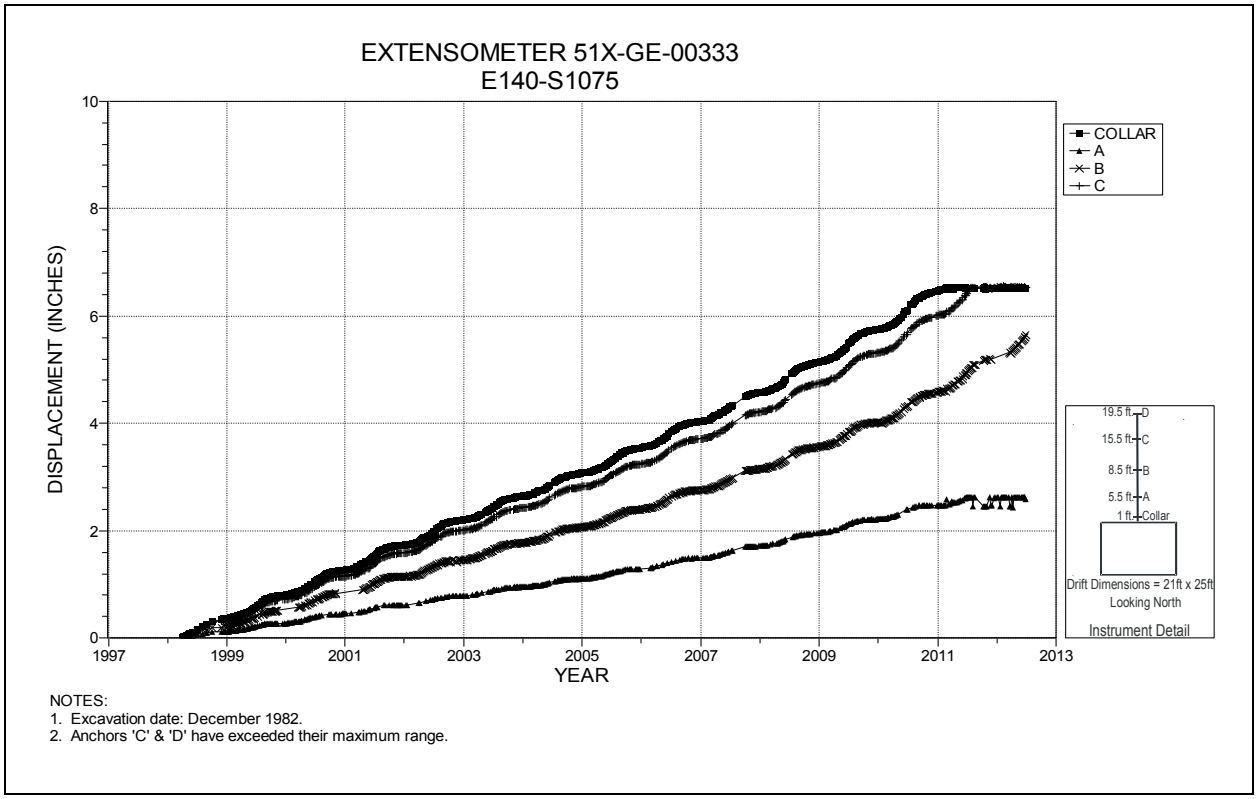
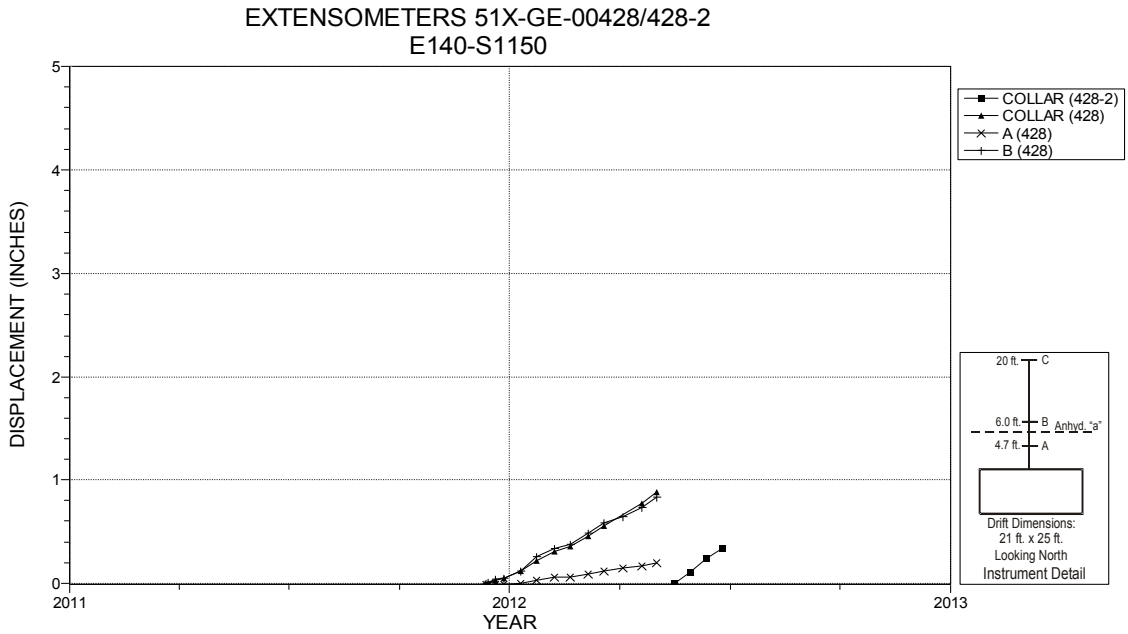
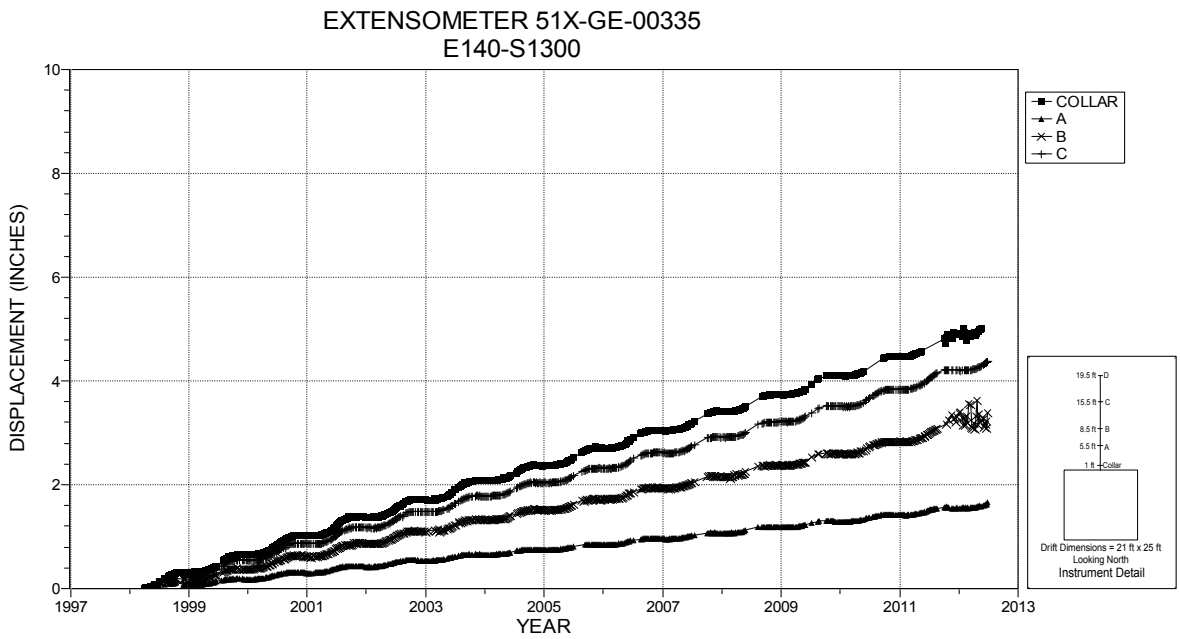


Figure 4-10 Extensometer 51X-GE-00333
E140 S1075 – Roof



NOTES:
1. Excavation date: December 1982.
2. 51X-GE-00428 was destroyed by a roof bolter and was replaced by the single anchor 51X-GE-00428-2.

Figure 4-11 Extensometers 51X-GE-00428/428-2
E140 S1150 – Roof



NOTES:
1. Excavation date: December 1982.
2. The Collar and 'B' anchors have become electrically noisy, possibly due to brine inflow.

Figure 4-12 Extensometer 51X-GE-00335
E140 S1300 – Roof

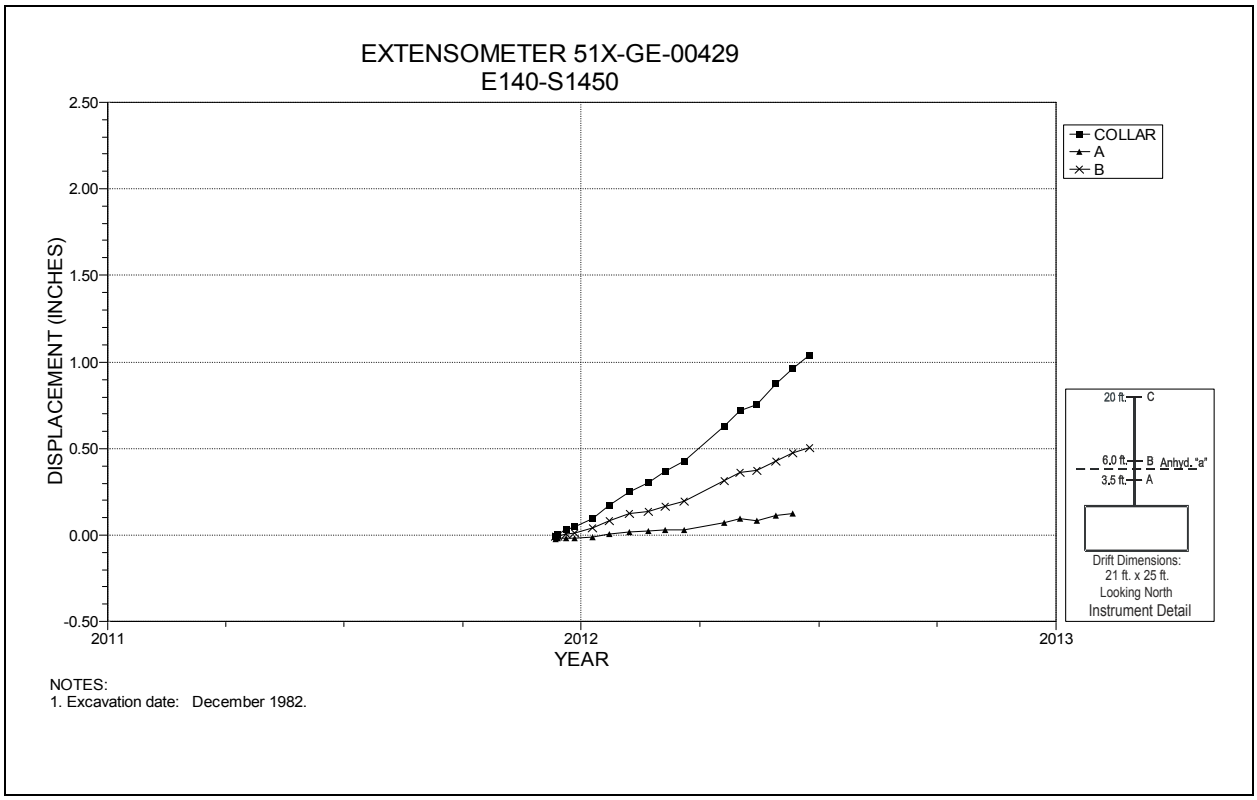


Figure 4-13 Extensometer 51X-GE-00429
E140 S1450 – Roof

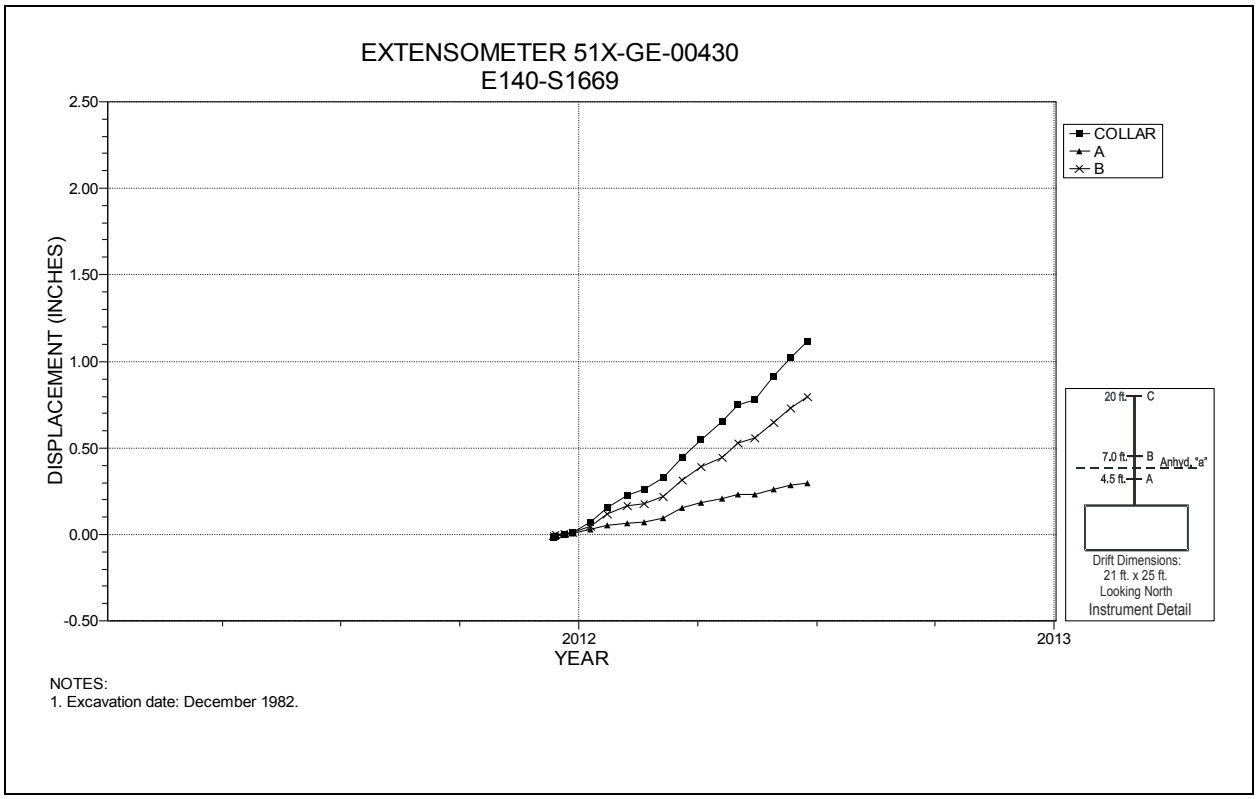


Figure 4-14 Extensometer 51X-GE-00430
E140 S1669 – Roof

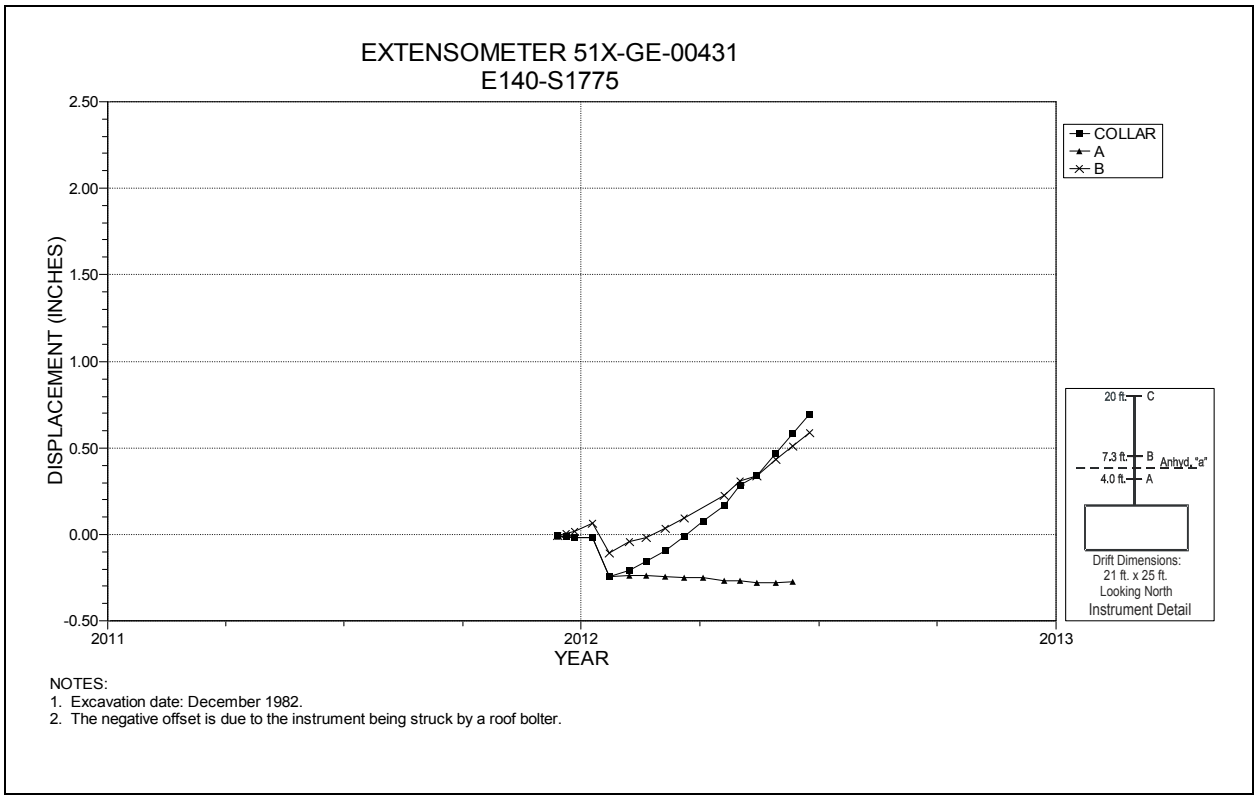


Figure 4-15 Extensometer 51X-GE-00431
E140 S1775 – Roof

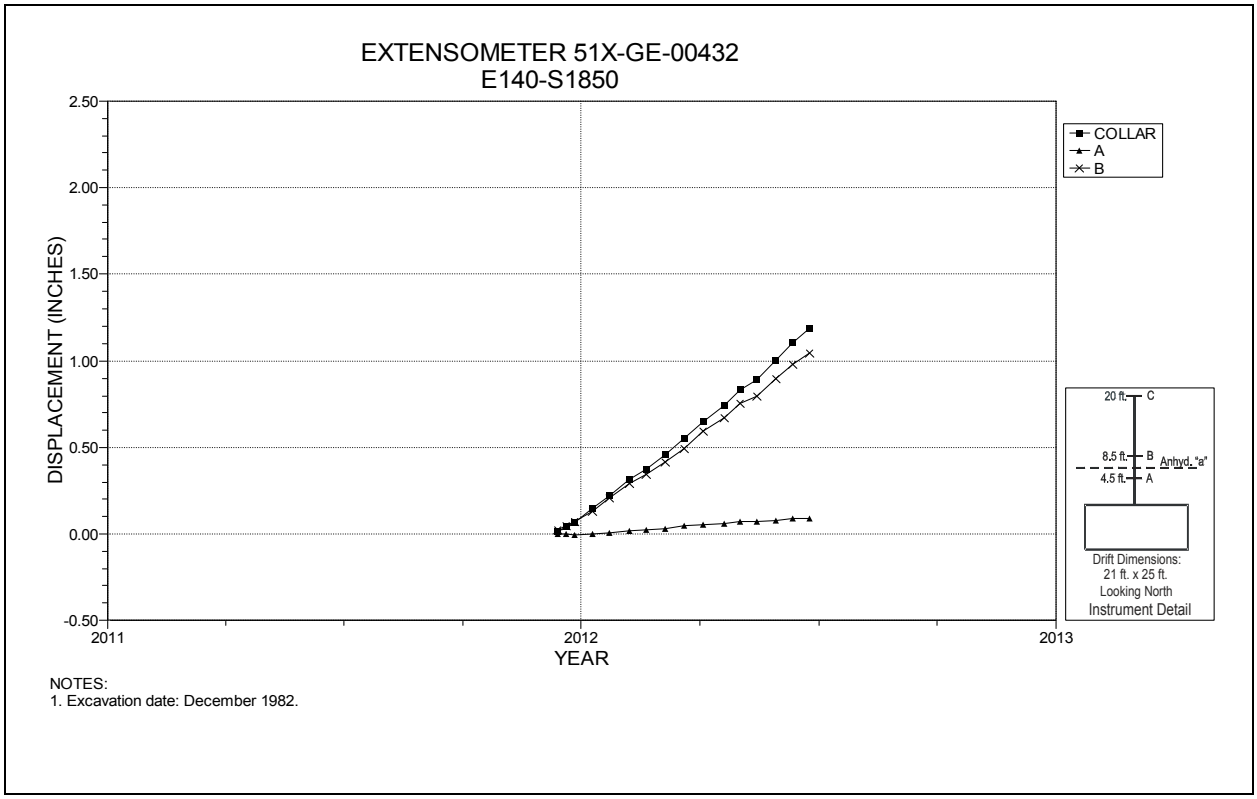


Figure 4-16 Extensometer 51X-GE-00432
E140 S1850 – Roof

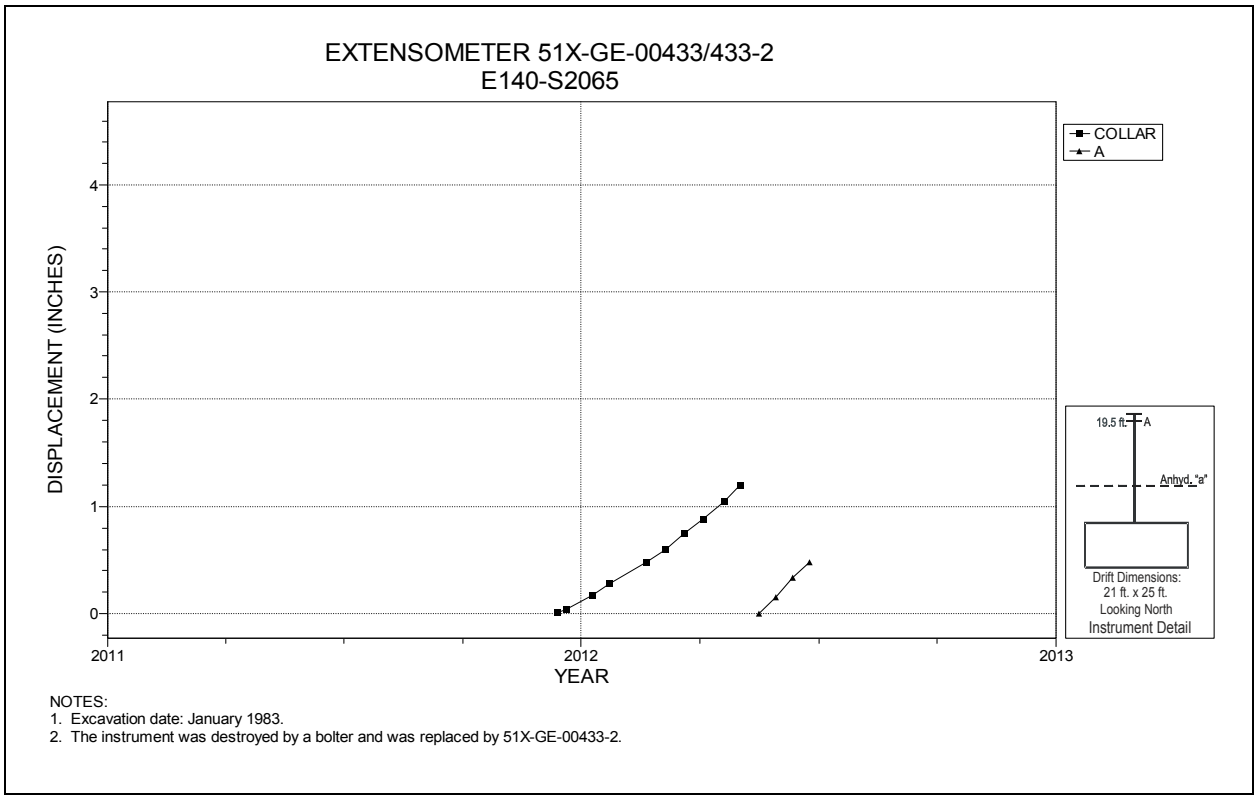


Figure 4-17 Extensometers 51X-GE-00433/433-2
E140 S2065 – Roof

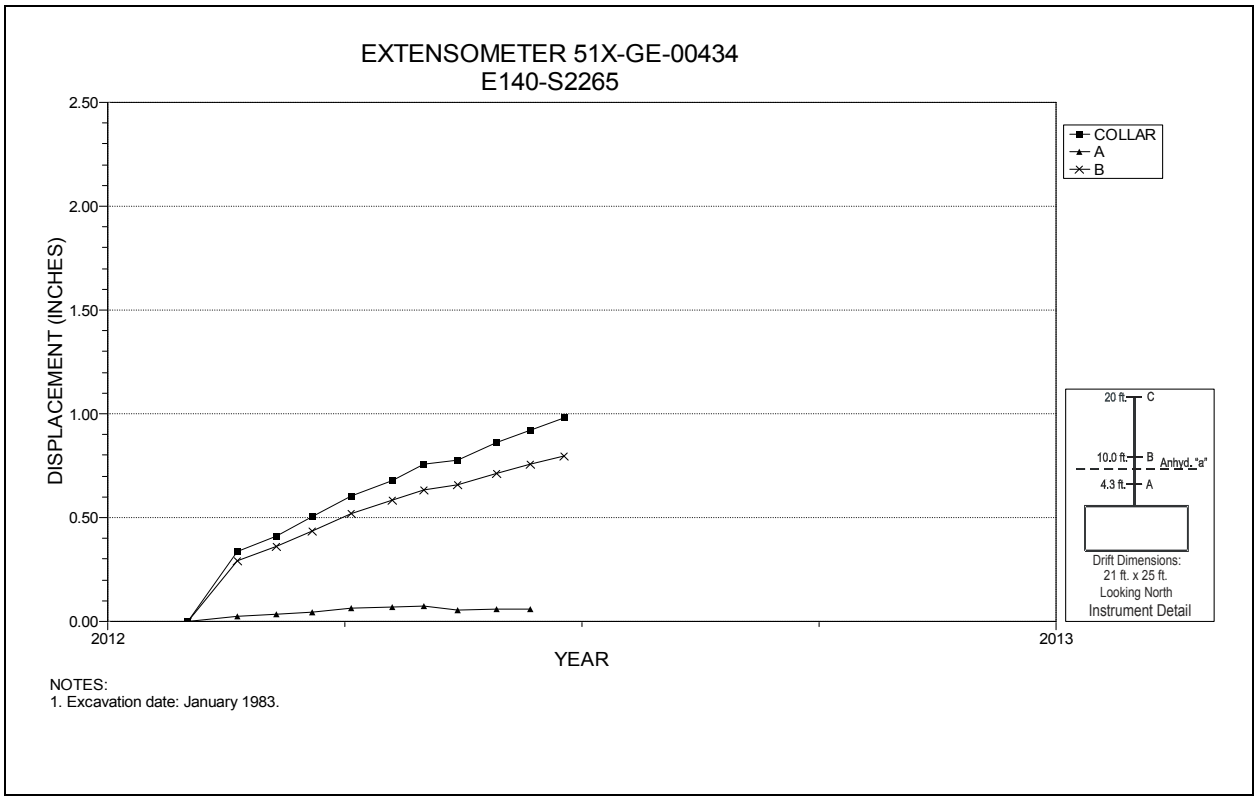


Figure 4-18 Extensometer 51X-GE-00434
E140 S2265 – Roof

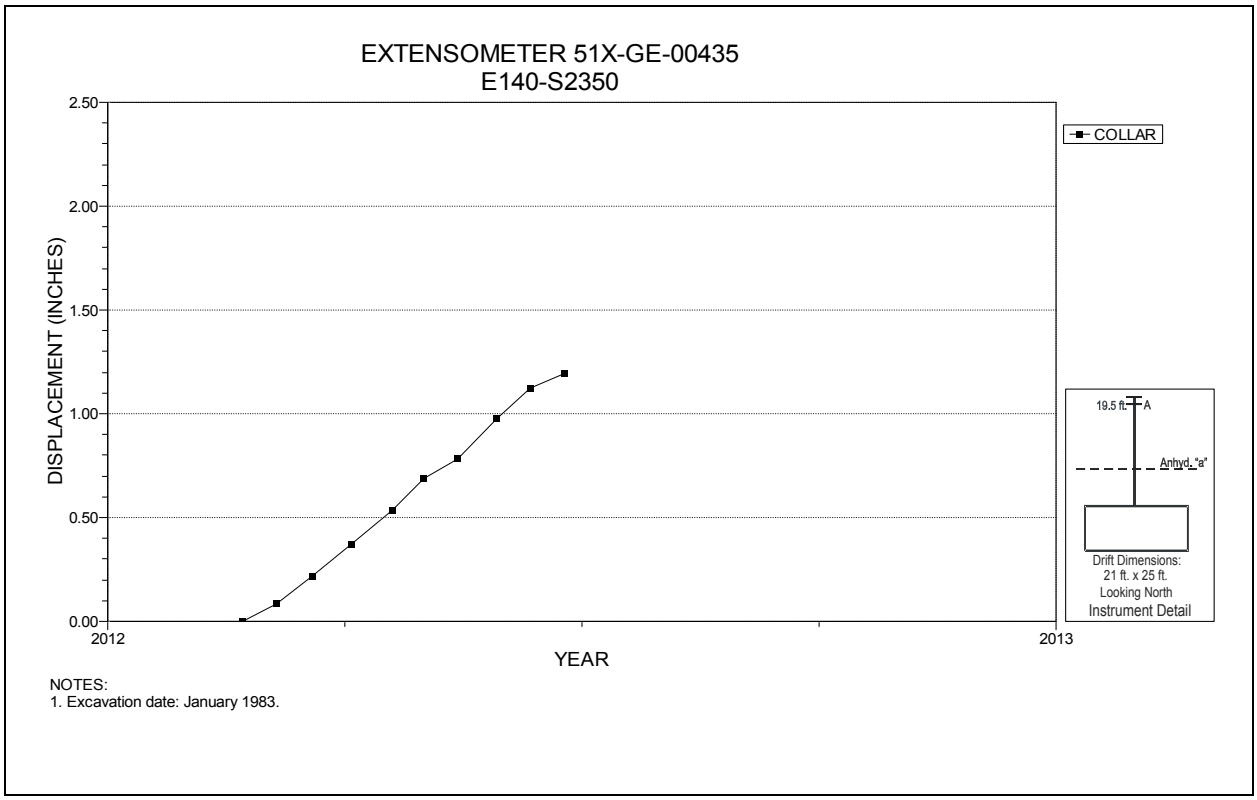


Figure 4-19 Extensometer 41X-GE-00435
E140 S2350 – Roof

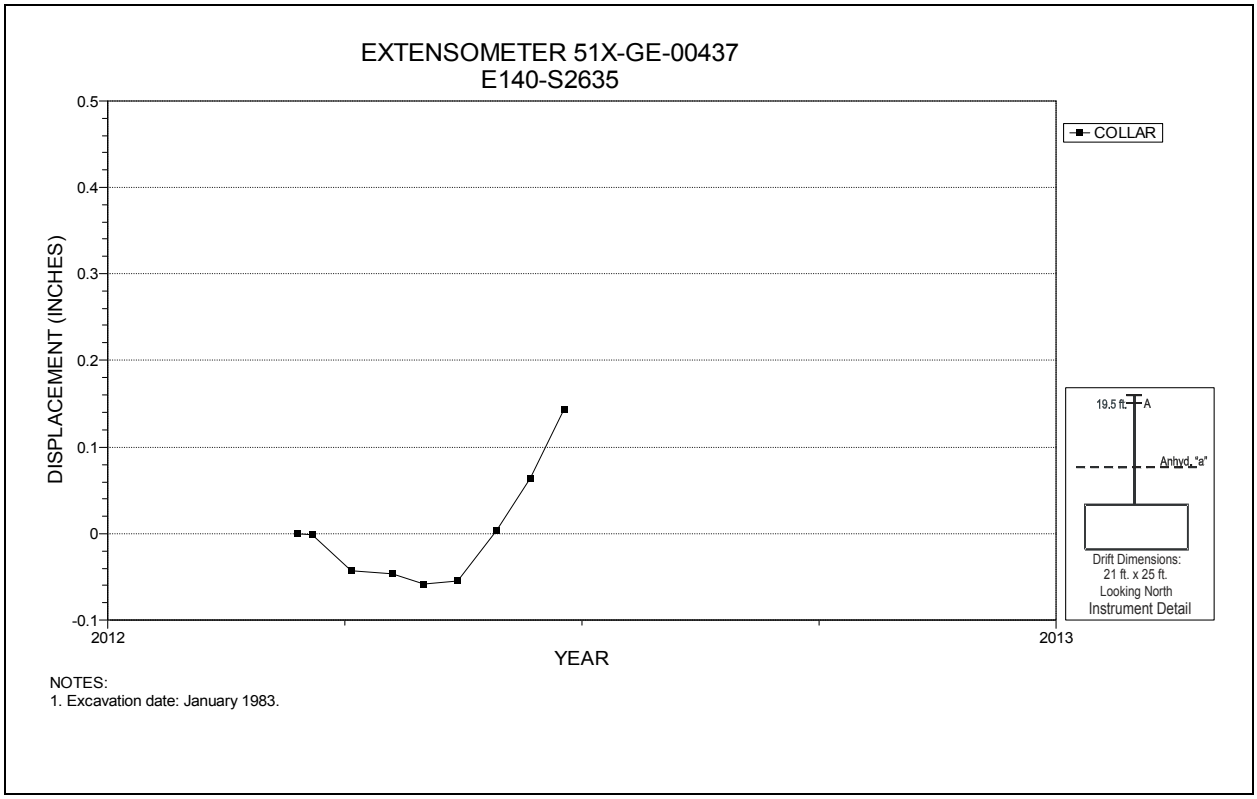


Figure 4-20 Extensometer 41X-GE-00437
E140 S2635 – Roof

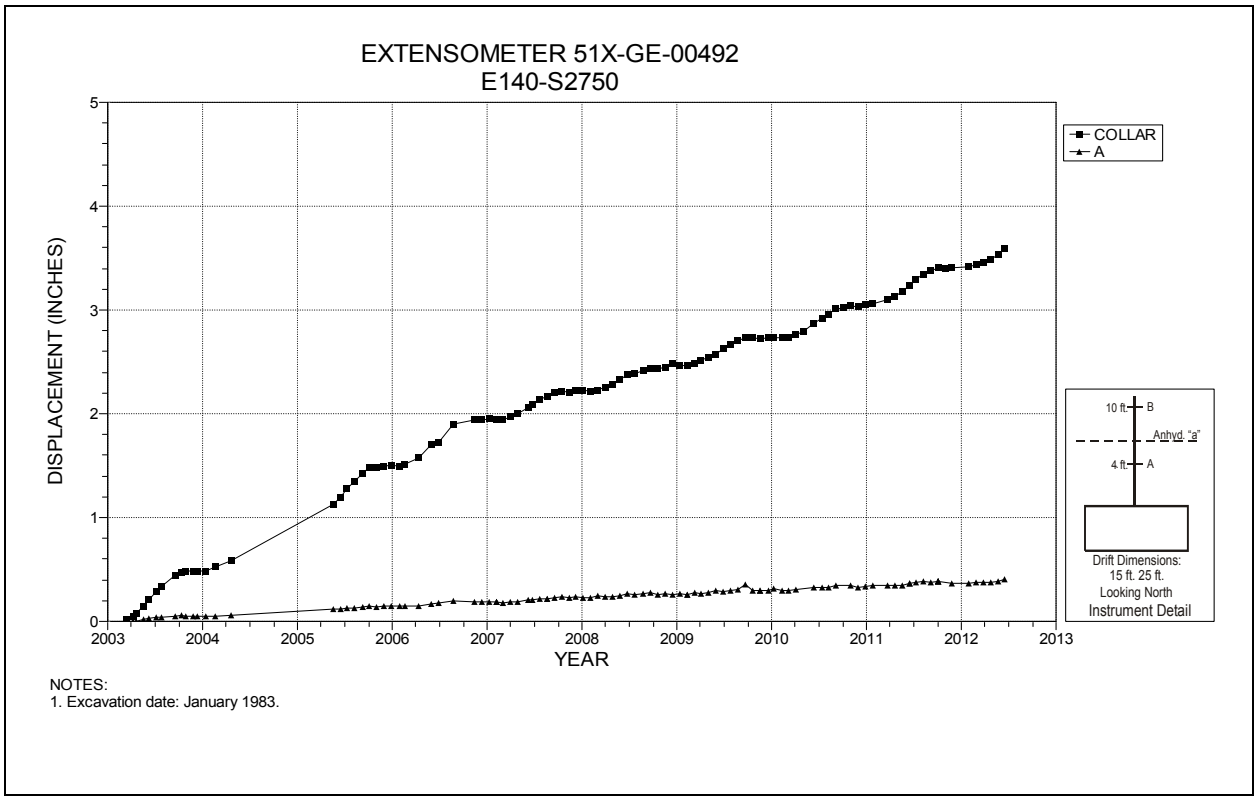


Figure 4-21 Extensometer 51X-GE-00492
E140 S2750 – Roof

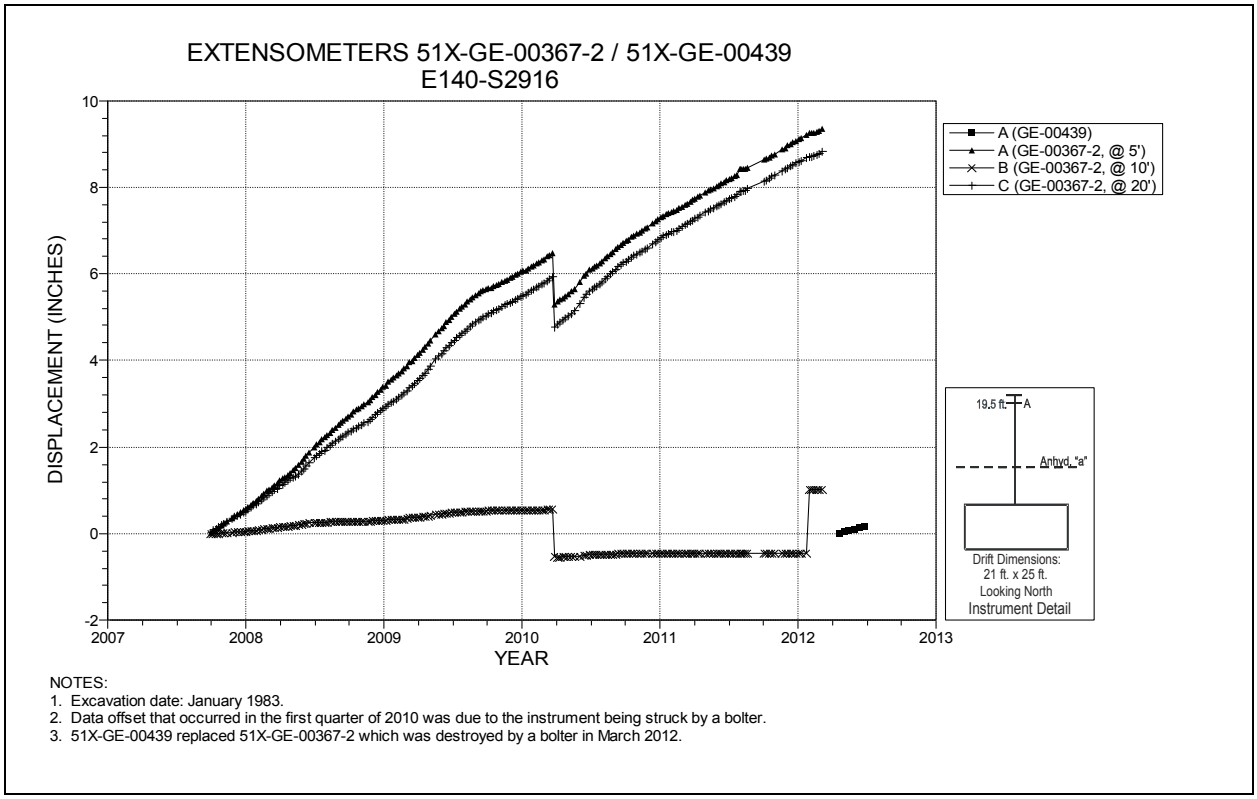


Figure 4-22 Extensometers 51X-GE-00367-2/51X-GE-00439
E140 S2916 – Roof

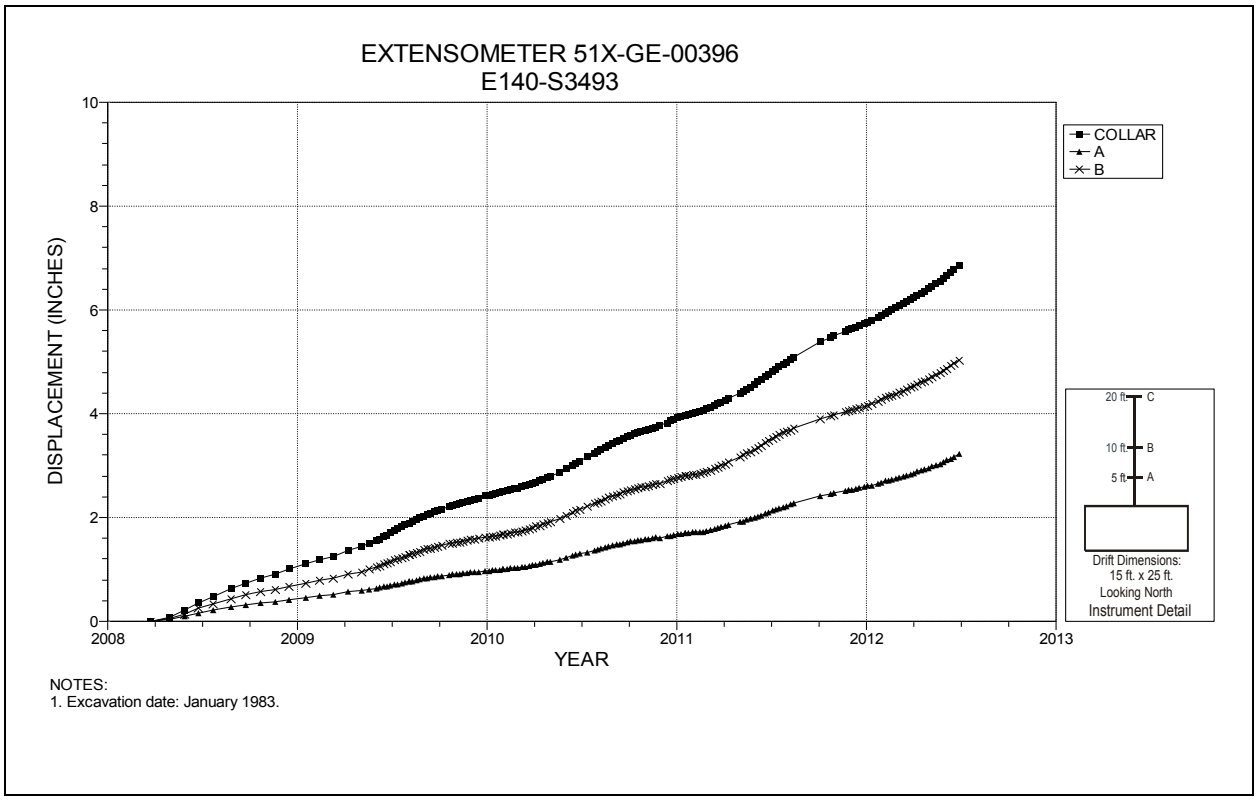


Figure 4-23 Extensometer 51X-GE-00396
E140 S3493 – Roof

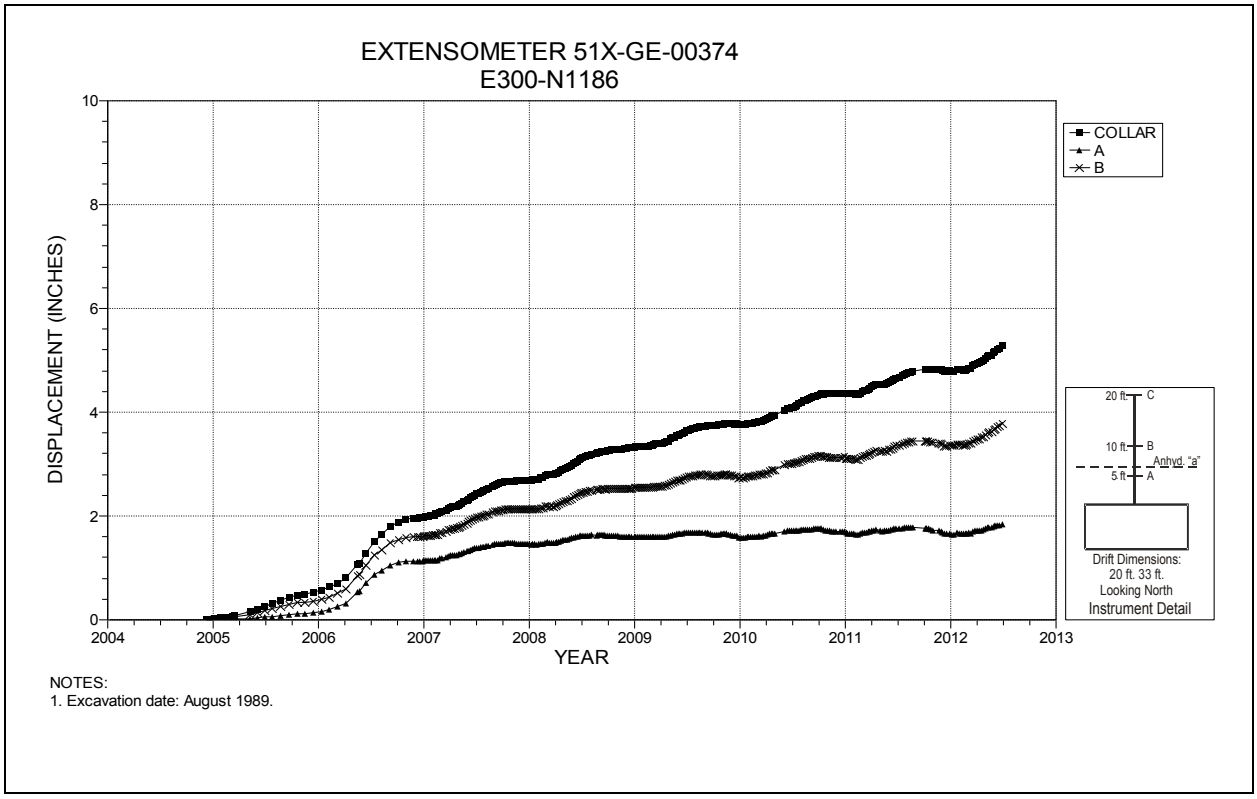


Figure 4-24 Extensometer 51X-GE-00374
E300 N1186 – Roof

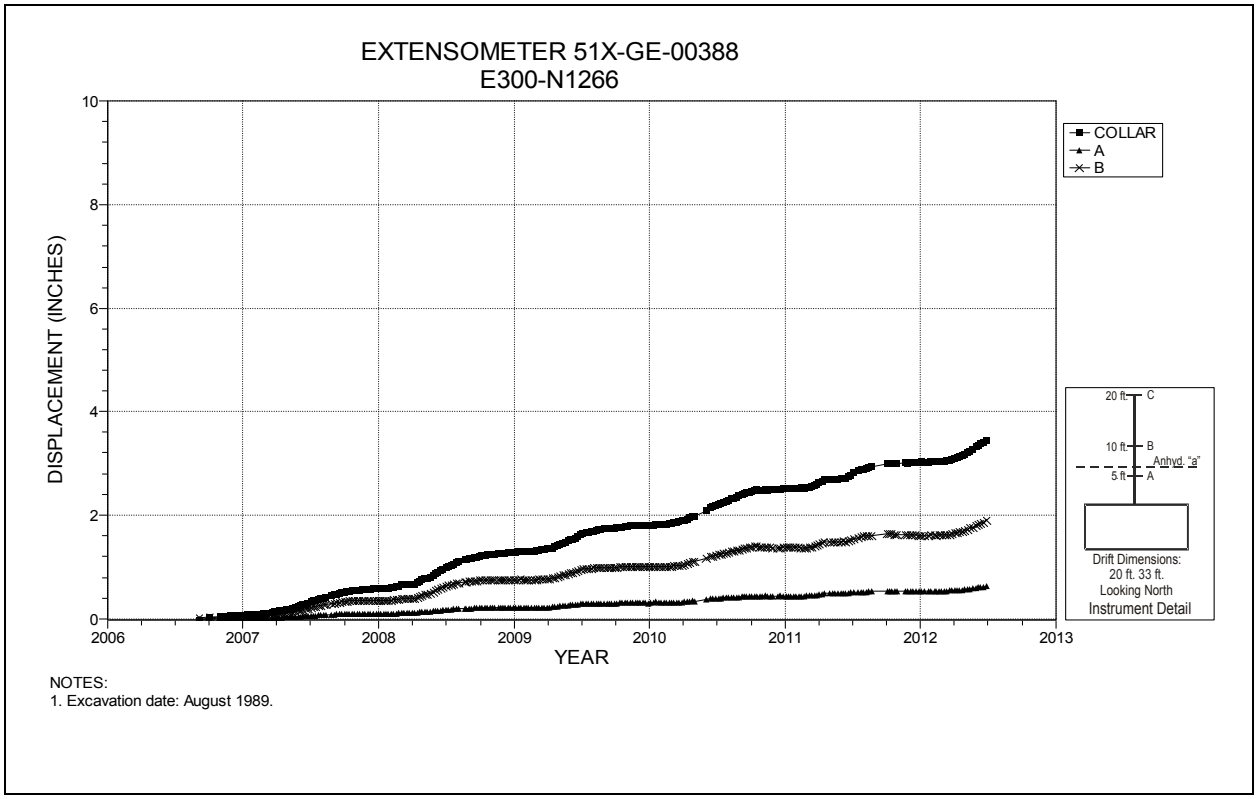


Figure 4-25 Extensometer 51X-GE-00388
E300 N1266 – Roof

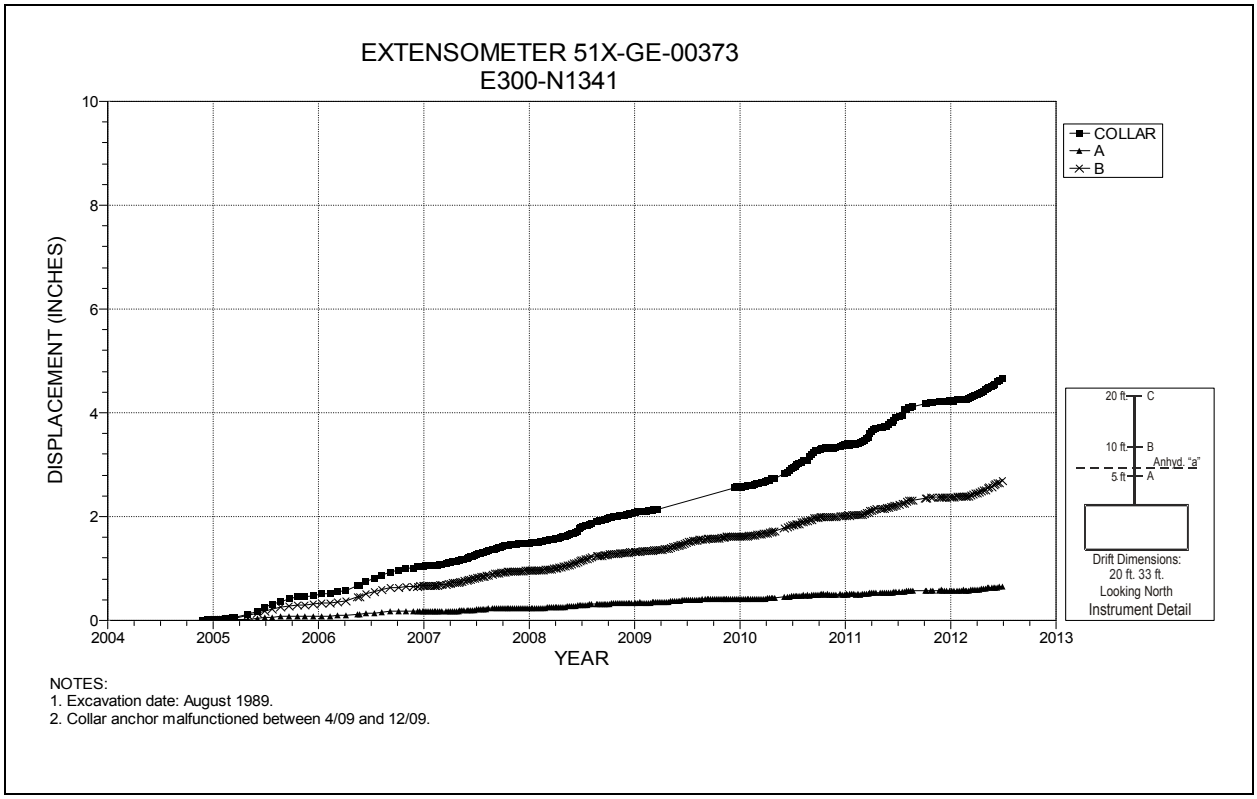


Figure 4-26 Extensometer 51X-GE-00373
E300 N1341 – Roof

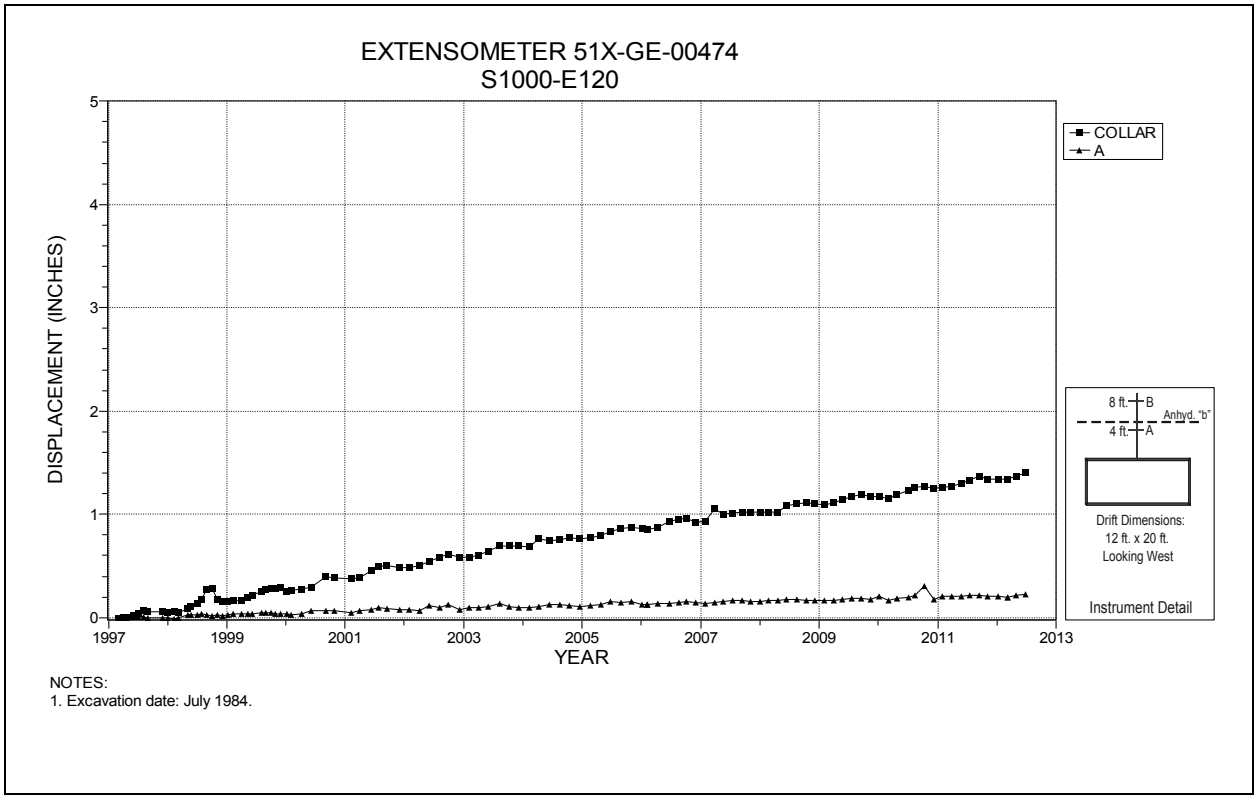


Figure 4-27 Extensometer 51X-GE-00474
S1000 E120 – Roof

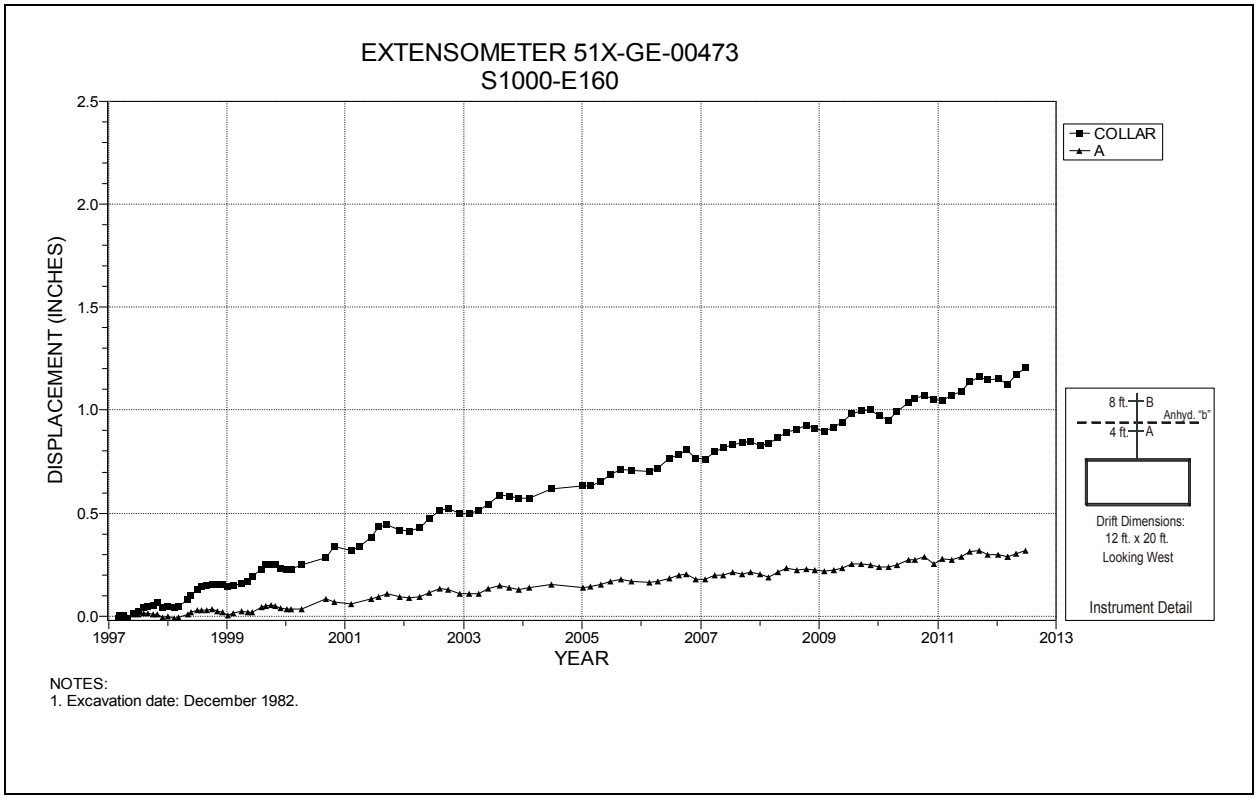


Figure 4-28 Extensometer 51X-GE-00473
S1000 E160 – Roof

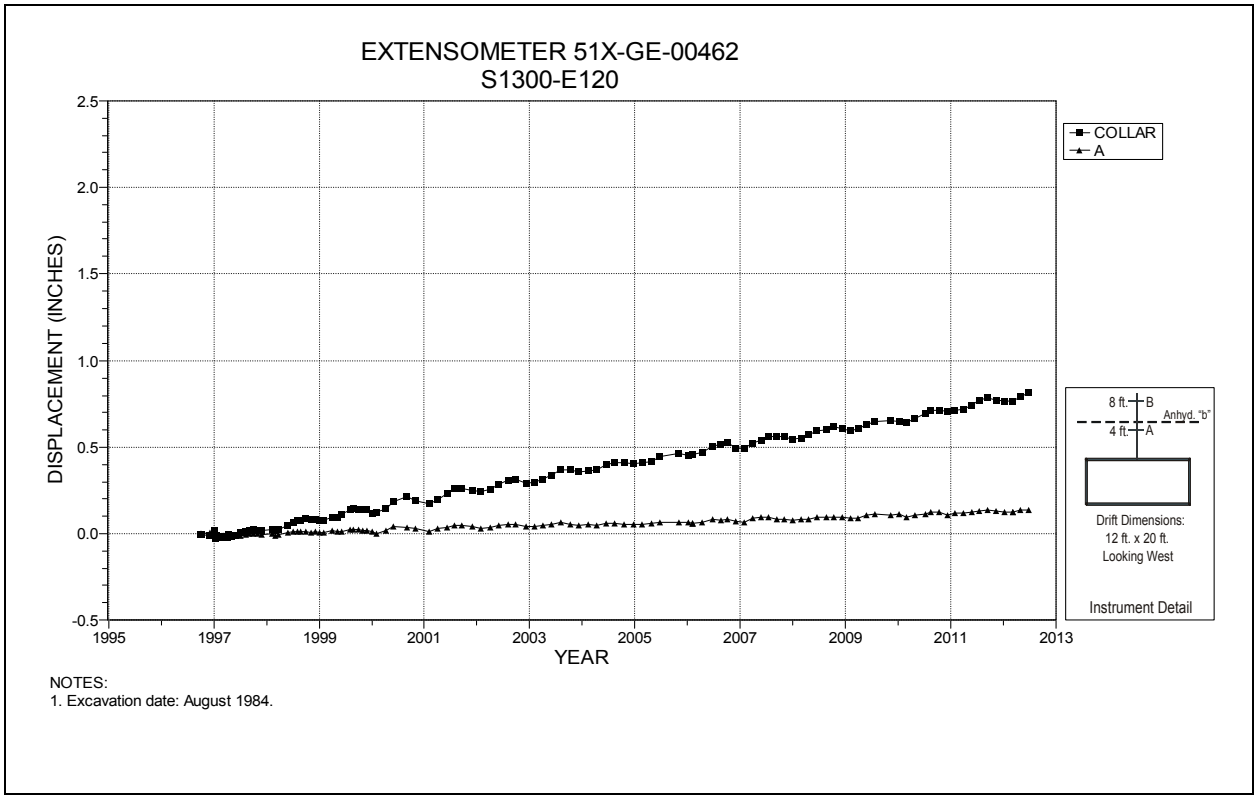


Figure 4-29 Extensometer 51X-GE-00462
S1300 E120 – Roof

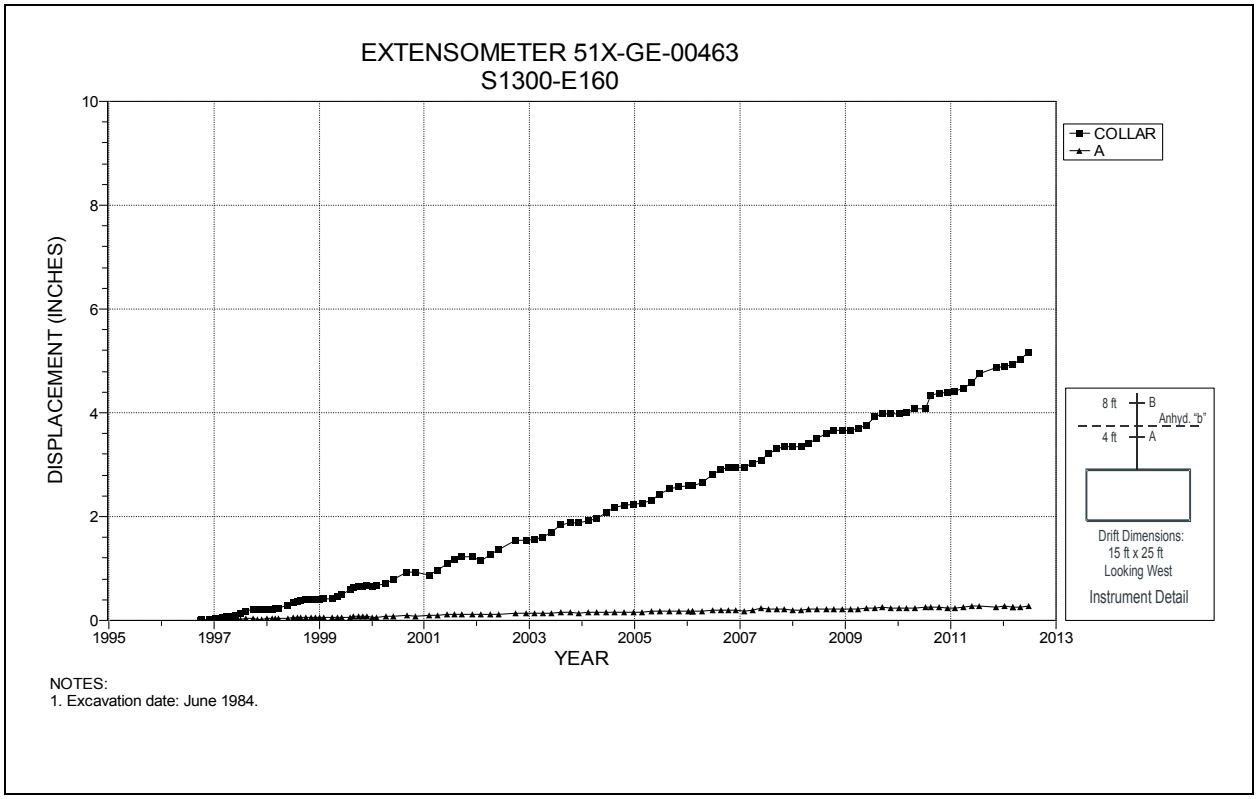


Figure 4-30 Extensometer 51X-GE-00463
S1300 E160 – Roof

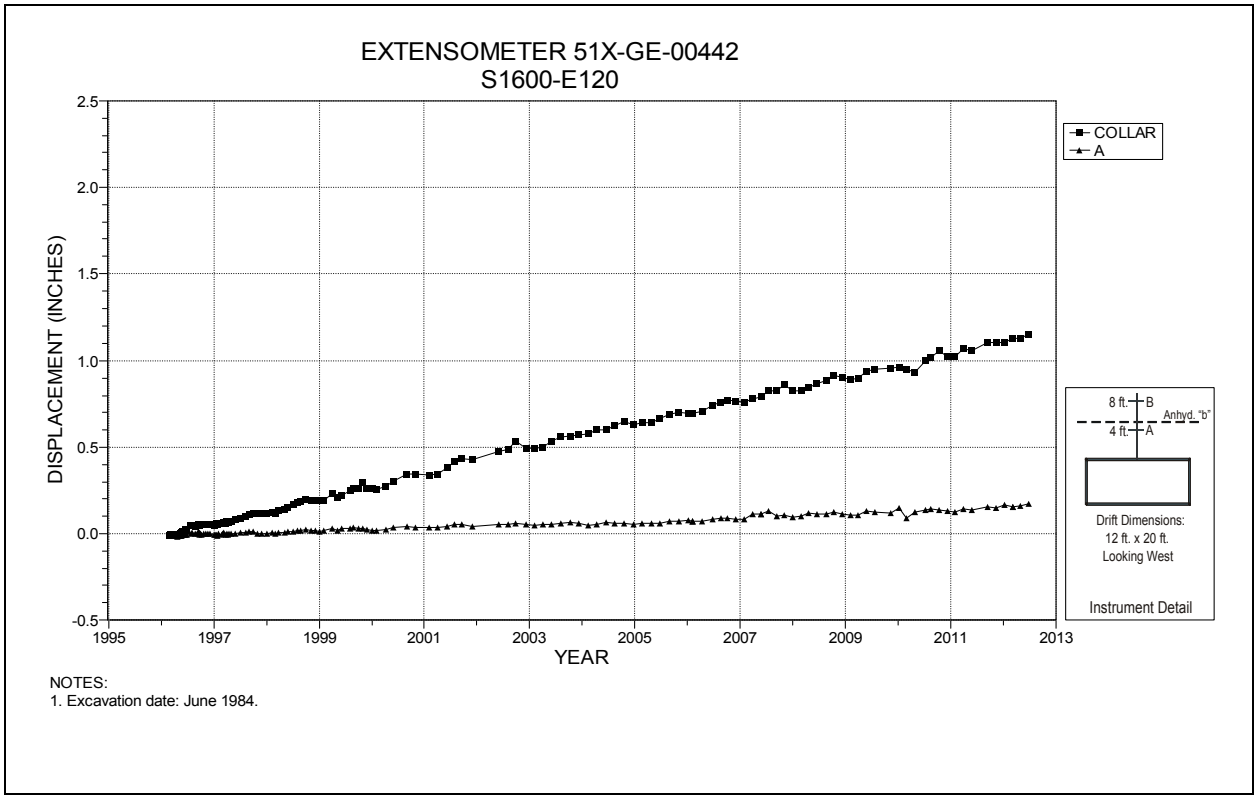


Figure 4-31 Extensometer 51X-GE-00442
S1600 E120 – Roof

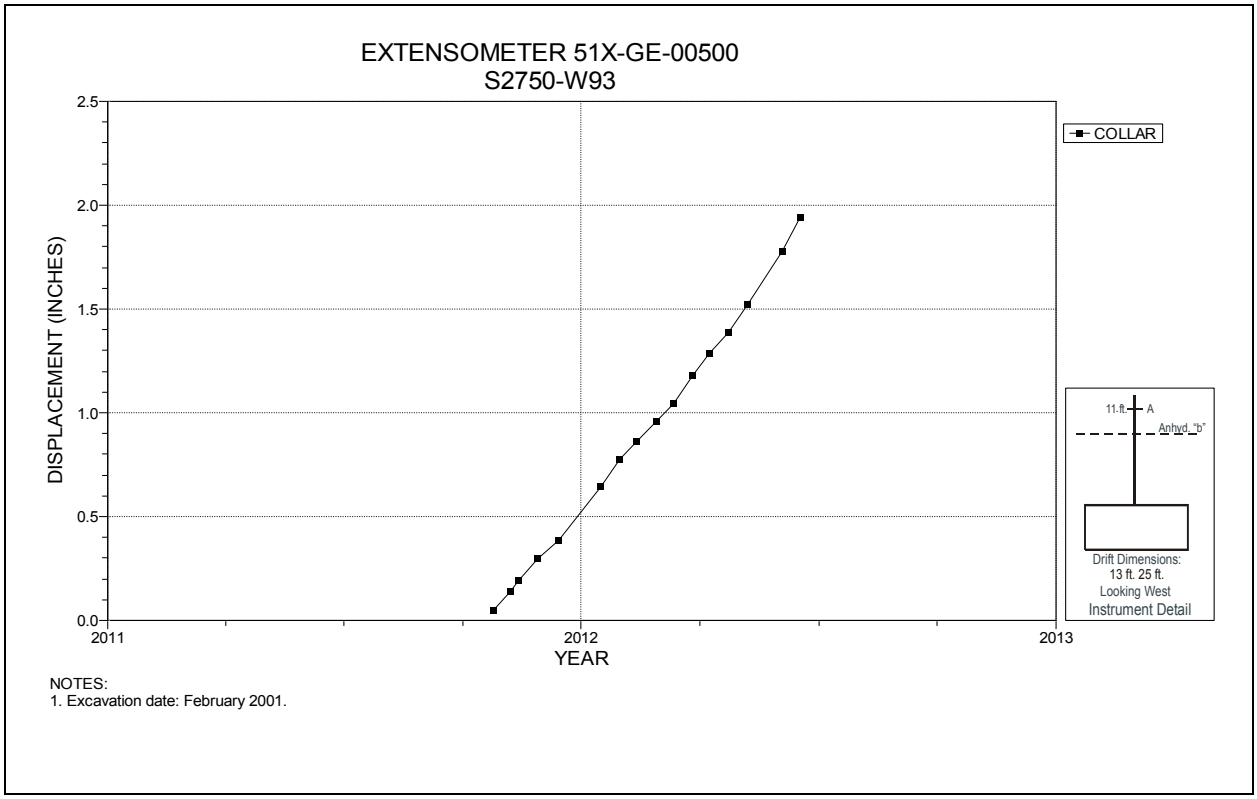


Figure 4-32 Extensometer 51X-GE-00500
S2750 W93 – Roof

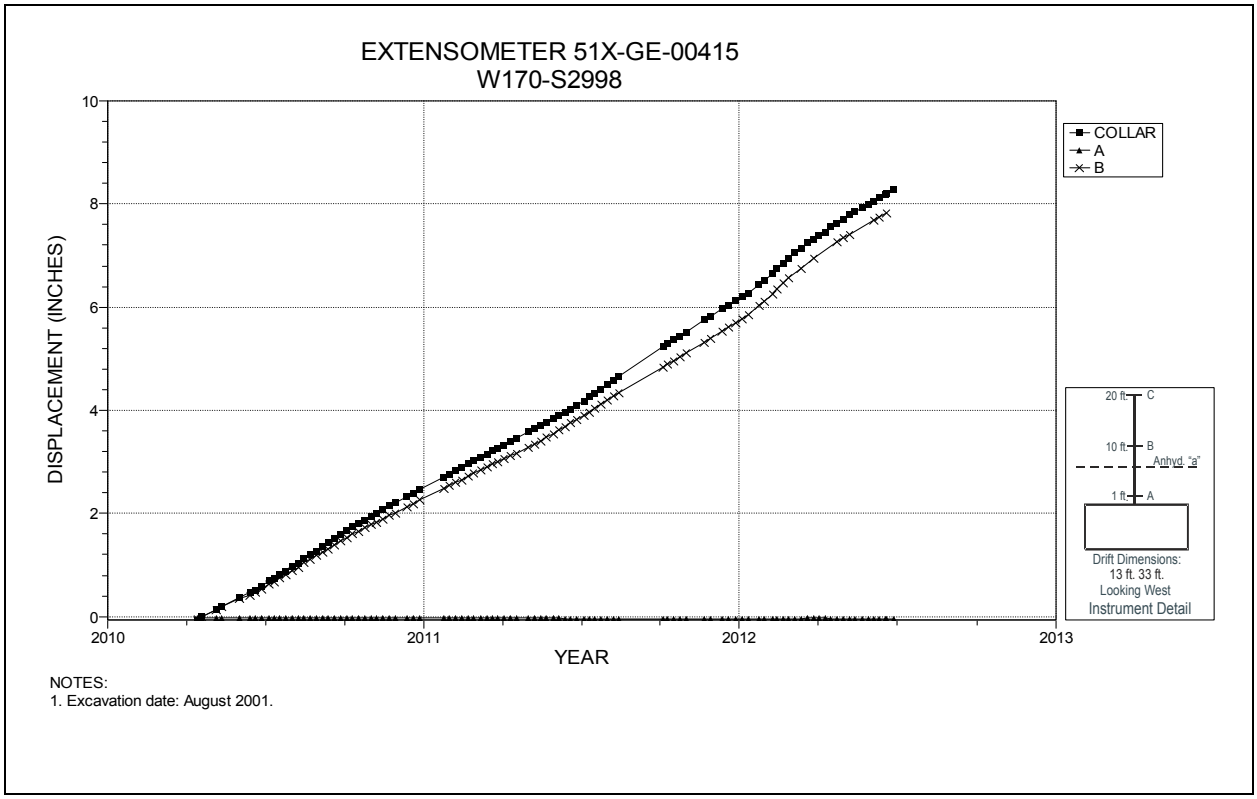


Figure 4-33 Extensometer 51X-GE-00415
W170 S2998 – Roof

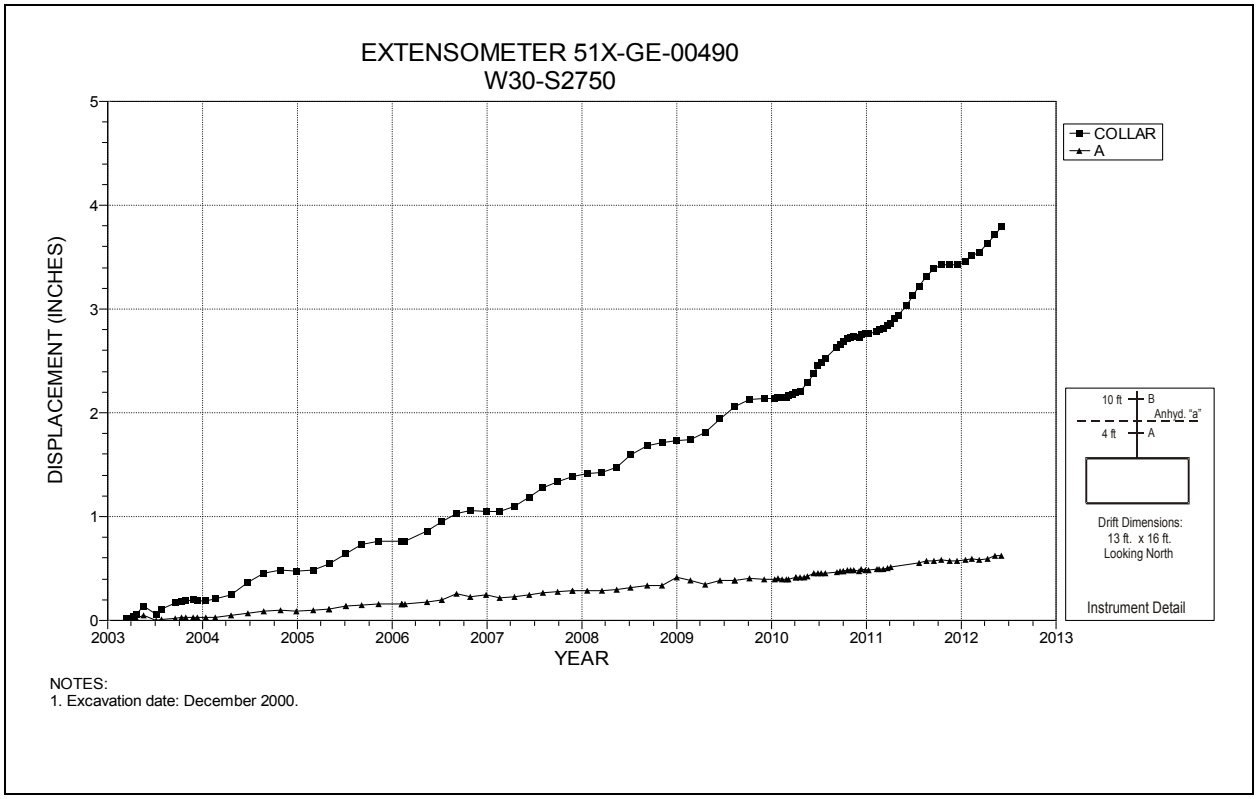


Figure 4-34 Extensometer 51X-GE-00490
W30 S2750 – Roof

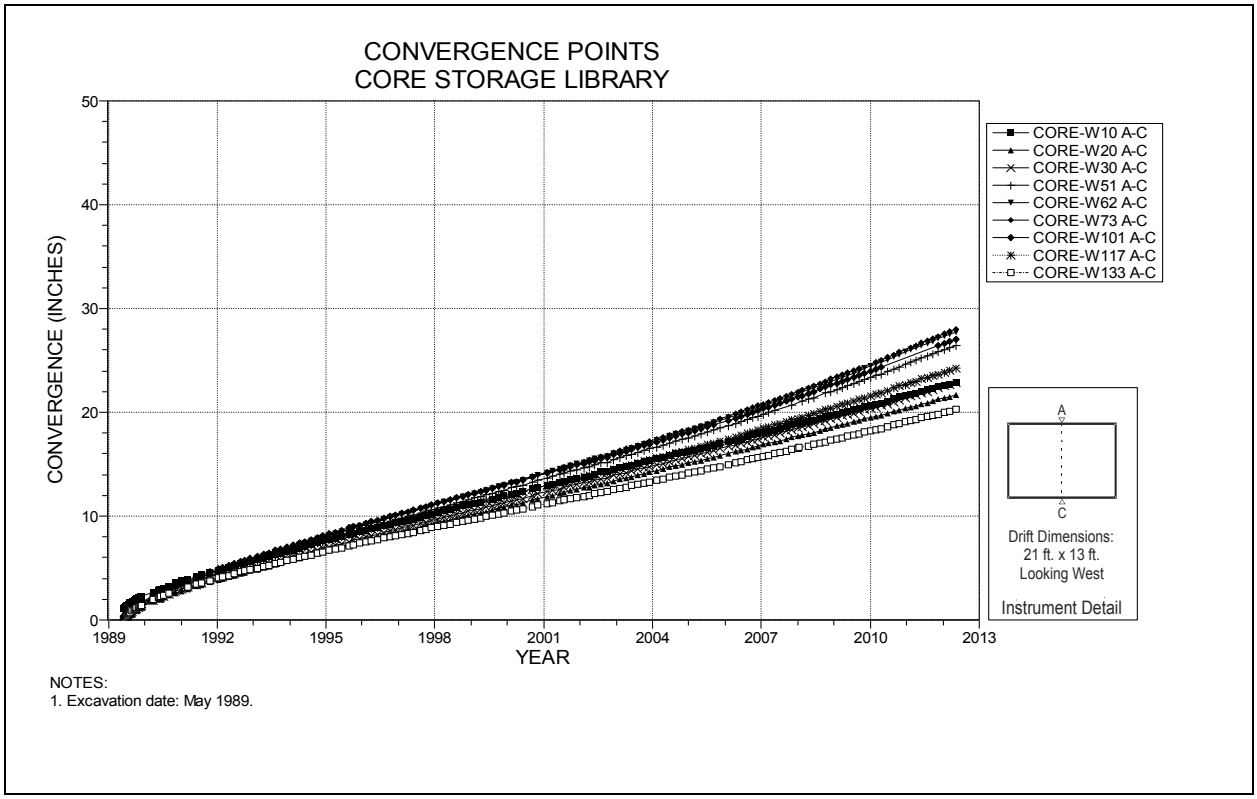


Figure 4-35 Convergence Point Array
Core Storage Library – Roof to Floor

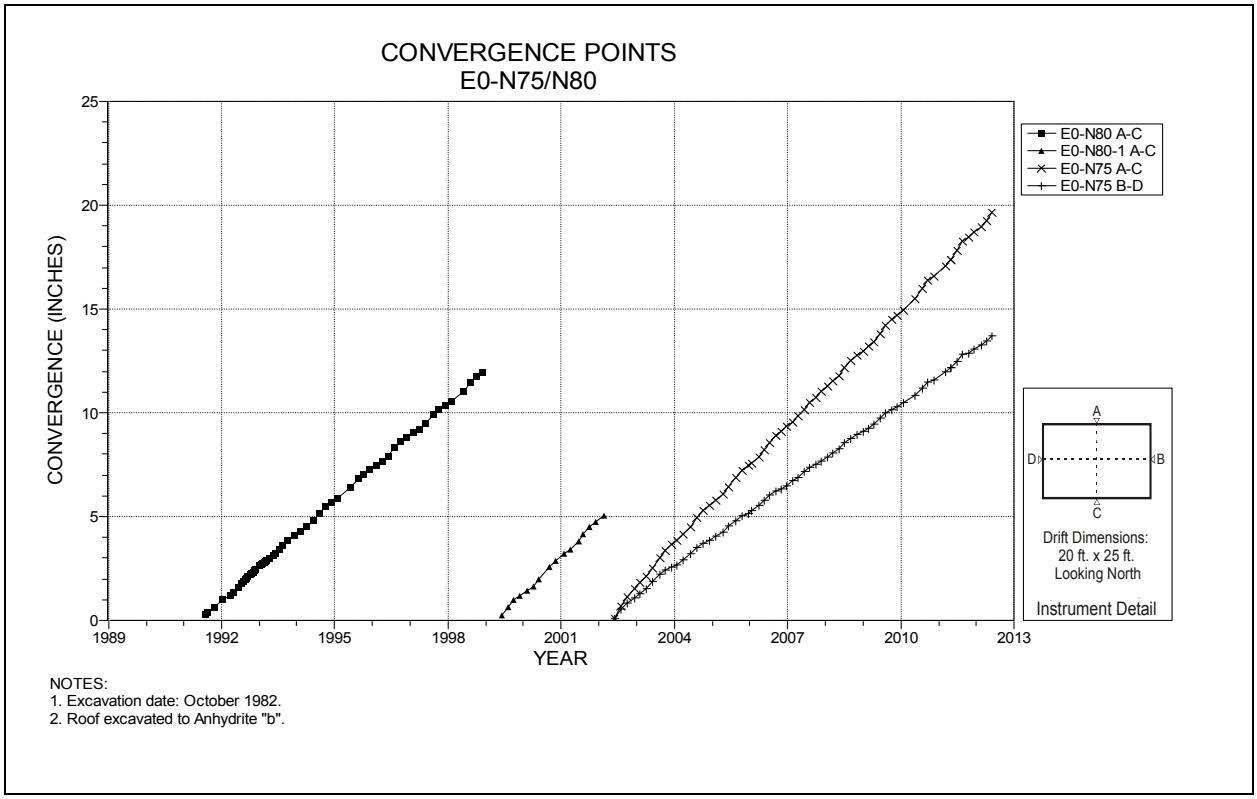


Figure 4-36 Convergence Point Array
E0 N75/N80 – All Chords

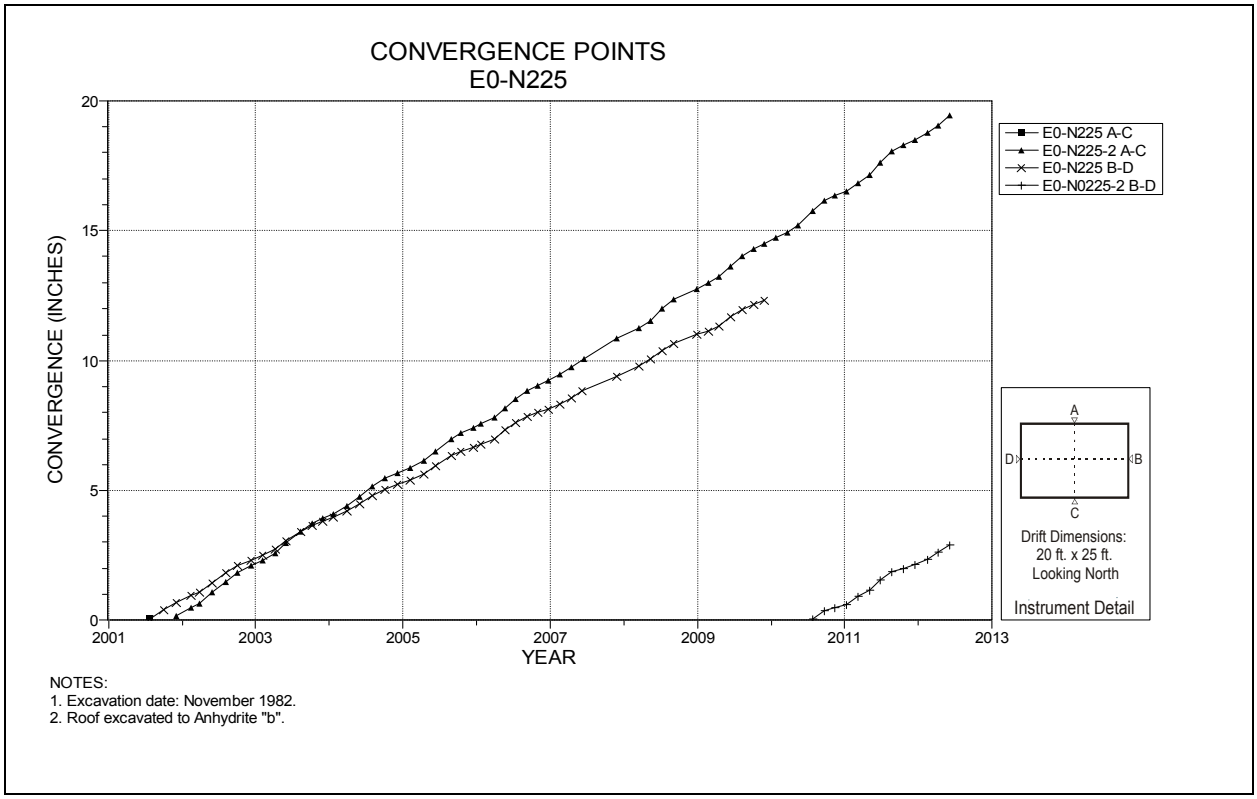


Figure 4-37 Convergence Point Array
E0 N225 – All Chords

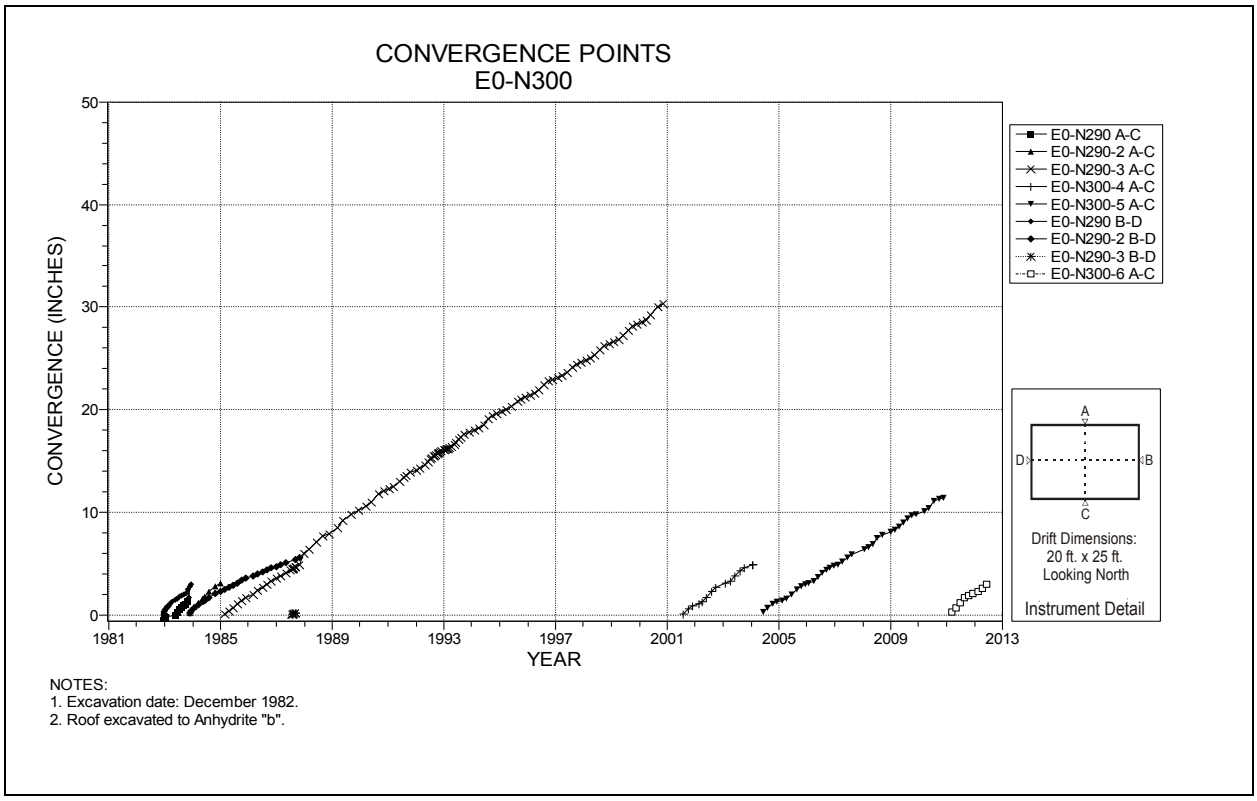


Figure 4-38 Convergence Point Array
E0 N300 – All Chords

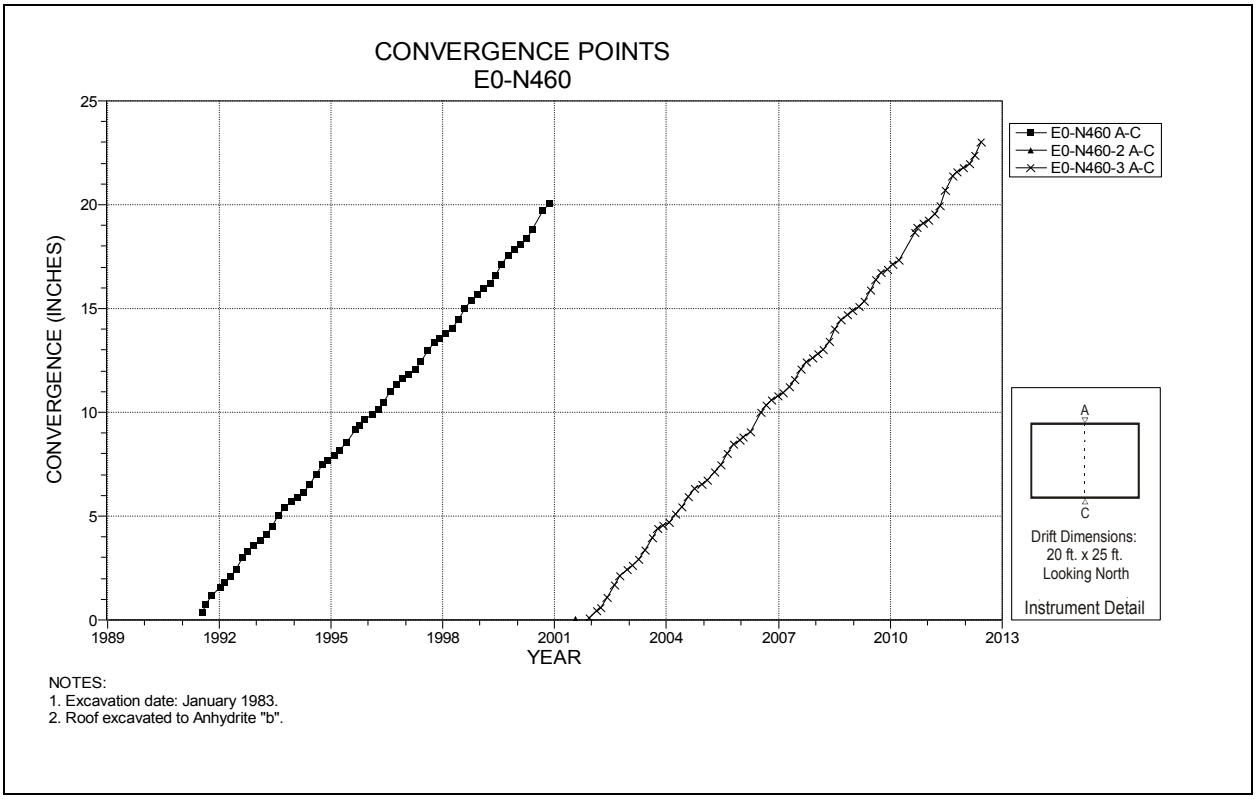


Figure 4-39 Convergence Point Array
E0 N460 – Roof to Floor

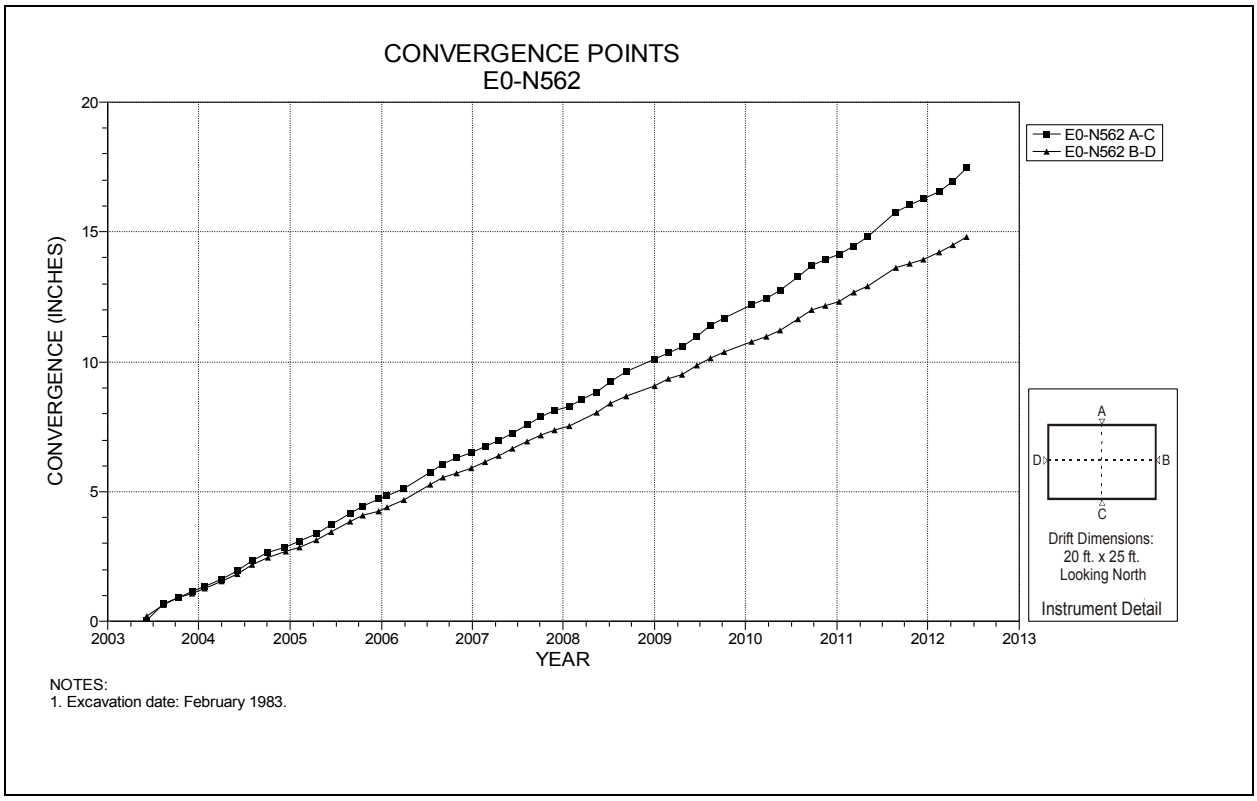


Figure 4-40 Convergence Point Array
E0 N562 – All Chords

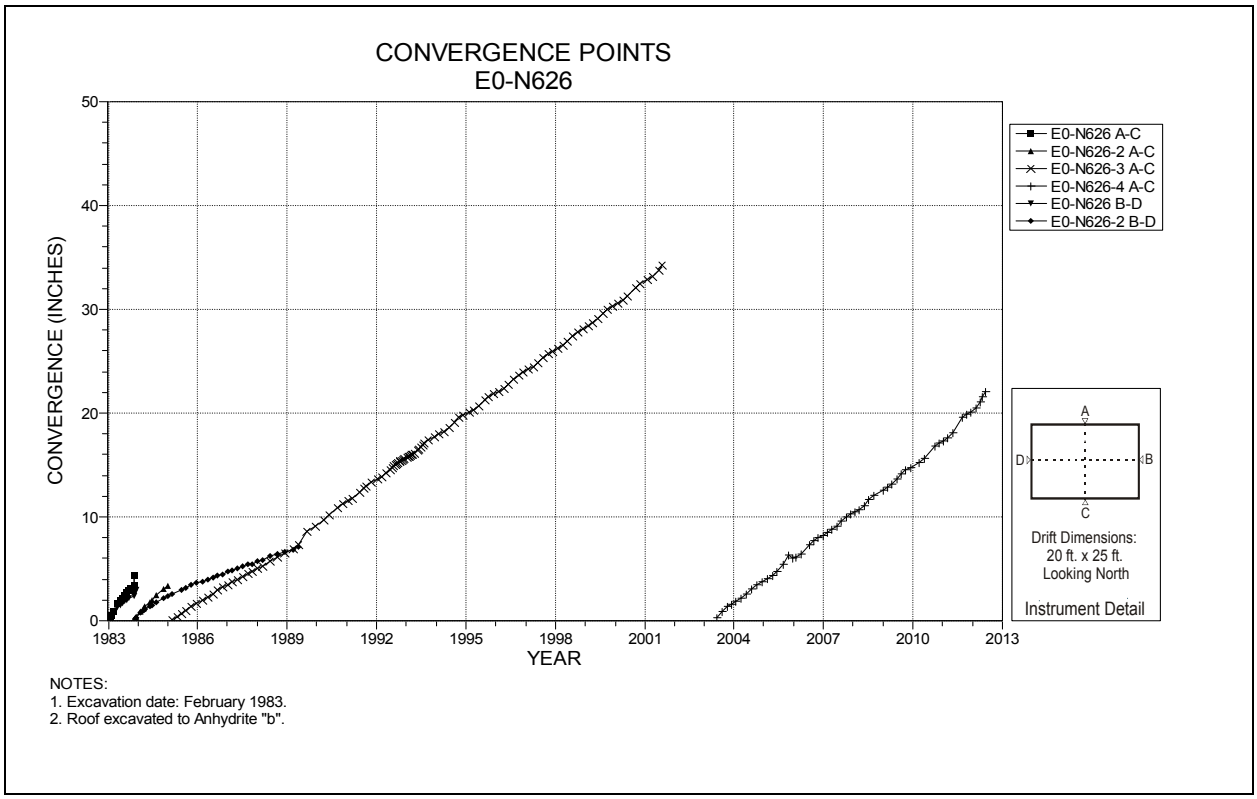


Figure 4-41 Convergence Point Array
E0 N626 – All Chords

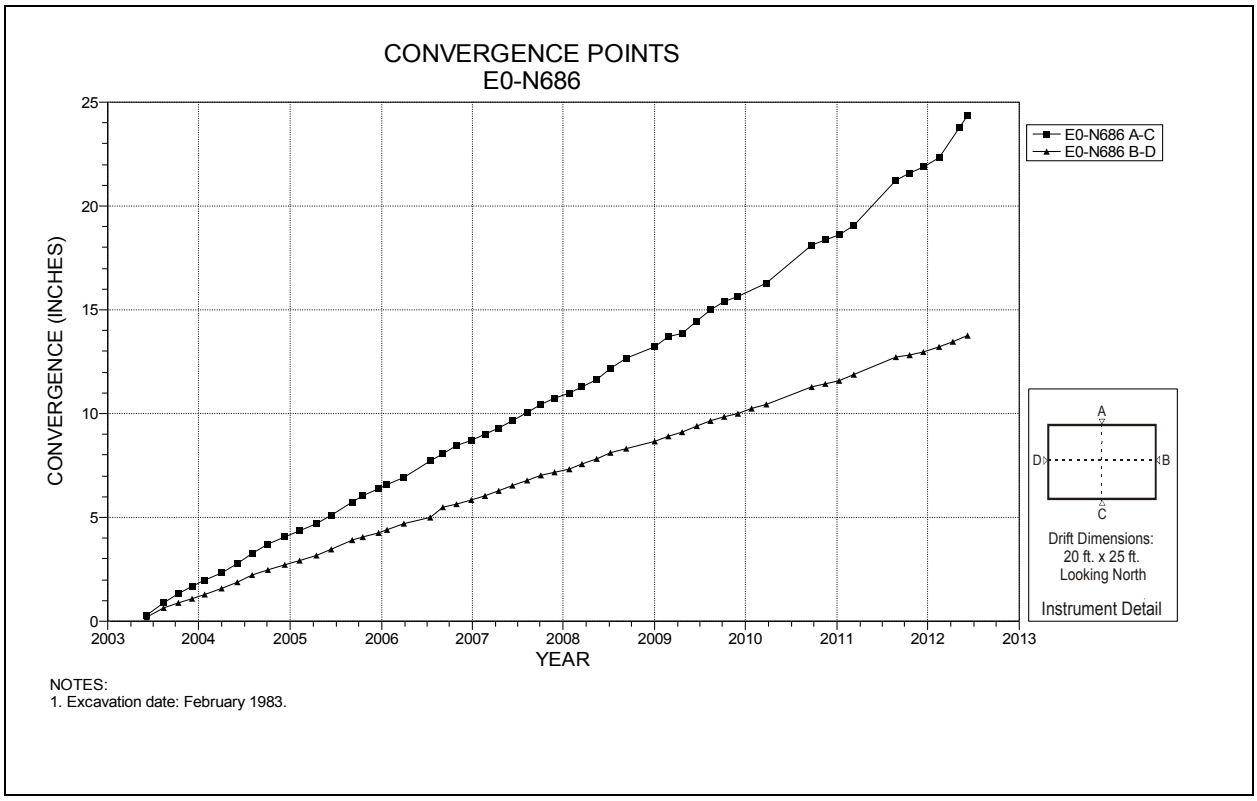
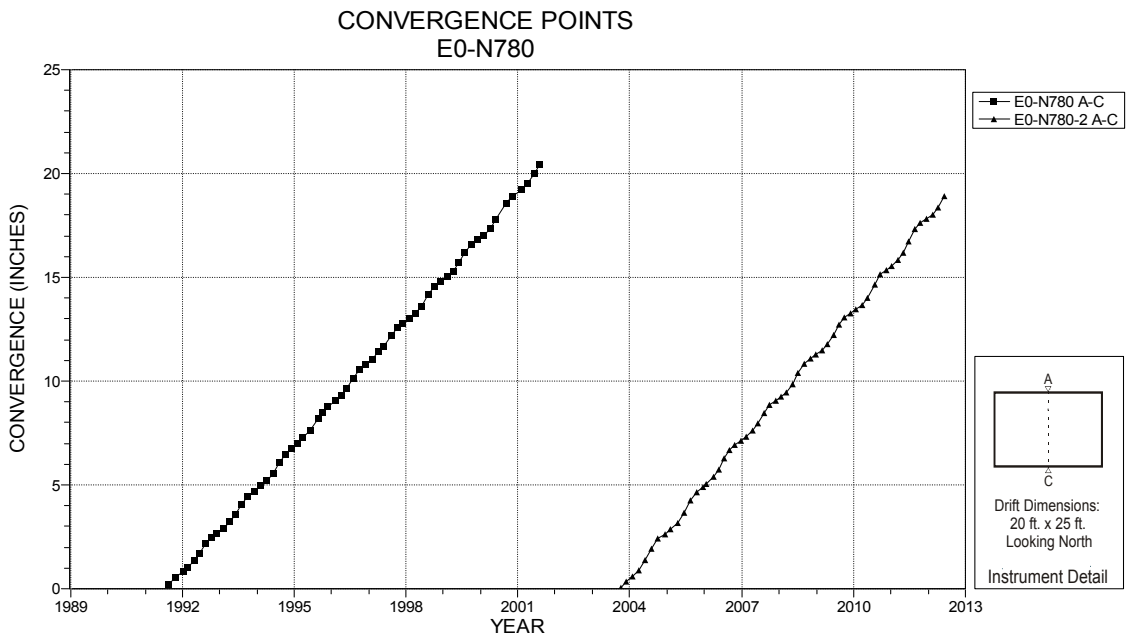
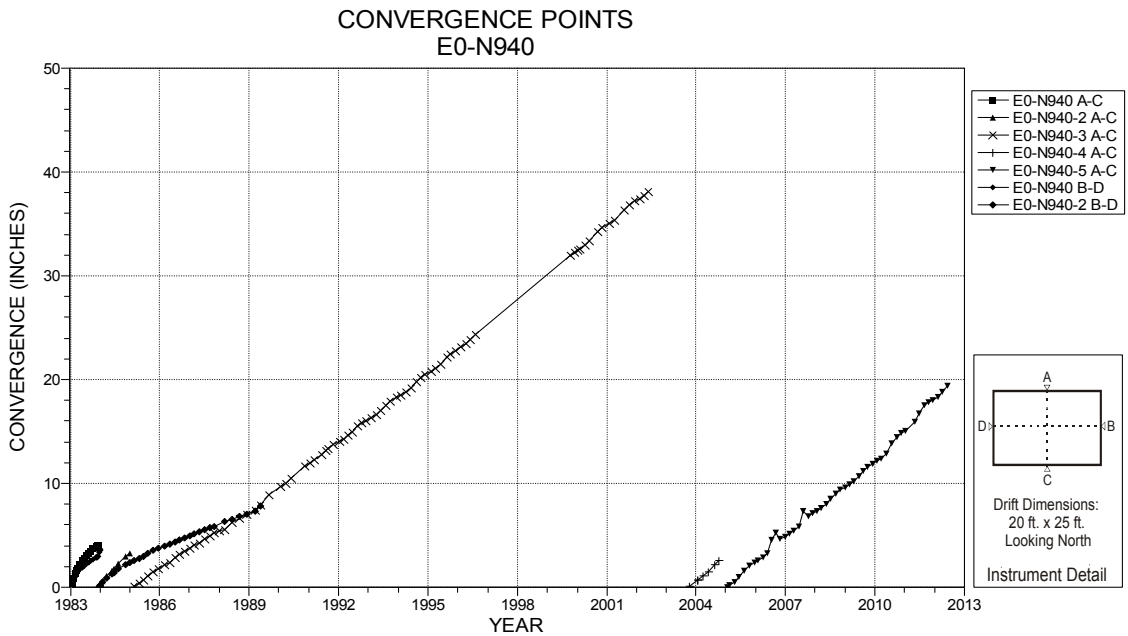


Figure 4-42 Convergence Point Array
E0 N686 – All Chords



NOTES:
1. Excavation date: February 1983.

Figure 4-43 Convergence Point Array
E0 N780 – Roof to Floor



NOTES:
1. Excavation date: February 1983.

Figure 4-44 Convergence Point Array
E0 N940 – All Chords

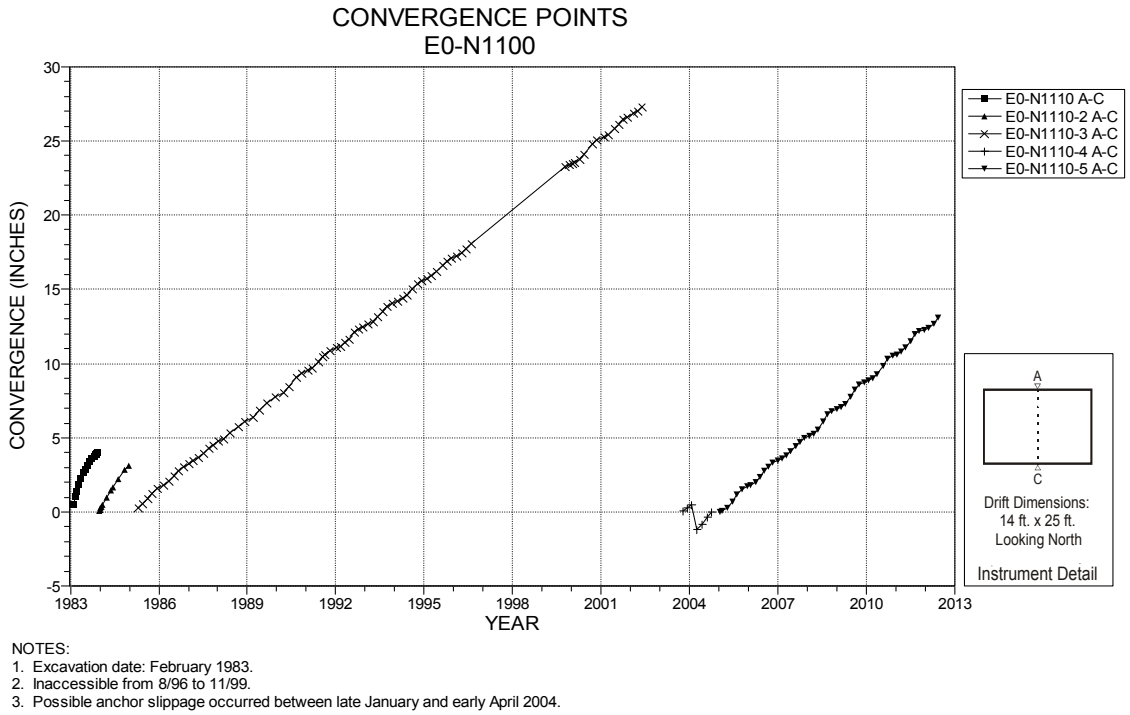


Figure 4-45 Convergence Point Array
E0 N1100 – Roof to Floor

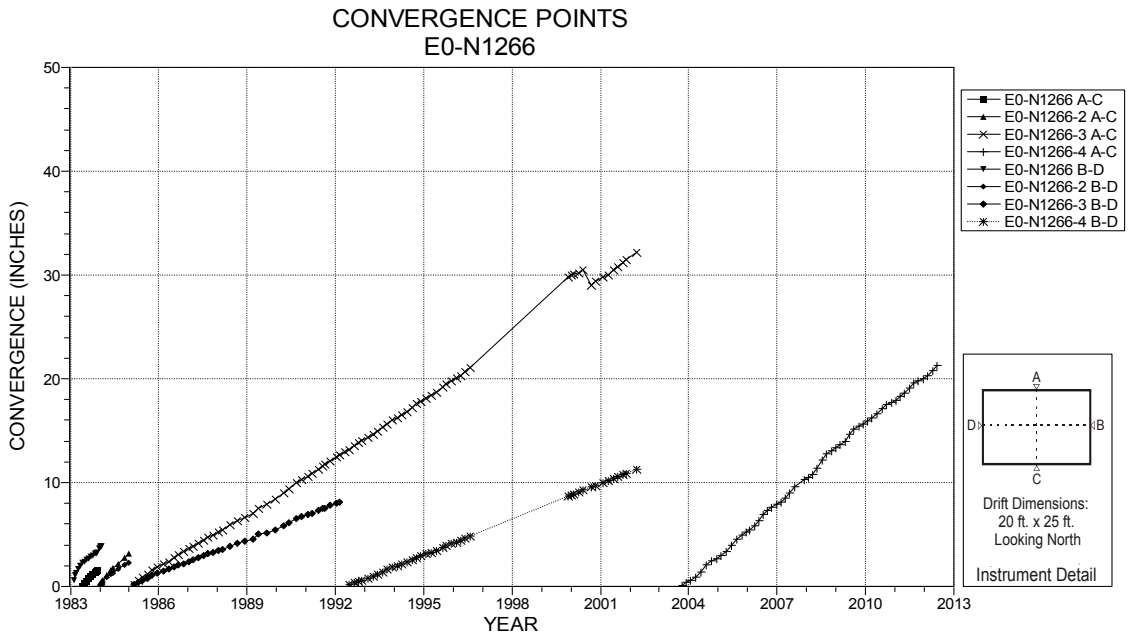
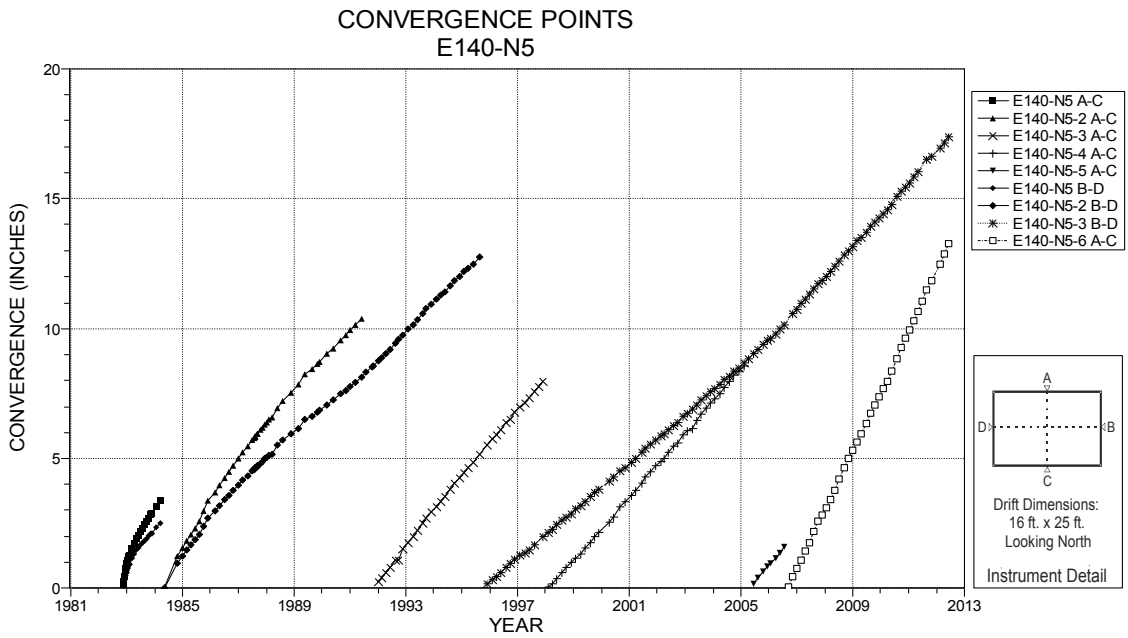
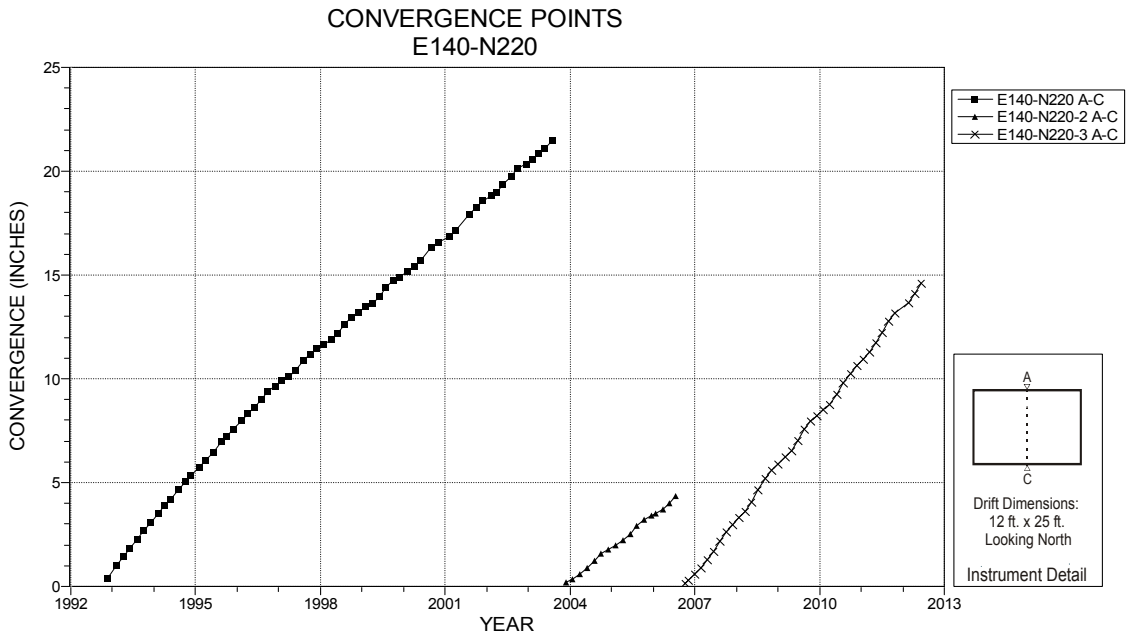


Figure 4-46 Convergence Point Array
E0 N1266 – Roof to Floor



NOTES:
1. Excavation date: November 1982.

Figure 4-47 Convergence Point Array
E140 N5 – All Chords



NOTES:
1. Excavation date: November 1982.
2. Reinstalled "C" point 9-27-2006.

Figure 4-48 Convergence Point Array
E140 N220 – Roof to Floor

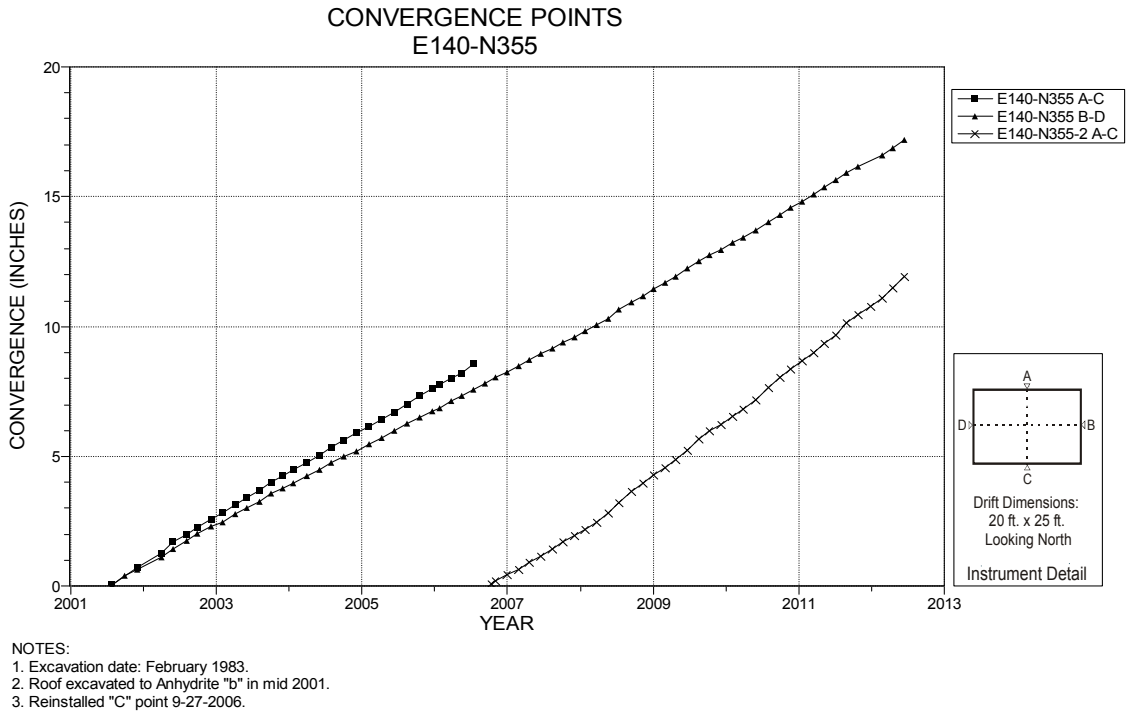


Figure 4-49 Convergence Point Array
E140 N355 – All Chords

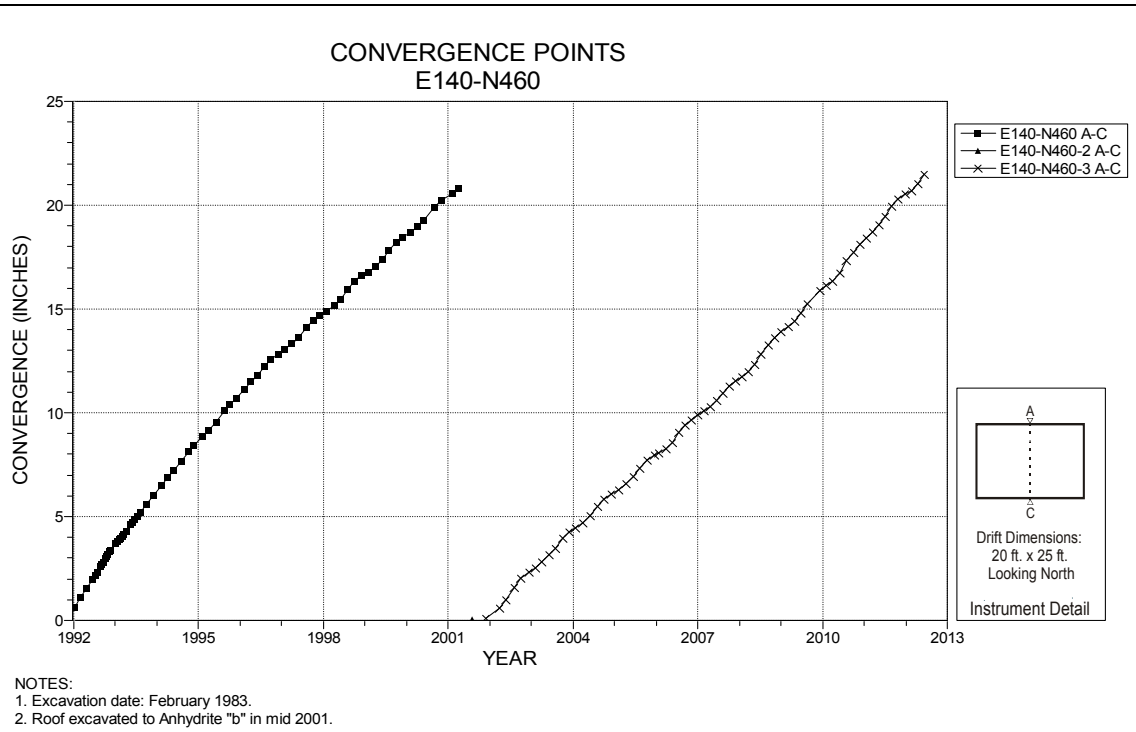
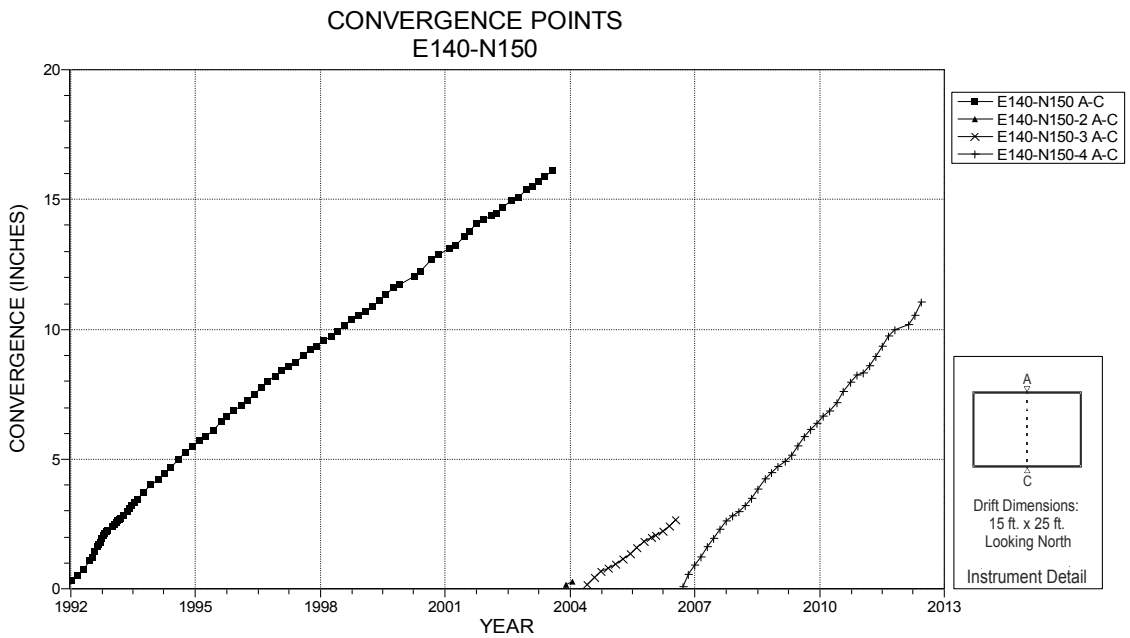
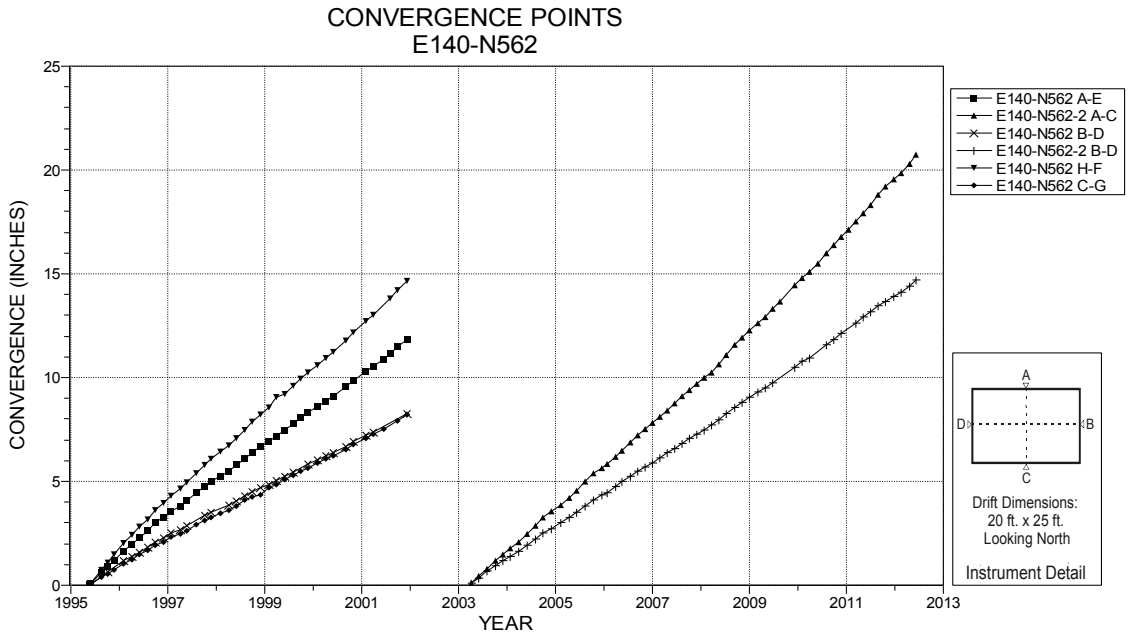


Figure 4-50 Convergence Point Array
E140 N460 – Roof to Floor



NOTES:
1. Excavation date: November 1982.
2. "C" Point mined out, reinstalled September 2006.

Figure 4-51 Convergence Point Array
E140 N150 – Roof to Floor



NOTES:
1. Excavation date: February 1983.
2. Roof excavated to Anhydrite "b" in early 2002.
3. Initially this location had three vertical chords: A-E, B-D, and H-F and a horizontal chord, G-G.

Figure 4-52 Convergence Point Array
E140 N562 – All Chords

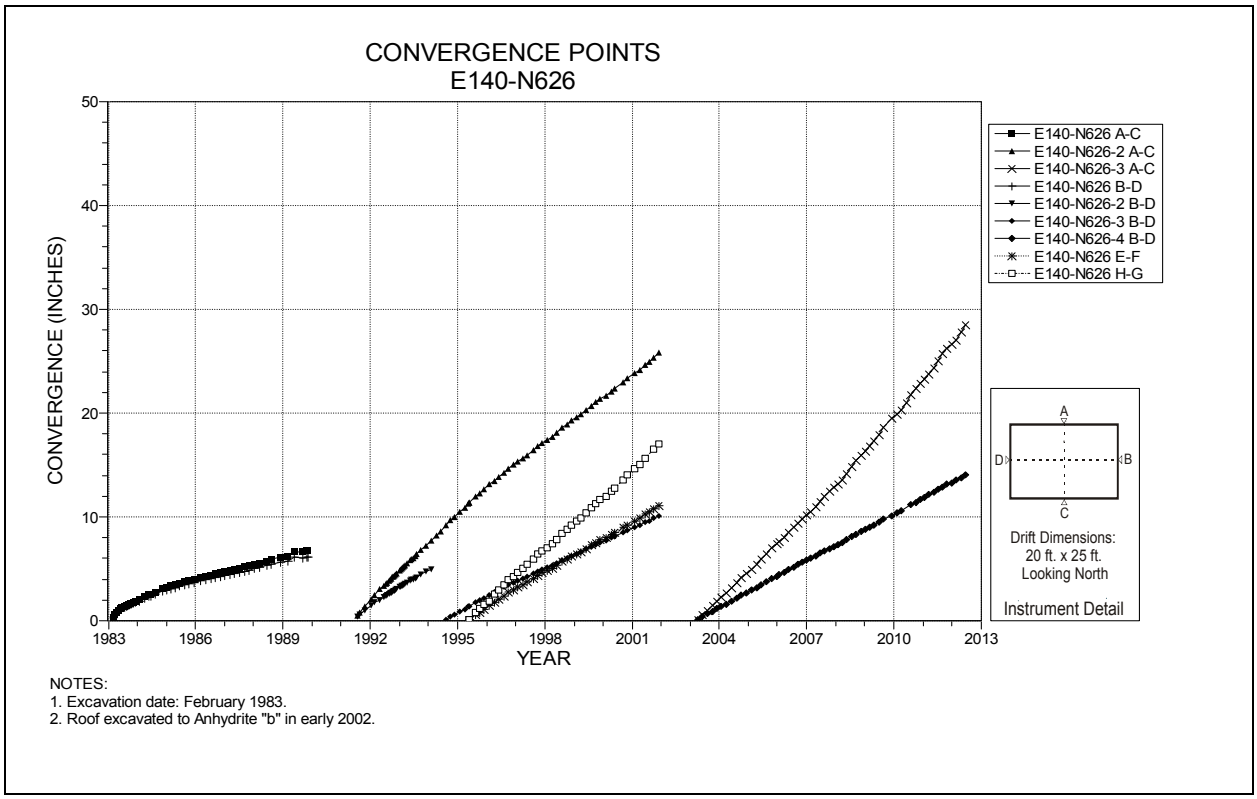


Figure 4-53 Convergence Point Array
E140 N626 – All Chords

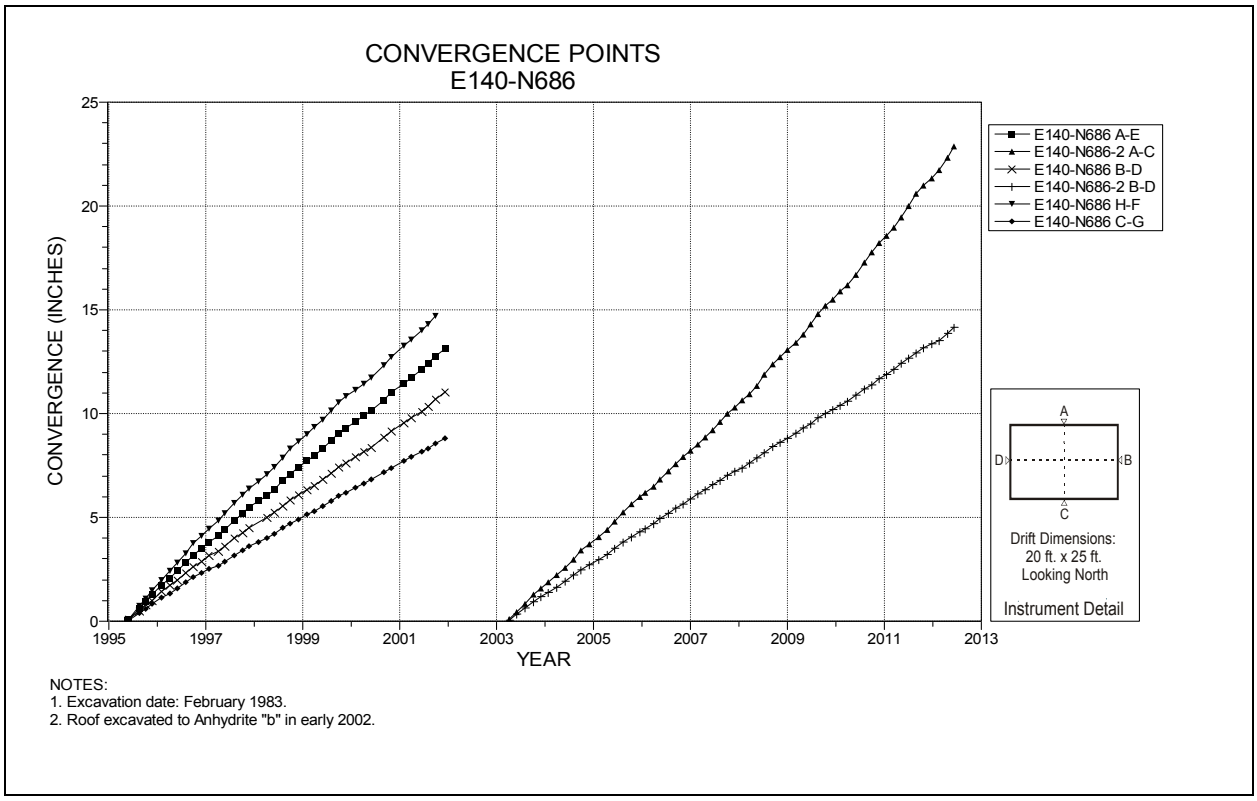


Figure 4-54 Convergence Point Array
E140 N686 – All Chords

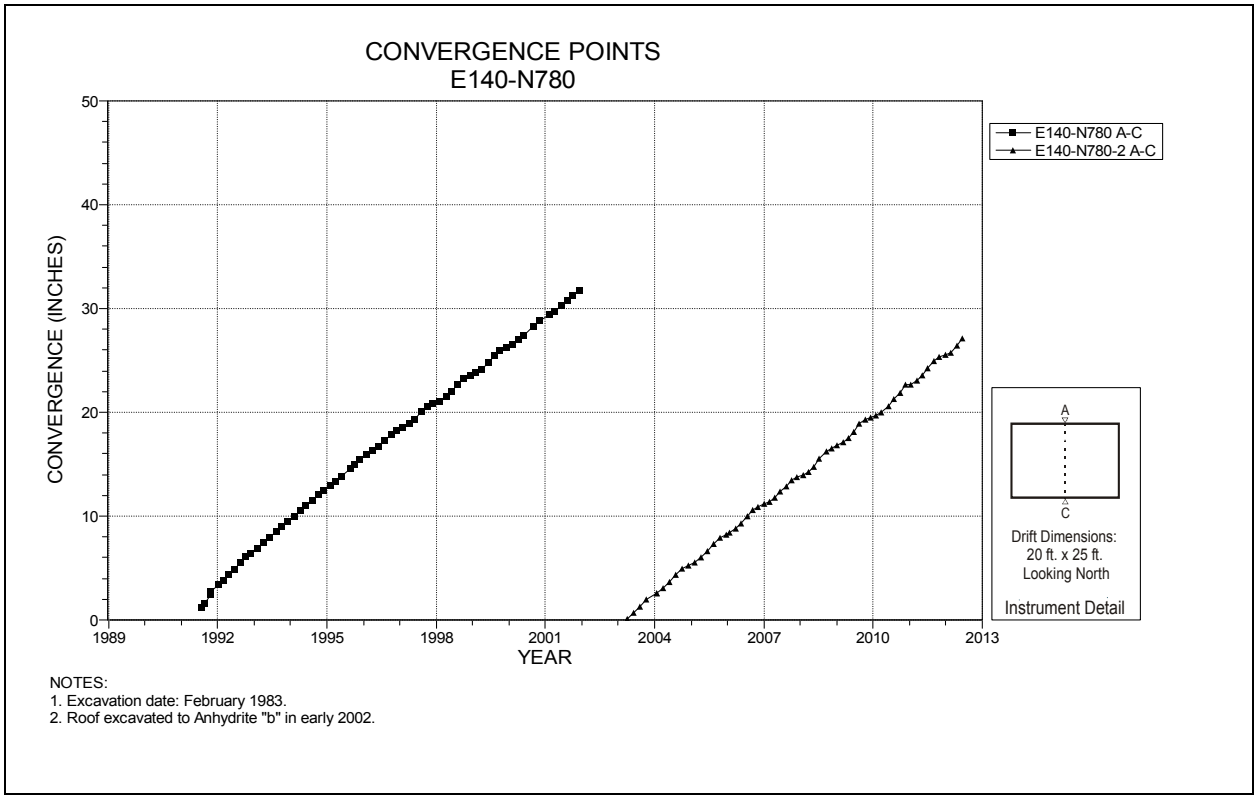


Figure 4-55 Convergence Point Array
E140 N780 – Roof to Floor

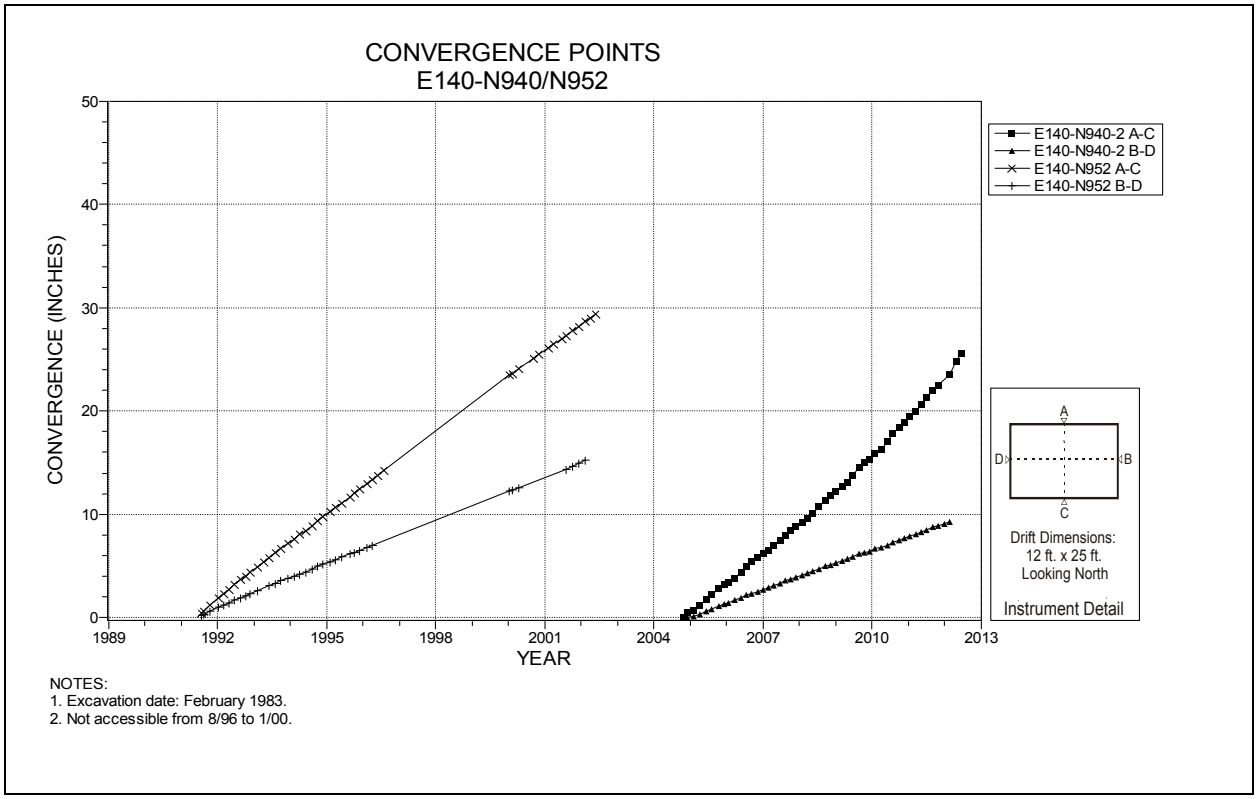


Figure 4-56 Convergence Point Array
E140 N940/N952 – All Chords

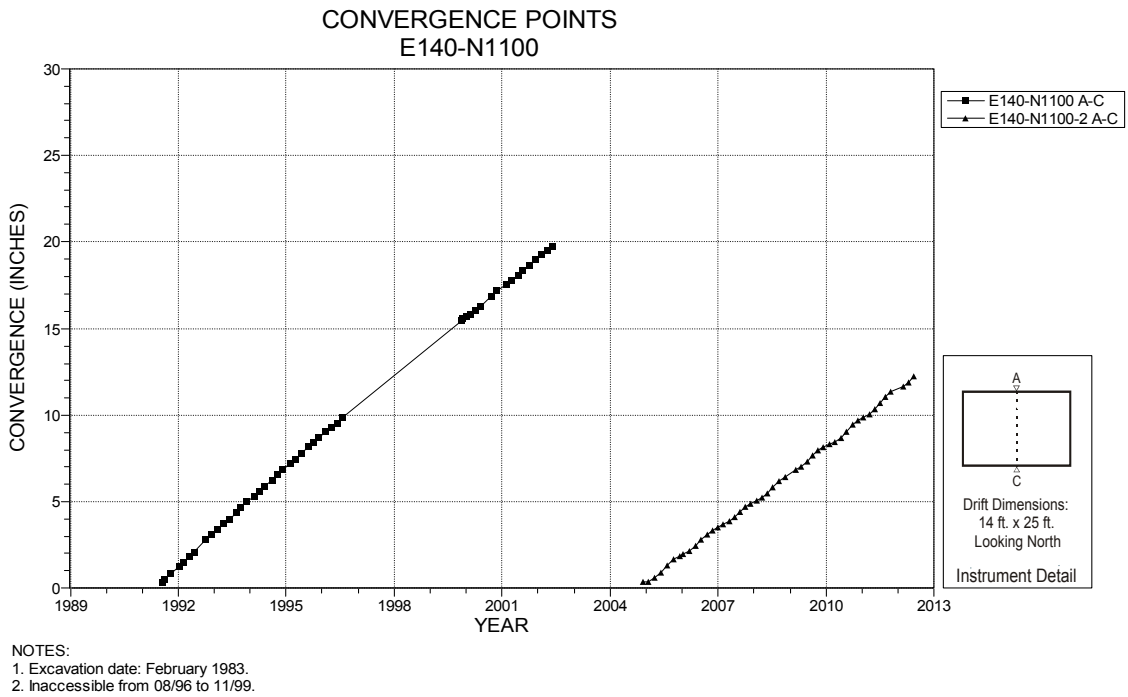


Figure 4-57 Convergence Point Array
E140 N1100 – Roof to Floor

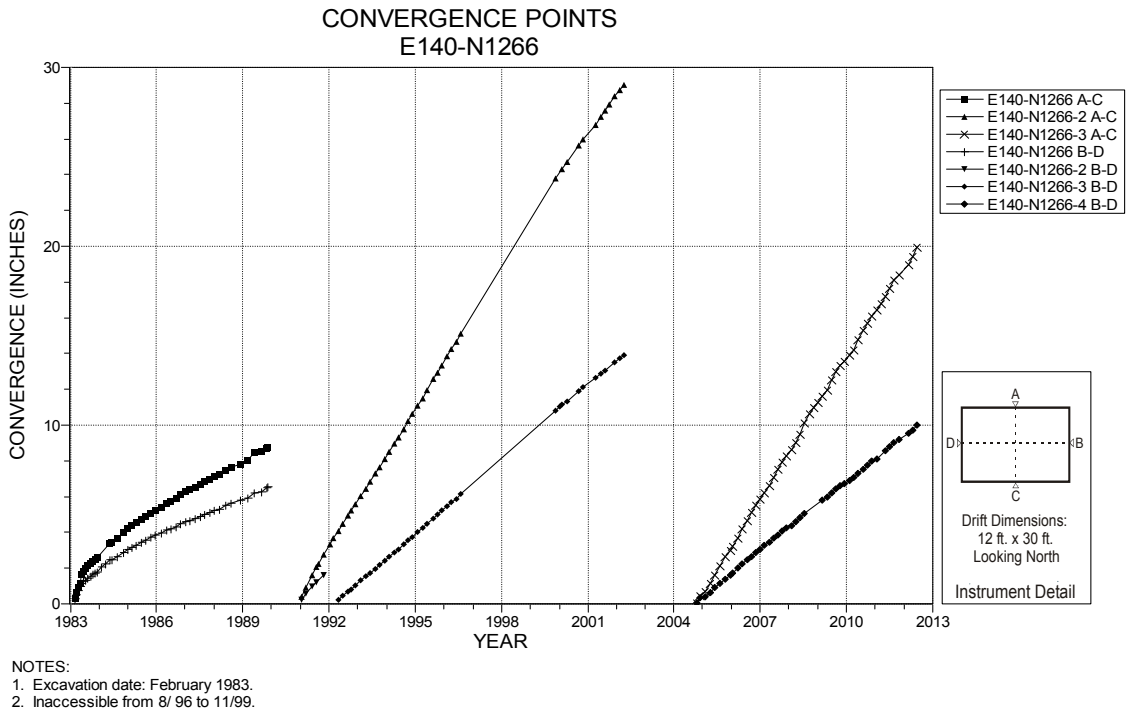


Figure 4-58 Convergence Point Array
E140 N1266 – All Chords

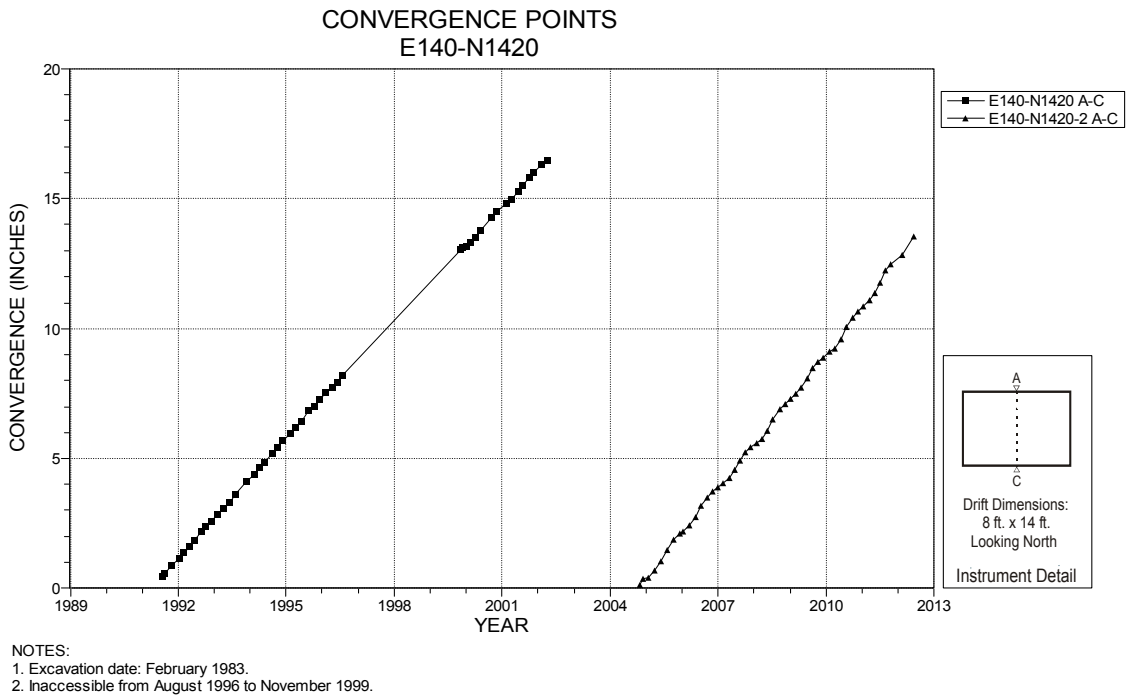


Figure 4-59 Convergence Point Array
E140 N1420 – Roof to Floor

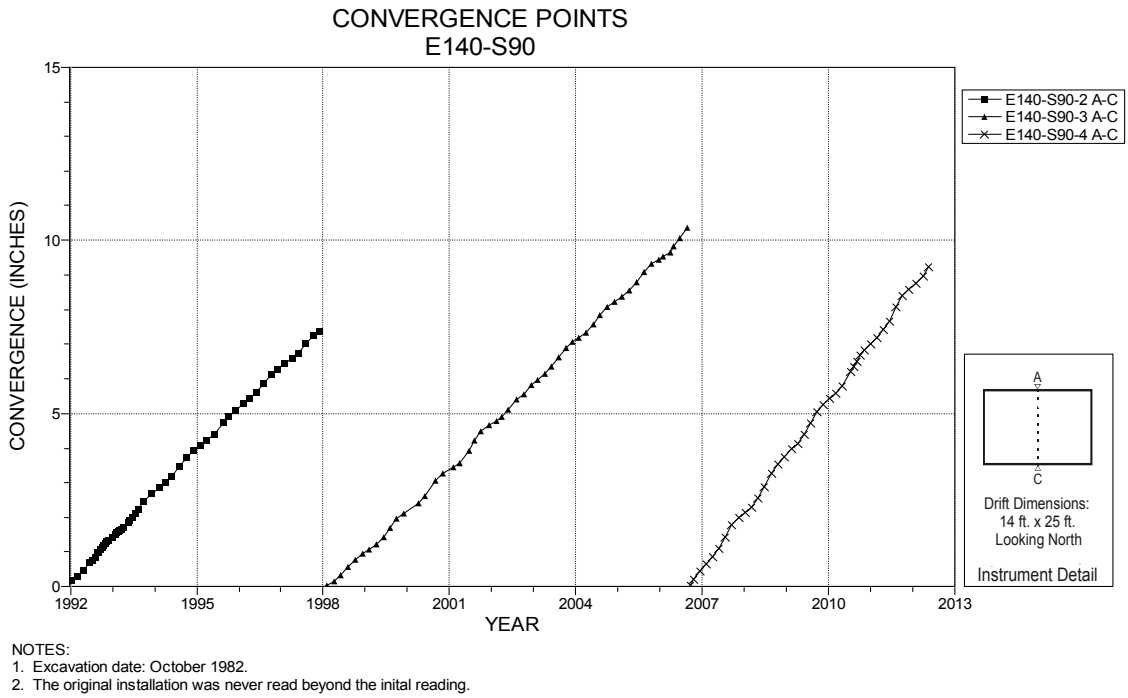


Figure 4-60 Convergence Point Array
E140 S90 – Roof to Floor

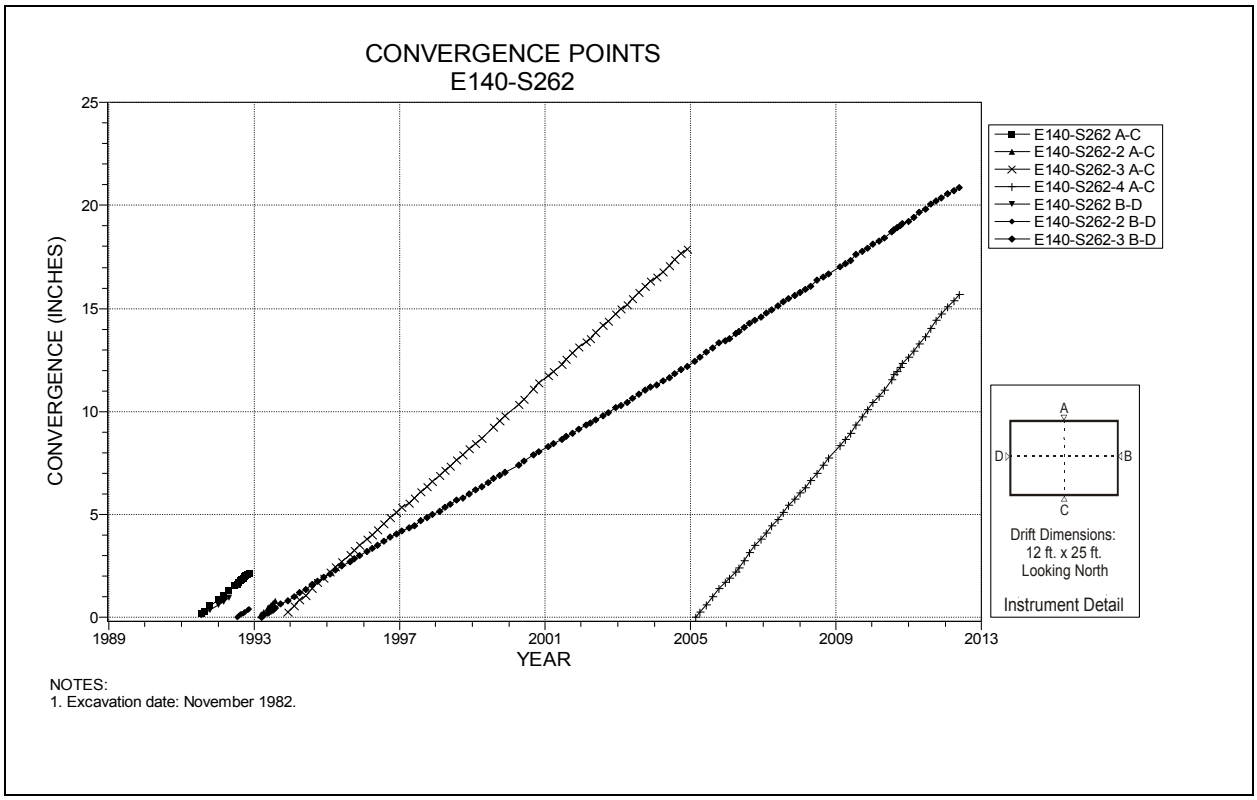


Figure 4-61 Convergence Point Array
E140 S262 – All Chords

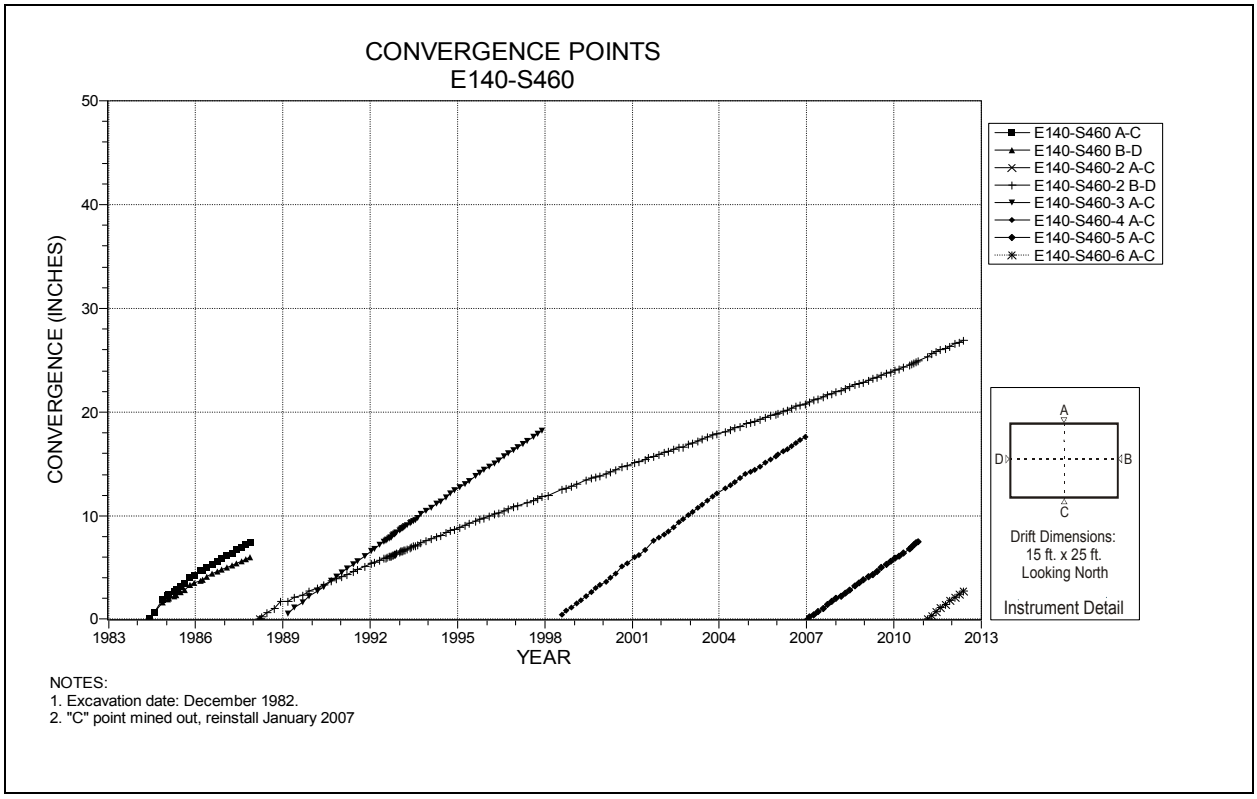
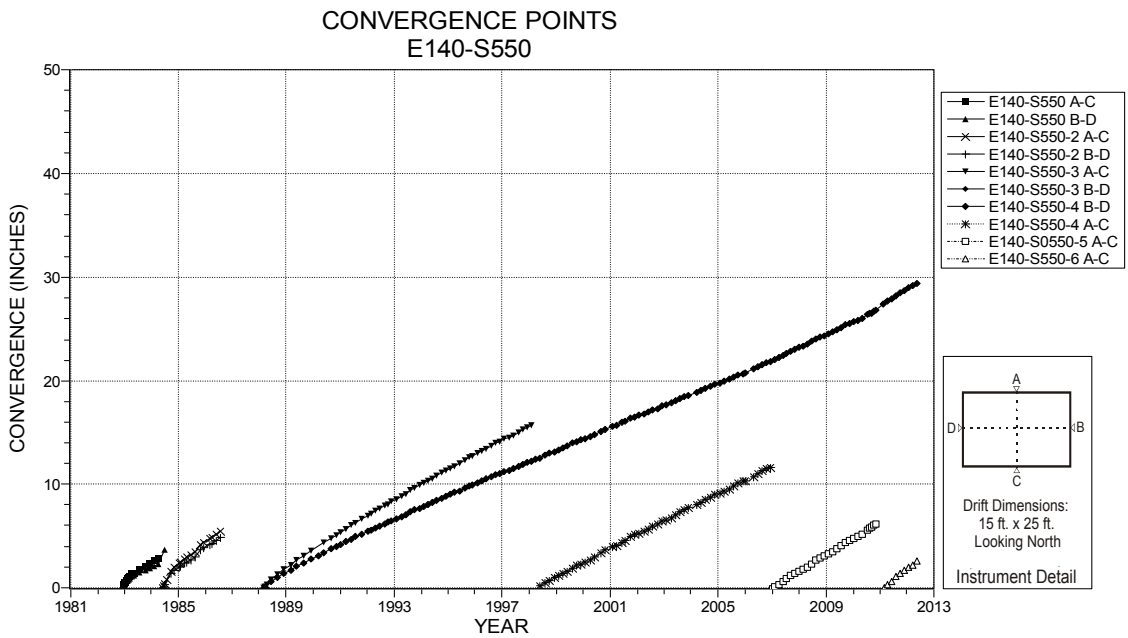
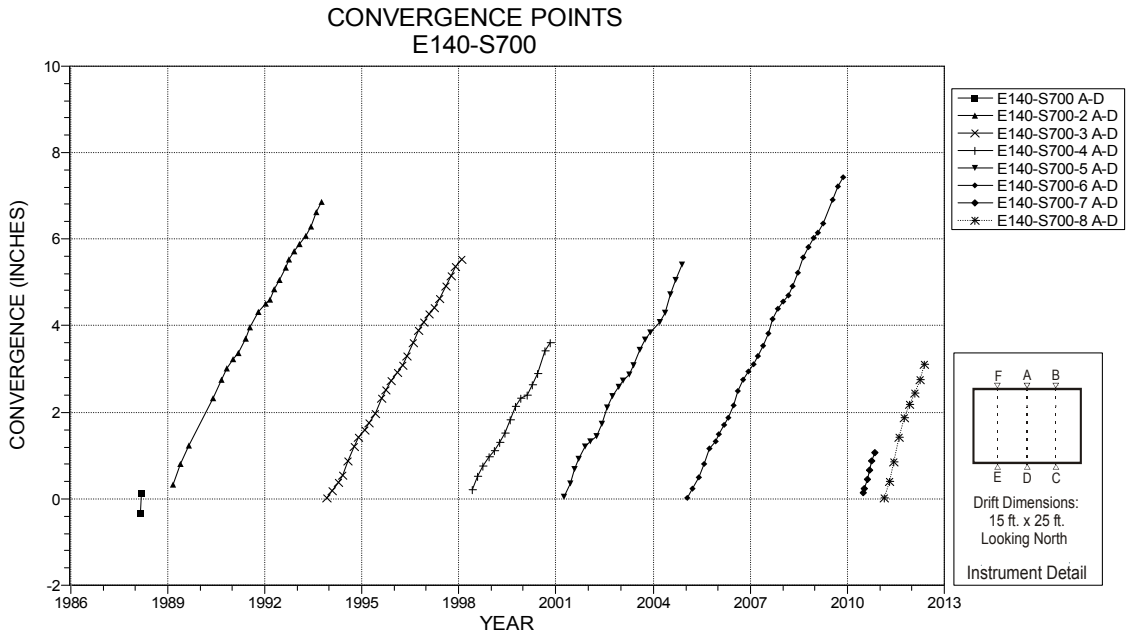


Figure 4-62 Convergence Point Array
E140 S460 – All Chords



NOTES:
1. Excavation date: December 1982.

Figure 4-63 Convergence Point Array
E140 S550 – All Chords



NOTES:
1. Excavation date: December 1982.

Figure 4-64 Convergence Point Array
E140 S700 – Roof to Floor

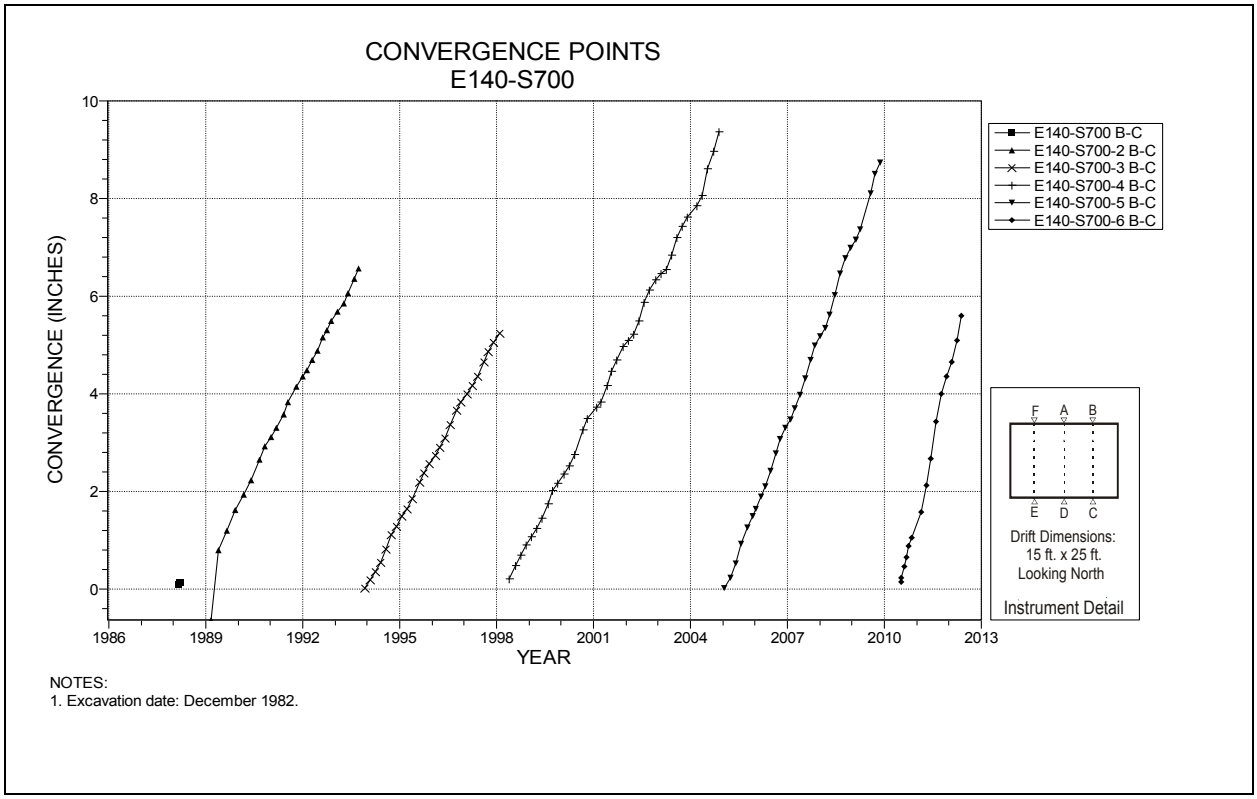


Figure 4-65 Convergence Point Array
E140 S700 – Roof to Floor – East Quarter Point

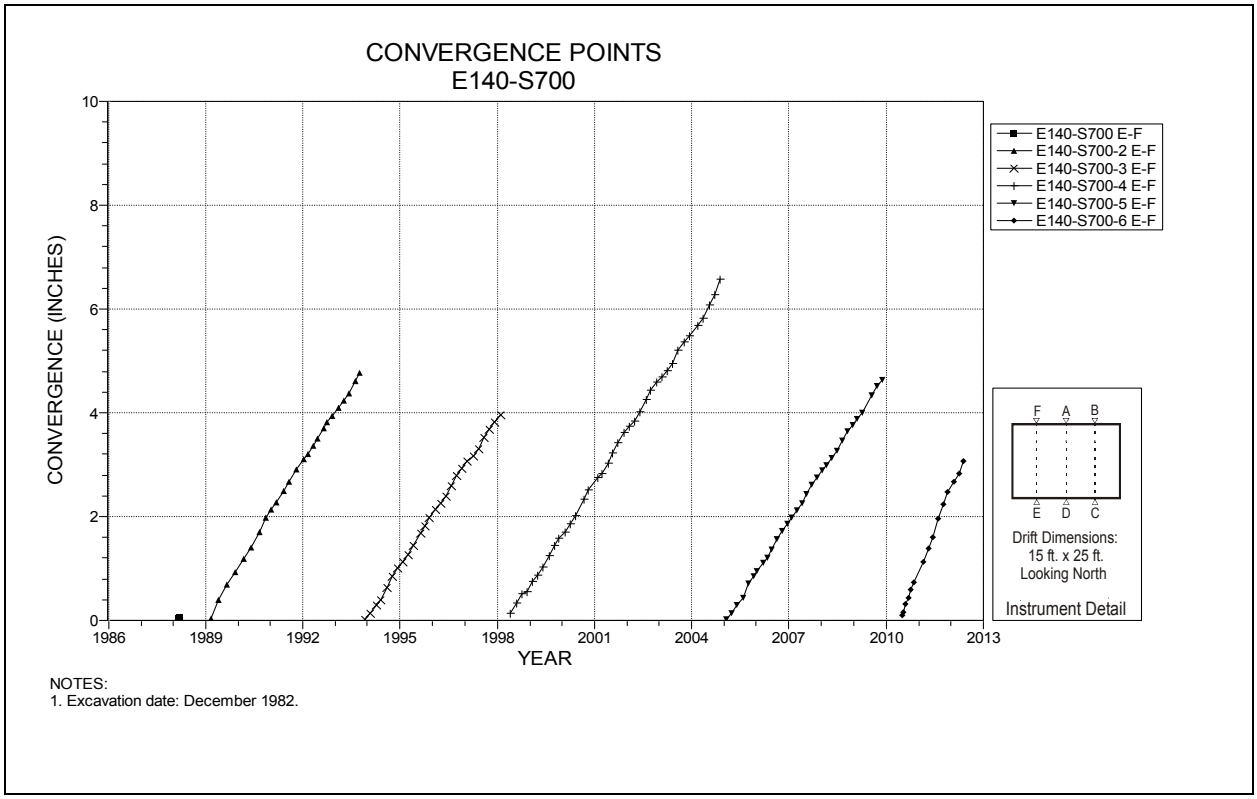


Figure 4-66 Convergence Point Array
E140 S700 – Roof to Floor – West Quarter Point

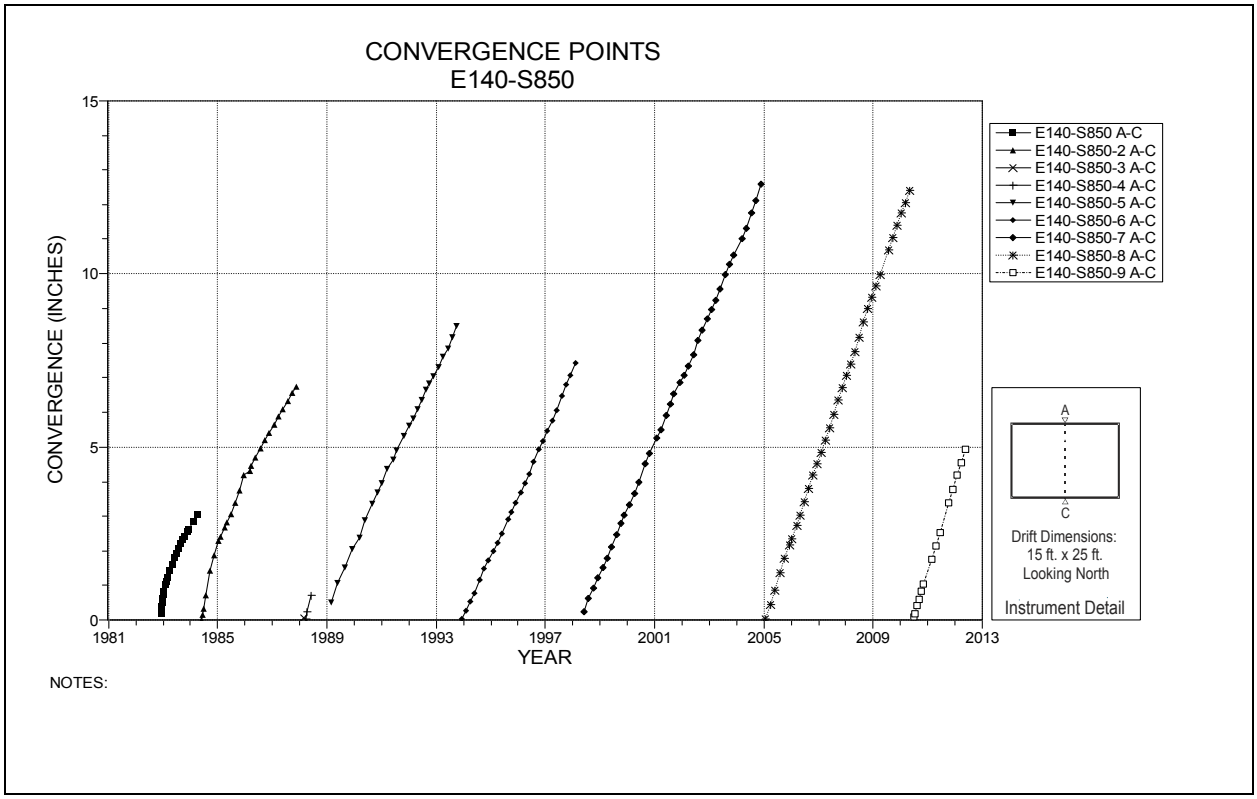


Figure 4-67 Convergence Point Array
E140 S850 – Roof to Floor

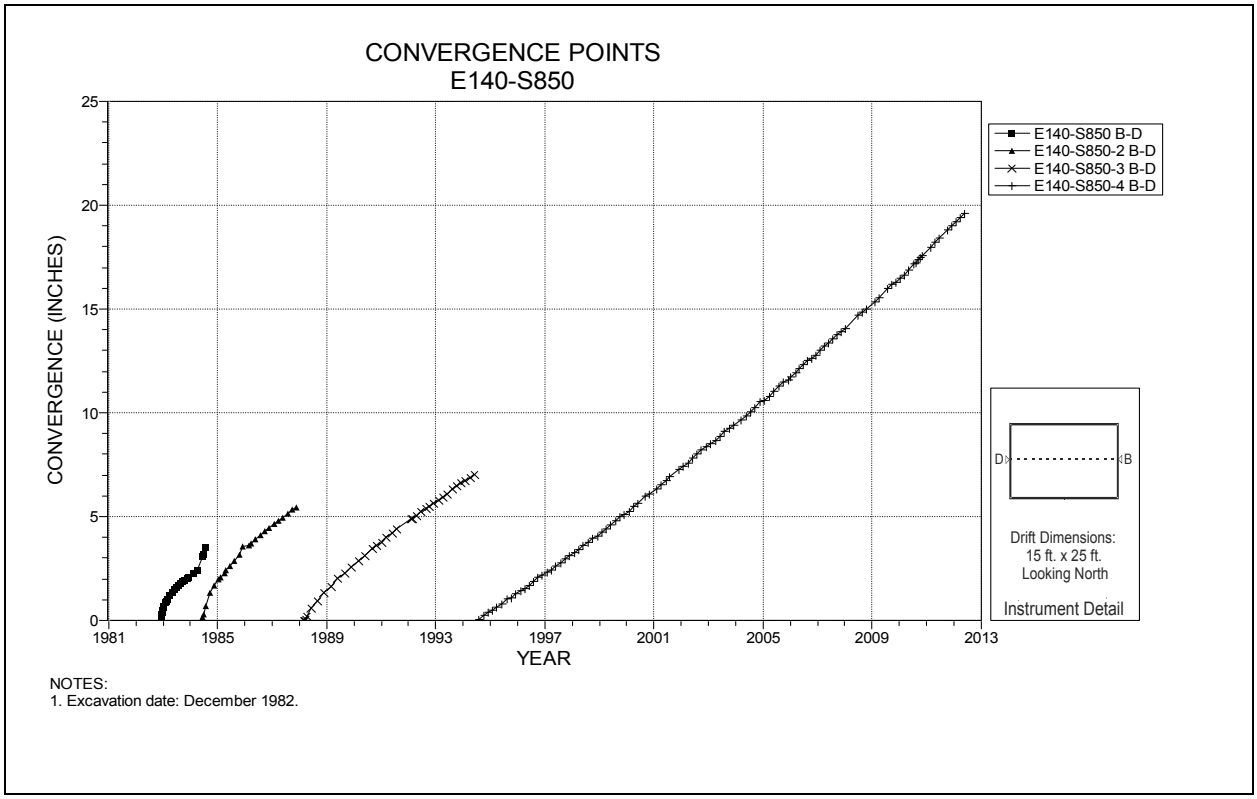
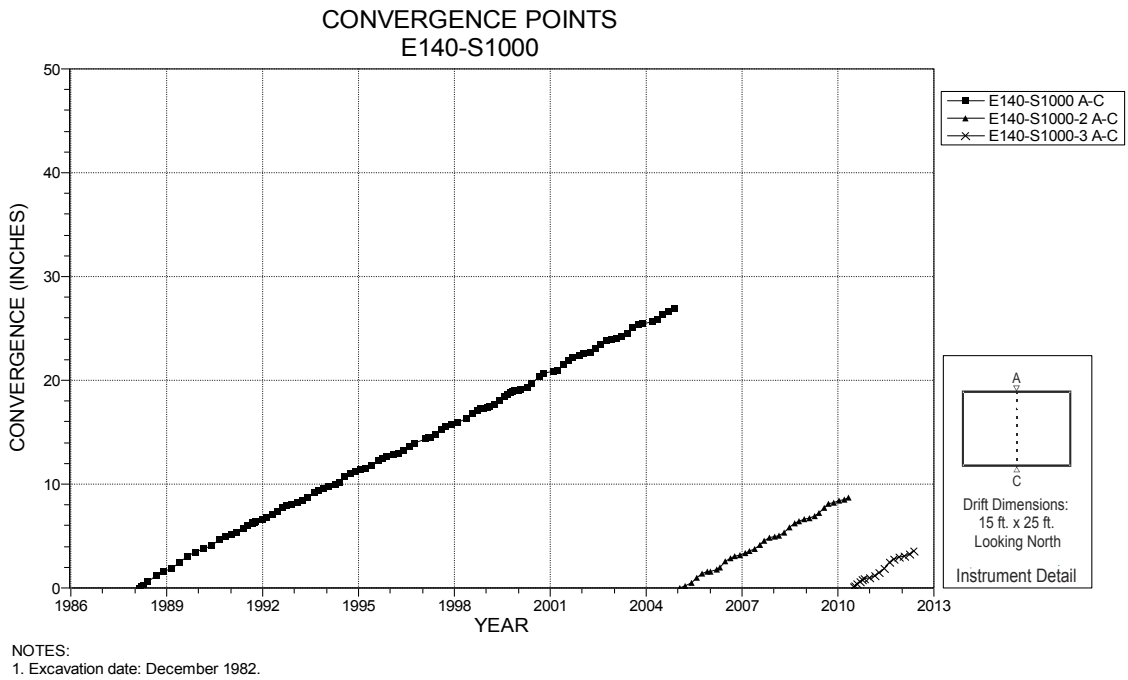
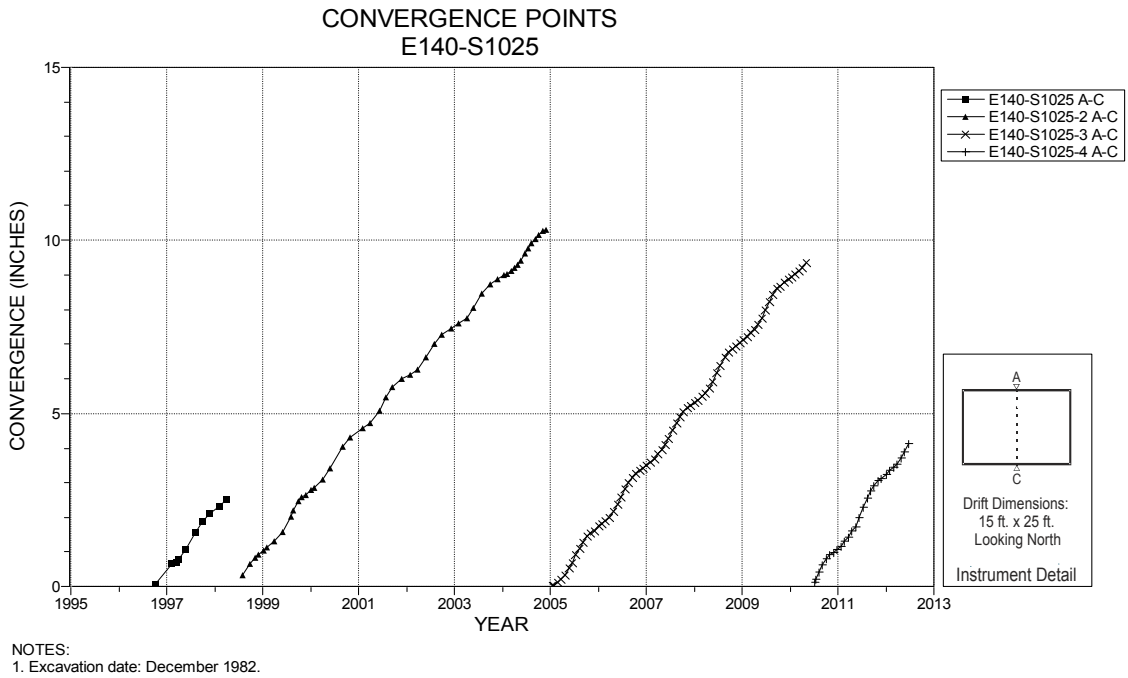


Figure 4-68 Convergence Point Array
E140 S850 – Rib to Rib



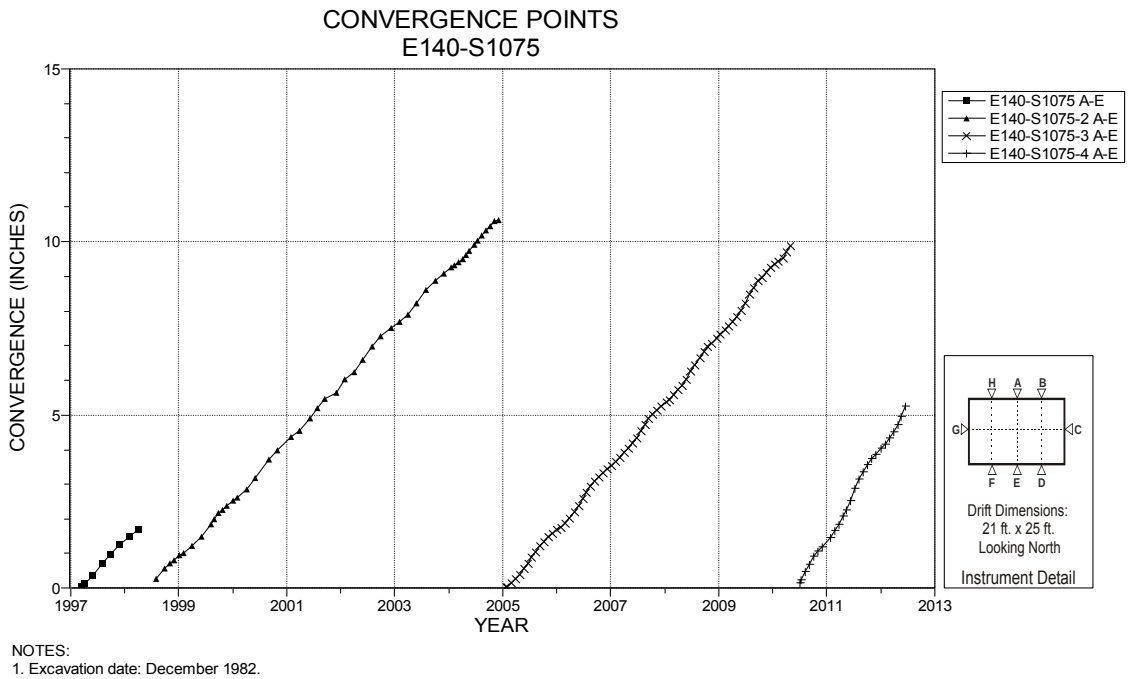
NOTES:
1. Excavation date: December 1982.

Figure 4-69 Convergence Point Array
E140 S1000 – Roof to Floor



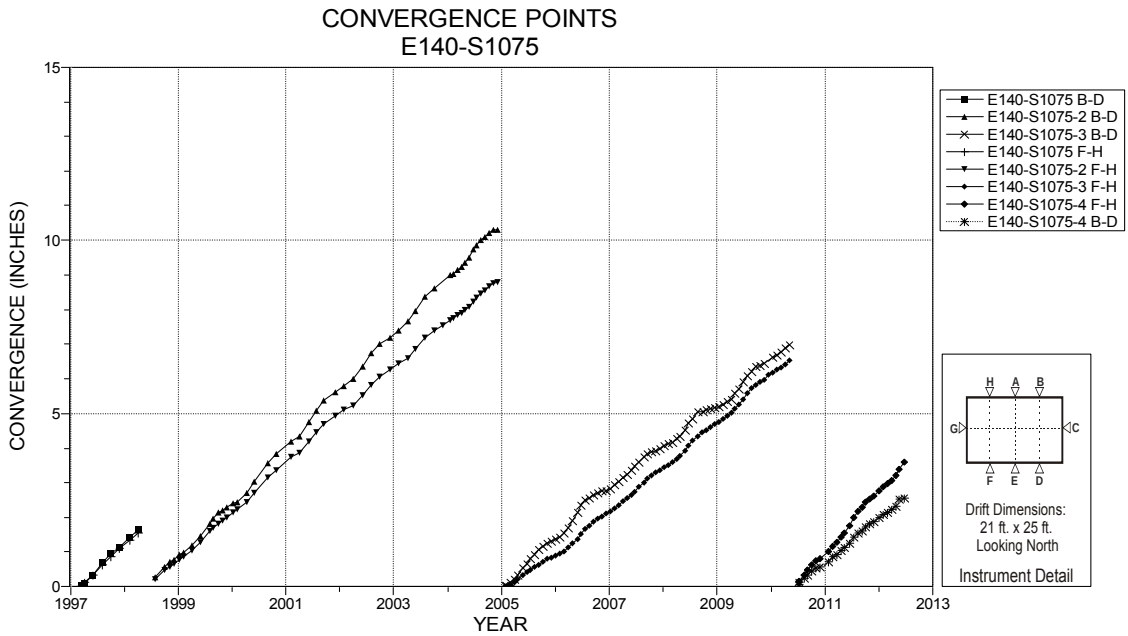
NOTES:
1. Excavation date: December 1982.

Figure 4-70 Convergence Point Array
E140 S1025 – Roof to Floor



NOTES:
1. Excavation date: December 1982.

Figure 4-71 Convergence Point Array
E140 S1075 – Roof to Floor – Centerline



NOTES:
1. Excavation date: December 1982.
2. Roof excavated to Anhydrite "b", November 1996.

Figure 4-72 Convergence Point Array
E140 S1075 – Roof to Floor – Quarter Points

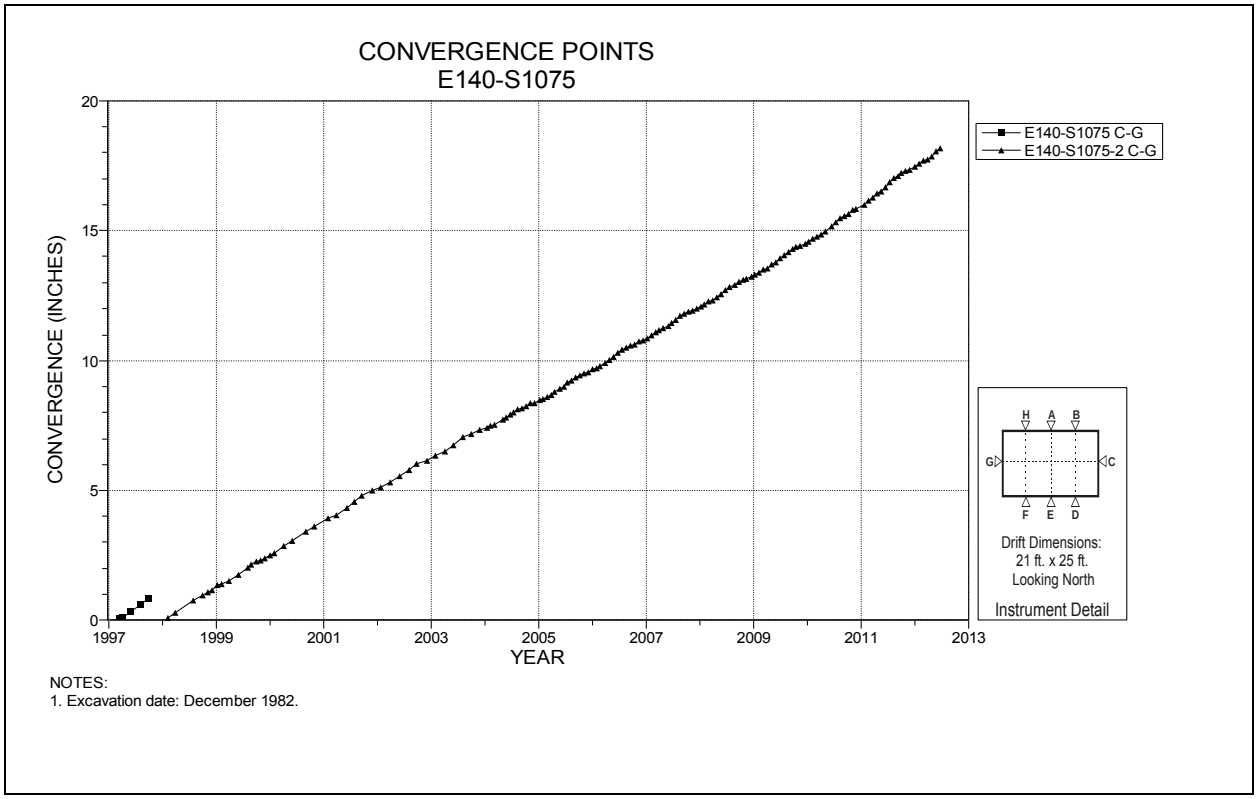


Figure 4-73 Convergence Point Array
E140 S1075 – Rib to Rib

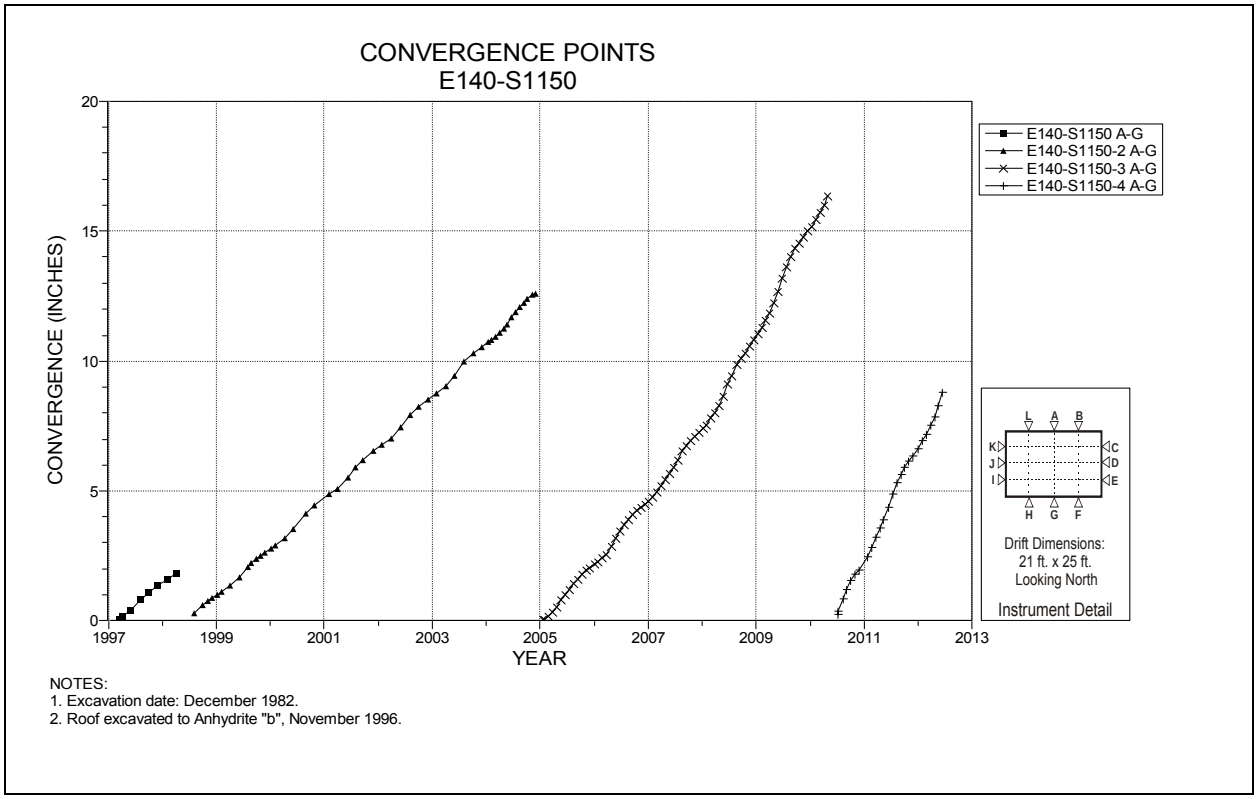


Figure 4-74 Convergence Point Array
E140 S1150 – Roof to Floor – Centerline

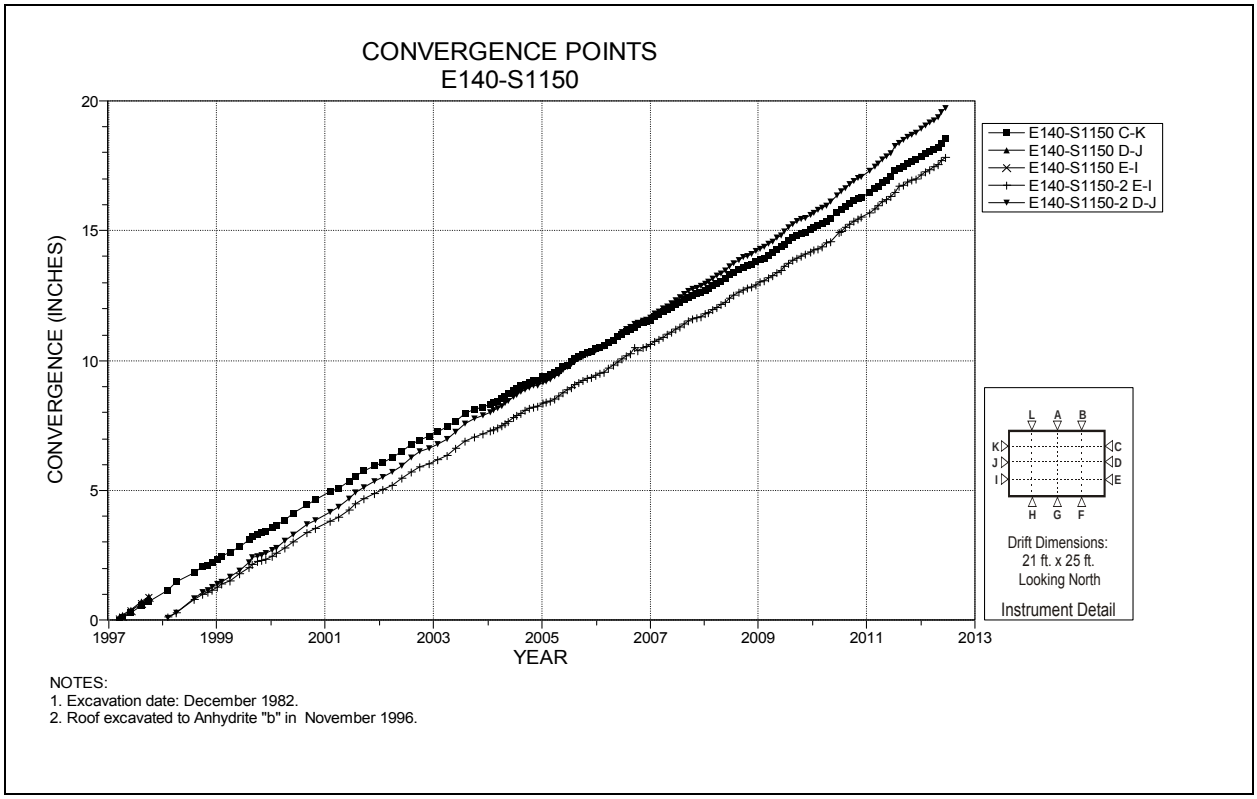


Figure 4-75 Convergence Point Array
E140 S1150 – Rib to Rib

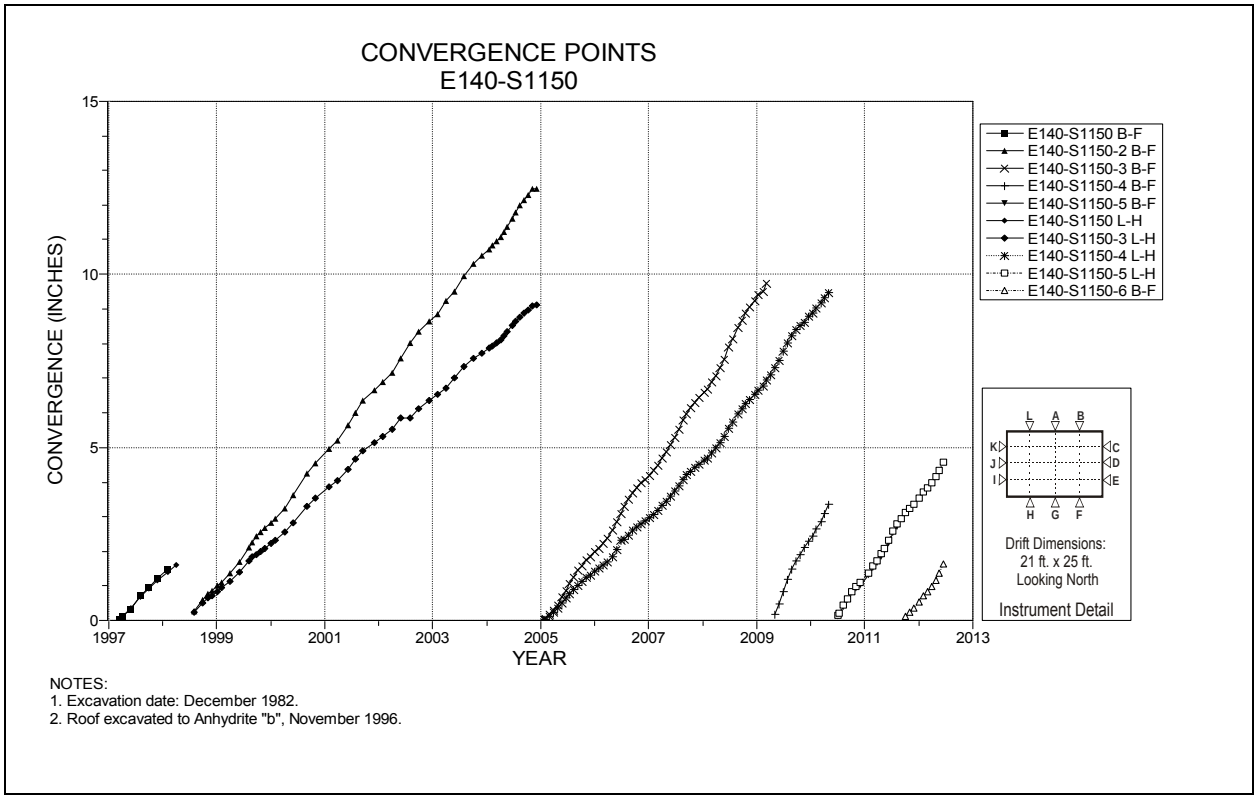


Figure 4-76 Convergence Point Array
E140 S1150 – Roof to Floor – Quarter Points

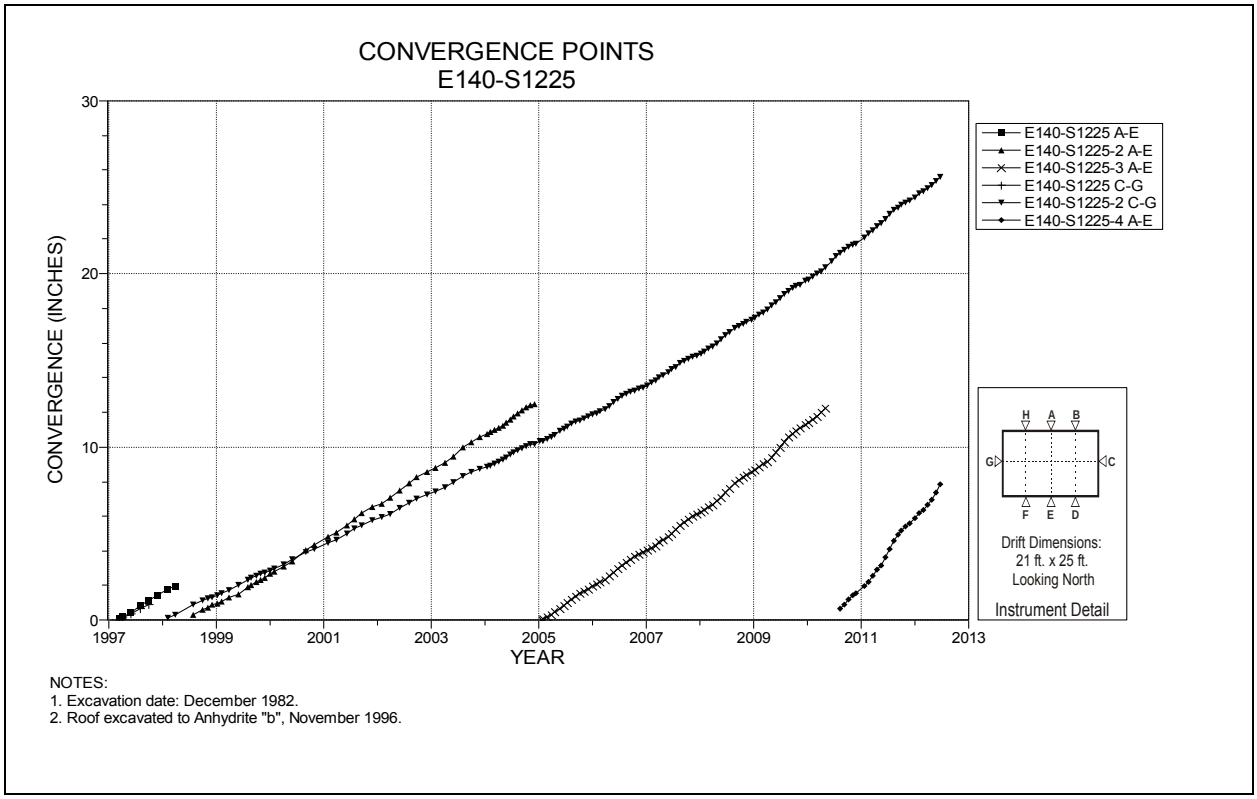


Figure 4-77 Convergence Point Array
E140 S1225 – Roof to Floor Centerline / Rib to Rib

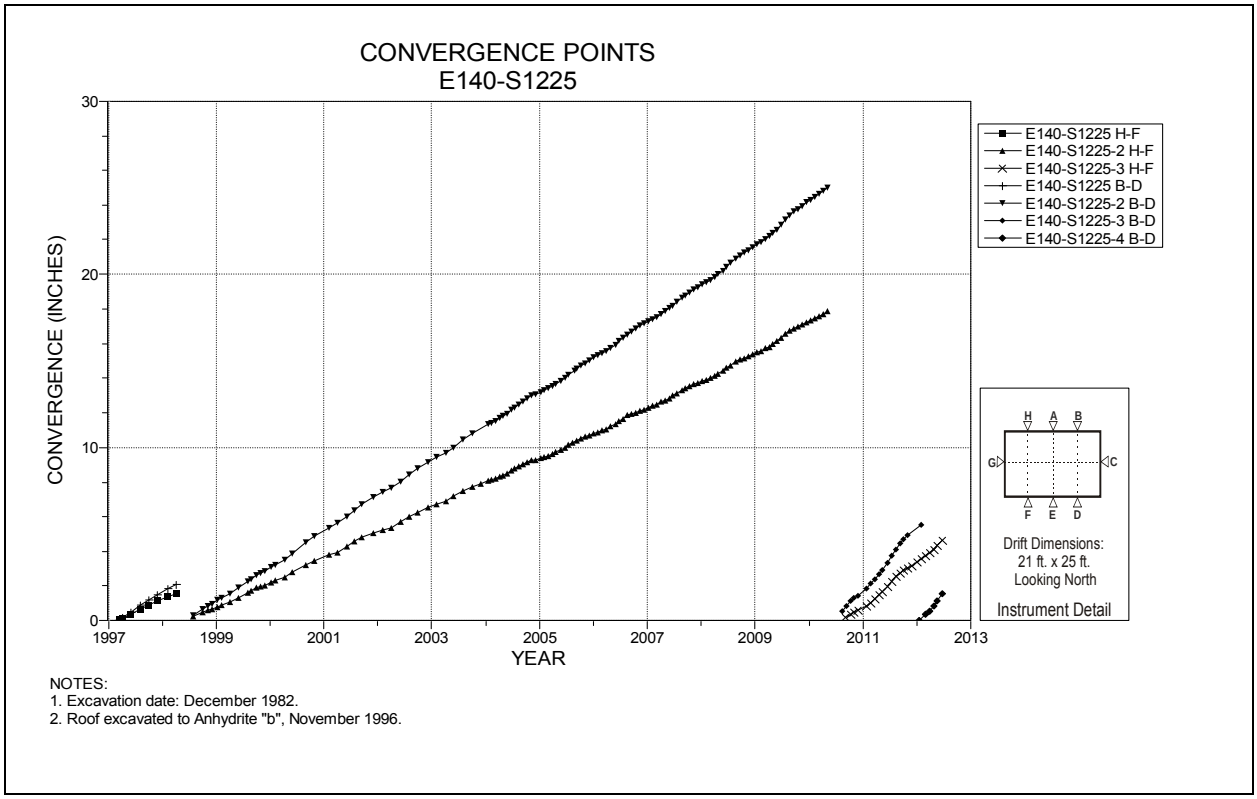


Figure 4-78 Convergence Point Array
E140 S1225 – Roof to Floor – Quarter Points

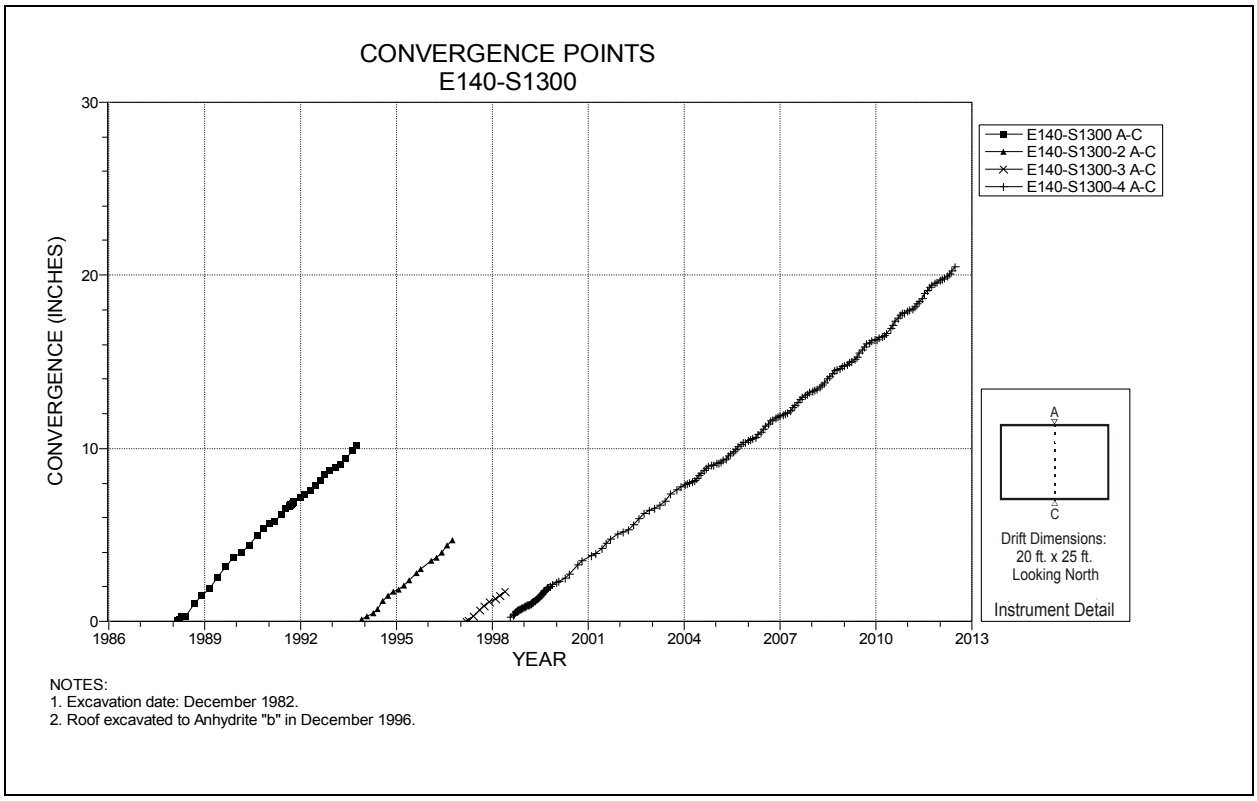


Figure 4-79 Convergence Point Array
E140 S1300 – Roof to Floor

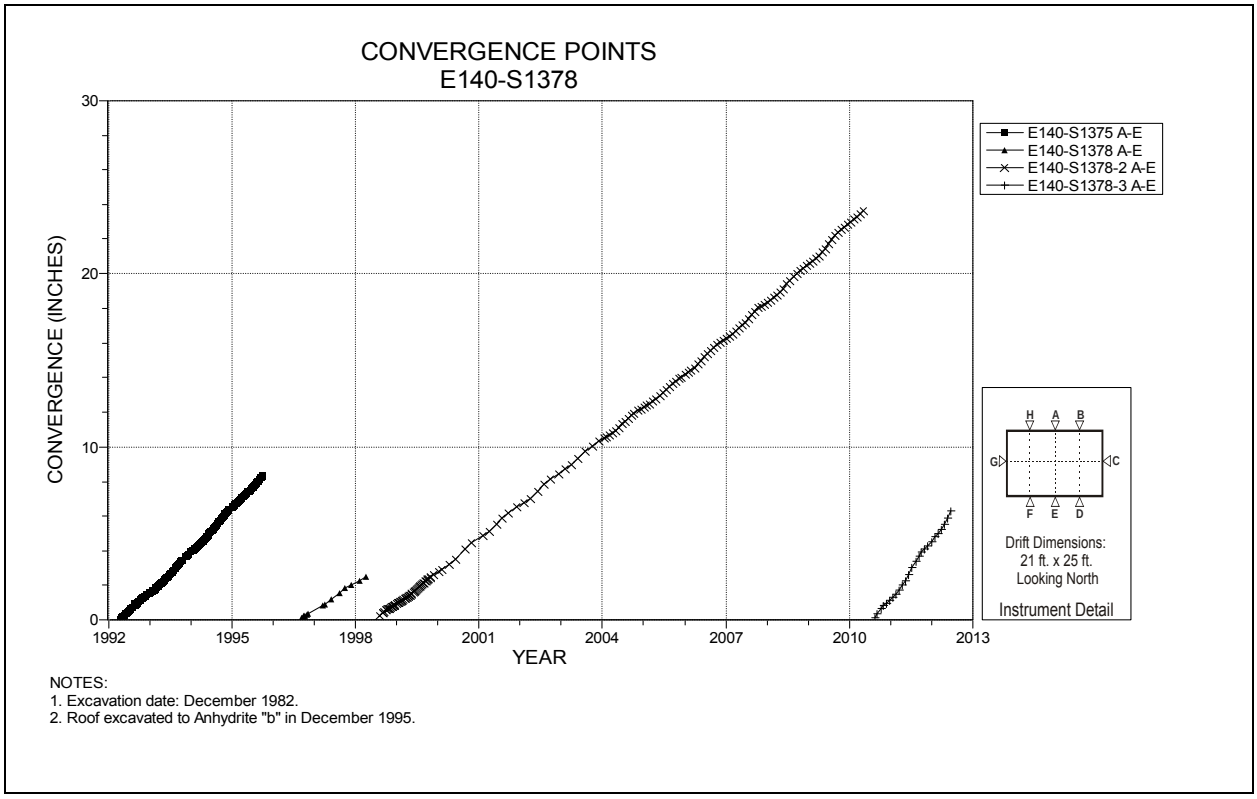


Figure 4-80 Convergence Point Array
E140 S1378 – Roof to Floor – Centerline

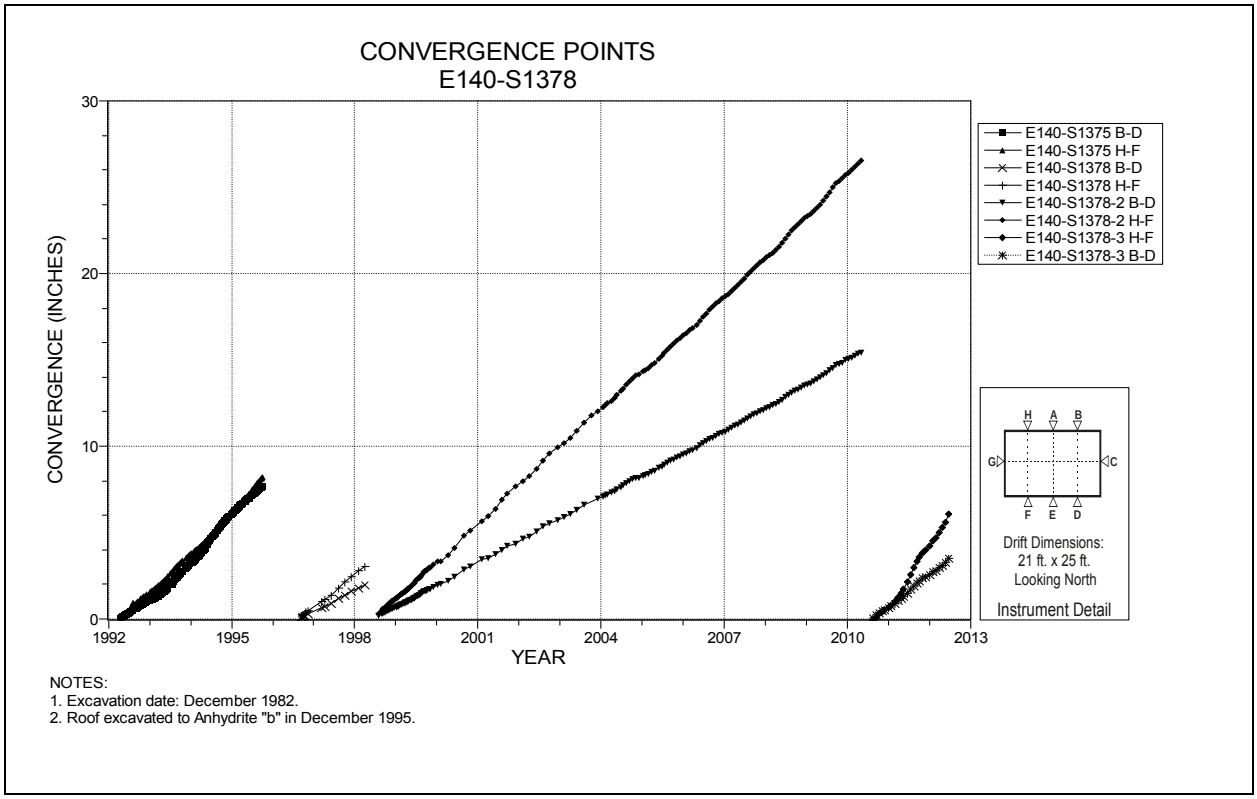


Figure 4-81 Convergence Point Array
E140 S1378 – Roof to Floor – Quarter Points

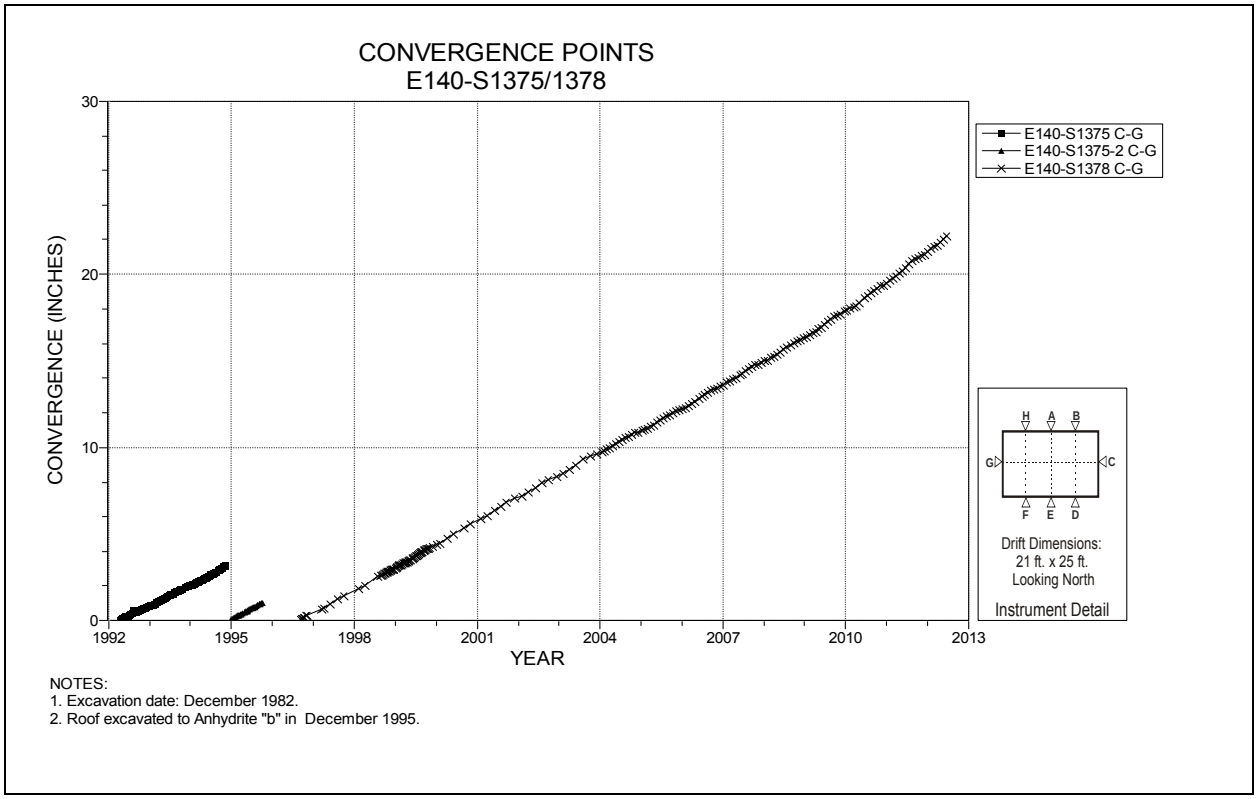
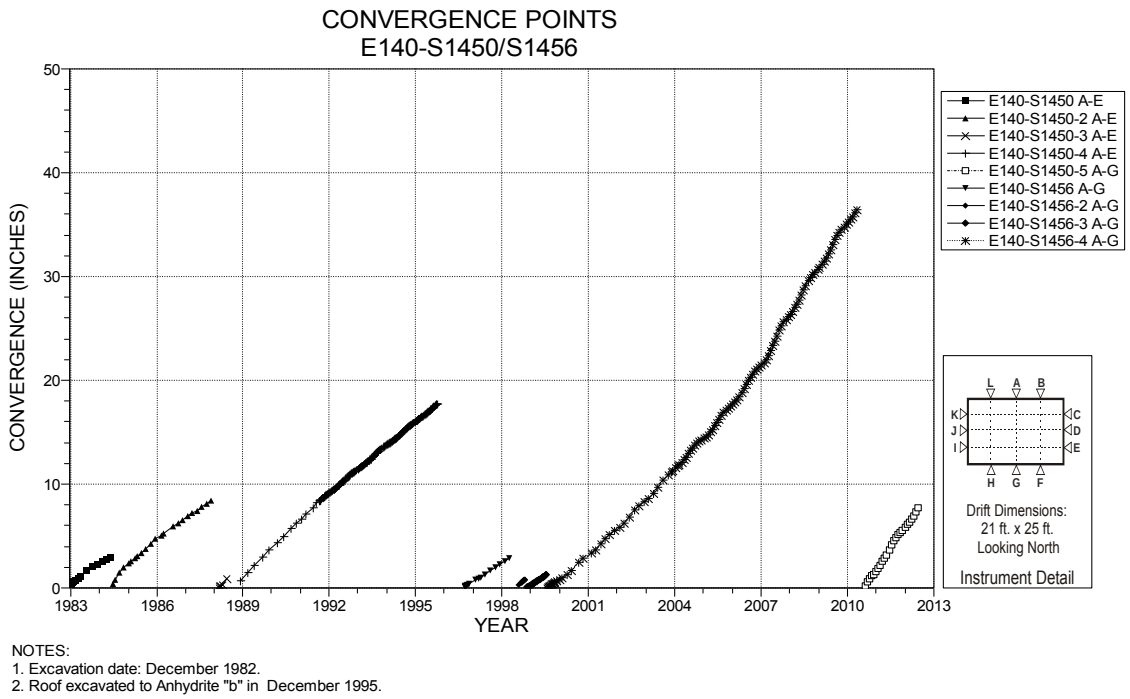
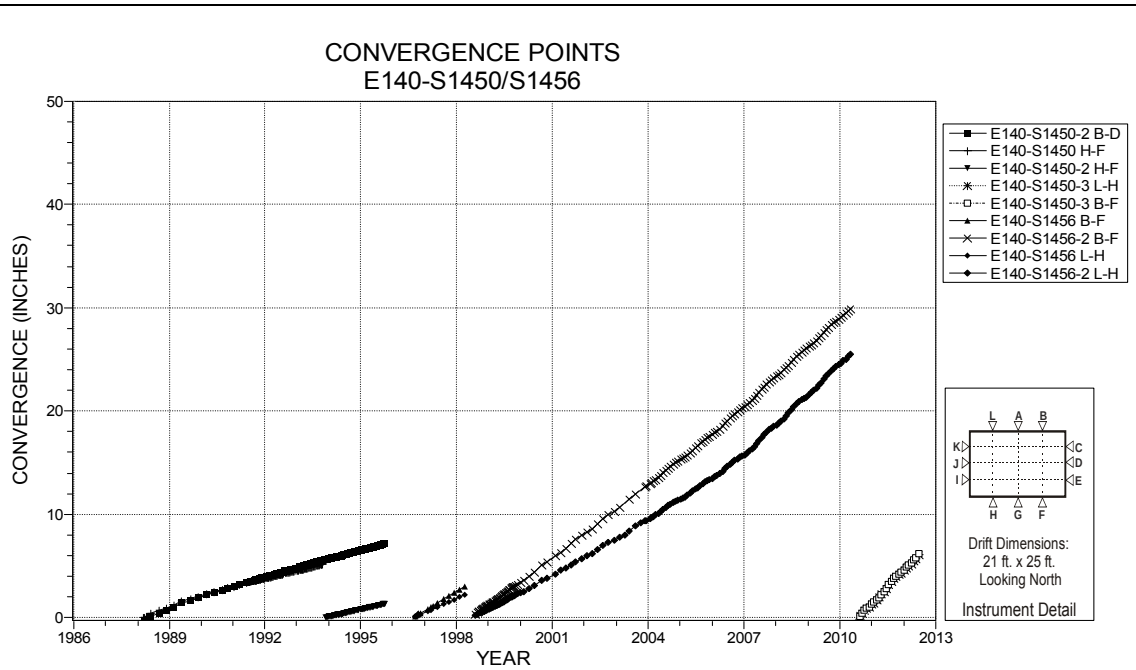


Figure 4-82 Convergence Point Array
E140 S1375/S1378 – Rib to Rib



NOTES:
1. Excavation date: December 1982.
2. Roof excavated to Anhydrite "b" in December 1995.

Figure 4-83 Convergence Point Array
E140 S1450/1456 – Roof to Floor – Centerline



NOTES:
1. Excavation date: December 1982.
2. Roof excavated to Anhydrite "b" in December 1995.

Figure 4-84 Convergence Point Array
E140 S1450/1456 – Roof to Floor – Quarter Points

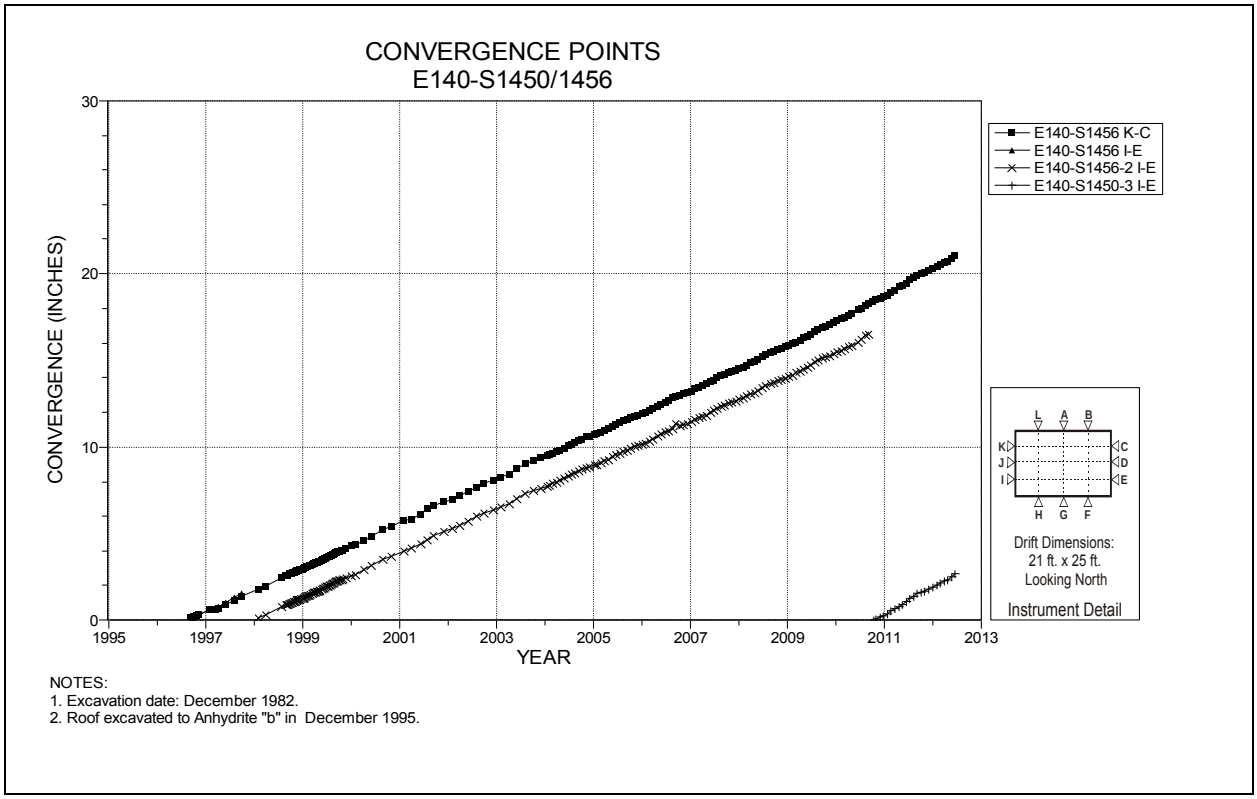


Figure 4-85 Convergence Point Array
E140 S1450/S1456 – Rib to Rib – Quarter Points

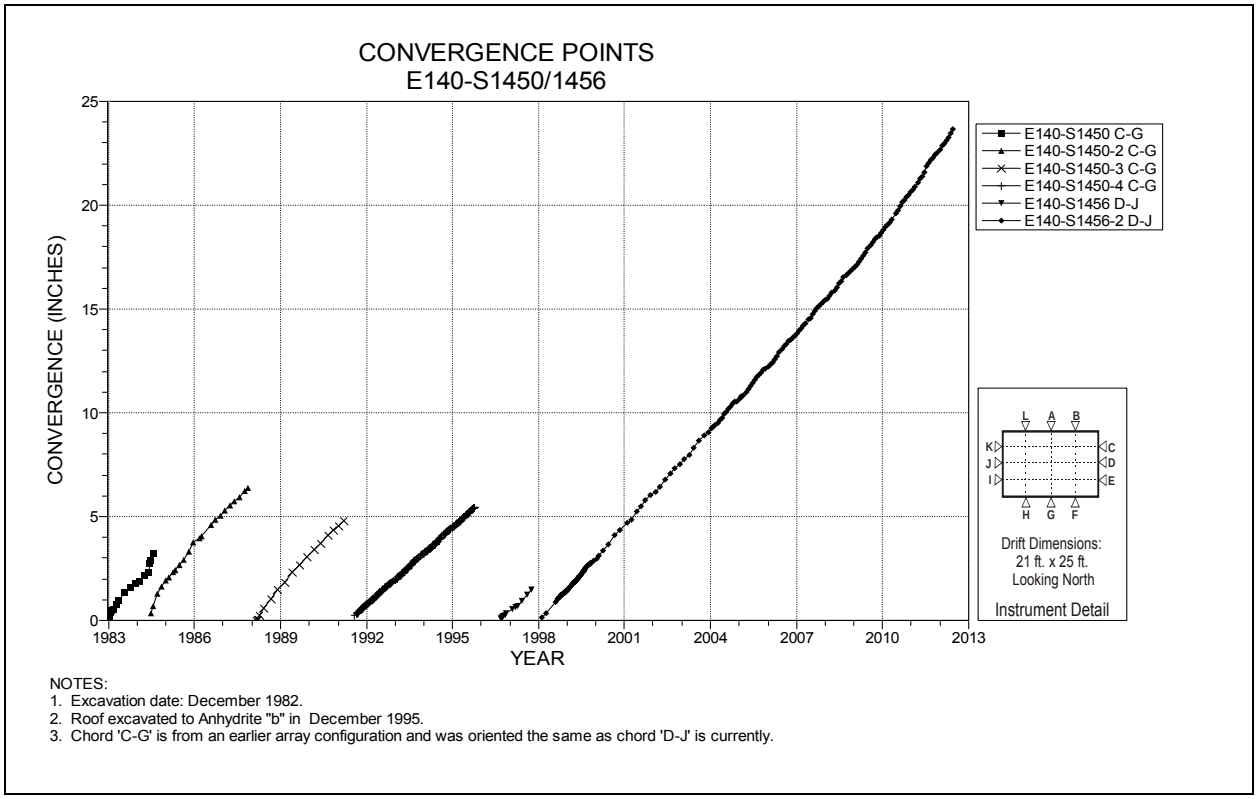


Figure 4-86 Convergence Point Array
E140 S1456/S1450 – Rib to Rib – Mid-Height

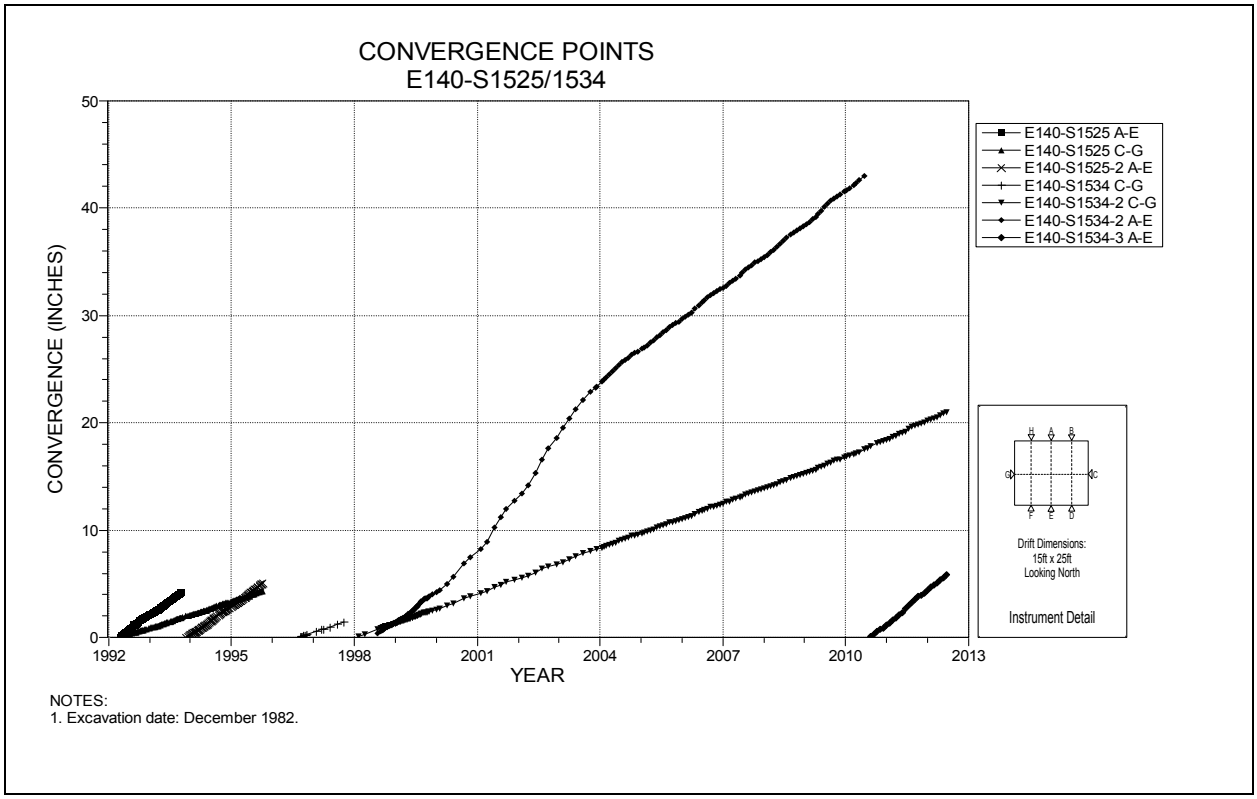


Figure 4-87 Convergence Point Array
E140 S1525/S1534 – Roof to Floor – Centerline and Rib to Rib

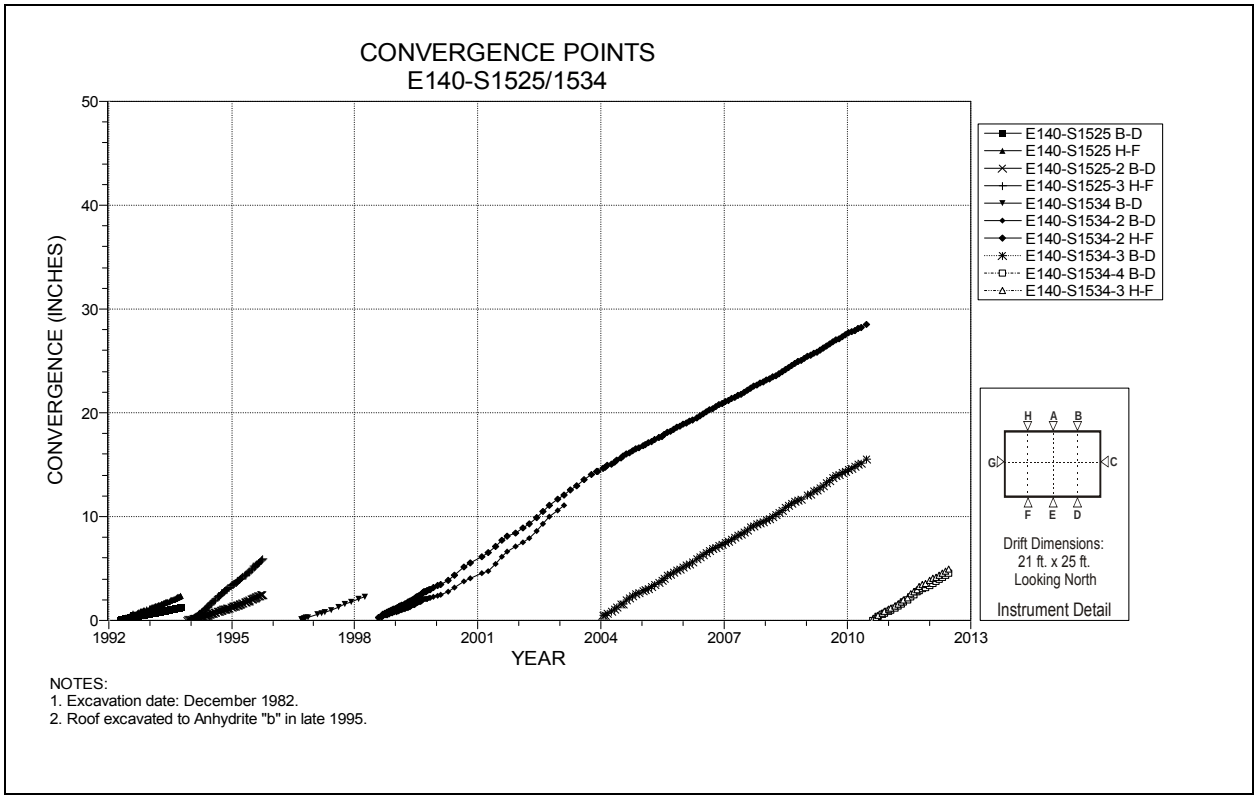


Figure 4-88 Convergence Point Array
E140 S1525/S1534 – Roof to Floor – Quarter Points

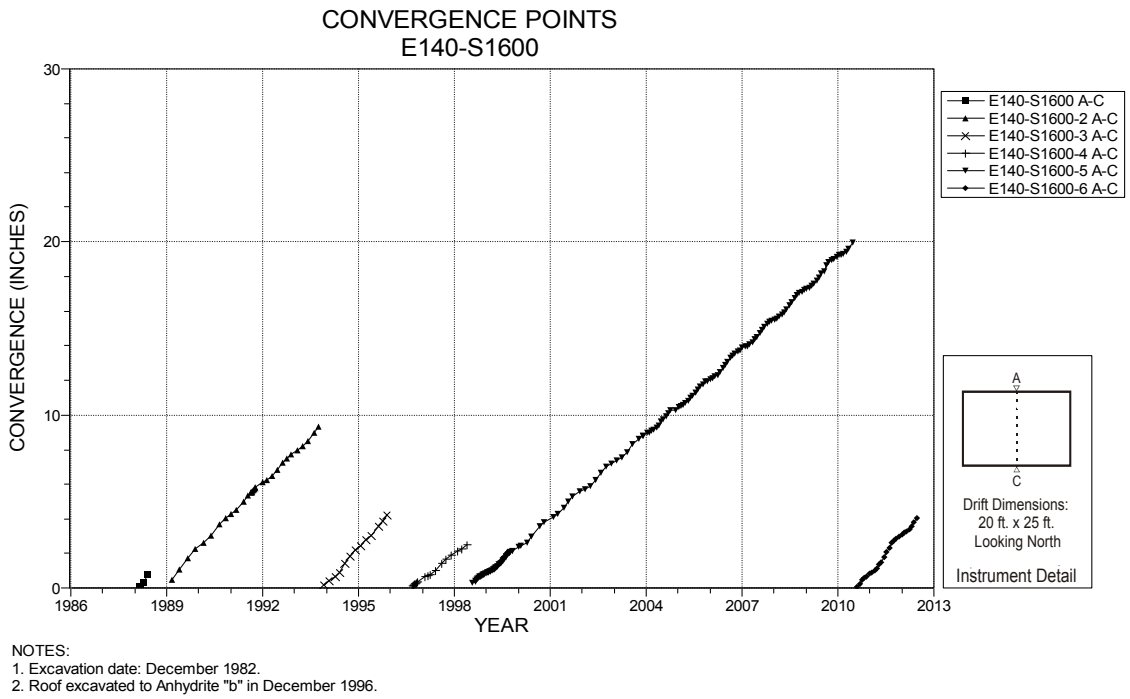


Figure 4-89 Convergence Point Array
E140 S1600 – Roof to Floor

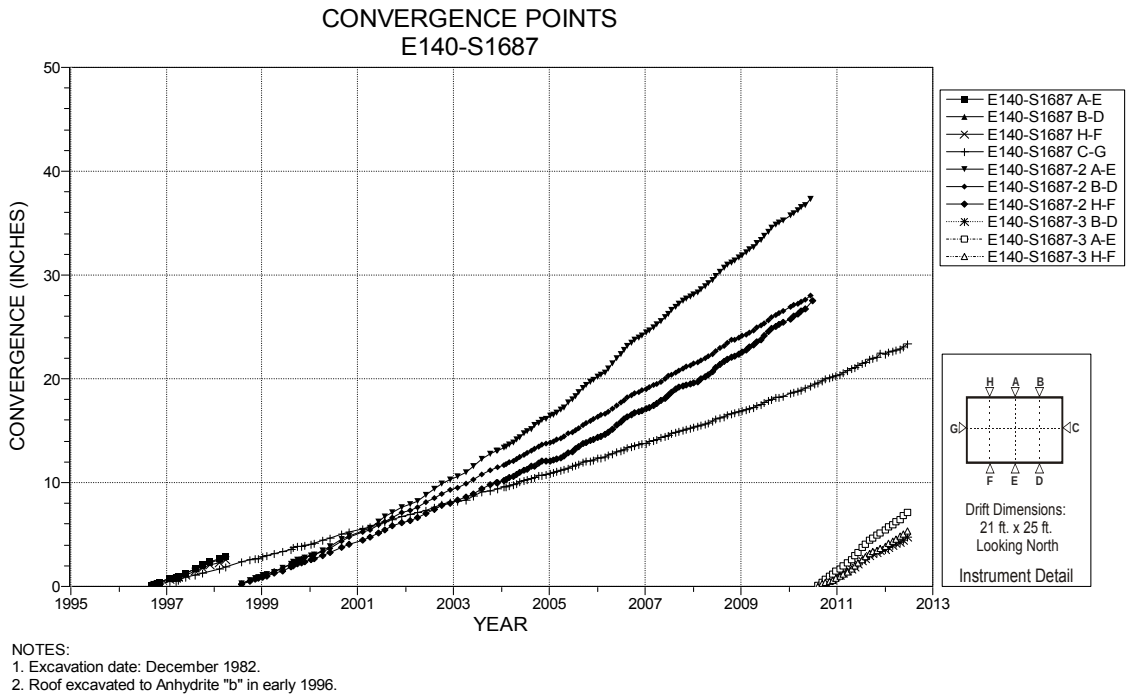


Figure 4-90 Convergence Point Array
E140 S1687 – All Chords

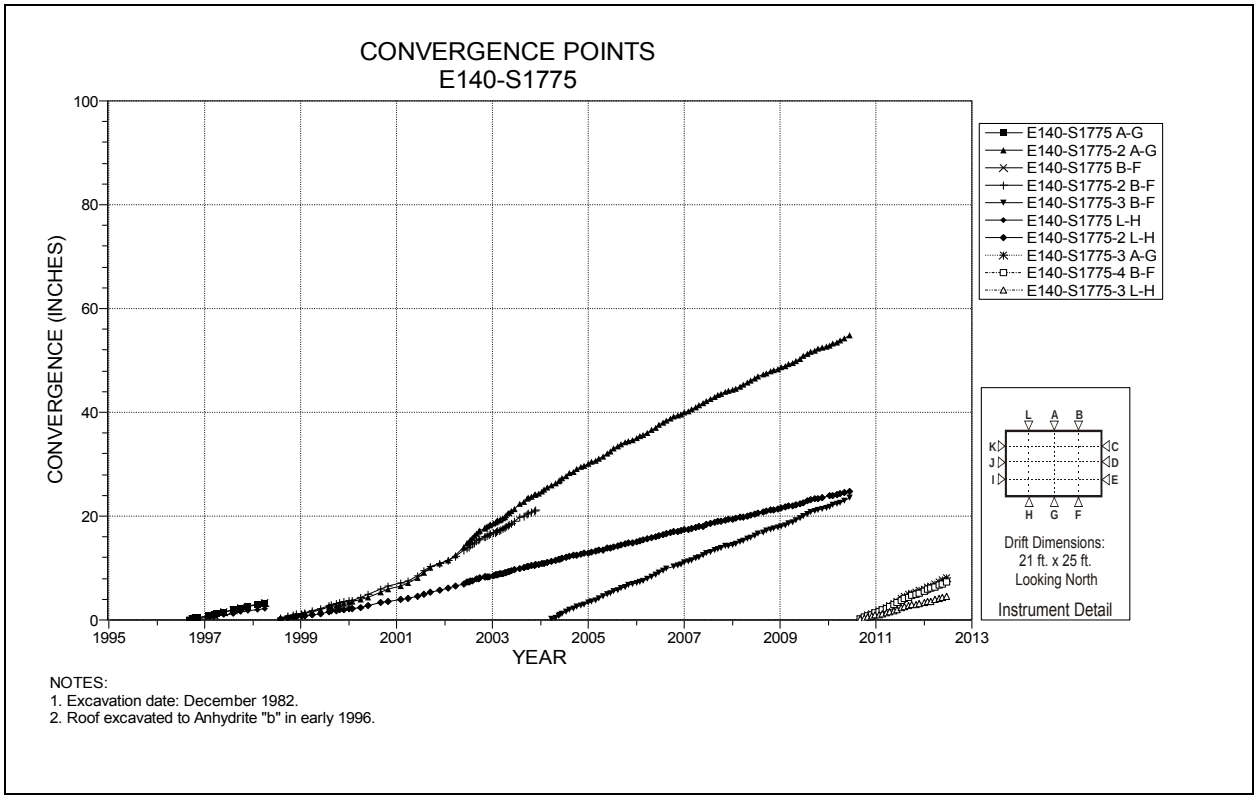


Figure 4-91 Convergence Point Array
E140 S1775 – Roof to Floor

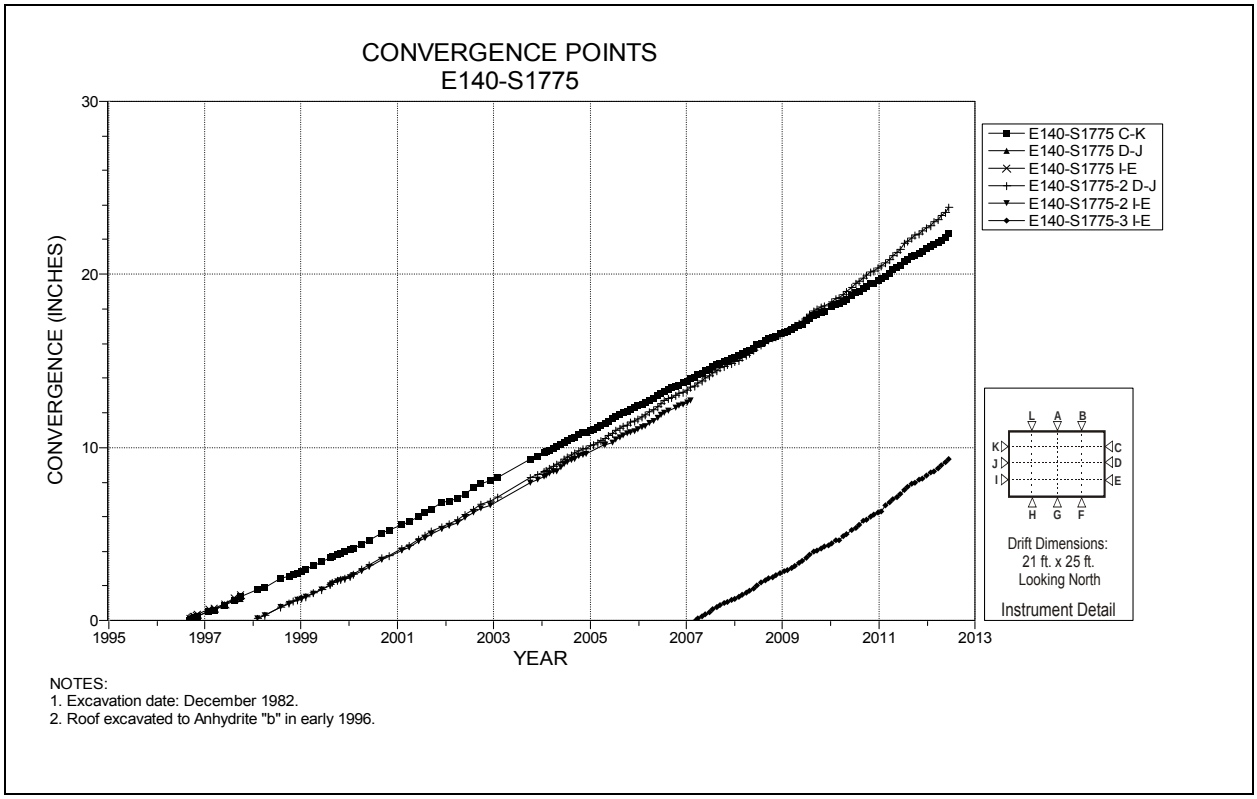


Figure 4-92 Convergence Point Array
E140 S1775 – Rib to Rib

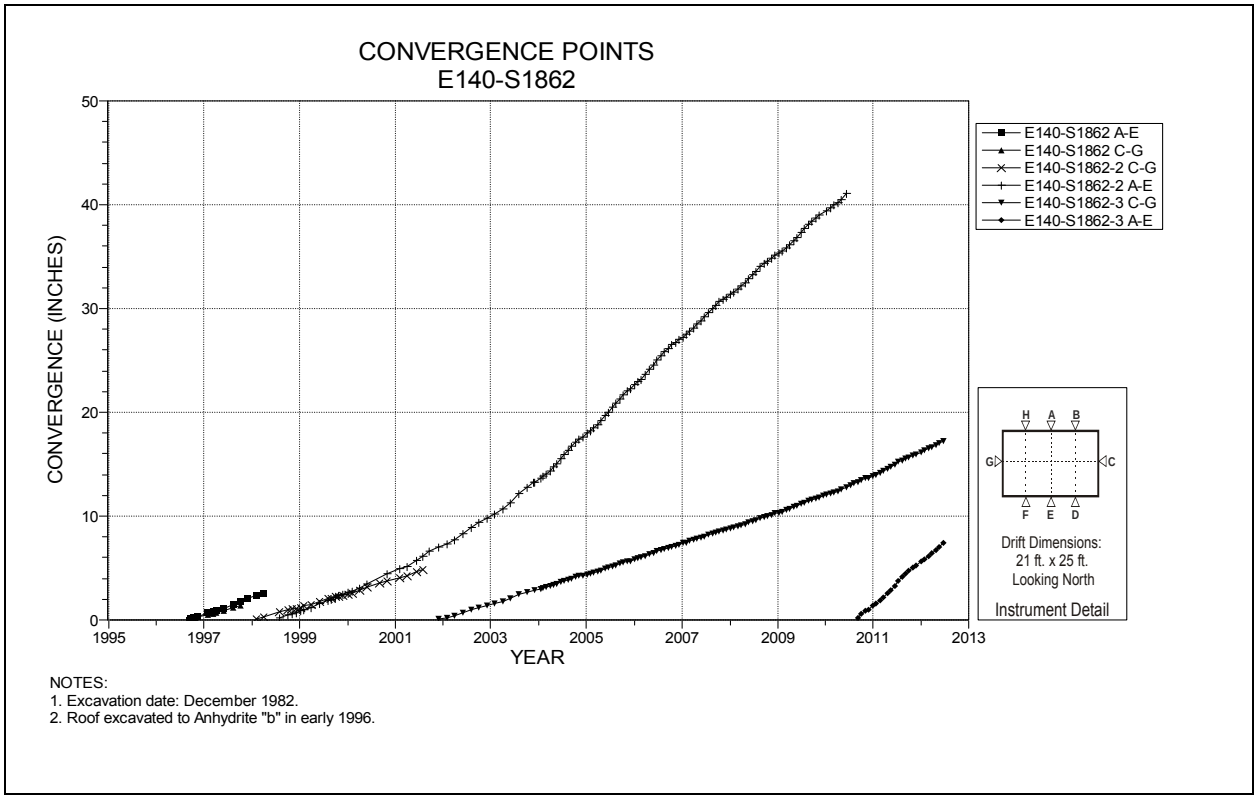


Figure 4-93 Convergence Point Array
E140 S1862 – Roof to Floor – Centerline and Rib to Rib

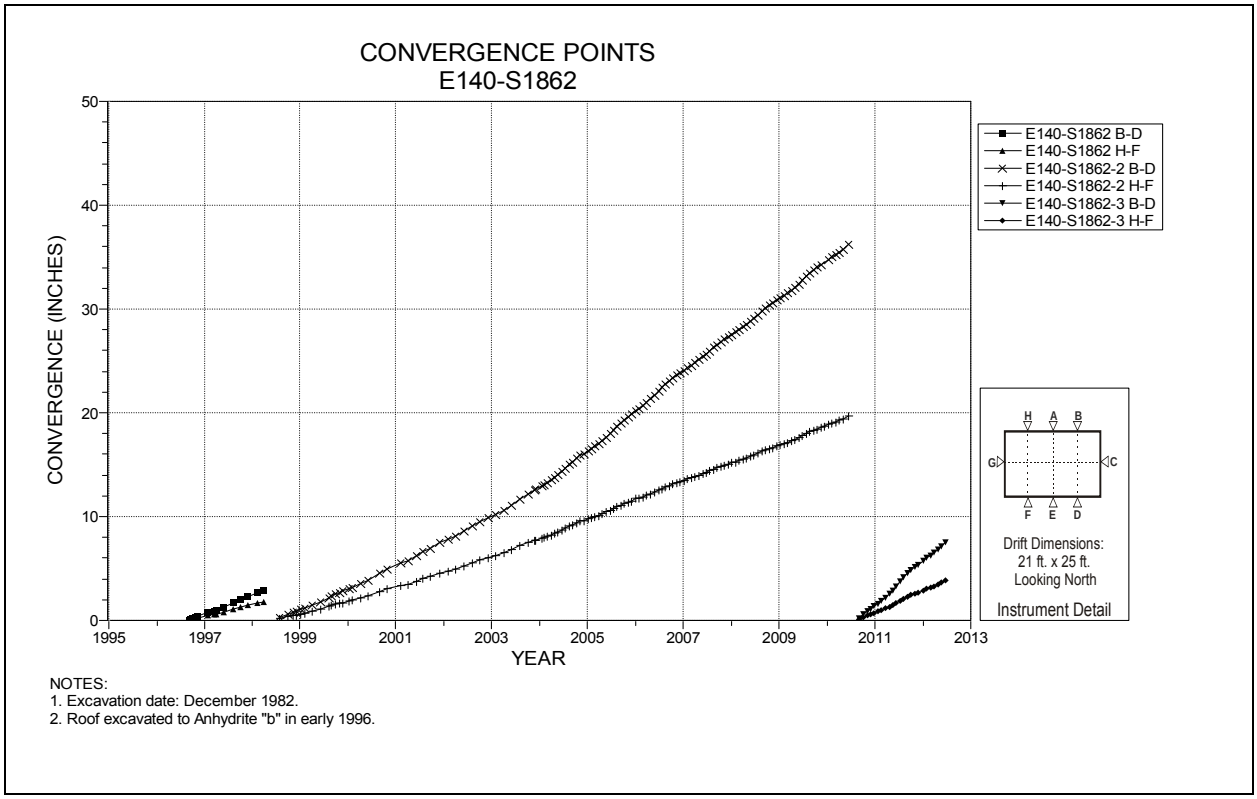


Figure 4-94 Convergence Point Array
E140 S1862 – Roof to Floor – Quarter Points

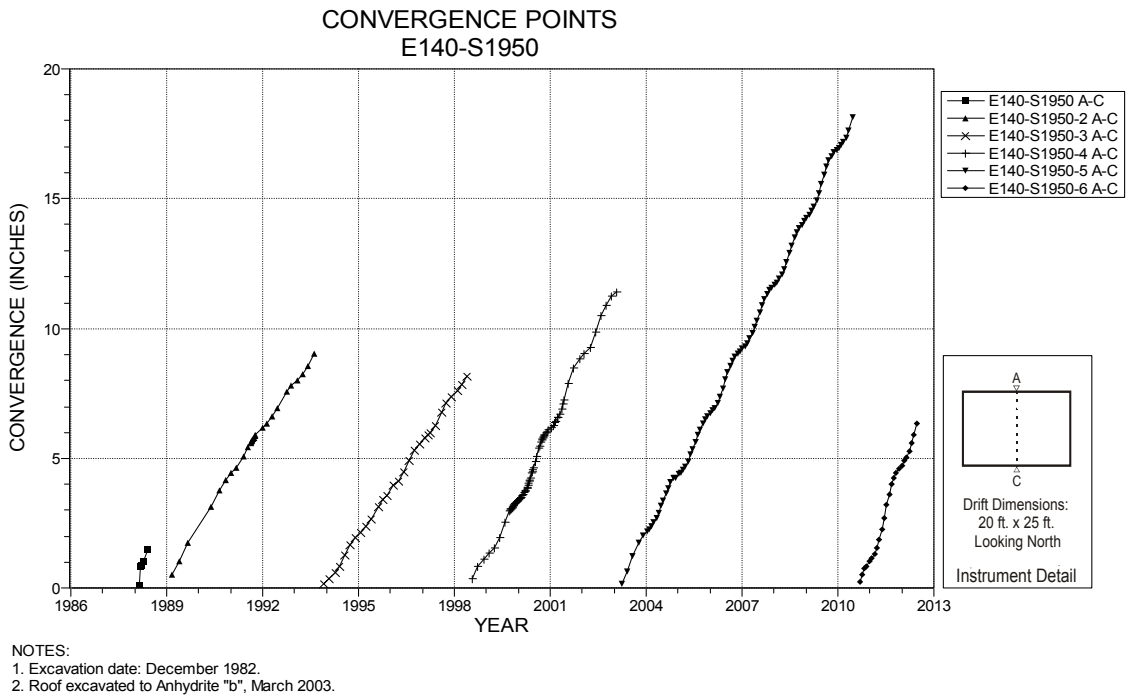


Figure 4-95 Convergence Point Array
E140 S1950 – Roof to Floor

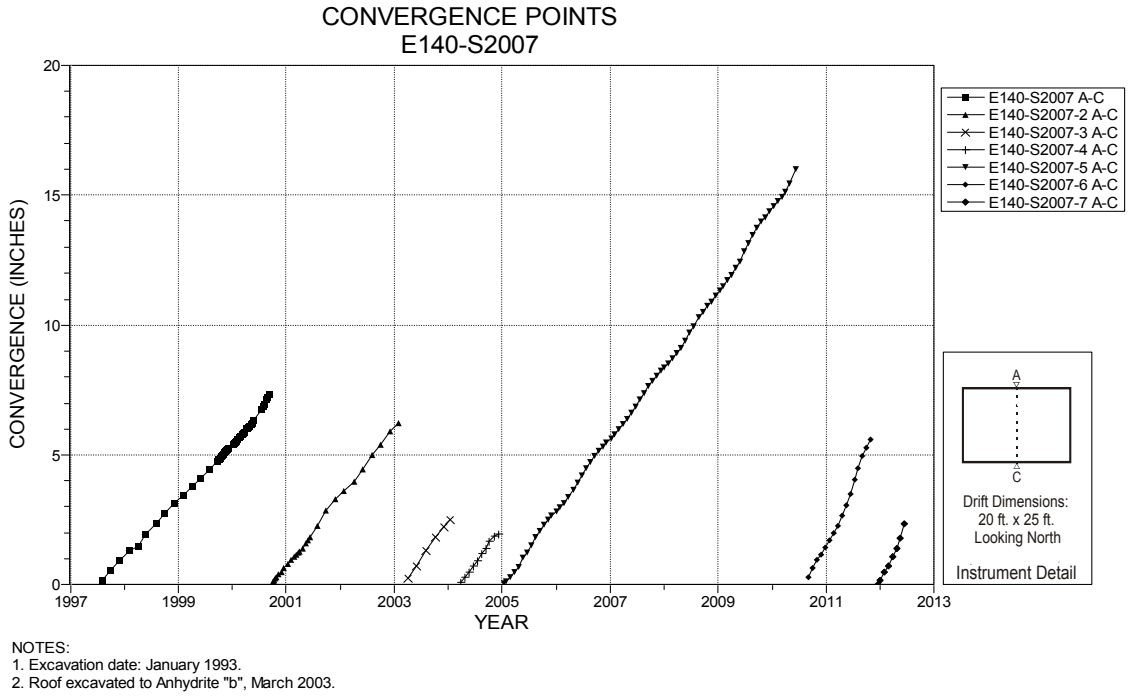


Figure 4-96 Convergence Point Array
E140 S2007 – Roof to Floor

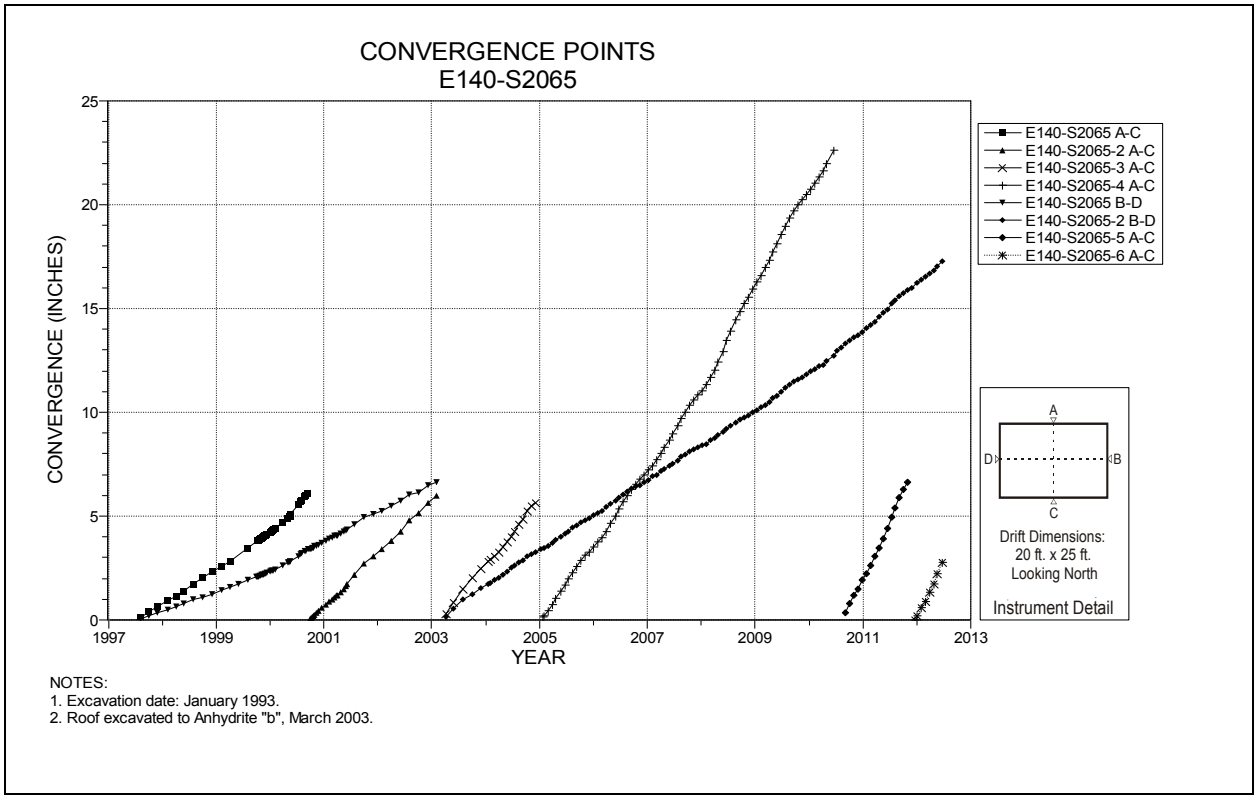


Figure 4-97 Convergence Point Array
E140 S2065 – All Chords

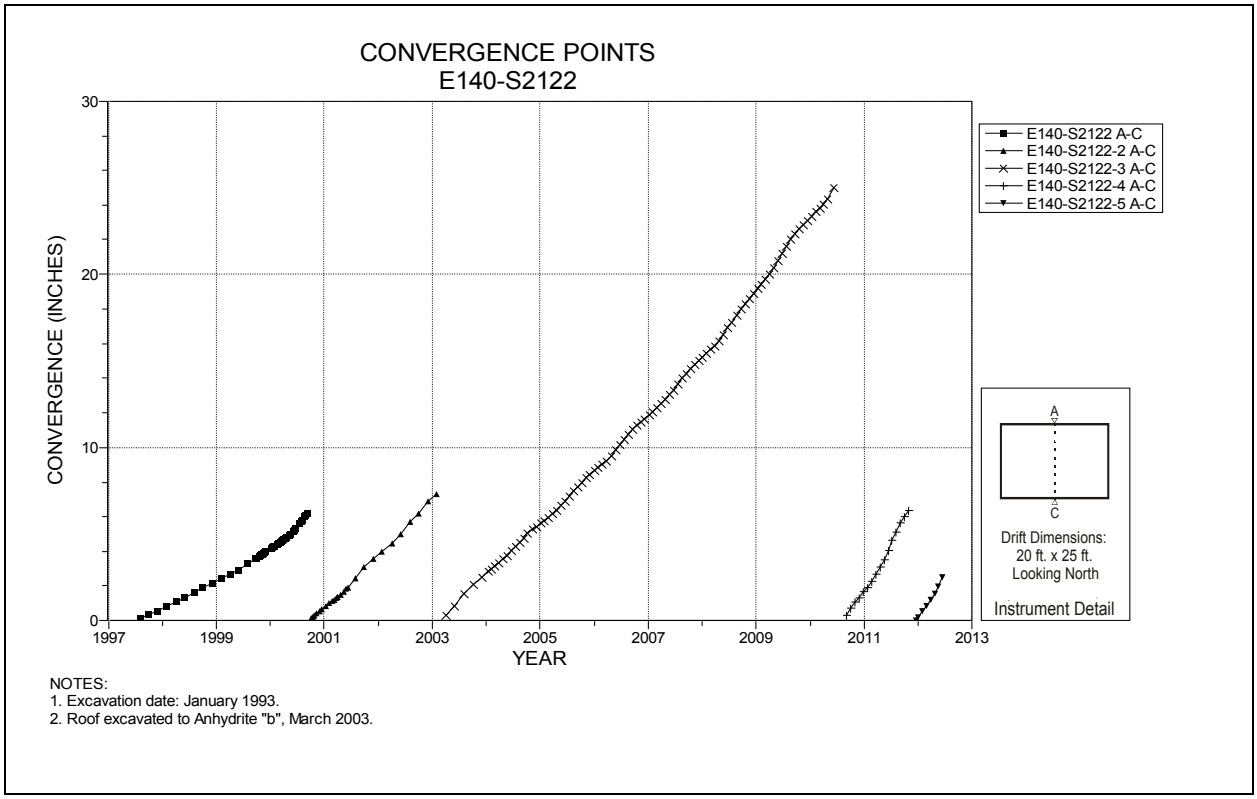


Figure 4-98 Convergence Point Array
E140 S2122 – Roof to Floor

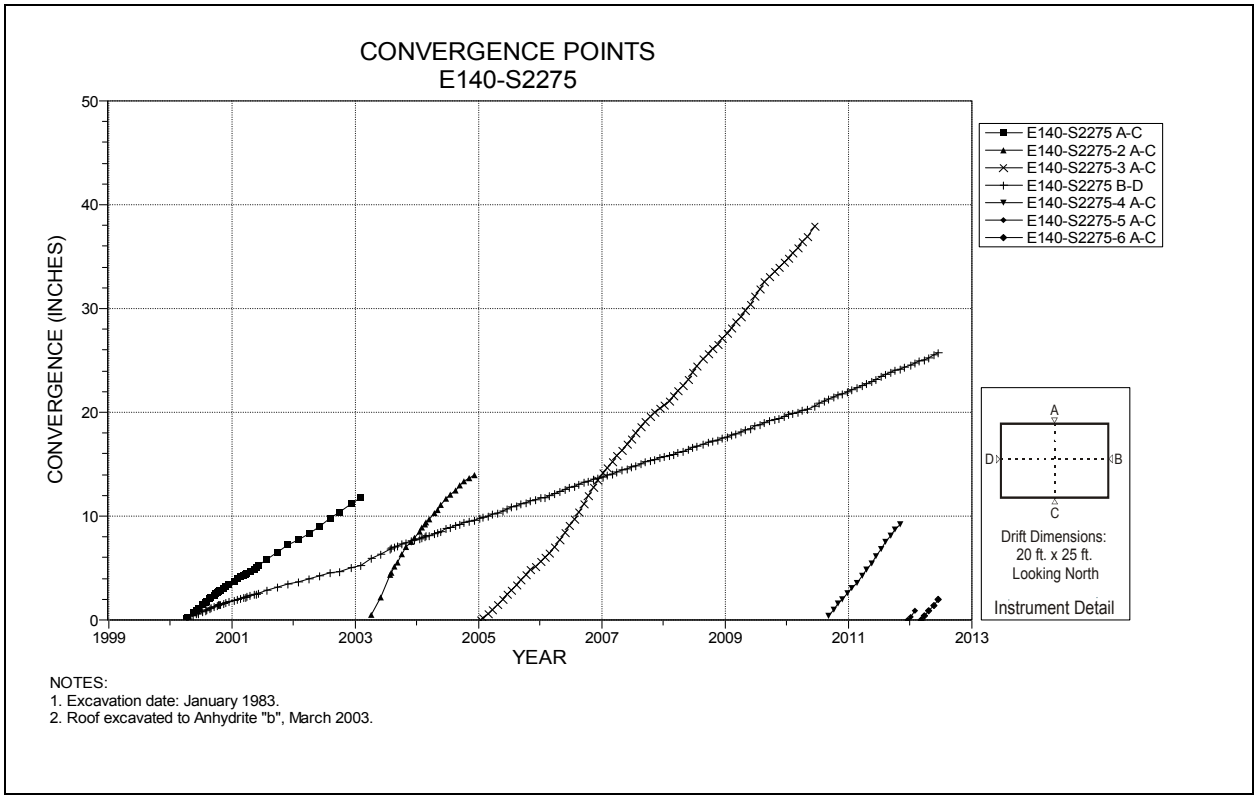


Figure 4-99 Convergence Point Array
E140 S2275 – All Chords

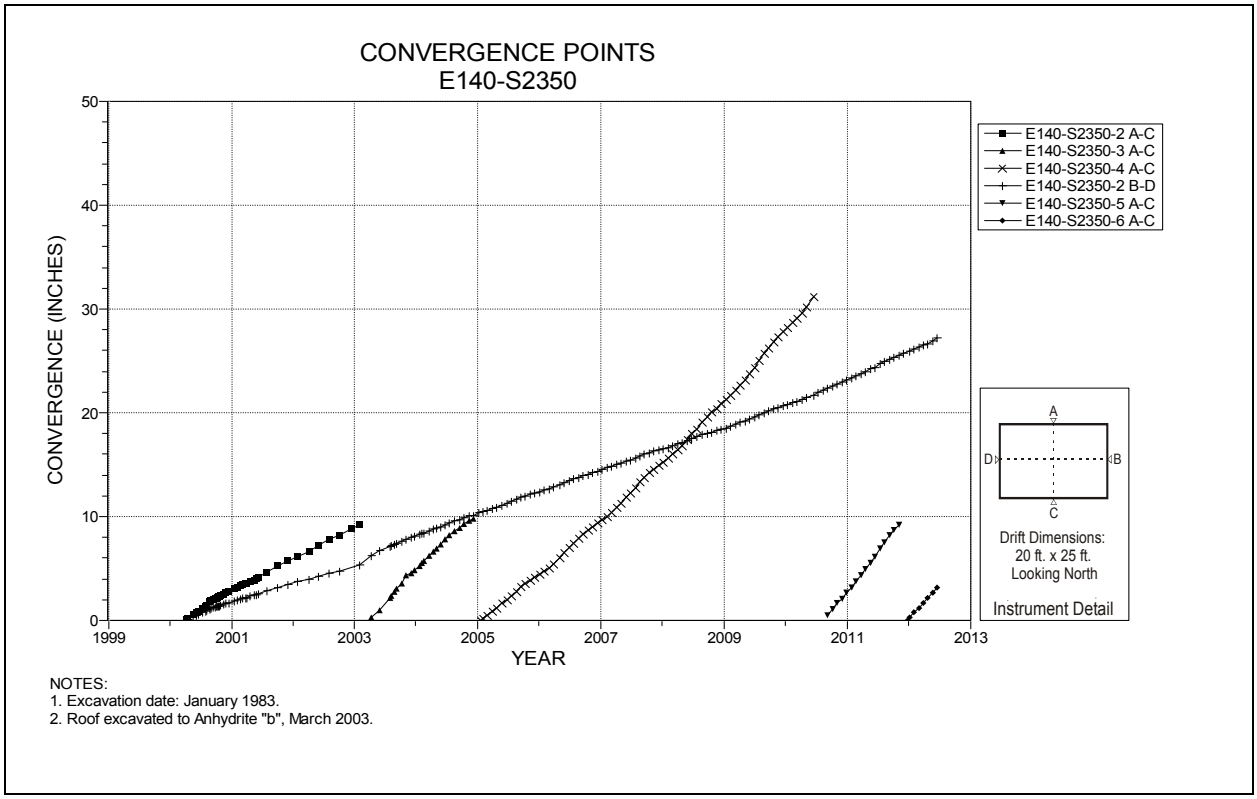


Figure 4-100 Convergence Point Array
E140 S2350 – All Chords

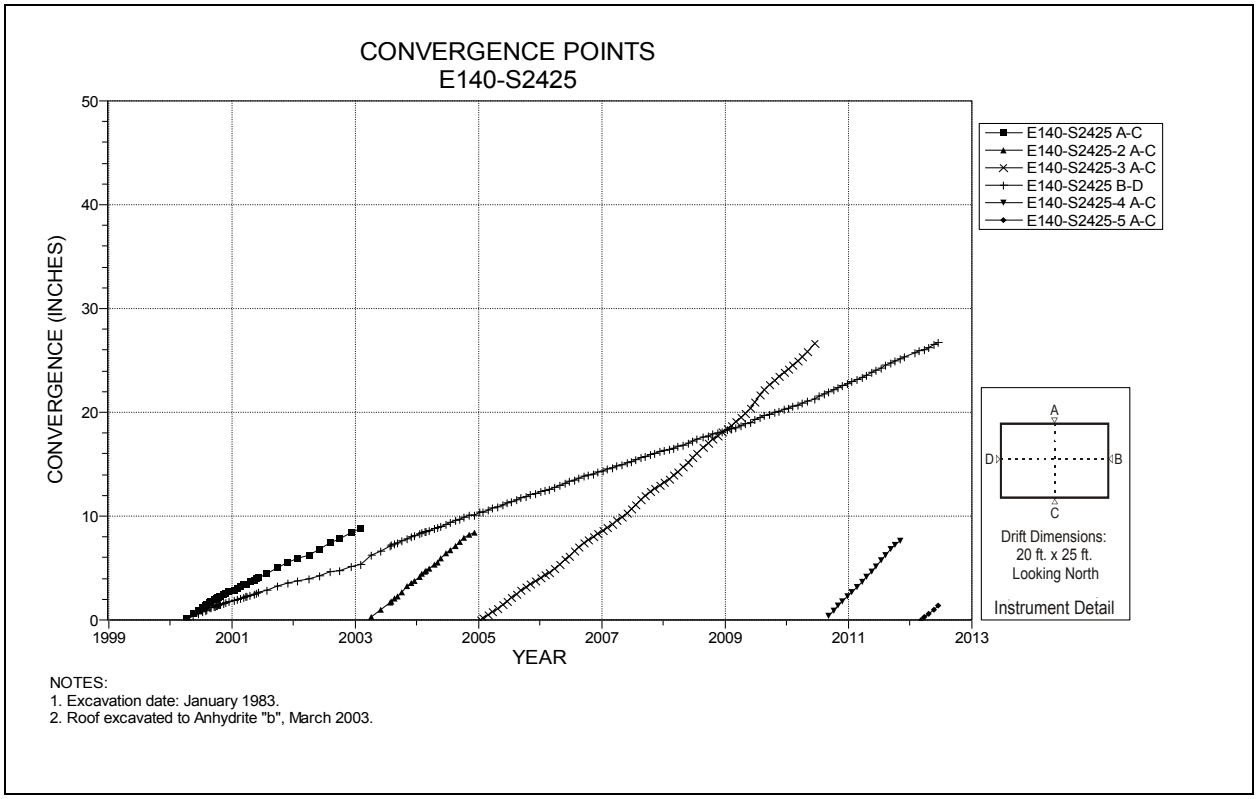


Figure 4-101 Convergence Point Array
E140 S2425 – All Chords

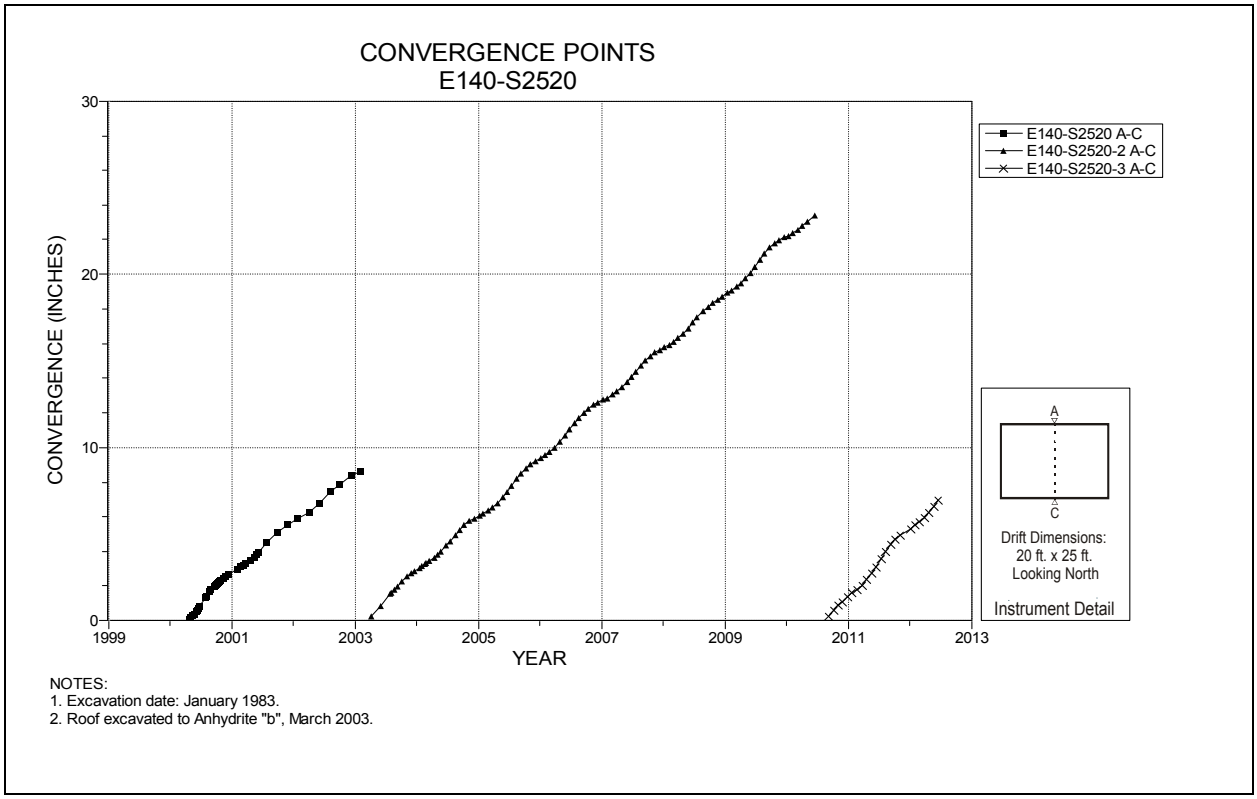


Figure 4-102 Convergence Point Array
E140 S2520 – Roof to Floor

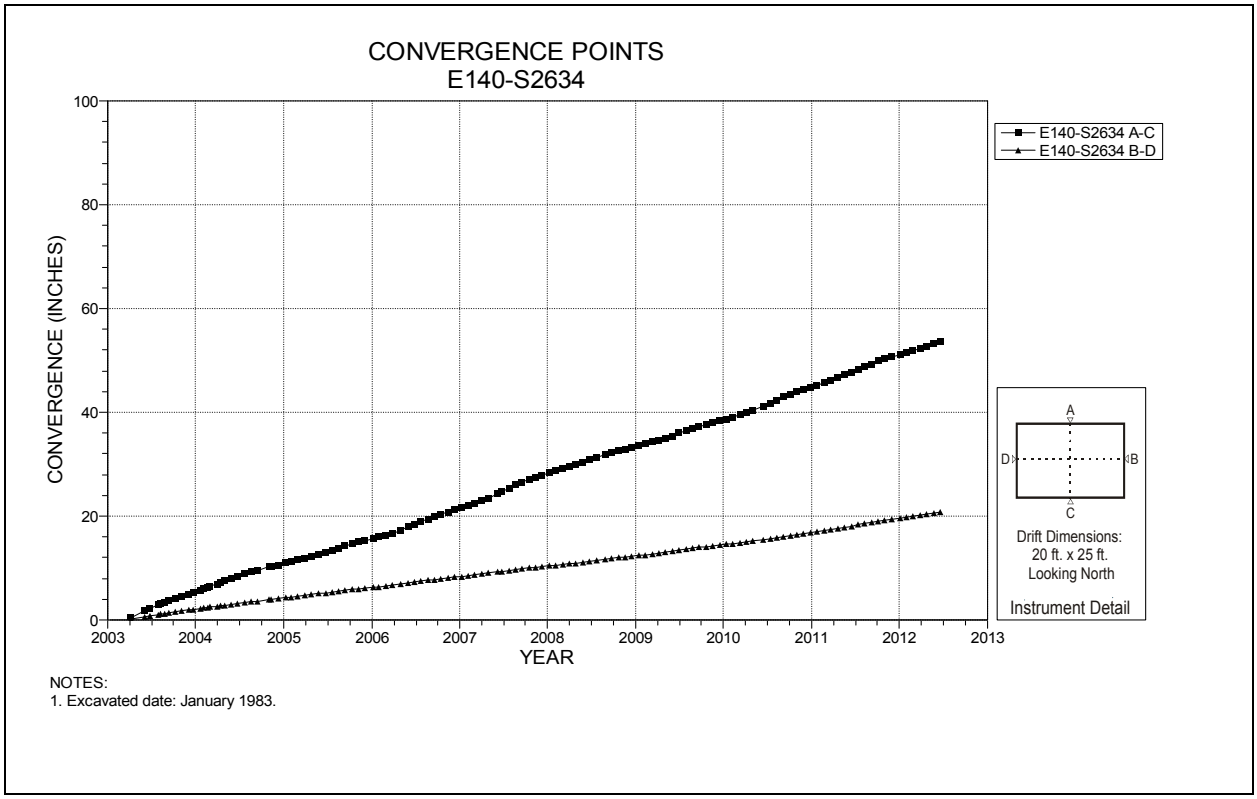


Figure 4-103 Convergence Point Array
E140 S2634 – All Chords

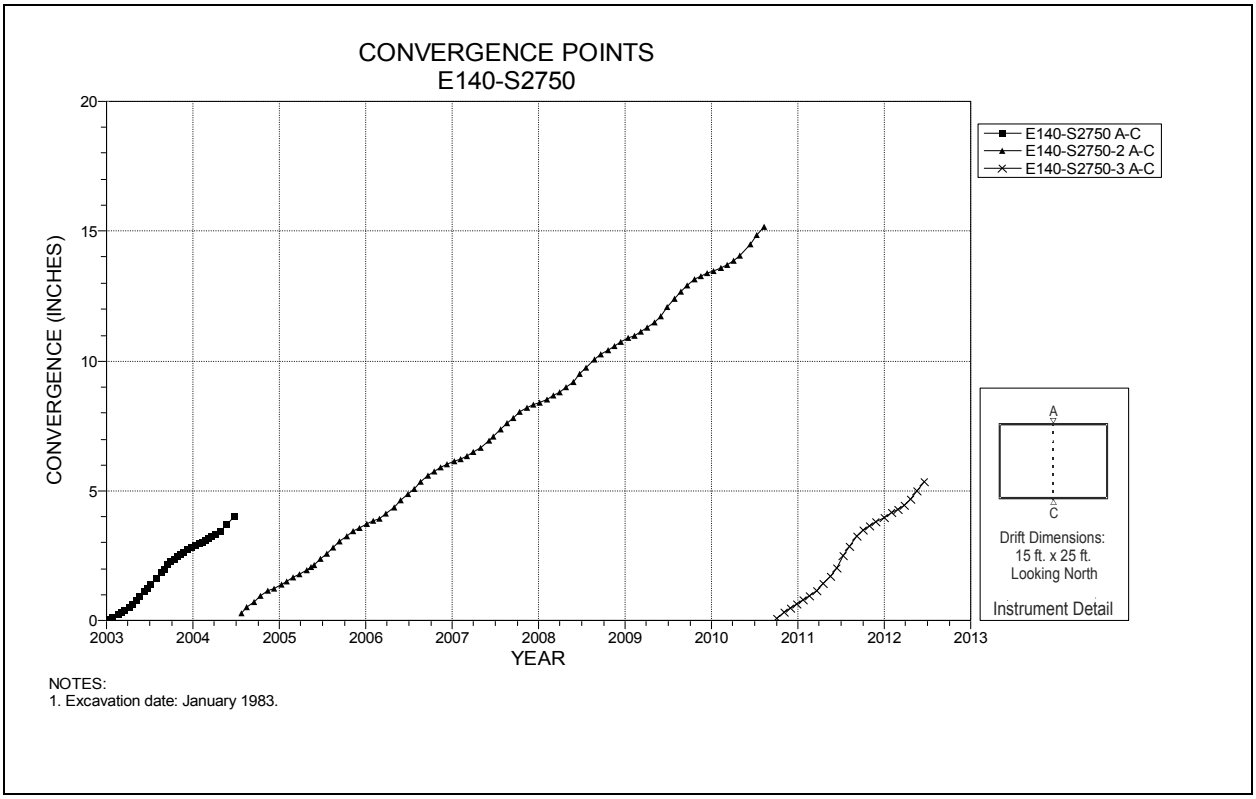


Figure 4-104 Convergence Point Array
E140 S2750 – Roof to Floor

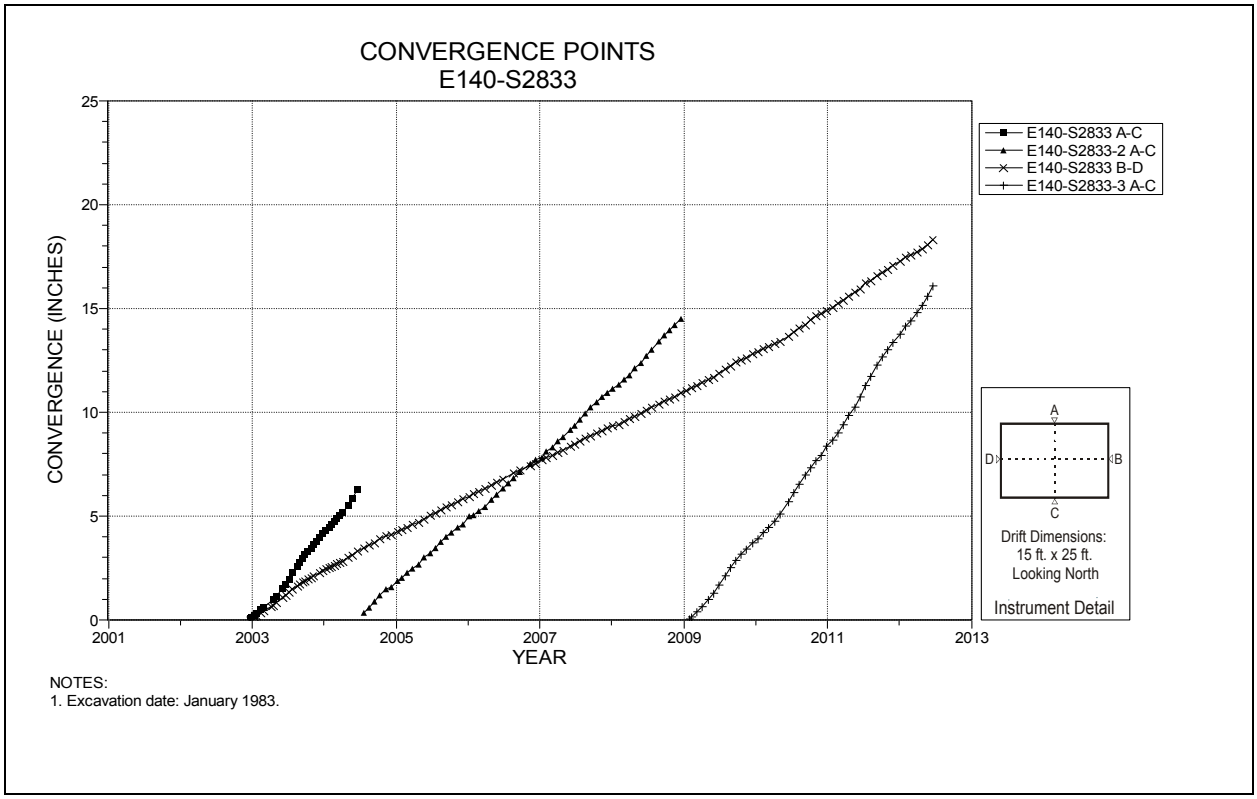


Figure 4-105 Convergence Point Array
E140 S2833 – All Chords

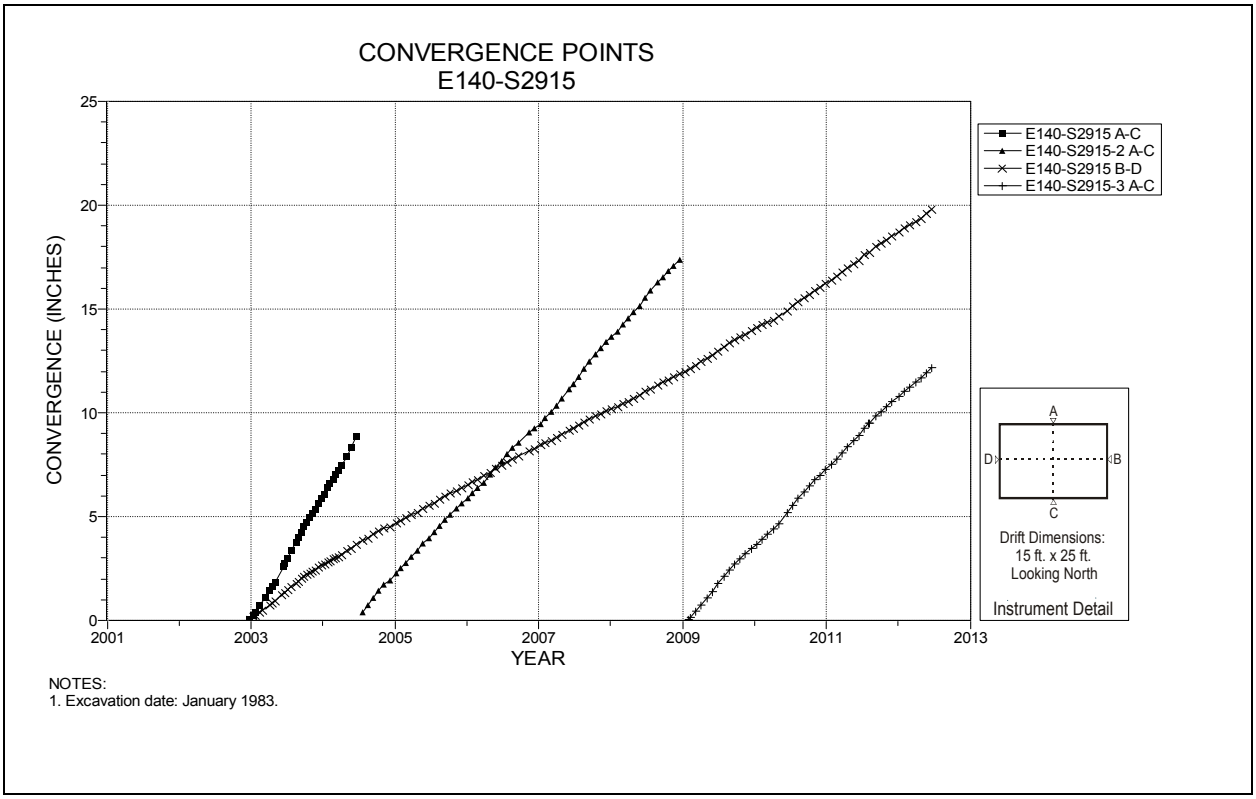


Figure 4-106 Convergence Point Array
E140 S2915 – All Chords

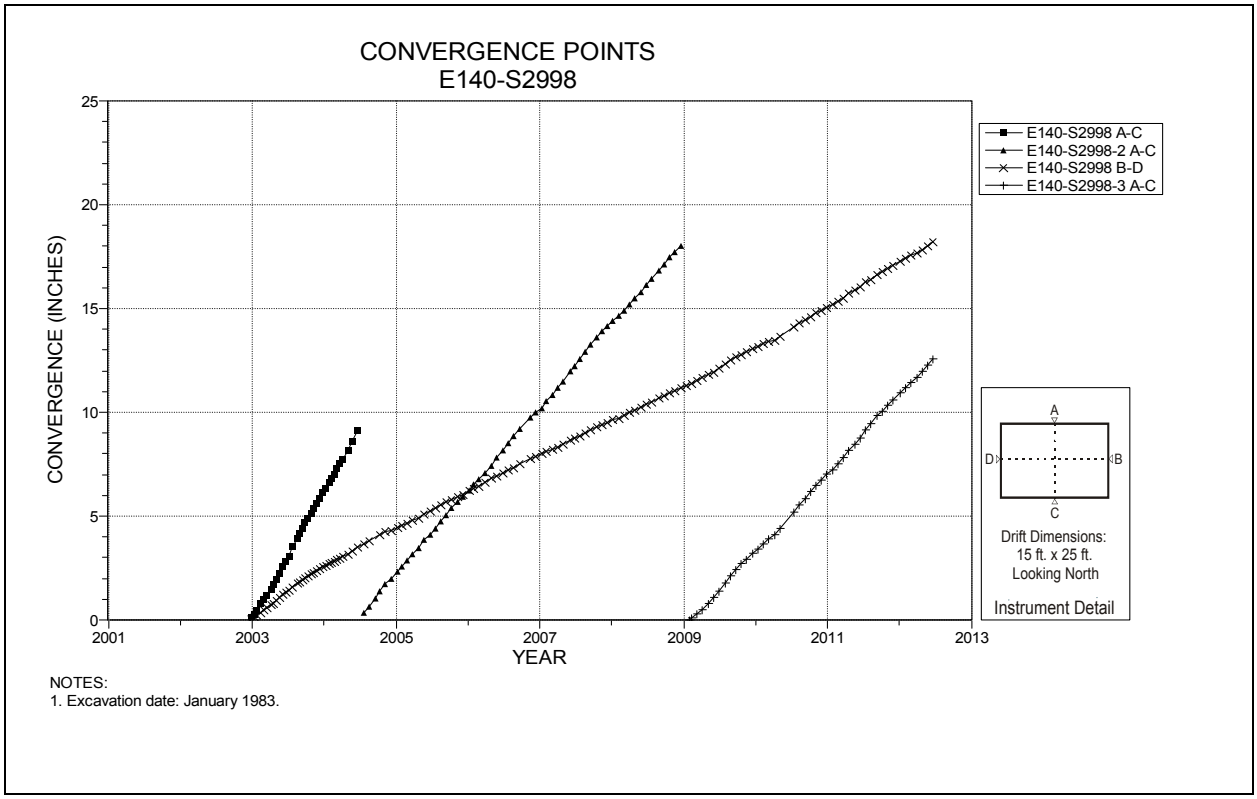


Figure 4-107 Convergence Point Array
E140 S2998 – All Chords

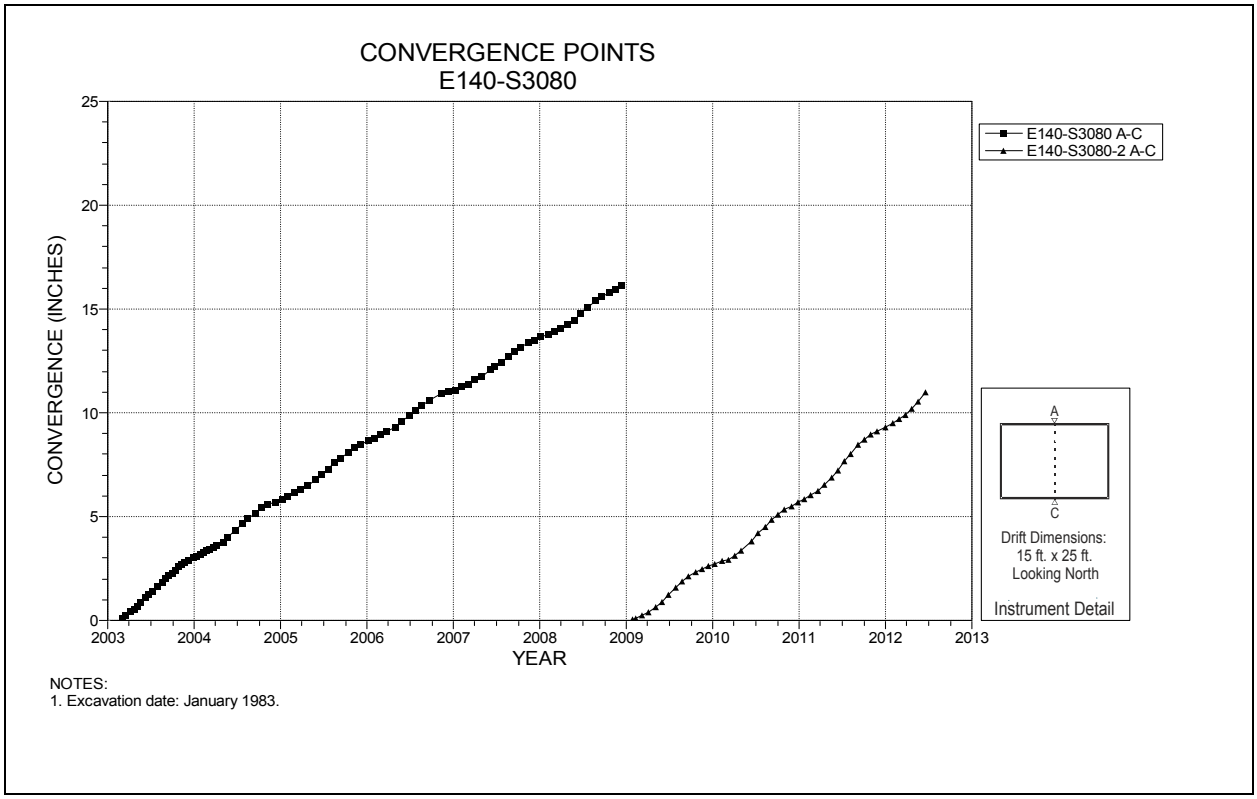


Figure 4-108 Convergence Point Array
E140 S3080 – Roof to Floor

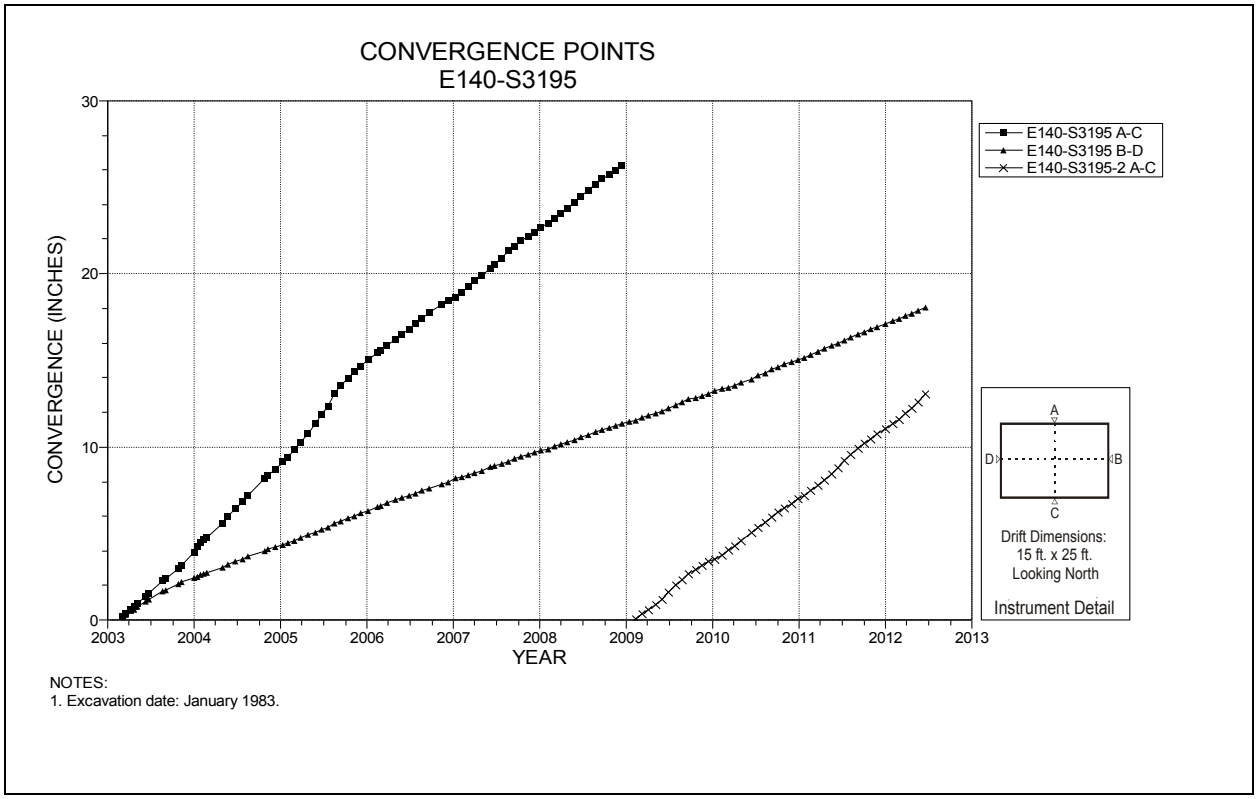


Figure 4-109 Convergence Point Array
E140 S3195 – All Chords

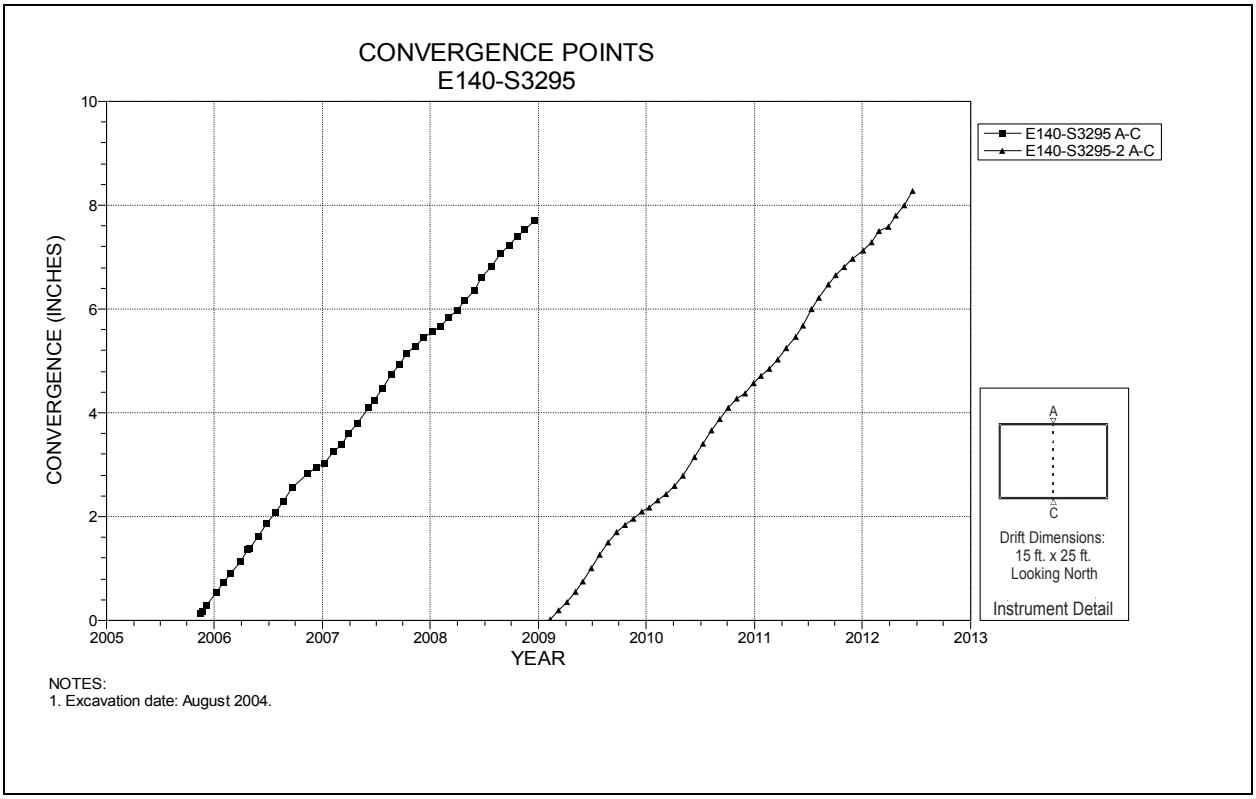


Figure 4-110 Convergence Point Array
E140 S3295 – Roof to Floor

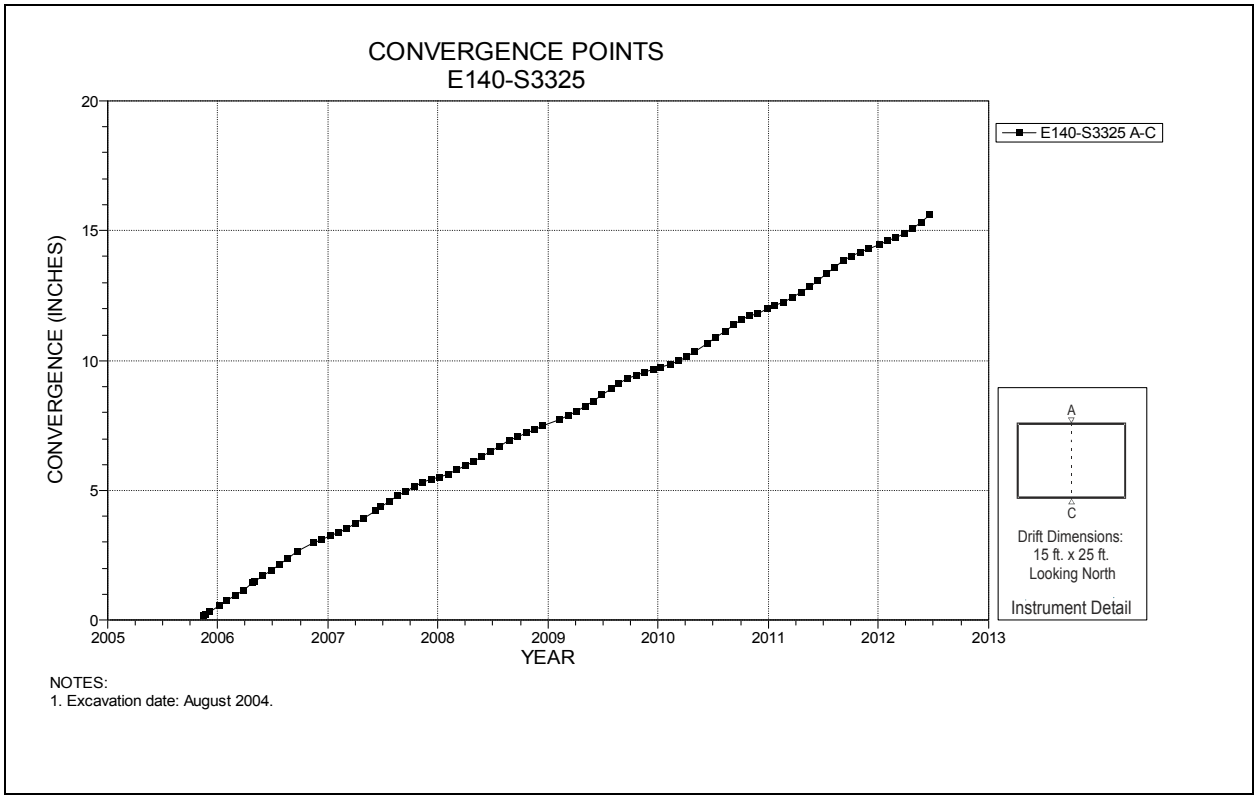


Figure 4-111 Convergence Point Array
E140 S3325 – Roof to Floor

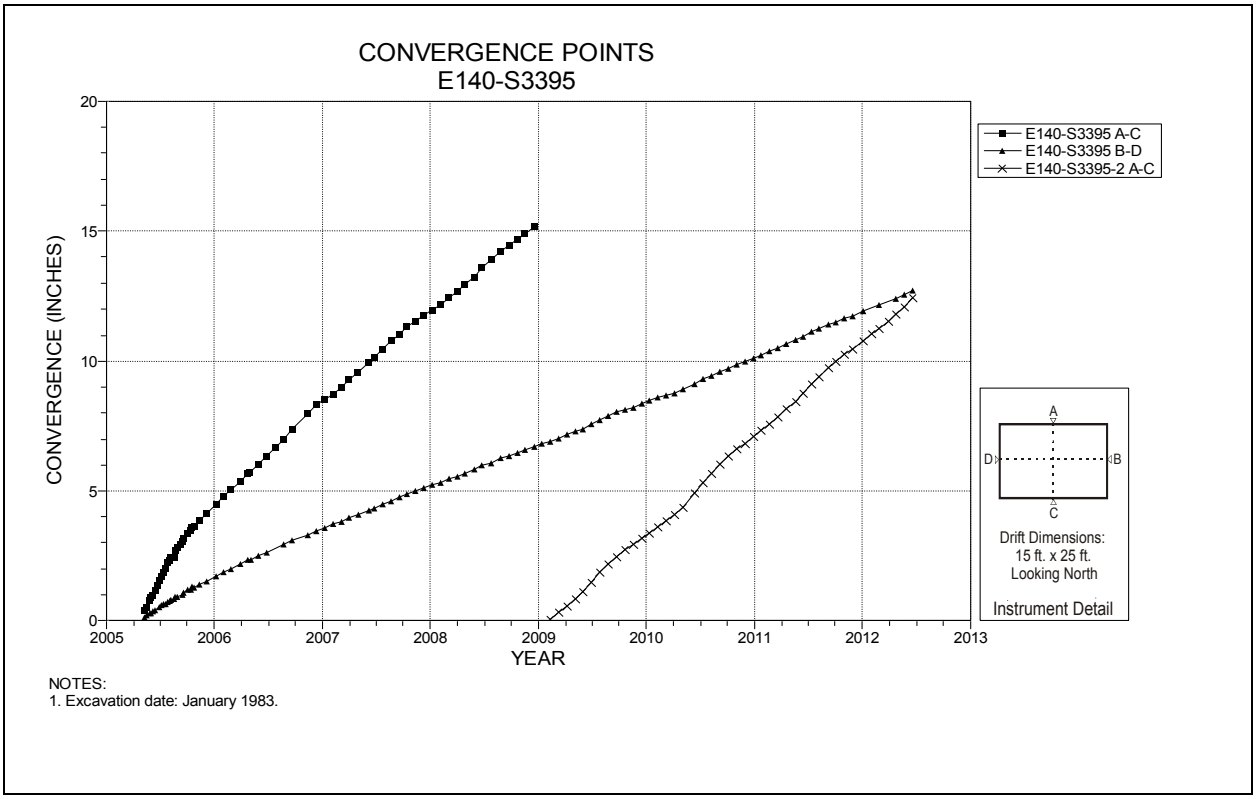


Figure 4-112 Convergence Point Array
E140 S3395 – All Chords

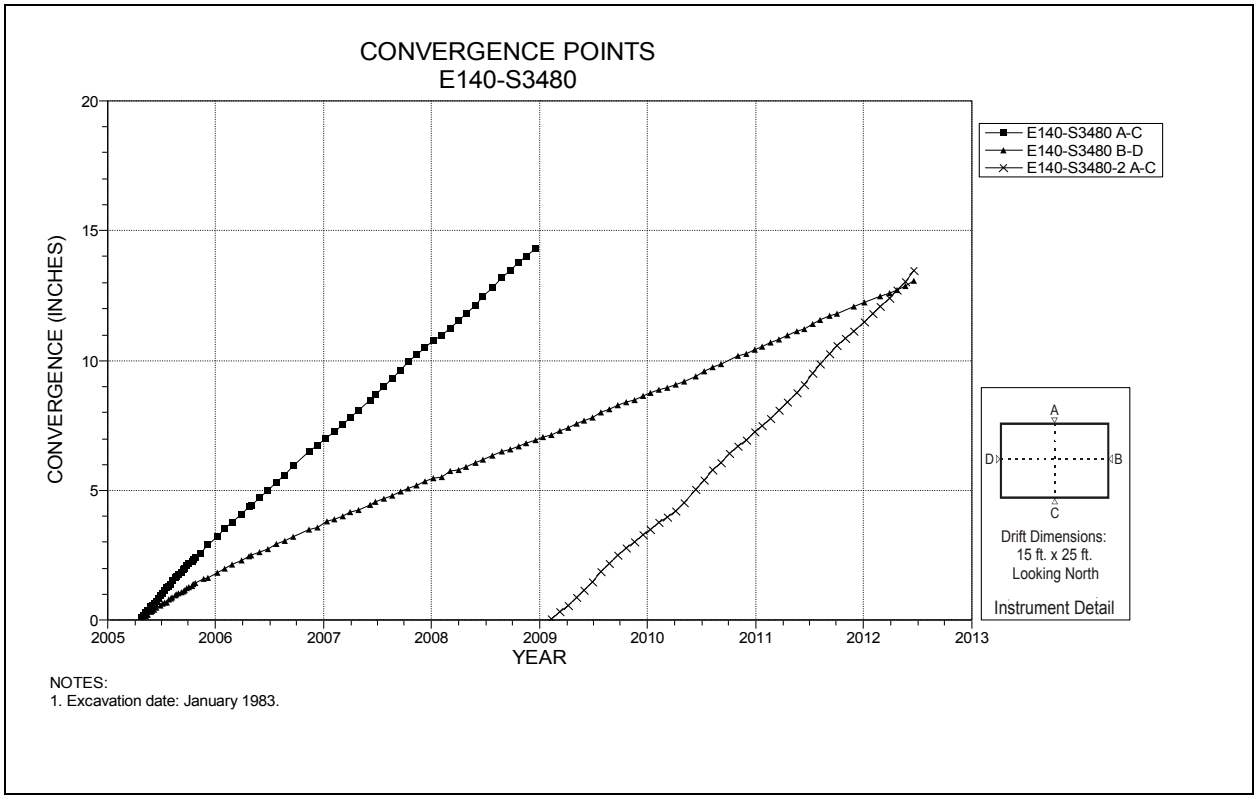


Figure 4-113 Convergence Point Array
E140 S3480 – All Chords

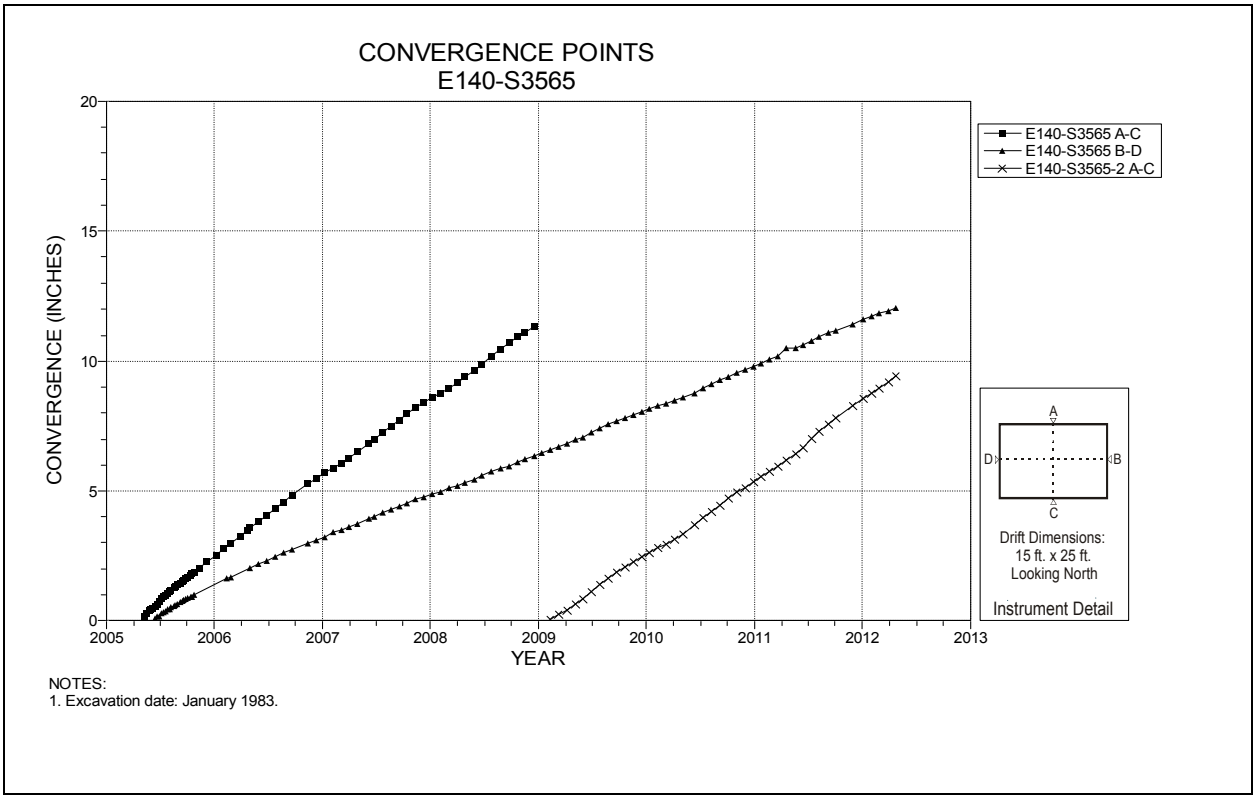


Figure 4-114 Convergence Point Array
E140 S3565 – All Chords

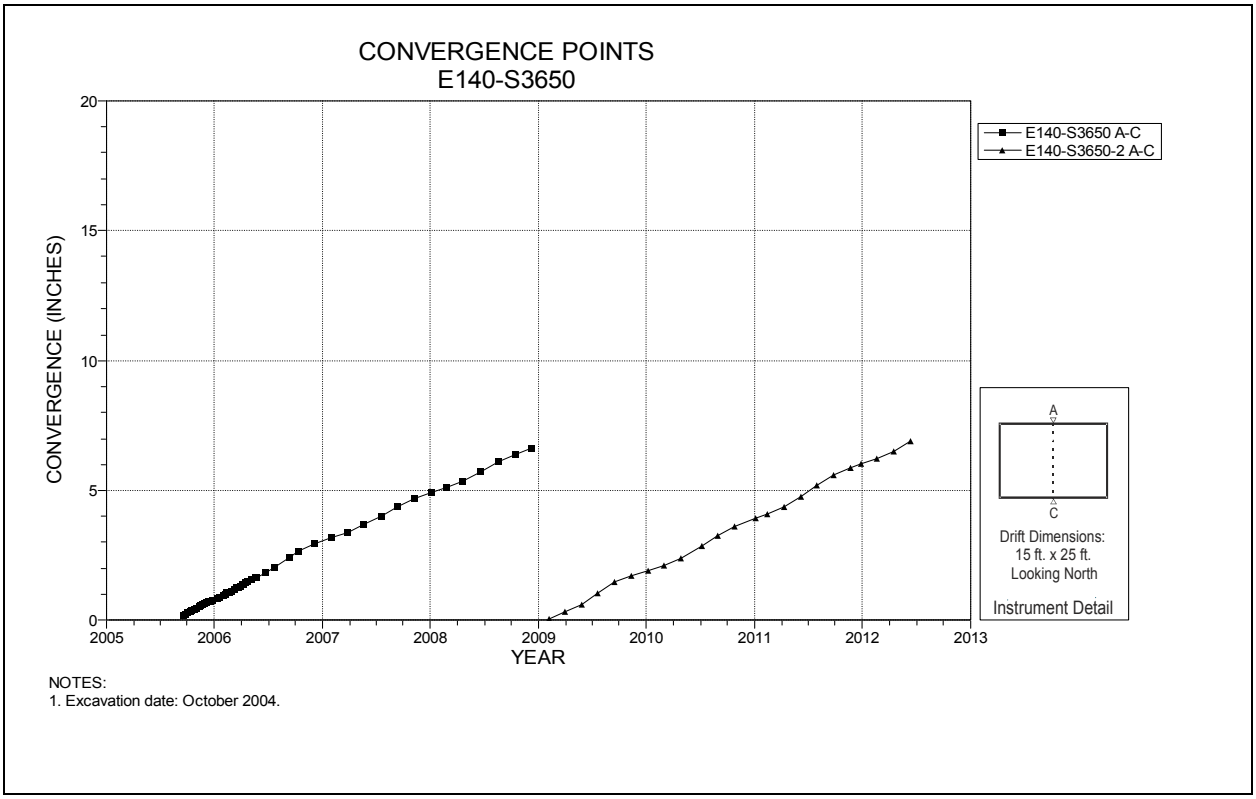


Figure 4-115 Convergence Point Array
E140 S3650 – Roof to Floor

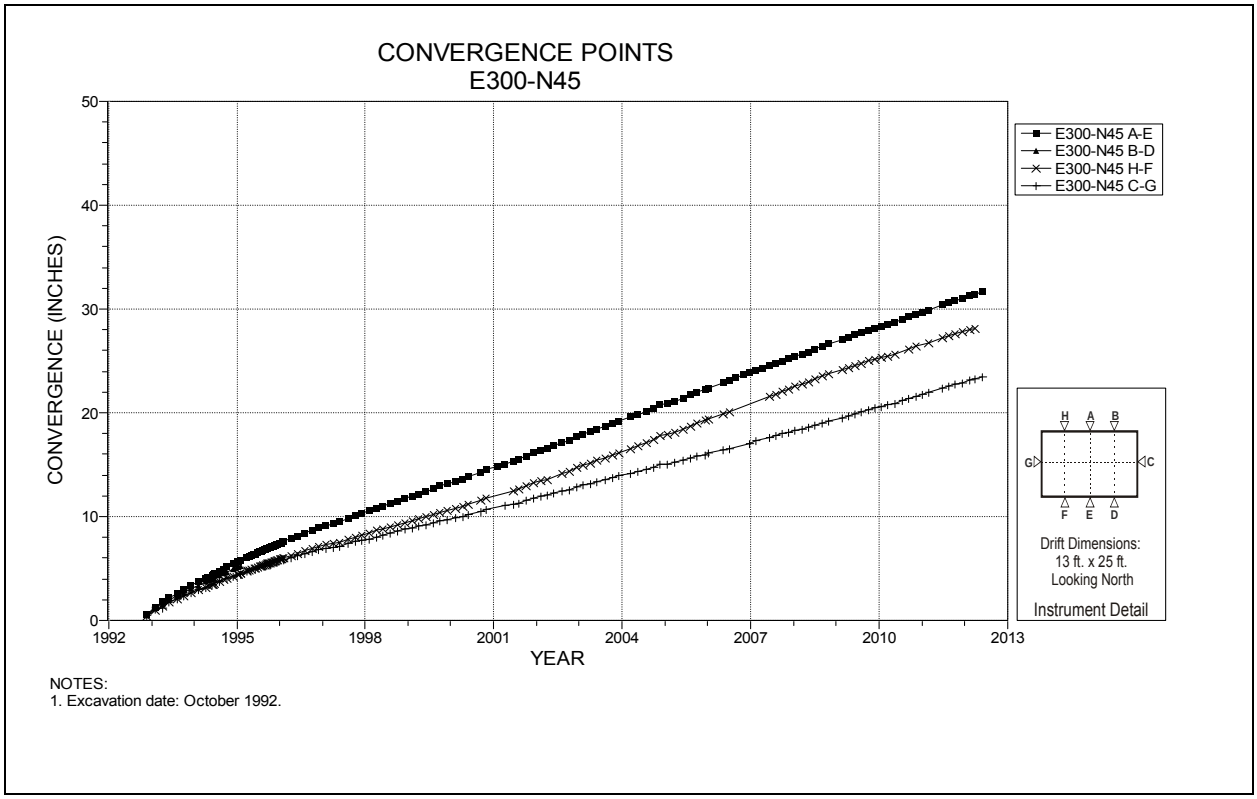


Figure 4-116 Convergence Point Array
E300 N45 – All Chords

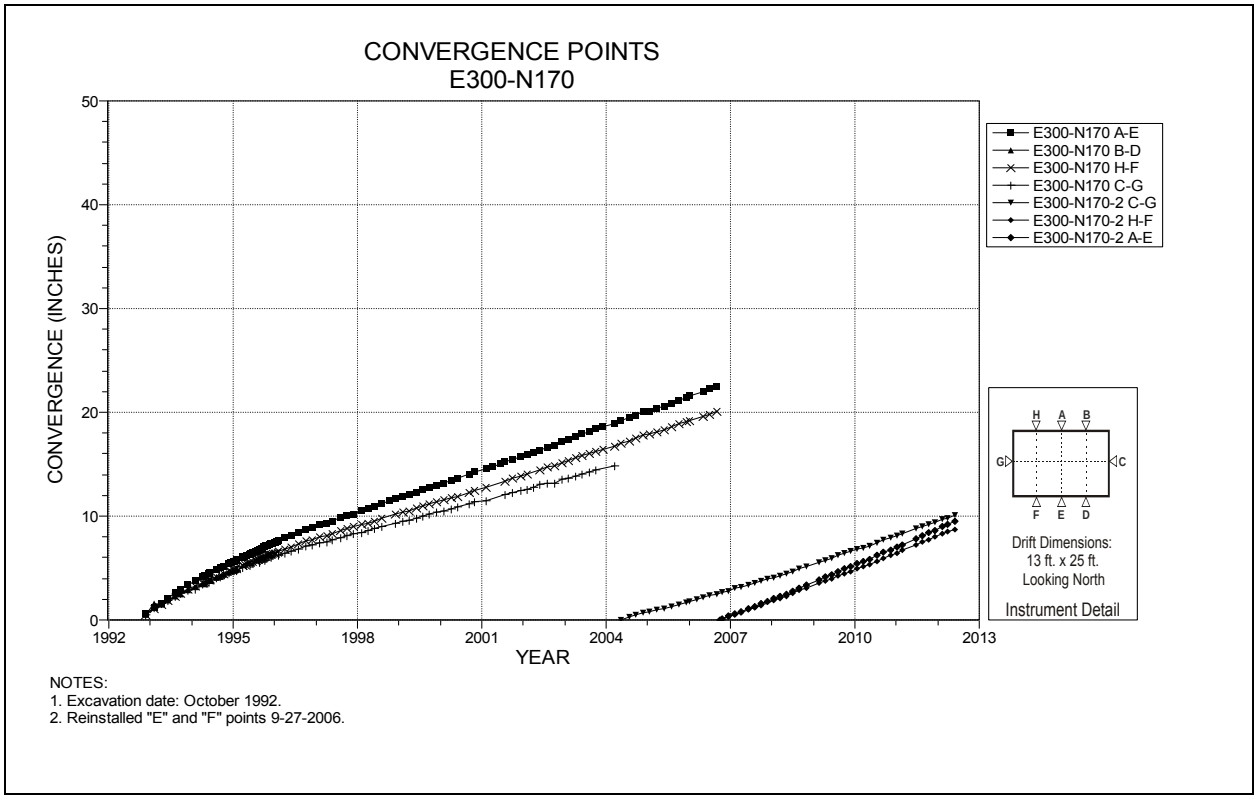


Figure 4-117 Convergence Point Array
E300 N170 – All Chords

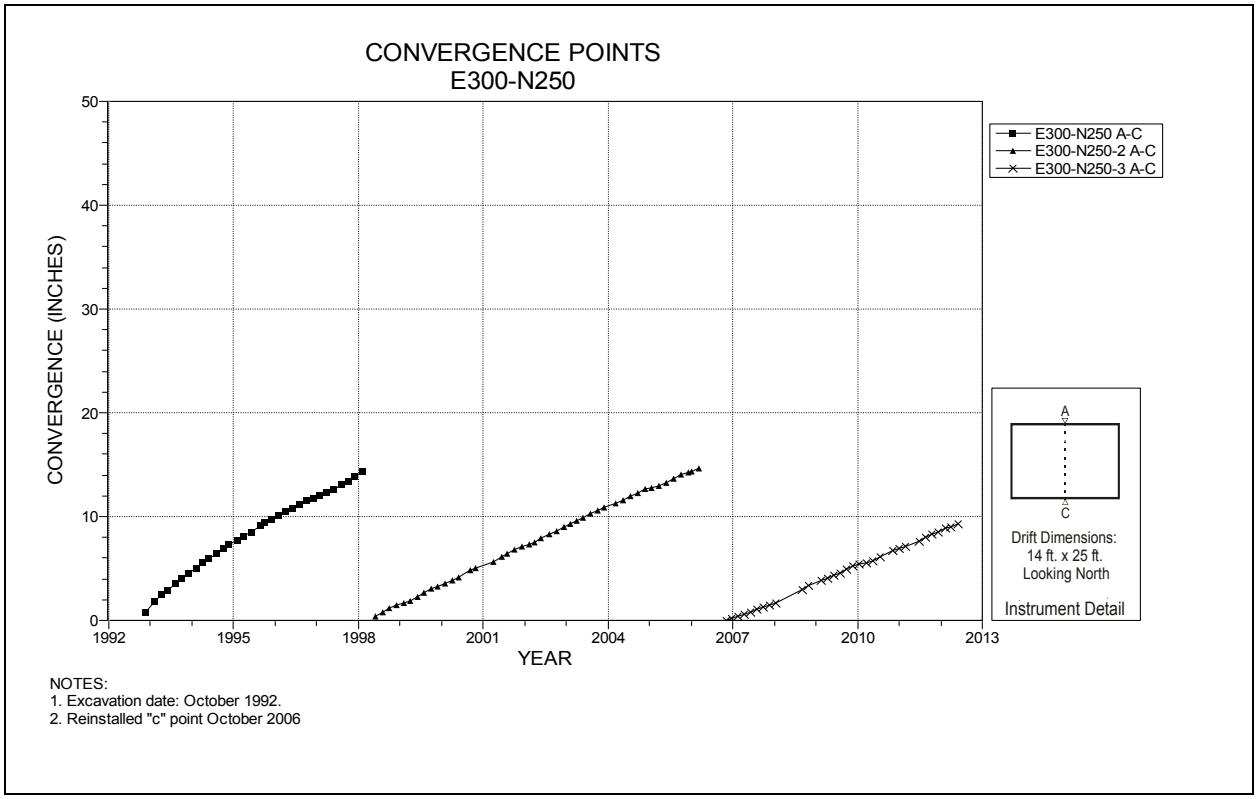


Figure 4-118 Convergence Point Array
E300 N250 – Roof to Floor

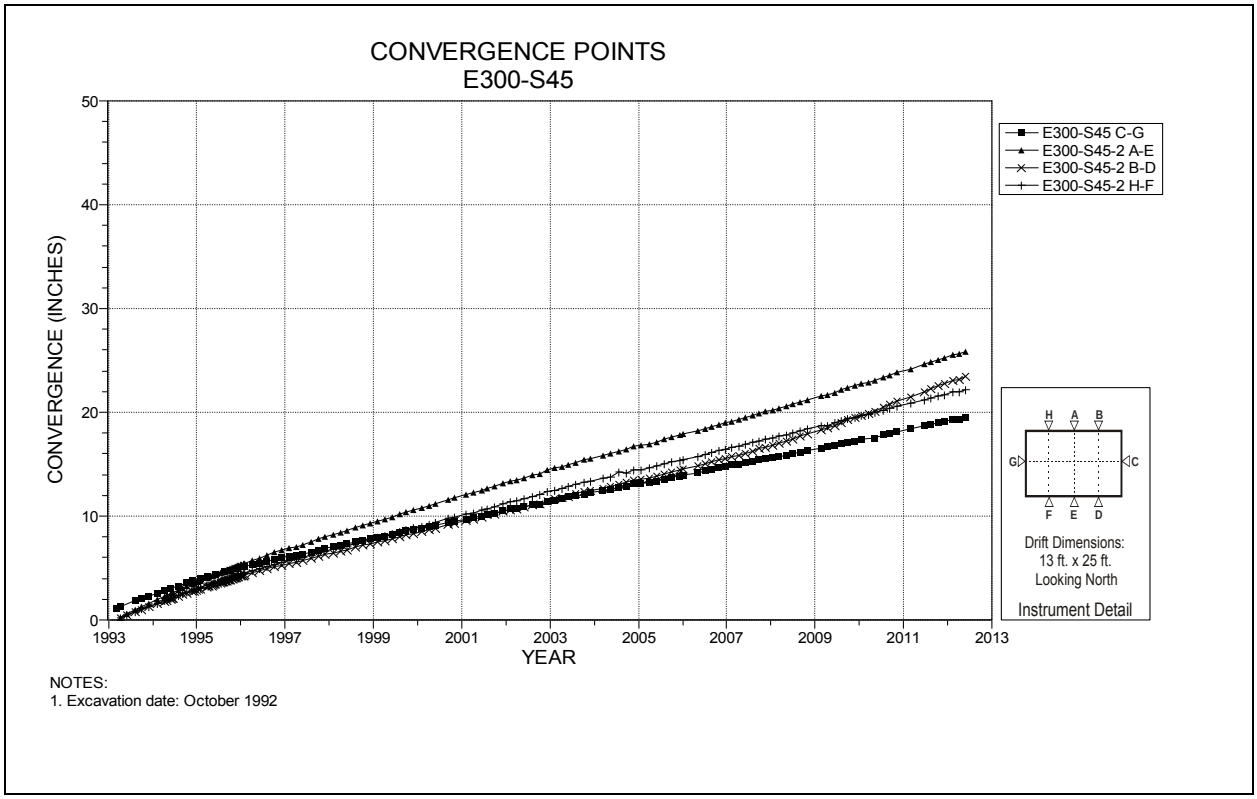


Figure 4-119 Convergence Point Array
E300 S45 – All Chords

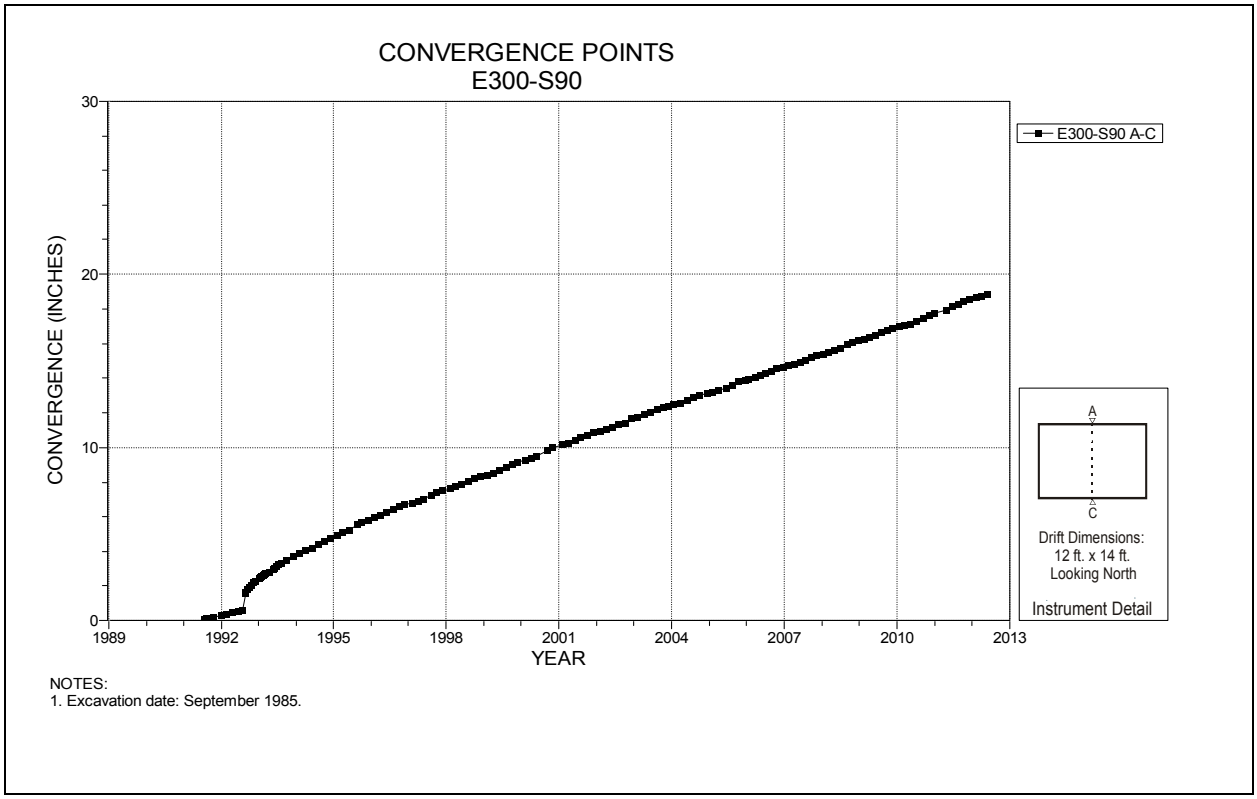


Figure 4-120 Convergence Point Array
E300 S90 – Roof to Floor

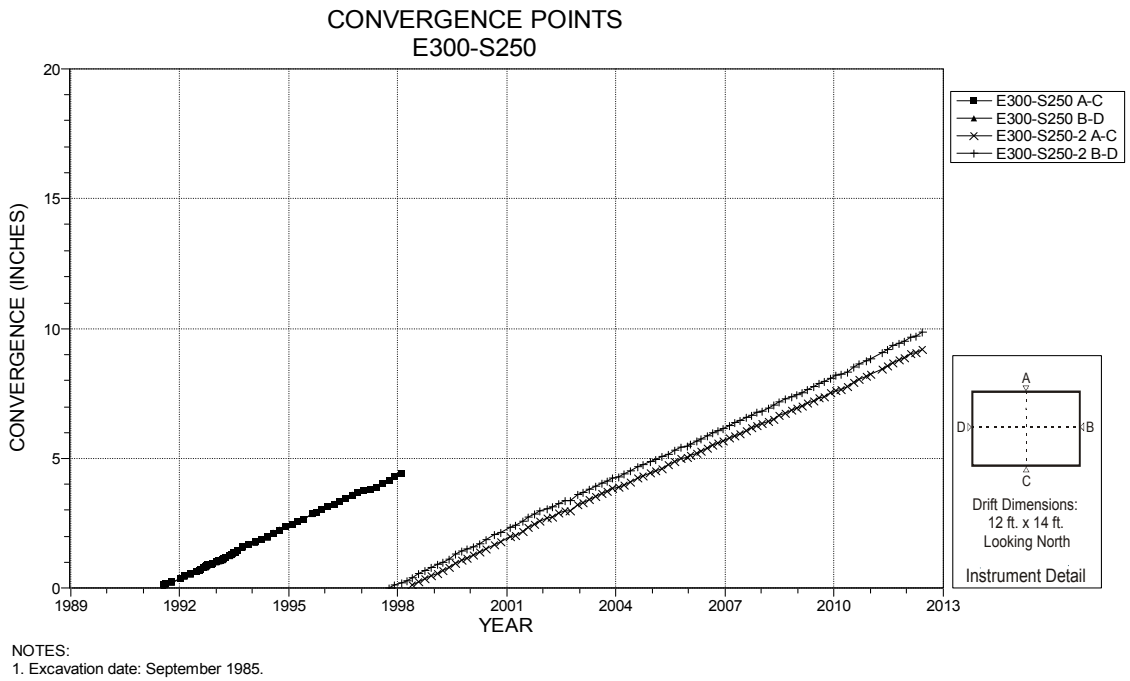


Figure 4-121 Convergence Point Array
E300 S250 – All Chords

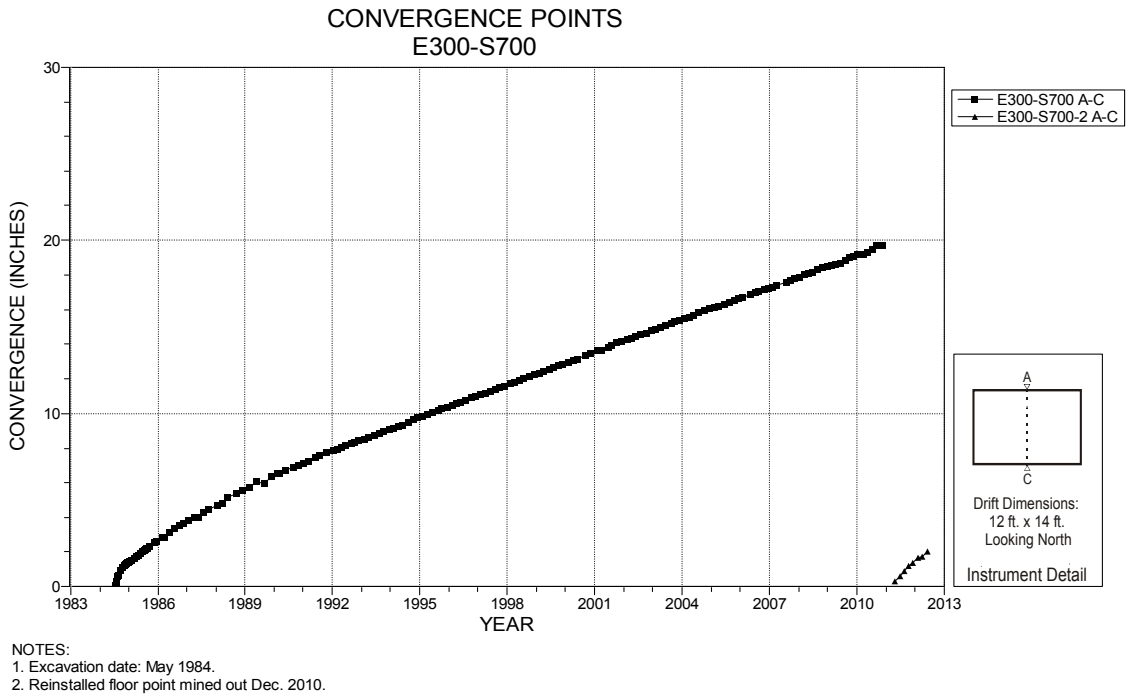


Figure 4-122 Convergence Point Array
E300 S700 – Roof to Floor

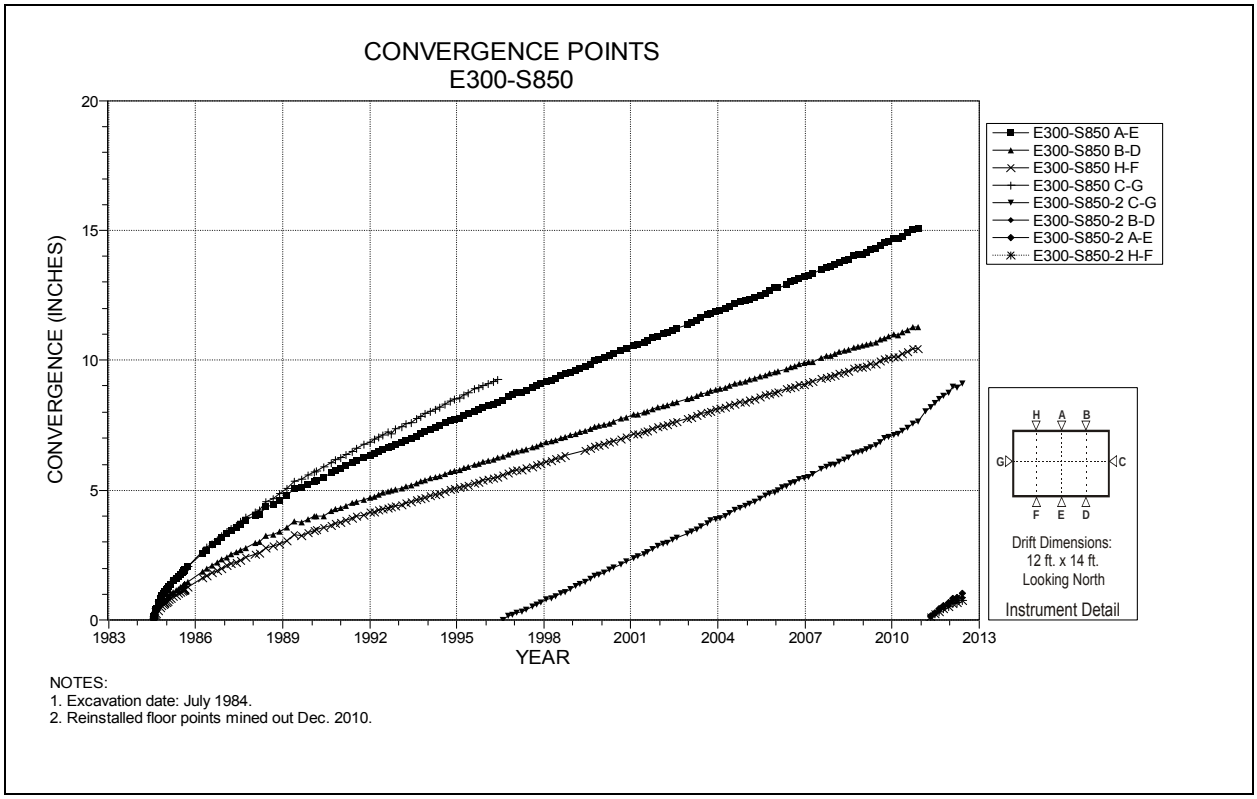


Figure 4-123 Convergence Point Array
E300 S850 – All Chords

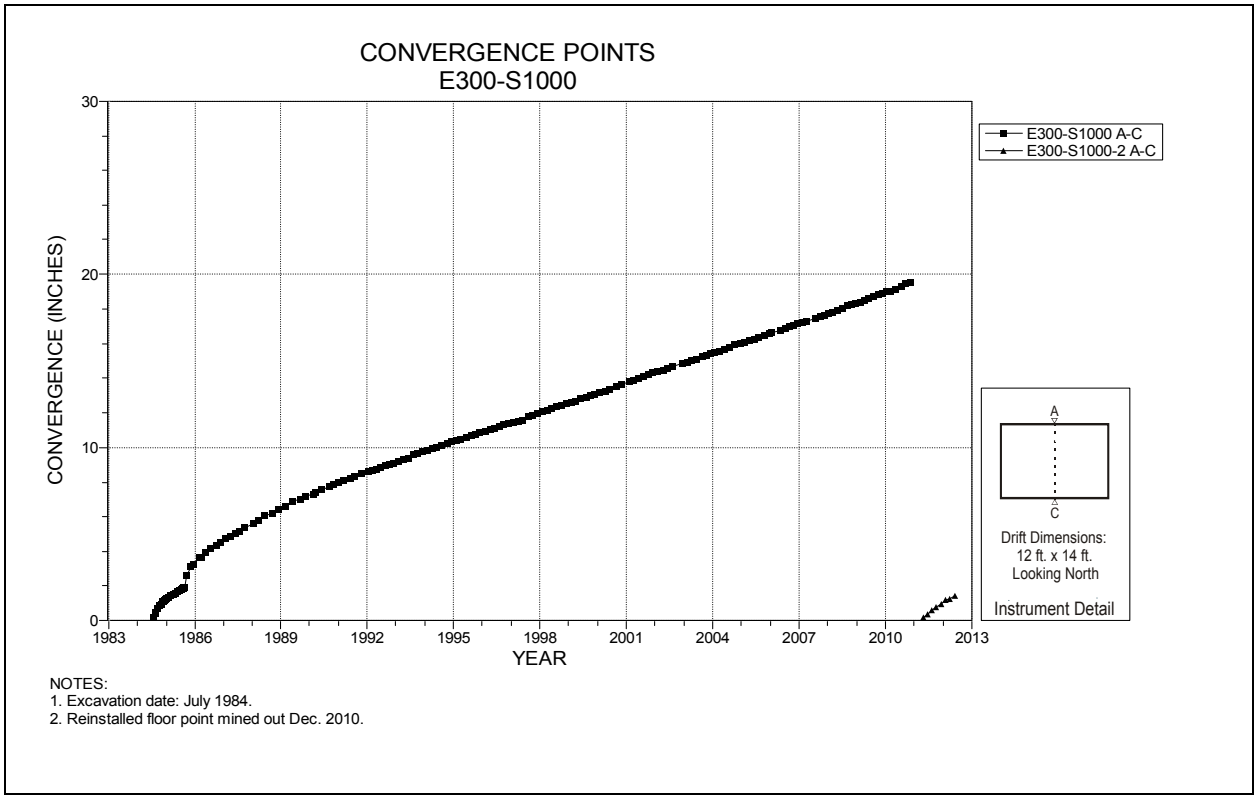


Figure 4-124 Convergence Point Array
E300 S1000 – Roof to Floor

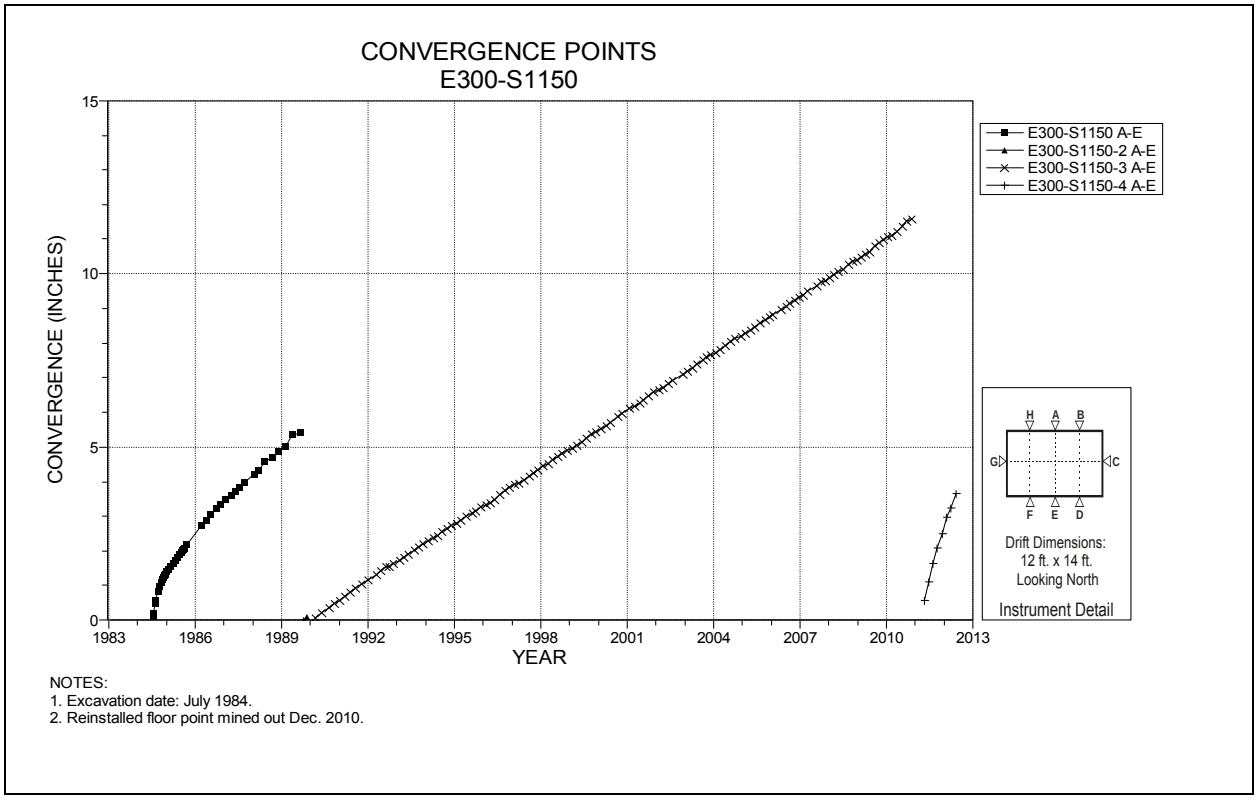


Figure 4-125 Convergence Point Array
E300 S1150 – Roof to Floor

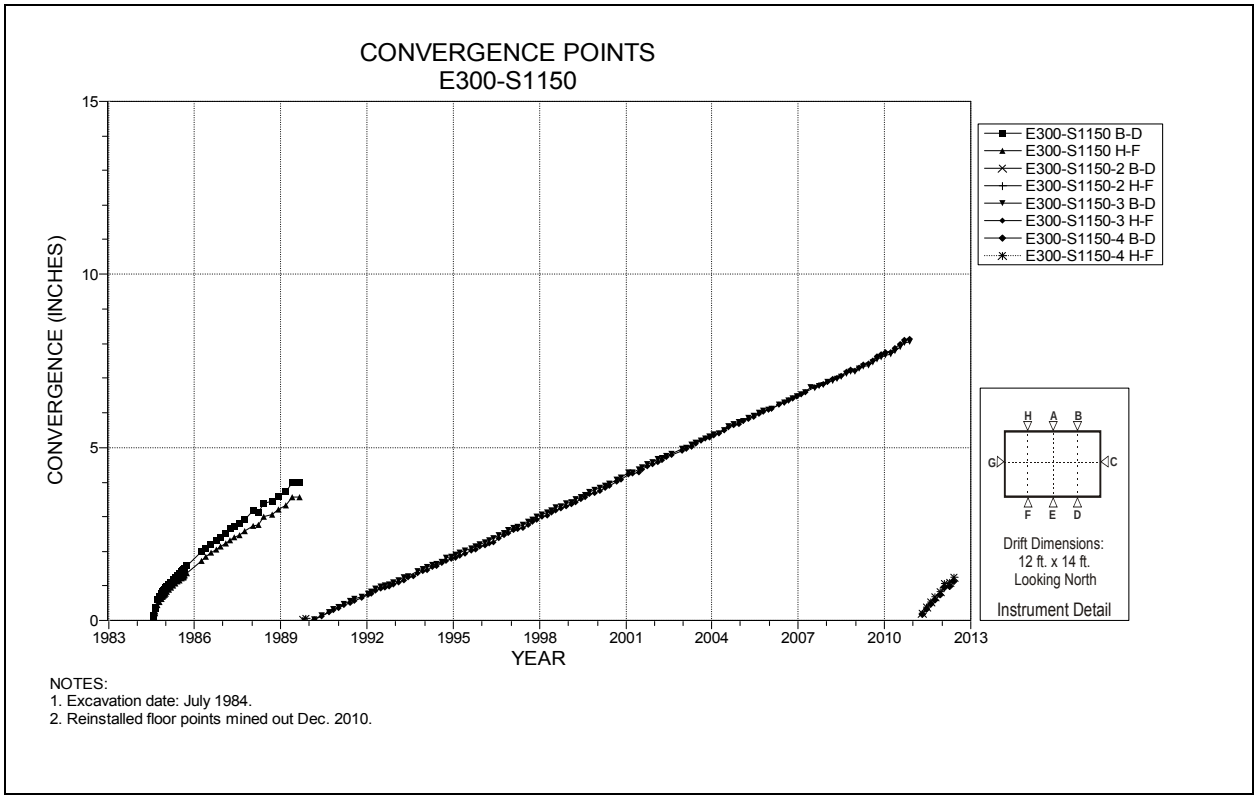


Figure 4-126 Convergence Point Array
E300 S1150 – Roof to Floor – Quarter Points

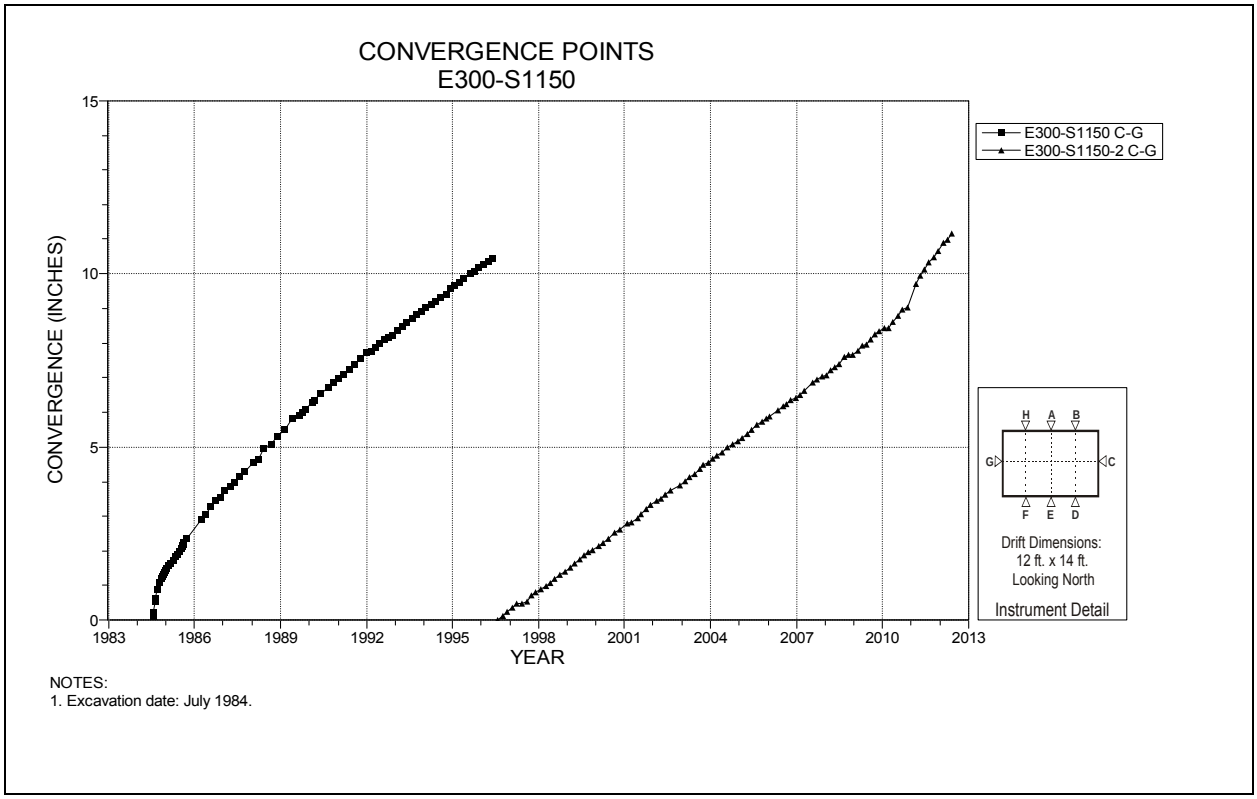


Figure 4-127 Convergence Point Array
E300 S1150 – Rib to Rib

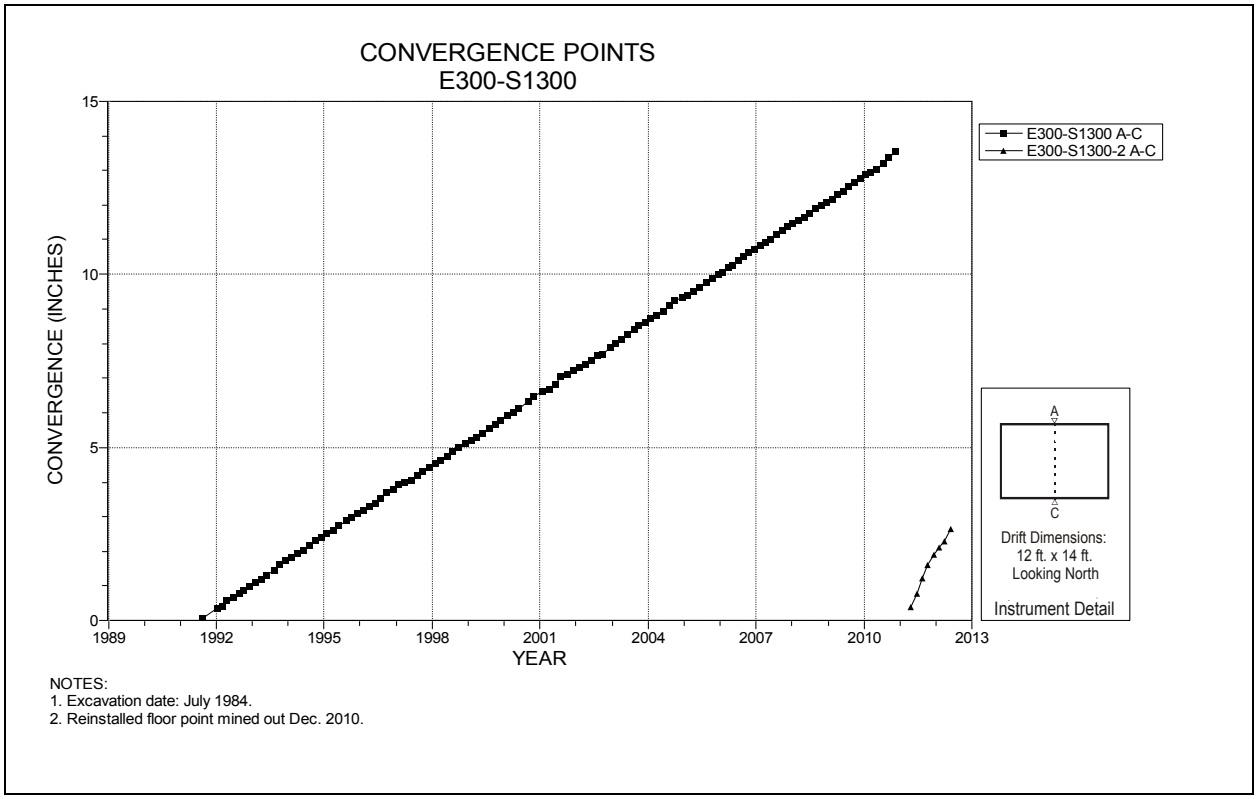


Figure 4-128 Convergence Point Array
E300 S1300 – Roof to Floor

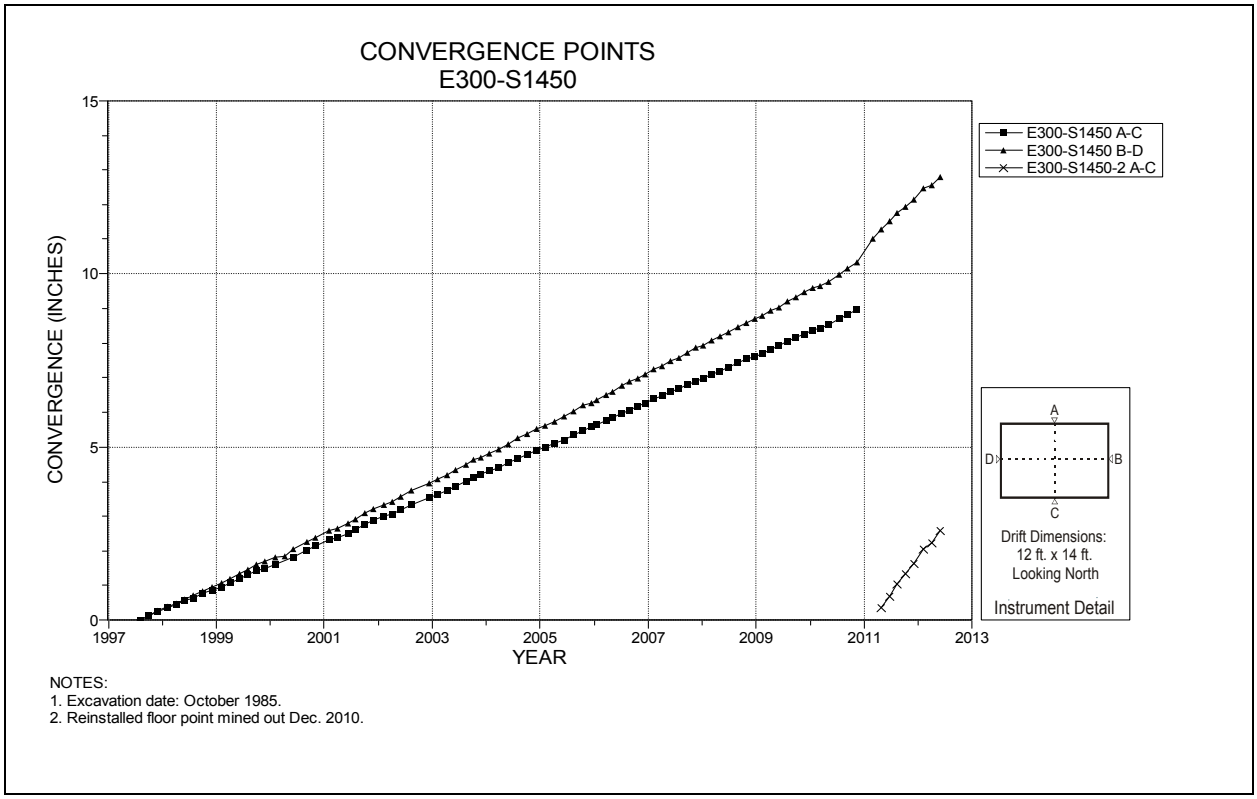


Figure 4-129 Convergence Point Array
E300 S1450 – All Chords

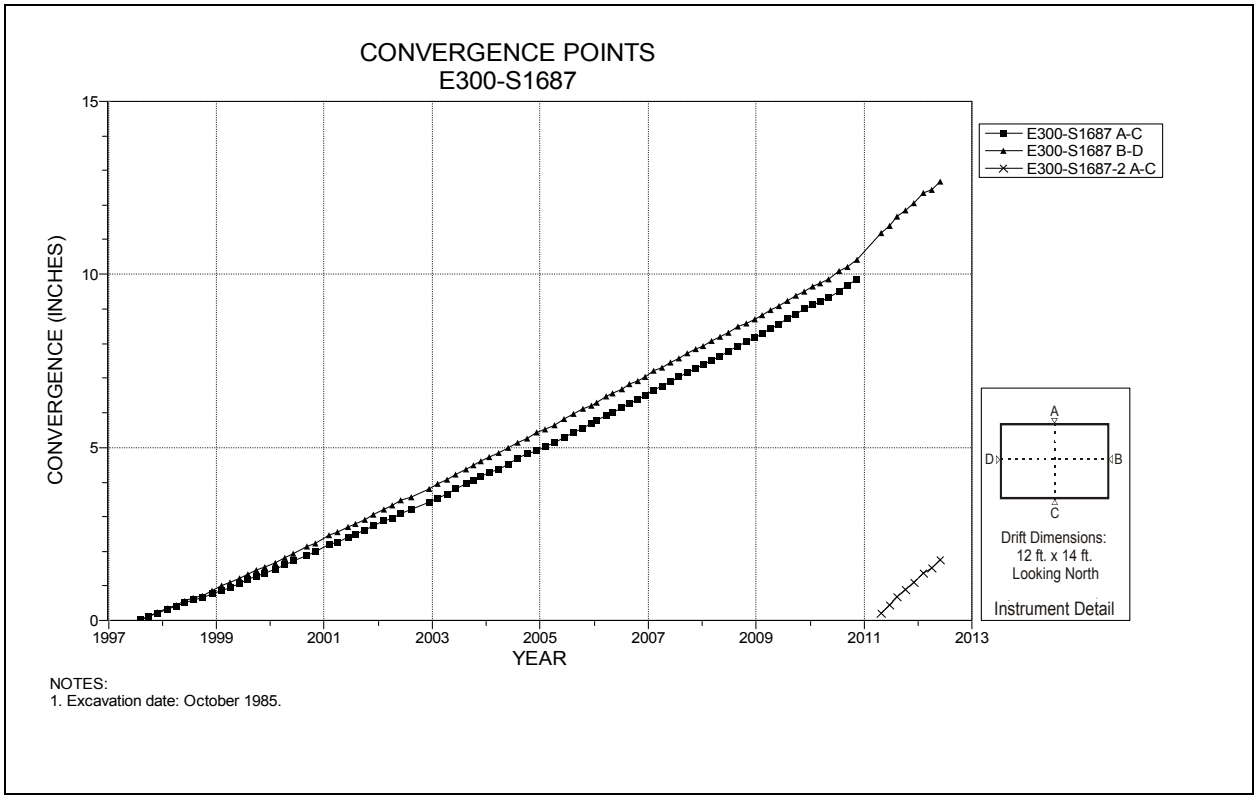


Figure 4-130 Convergence Point Array
E300 S1687 – All Chords

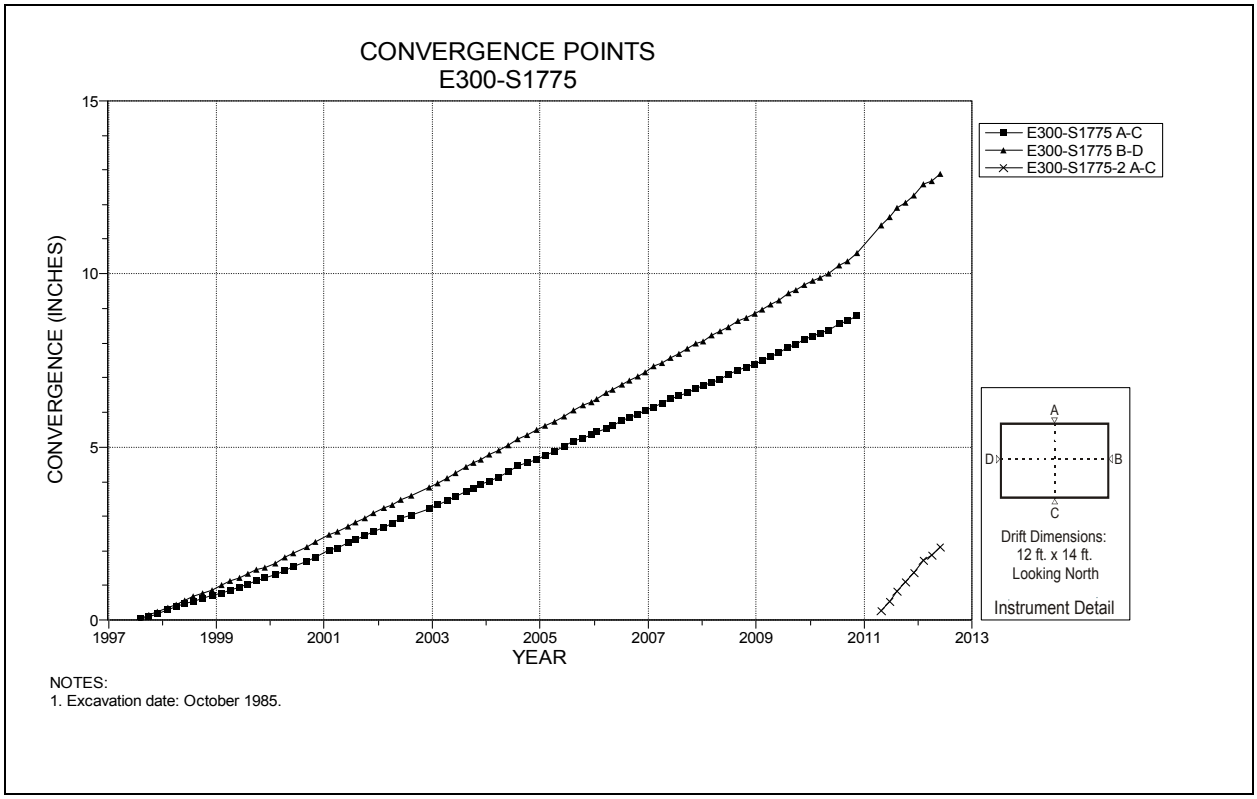


Figure 4-131 Convergence Point Array
E300 S1775 – All Chords

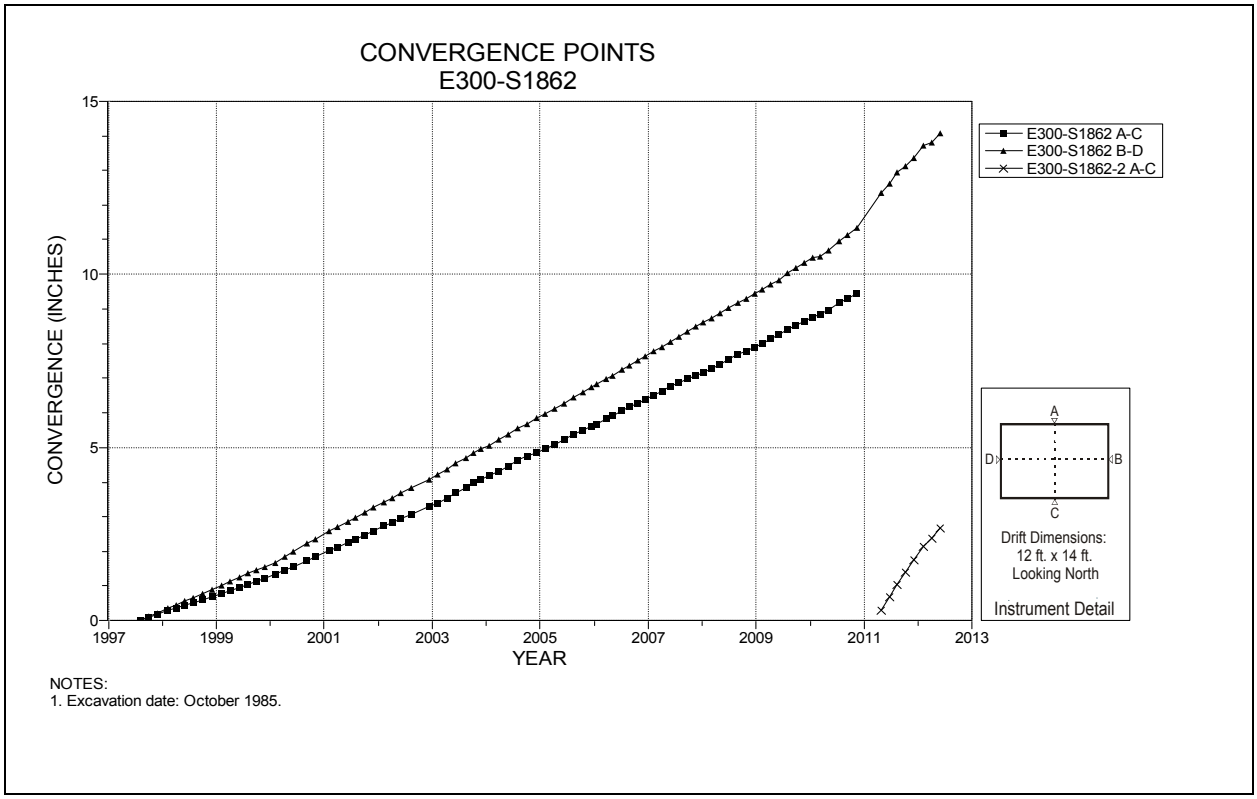


Figure 4-132 Convergence Point Array
E300 S1862 – All Chords

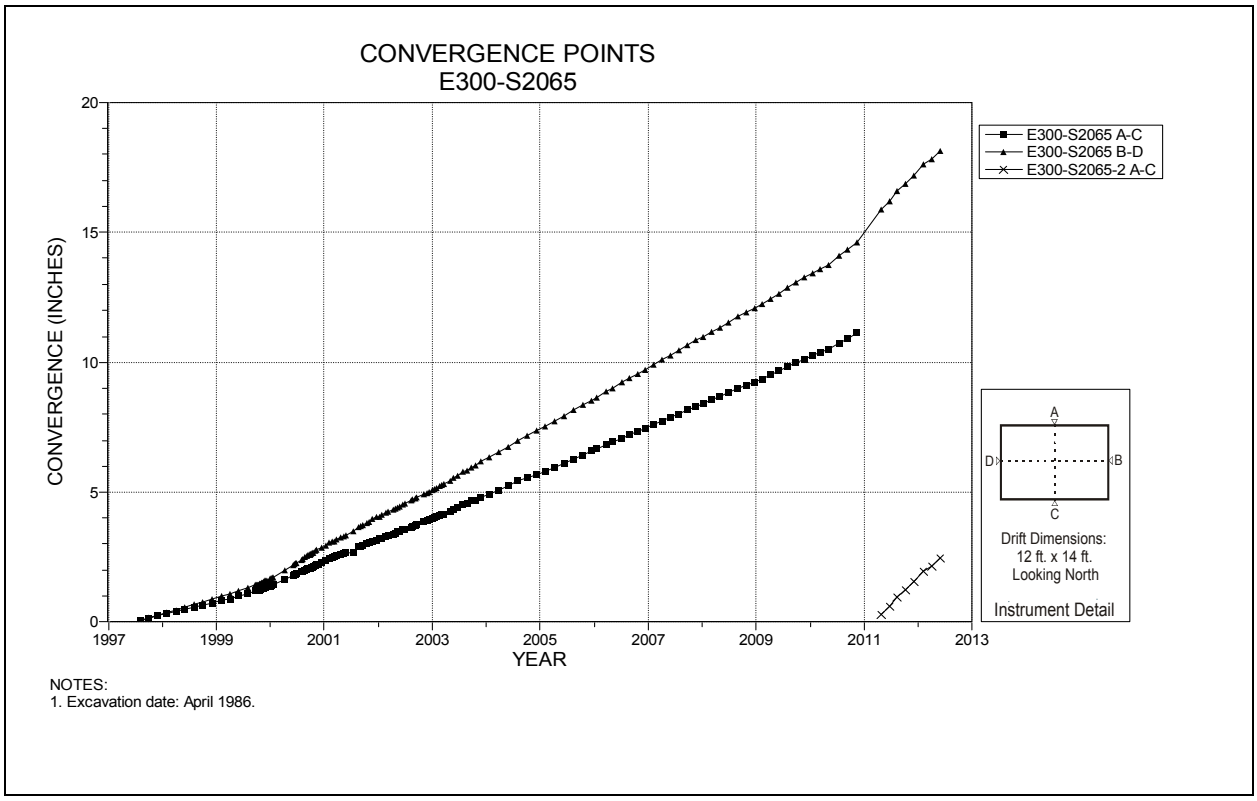


Figure 4-133 Convergence Point Array
E300 S2065 – All Chords

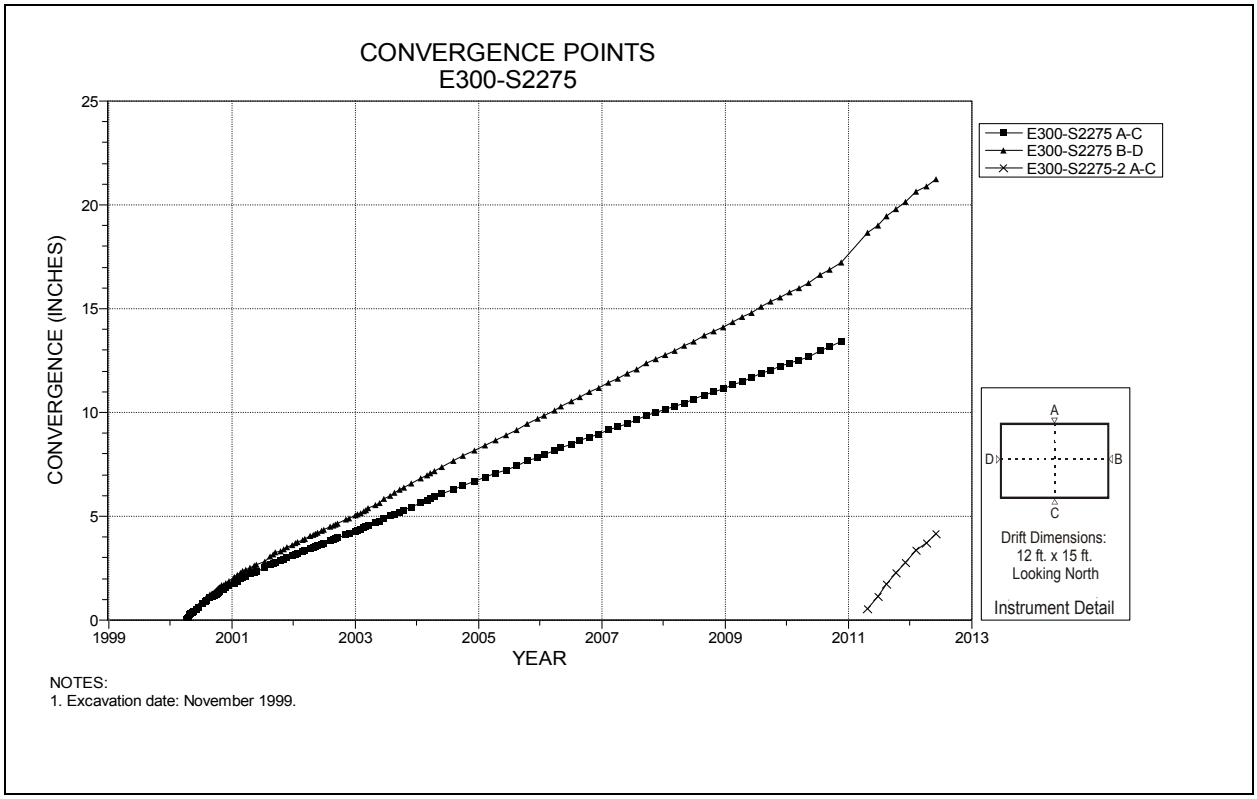


Figure 4-134 Convergence Point Array
E300 S2275 – All Chords

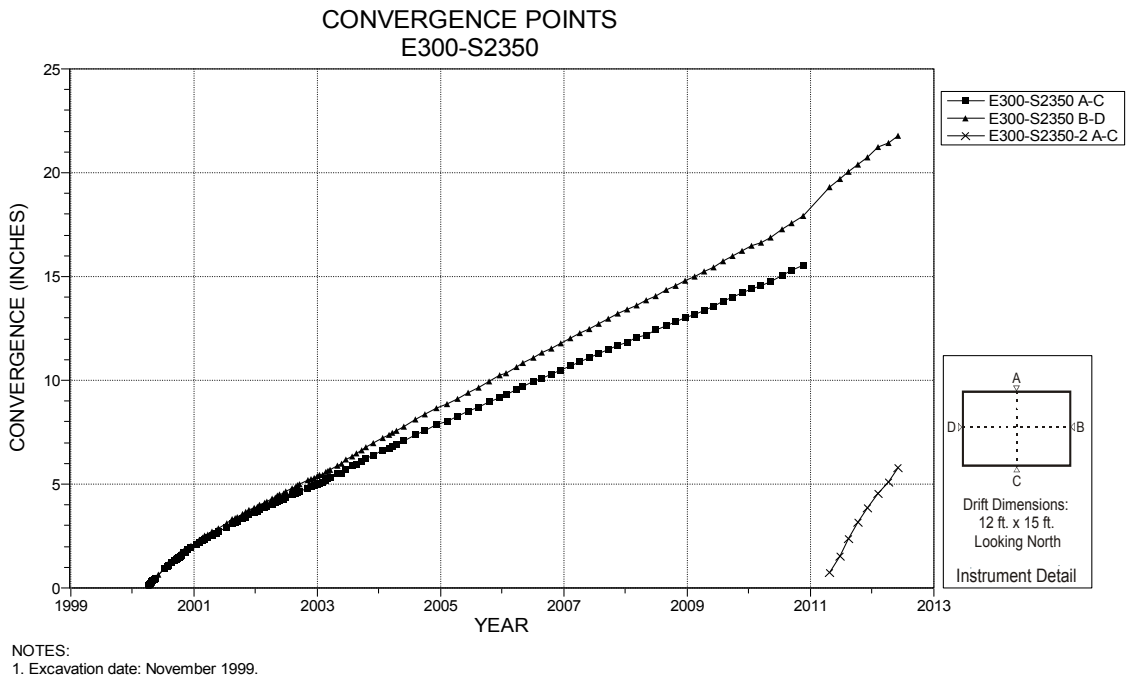


Figure 4-135 Convergence Point Array
E300 S2350 – All Chords

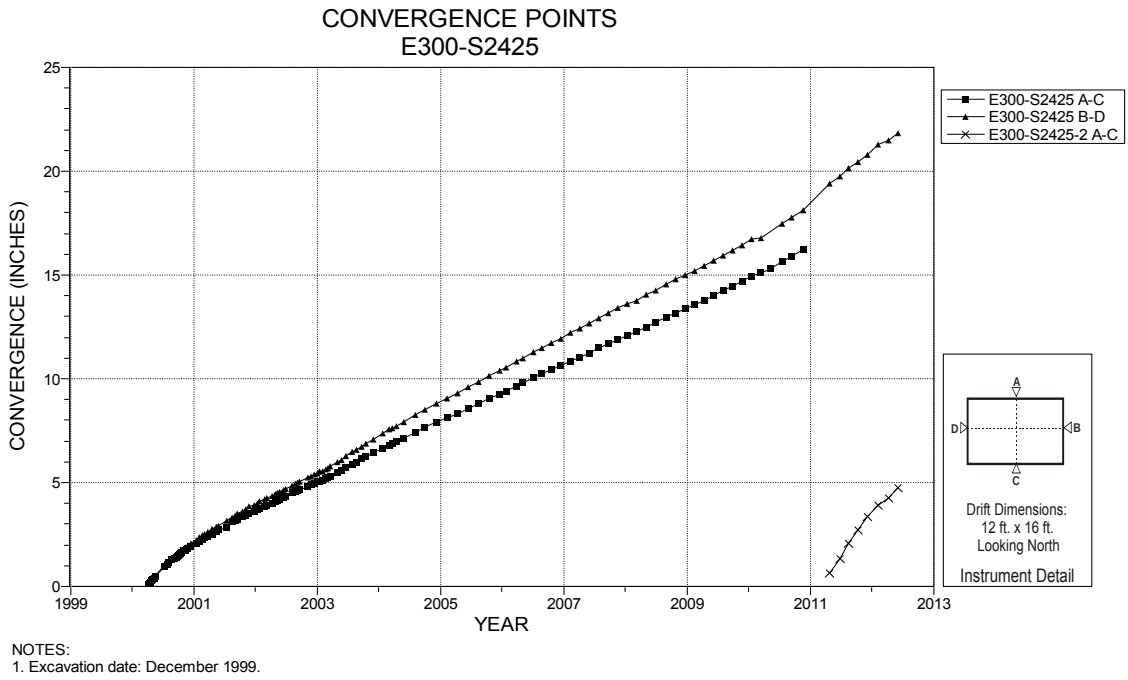


Figure 4-136 Convergence Point Array
E300 S2425 – All Chords

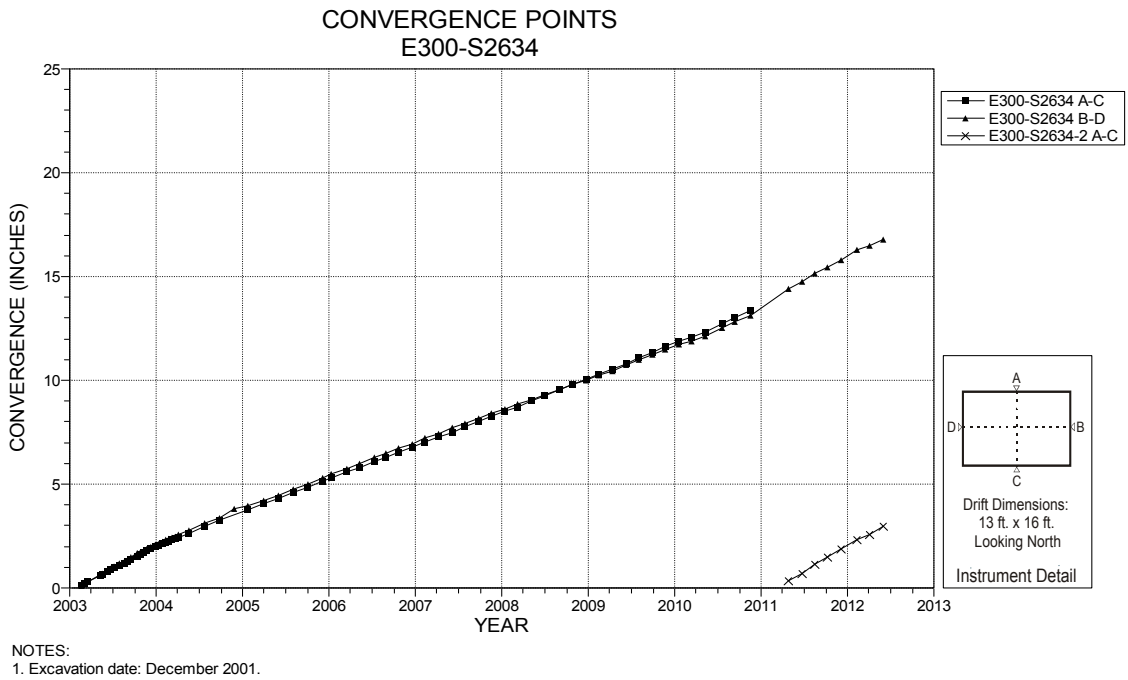


Figure 4-137 Convergence Point Array
E300 S2634 – All Chords

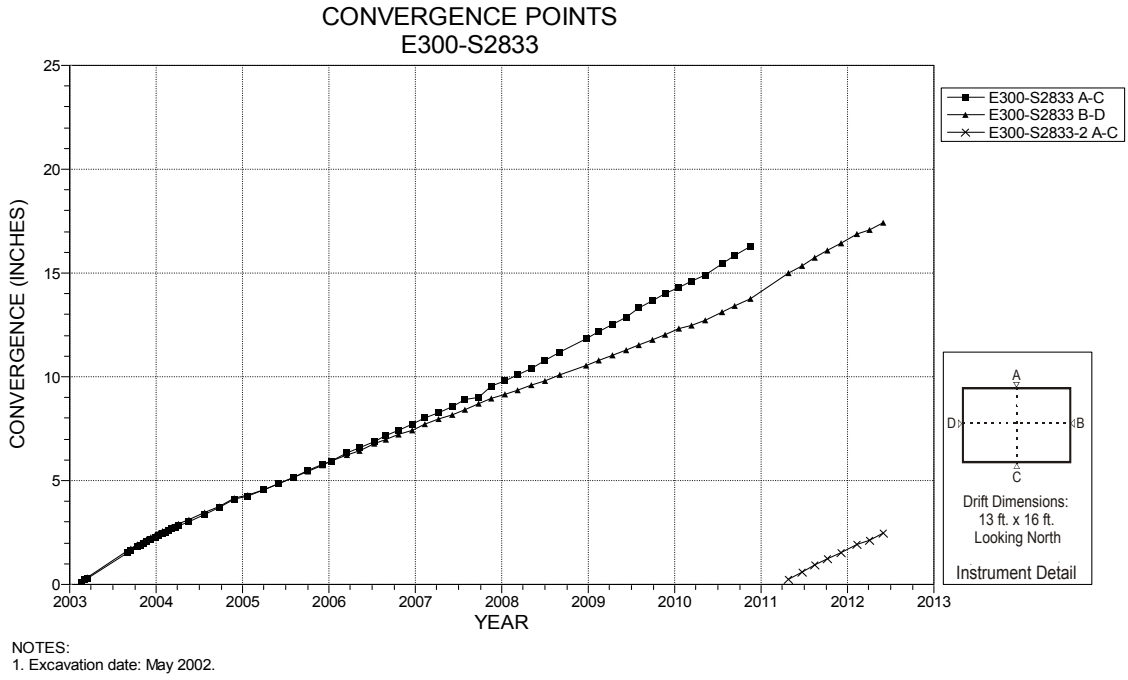


Figure 4-138 Convergence Point Array
E300 S2833 – All Chords

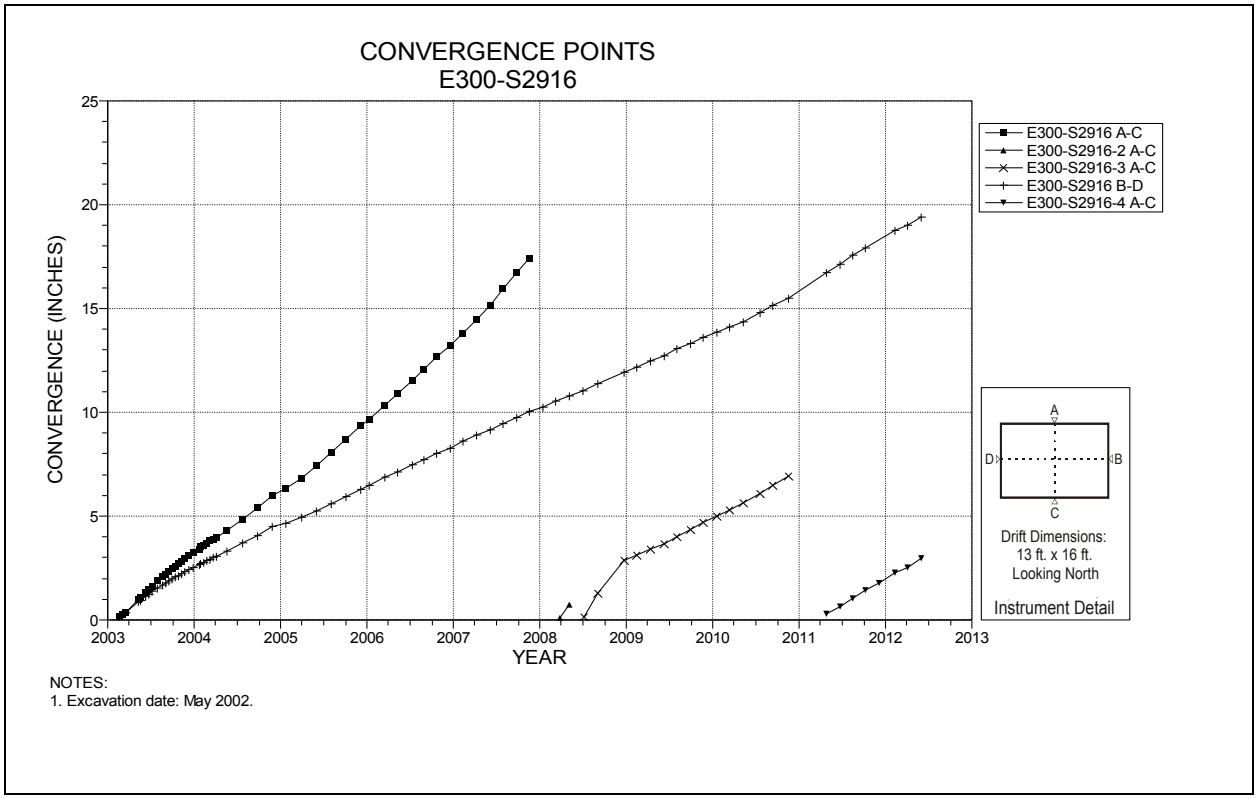


Figure 4-139 Convergence Point Array
E300 S2916 – All Chords

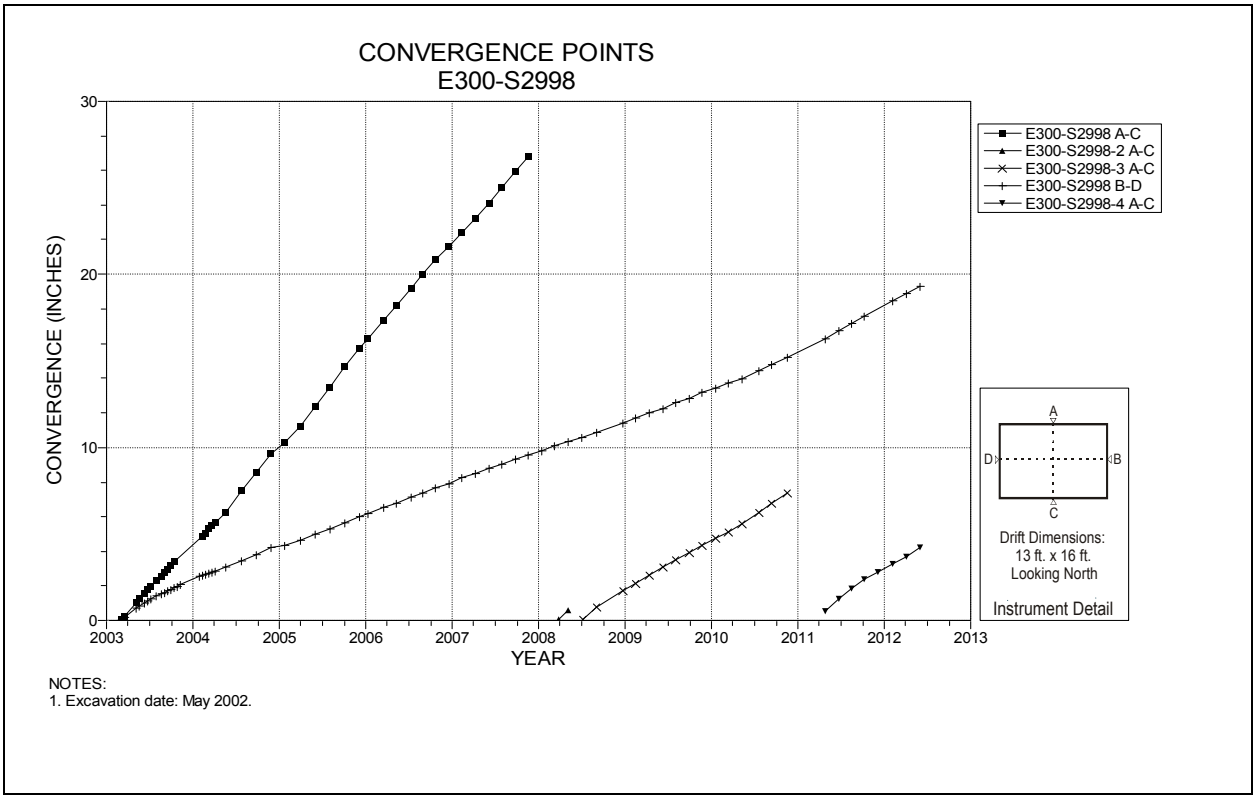


Figure 4-140 Convergence Point Array
E300 S2998 – All Chords

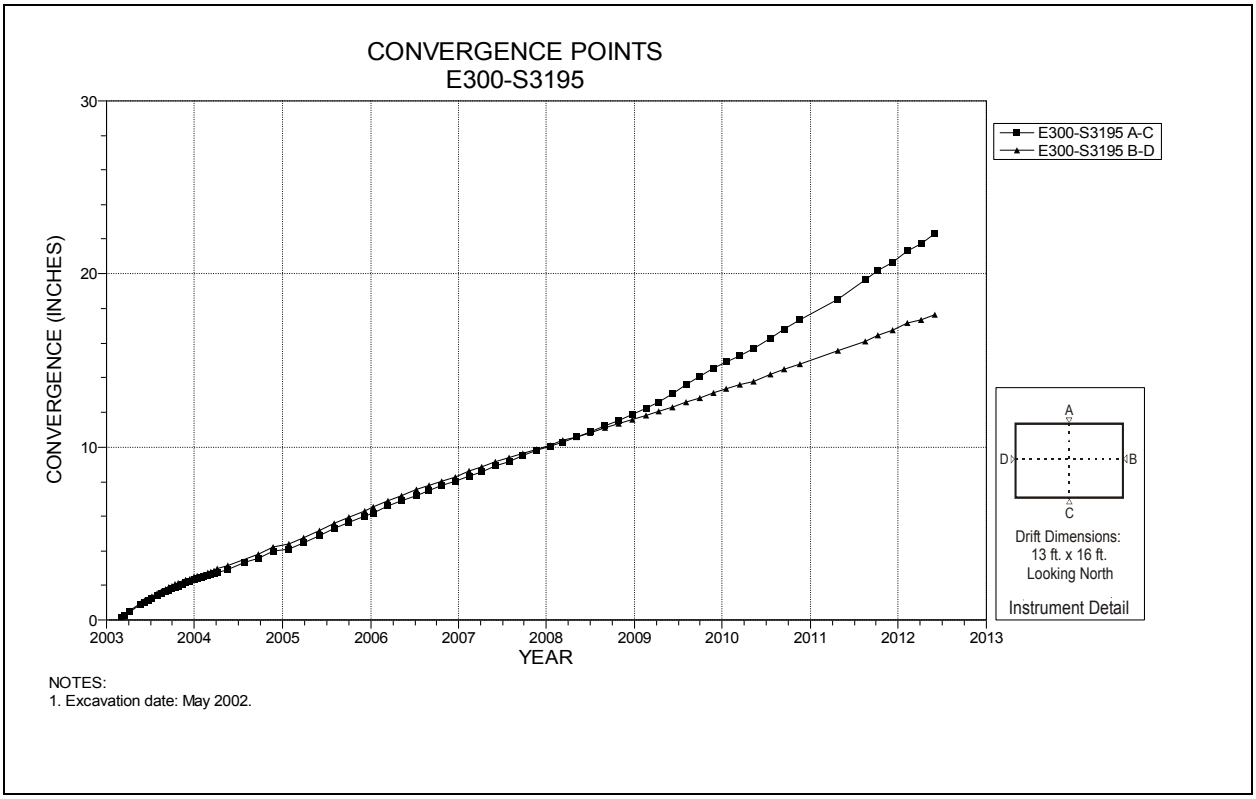


Figure 4-141 Convergence Point Array
E300 S3195 – All Chords

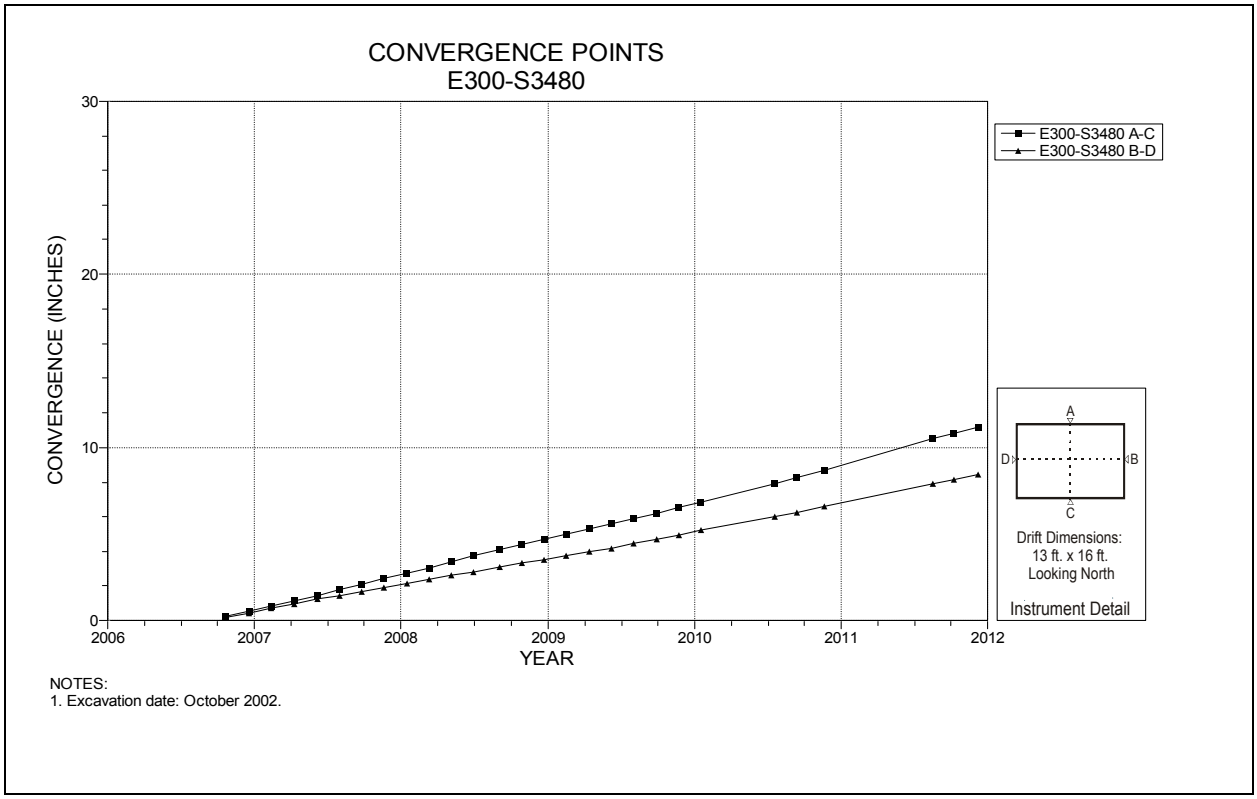


Figure 4-142 Convergence Point Array
E300 S3480 – All Chords

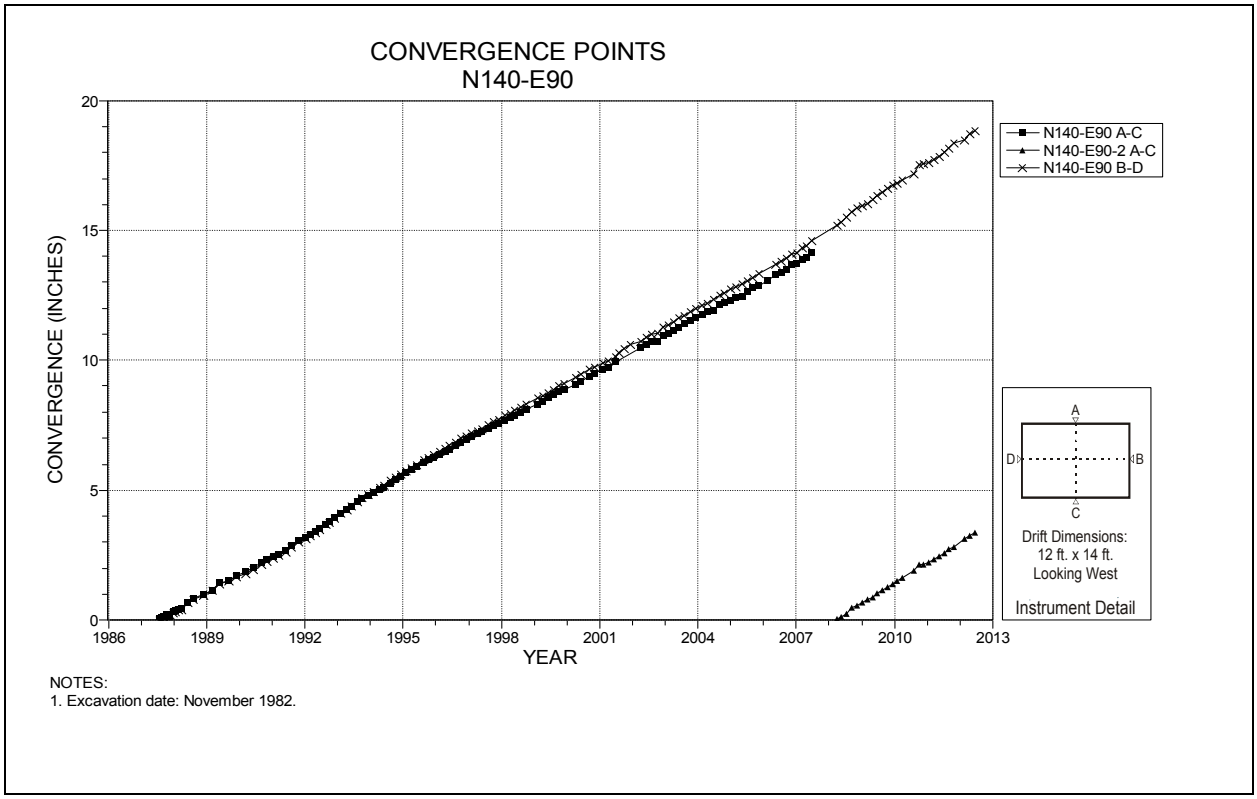


Figure 4-143 Convergence Point Array
N140 E90 – All Chords

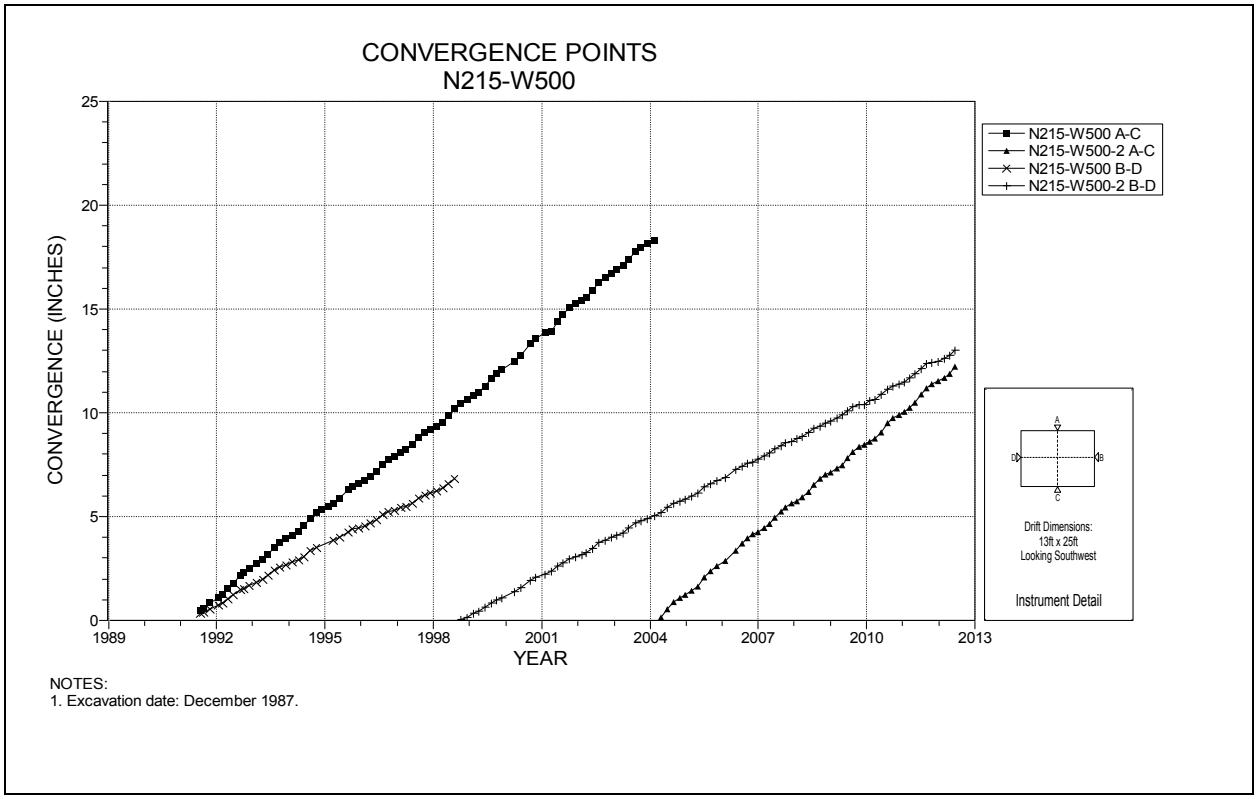


Figure 4-144 Convergence Point Array
N215 W500 – All Chords

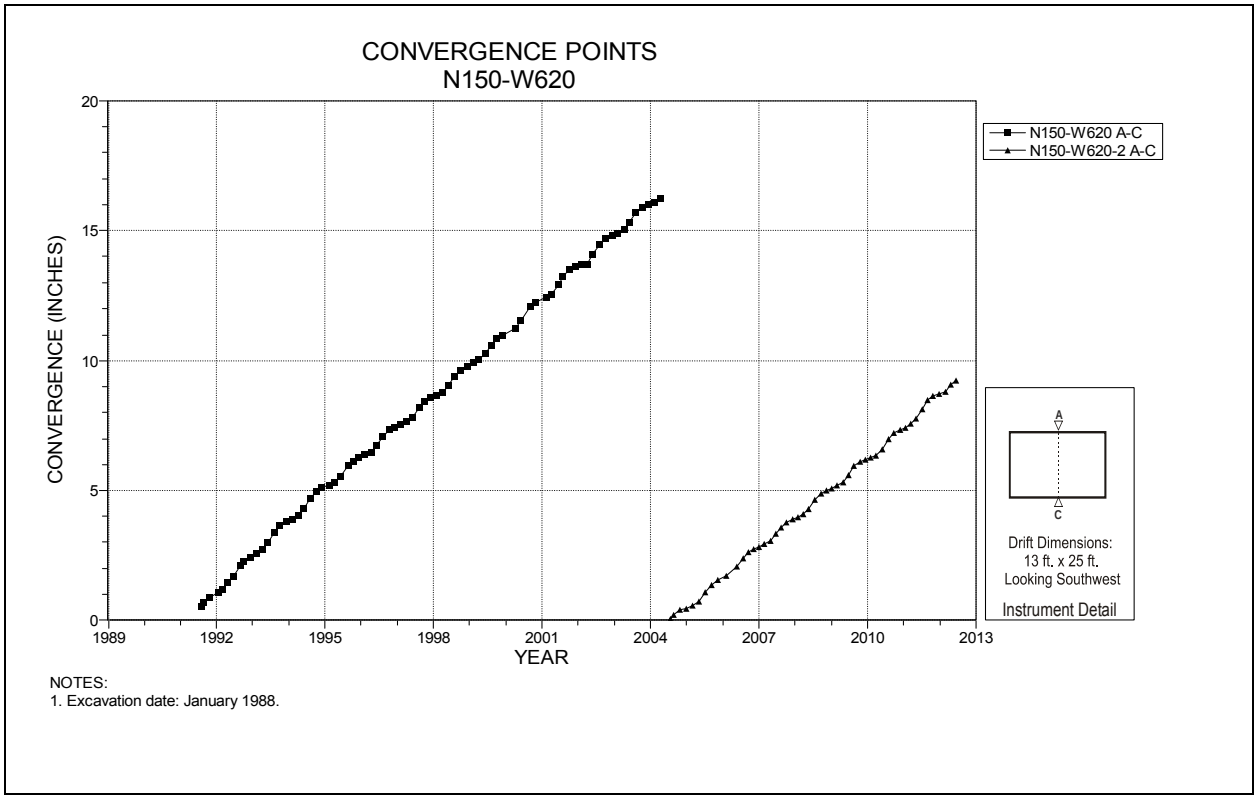


Figure 4-145 Convergence Point Array
N150 W620 – Roof to Floor

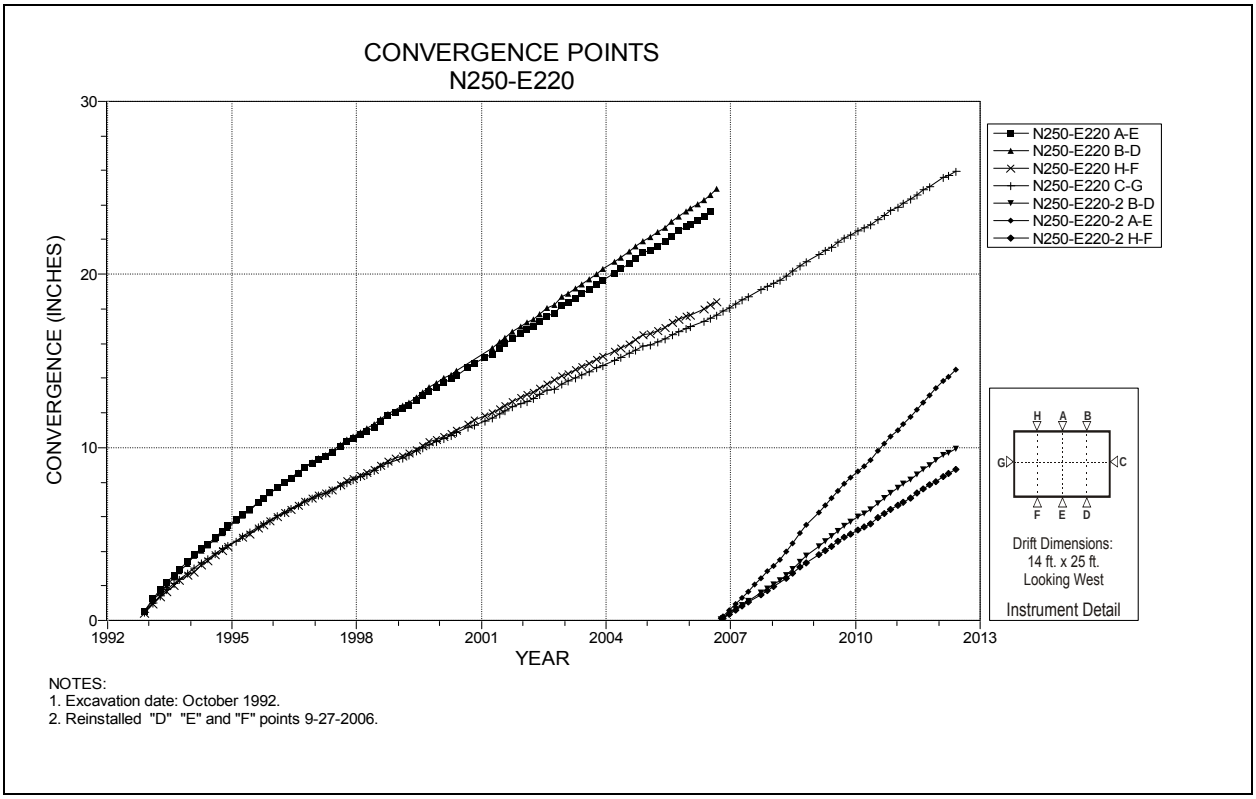


Figure 4-146 Convergence Point Array
N250 E220 – All Chords

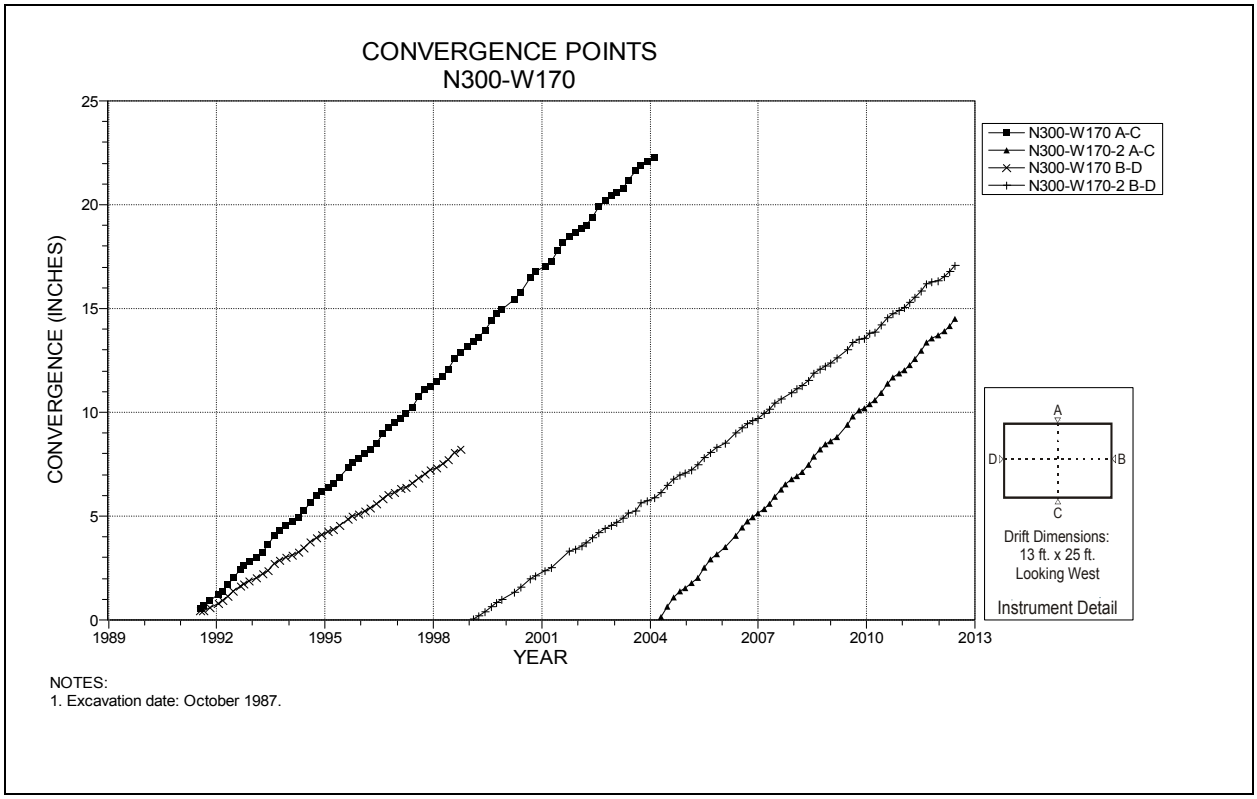


Figure 4-147 Convergence Point Array
N300 W170 – All Chords

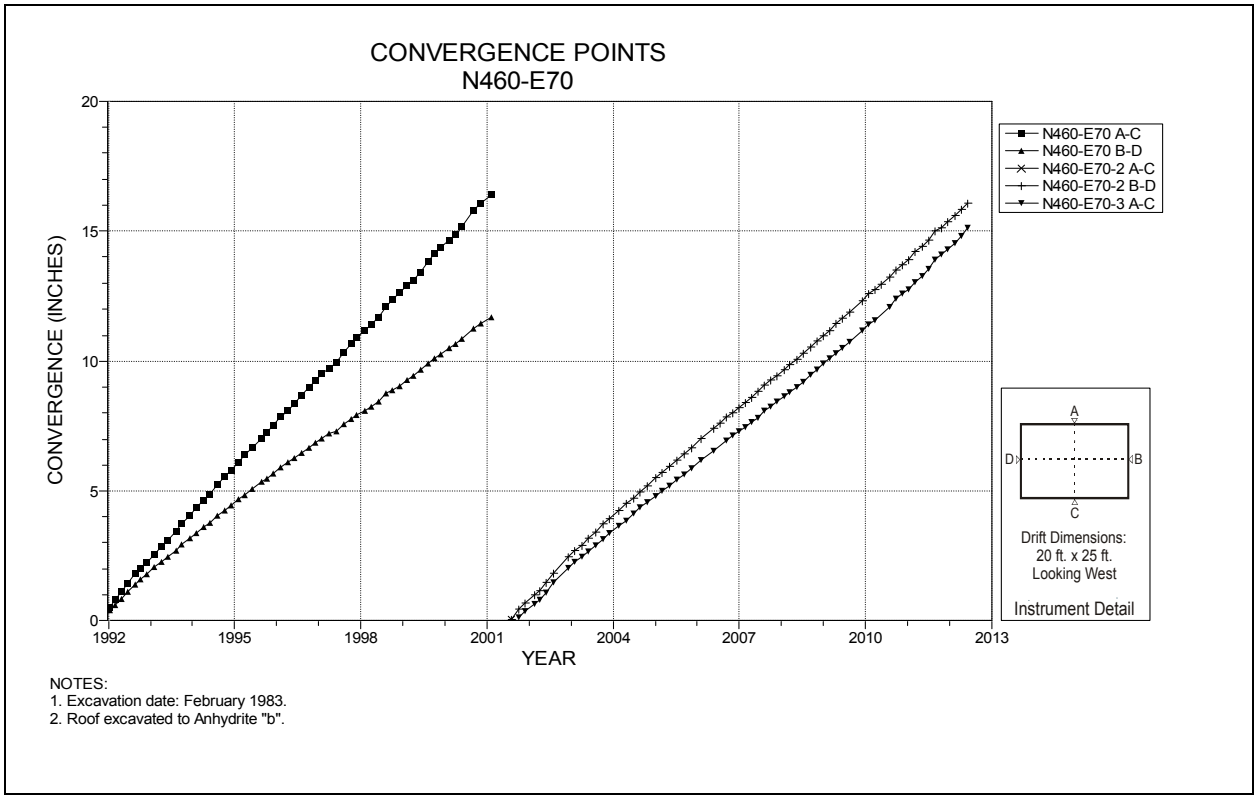


Figure 4-148 Convergence Point Array
N460 E70 – All Chords

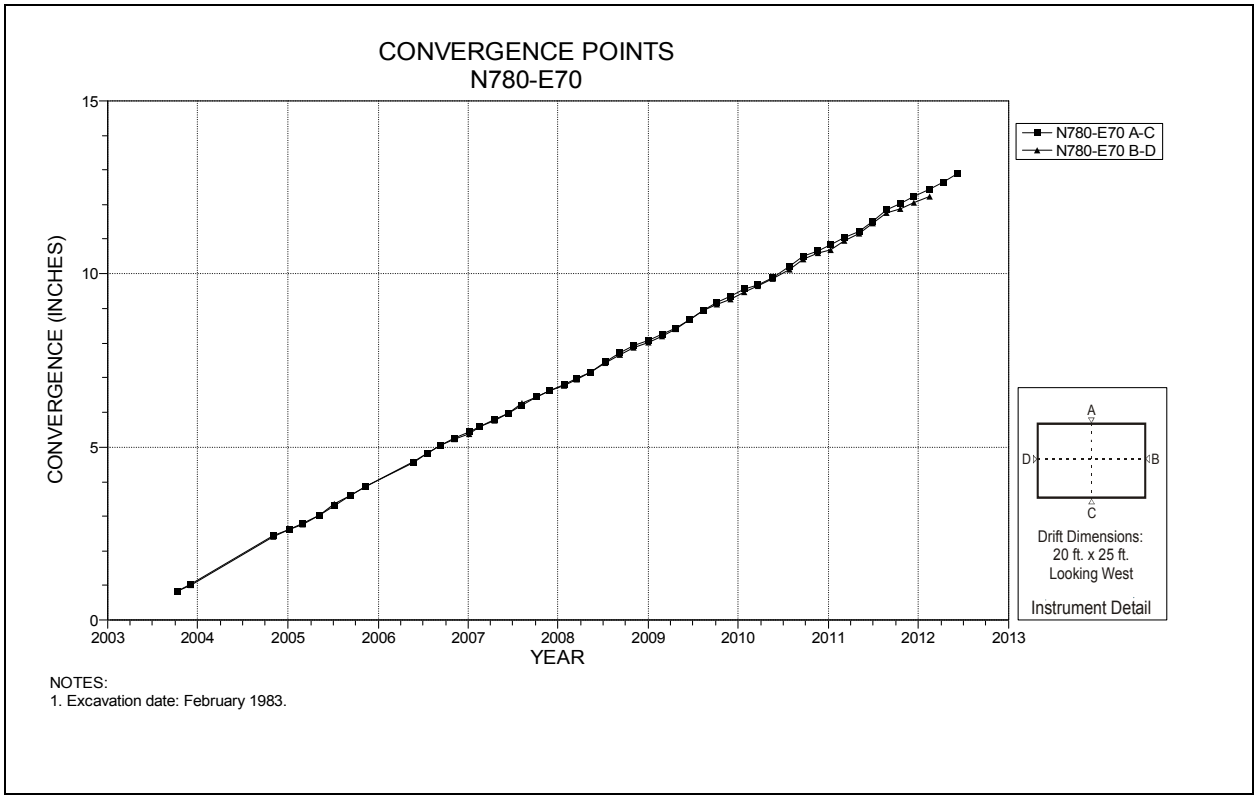


Figure 4-149 Convergence Point Array
N780 E70 – All Chords

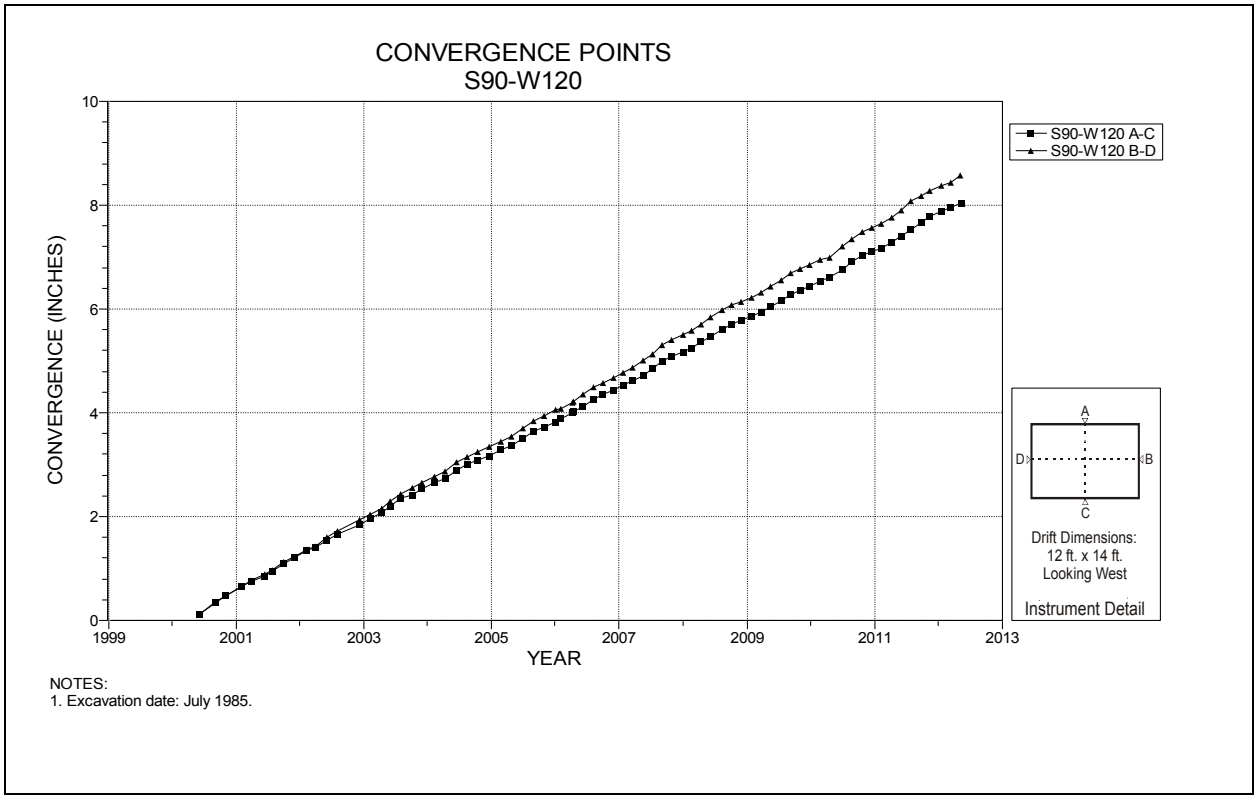


Figure 4-150 Convergence Point Array
S90 W120 – All Chords

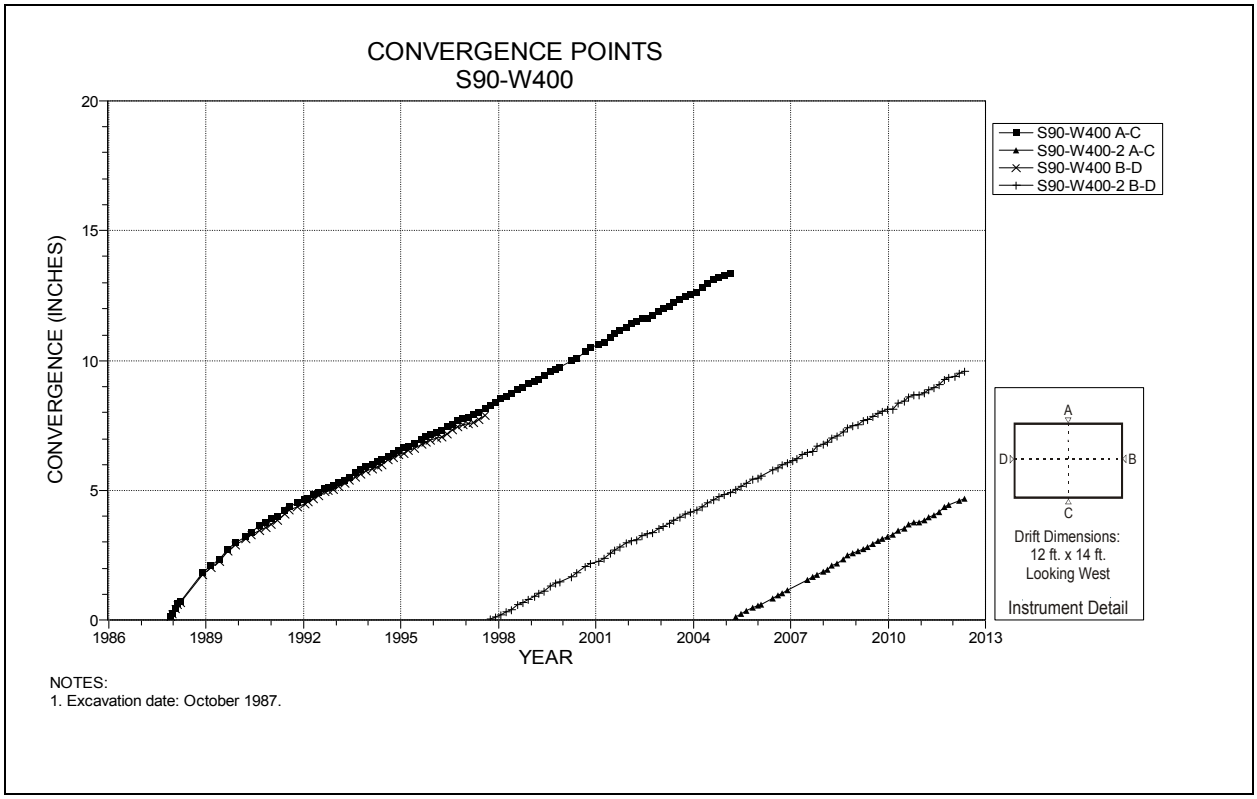


Figure 4-151 Convergence Point Array
S90 W400 – All Chords

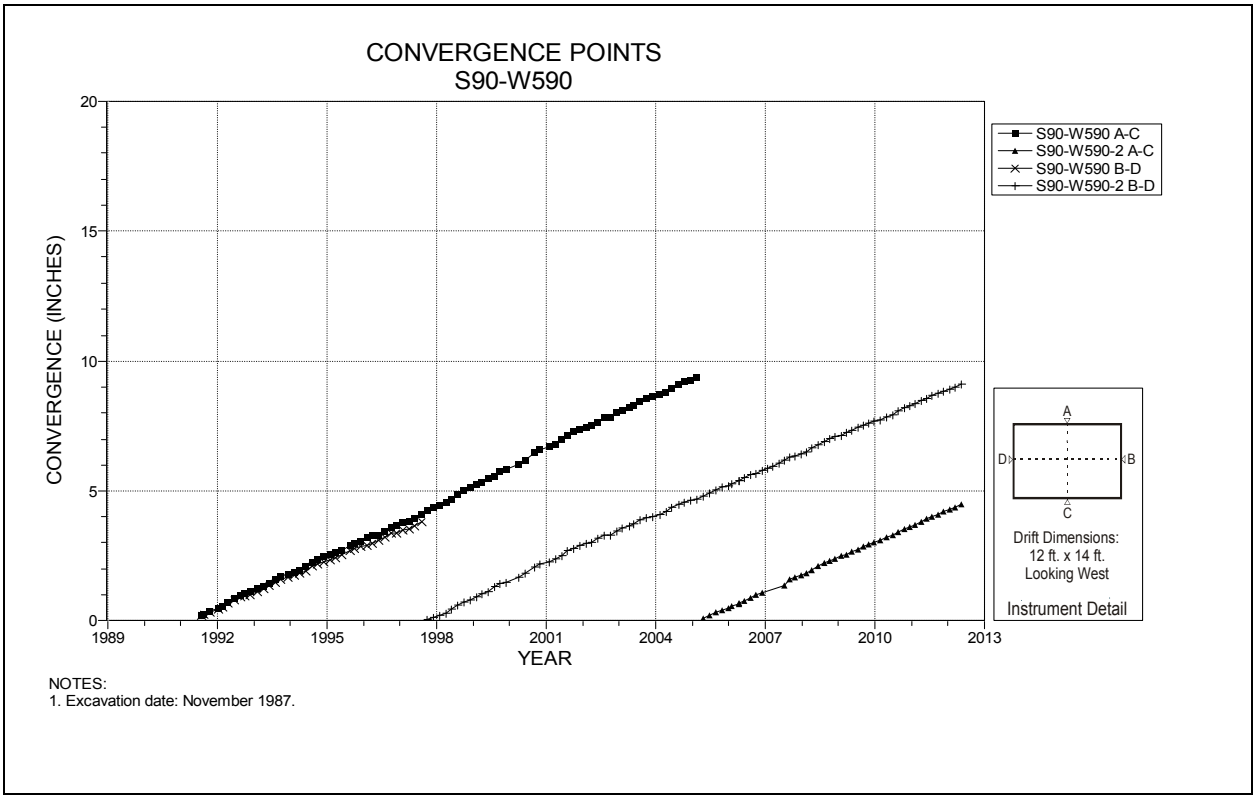


Figure 4-152 Convergence Point Array
S90 W590 – All Chords

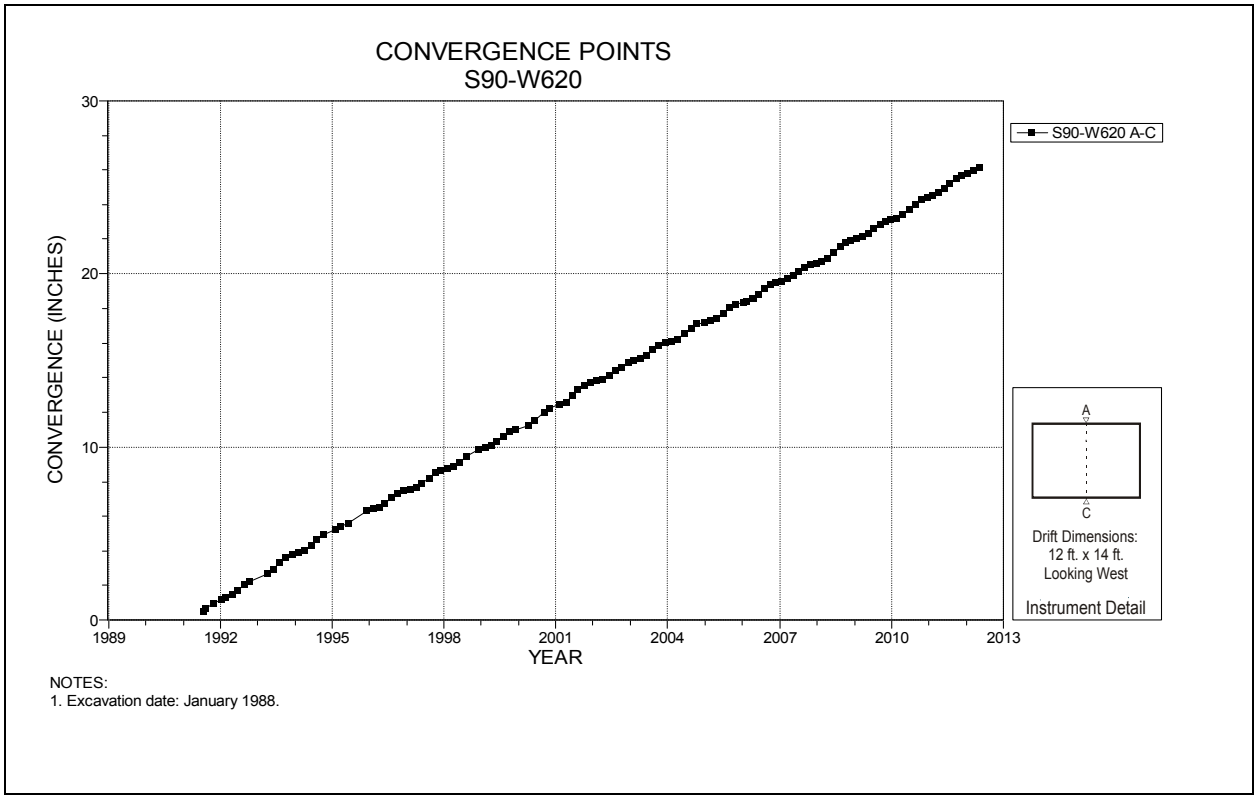


Figure 4-153 Convergence Point Array
S90 W620 – Roof to Floor

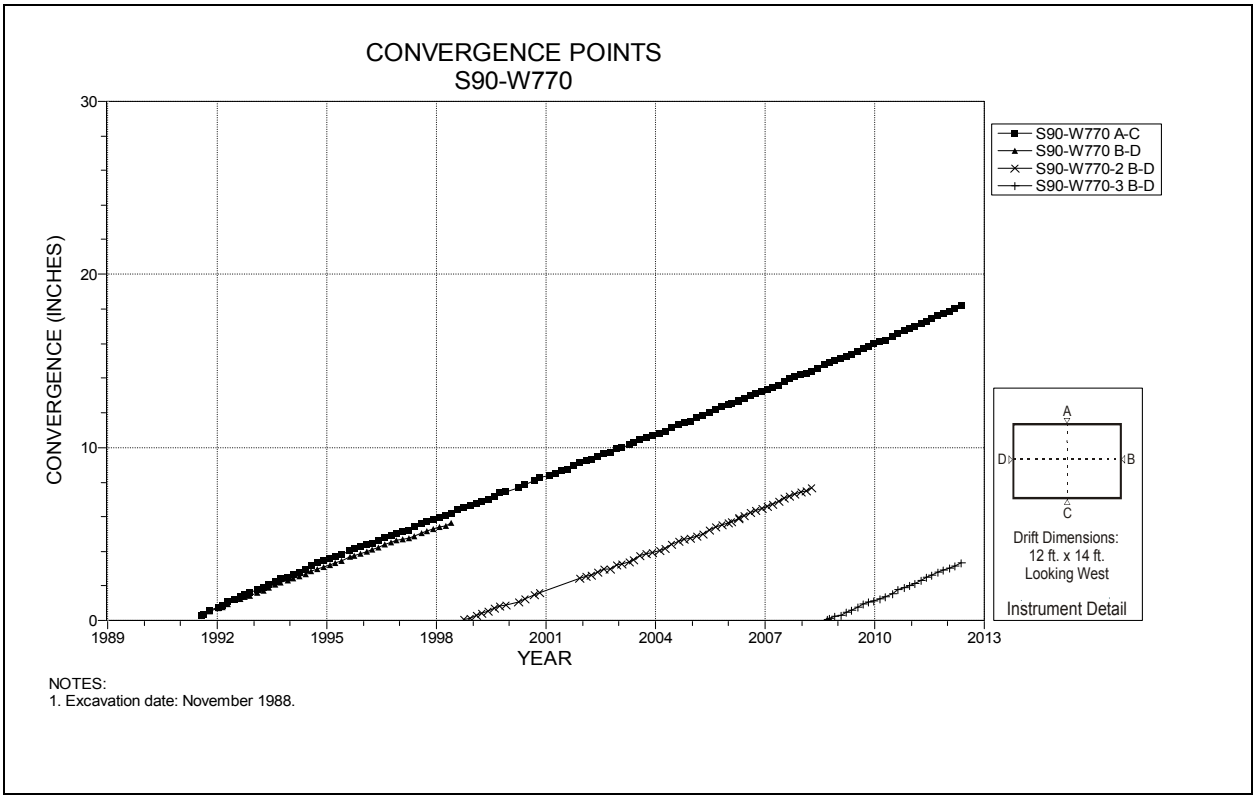


Figure 4-154 Convergence Point Array
S90 W770 – All Chords

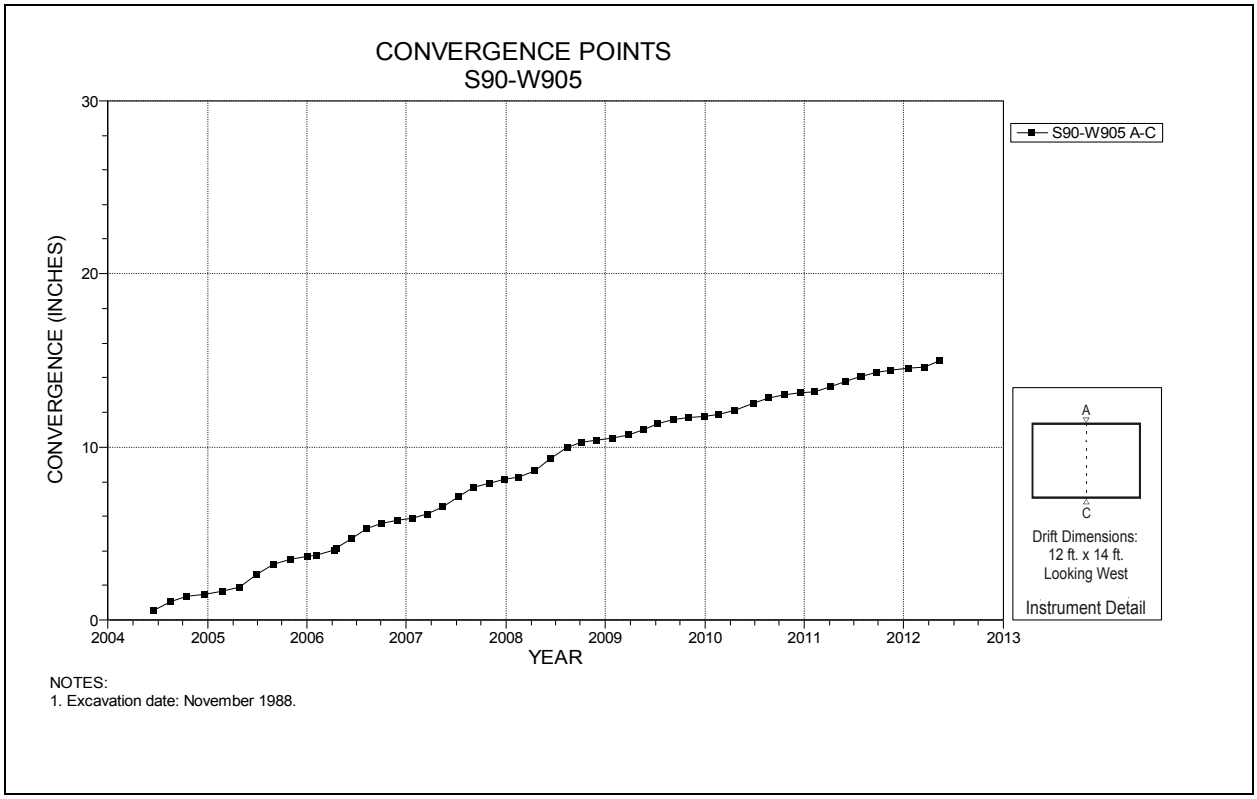


Figure 4-155 Convergence Point Array
S90 W905 – Roof to Floor

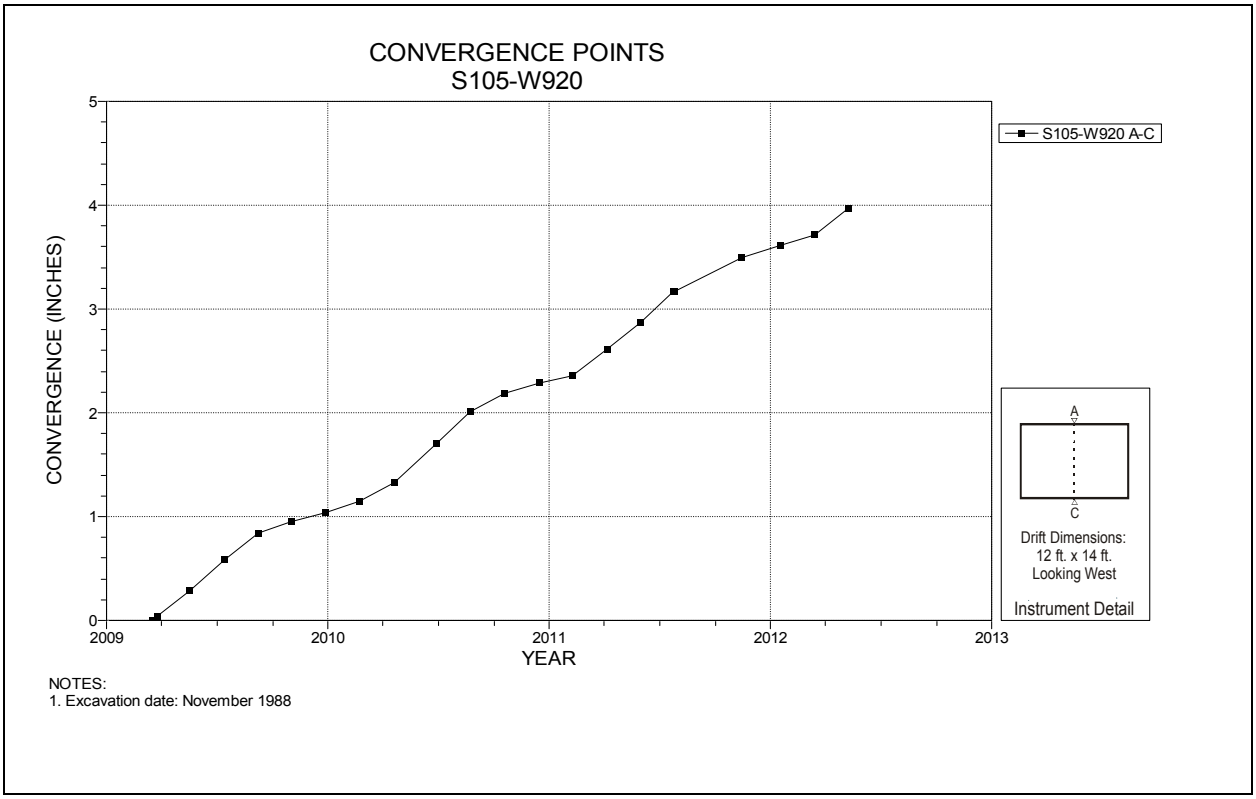


Figure 4-156 Convergence Point Array
S105 W905 – Roof to Floor

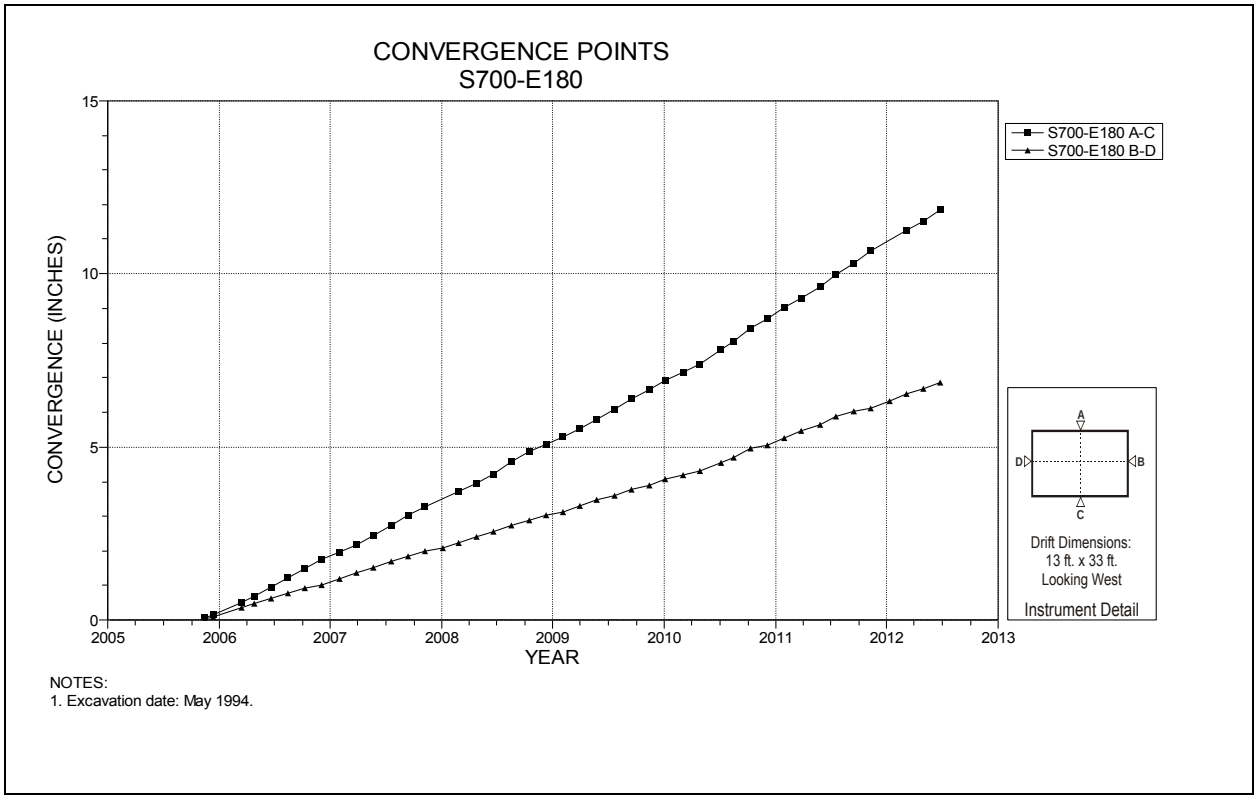


Figure 4-157 Convergence Point Array
S700 E180 – All Chords

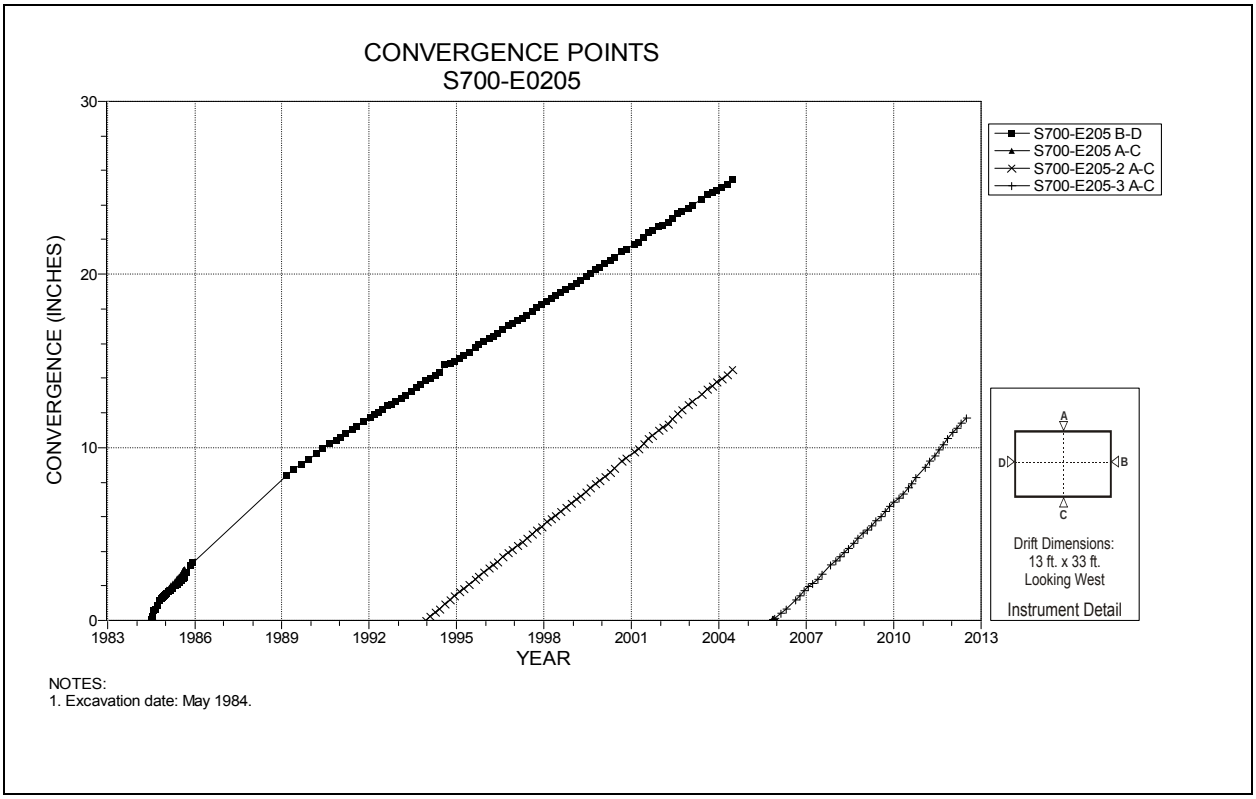


Figure 4-158 Convergence Point Array
S700 E205 – All Chords

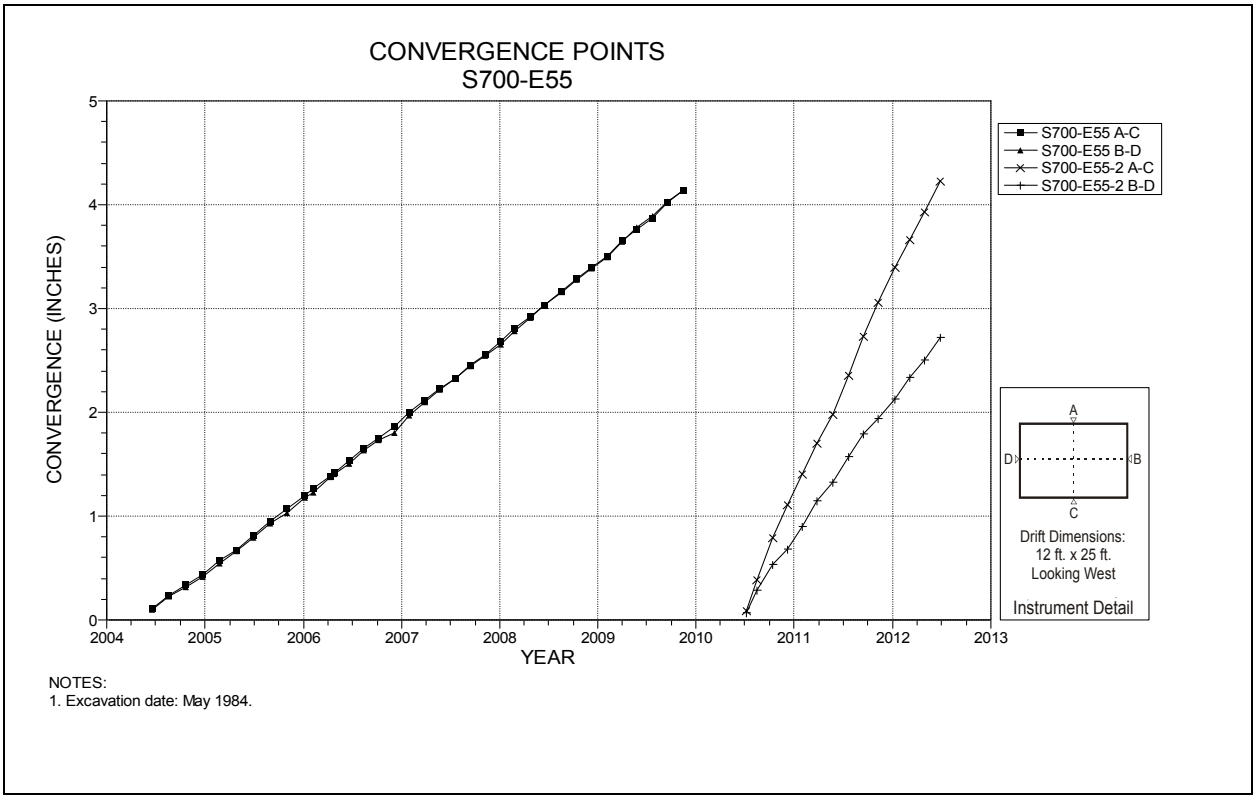


Figure 4-159 Convergence Point Array
S700 E55 – All Chords

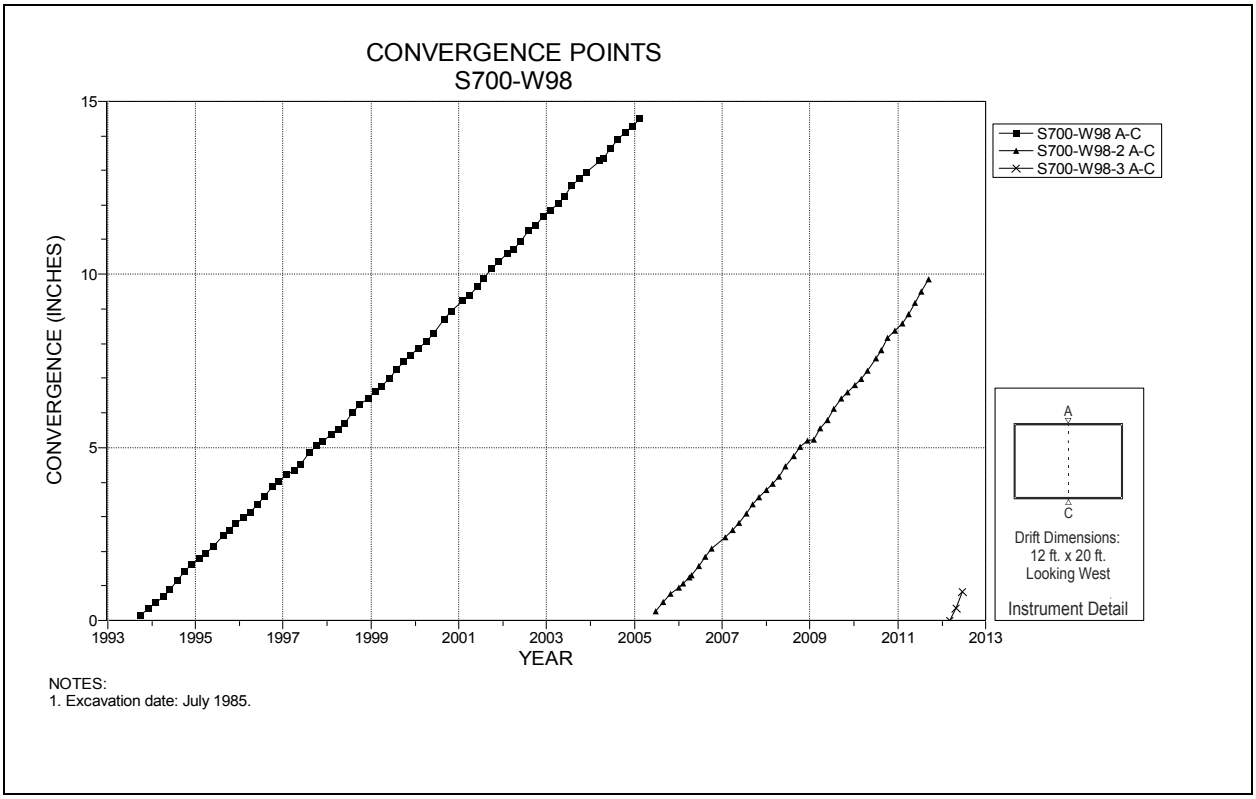


Figure 4-160 Convergence Point Array
S700 W98 – Roof to Floor

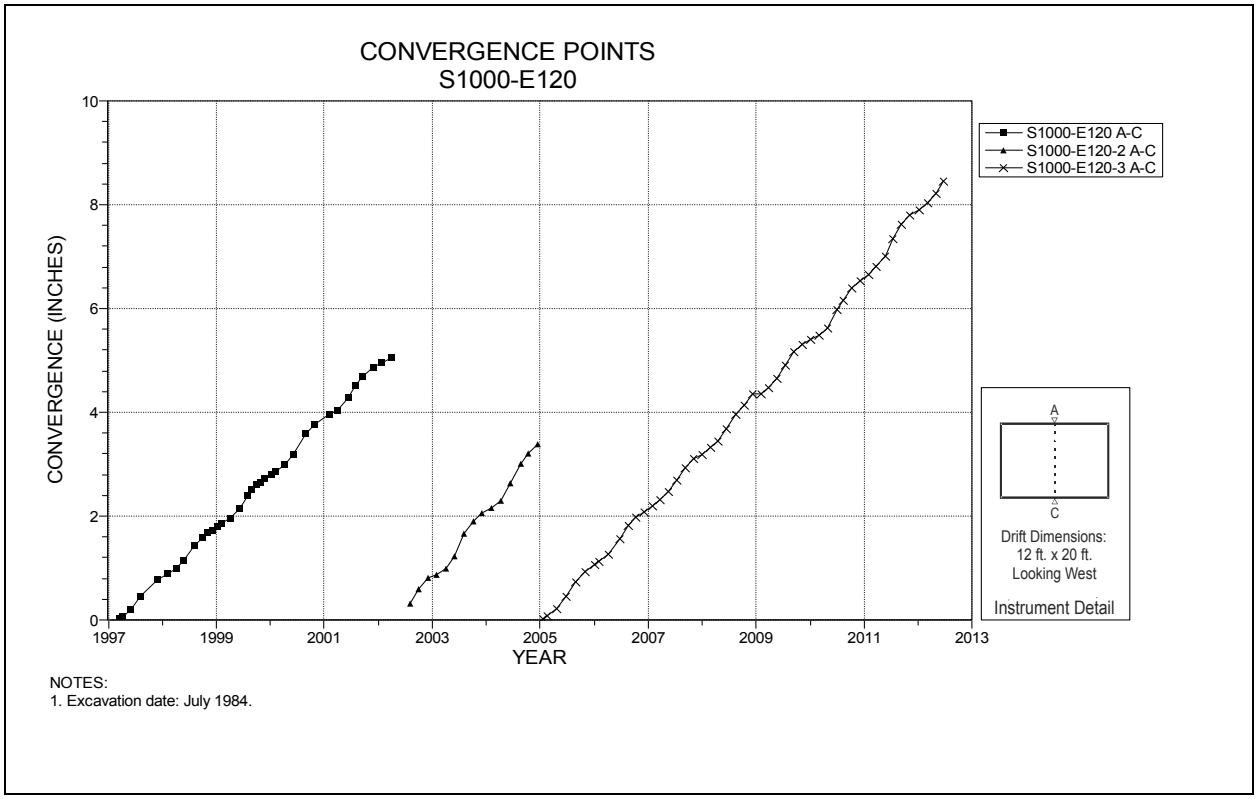


Figure 4-161 Convergence Point Array
S1000 E120 – Roof to Floor

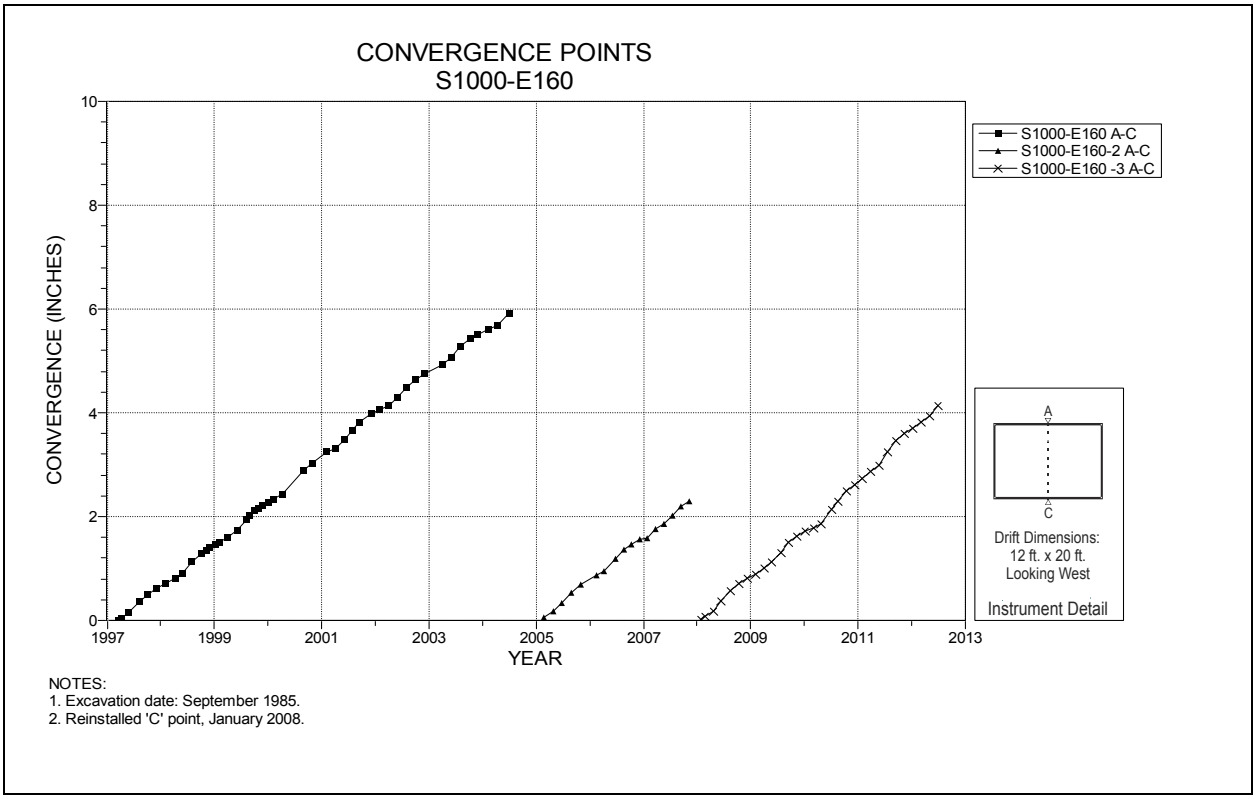


Figure 4-162 Convergence Point Array
S1000 E160 – Roof to Floor

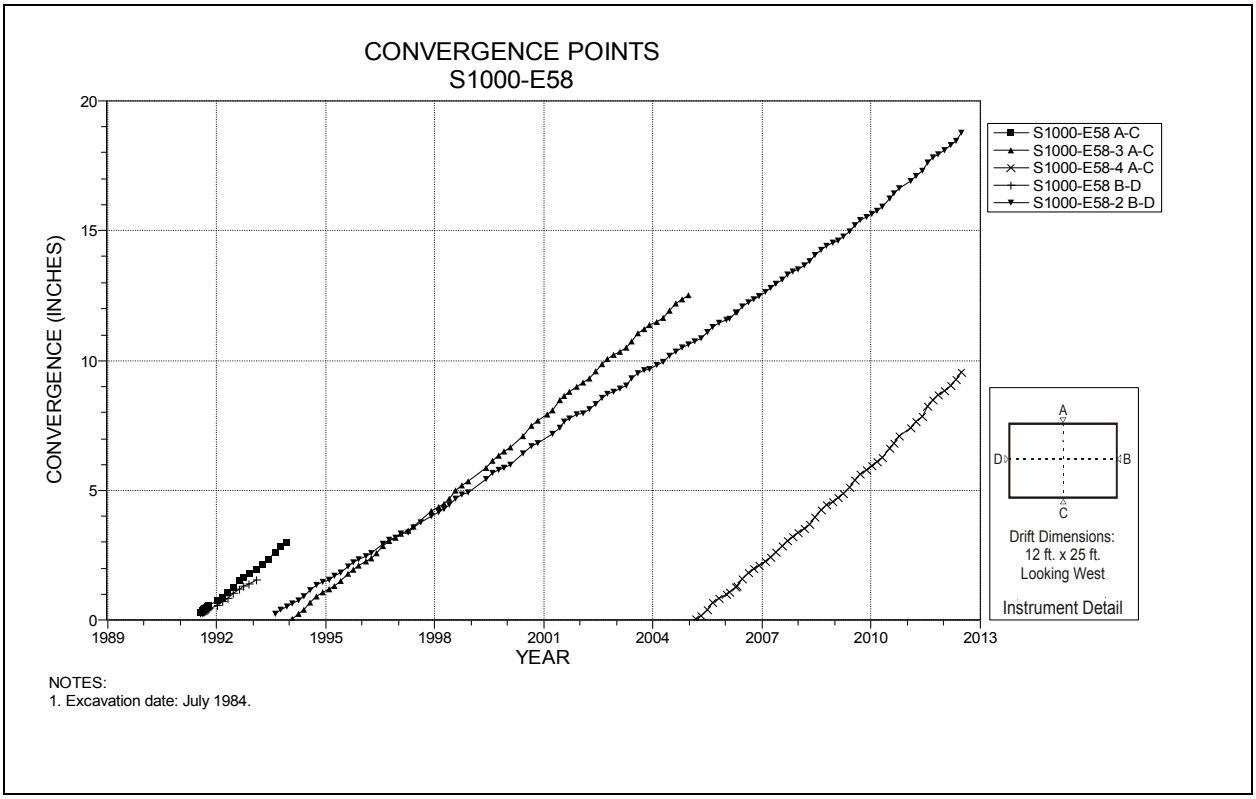


Figure 4-163 Convergence Point Array
S1000 E58 – All Chords

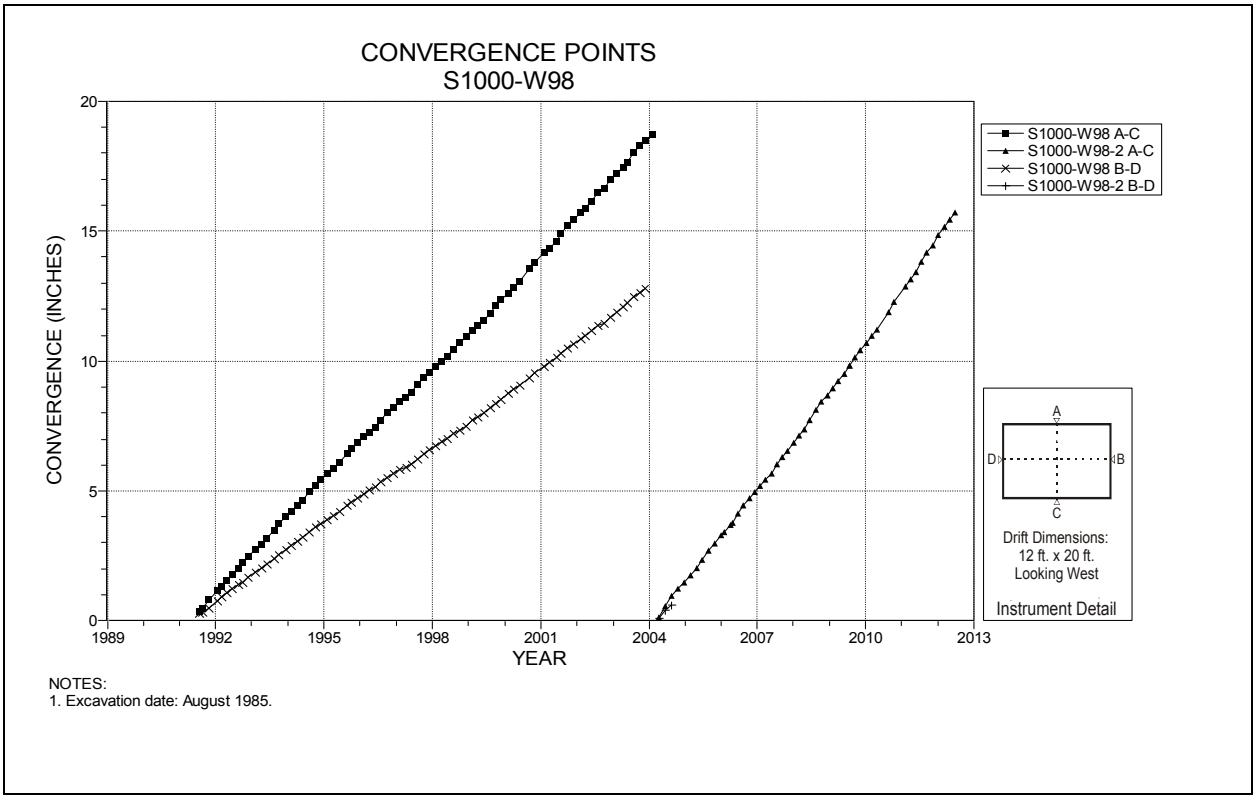


Figure 4-164 Convergence Point Array
S1000 E98 – All Chords

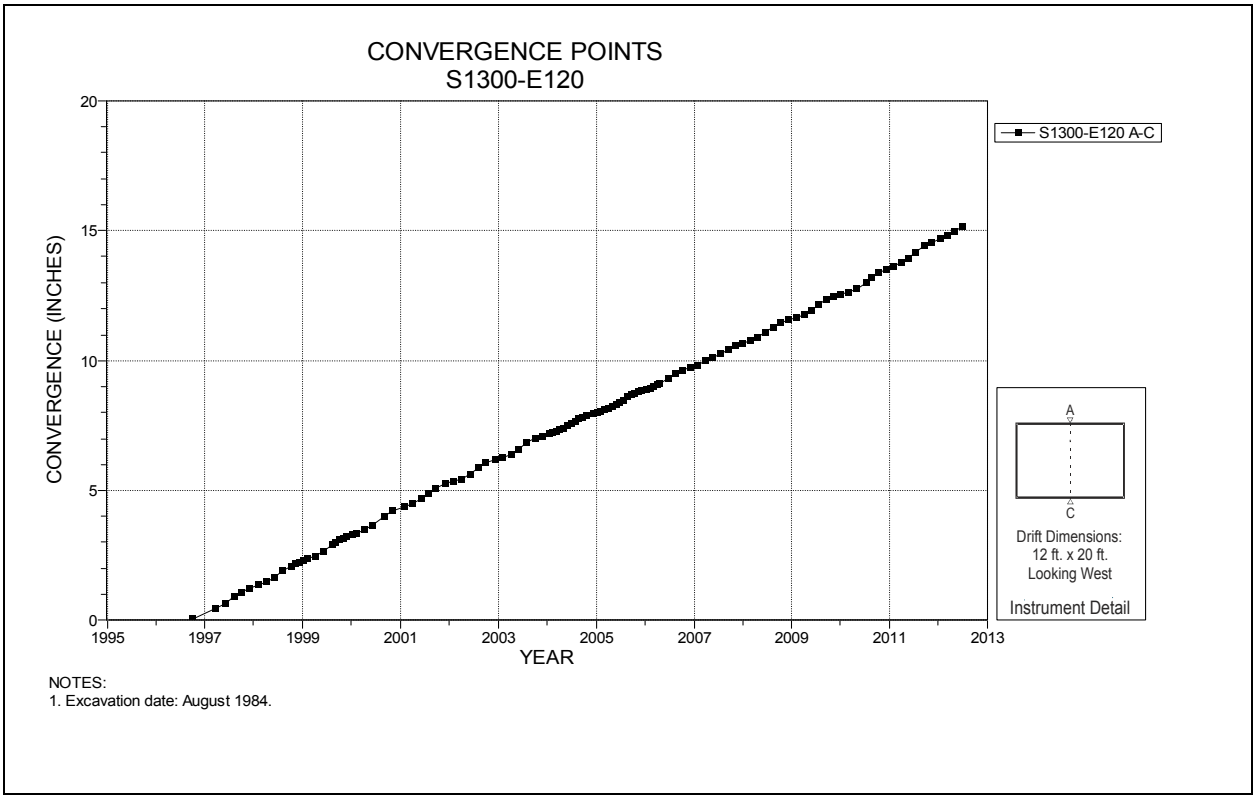


Figure 4-165 Convergence Point Array
S1300 E120 – Roof to Floor

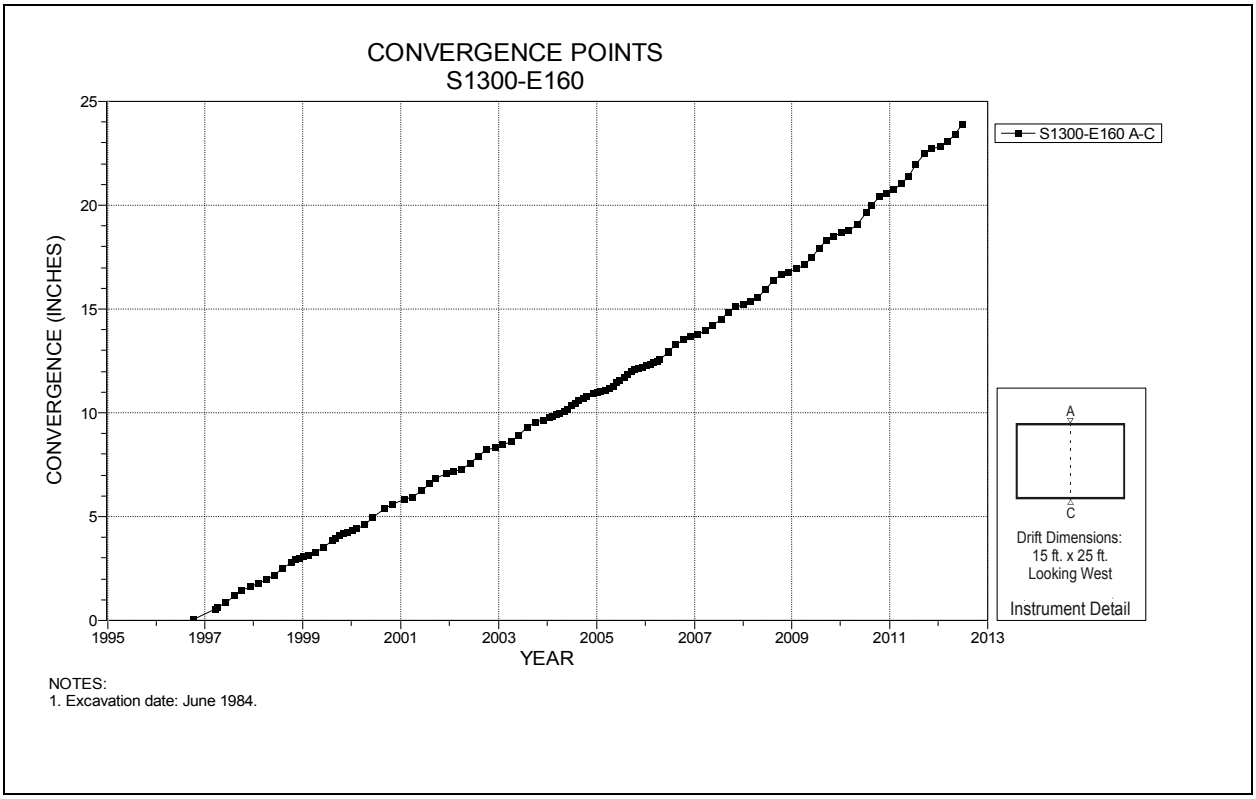


Figure 4-166 Convergence Point Array
S1300 E160 – Roof to Floor

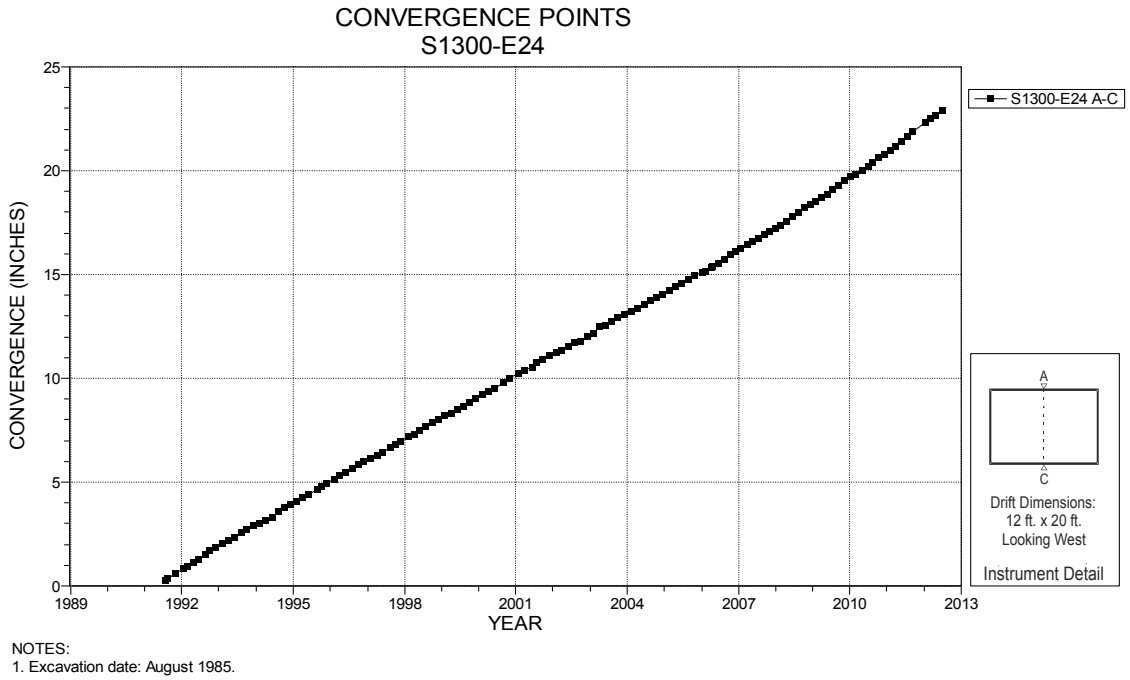


Figure 4-167 Convergence Point Array
S1300 E24 – Roof to Floor

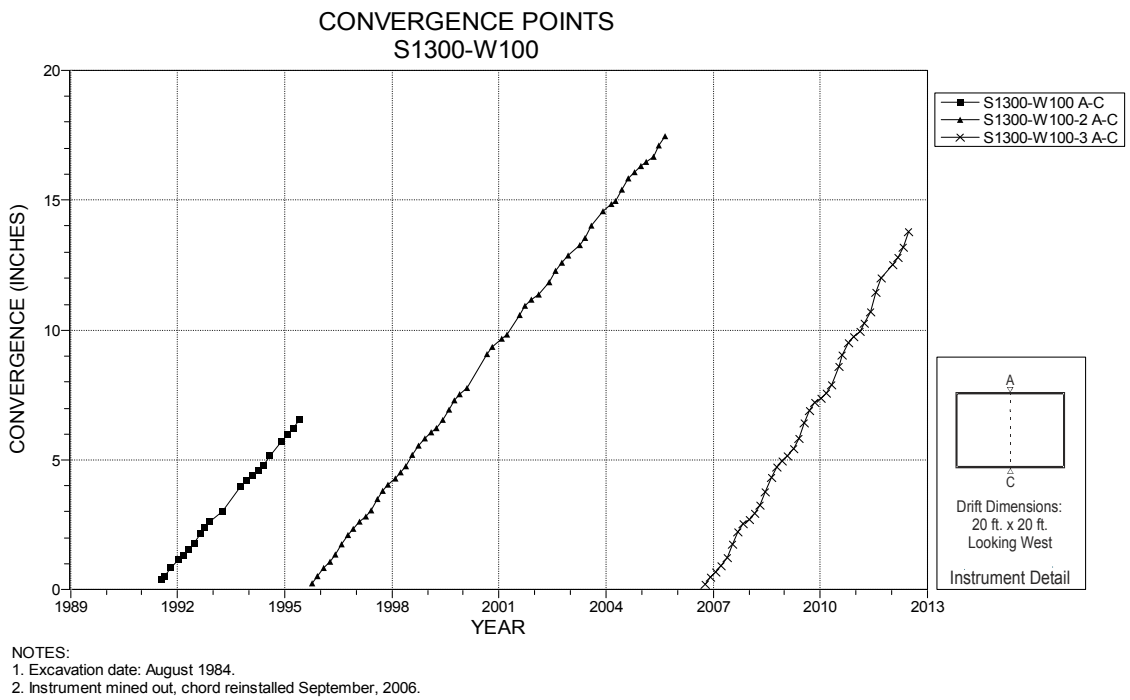


Figure 4-168 Convergence Point Array
S1300 W100 – Roof to Floor

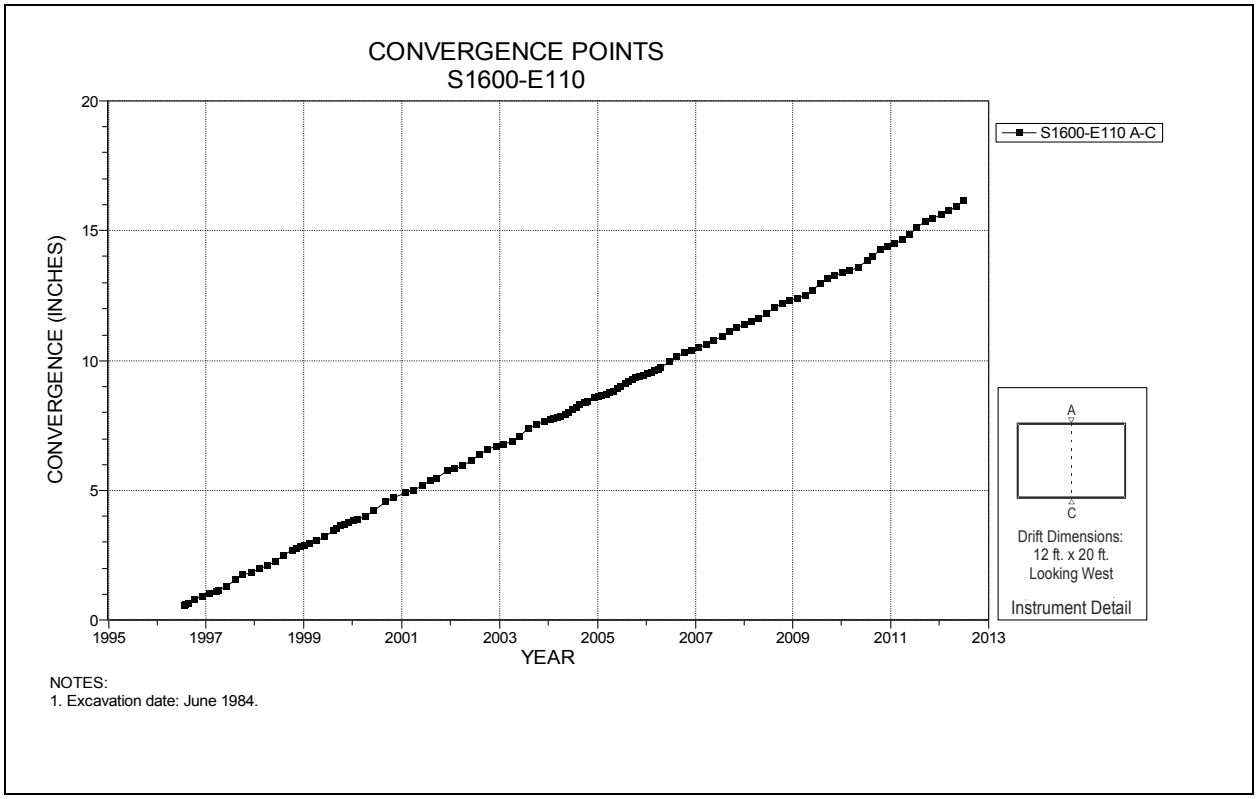


Figure 4-169 Convergence Point Array
S1600 E110 – Roof to Floor

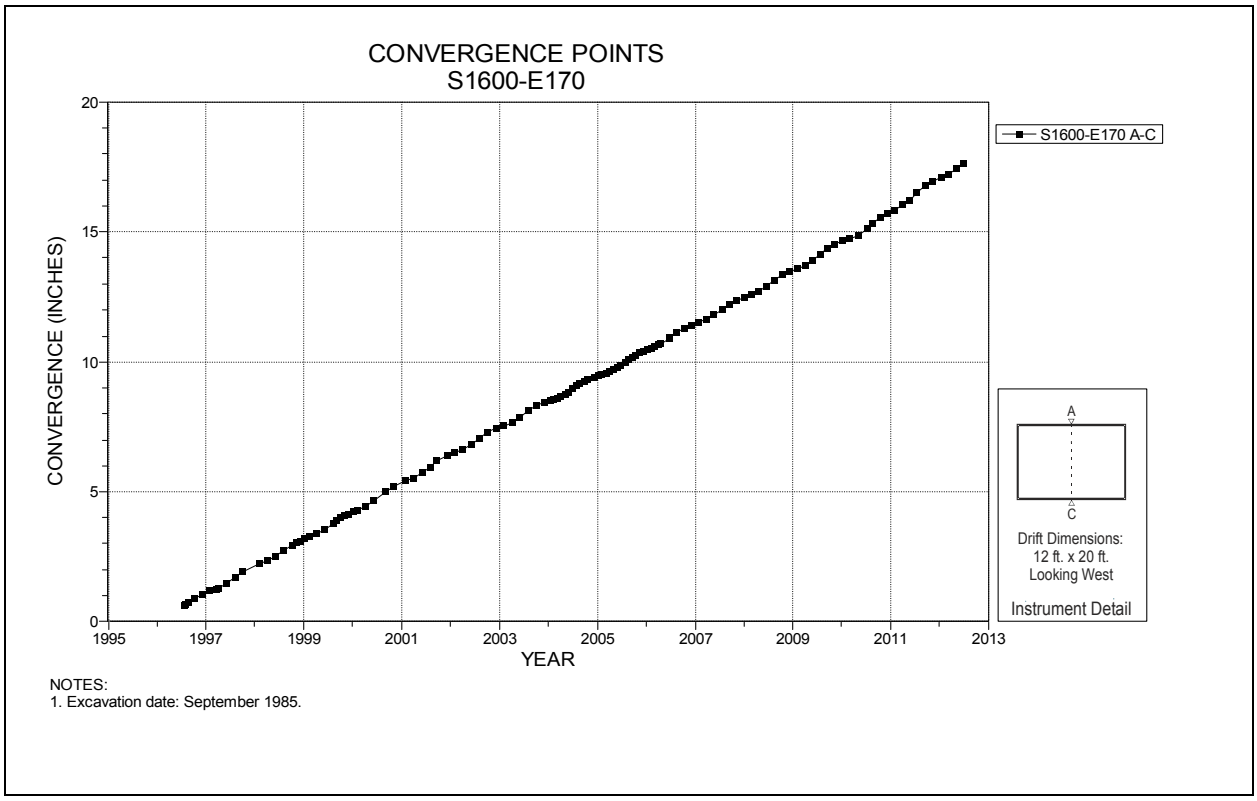
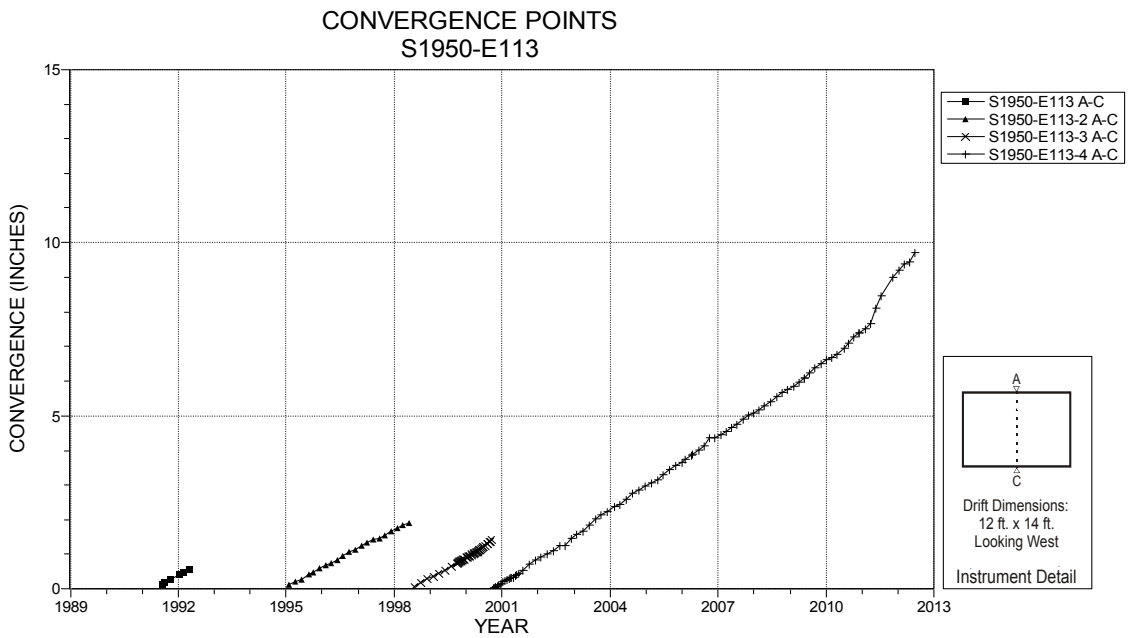
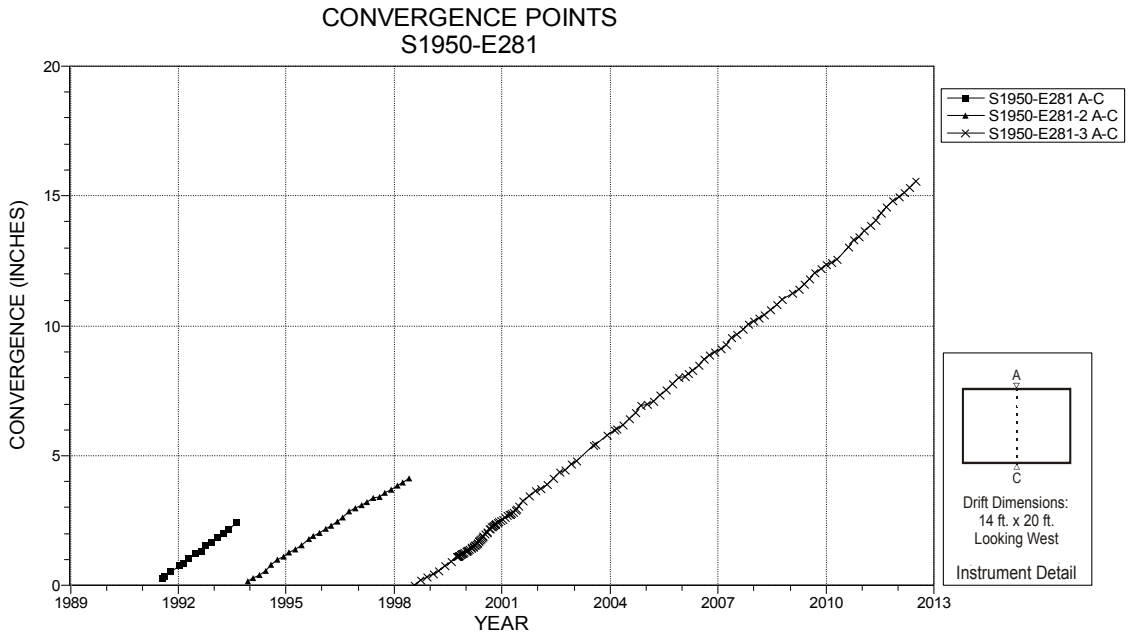


Figure 4-170 Convergence Point Array
S1600 E170 – Roof to Floor



NOTES:
1. Excavation date: January 1986.

Figure 4-171 Convergence Point Array
S1950 E113 – Roof to Floor



NOTES:
1. Excavation date: November 1985.

Figure 4-172 Convergence Point Array
S1950 E281 – Roof to Floor

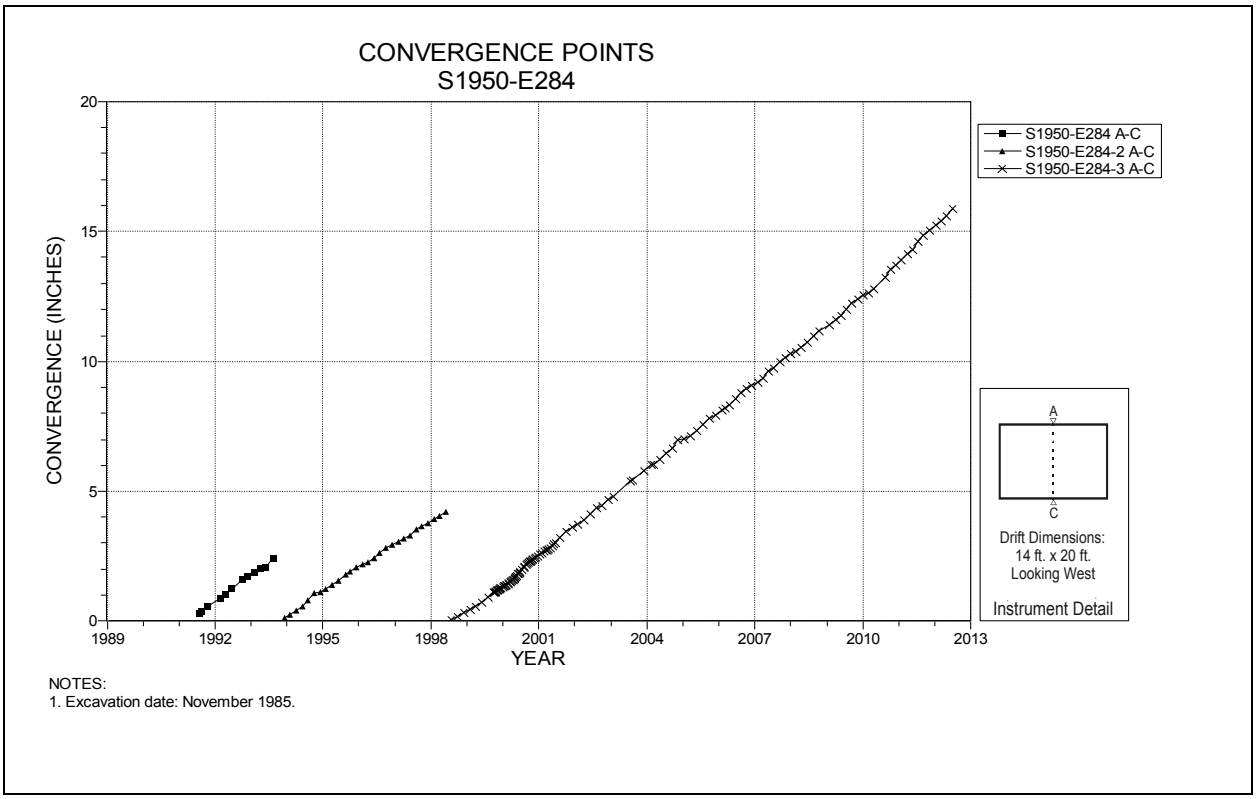


Figure 4-173 Convergence Point Array
S1950 E284 – Roof to Floor

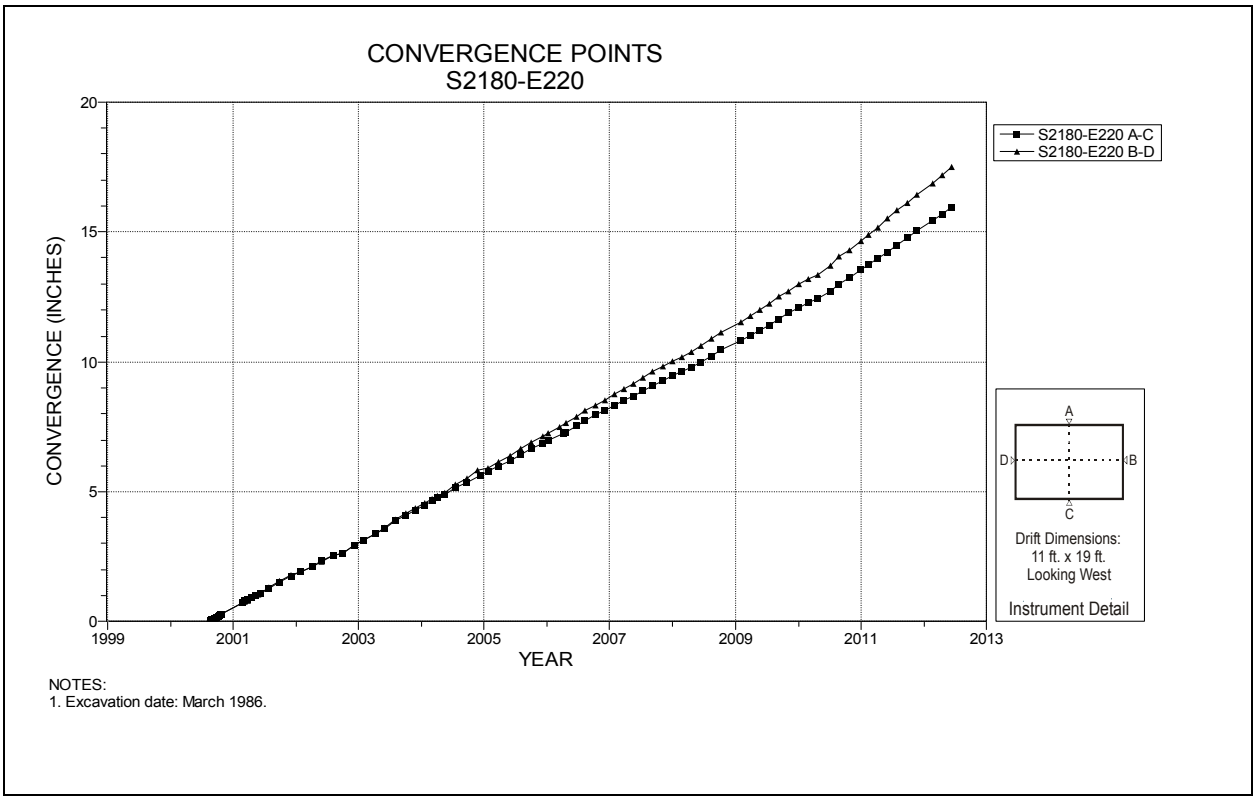


Figure 4-174 Convergence Point Array
S2180 E220 – All Chords

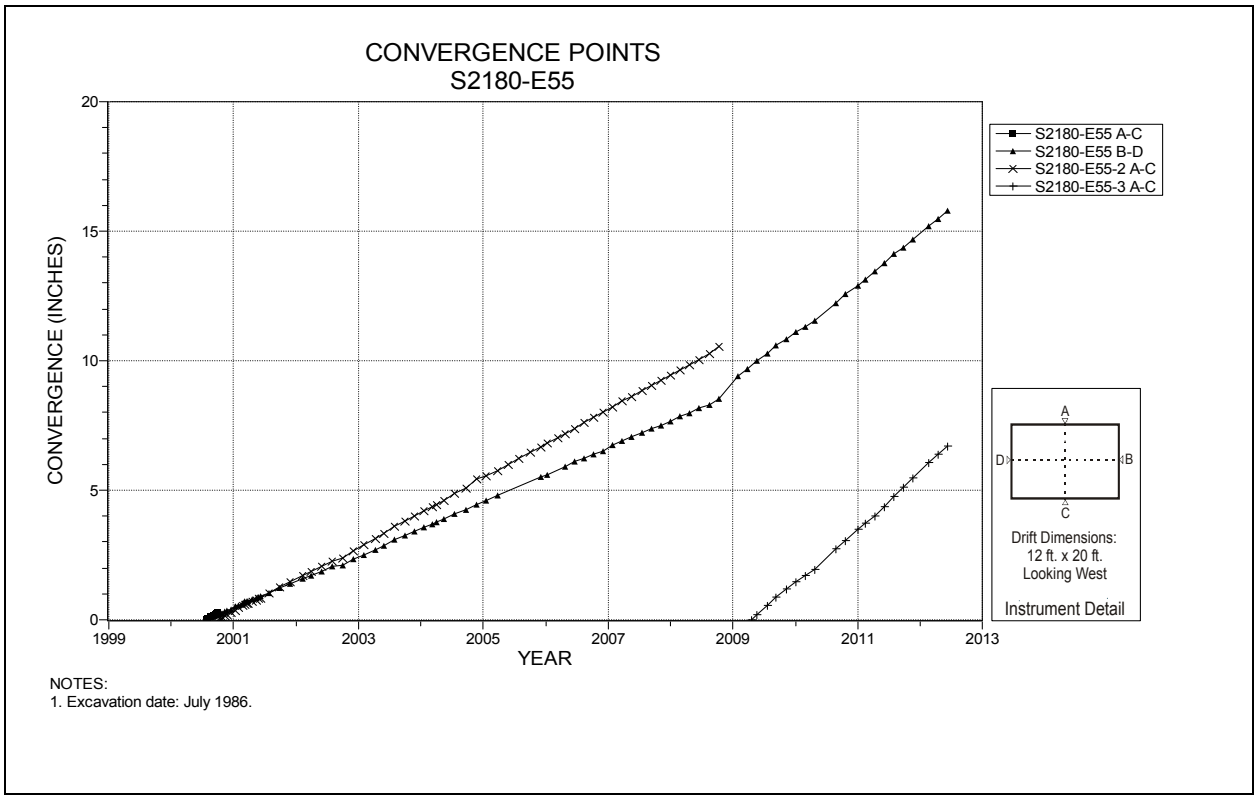


Figure 4-175 Convergence Point Array
S2180 E55 – All Chords

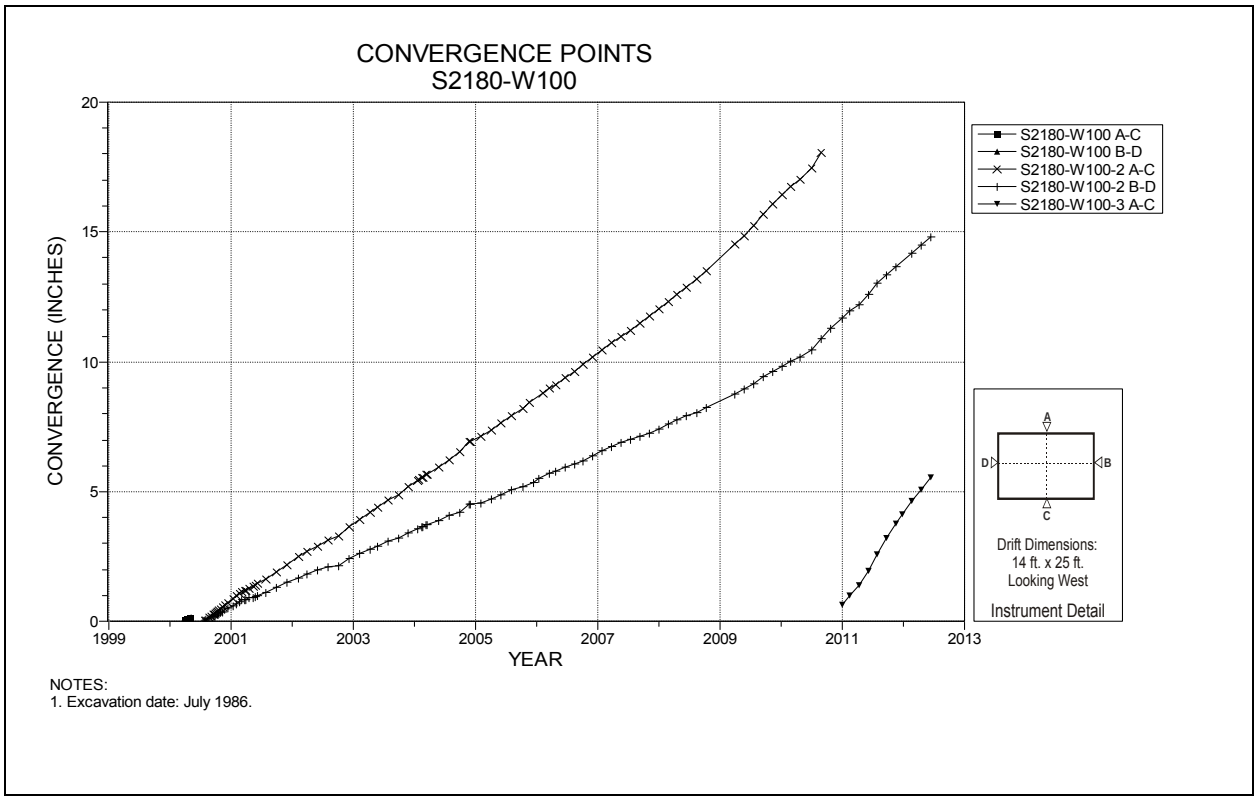


Figure 4-176 Convergence Point Array
S2180 W100 – All Chords

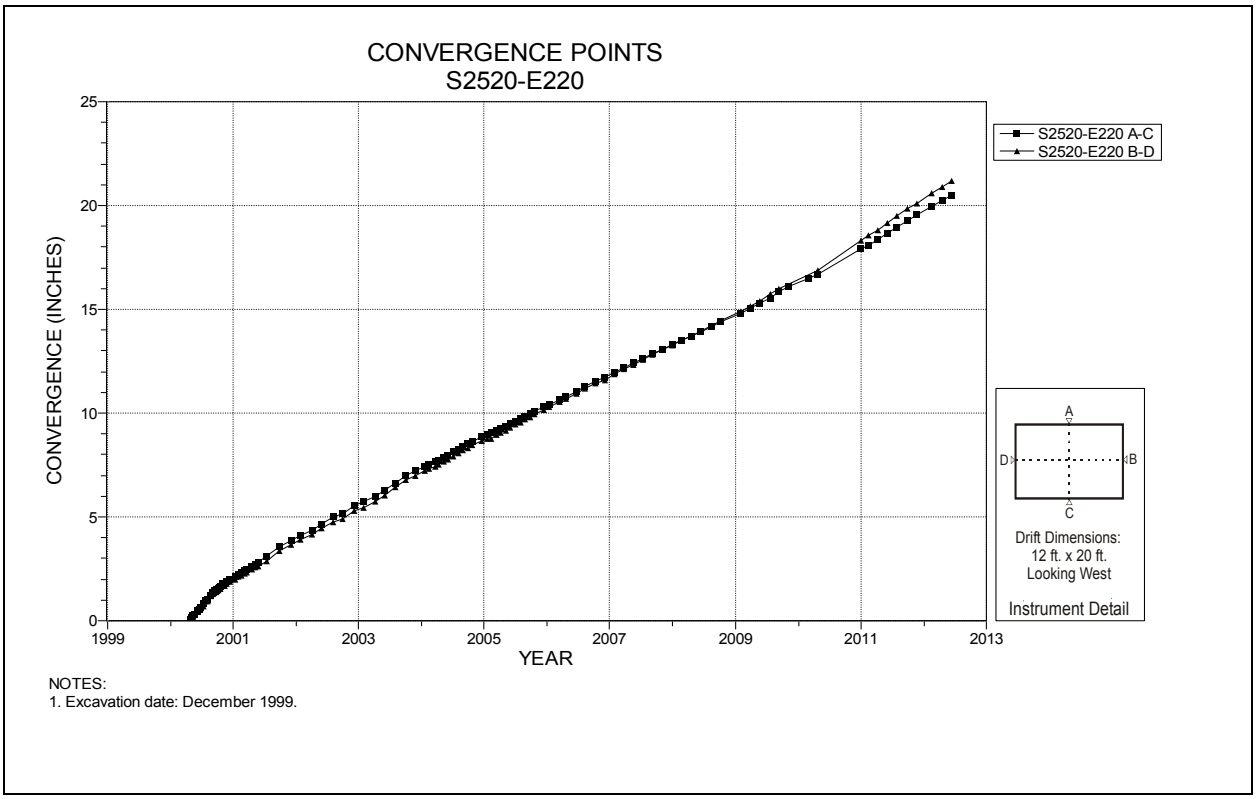


Figure 4-177 Convergence Point Array
S2520 E220 – All Chords

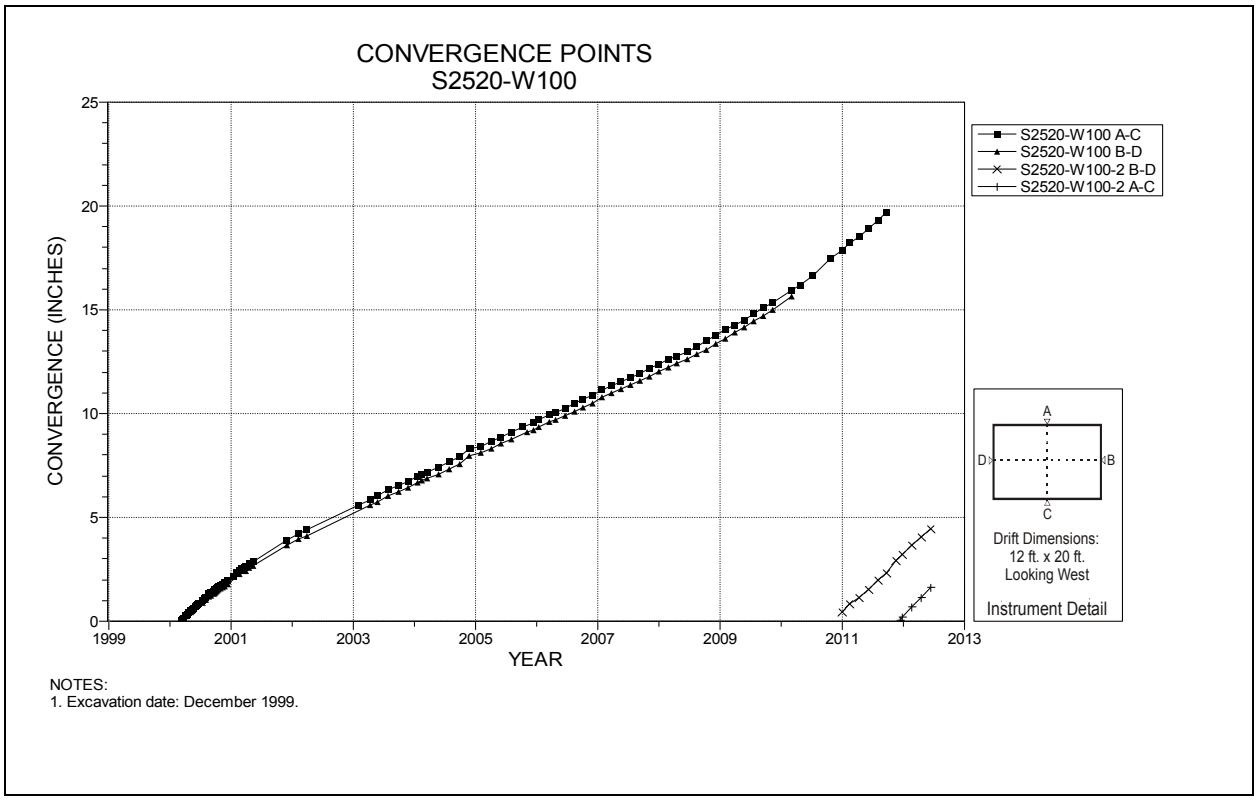
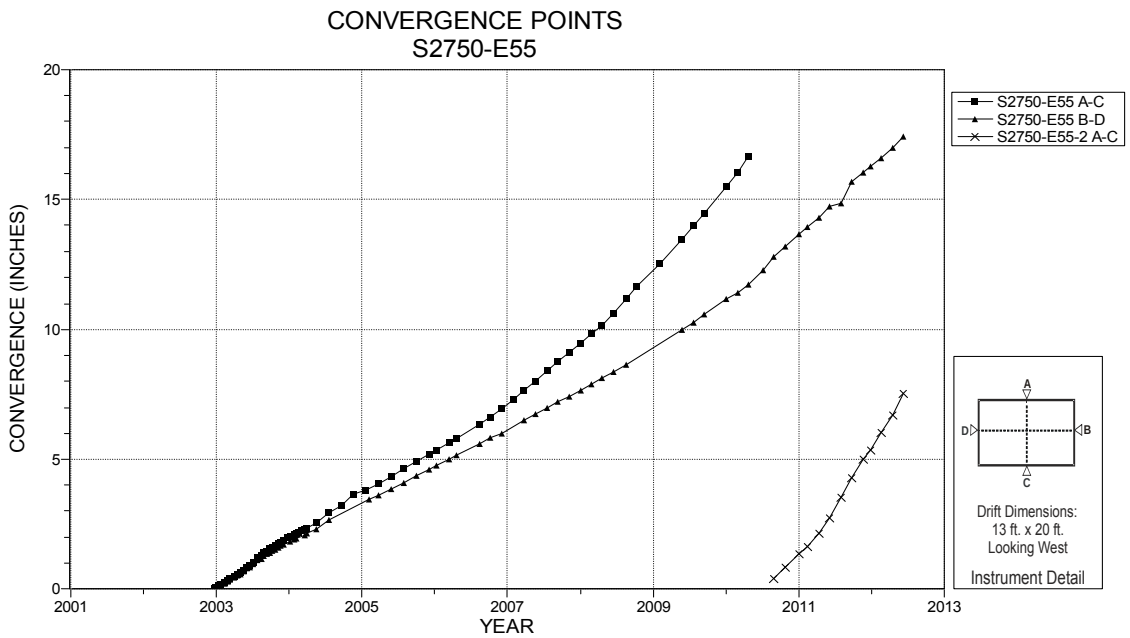
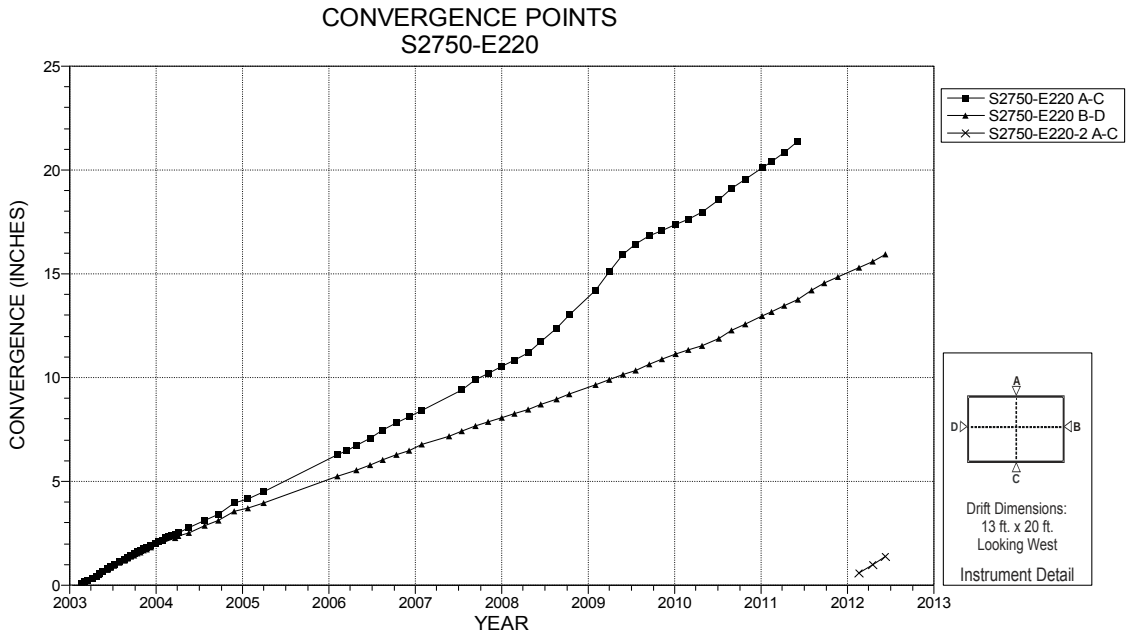


Figure 4-178 Convergence Point Array
S2520 W100 – All Chords



NOTES:
1. Excavation date: February 2001.

Figure 4-179 Convergence Point Array
S2750 E55 – All Chords



NOTES:
1. Excavation date: April 2001.
2. Convergence points inaccessible since early 2007

Figure 4-180 Convergence Point Array
S2750 E220 – All Chords

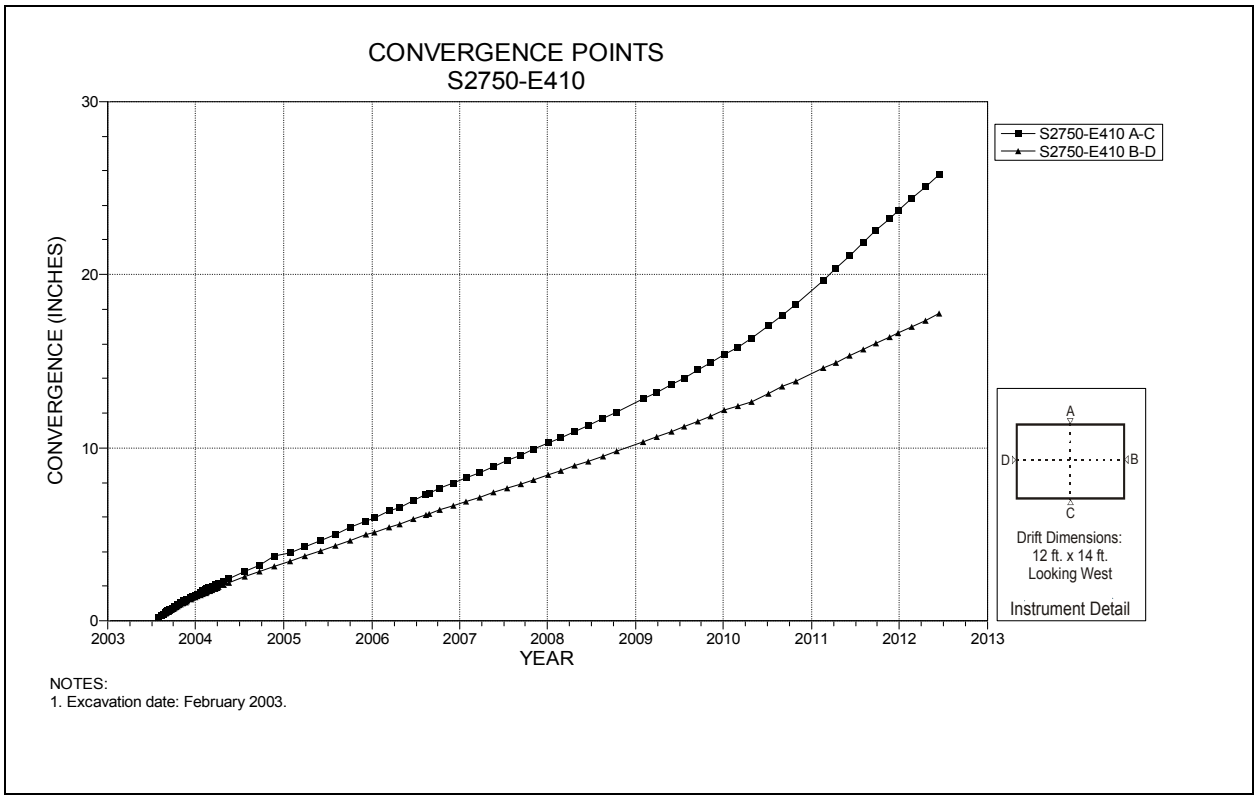


Figure 4-181 Convergence Point Array
S2750 E410 – All Chords

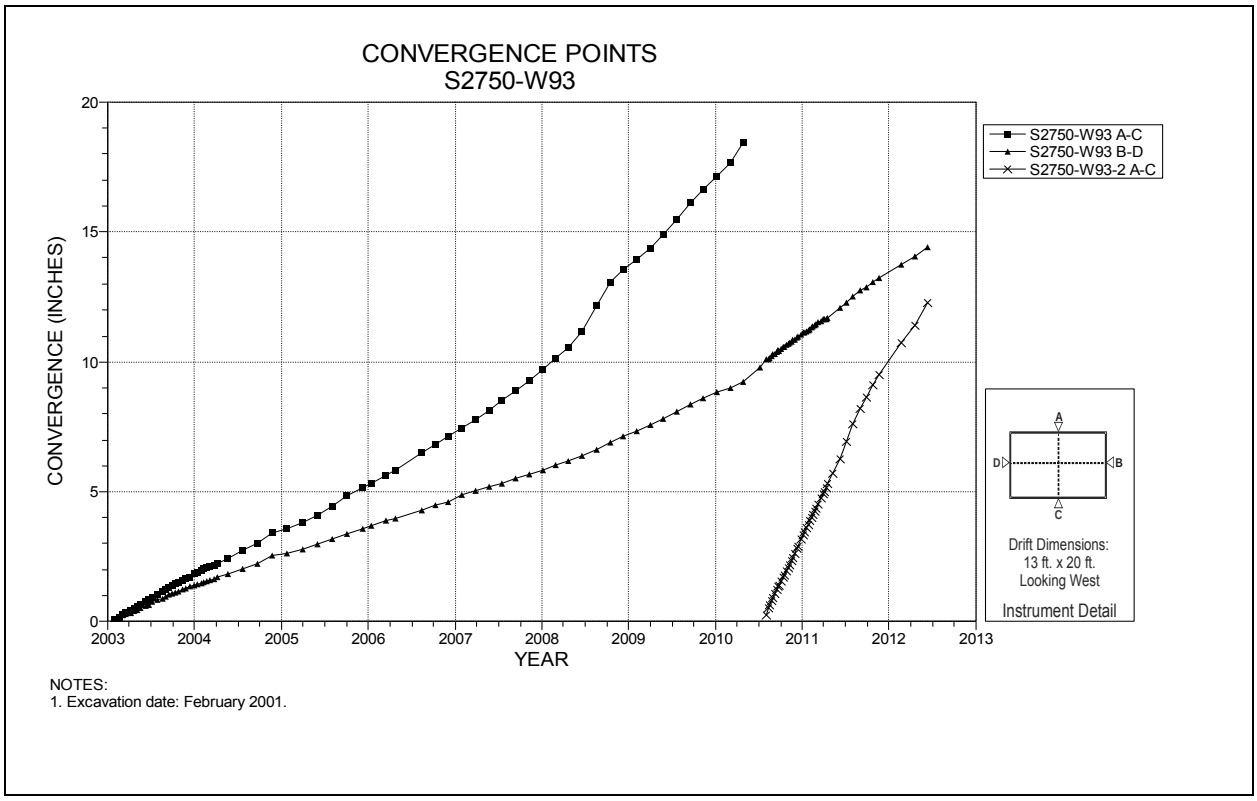


Figure 4-182 Convergence Point Array
S2750 W93 – All Chords

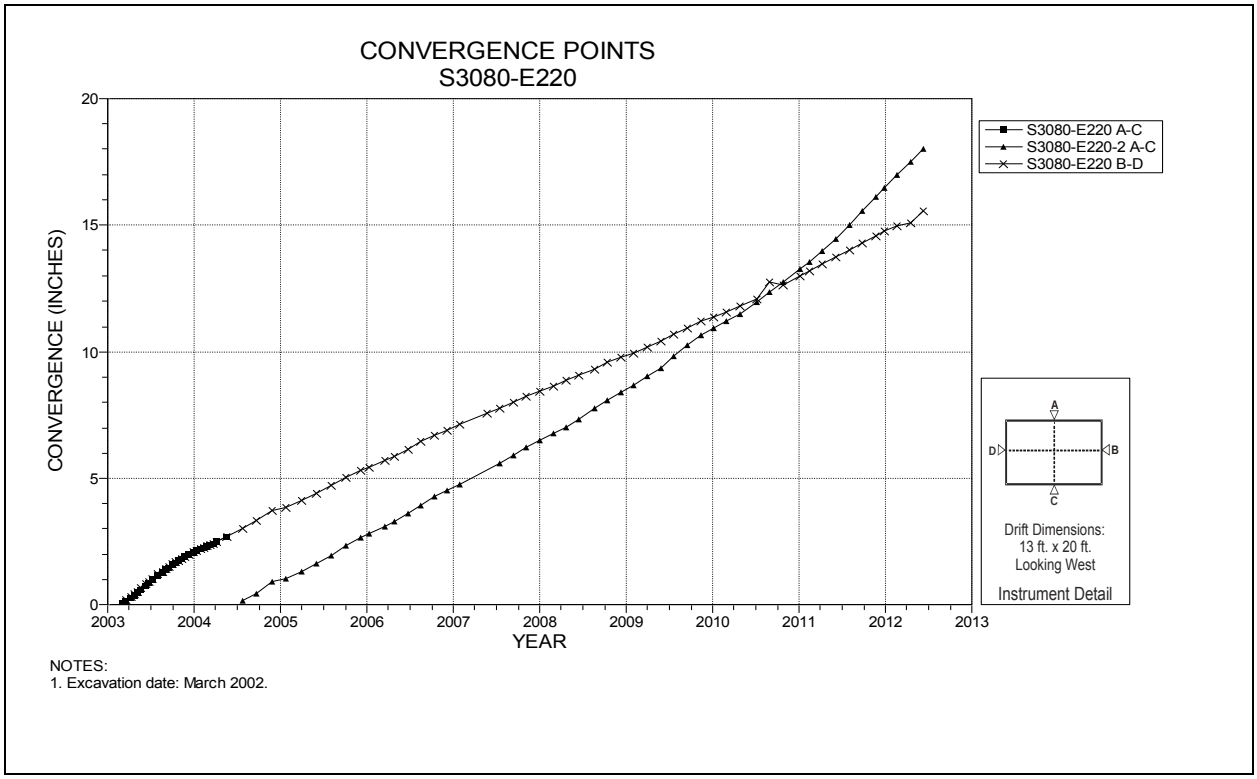


Figure 4-183 Convergence Point Array
S3080 E220 – All Chords

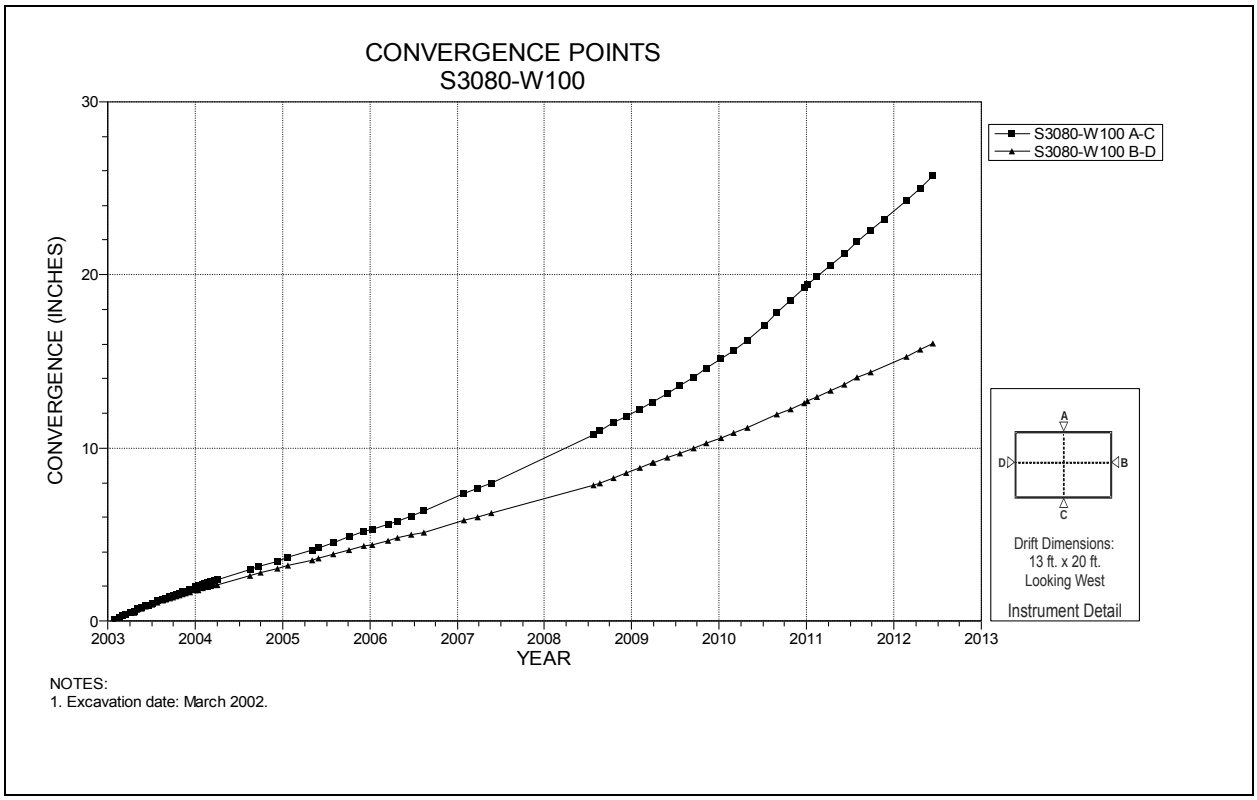


Figure 4-184 Convergence Point Array
S3080 W100 – All Chords

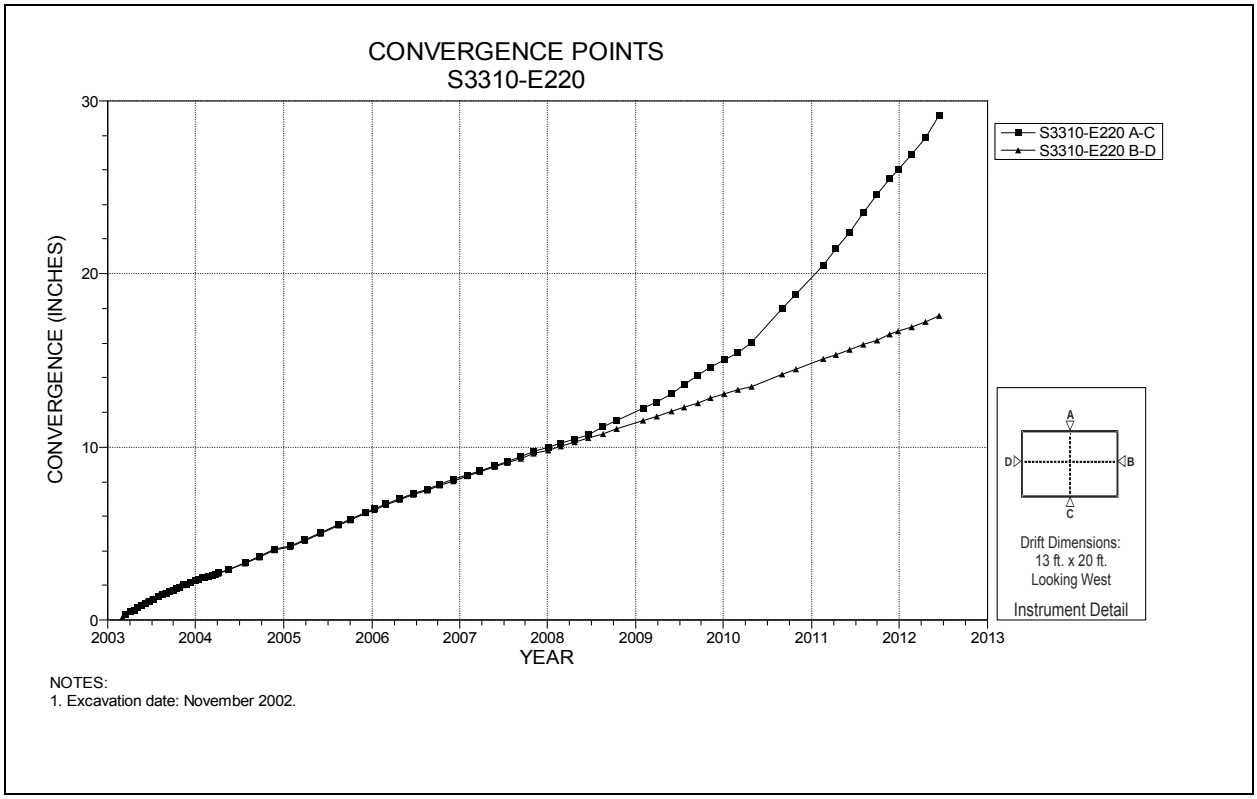


Figure 4-185 Convergence Point Array
S3310 E220 – All Chords

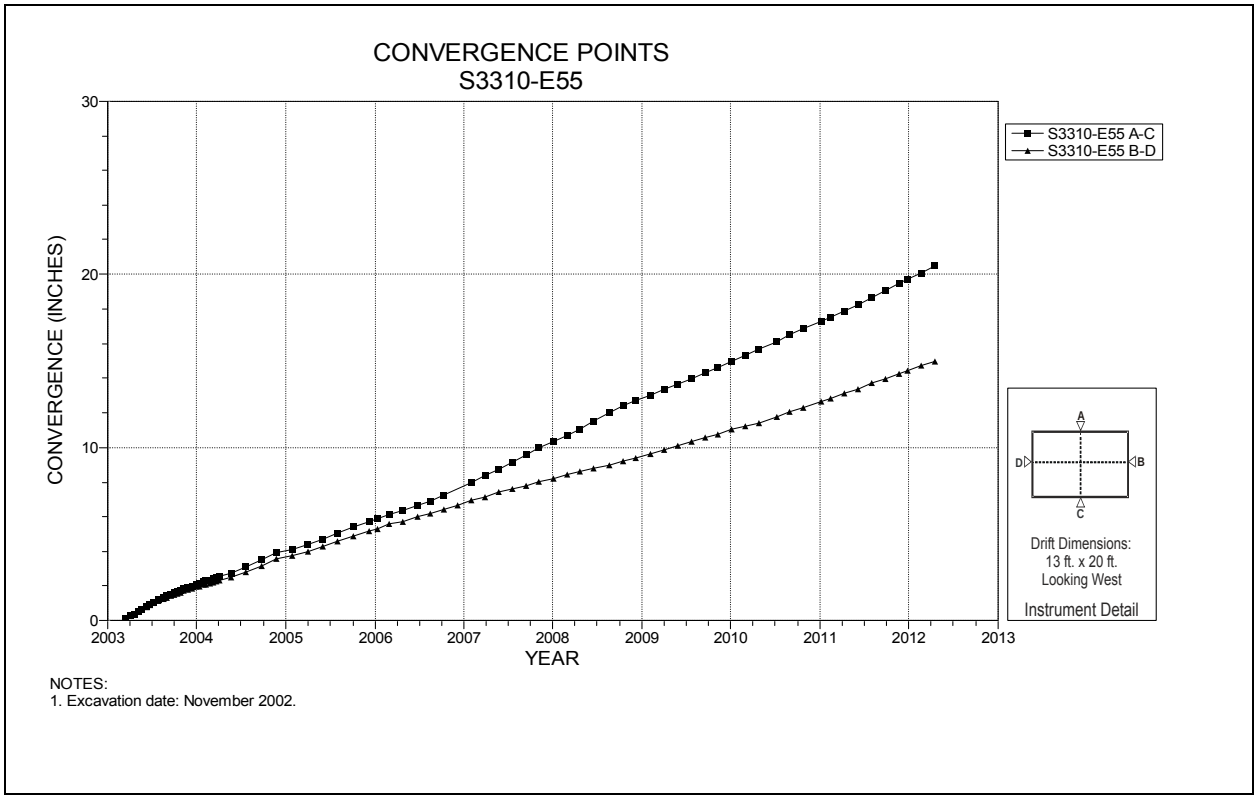


Figure 4-186 Convergence Point Array
S3310 E55 – All Chords

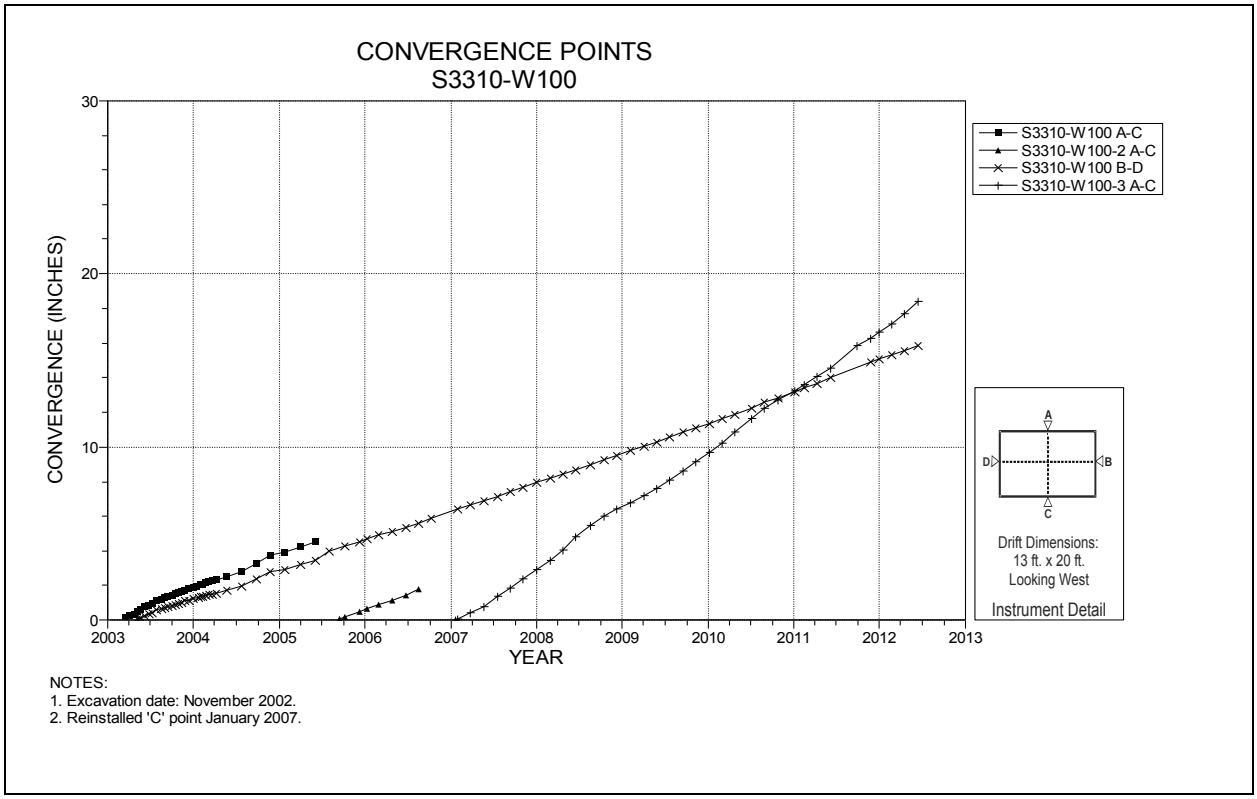


Figure 4-187 Convergence Point Array
S3310 W100 – All Chords

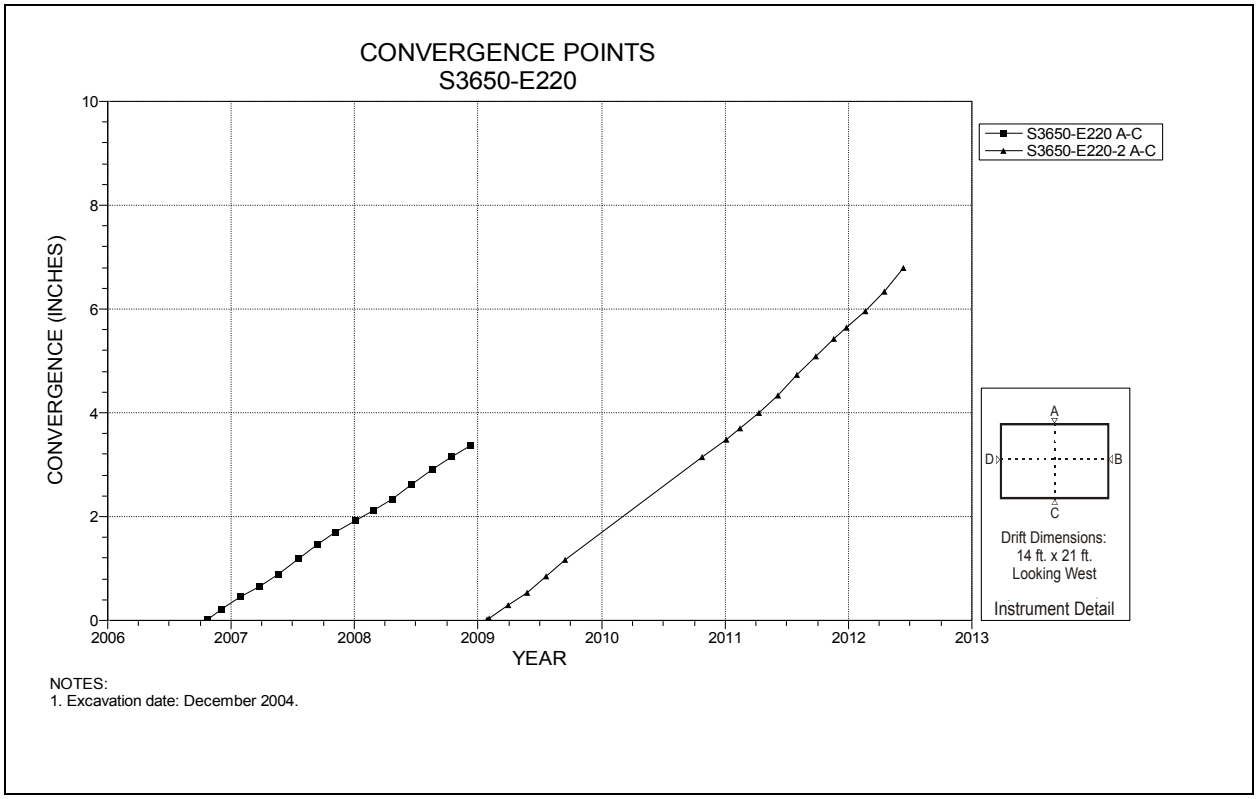


Figure 4-188 Convergence Point Array
S3650 E220 – All Chords

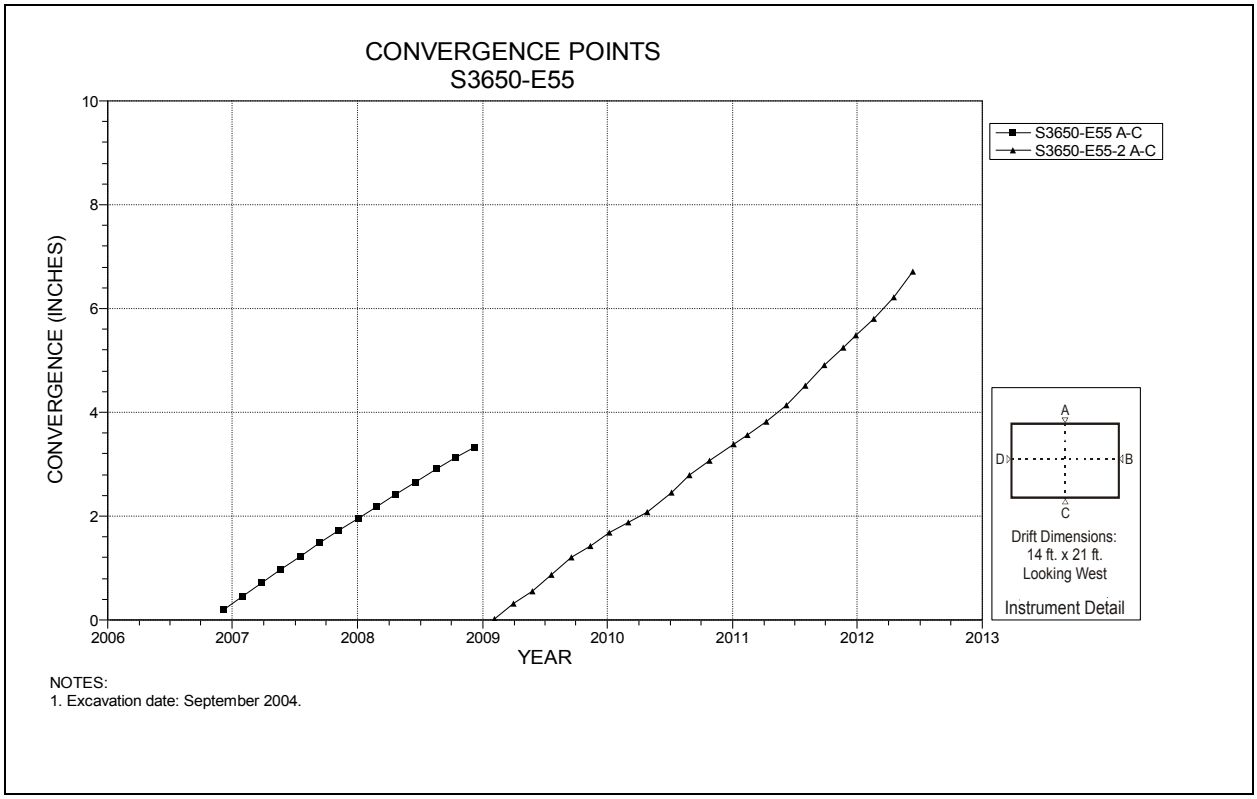


Figure 4-189 Convergence Point Array
S3650 E55 – Roof to Floor

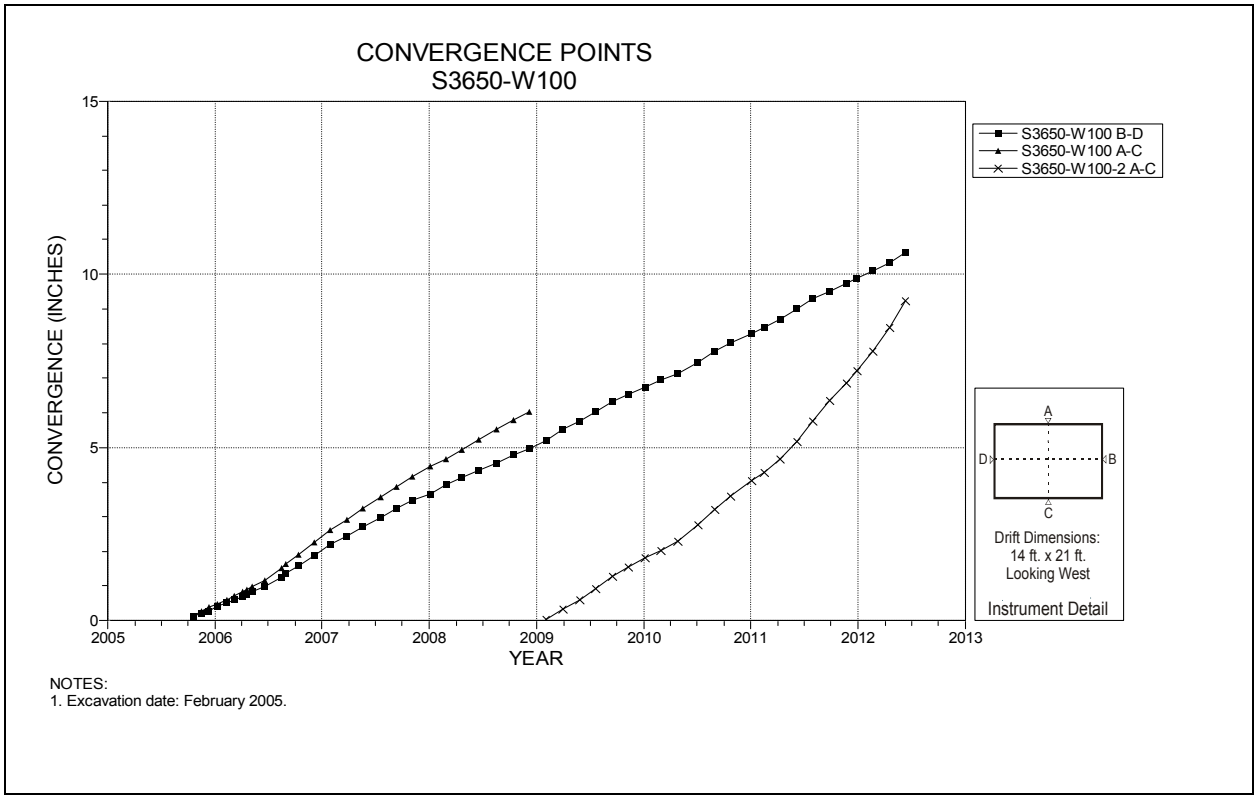


Figure 4-190 Convergence Point Array
S3650 W100 – All Chords

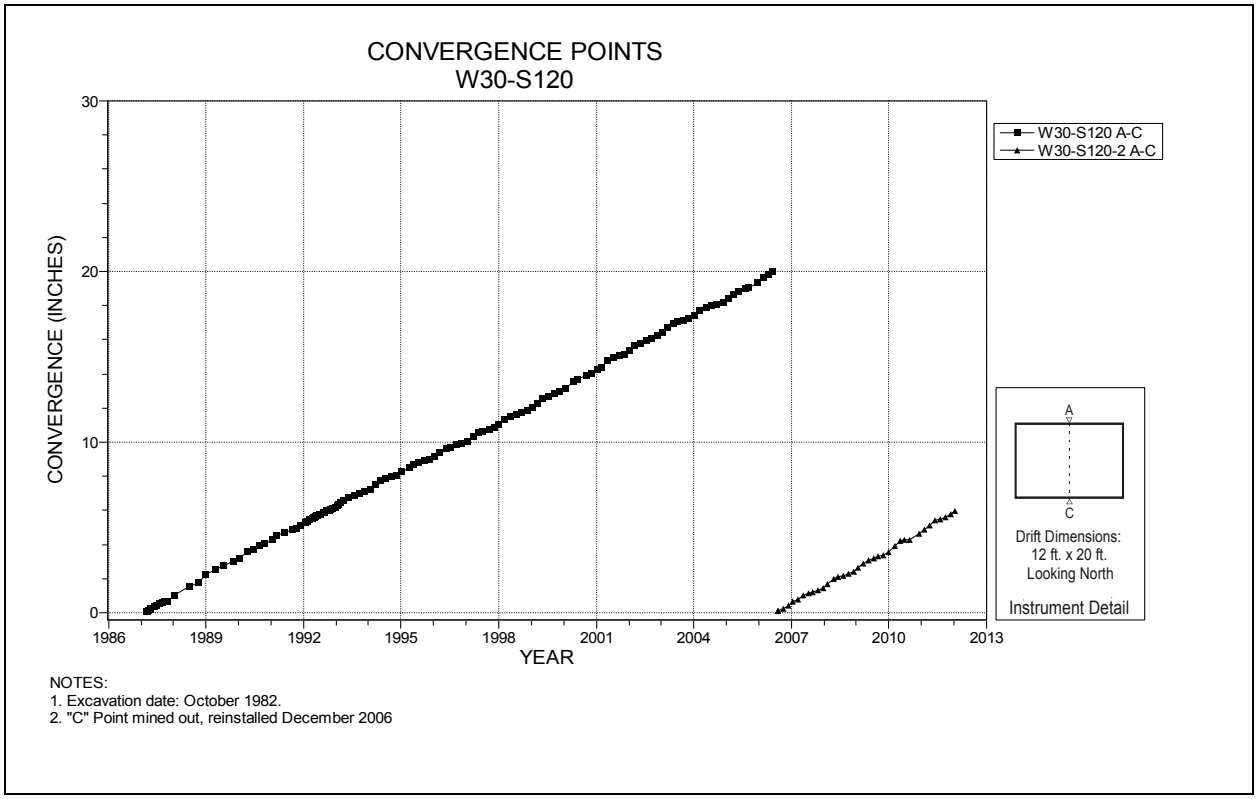


Figure 4-191 Convergence Point Array
W30 S120 – Roof to Floor

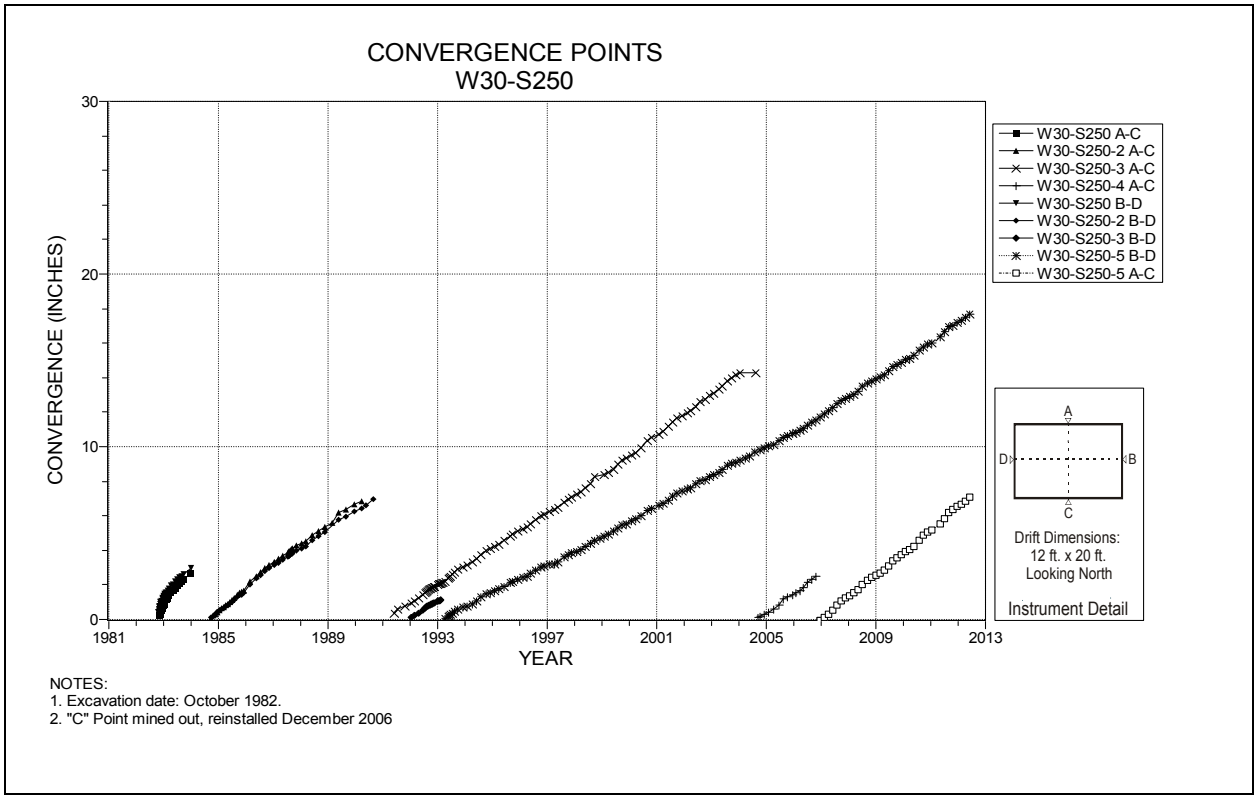


Figure 4-192 Convergence Point Array
W30 S250 – All Chords

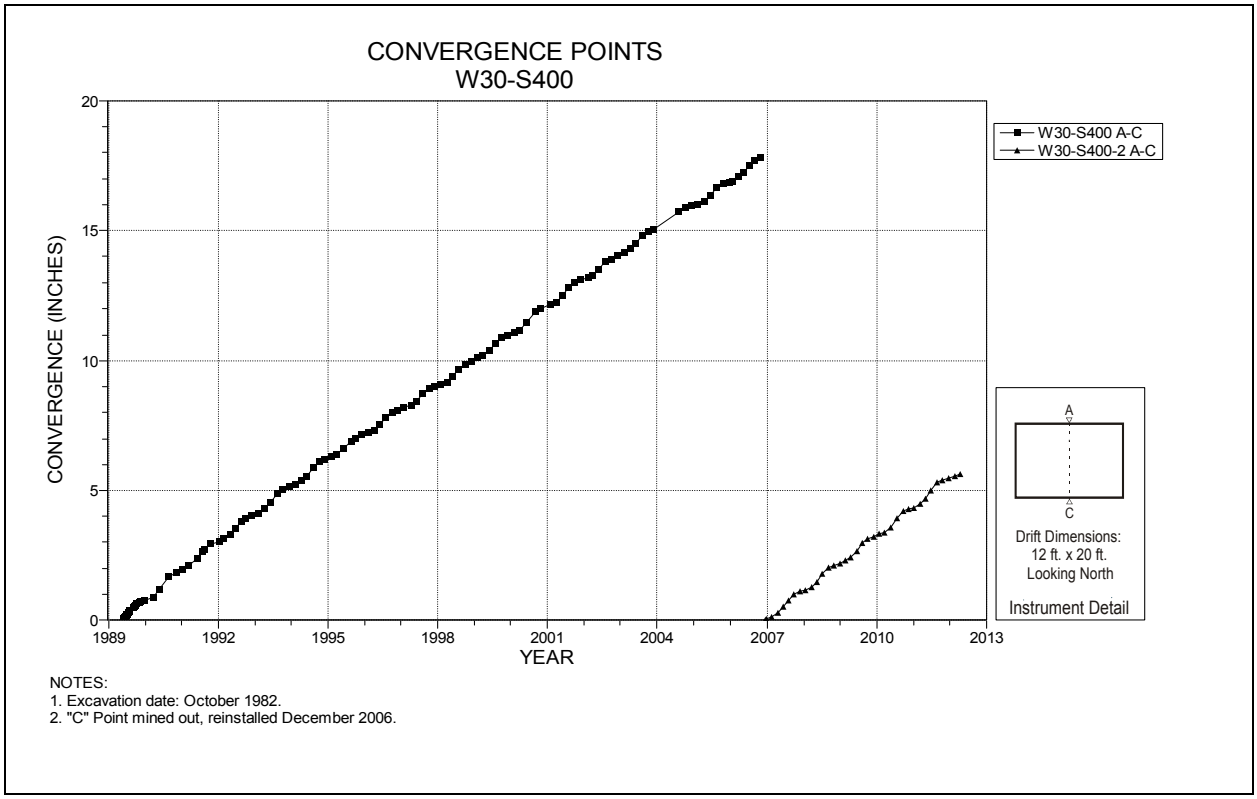


Figure 4-193 Convergence Point Array
W30 S400 – Roof to Floor

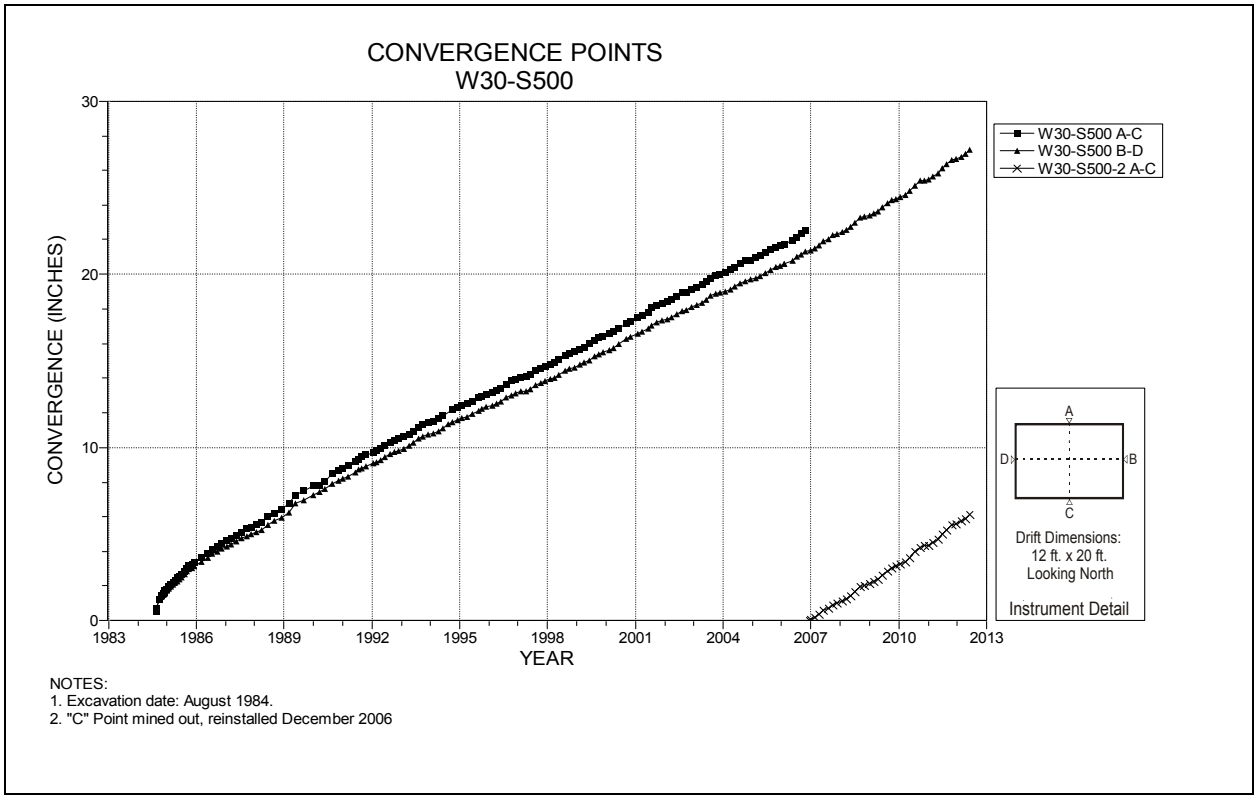


Figure 4-194 Convergence Point Array
W30 S500 – All Chords

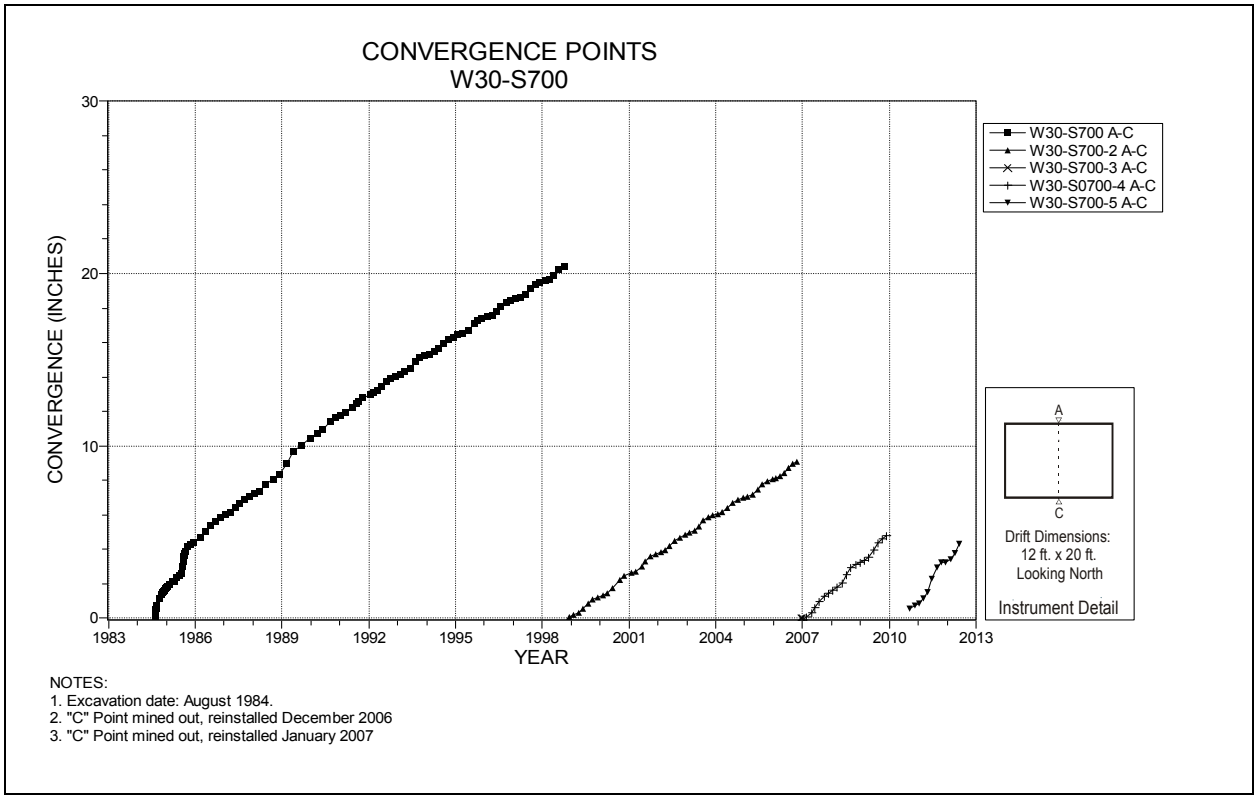


Figure 4-195 Convergence Point Array
W30 S700 – Roof to Floor

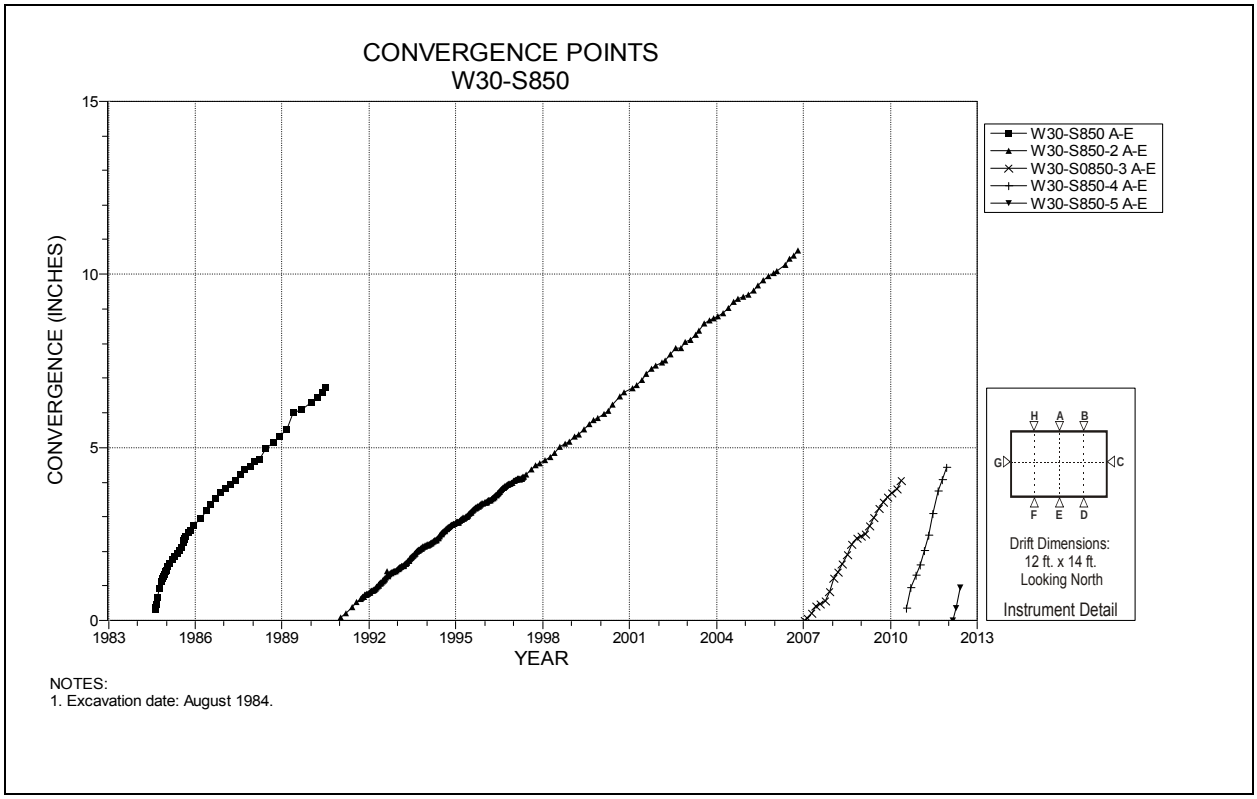


Figure 4-196 Convergence Point Array
W30 S850 – Roof to Floor

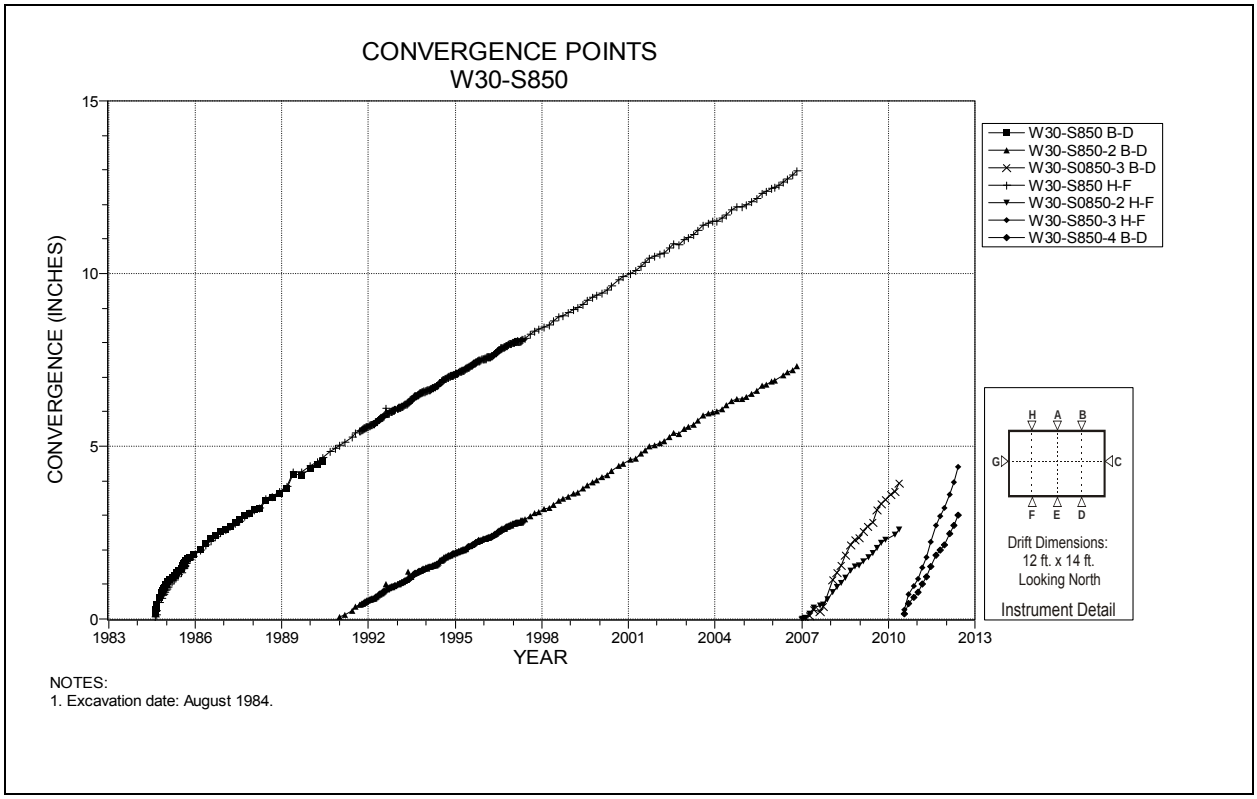


Figure 4-197 Convergence Point Array
W30 S850 – Roof to Floor – Quarter Points

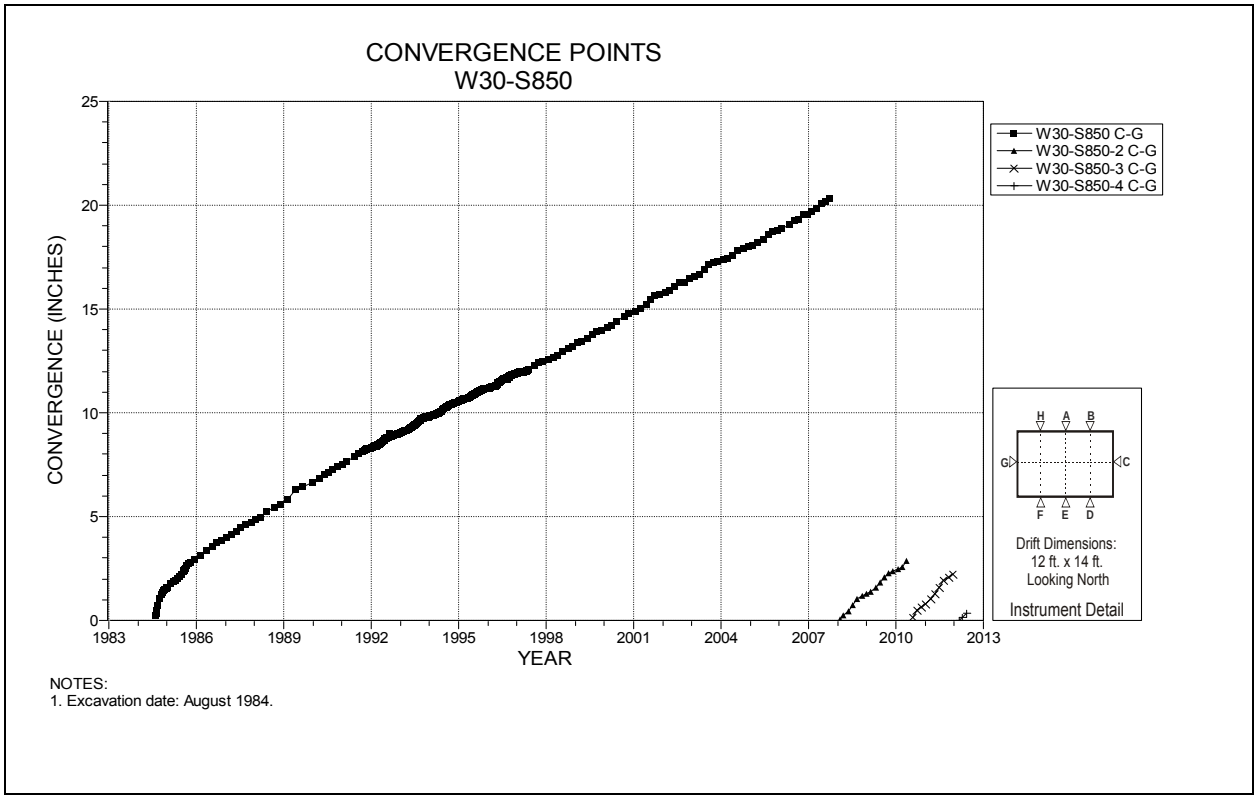


Figure 4-198 Convergence Point Array
W30 S850 – Rib to Rib

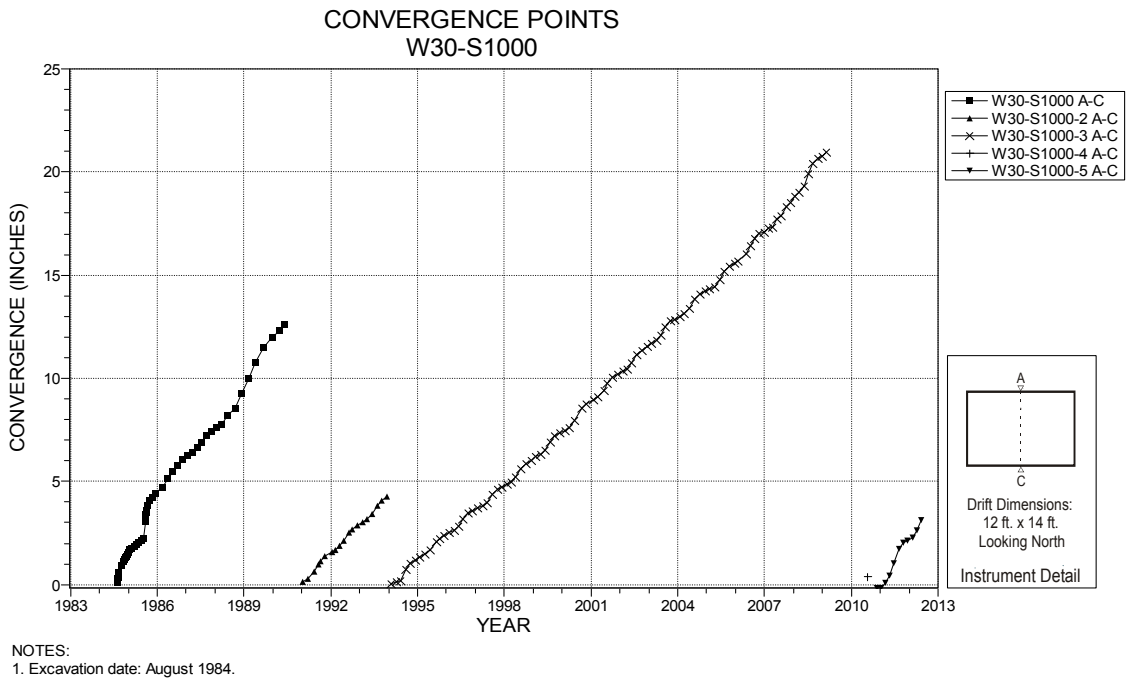


Figure 4-199 Convergence Point Array
W30 S1000 – Roof to Floor

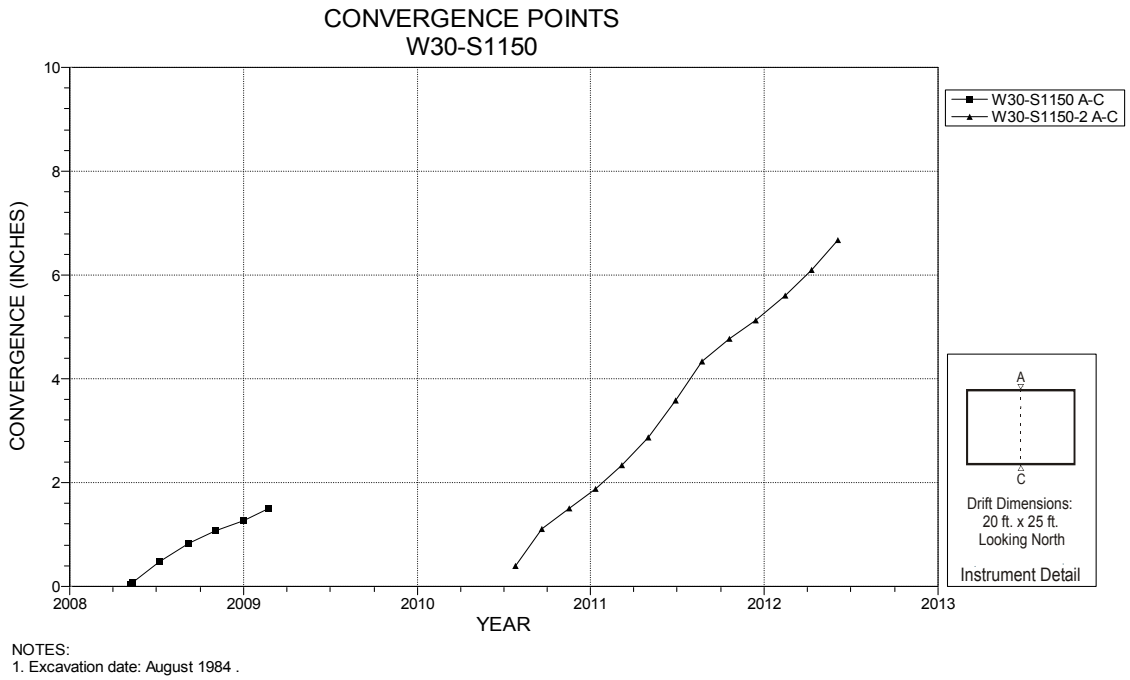


Figure 4-200 Convergence Point Array
W30 S1150 – Roof to Floor

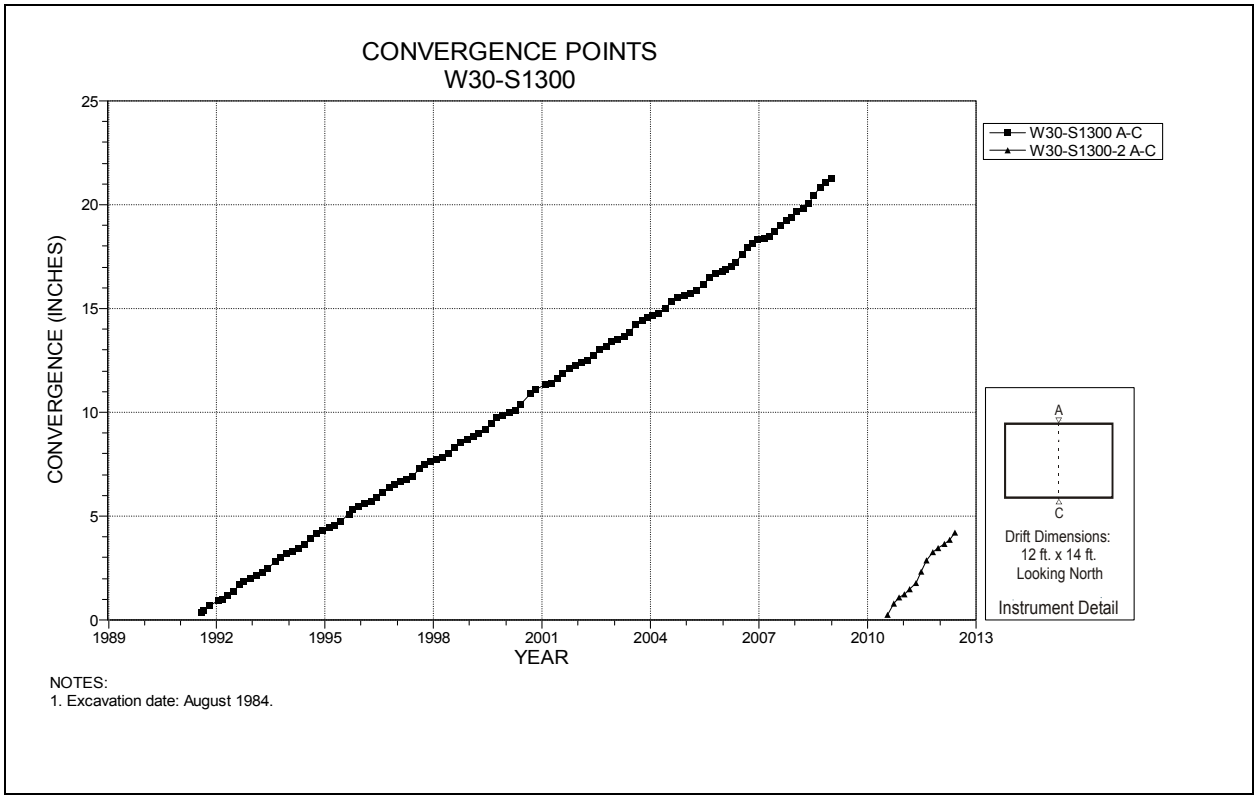


Figure 4-201 Convergence Point Array
W30 S1300 – Roof to Floor

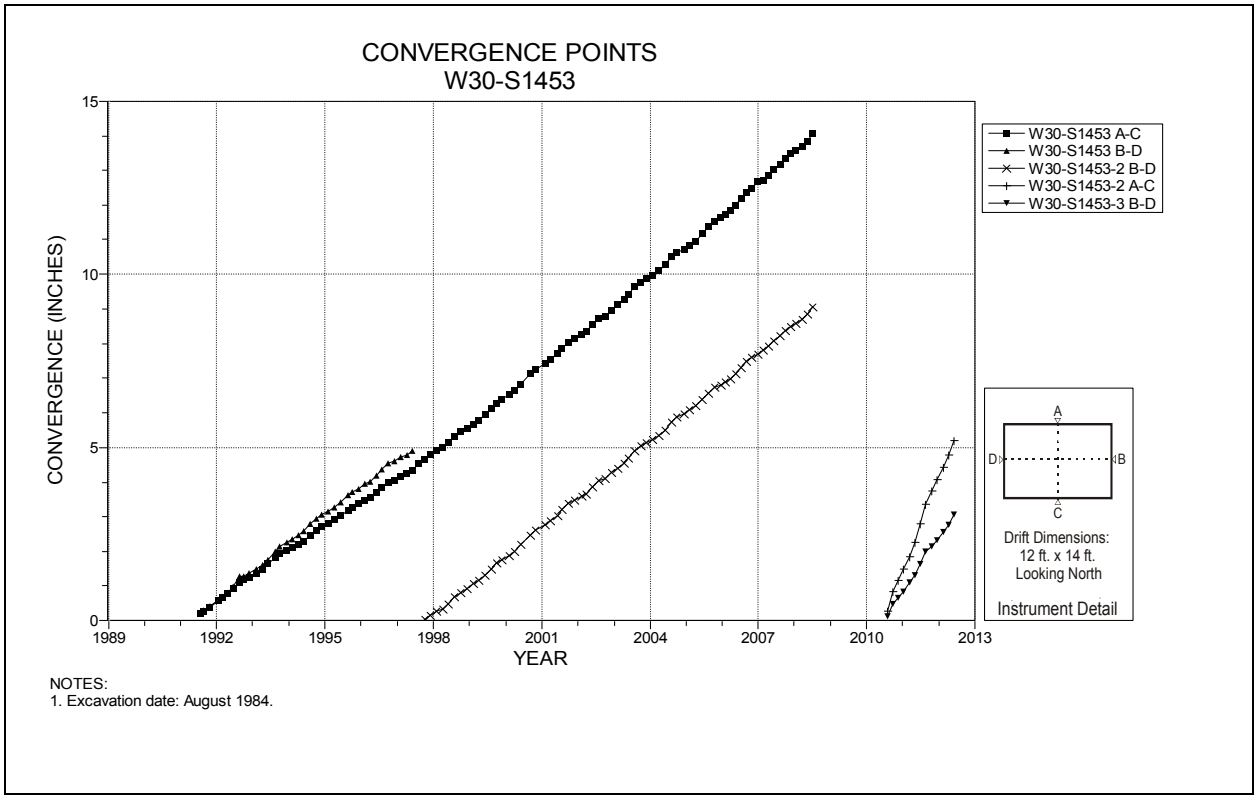


Figure 4-202 Convergence Point Array
W30 S1453 – All Chords

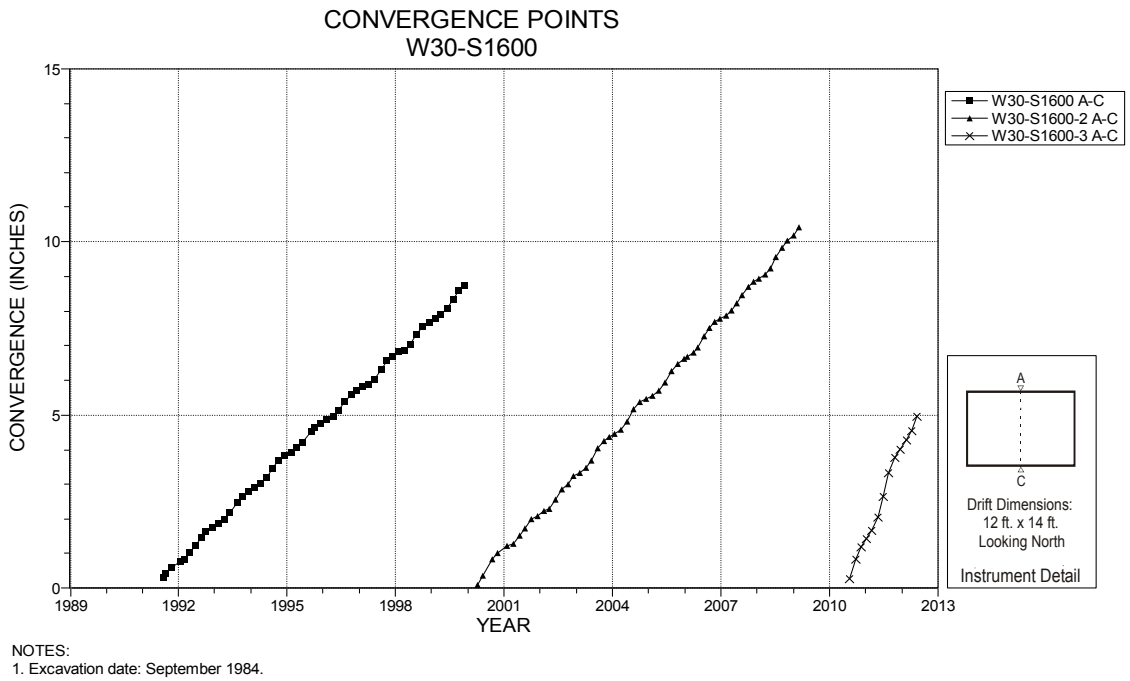


Figure 4-203 Convergence Point Array
W30 S1600 – Roof to Floor

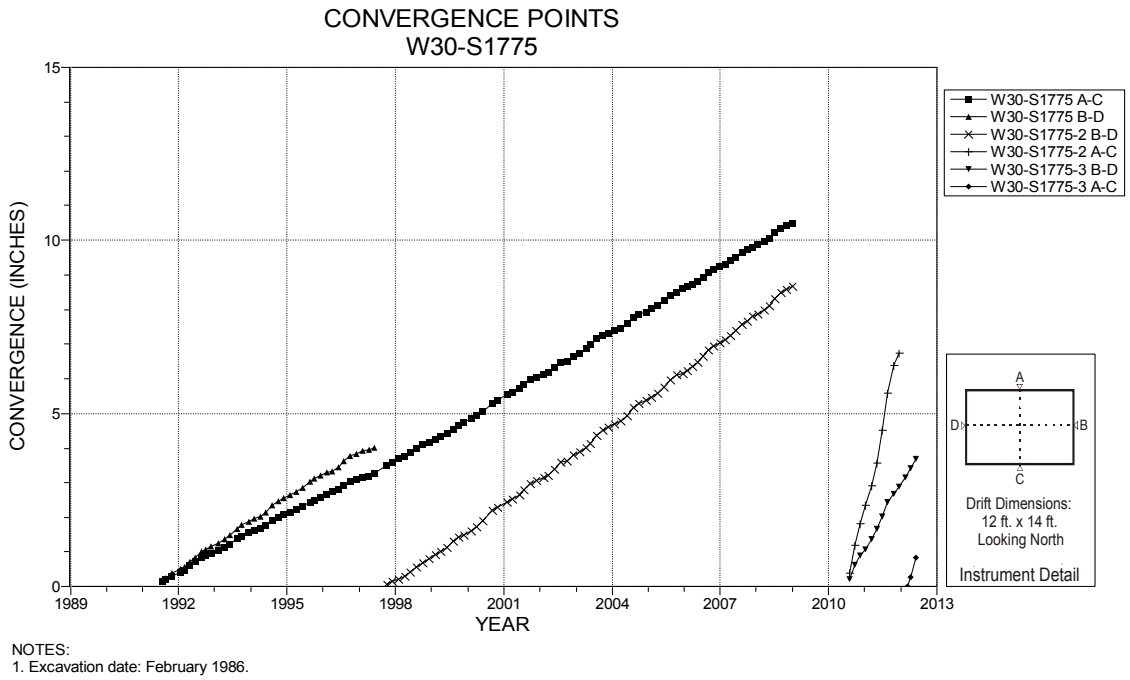


Figure 4-204 Convergence Point Array
W30 S1775 – All Chords

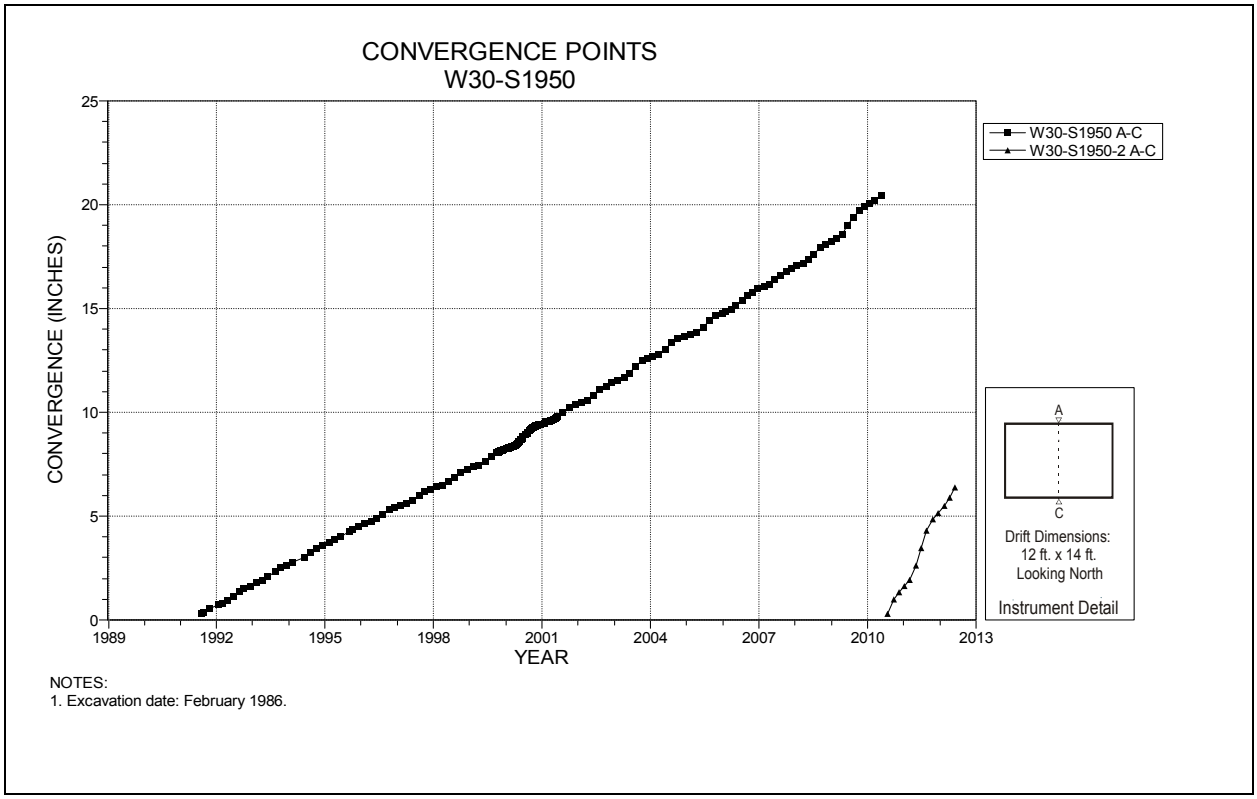


Figure 4-205 Convergence Point Array
W30 S1950 – Roof to Floor

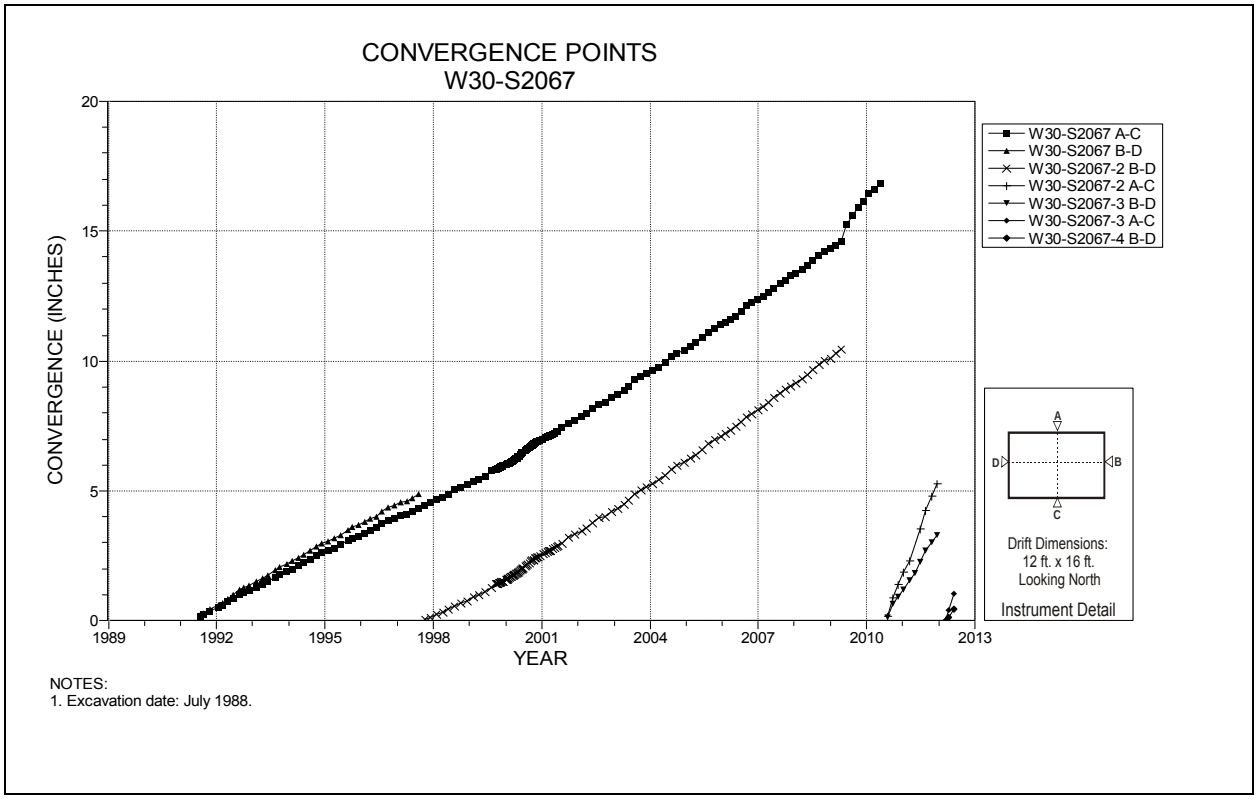


Figure 4-206 Convergence Point Array
W30 S2067 – All Chords

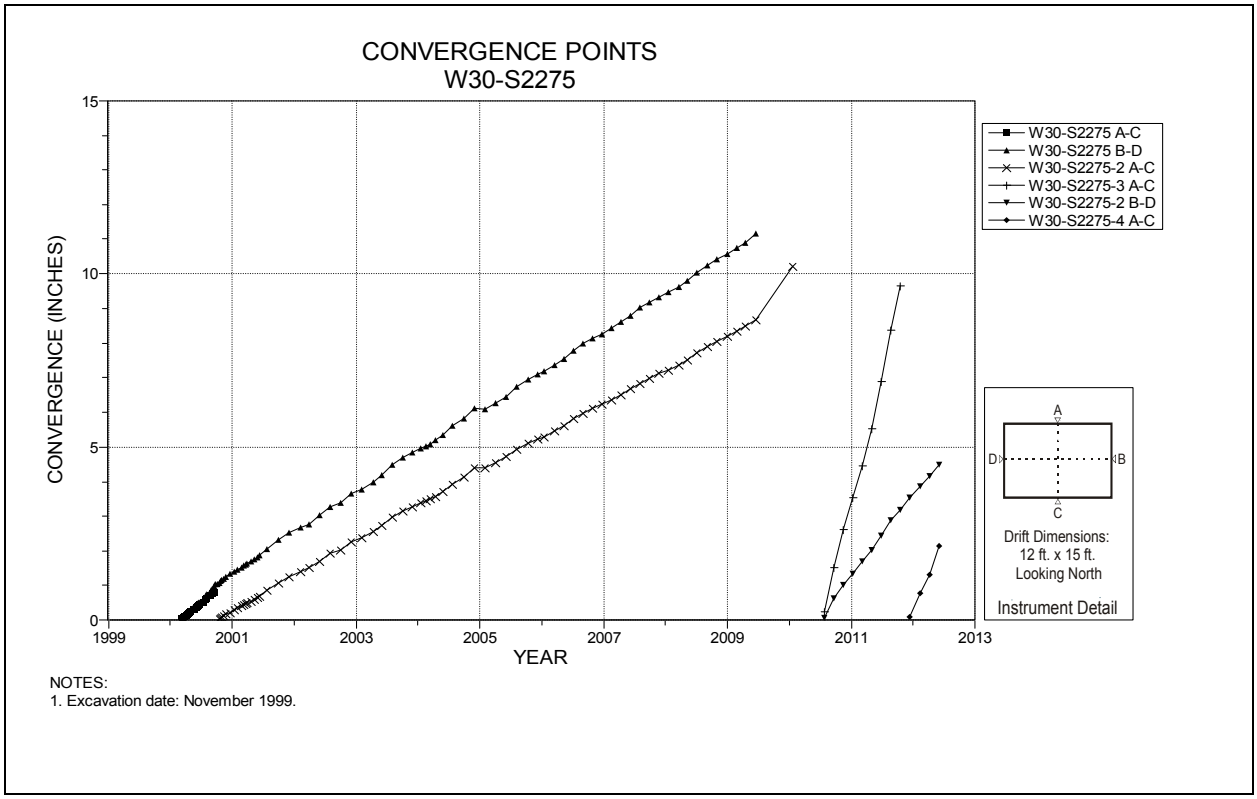


Figure 4-207 Convergence Point Array
W30 S2275 – All Chords

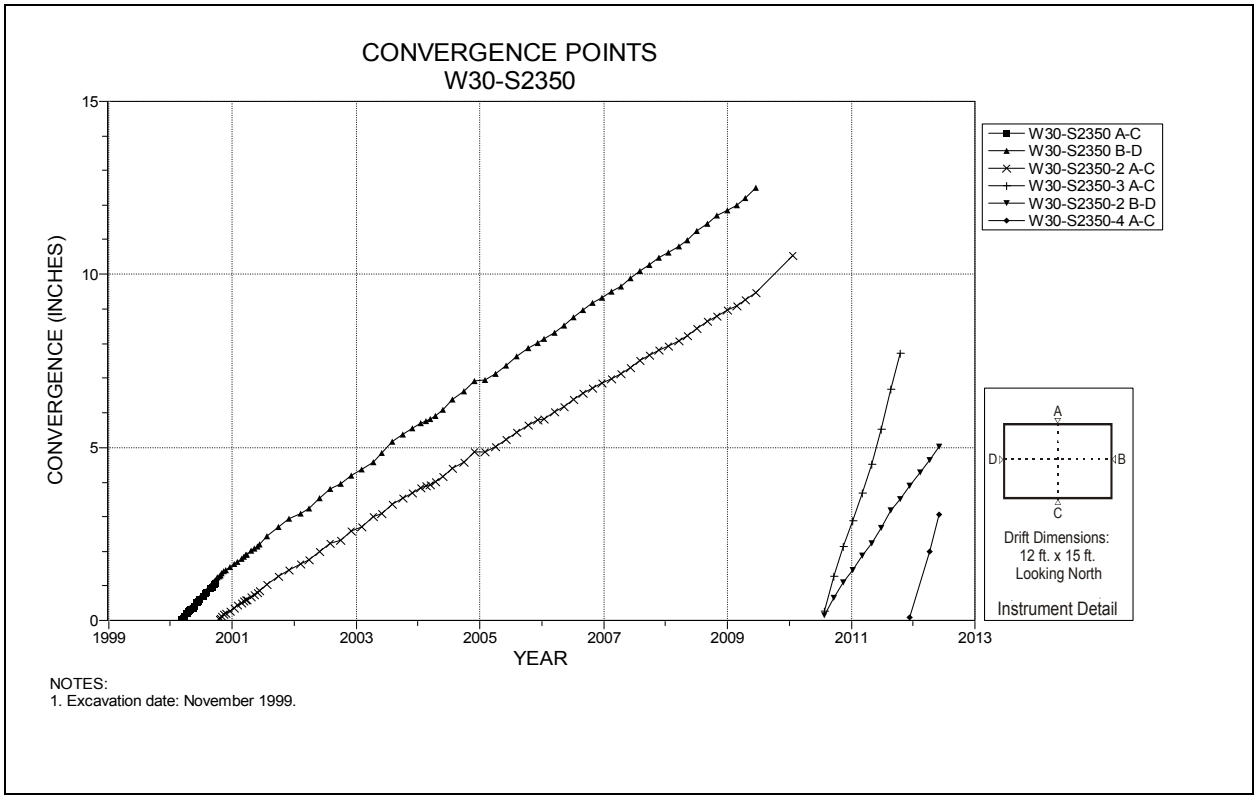


Figure 4-208 Convergence Point Array
W30 S2350 – All Chords

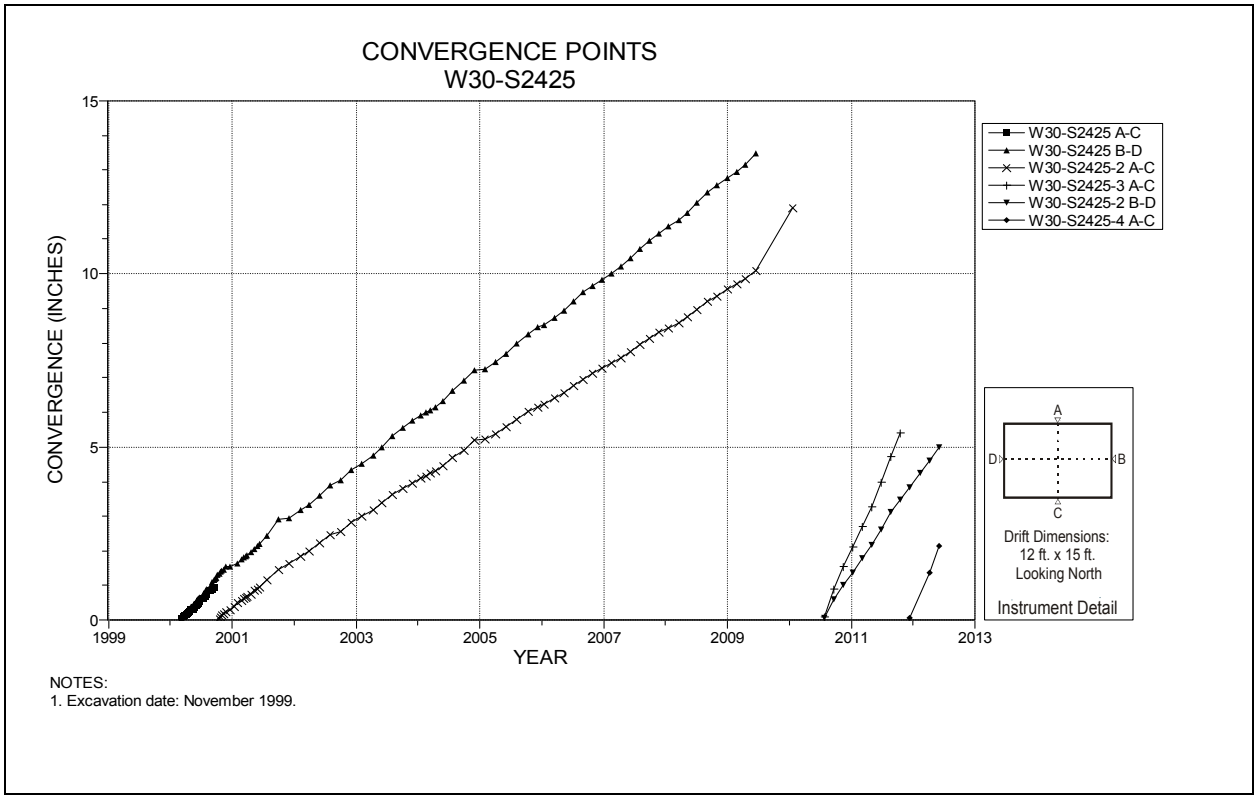


Figure 4-209 Convergence Point Array
W30 S2425 – All Chords

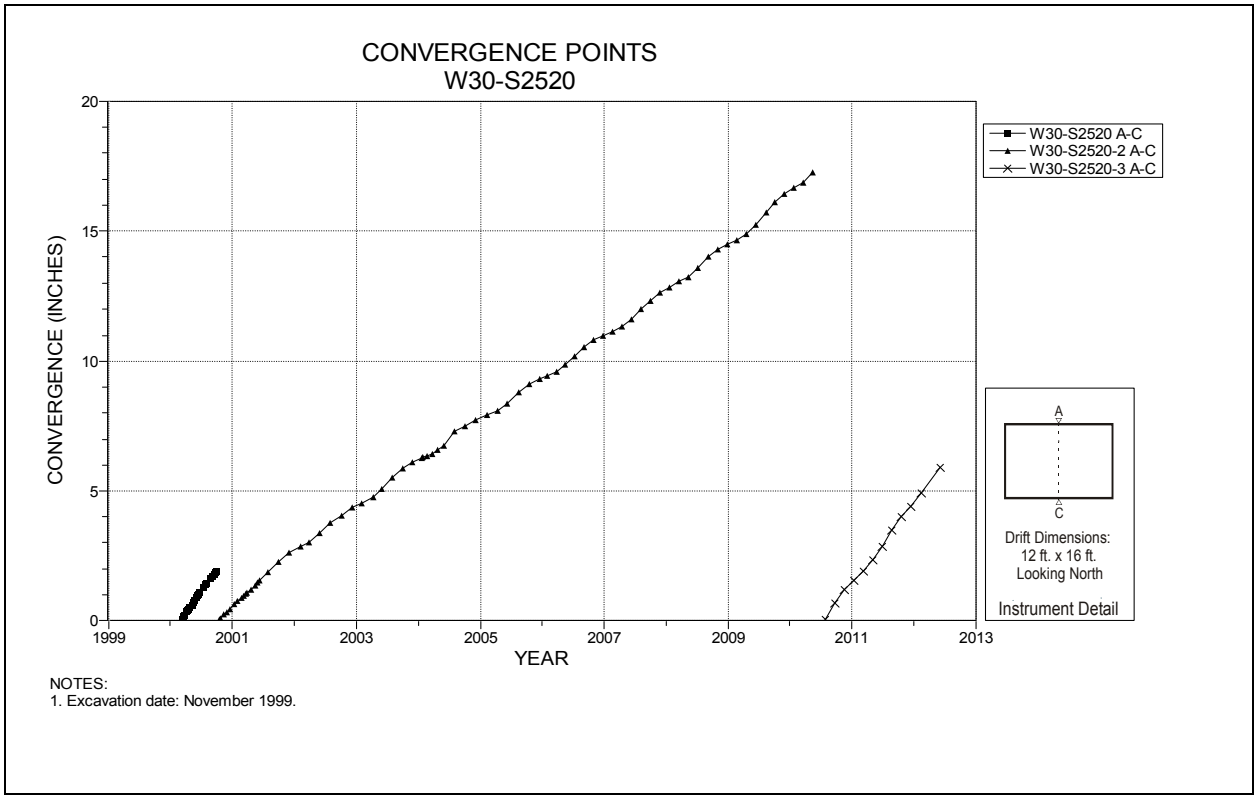


Figure 4-210 Convergence Point Array
W30 S2520 – Roof to Floor

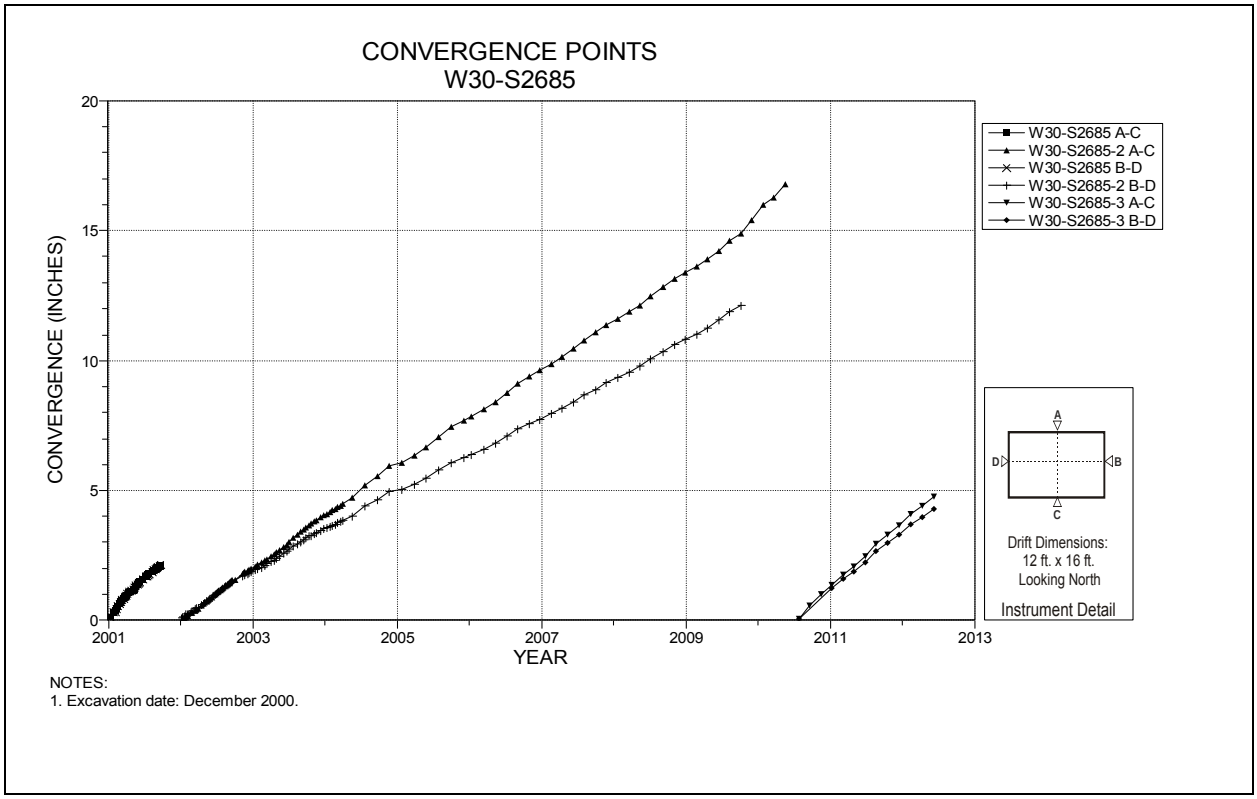


Figure 4-211 Convergence Point Array
W30 S2685 – All Chords

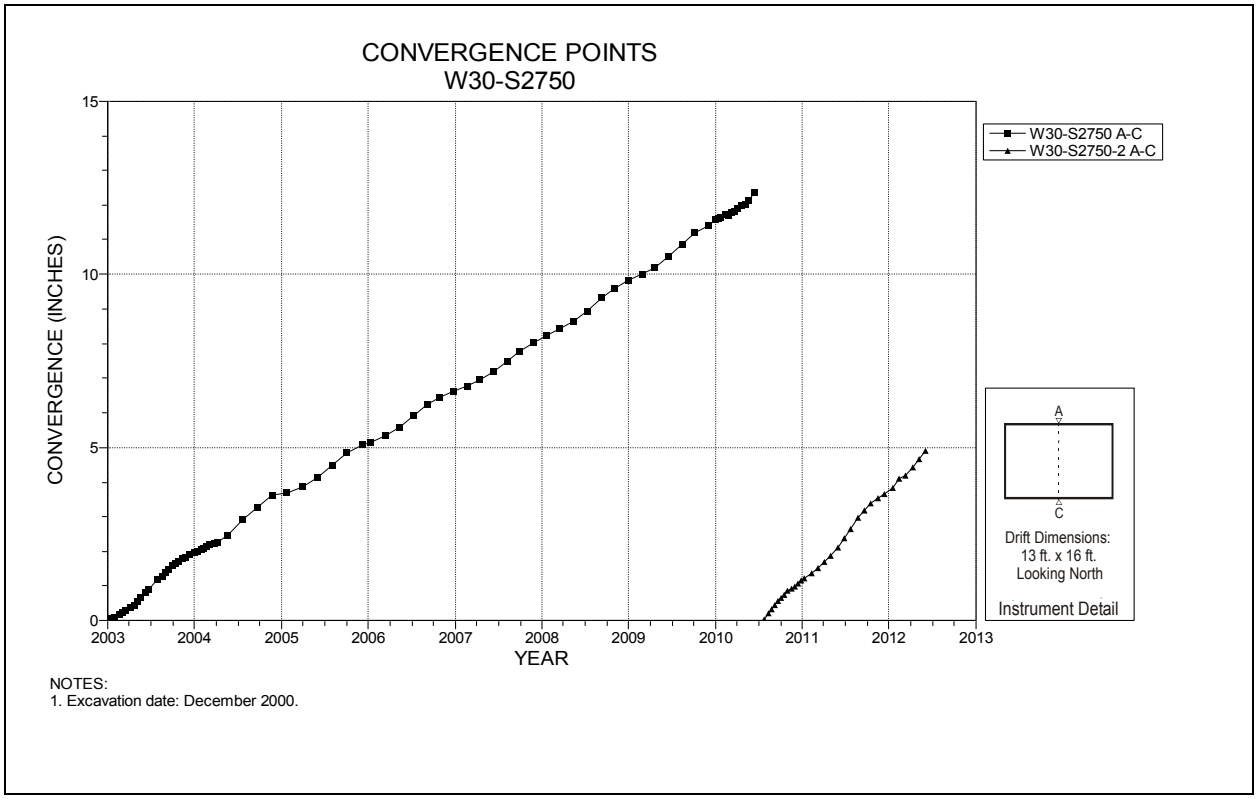


Figure 4-212 Convergence Point Array
W30 S2750 – Roof to Floor

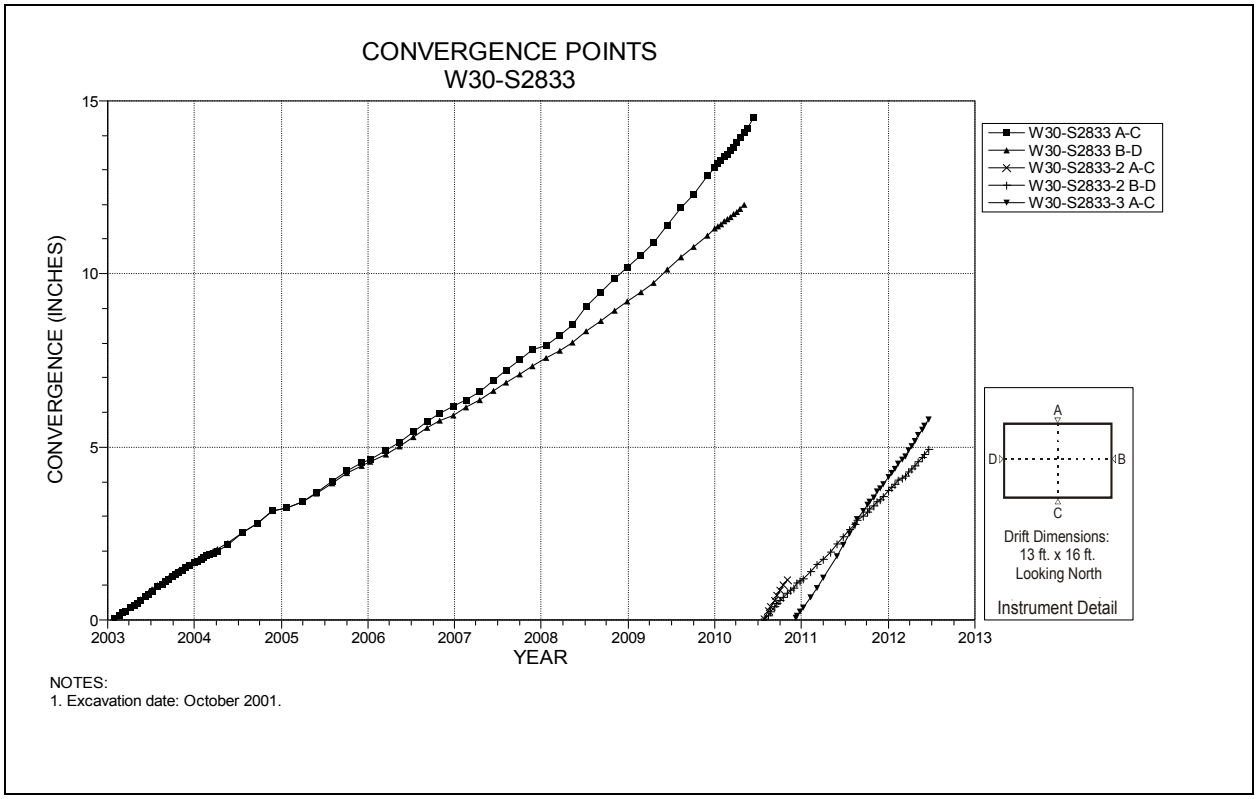


Figure 4-213 Convergence Point Array
W30 S2833 – All Chords

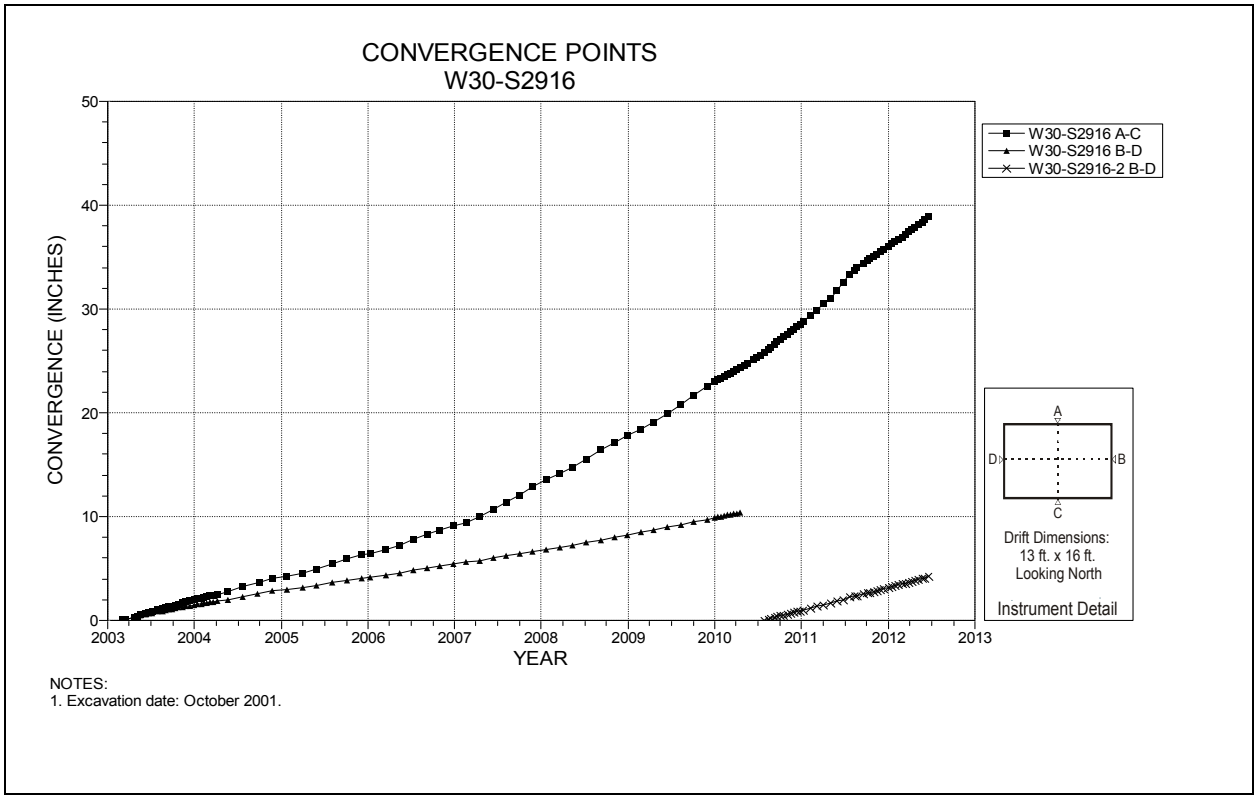


Figure 4-214 Convergence Point Array
W30 S2916 – All Chords

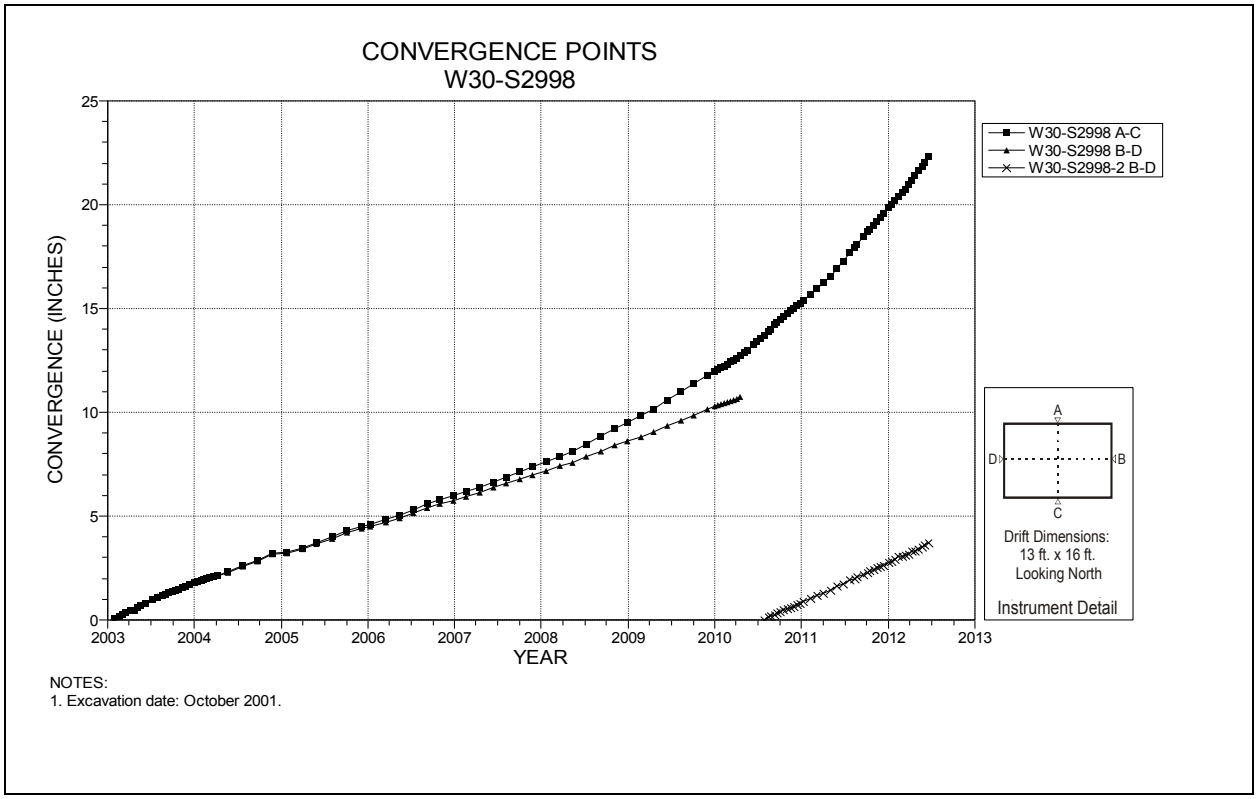


Figure 4-215 Convergence Point Array
W30 S2998 – All Chords

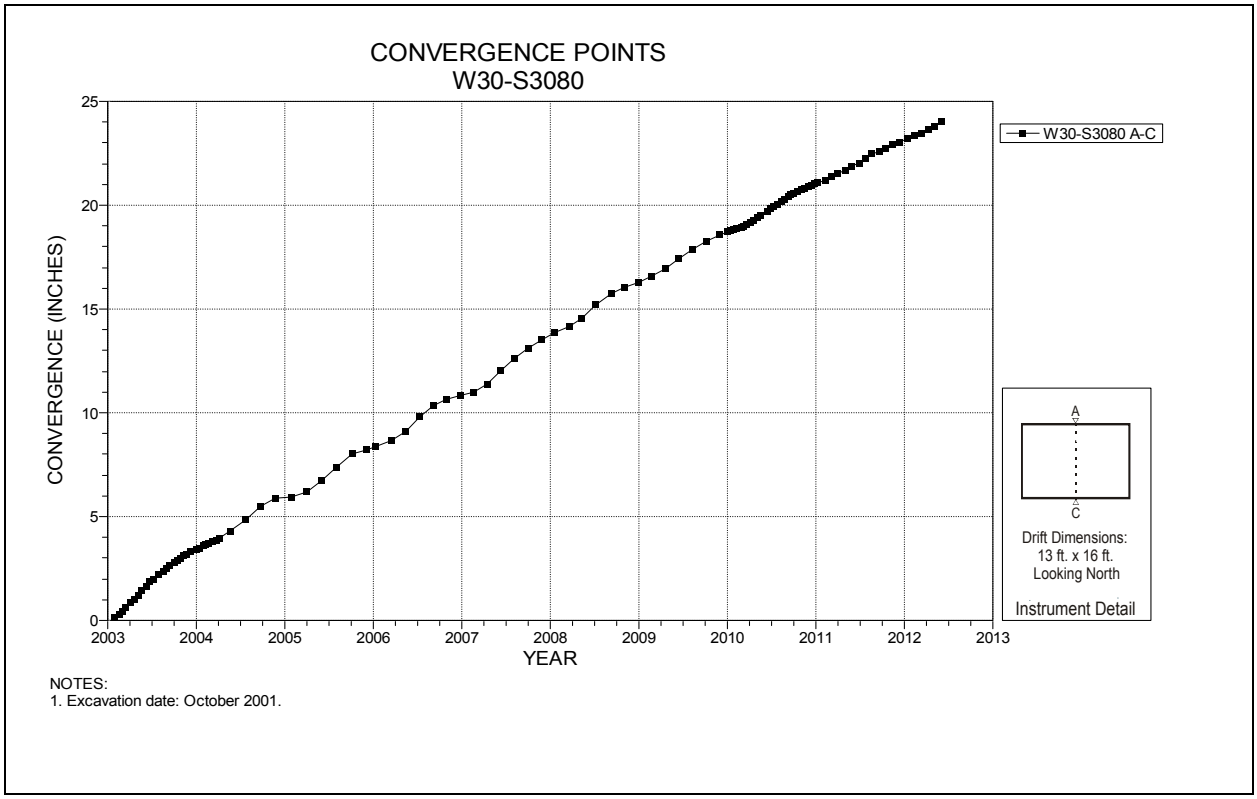


Figure 4-216 Convergence Point Array
W30 S3080 – Roof to Floor

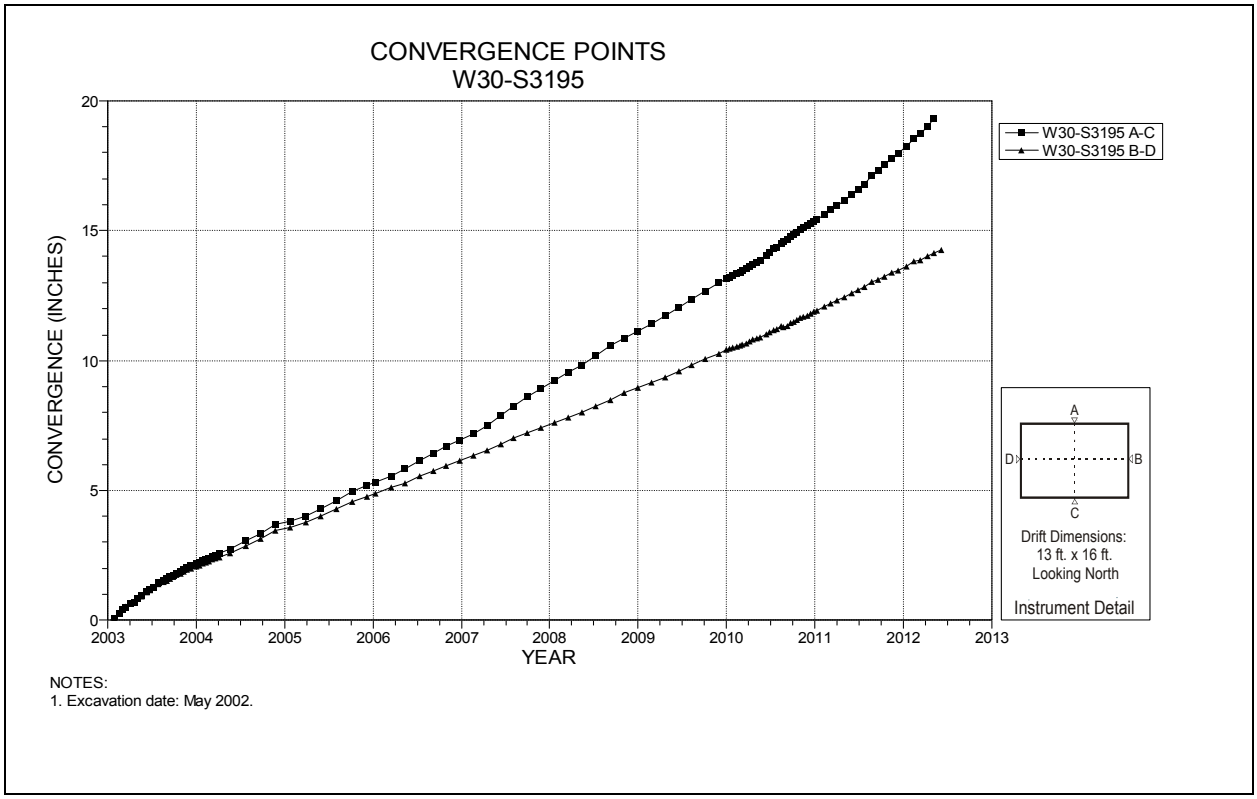


Figure 4-217 Convergence Point Array
W30 S3195 – All Chords

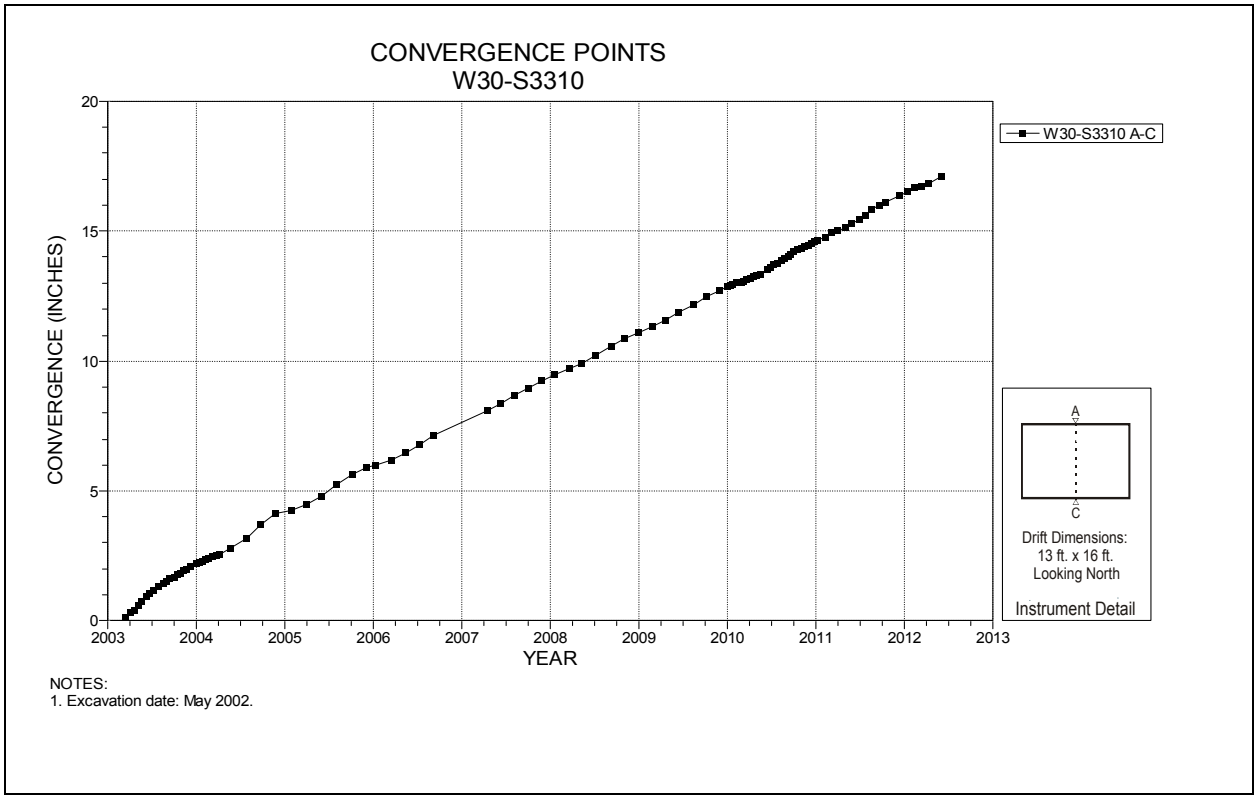


Figure 4-218 Convergence Point Array
W30 S3310 – Roof to Floor

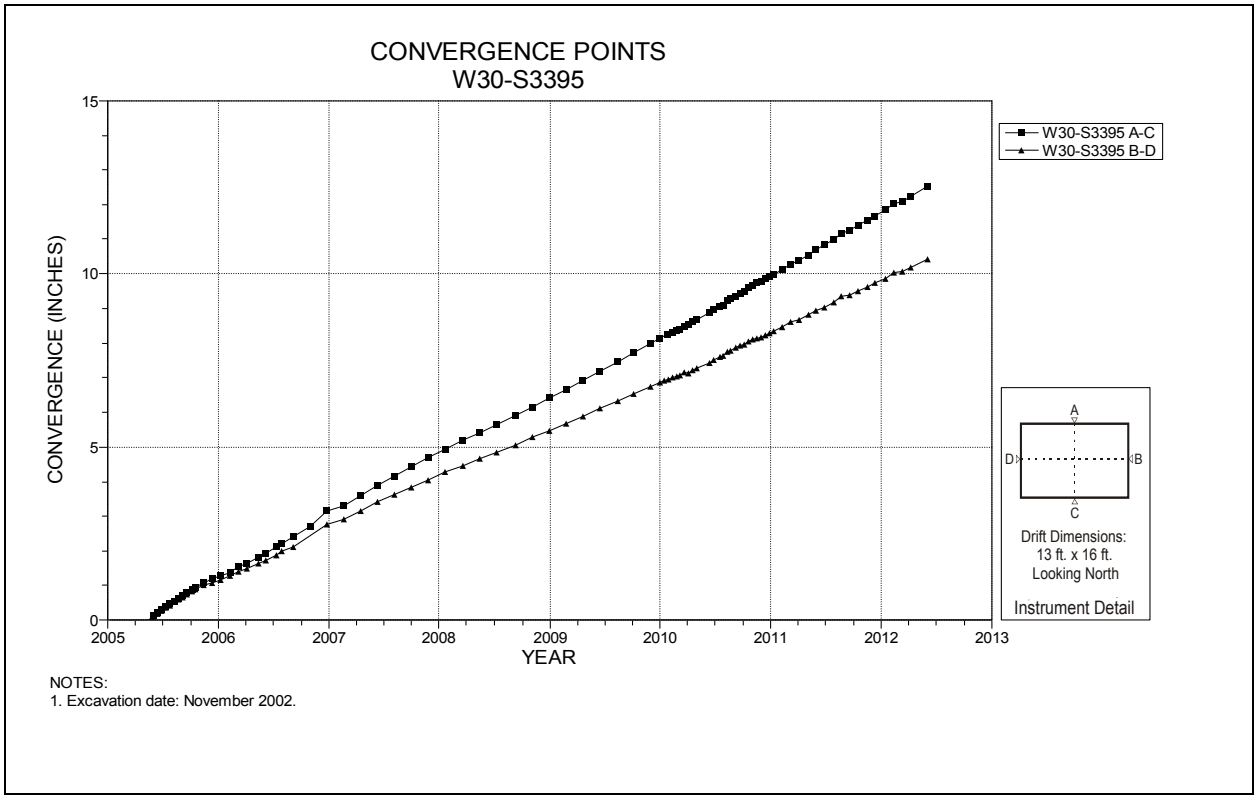


Figure 4-219 Convergence Point Array
W30 S3395 – All Chords

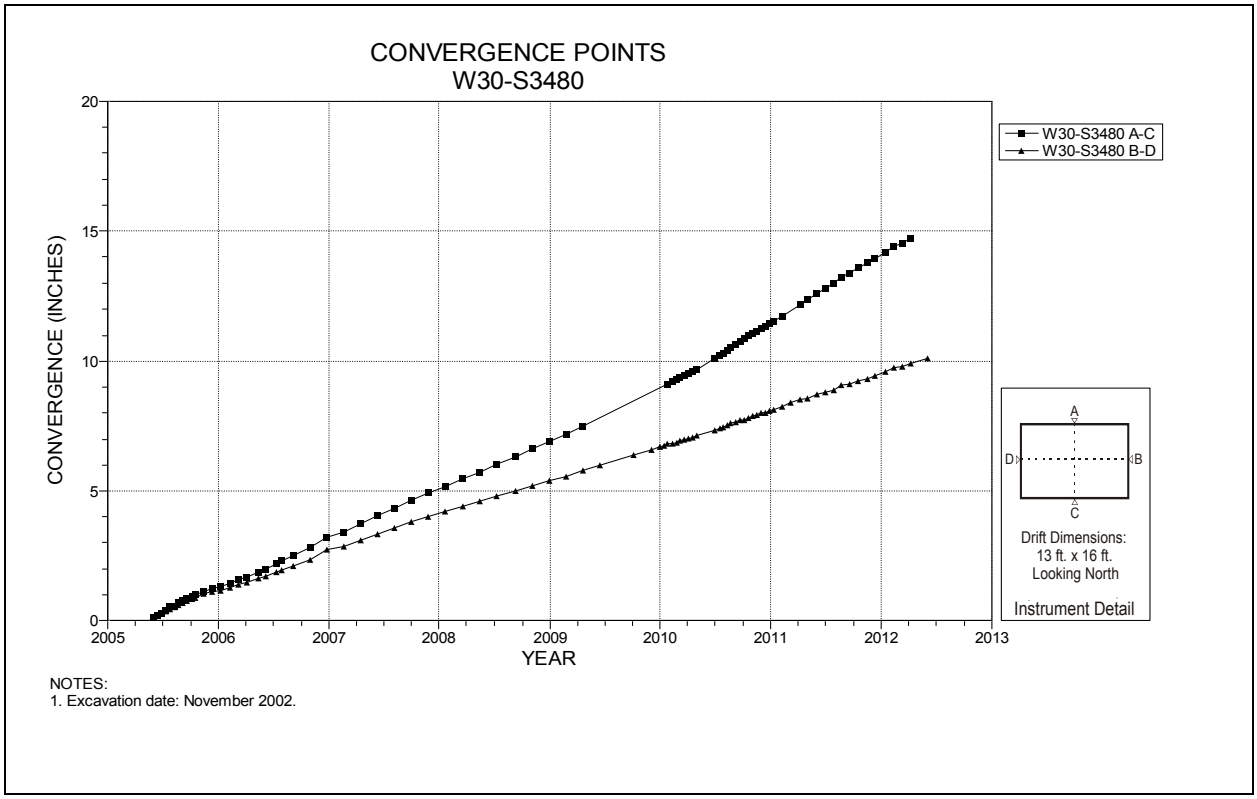


Figure 4-220 Convergence Point Array
W30 S3480 – All Chords

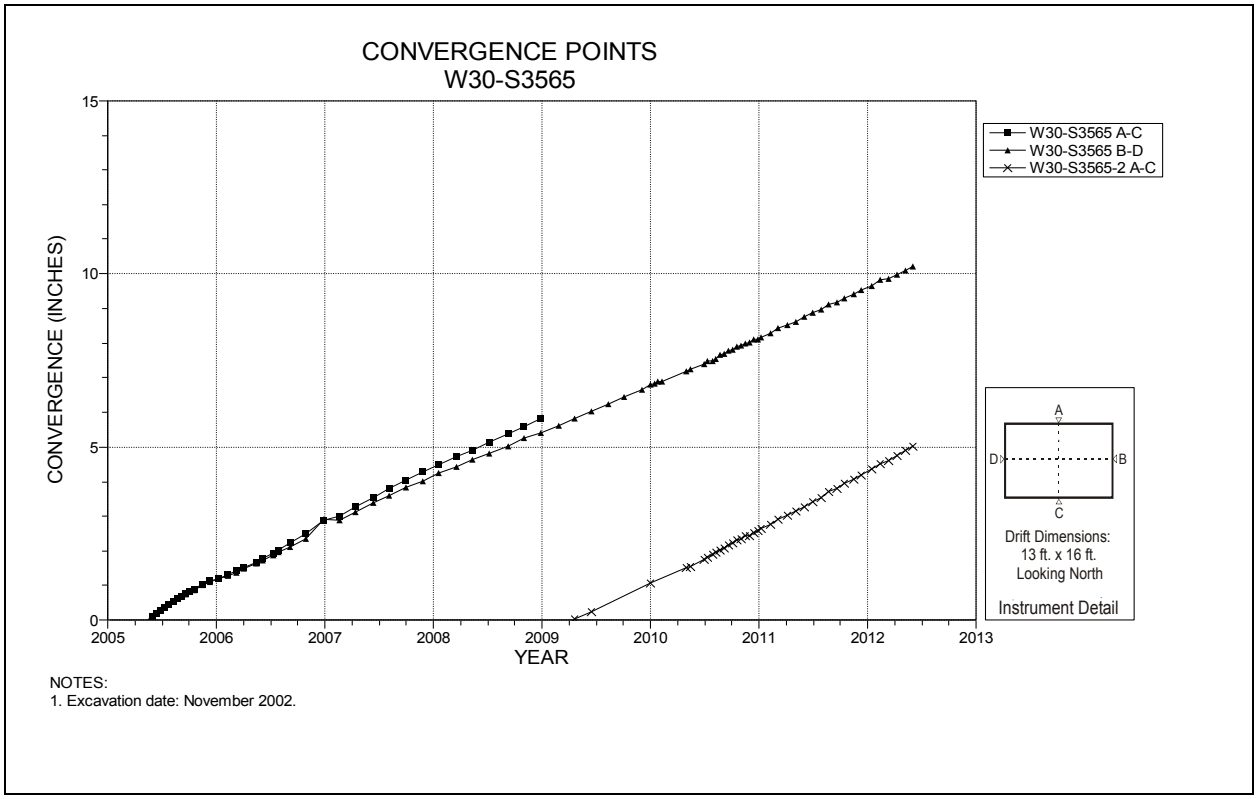


Figure 4-221 Convergence Point Array
W30 S3565 – All Chords

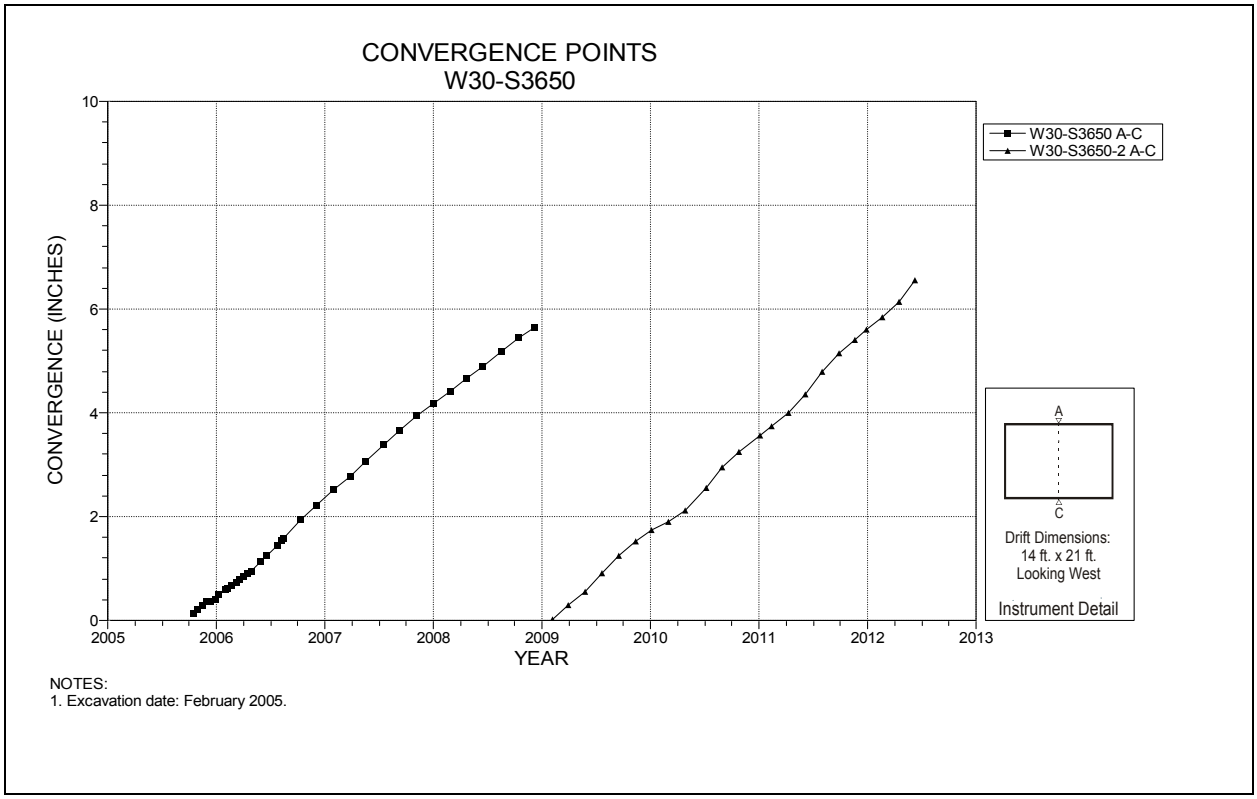


Figure 4-222 Convergence Point Array
W30 S3650 – Roof to Floor

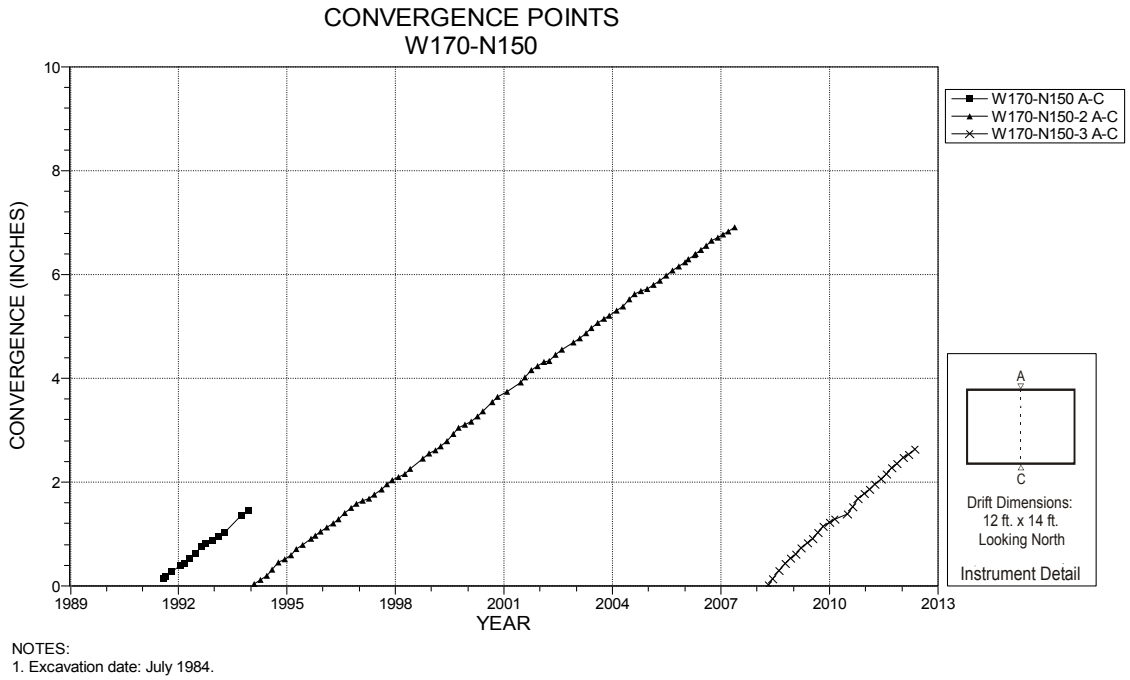


Figure 4-223 Convergence Point Array
W170 N150 – Roof to Floor

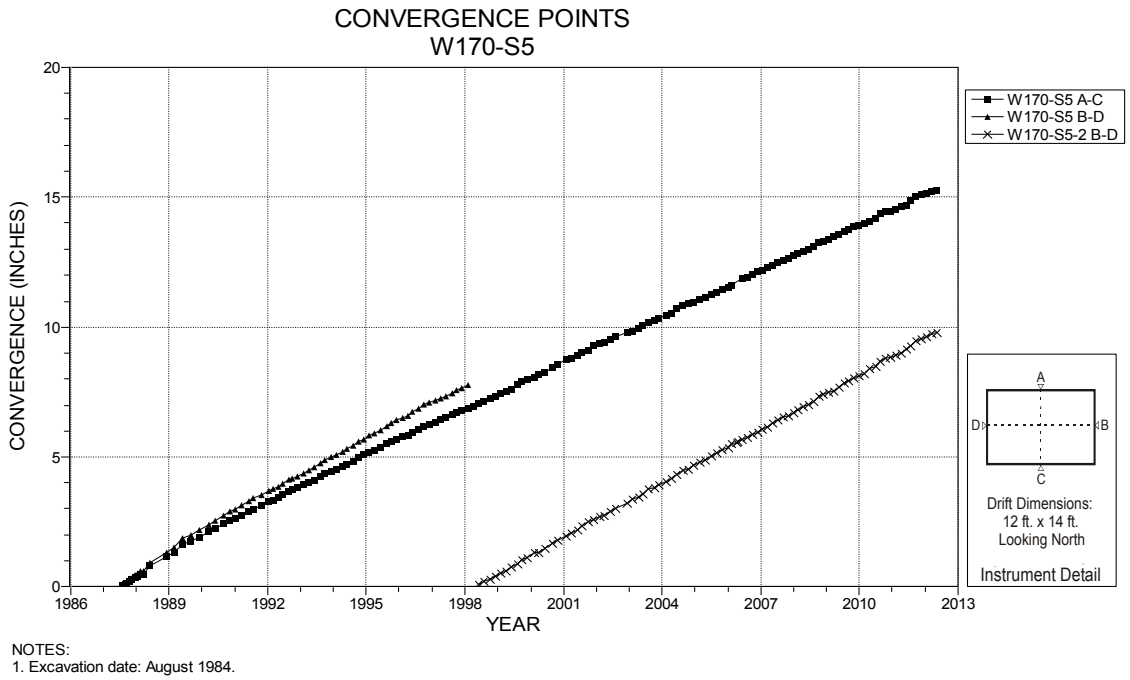


Figure 4-224 Convergence Point Array
W170 S5 – All Chords

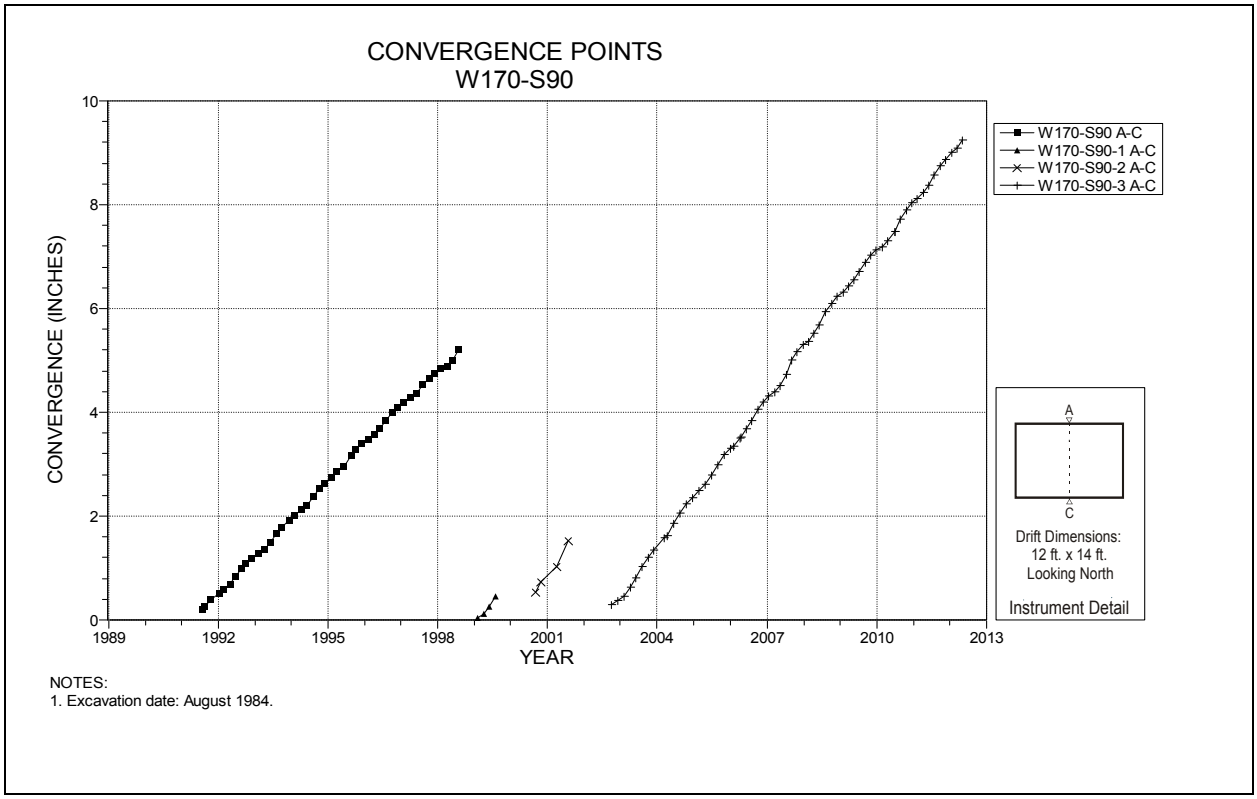


Figure 4-225 Convergence Point Array
W170 S90 – Roof to Floor

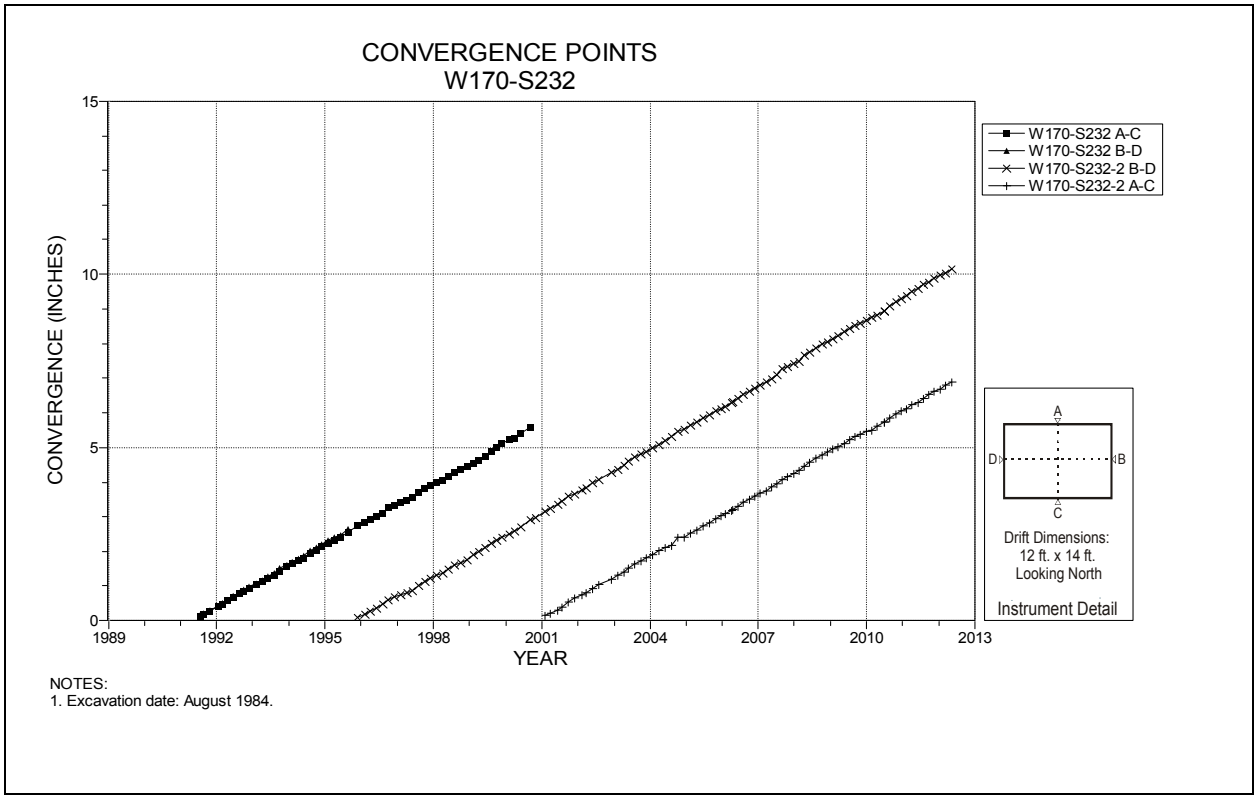


Figure 4-225a Convergence Point Array
W170 S232 – All Chords

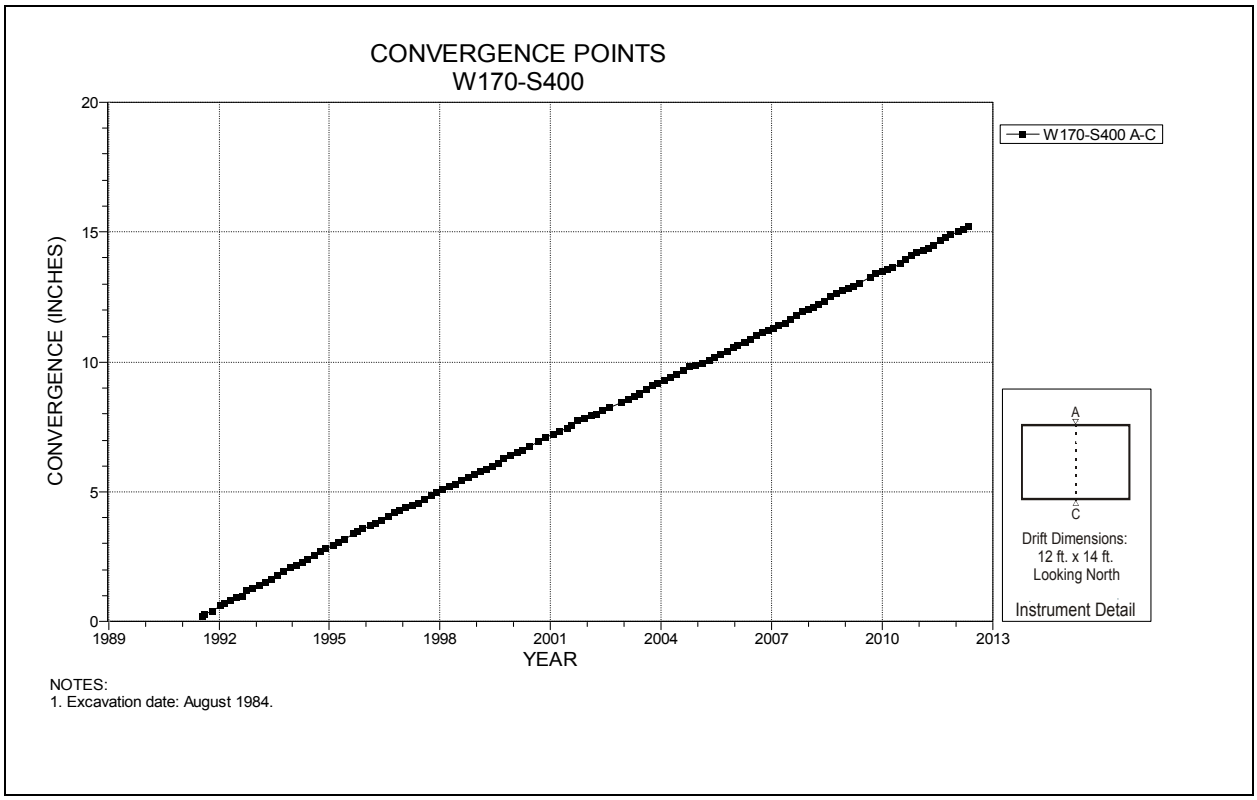


Figure 4-226 Convergence Point Array
W170 S400 – Roof to Floor

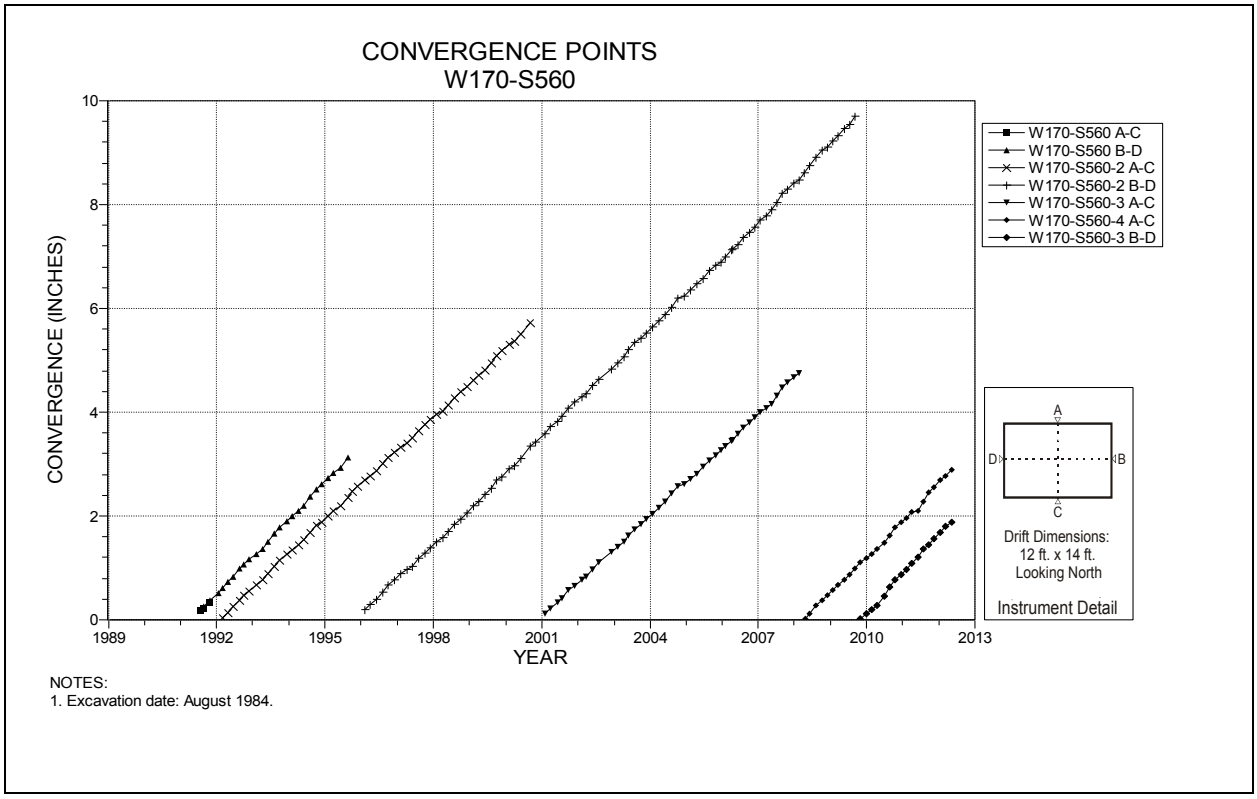
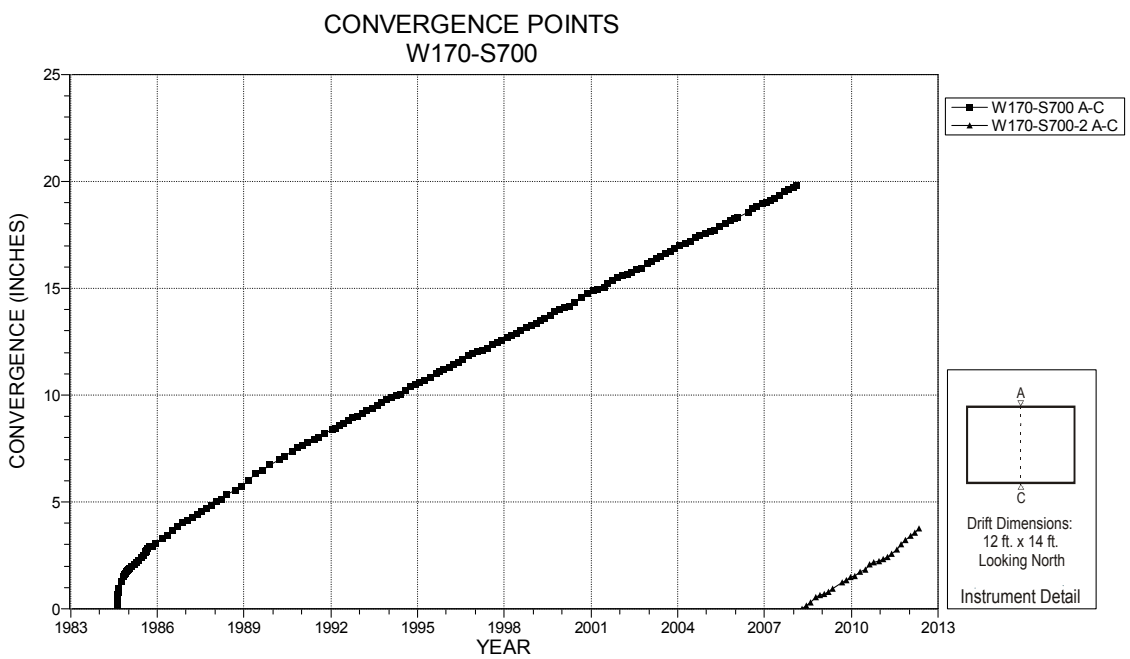
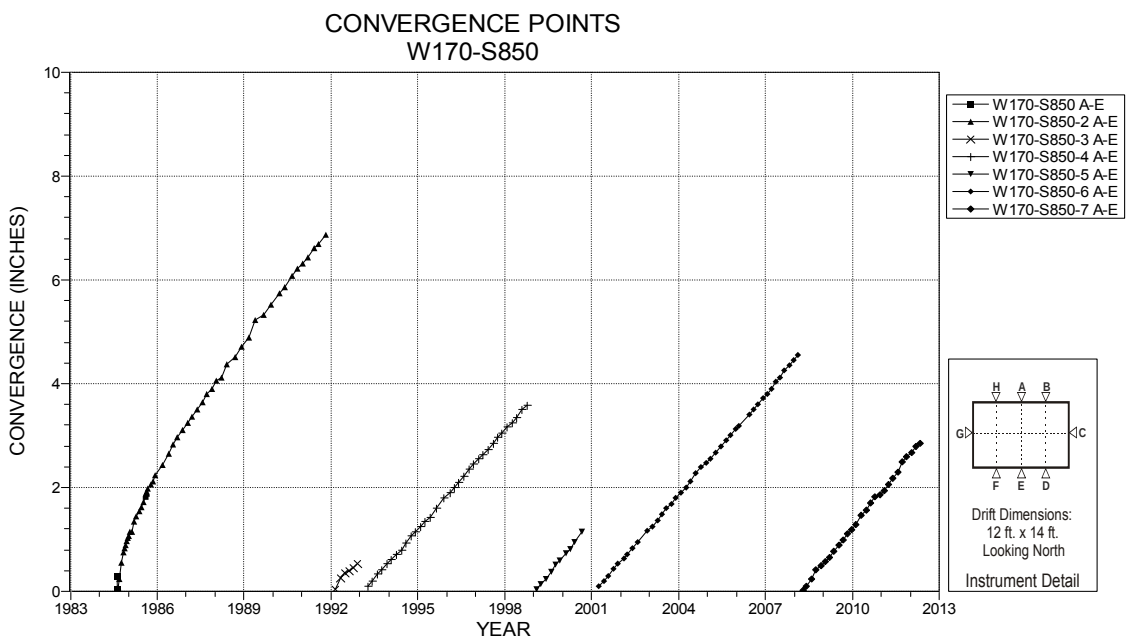


Figure 4-227 Convergence Point Array
W170 S560 – All Chords



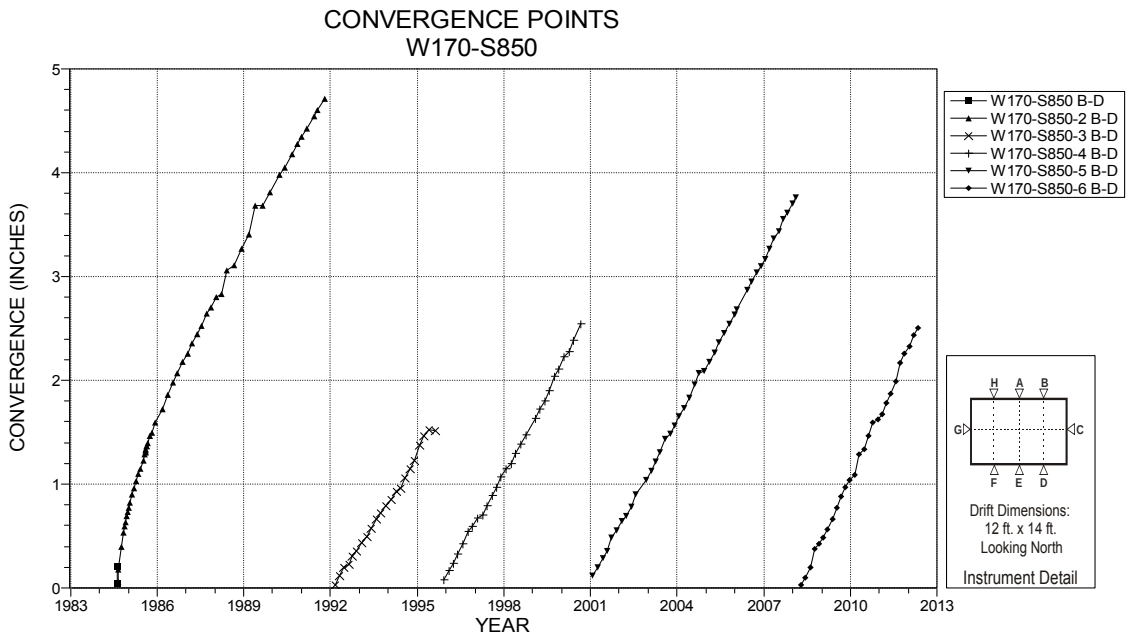
NOTES:
1. Excavation date: August 1984.

Figure 4-228 Convergence Point Array
W170 S700 – Roof to Floor



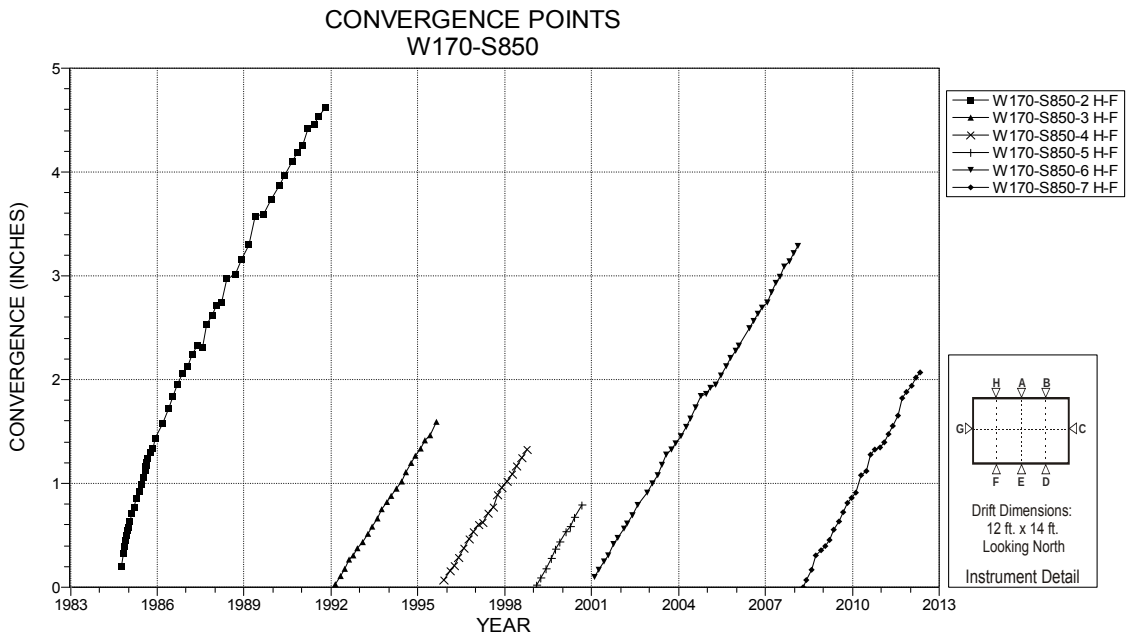
NOTES:
1. Excavation date: August 1984.
2. Chords for this location are on separate plots.

Figure 4-229 Convergence Point Array
W170 S850 – Roof to Floor – Centerline



NOTES:
1. Excavation date: August 1984.
2. Chords for this location are on separate plots.

Figure 4-230 Convergence Point Array
W170 S850 – Roof to Floor – East Quarter Point



NOTES:
1. Excavation date: August 1984.
2. Chords for this location are on separate plots.

Figure 4-231 Convergence Point Array
W170 S850 – Roof to Floor – West Quarter Point

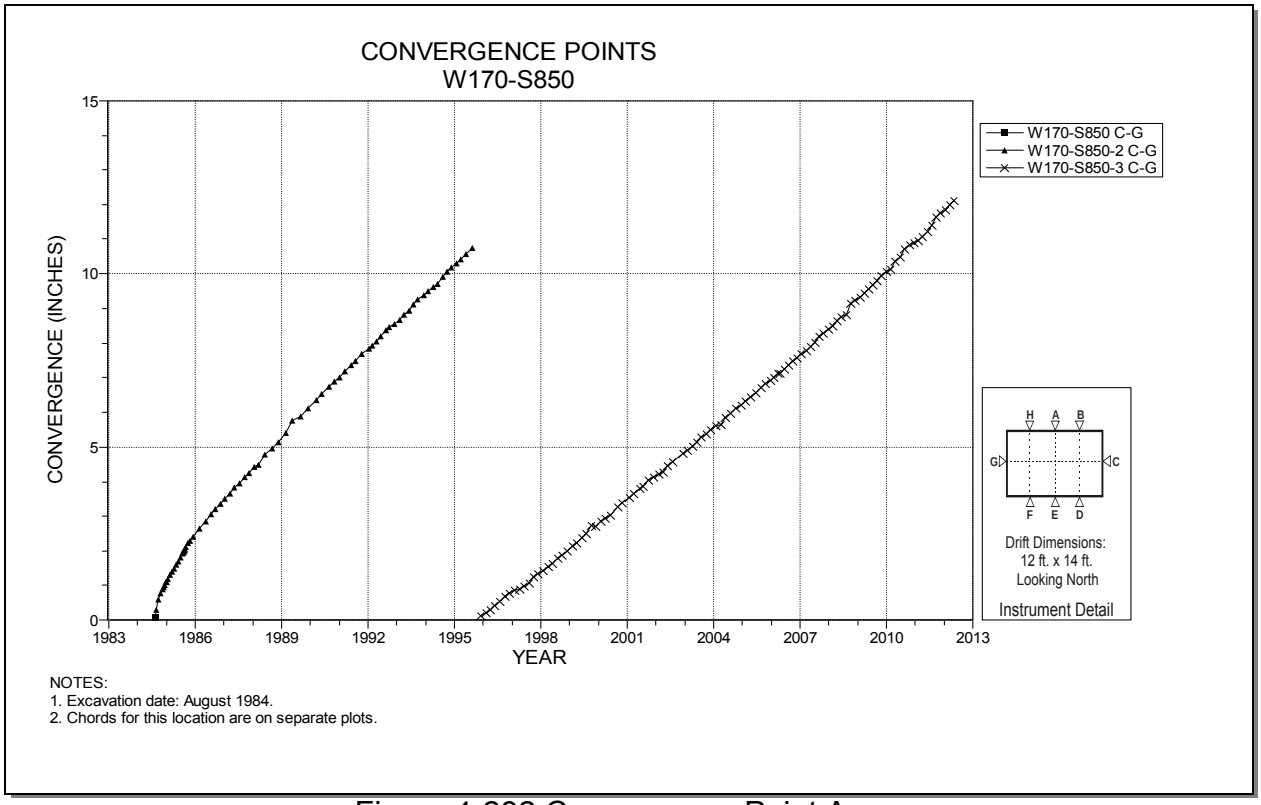


Figure 4-232 Convergence Point Array
W170 S850 – Rib to Rib

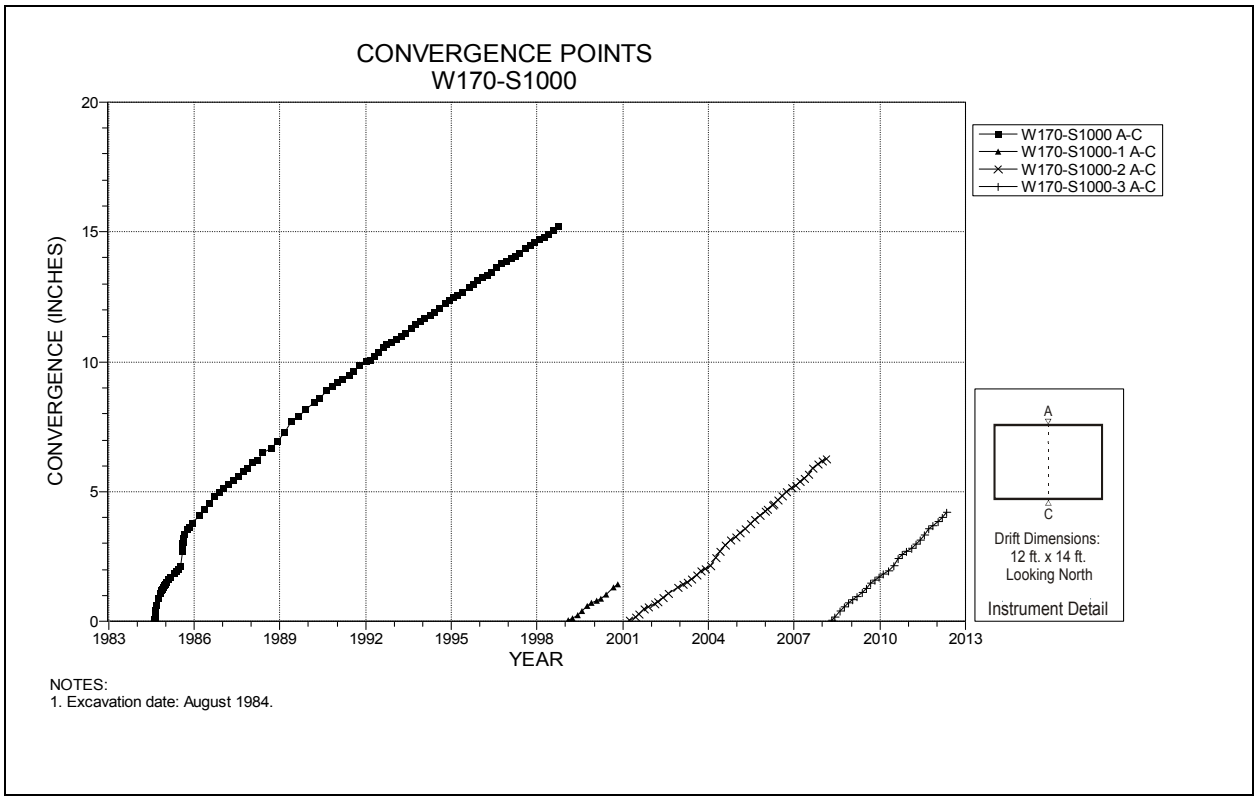


Figure 4-233 Convergence Point Array
W170 S1000 – Roof to Floor

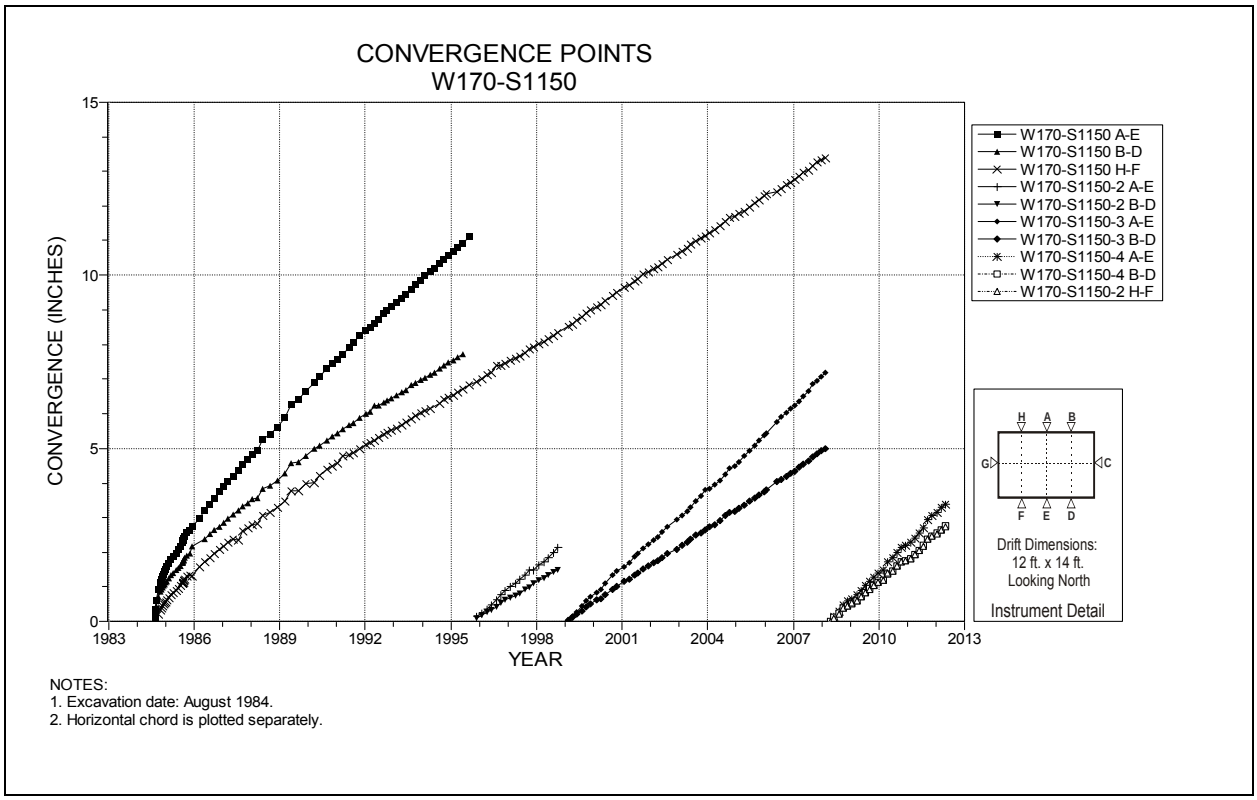


Figure 4-234 Convergence Point Array
W170 S1150 – Roof to Floor

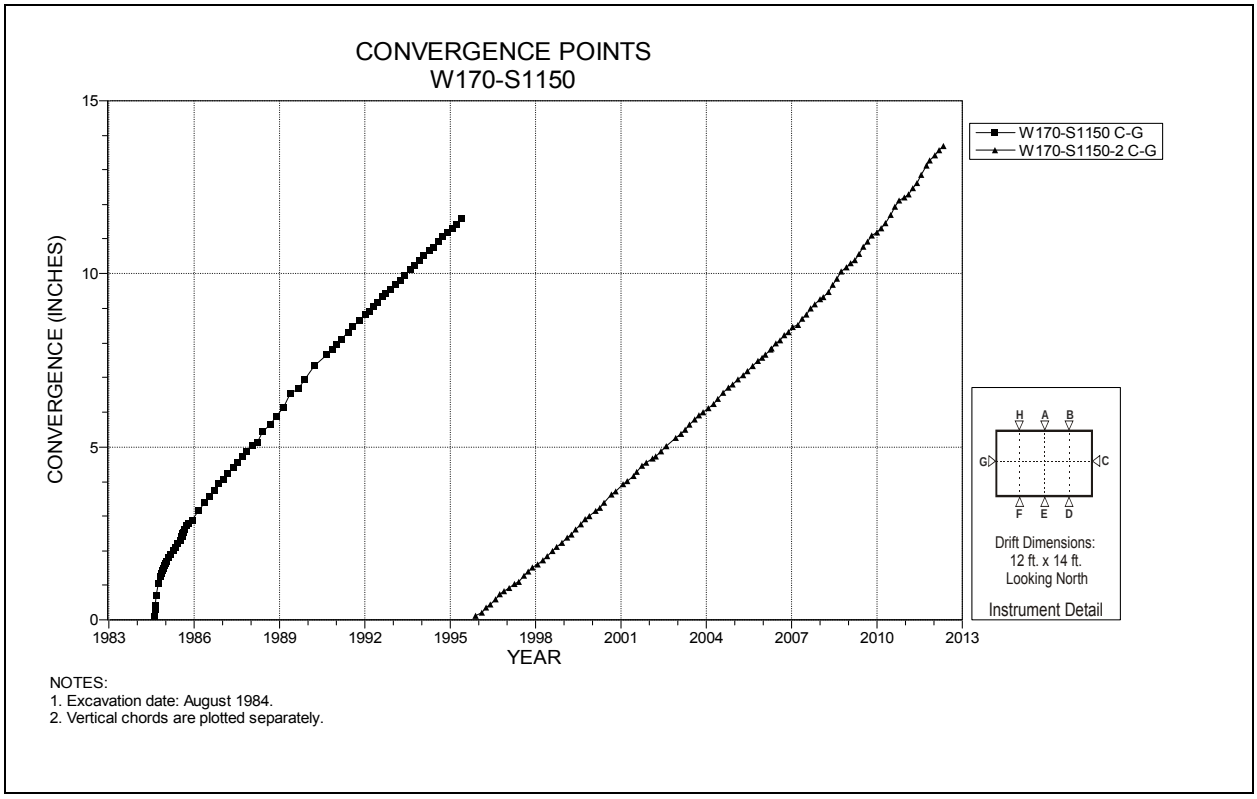


Figure 4-235 Convergence Point Array
W170 S1150 – Rib to Rib

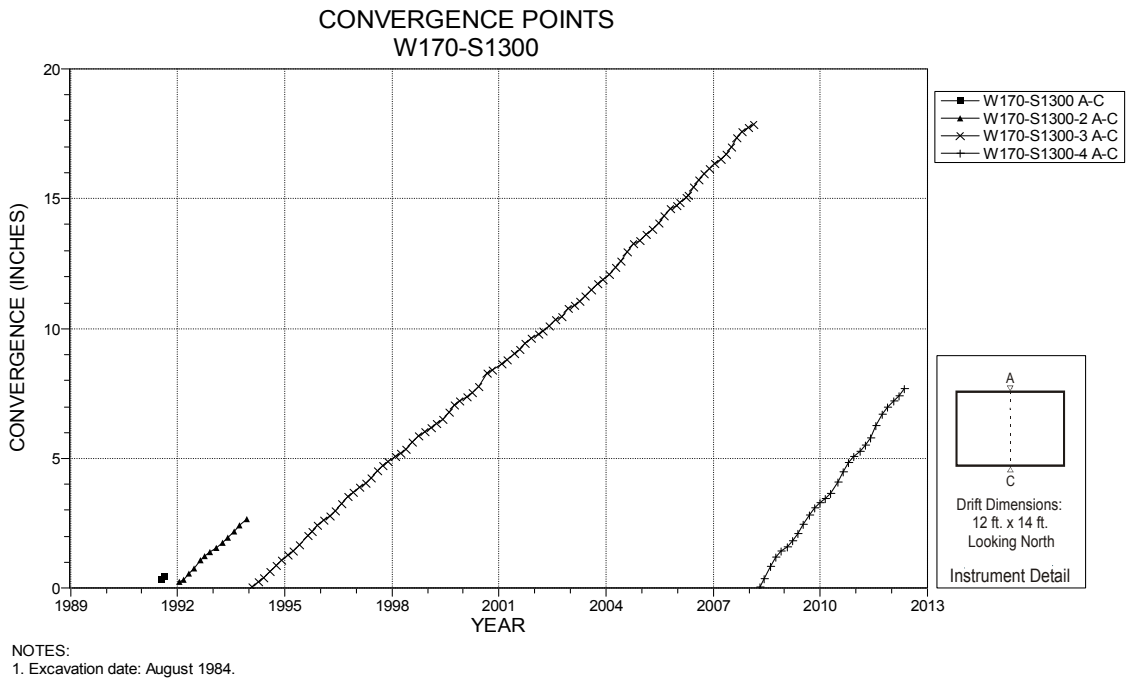


Figure 4-236 Convergence Point Array
W170 S1300 – Roof to Floor

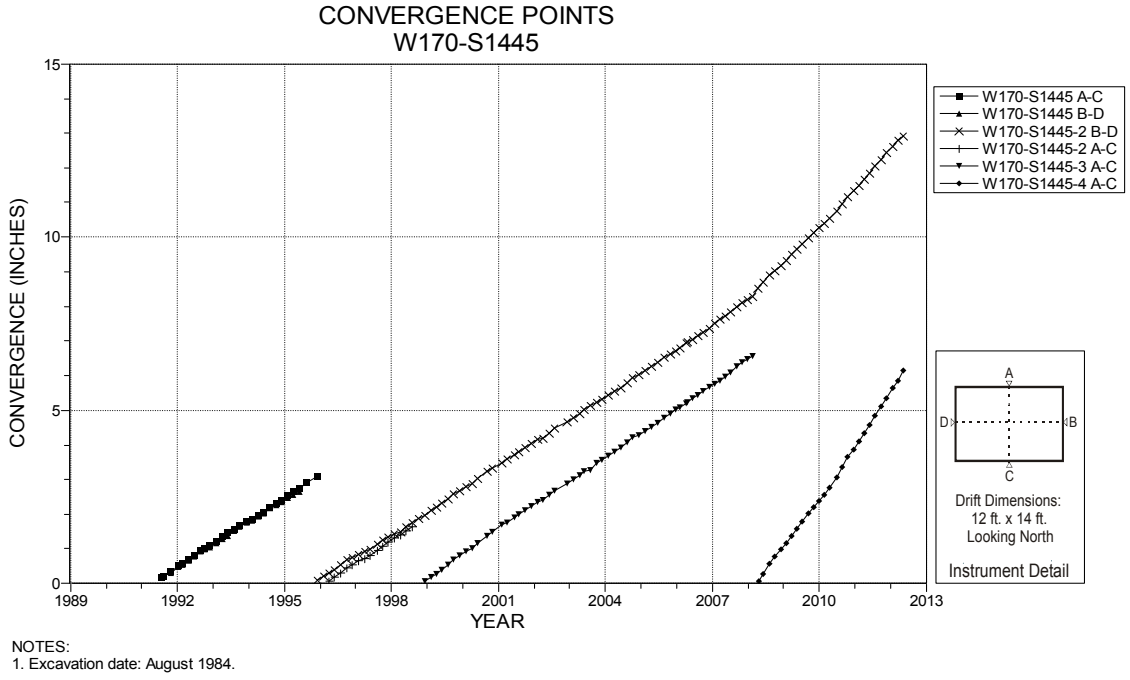


Figure 4-237 Convergence Point Array
W170 S1445 – All Chords

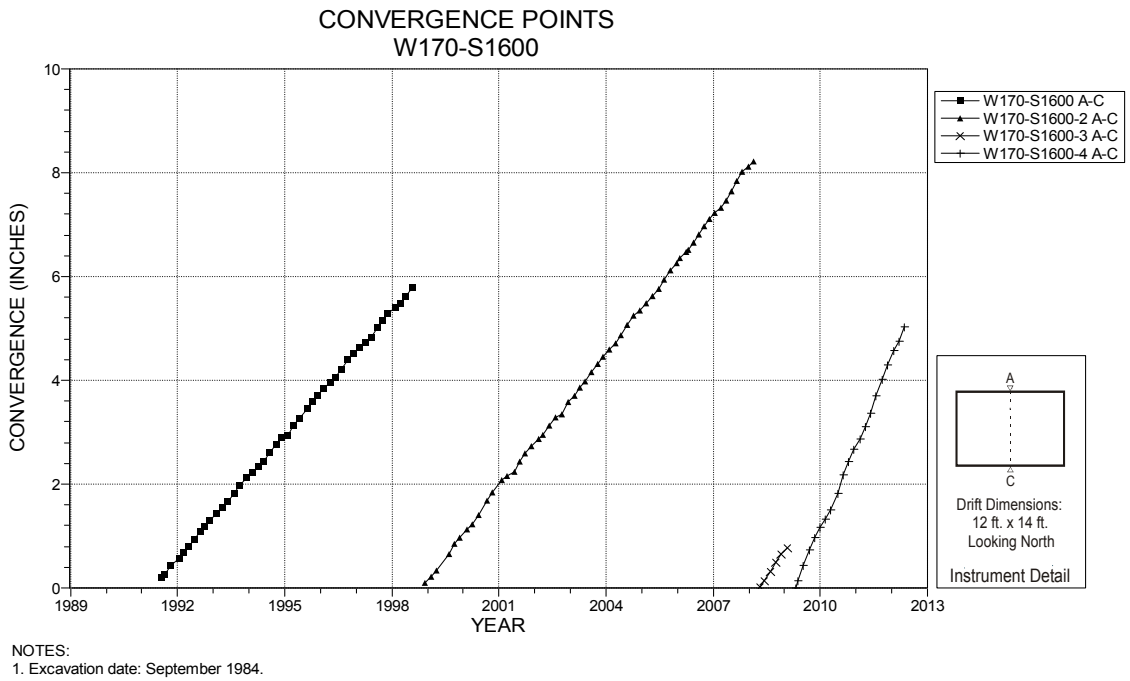


Figure 4-238 Convergence Point Array
W170 S1600 – Roof to Floor

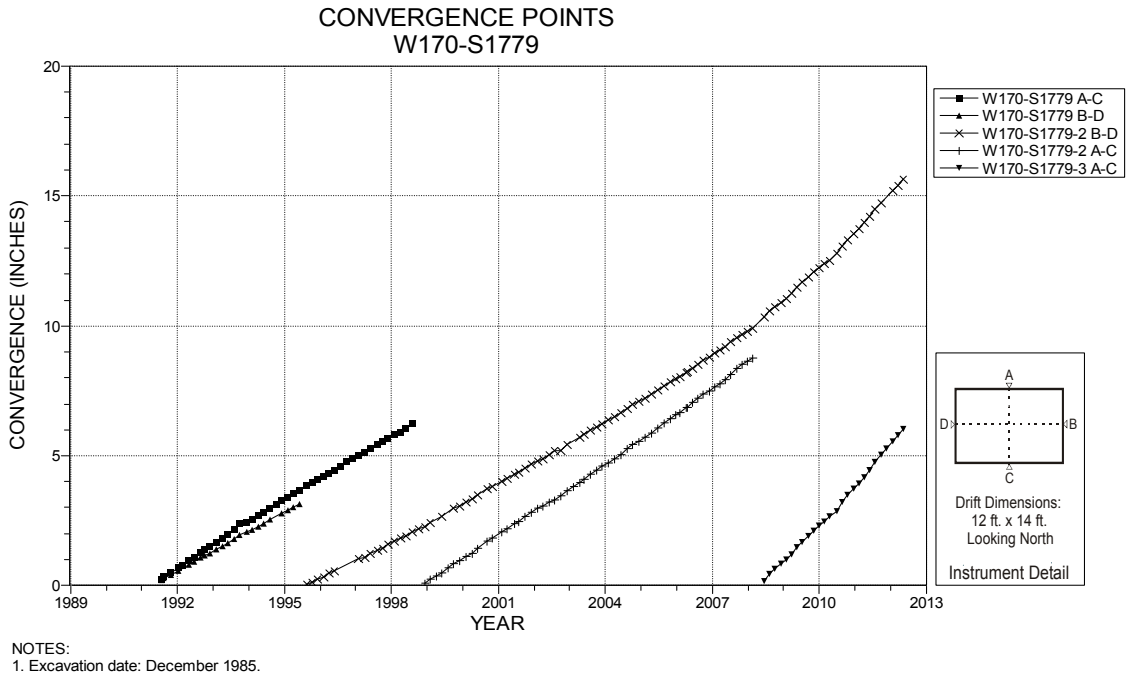


Figure 4-239 Convergence Point Array
W170 S1779 – All Chords

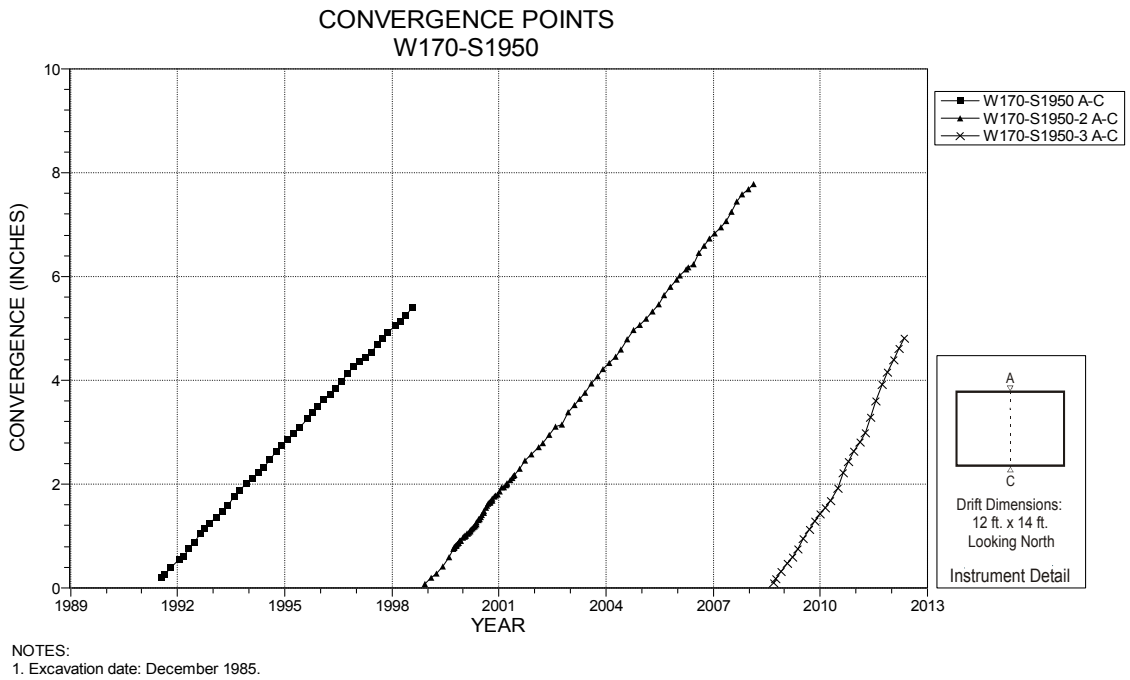


Figure 4-240 Convergence Point Array
W170 S1950 – Roof to Floor

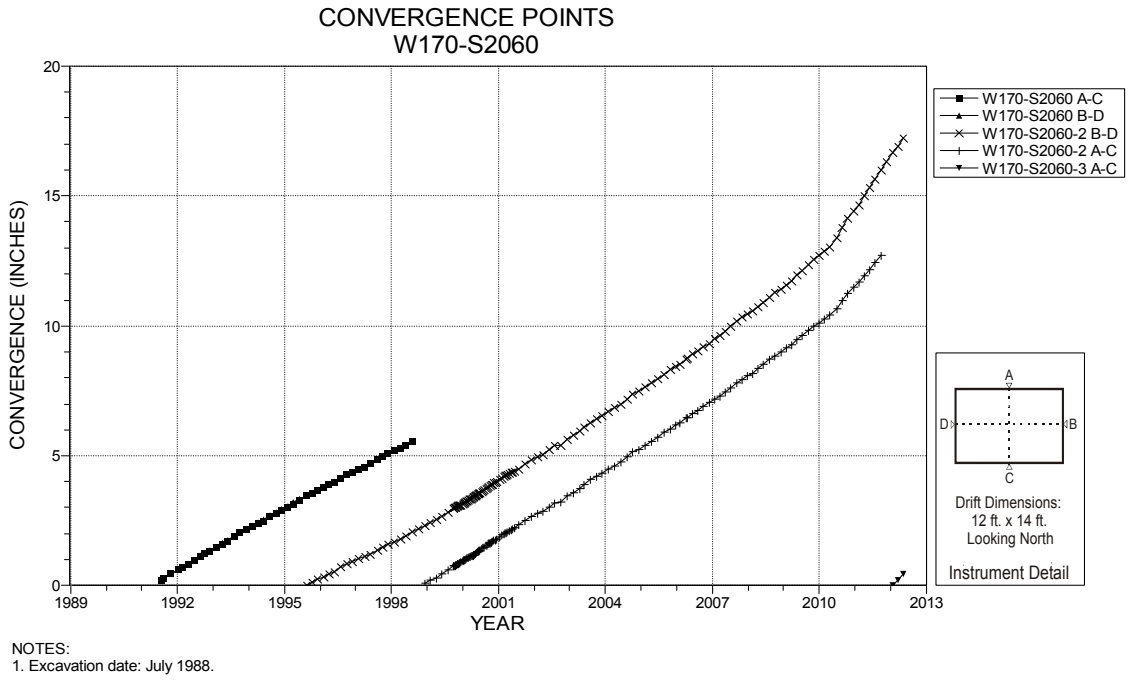


Figure 4-241 Convergence Point Array
W170 S2060 – All Chords

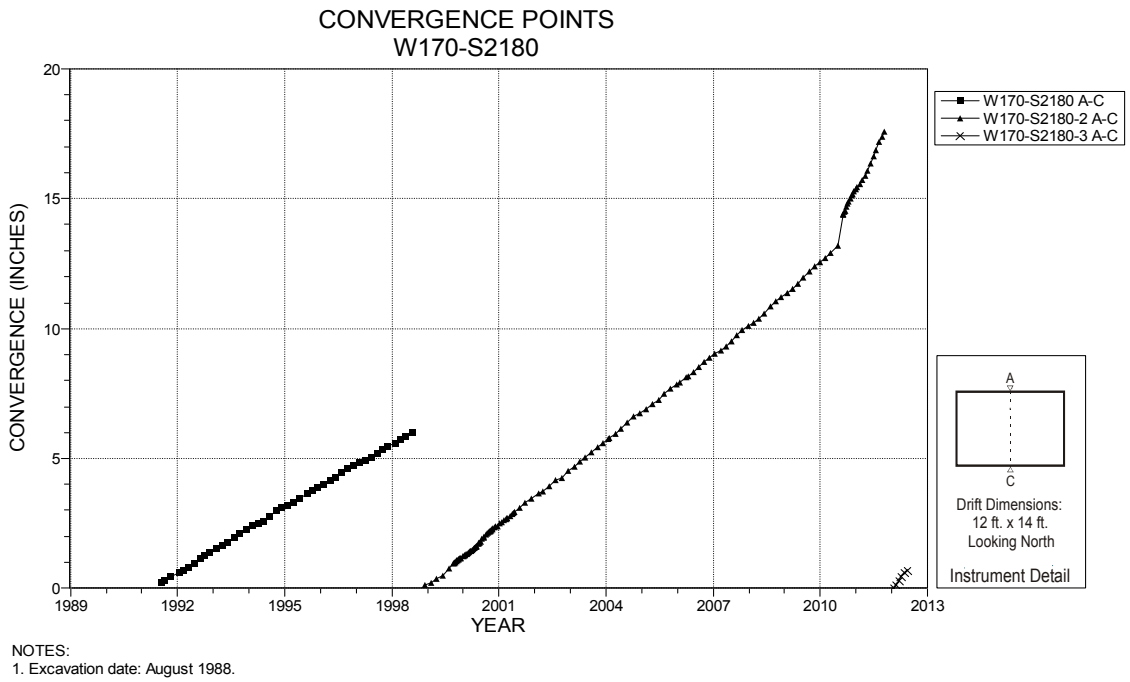


Figure 4-242 Convergence Point Array
W170 S2180 – Roof to Floor

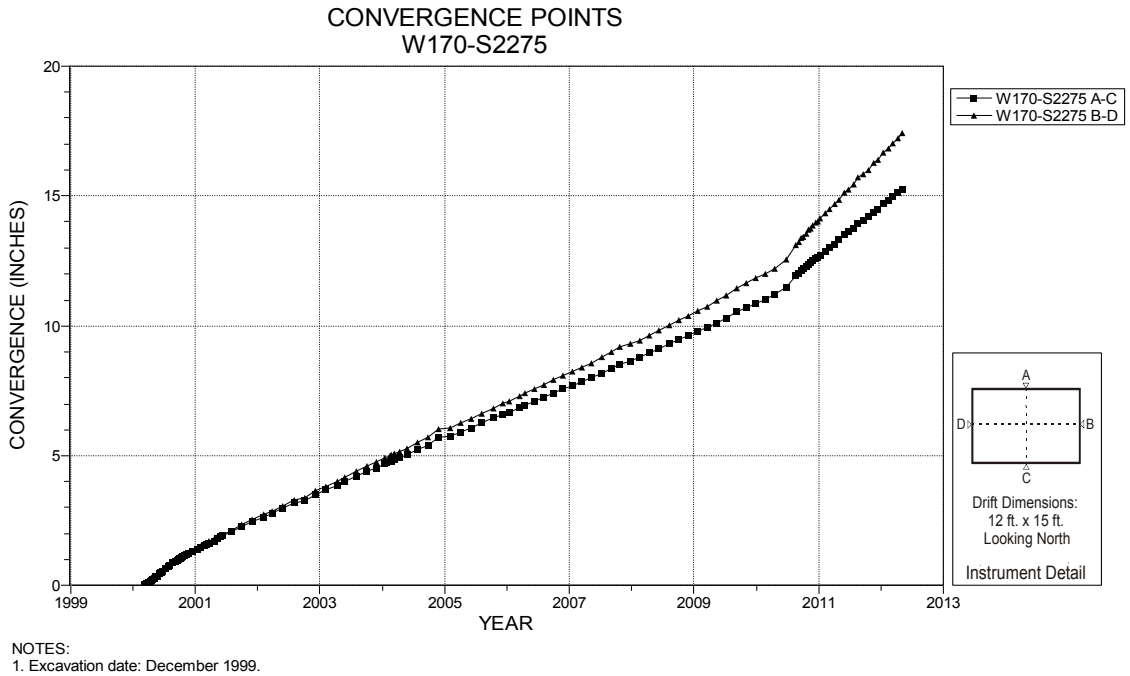


Figure 4-243 Convergence Point Array
W170 S2275 – All Chords

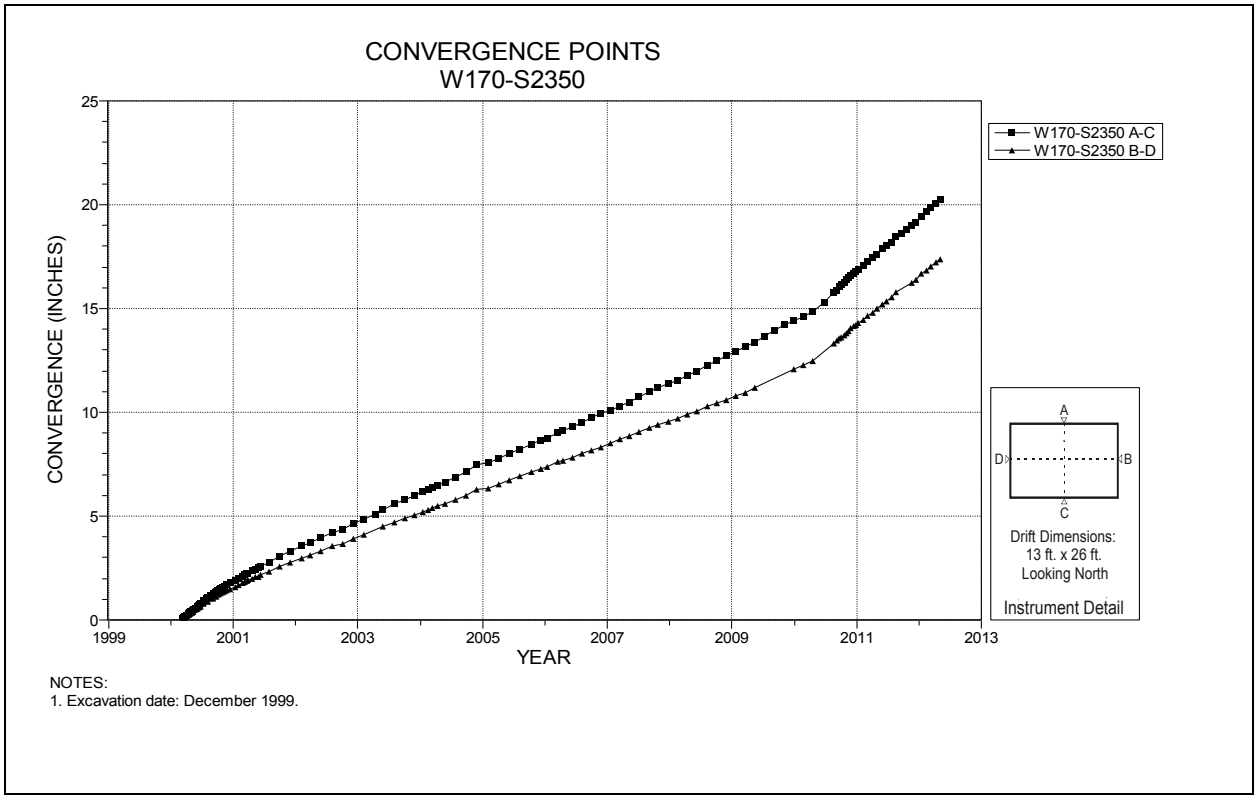


Figure 4-244 Convergence Point Array
W170 S2350 – All Chords

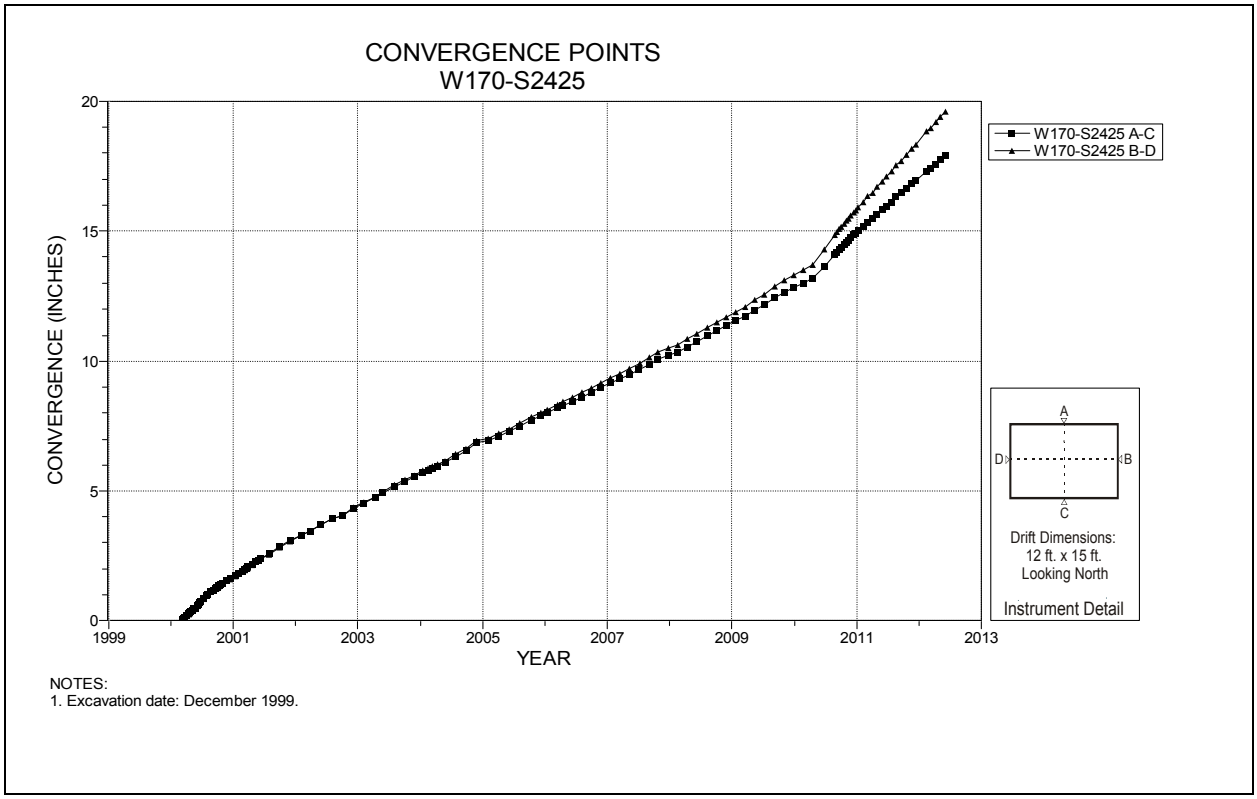


Figure 4-245 Convergence Point Array
W170 S2425 – All Chords

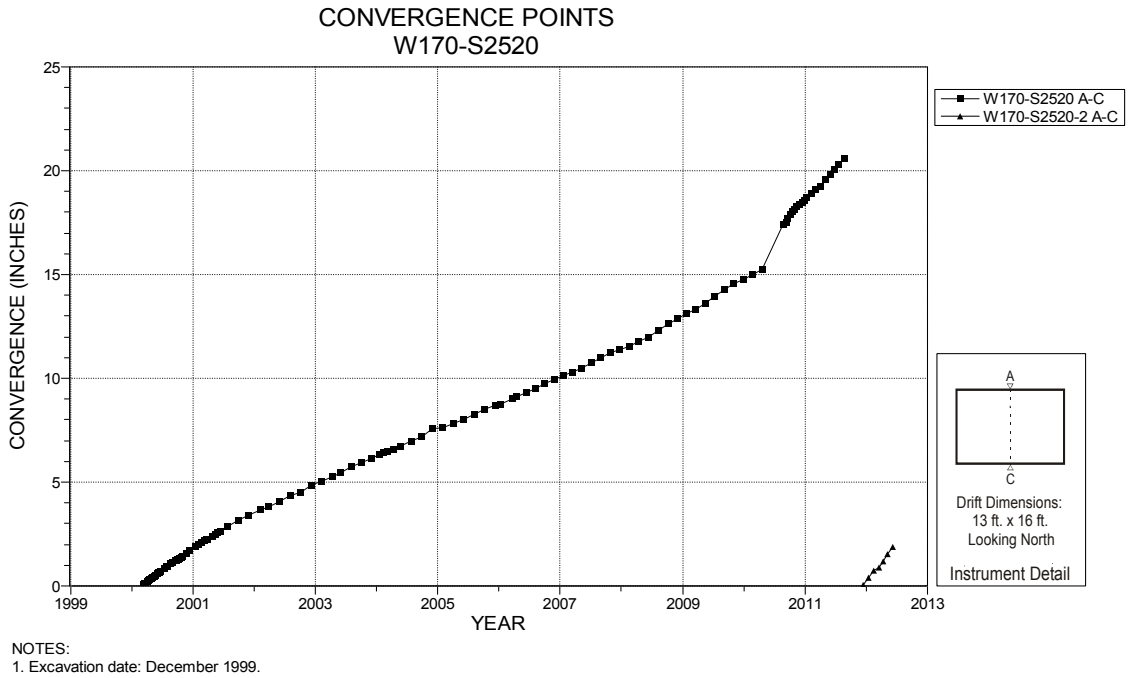


Figure 4-246 Convergence Point Array
W170 S2520 – Roof to Floor

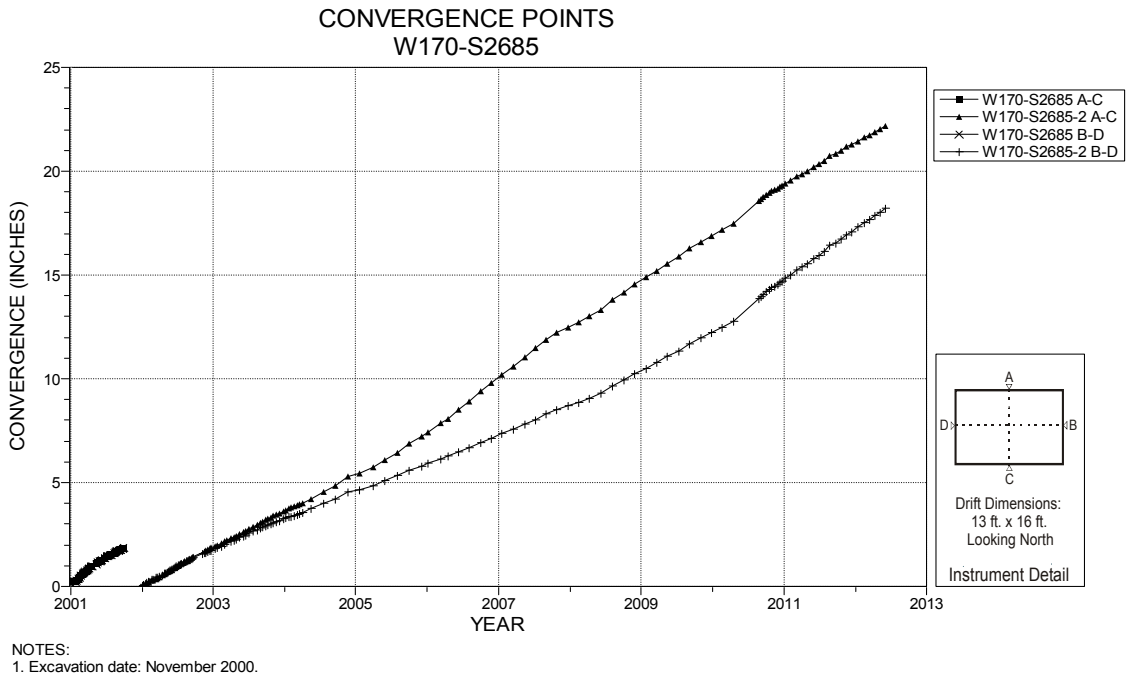


Figure 4-247 Convergence Point Array
W170 S2685 – All Chords

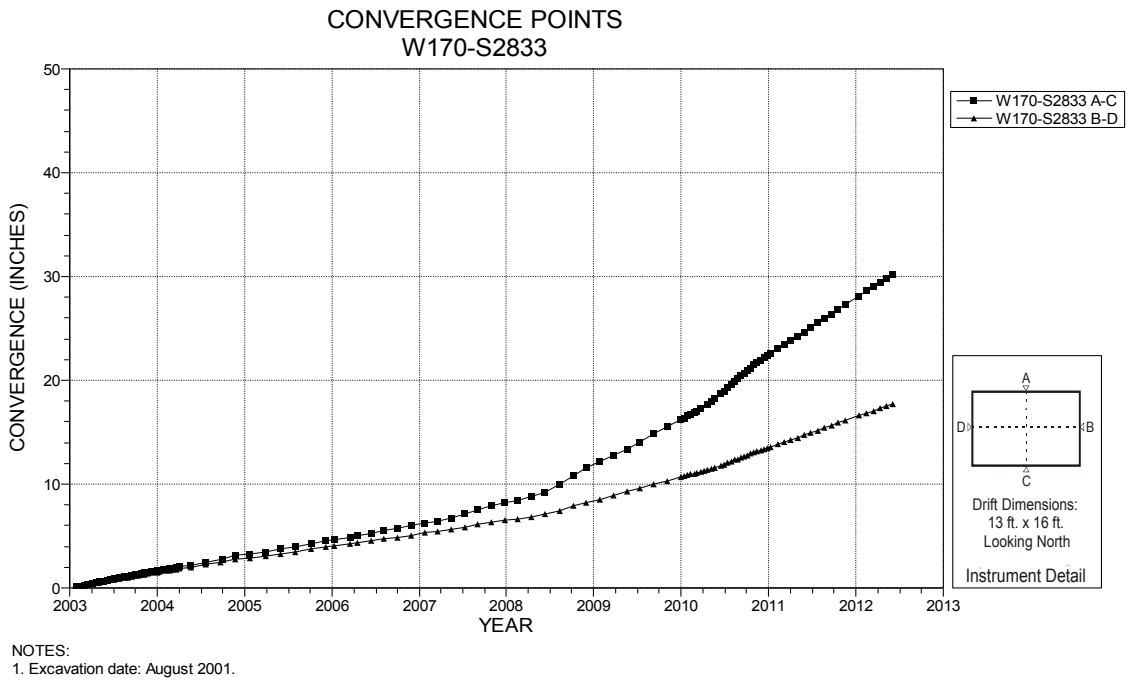


Figure 4-248 Convergence Point Array
W170 S2833 – All Chords

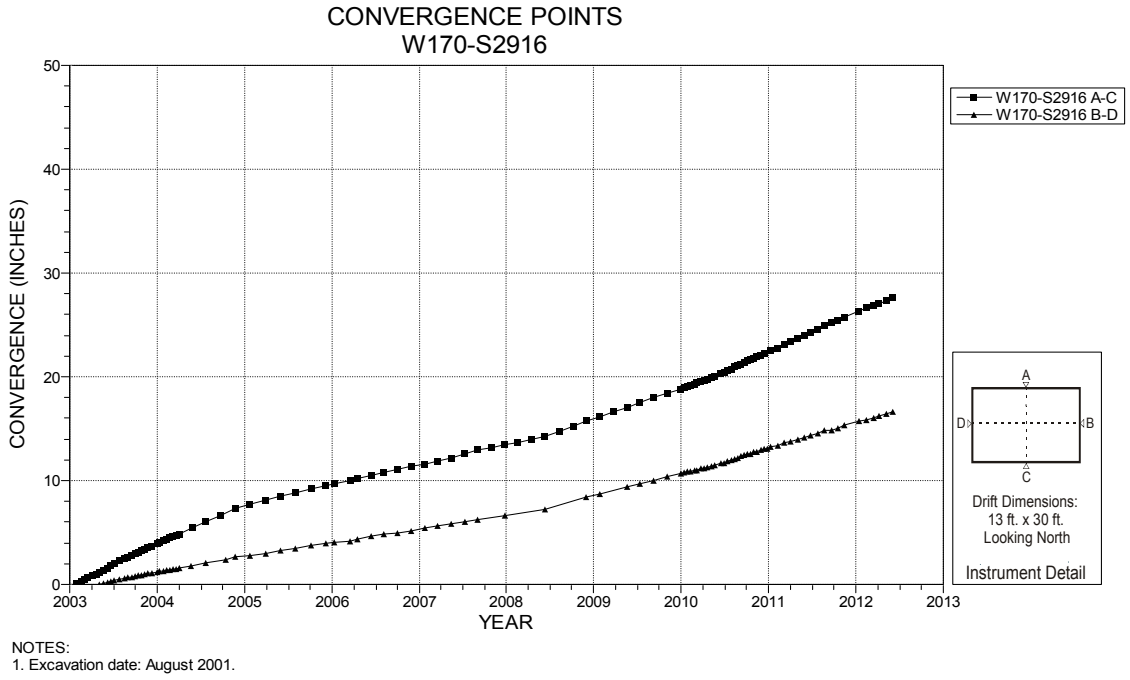


Figure 4-249 Convergence Point Array
W170 S2916 – All Chords

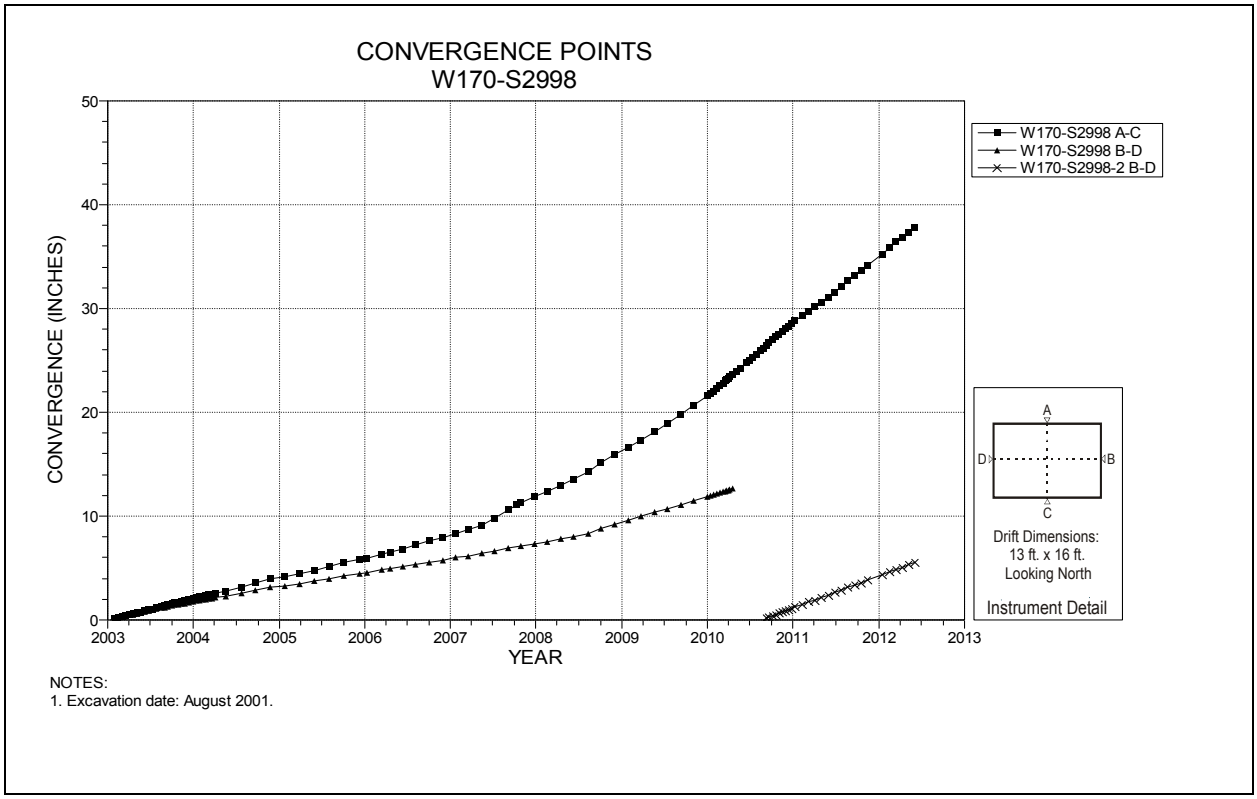


Figure 4-250 Convergence Point Array
W170 S2998 – All Chords

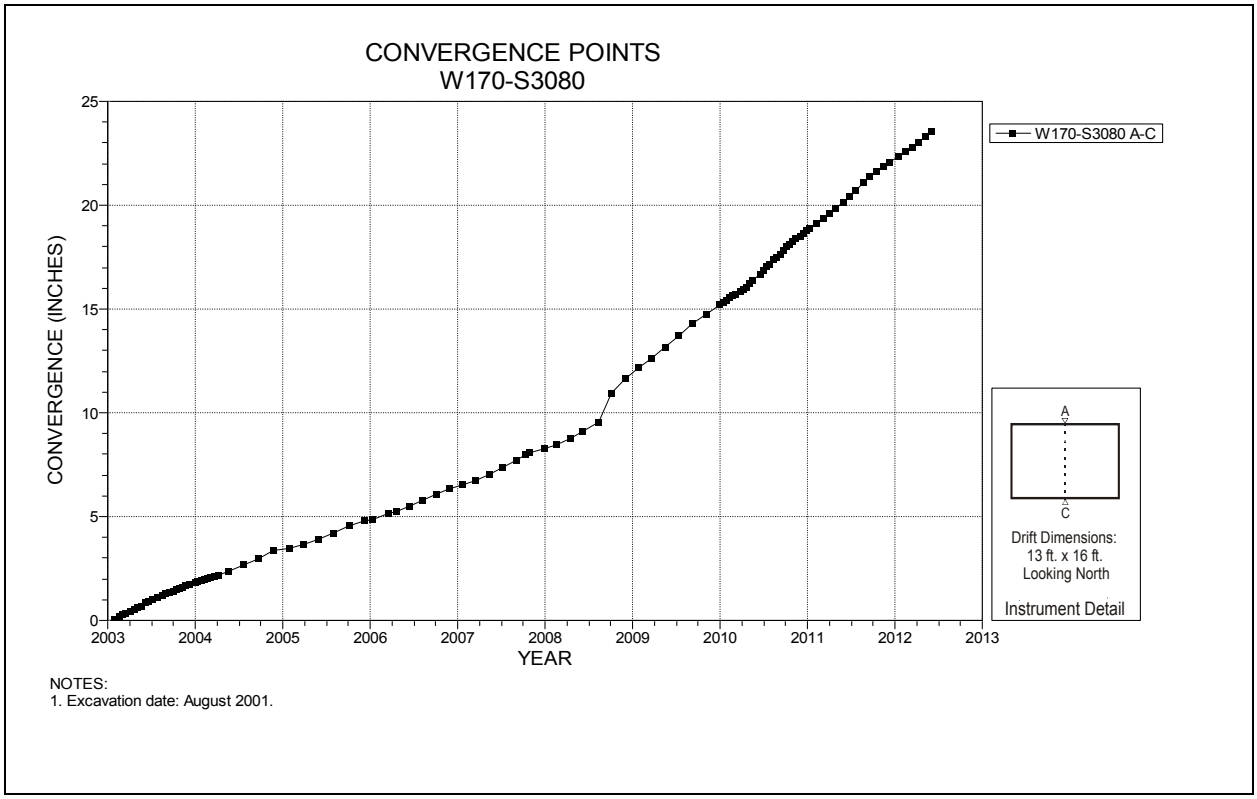


Figure 4-251 Convergence Point Array
W170 S3080 – Roof to Floor

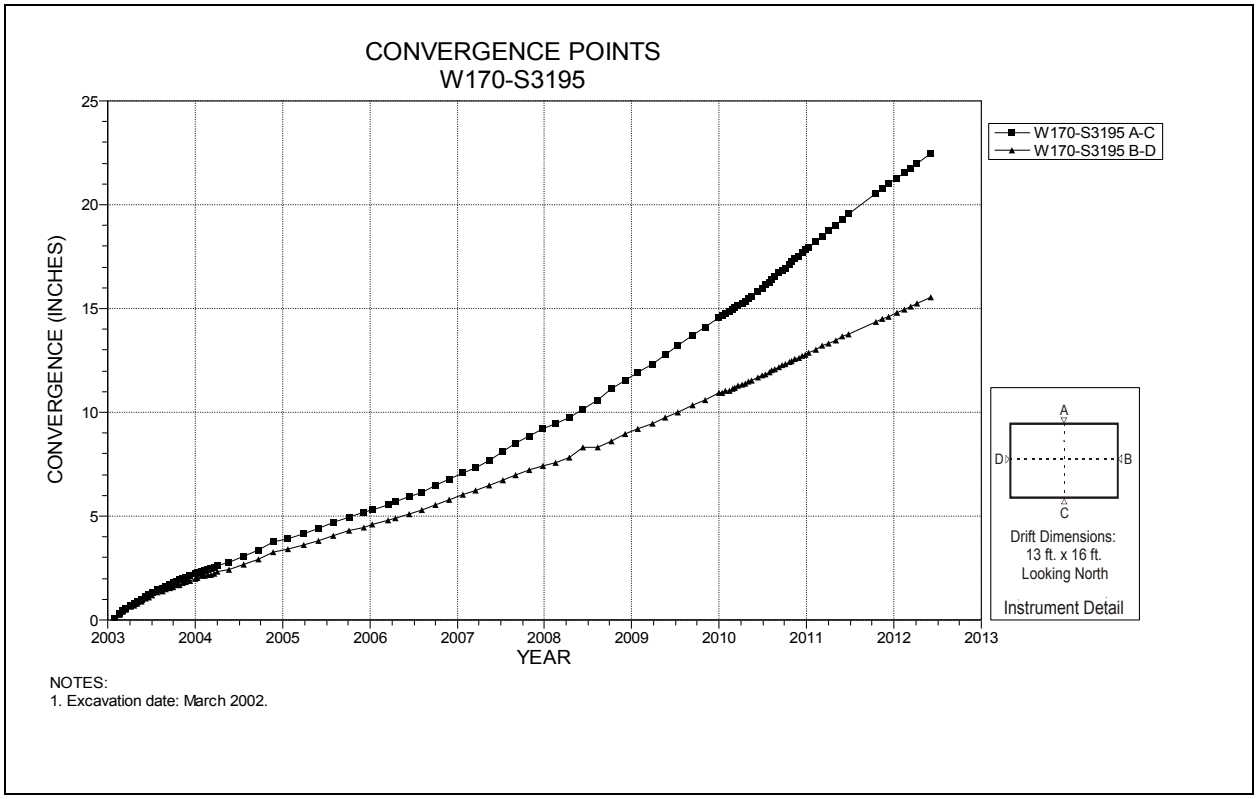


Figure 4-252 Convergence Point Array
W170 S3195 – All Chords

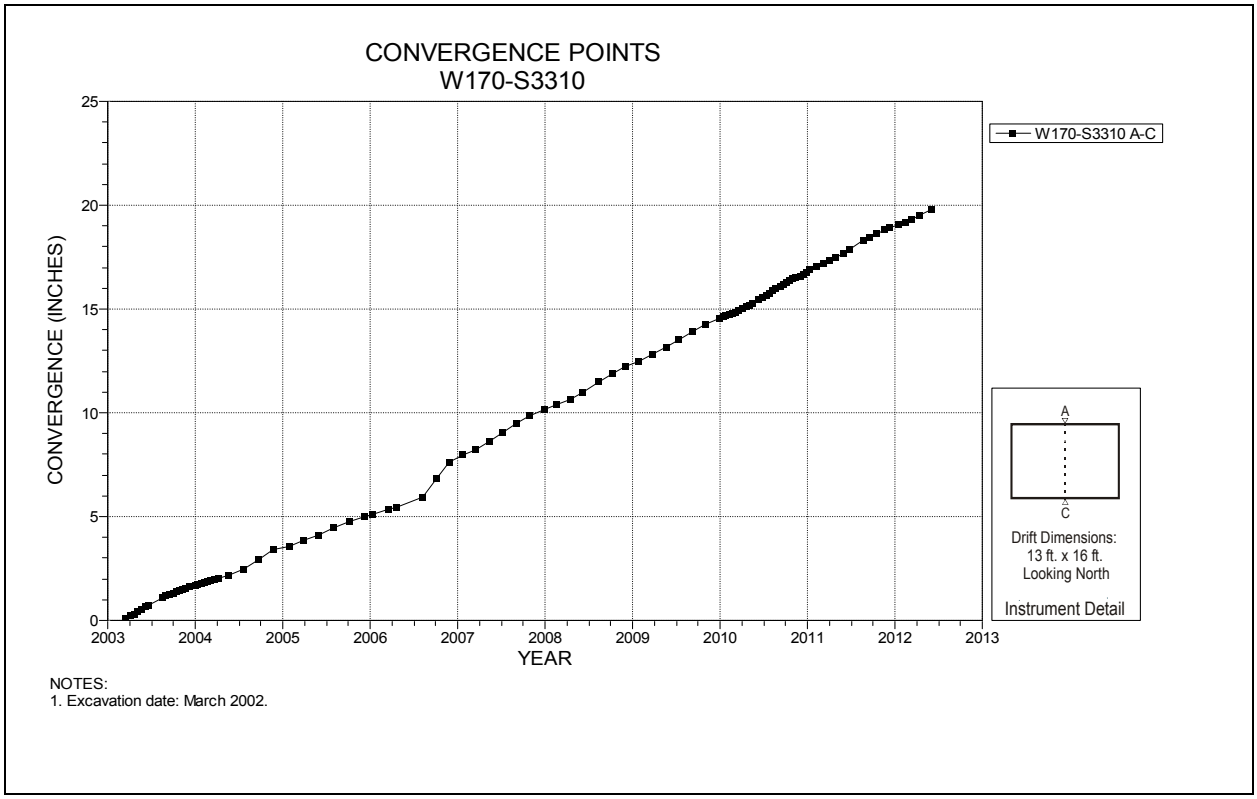


Figure 4-253 Convergence Point Array
W170 S3310 – Roof to Floor

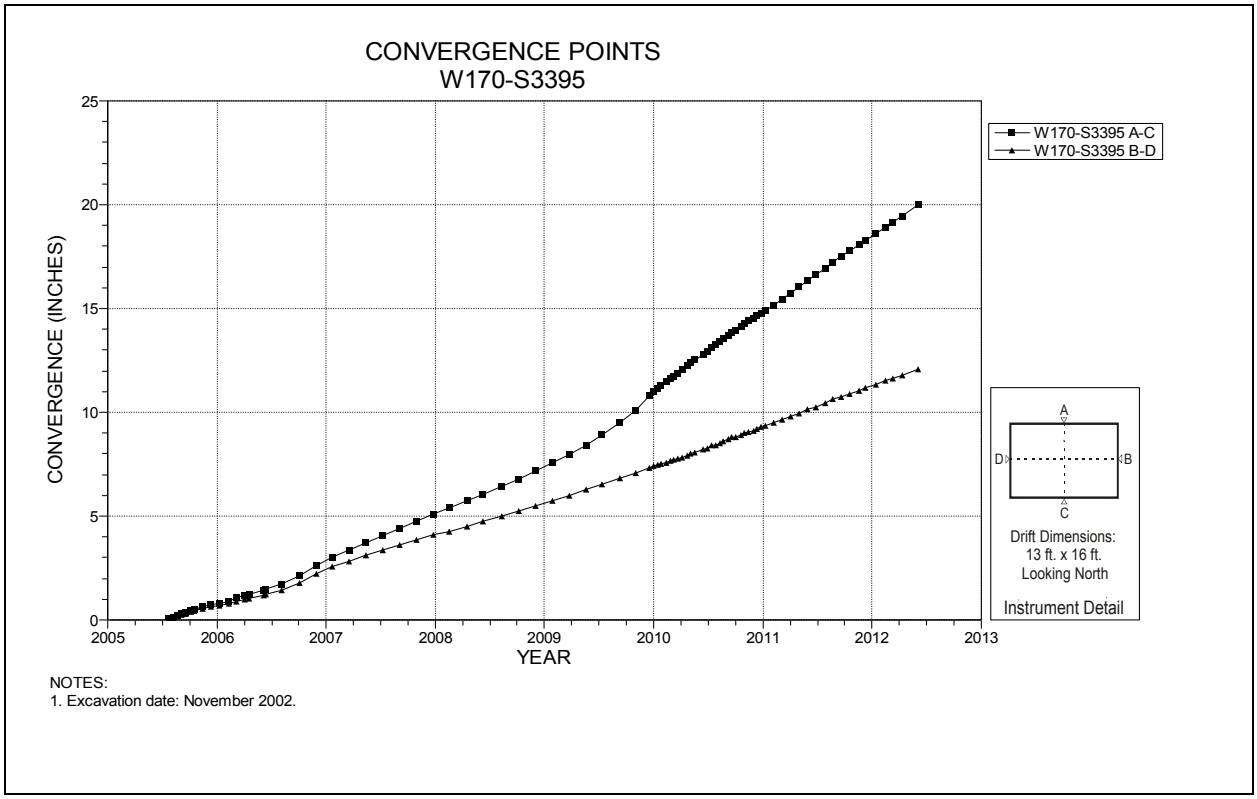


Figure 4-254 Convergence Point Array
W170 S3395 – All Chords

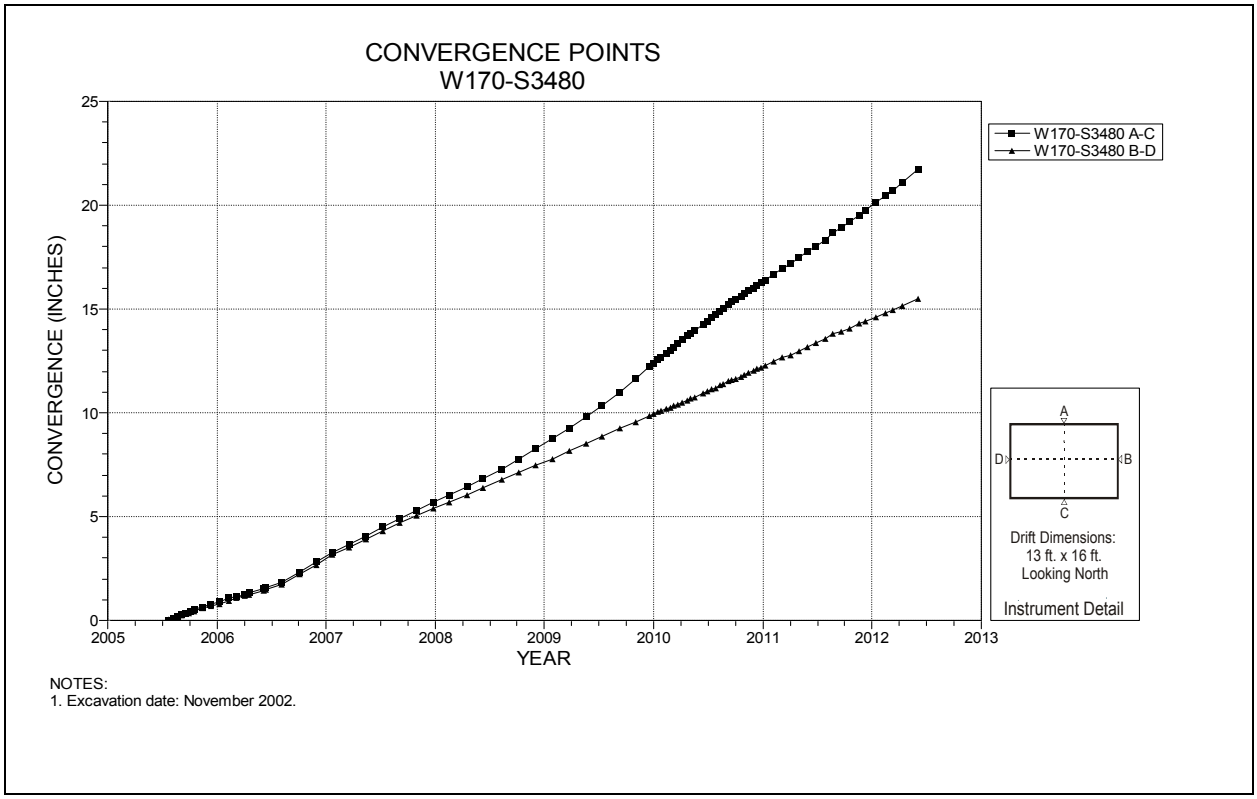


Figure 4-255 Convergence Point Array
W170 S3480 – All Chords

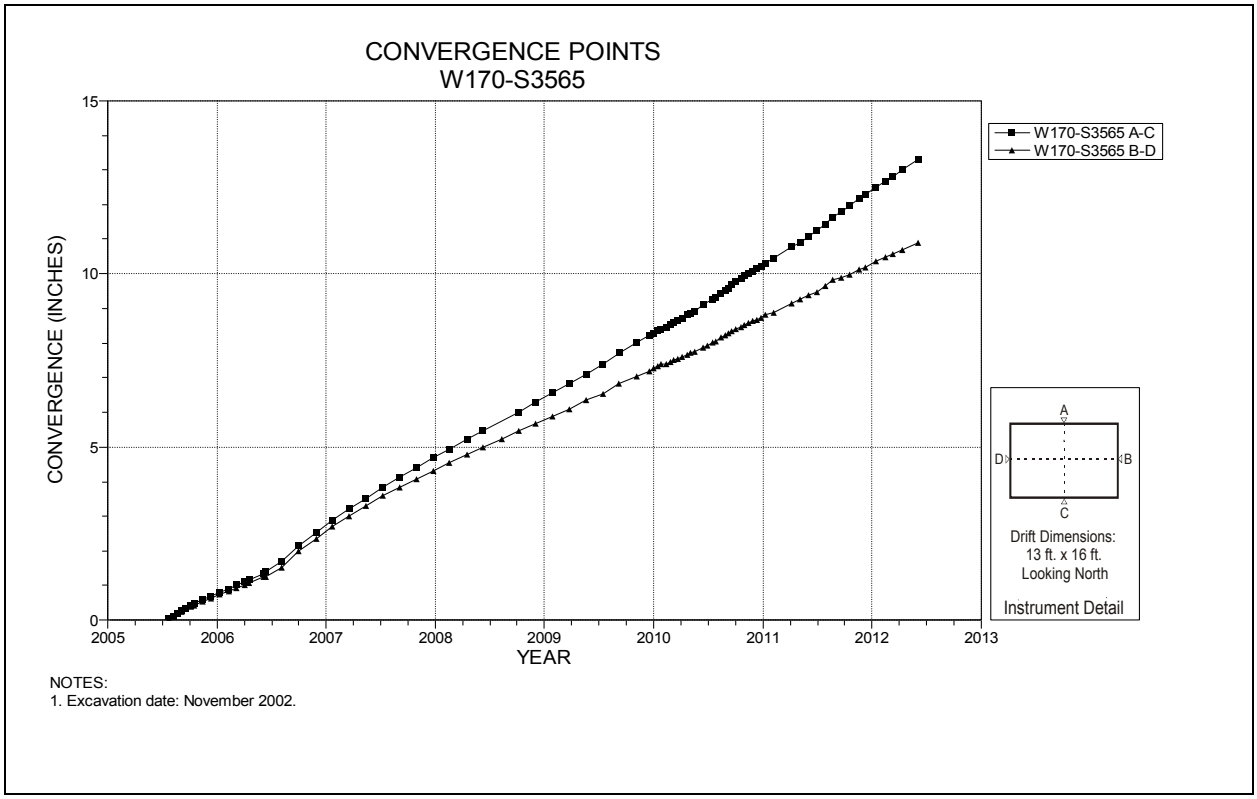


Figure 4-256 Convergence Point Array
W170 S3565 – All Chords

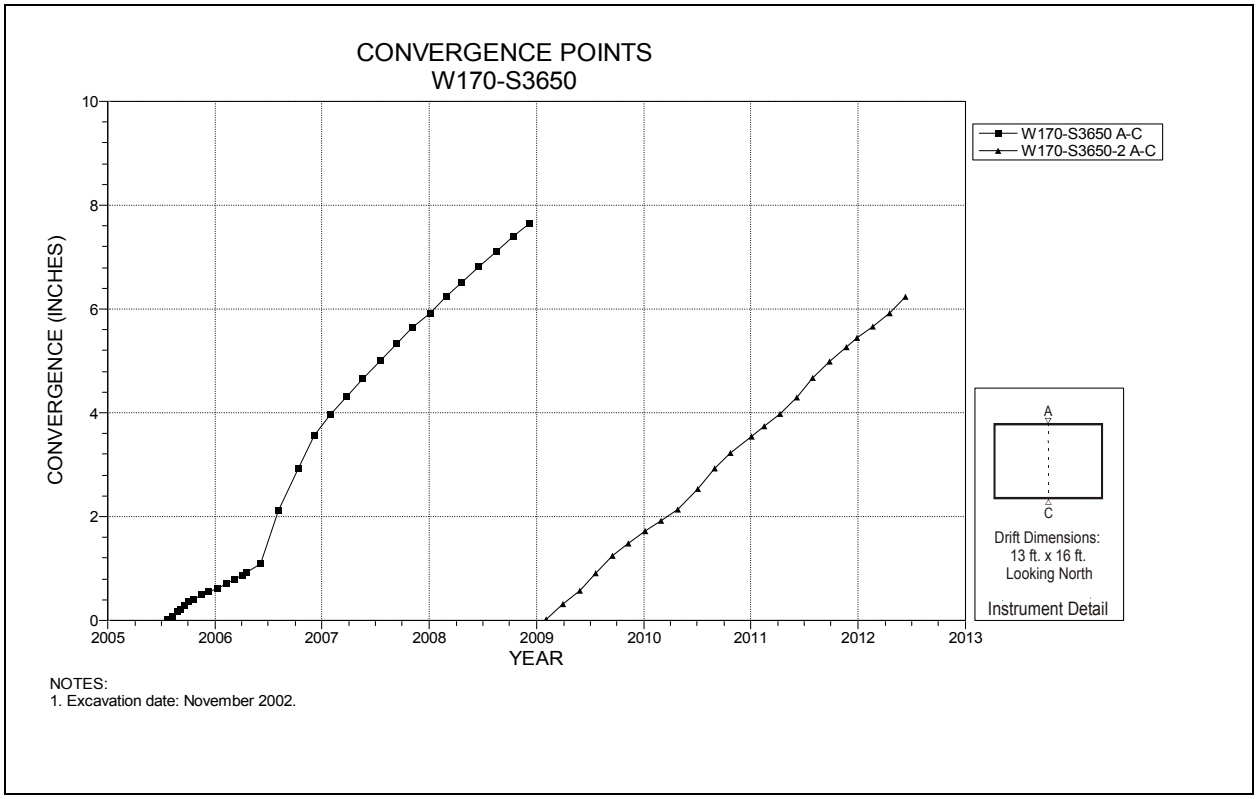
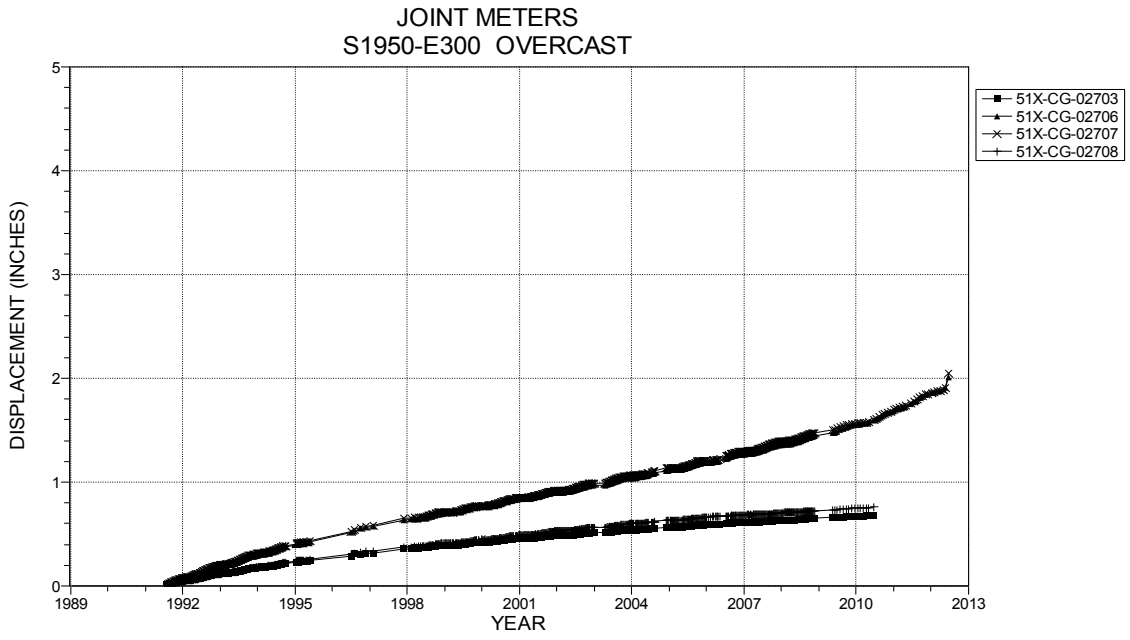
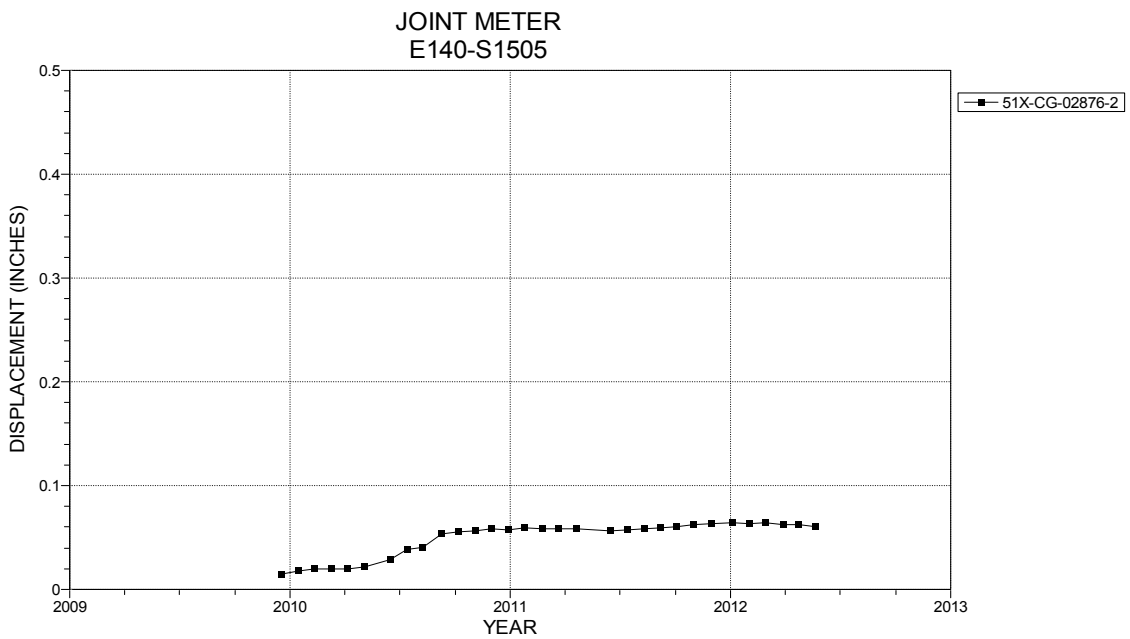


Figure 4-257 Convergence Point Array
W170 S3650 – Roof to Floor



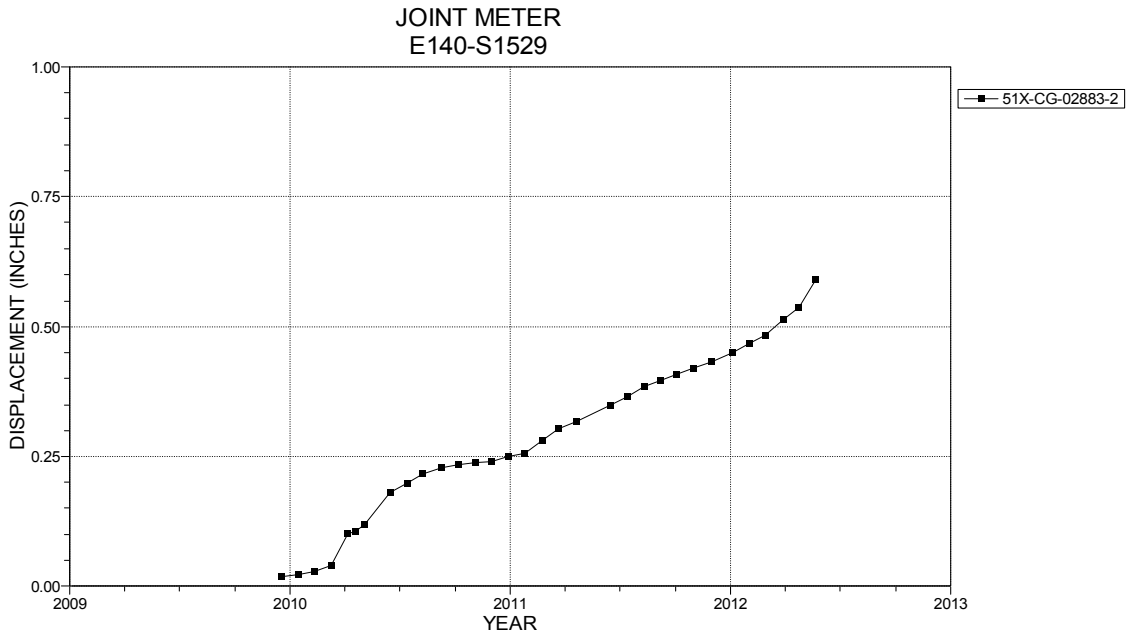
NOTES:
1. Excavation date: March 1985.

Figure 4-258 Joint Meters
S1950 E300



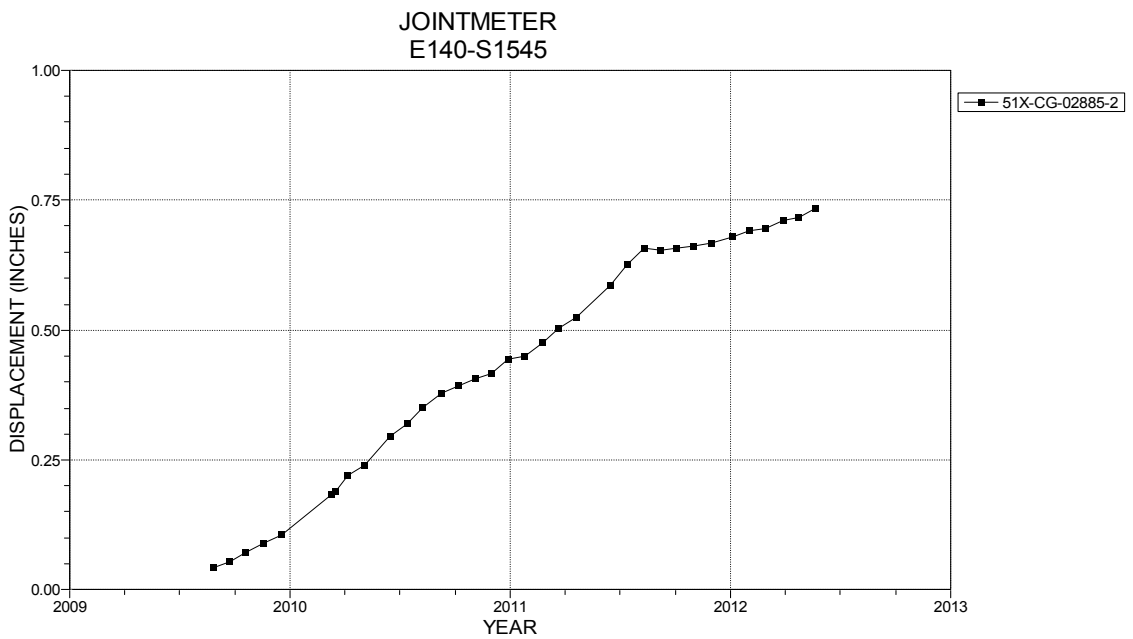
NOTES:
1. Excavation date: December 1982.

Figure 4-259 Joint Meter
E140 S1505



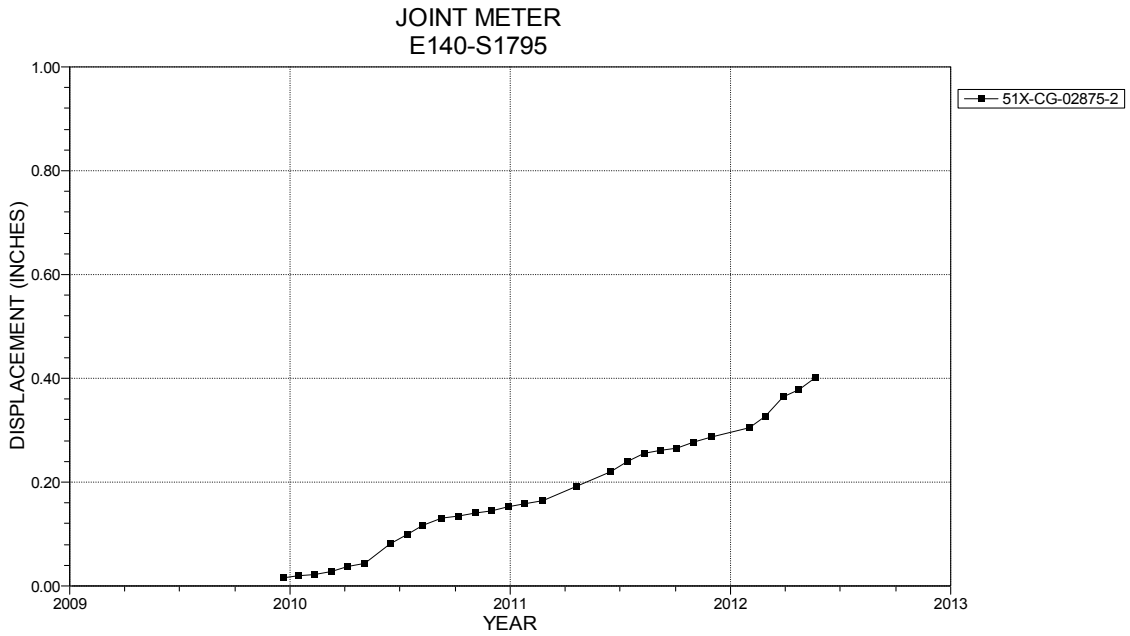
NOTES:
1. Excavation date: December 1982.

Figure 4-260 Joint Meter
E140 S1529



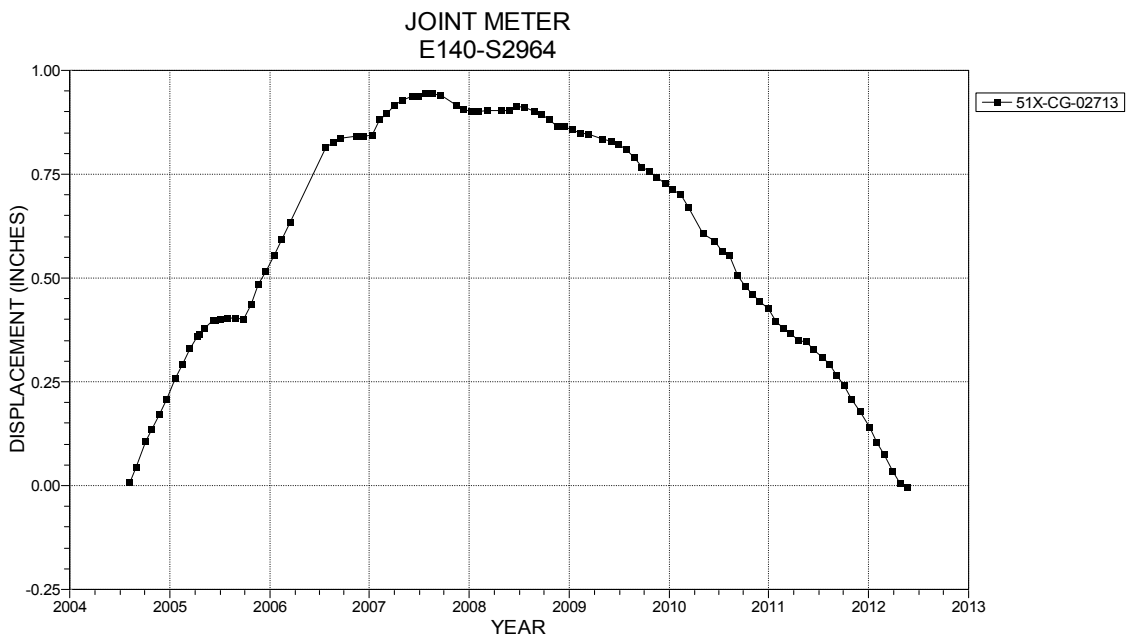
NOTES:
1. Excavation date: December 1982.
2. Instrument was reinstalled on July 30, 2009.

Figure 4-261 Joint Meter
E140 S1545



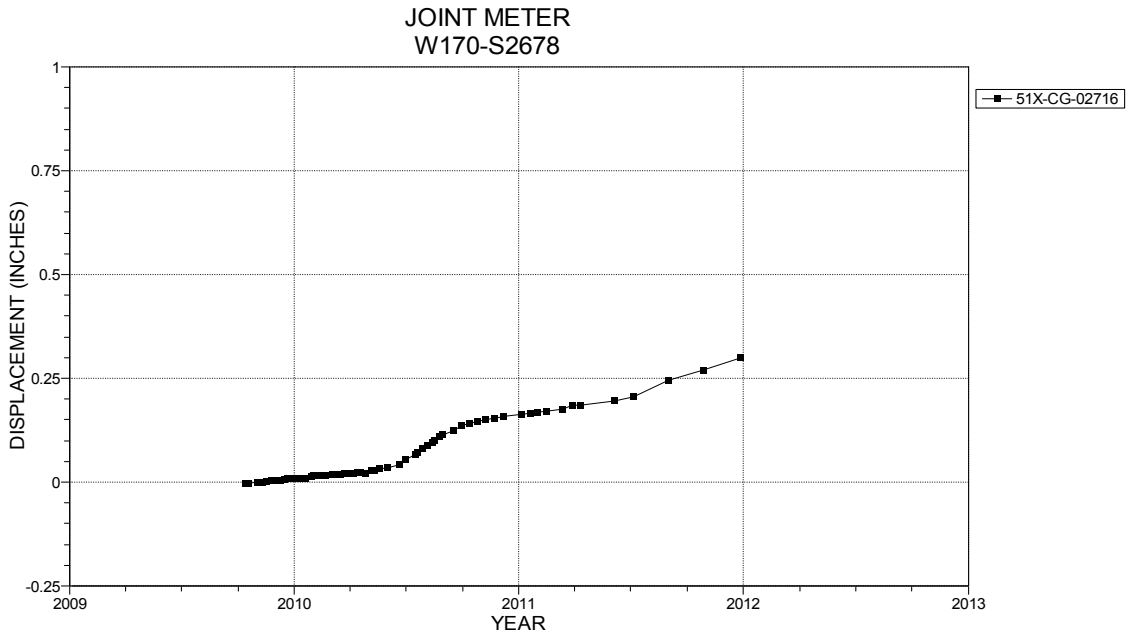
NOTES:
1. Excavation date: December 1982.

Figure 4-262 Joint Meter
E140 S1795



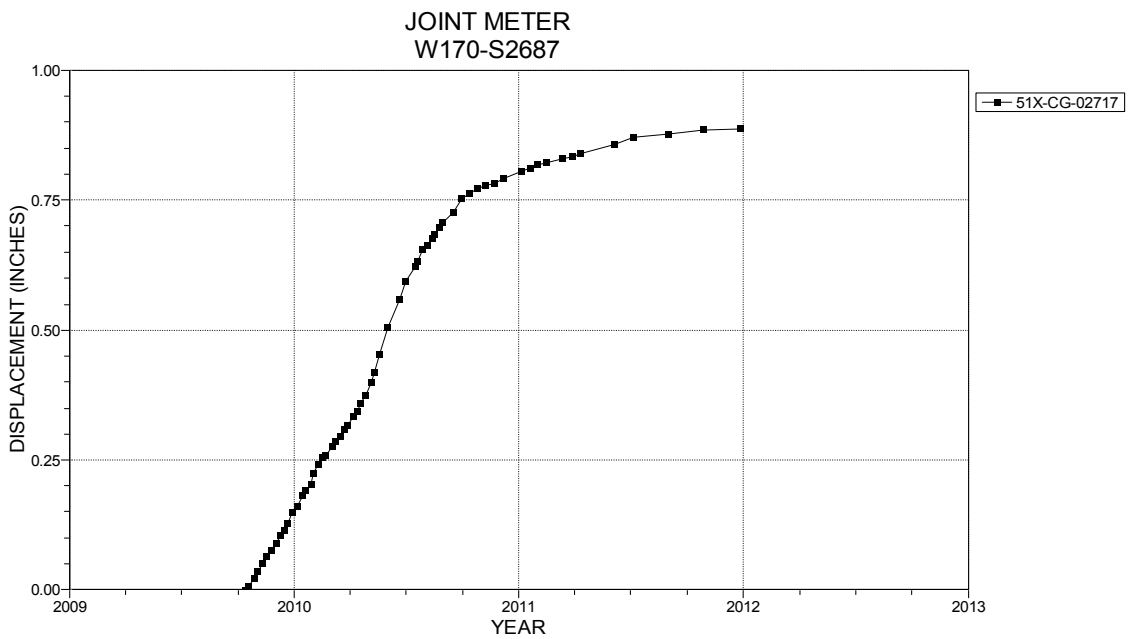
NOTES:
1. Excavation date: January 1983.

Figure 4-263 Joint Meter
E140 S2964



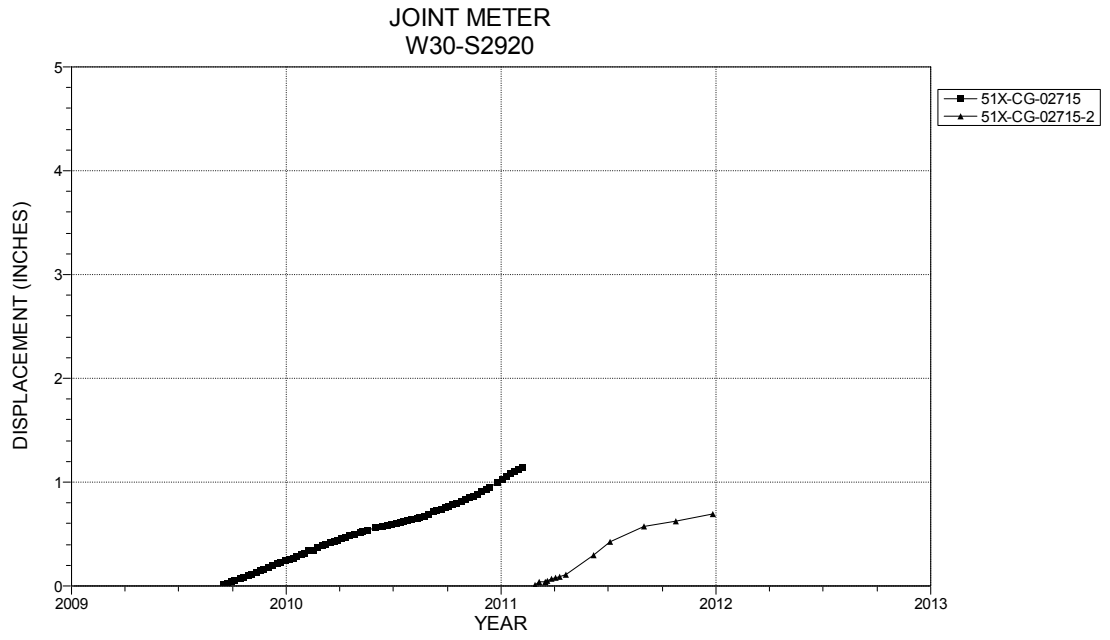
NOTES:
1. Excavation date: December 1982.

Figure 4-264 Joint Meter
W170-S2678



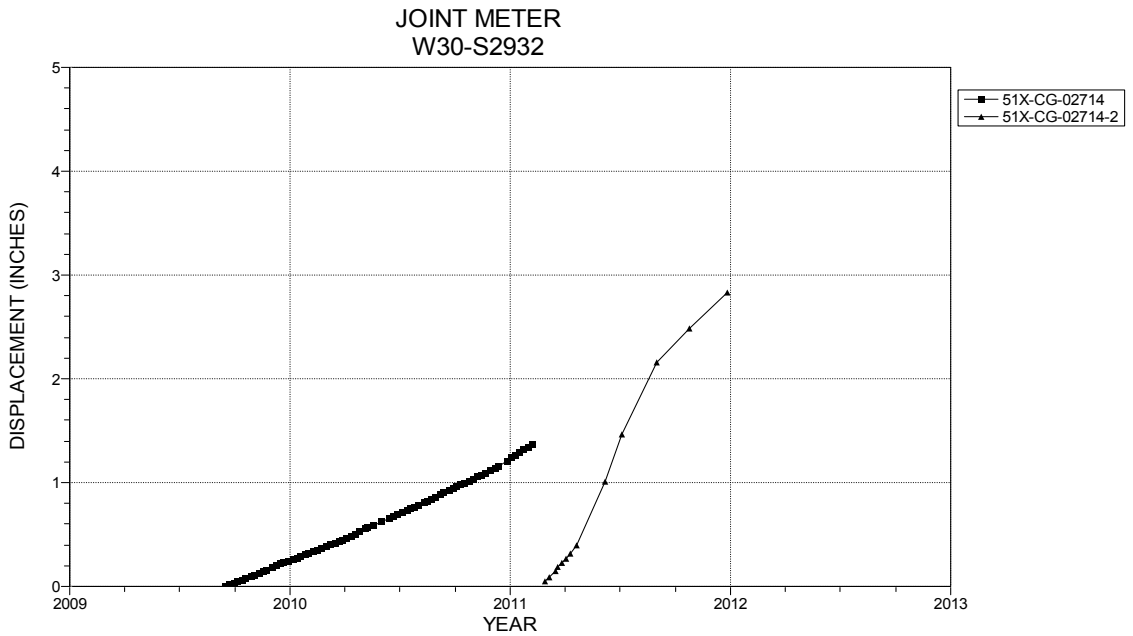
NOTES:
1. Excavation date: December 1982.

Figure 4-265 Joint Meter
W170-S2687



NOTES:
1. Excavation date: October 2001.
2. 51X-CG-02715-2 is a reset of the original installation.

Figure 4-266 Joint Meters
W170-S2920



NOTES:
1. Excavation date: October 2001.
2. 51X-CG-02714-2 is a reset of the original installation.

Figure 4-267 Joint Meters
W170-S2932

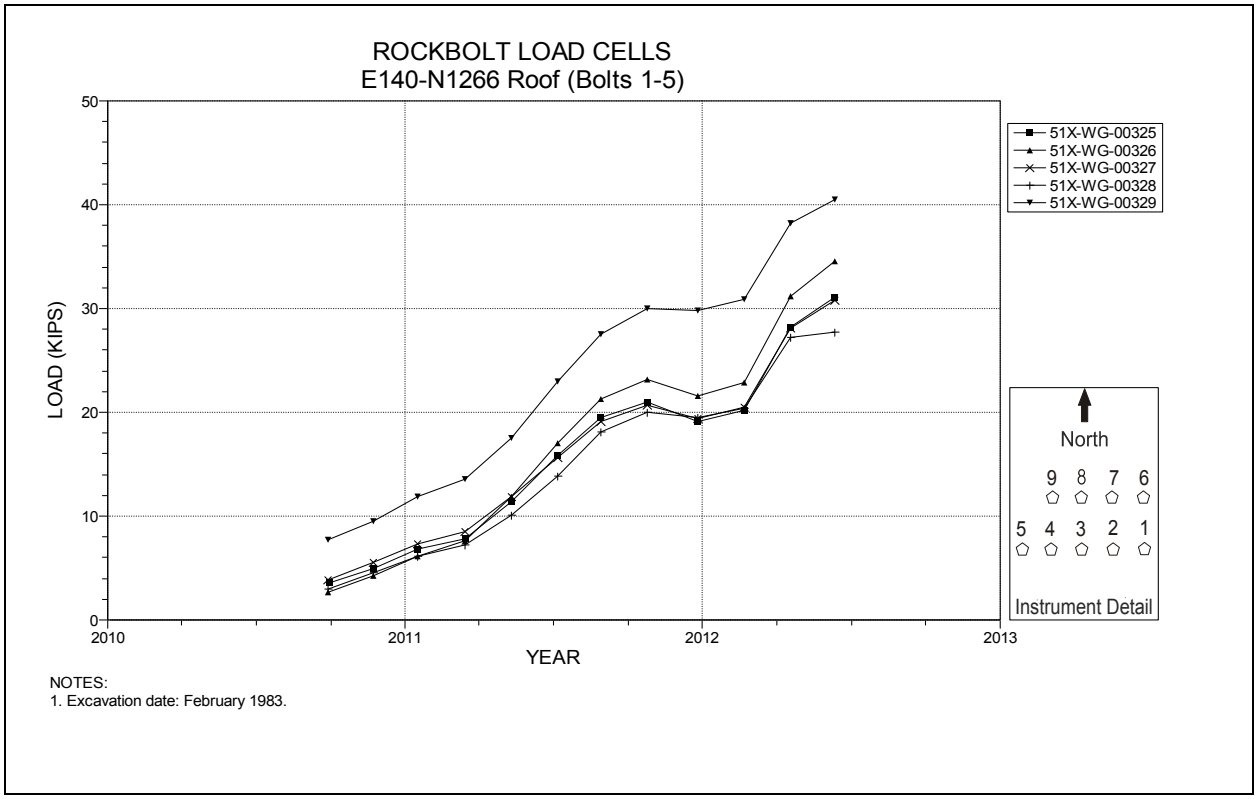


Figure 4-268 Rock Bolt Load Cells, Bolts 1-5
E140 N1266

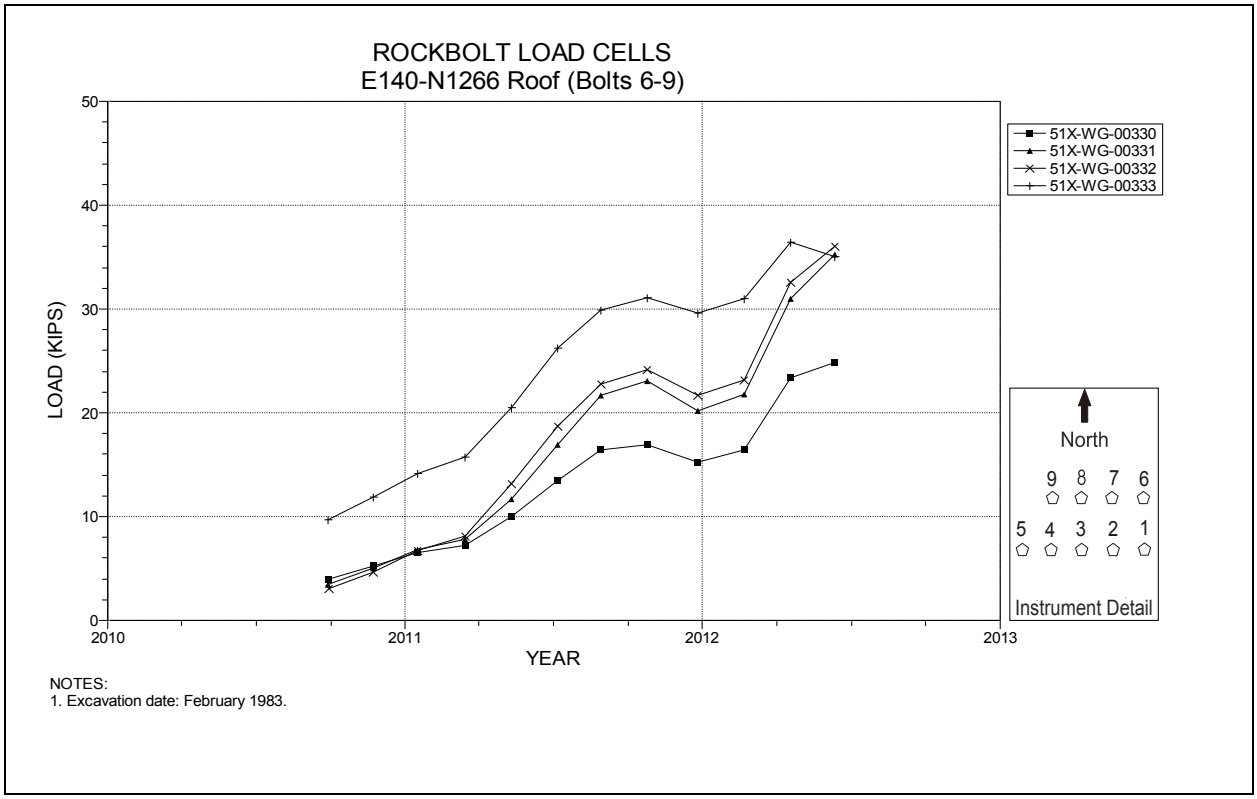


Figure 4-269 Rock Bolt Load Cells, Bolts 6-9
E140 N1266

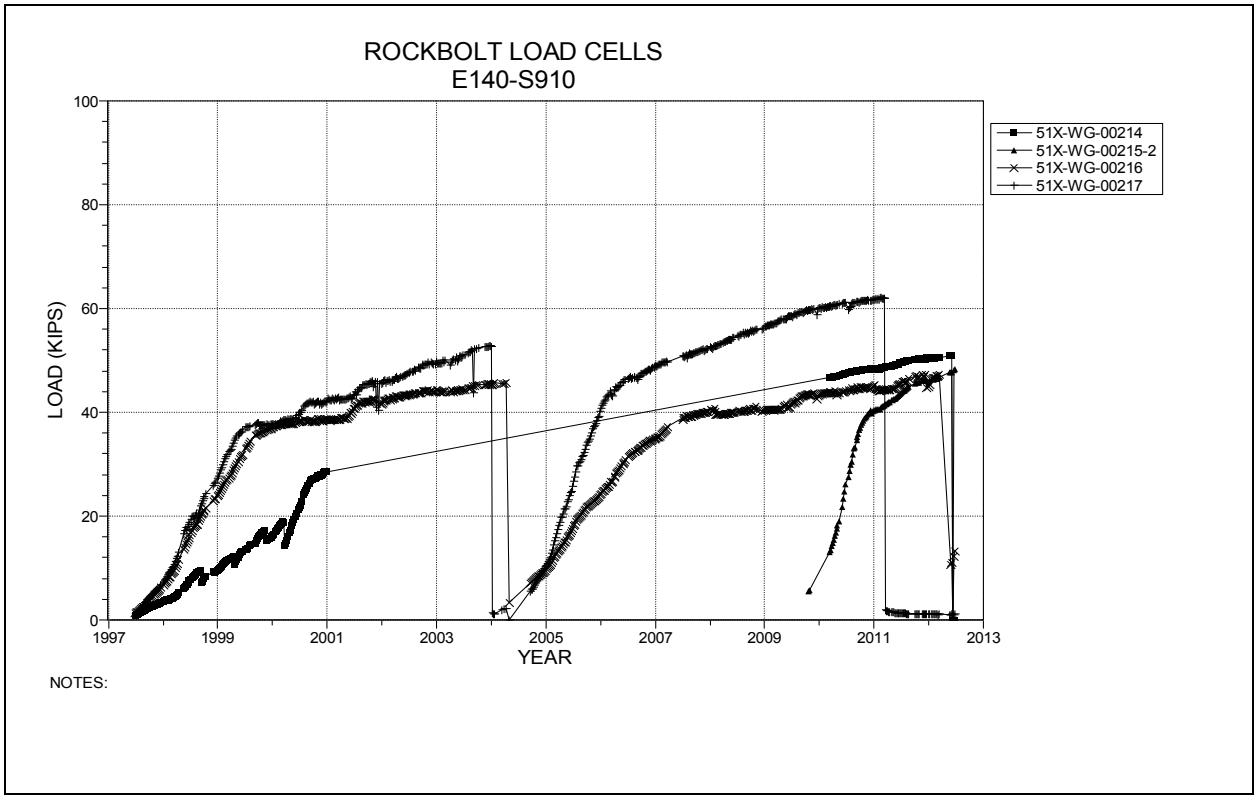


Figure 4-270 Rock Bolt Load Cells
E140 S910

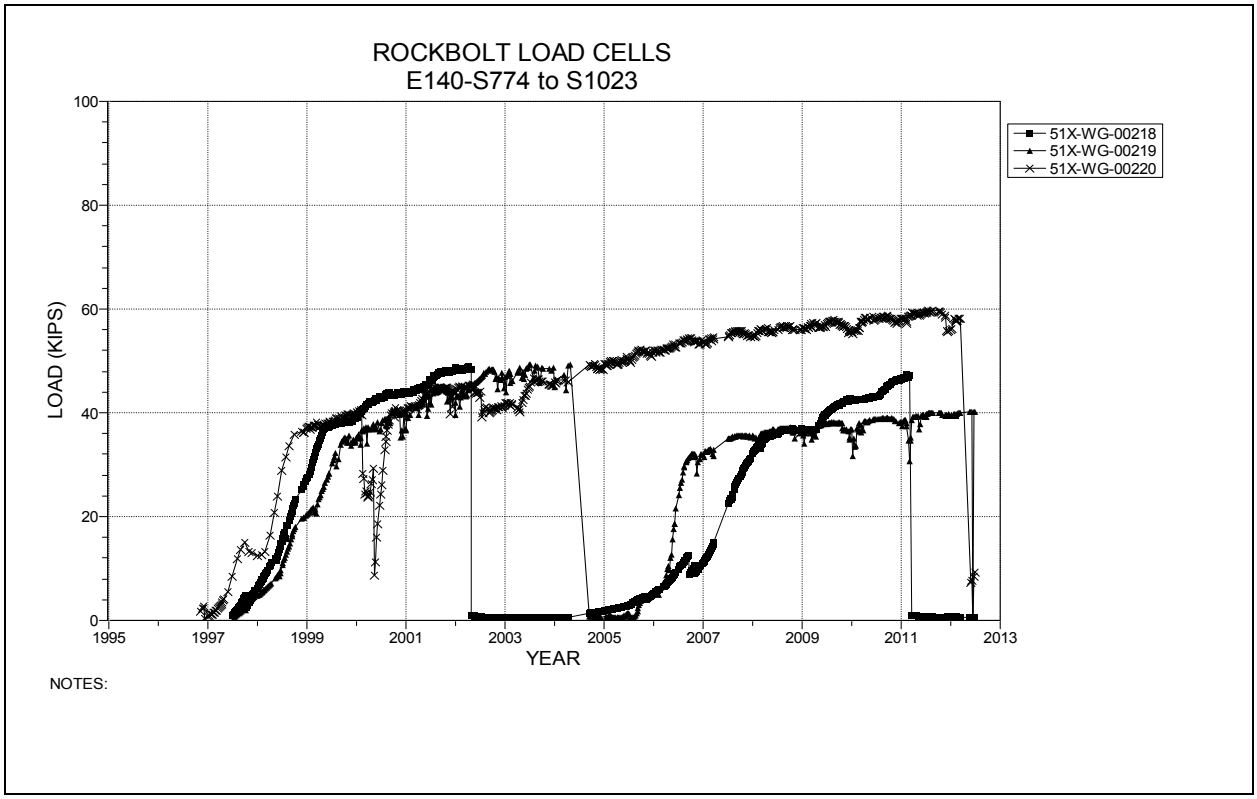
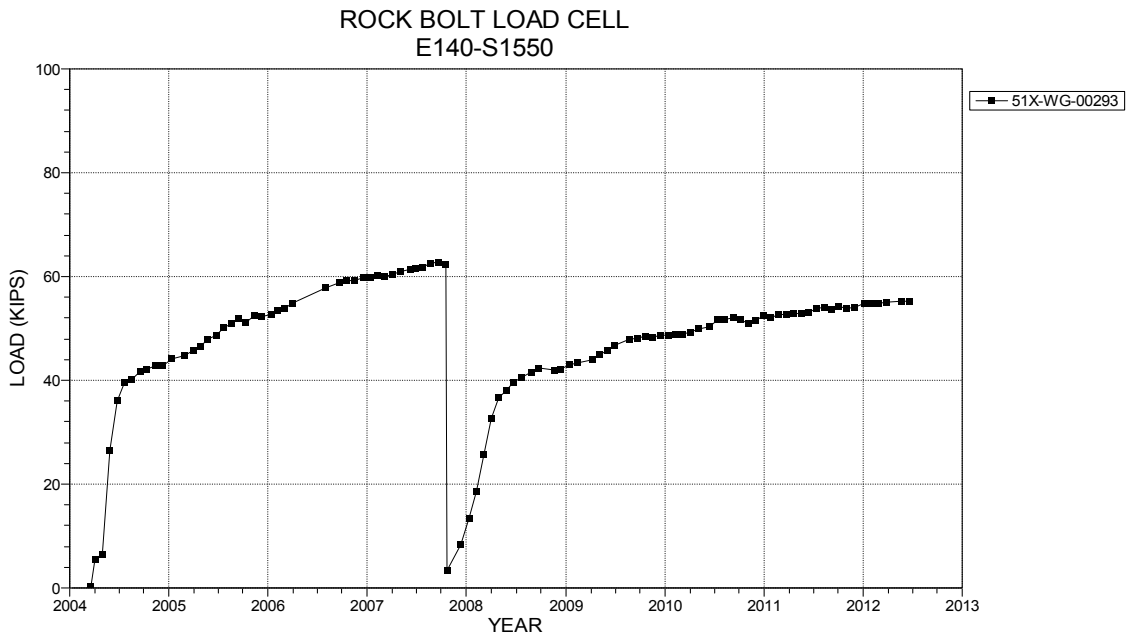
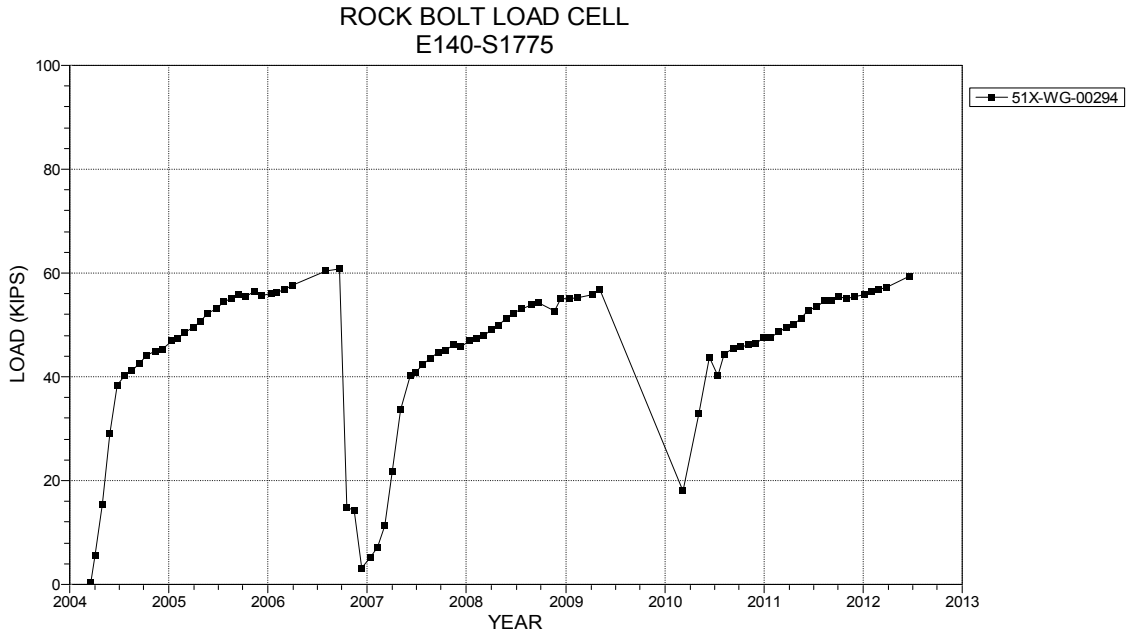


Figure 4-271 Rock Bolt Load Cells
E140 S774 – S1023



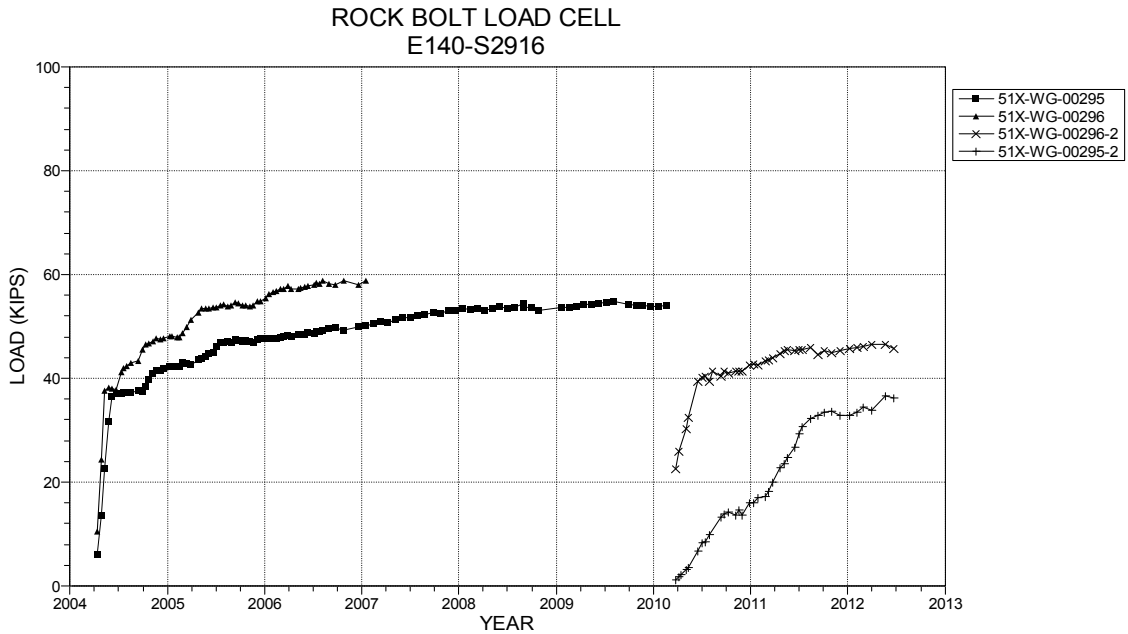
NOTES:
1. Excavation date: December 1982.
2. Bolt broke in October 2007 and was reinstalled.

Figure 4-272 Rock Bolt Load Cell
E140 S1550



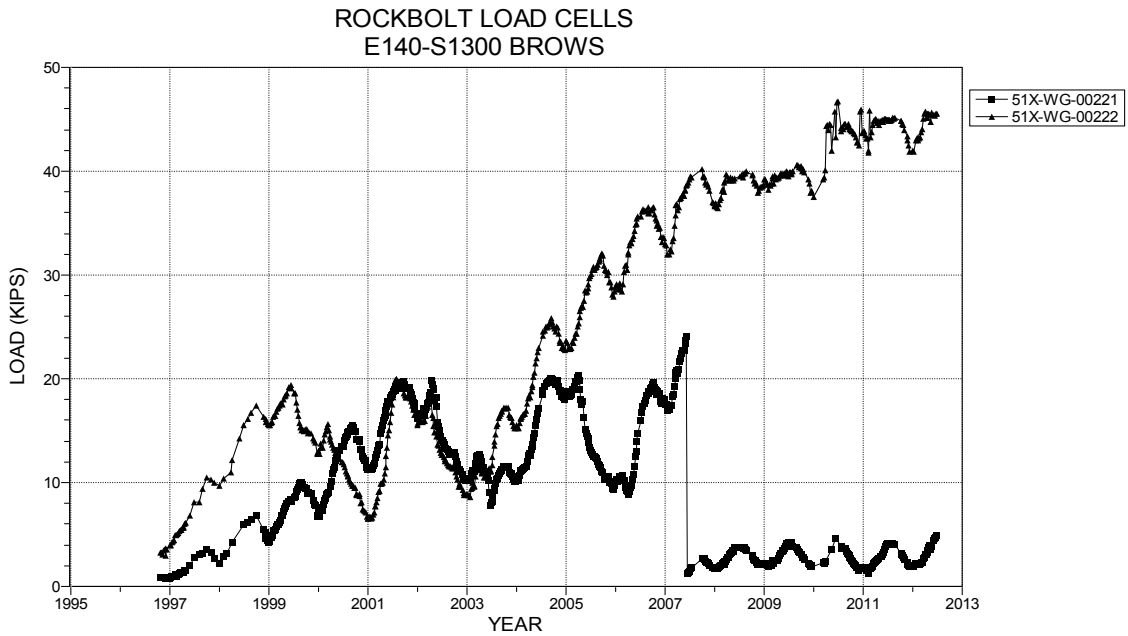
NOTES:
1. Excavation date: December 1982.
2. Reinstalled RBLC due to broken bolt, replaced Oct. 2006
3. Reinstalled RBLC due to broken bolt, replaced March 2010.

Figure 4-273 Rock Bolt Load Cell
E140 S1775



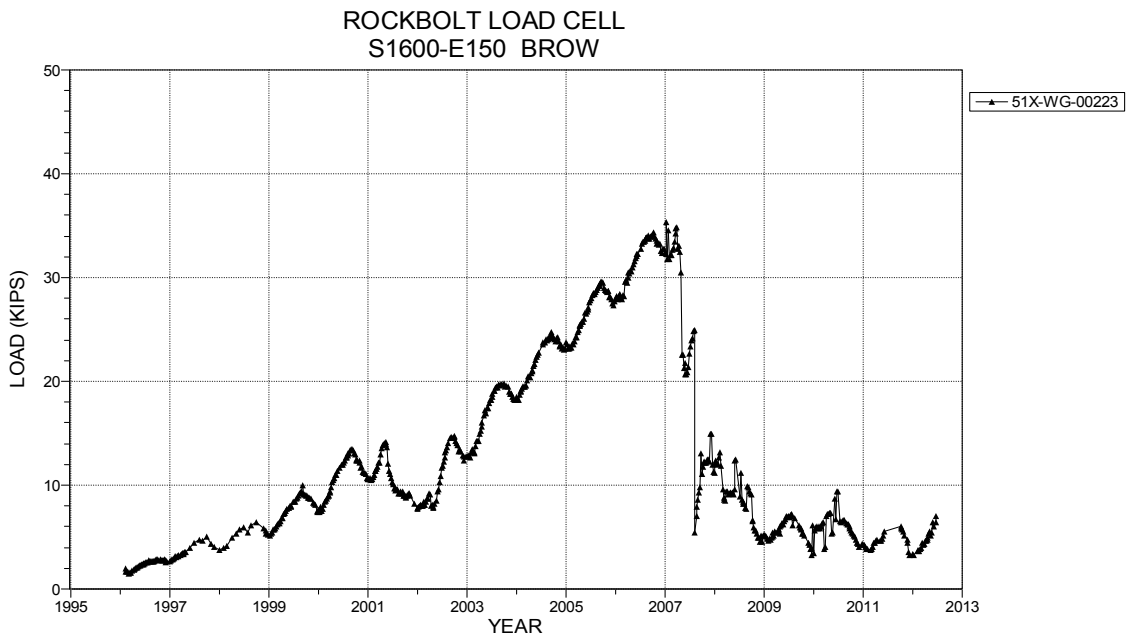
NOTES:
1. Excavation date: January 1983.
2. 51X-WG-00295-2 installed on replacement bolt 03/2010.
3. 51X-WG-00296-2 installed on replacement bolt 03/2010.

Figure 4-274 Rock Bolt Load Cells
E140 S2916



NOTES:
1. Excavation date: December 1982.
2. 51X-WG-00221 is located on the E120 brow and 51X-WG-00222 is on the E160 brow.

Figure 4-275 Rock Bolt Load Cells
E140 S1300 Brows



NOTES:
1. Excavation date: December 1982.

Figure 4-276 Rock Bolt Load Cell
E1600 E150 Brow

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5.0 Instrumentation Summary for the Waste Disposal Area

This chapter presents a summary of the data collected from instruments located in the Waste Disposal Area at the WIPP. Table 5-1 presents data and analysis of the access drifts associated with Panel 1. Plots of the instrument data are presented as Figures 5-1 through 5-14.

Table 5-2 presents data and analysis of the access drifts associated with Panel 2. Plots of the instrument data are presented as Figures 5-15 and 5-16.

Panel 3 data and analysis are presented on Table 5-3. Plots of the instrument data are presented as Figures 5-17 through 5-18.

Table 5-4 presents data and analysis of Panel 4. The instrument data plot is presented as Figure 5-19.

Table 5-5 presents data and analysis of Panel 5. Plots of the instrument data are presented as Figures 5-20 and 5-21.

Table 5-6 presents data and analysis of Panel 6. Plots of the instrument data are presented as Figures 5-22 through 5-81.

Table 5-7 presents data and analysis of Panel 7. Plots of the instrument data are presented as Figures 5-82 through 5-139.

Table 5-1
Panel 1 Access Drifts Data Analysis

Convergence Points

Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S1600-E311-2 A-C	S1600-E311	5-1	06/28/12	16.827	22.274	0.9	0.8	13%	
S1600-E332-3 A-C	S1600-E332	5-2	06/28/12	16.259	20.686	1.0	0.9	11%	
S1600-E357-2 A-C	S1600-E357	5-3	06/28/12	19.031	24.429	1.3	1.1	18%	
S1600-E382-2 A-C	S1600-E382	5-4	06/28/12	18.724	24.104	1.2	1.0	20%	
S1600-E407-2 A-G	S1600-E407	5-5	06/28/12	20.915	26.357	1.4	1.2	17%	
S1600-E407-2 B-F	S1600-E407	5-5	06/28/12	19.356	24.362	1.3	1.1	18%	
S1600-E407-2 H-L	S1600-E407	5-5	06/28/12	20.317	25.382	1.4	1.3	8%	
S1600-E432-2 A-C	S1600-E432	5-6	06/28/12	24.388	31.147	1.8	1.5	20%	
S1600-E453 A-C	S1600-E453	5-7	06/28/12	5.138	5.138	0.7	0.7	0%	
S1600-E453 B-D	S1600-E453	5-7	06/28/12	4.848	4.848	0.6	0.7	-14%	
S1950-E311-7 A-C	S1950-E311	5-8	06/28/12	2.815	32.206	1.5	1.5	0%	
S1950-E311-3 B-D	S1950-E311	5-8	06/28/12	17.832	30.833	1.4	1.6	-13%	
S1950-E332-4 A-C	S1950-E332	5-9	06/28/12	20.615	39.217	1.9	1.7	12%	
S1950-E332-4 B-D	S1950-E332	5-9	04/30/12	15.776	33.722	1.9	1.8	6%	
S1950-E357-7 A-C	S1950-E357	5-10	06/28/12	26.336	46.500	2.5	2.3	9%	
S1950-E357-4 B-D	S1950-E357	5-10	06/28/12	17.107	35.566	2.0	1.8	11%	
S1950-E382-5 A-C	S1950-E382	5-11	06/28/12	30.913	49.548	2.9	2.7	7%	
S1950-E382-3 B-D	S1950-E382	5-11	06/28/12	23.962	38.344	1.9	2.1	-10%	
S1950-E407-4 A-G	S1950-E407	5-12	06/28/12	30.512	52.336	2.8	2.6	8%	
S1950-E407-3 H-L	S1950-E407	5-12	06/28/12	29.818	50.550	2.5	2.4	4%	
S1950-E407-3 D-J	S1950-E407	5-13	06/28/12	25.024	39.201	2.0	2.0	0%	
S1950-E432-3 A-C	S1950-E432	5-14	06/28/12	30.016	51.811	2.7	2.4	13%	
S1950-E432-3 B-D	S1950-E432	5-14	06/28/12	23.395	37.796	1.9	1.7	12%	

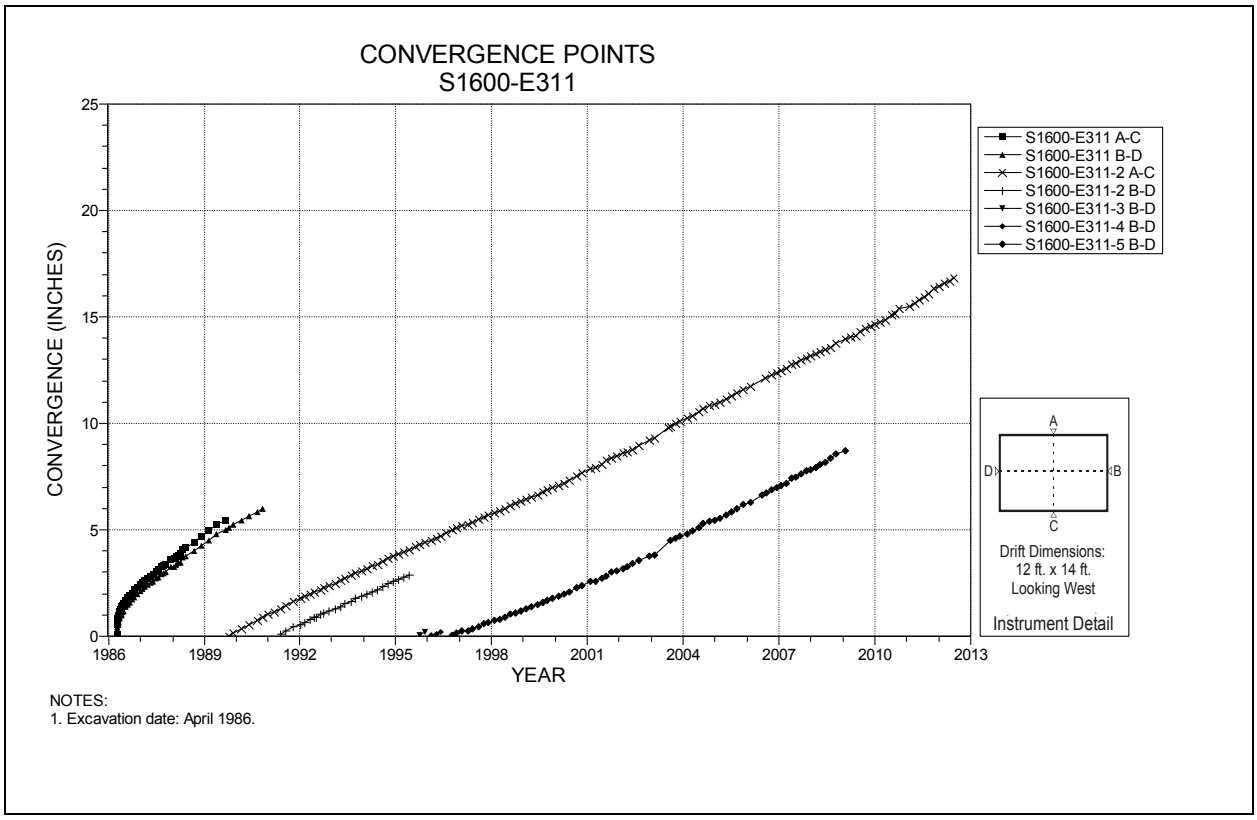


Figure 5-1 Convergence Point Array
S1600 E311 – All Chords

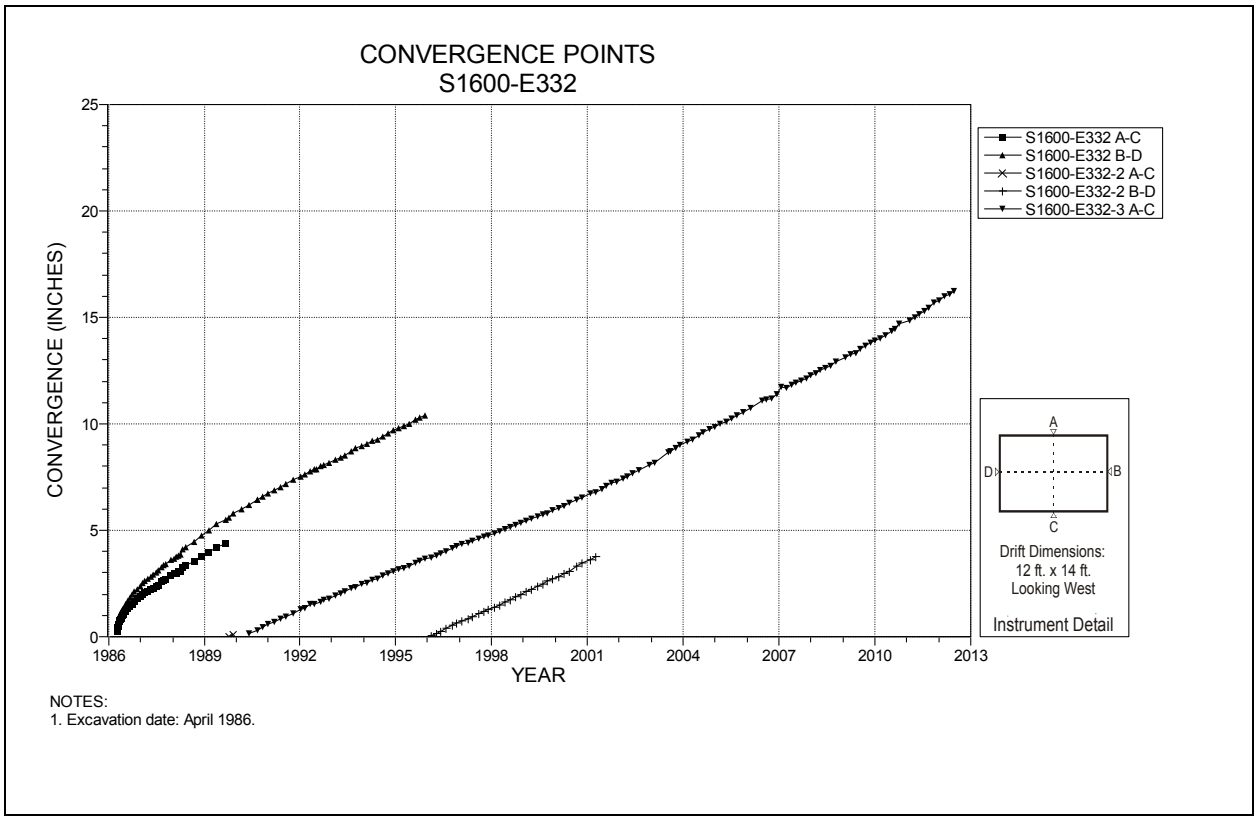


Figure 5-2 Convergence Point Array
S1600 E332 – All Chords

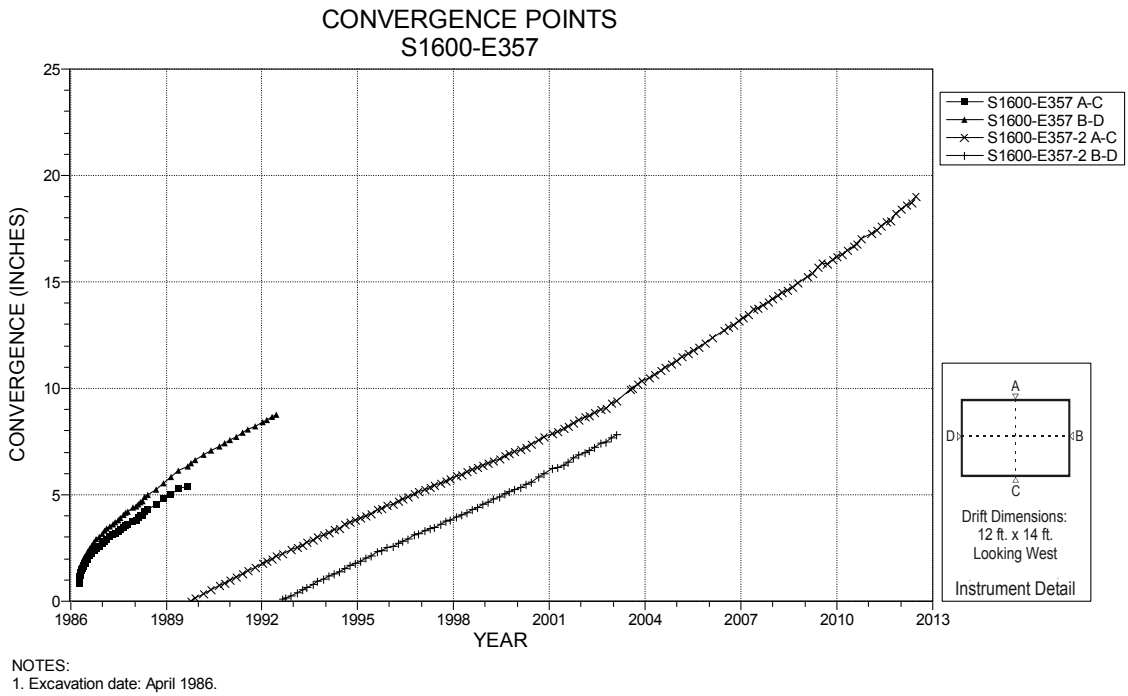


Figure 5-3 Convergence Point Array
S1600 E357 – All Chords

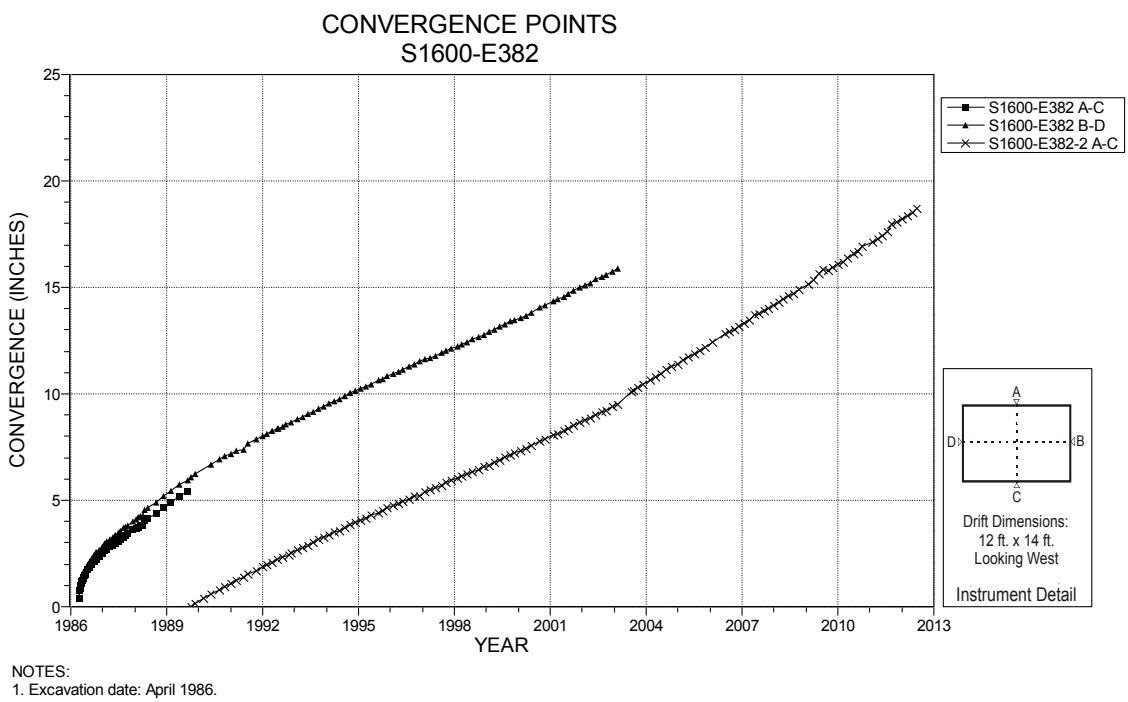
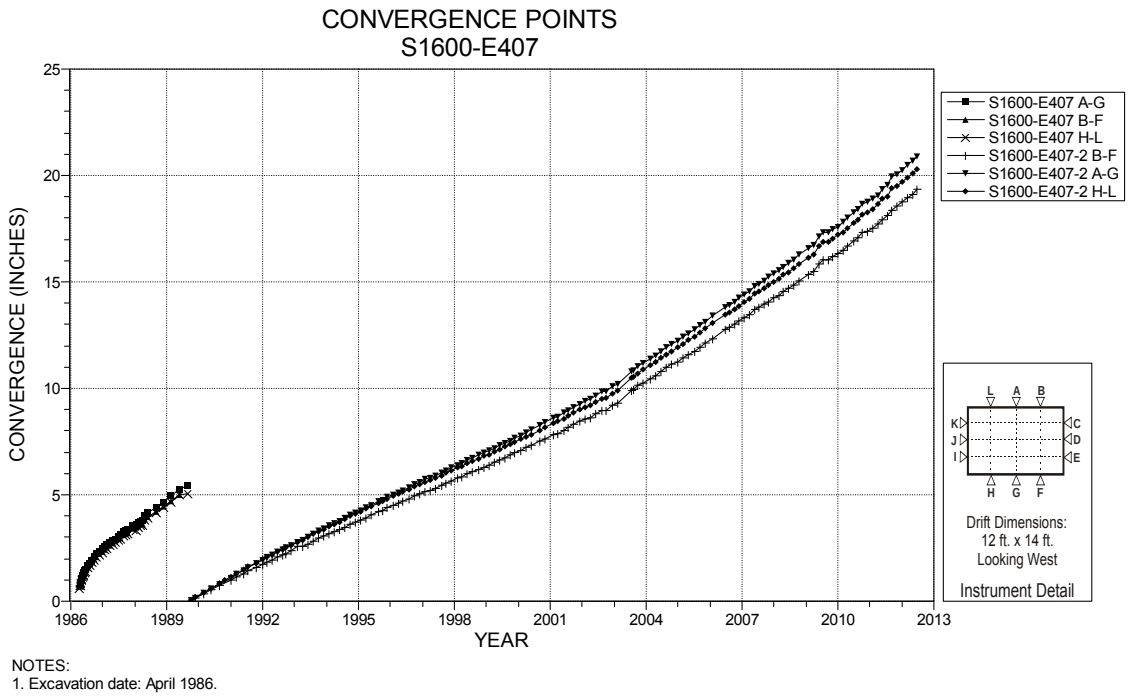
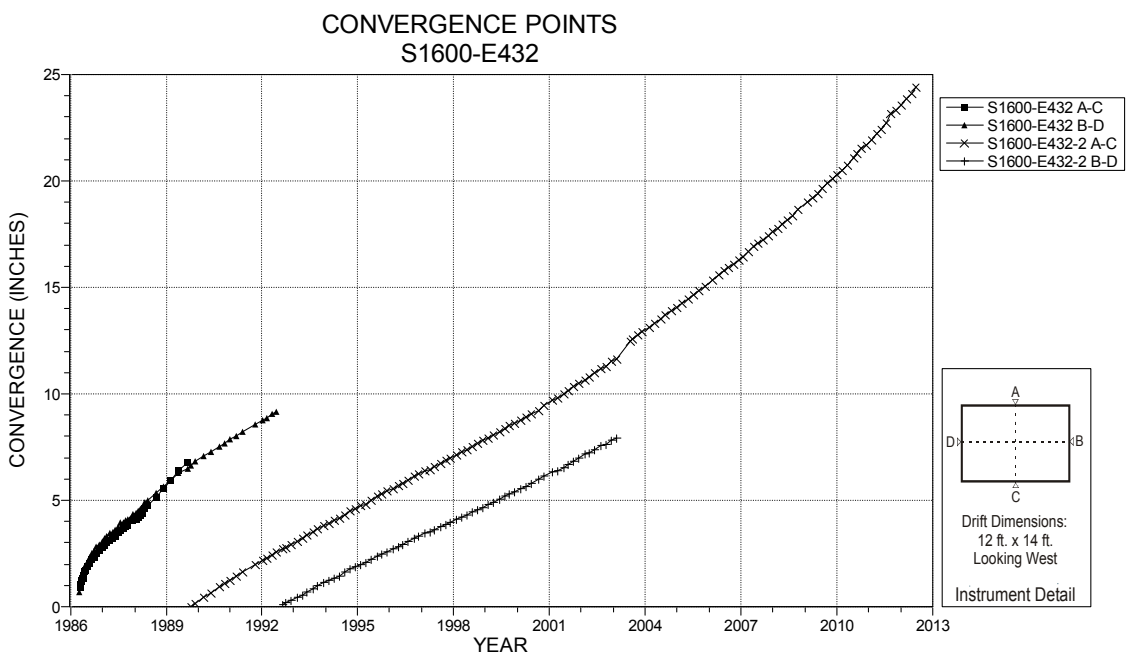


Figure 5-4 Convergence Point Array
S1600 E382 – All Chords



NOTES:
1. Excavation date: April 1986.

Figure 5-5 Convergence Point Array
S1600 E407 – All Vertical Chords



NOTES:
1. Excavation date: April 1986.

Figure 5-6 Convergence Point Array
S1600 E432 – All Chords

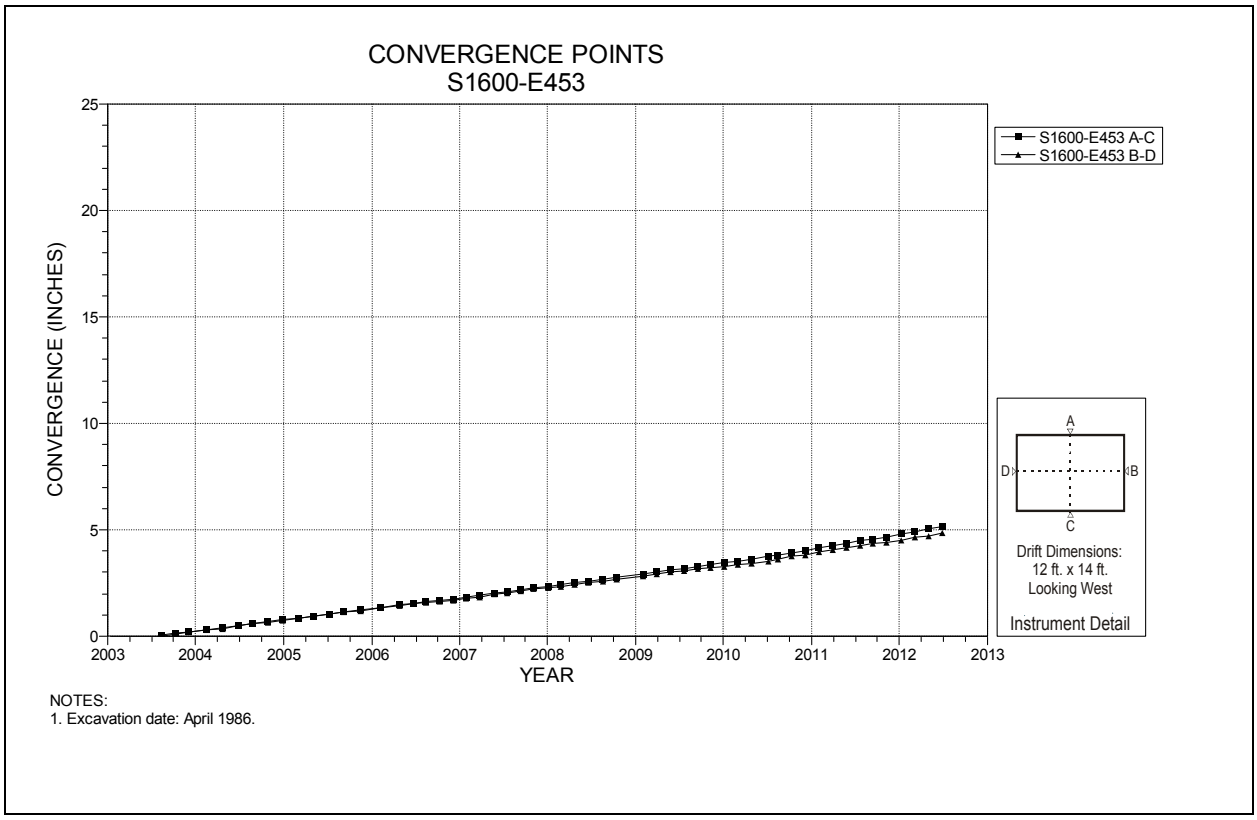


Figure 5-7 Convergence Point Array
S1600 E453 – All Chords

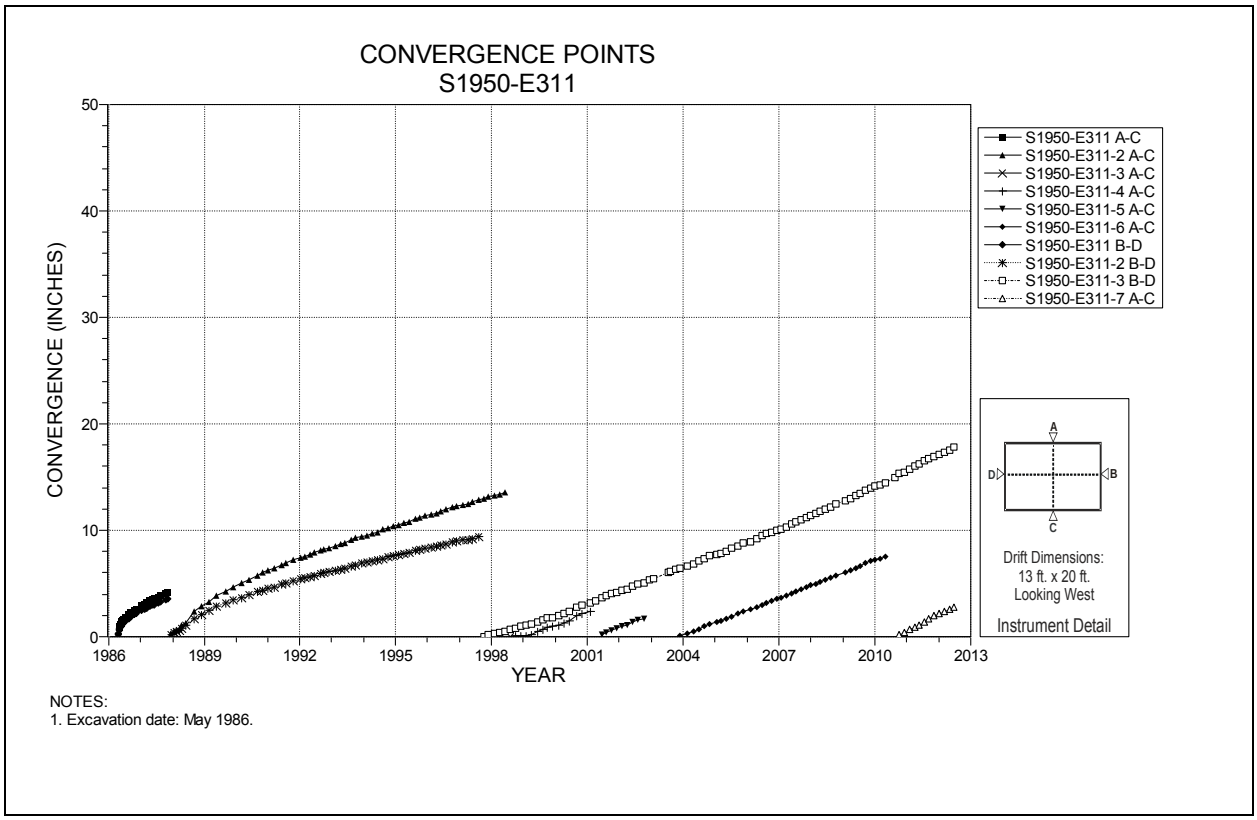


Figure 5-8 Convergence Point Array
S1950 E311 – All Chords

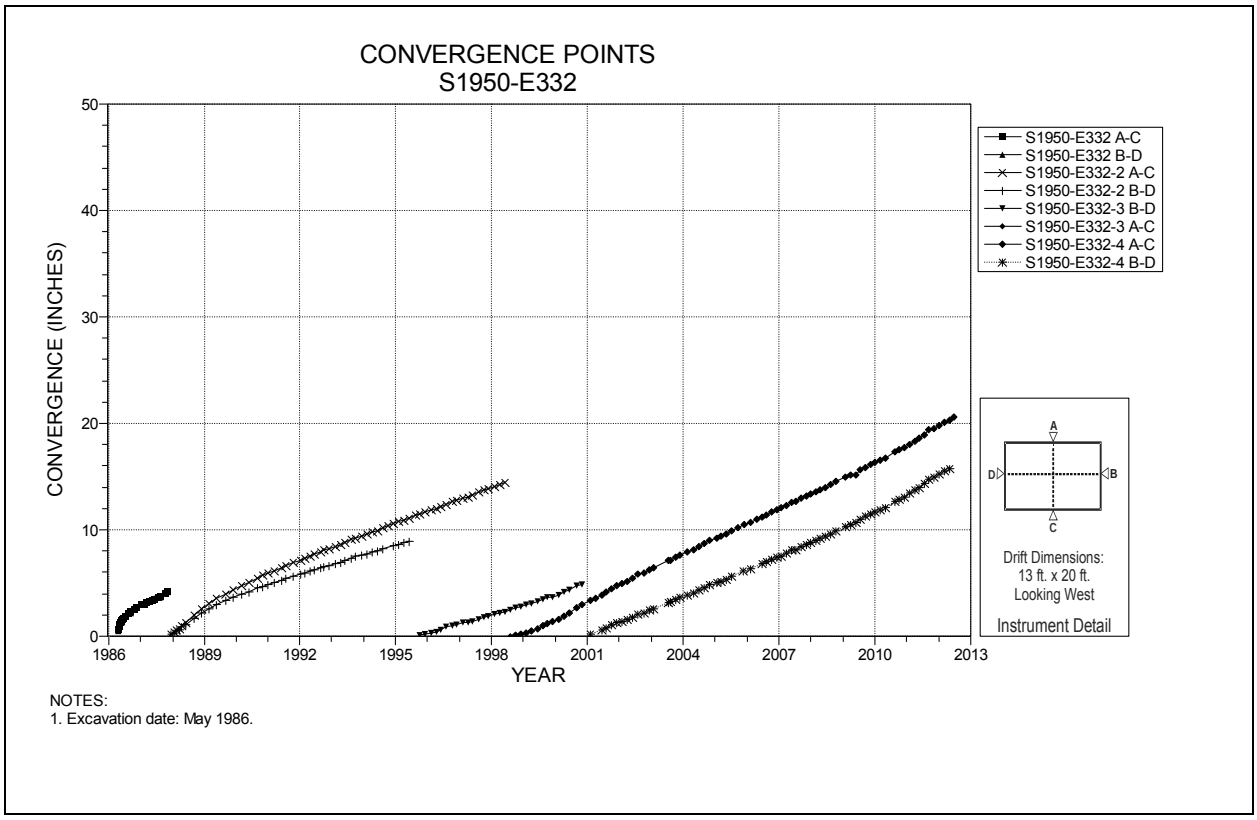


Figure 5-9 Convergence Point Array
S1950 E332 – All Chords

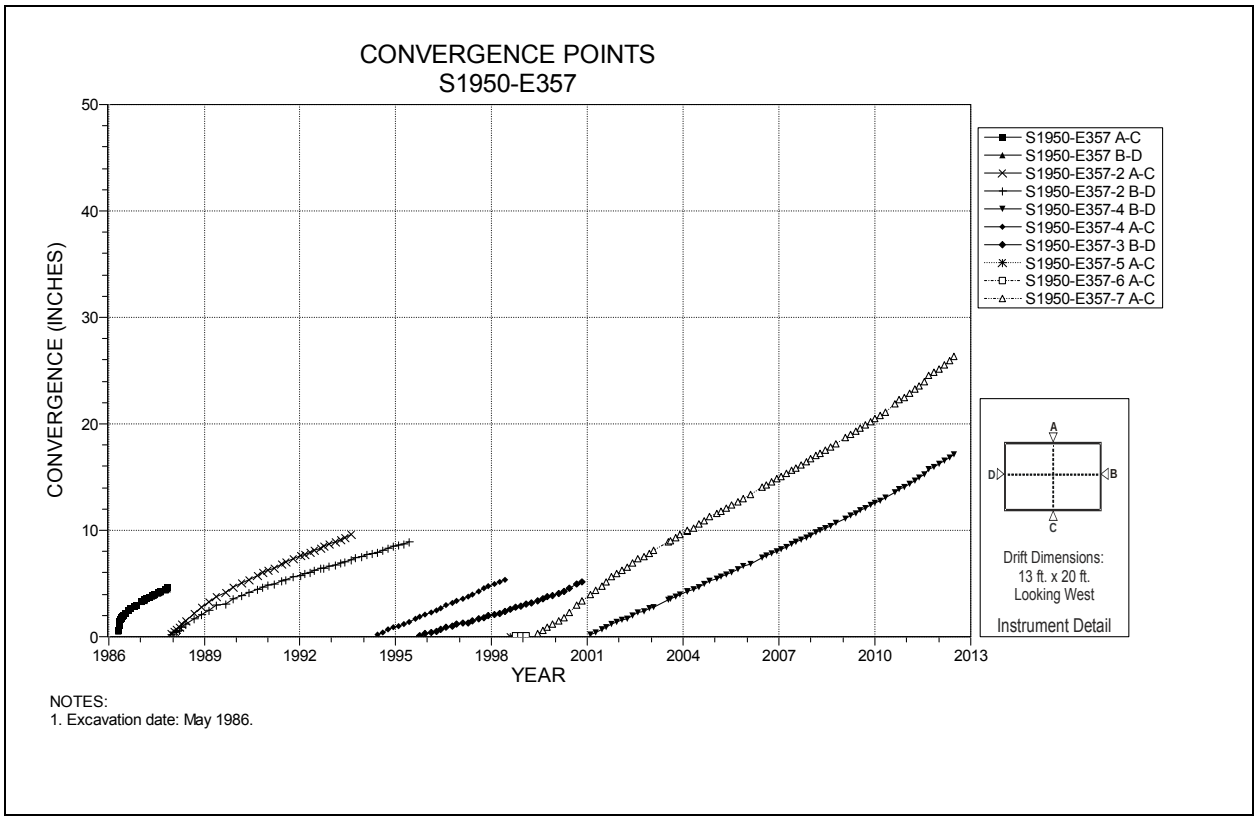


Figure 5-10 Convergence Point Array
S1950 E357 – All Chords

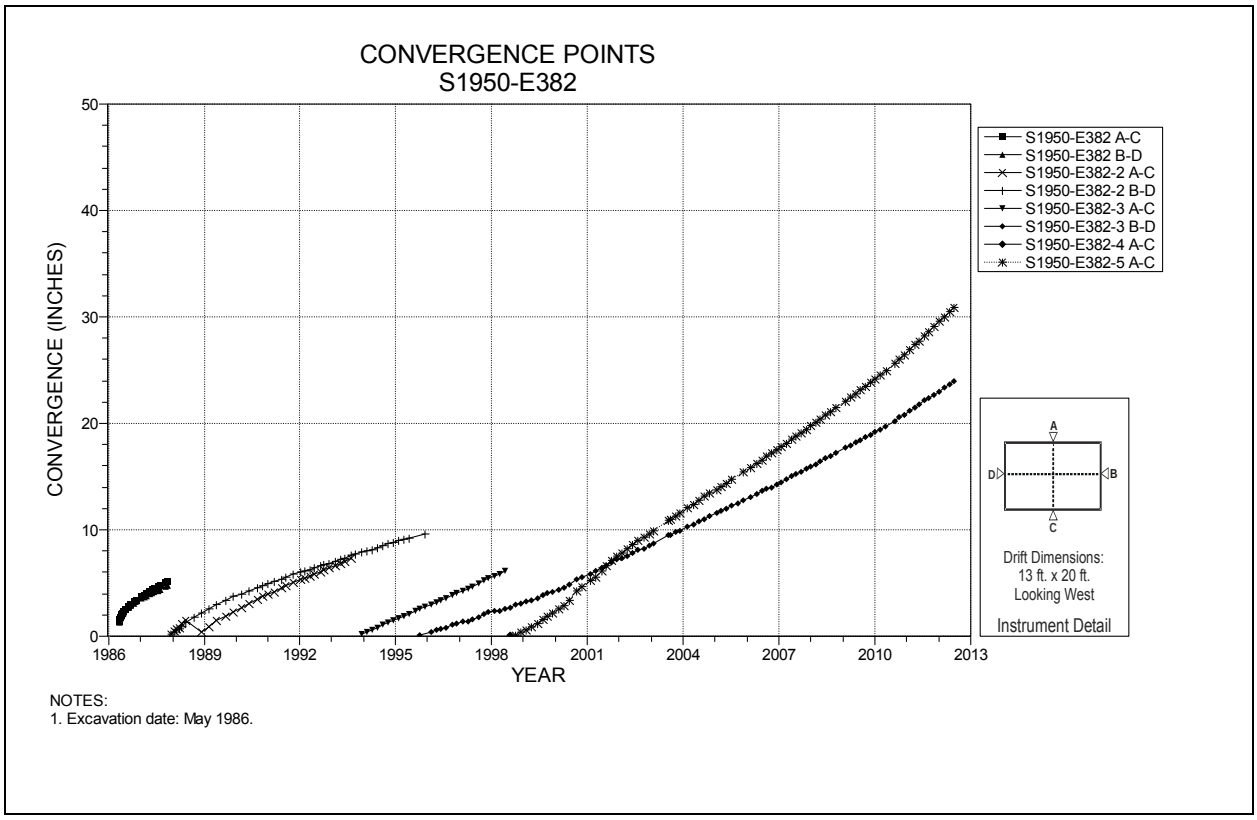


Figure 5-11 Convergence Point Array
S1950 E382 – All Chords

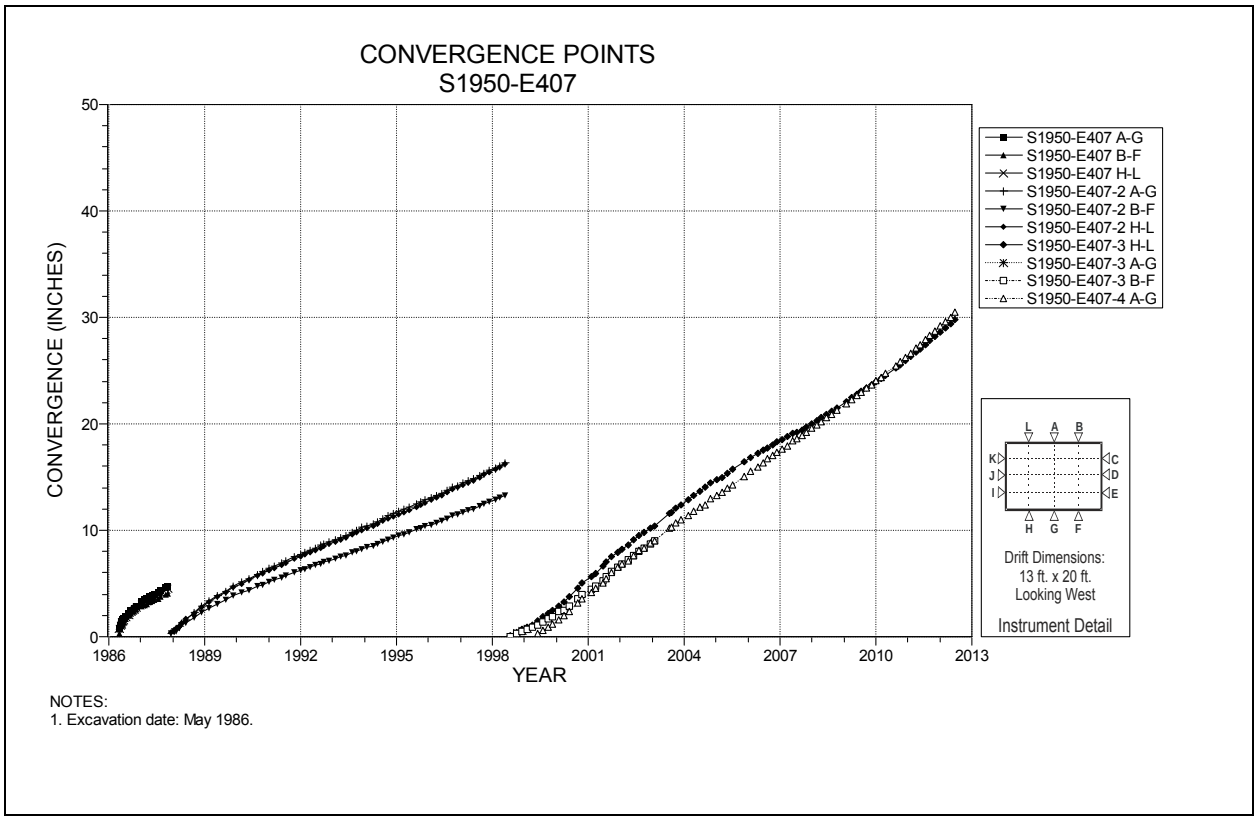


Figure 5-12 Convergence Point Array
S1950 E407 – Roof to Floor

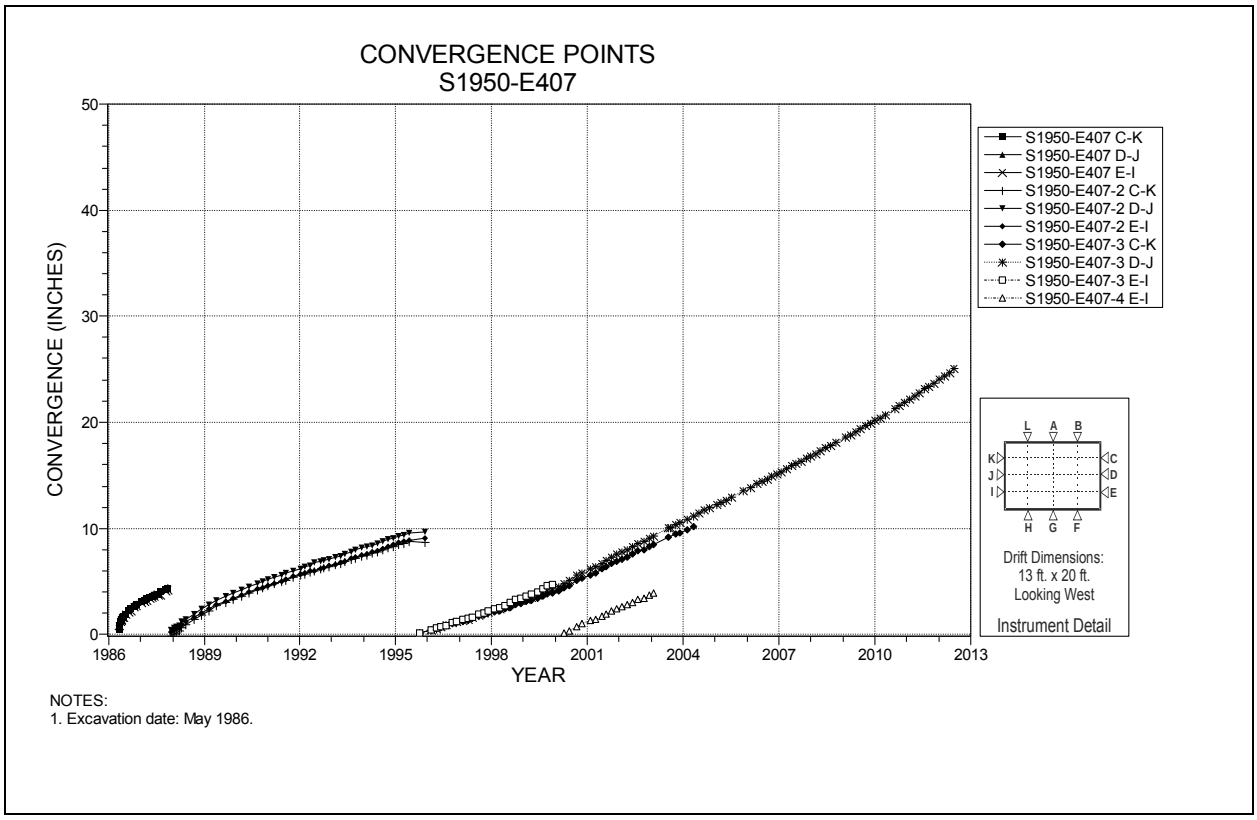


Figure 5-13 Convergence Point Array
S1950 E407 – Rib to Rib

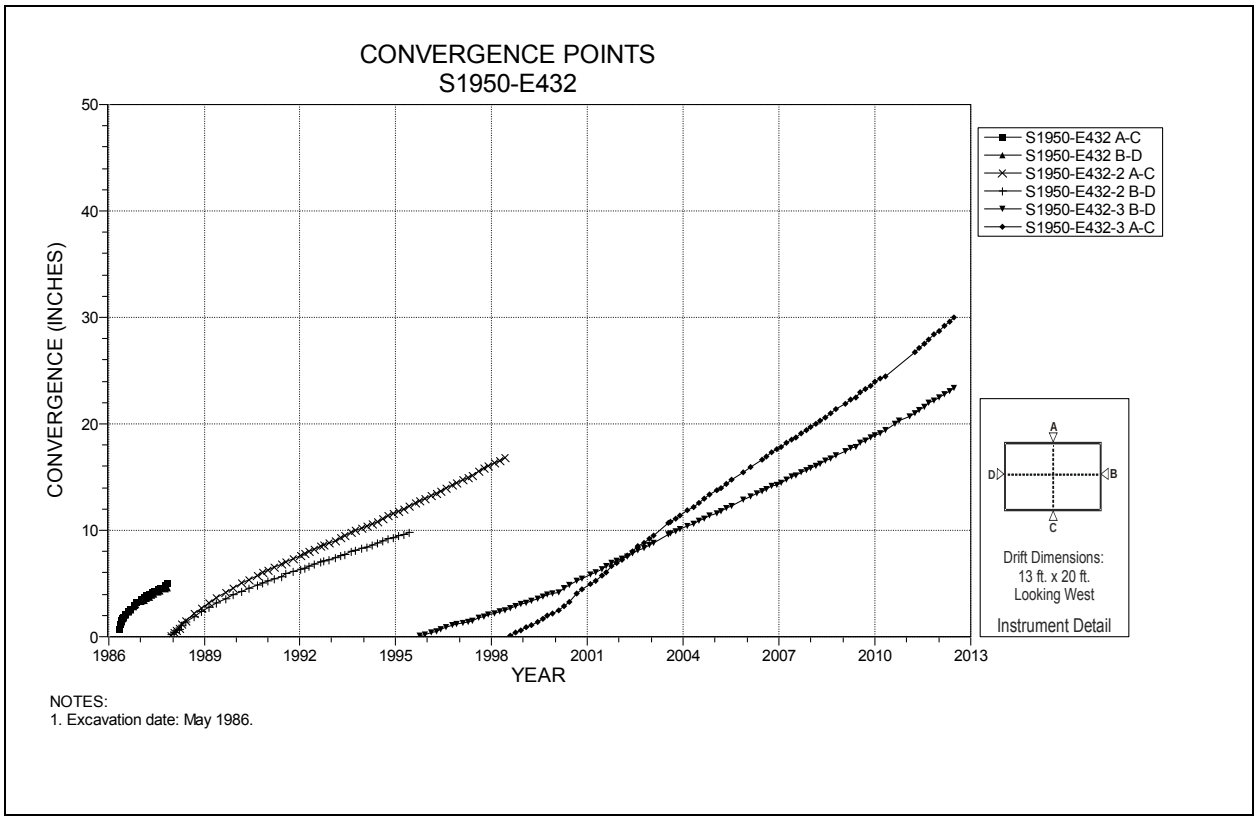


Figure 5-14 Convergence Point Array
S1950 E432 – All Chords

Table 5-2
Panel 2 Access Drifts Data Analysis

Convergence Points									
Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S2180-E410-2 A-C	S2180-E410	5-15	06/14/12	10.684	15.481	1.5	1.5	0%	
S2180-E410 B-D	S2180-E410	5-15	06/14/12	20.074	20.074	2.3	2.2	5%	
S2520-E410-3 A-C	S2520-E410	5-16	06/11/12	24.310	32.446	3.5	3.5	0%	

Table 5- Panel 2 Access Drifts Data Analysis

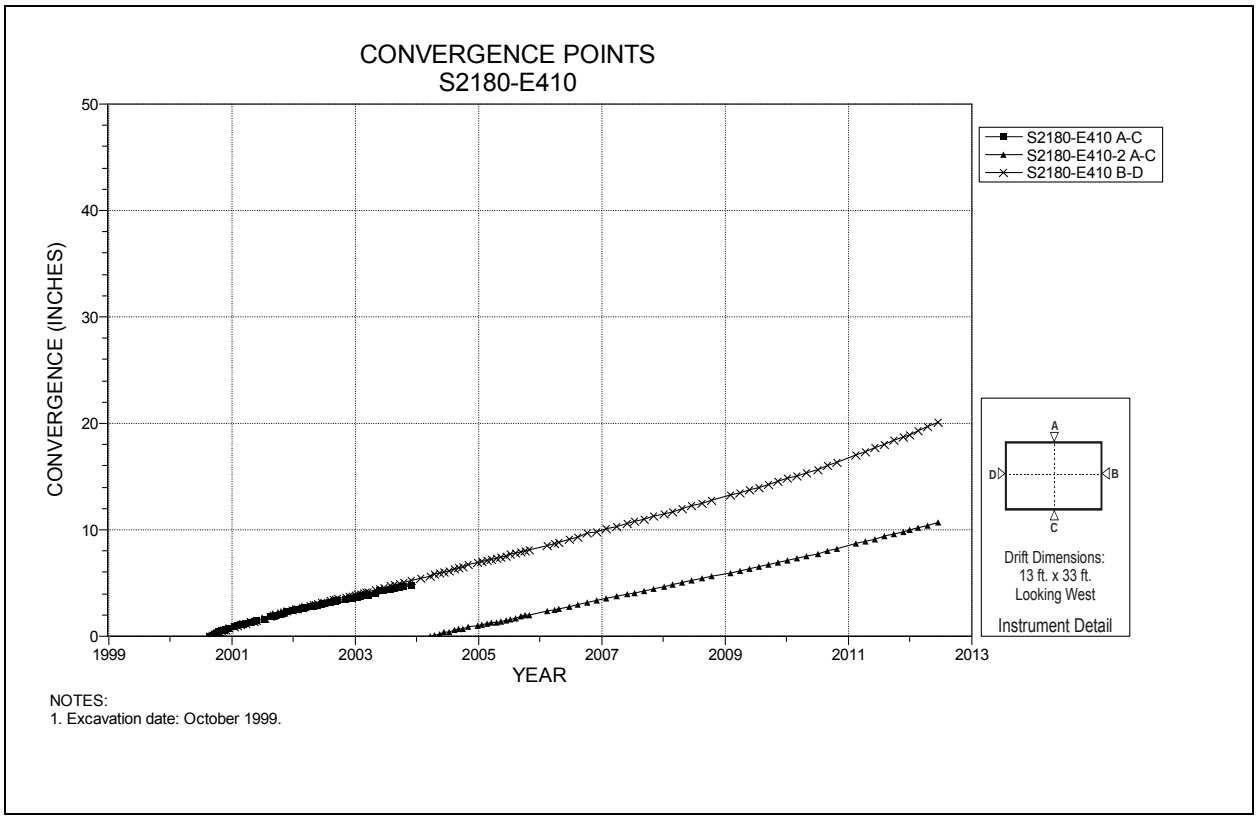


Figure 5-15 Convergence Point Array
S2180 E410 – All Chords

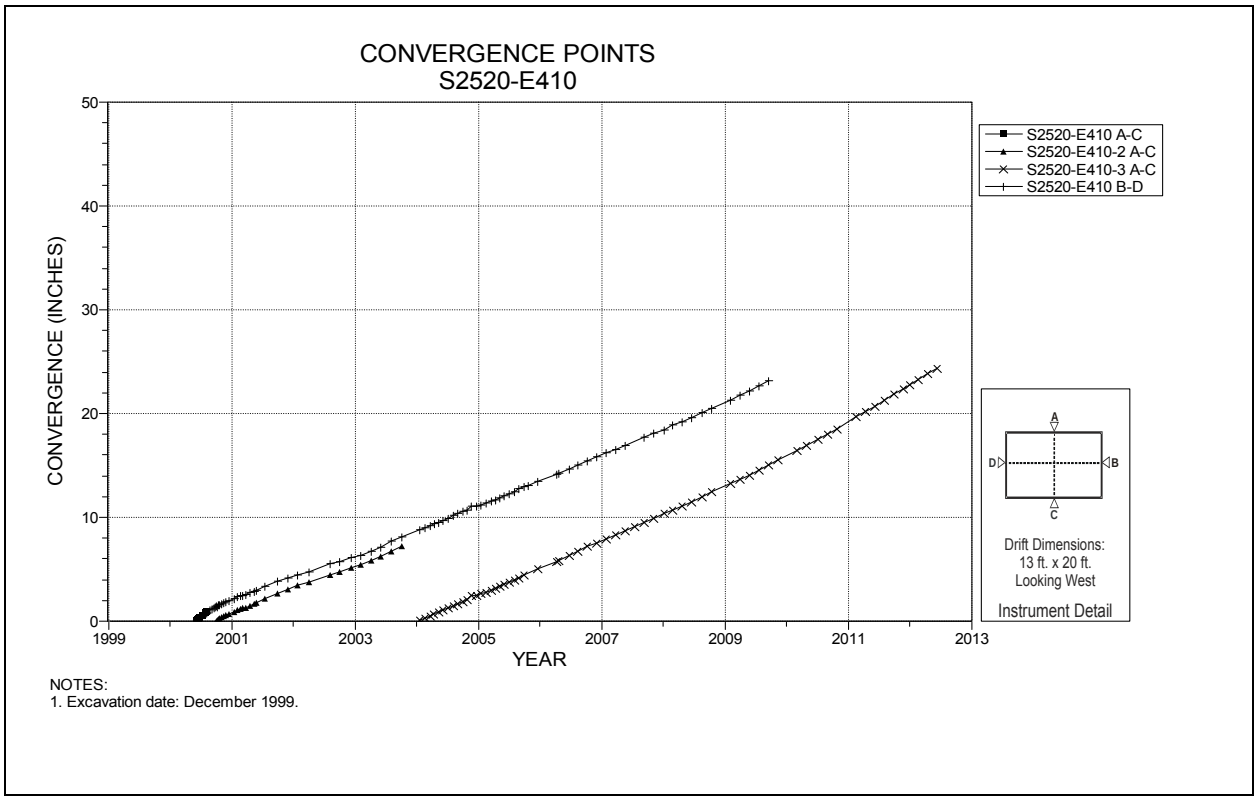


Figure 5-16 Convergence Point Array
S2520 E410 – All Chords

Table 5-3
Panel 3 Access Drift Data Analysis

Convergence Points									
Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S2750-E410 A-C	S2750-E410	5-17	06/14/12	25.807	25.807	4.5	4.5	0%	
S2750-E410 B-D	S2750-E410	5-17	06/14/12	17.789	17.789	2.4	2.4	0%	
S3080-E410-2 A-C	S3080-E410	5-18	06/11/12	26.589	29.102	4.5	4.2	7%	
S3080-E410 B-D	S3080-E410	5-18	06/11/12	20.985	20.985	2.7	2.6	4%	

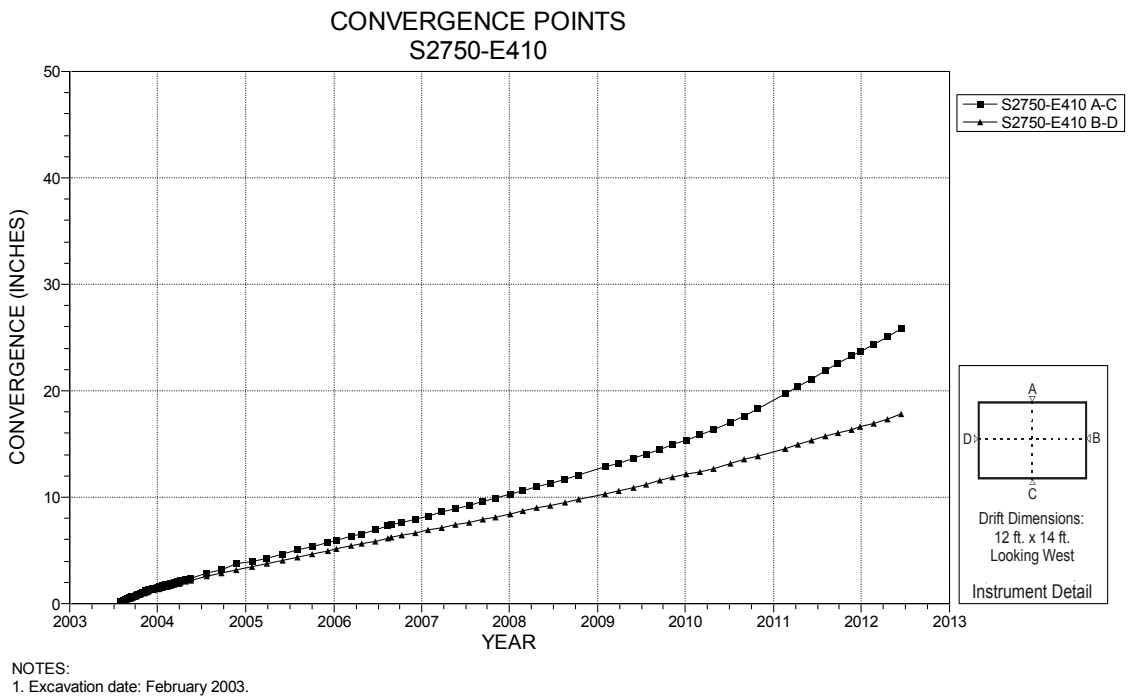


Figure 5-17 Convergence Point Array
S2750 E410 – All Chords

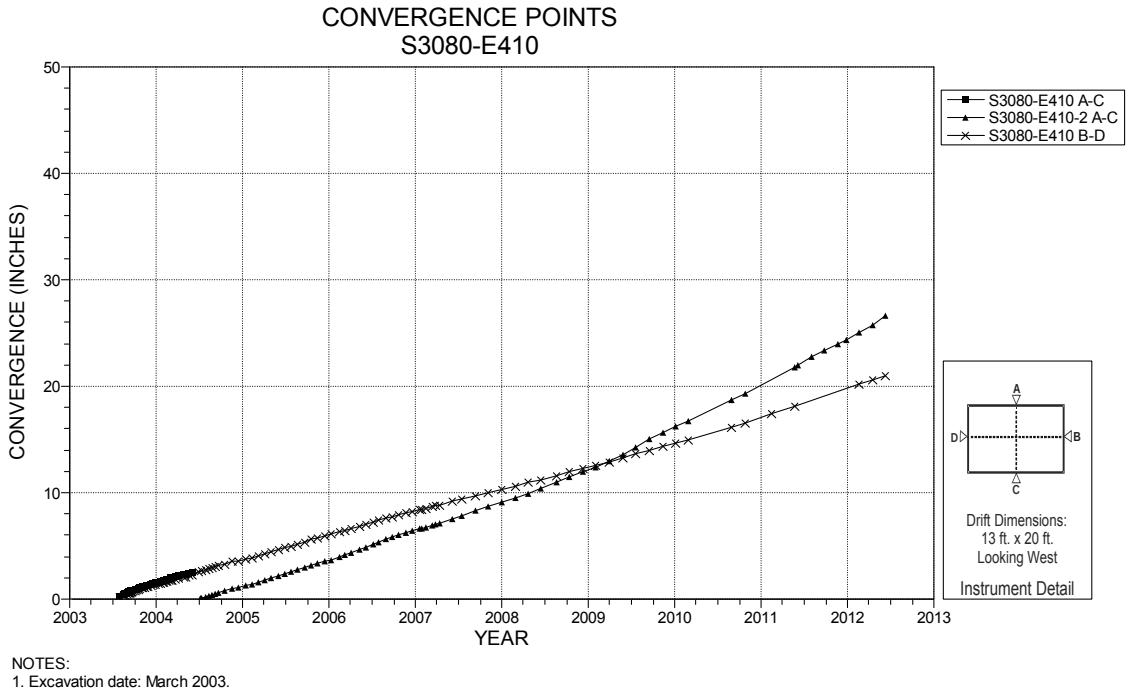


Figure 5-18 Convergence Point Array
S3080 E410 – All Chords

Table 5-4
Panel 4 Access Drift Data Analysis

Convergence Points									
Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S3310-E410 A-C	S3310-E410	5-19	6/14/2012	14.027	14.027	2.0	N/A	N/A	One reading during 10’ – 11’ reporting period.

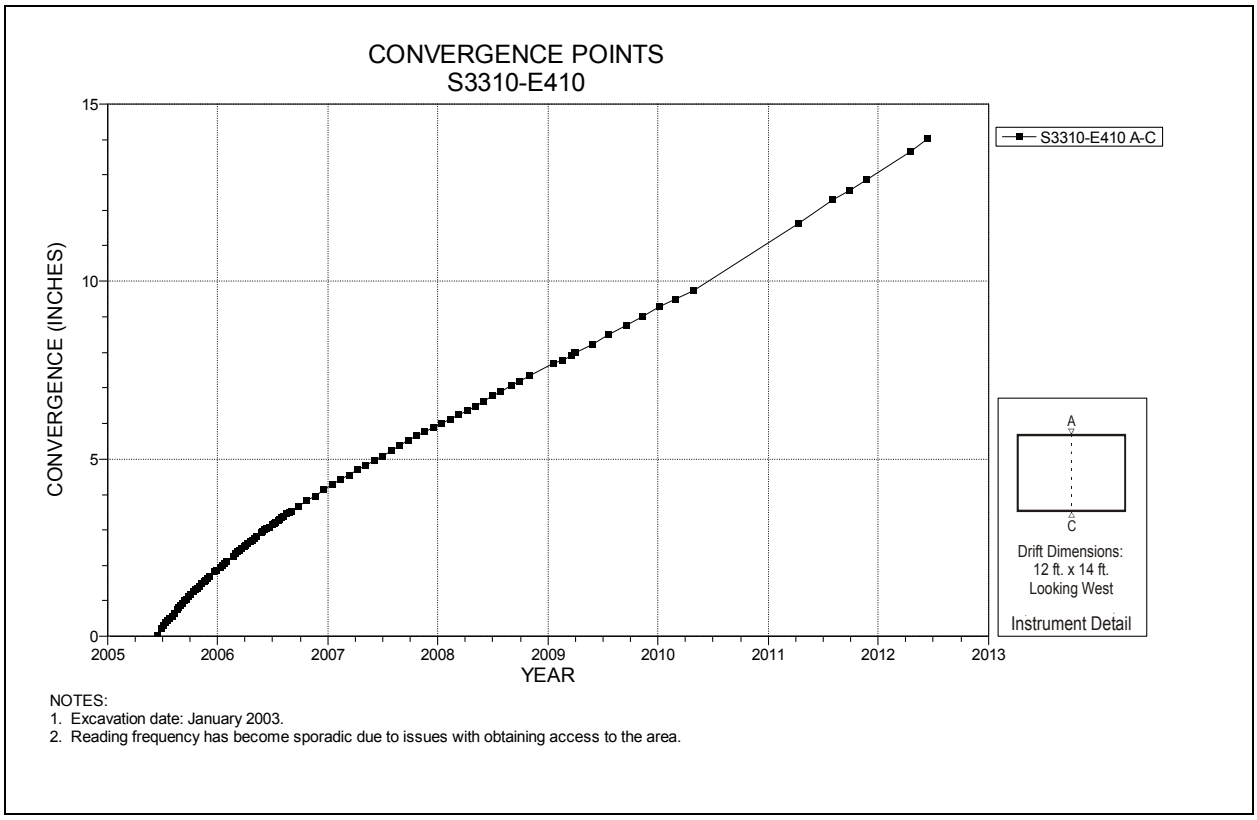


Figure 5-19 Convergence Point Array
S3310 E410 – Roof to Floor

Table 5-5 Panel 5 Data Analysis

Convergence Points									
Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S3310-W285 A-C	S3310-W285	5-20	6/11/2012	10.489	10.489	2.6	2.2	18%	
S3650-W285-2 A-C	S3650-W285	5-21	6/11/2012	8.966	11.407	3.7	2.6	45%	

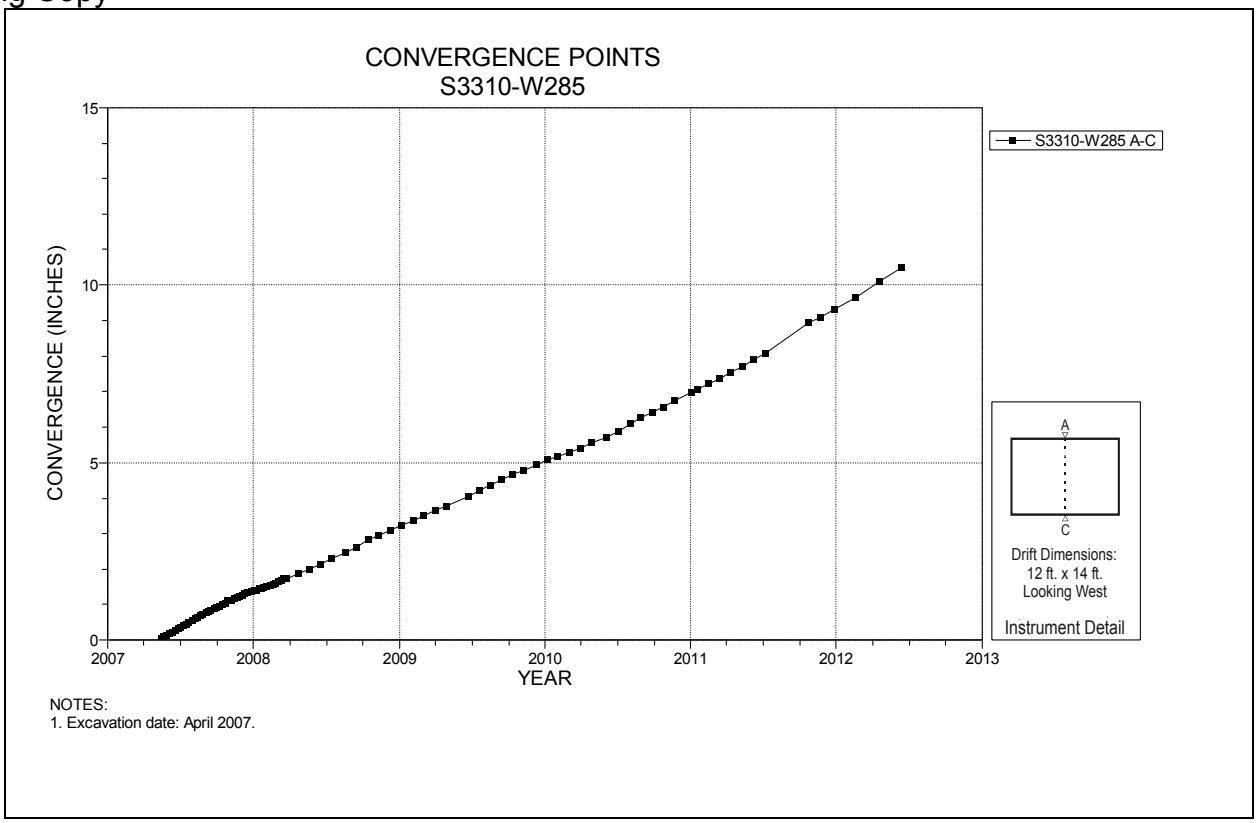


Figure 5-20 Convergence Point Array
S3310 W285 – Roof to Floor

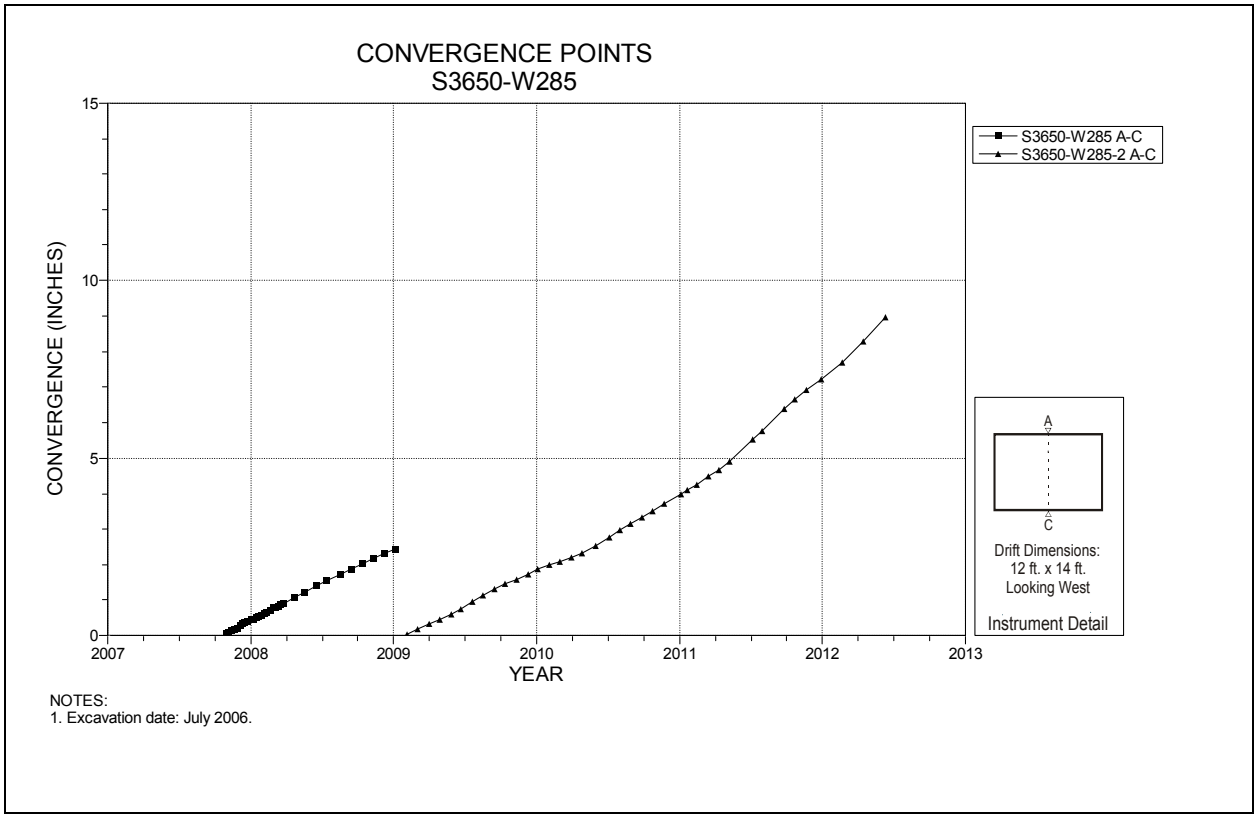


Figure 5-21 Convergence Point Array
S3650 W285 – Roof to Floor

Table 5-6
Panel 6 Data Analysis

Extensometers

Field Tag	Location	Figure Number	Date of Last Reading	Collar Displacement Relative to Deepest Anchor (inches)	Displacement Rate 2011 to 2012 (in/year)	Displacement Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
51X-GE-00501	S2750-W285	5-22	06/25/12	0.548	1.9	N/A	N/A	
51X-GE-00413-2	S2750-W585	5-23	06/28/12	4.328	2.9	3.1	-6%	
51X-GE-00414	S2750-W985	5-24	06/28/12	3.362	1.6	1.6	0%	
51X-GE-00403	W390-S2916	5-25	03/05/12	14.254	4.6	5.7	-19%	
51X-GE-00405	W520-S2916	5-26	06/28/12	12.087	5.1	3.8	34%	
51X-GE-00406	W660-S2916	5-27	06/28/12	8.098	3.5	2.5	40%	
51X-GE-00407	W790-S2916	5-28	06/28/12	5.664	1.7	2.0	-15%	
51X-GE-00408-2	W920-S2916	5-29	06/28/12	2.530	1.3	1.3	0%	Anchor “B” was used (anchor “C” has failed).
51X-GE-00409	W1050-S2916	5-30	06/28/12	4.802	1.7	1.9	-11%	
51X-GE-00410	W1190-S2916	5-31	06/28/12	3.794	1.5	1.7	-12%	
51X-GE-00411	S3080-W585	5-32	06/28/12	8.826	3.8	4.1	-7%	
51X-GE-00412	S3080-W985	5-33	06/28/12	3.889	1.6	1.8	-11%	

[1] N/A – Insufficient data available to perform the calculation. This is usually due to the inability to read the instruments because of activities such as: the temporary removal of an instrument due to floor, rib or back trimming; locations blocked by equipment or waste disposal, etc.

Convergence Points

Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S2750-W285-2 A-C	S2750-W285	5-34	06/25/12	14.438	19.119	7.6	6.4	19%	
S2750-W390-2 A-C	S2750-W390	5-35	06/25/12	11.552	18.678	5.1	6.0	-15%	
S2750-W460-2 A-C	S2750-W460	5-36	06/25/12	15.682	21.708	6.8	8.4	-19%	
S2750-W520-2 A-C	S2750-W520	5-37	06/25/12	11.990	18.706	5.0	6.6	-24%	
S2750-W590-2 A-C	S2750-W590	5-38	06/25/12	13.469	17.171	5.7	7.4	-23%	
S2750-W660-2 A-C	S2750-W660	5-39	06/25/12	12.205	16.295	4.9	7.0	-30%	
S2750-W725-2 A-C	S2750-W725	5-40	06/25/12	12.482	16.762	5.1	7.1	-28%	
S2750-W790-2 A-C	S2750-W790	5-41	06/25/12	11.847	16.300	4.7	6.7	-30%	
S2750-W855-2 A-C	S2750-W855	5-42	06/25/12	12.117	13.802	5.6	6.3	-11%	
S2750-W920-2 A-C	S2750-W920	5-43	06/25/12	12.054	13.978	5.5	6.3	-13%	

Table 5-6
Panel 6 Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S2750-W985-2 A-C	S2750-W985	5-44	04/03/12	8.462	10.372	4.2	5.1	-18%	
S2750-W1050-2 A-C	S2750-W1050	5-45	03/05/12	7.996	9.979	3.9	5.1	-24%	
S2750-W1120-2 A-C	S2750-W1120	5-46	09/13/11	5.342	5.958	4.0	4.2	-5%	
S2750-W1190-2 A-C	S2750-W1190	5-47	09/13/11	5.679	6.702	3.5	3.5	0%	
W390-S2833-2 A-C	W390-S2833	5-48	06/25/12	18.233	25.762	8.2	9.3	-12%	
W390-S2916-2 A-C	W390-S2916	5-49	06/25/12	15.910	25.123	6.7	8.5	-21%	
W390-S2916 B-D	W390-S2916	5-49	06/25/12	3.870	3.870	3.3	4.0	-18%	
W390-S2998-2 A-C	W390-S2998	5-50	06/25/12	11.015	20.068	4.6	5.9	-22%	
W520-S2833-2 A-C	W520-S2833	5-51	06/25/12	10.432	16.440	4.9	5.1	-4%	
W520-S2916-2 A-C	W520-S2916	5-52	06/25/12	14.170	20.273	7.1	6.6	8%	
W520-S2916 B-D	W520-S2916	5-52	06/25/12	5.178	5.178	3.2	3.5	-9%	
W520-S2998-2 A-C	W520-S2998	5-53	06/25/12	9.929	15.639	4.7	4.8	-2%	
W660-S2833-2 A-C	W660-S2833	5-54	06/25/12	11.080	15.374	5.3	5.6	-5%	
W660-S2916-2 A-C	W660-S2916	5-55	06/25/12	11.599	16.661	5.9	5.5	7%	
W660-S2916 B-D	W660-S2916	5-55	06/25/12	5.740	5.740	3.6	3.7	-3%	
W660-S2998-2 A-C	W660-S2998	5-56	06/25/12	10.714	15.504	5.2	5.3	-2%	
W790-S2833-2 A-C	W790-S2833	5-57	05/29/12	10.126	15.434	4.7	5.5	-15%	
W790-S2916-2 A-C	W790-S2916	5-58	06/25/12	9.518	14.782	4.2	5.1	-18%	
W790-S2916 B-D	W790-S2916	5-58	06/25/12	5.668	5.668	3.3	3.7	-11%	
W790-S2998-2 A-C	W790-S2998	5-59	06/25/12	8.700	13.806	3.8	4.7	-19%	
W920-S2833-2 A-C	W920-S2833	5-60	05/31/12	8.703	12.389	4.1	4.7	-13%	
W920-S2916-2 A-C	W920-S2916	5-61	05/31/12	8.686	12.463	4.1	4.7	-13%	
W920-S2916 B-D	W920-S2916	5-61	05/31/12	5.100	5.100	3.1	3.5	-11%	
W920-S2998-2 A-C	W920-S2998	5-62	05/02/12	7.081	10.666	3.3	4.1	-20%	
W1050-S2833-2 A-C	W1050-S2833	5-63	03/05/12	6.336	7.278	2.7	3.9	-31%	
W1050-S2916-2 A-C	W1050-S2916	5-64	01/12/12	7.395	8.437	3.6	4.9	-27%	
W1050-S2916 B-D	W1050-22916	5-64	01/12/12	4.160	4.160	2.6	3.8	-32%	
W1050-S2998-2 A-C	W1050-S2998	5-65	11/07/11	5.313	6.259	3.4	3.9	-13%	

Table 5-6
Panel 6 Data Analysis (Continued)

Convergence Points (Continued)									
Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate[1] 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
W1190-S2833-2 A-C	W1190-S2833	5-66	09/13/11	6.825	8.253	3.8	4.1	-7%	
W1190-S2916-2 A-C	W1190-S2916	5-67	08/15/11	5.234	6.764	4.3	4.5	-4%	
W1190-S2916 B-D	W1190-S2916	5-67	08/15/11	2.601	2.601	3.1	3.3	-6%	
W1190-S2998-2 A-C	W1190-S2998	5-68	08/15/11	4.734	6.259	3.5	4.2	-17%	
S3080-W285-2 A-C	S3080-W285	5-69	06/25/12	5.795	9.762	2.8	2.8	0%	
S3080-W390-2 A-C	S3080-W390	5-70	06/25/12	8.661	16.859	3.5	4.8	-27%	
S3080-W460-2 A-C	S3080-W460	5-71	06/25/12	10.516	18.55	4.6	5.7	-19%	
S3080-W520-2 A-C	S3080-W520	5-72	06/25/12	11.25	19.721	4.8	6.0	-20%	
S3080-W585-2 A-C	S3080-W585	5-73	06/25/12	13.143	22.321	5.7	7.0	-19%	
S3080-W660-2 A-C	S3080-W660	5-74	06/25/12	11.225	18.349	4.7	6.1	-23%	
S3080-W725-2 A-C	S3080-W725	5-75	06/25/12	11.185	11.185	5.1	5.7	-11%	
S3080-W790-2 A-C	S3080-W790	5-76	06/25/12	11.693	17.43	5.1	6.2	-18%	
S3080-W855-2 A-C	S3080-W855	5-77	04/03/12	10.191	13.451	5.8	5.7	2%	
S3080-W920-2 A-C	S3080-W920	5-78	05/02/12	9.127	12.906	4.5	5.5	-18%	
S3080-W985-2 A-C	S3080-W985	5-79	10/11/11	6.095	8.113	4.7	4.7	0%	
S3080-W1050-2 A-C	S3080-W1050	5-80	11/07/11	6.014	7.612	3.8	4.3	-12%	
S3080-W1190-2 A-C	S3080-W1190	5-81	07/19/11	3.425	4.653	N/A	3.2	N/A	

[1] N/A – Insufficient data available to perform the calculation. This is usually due to the inability to read the instruments because of activities such as: the temporary removal of an instrument due to floor, rib or back trimming; locations blocked by equipment or waste disposal, etc.

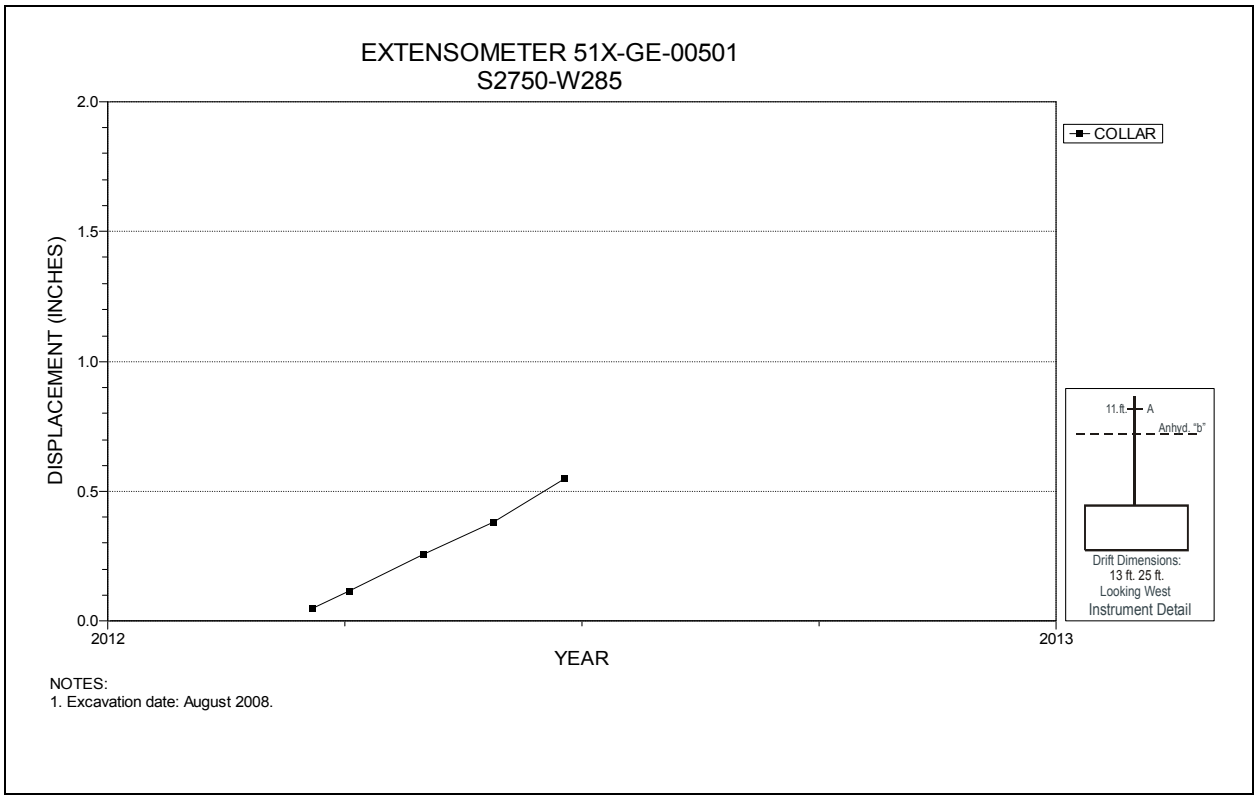


Figure 5-22 Extensometer 51X-GE-00501
S2750 W285 – Roof

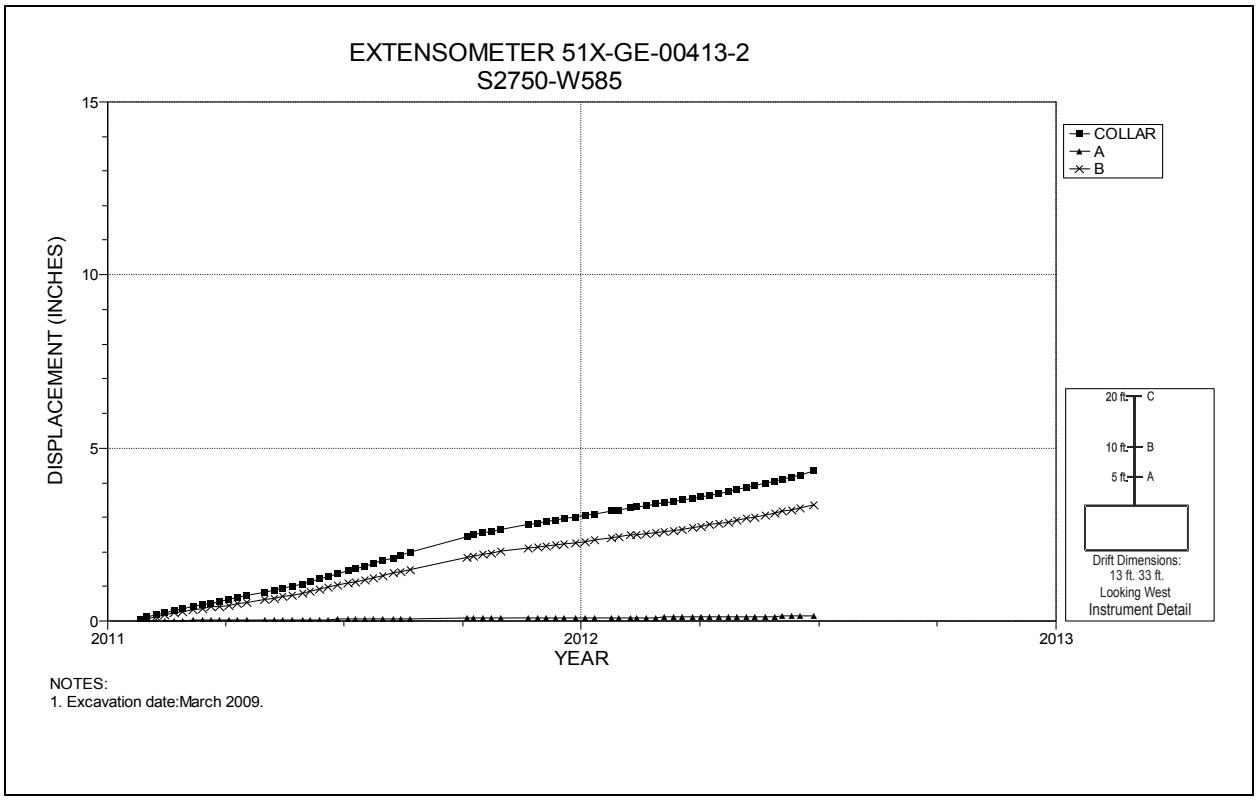


Figure 5-23 Extensometer 51X-GE-00413-2
S2750 W585 – Roof

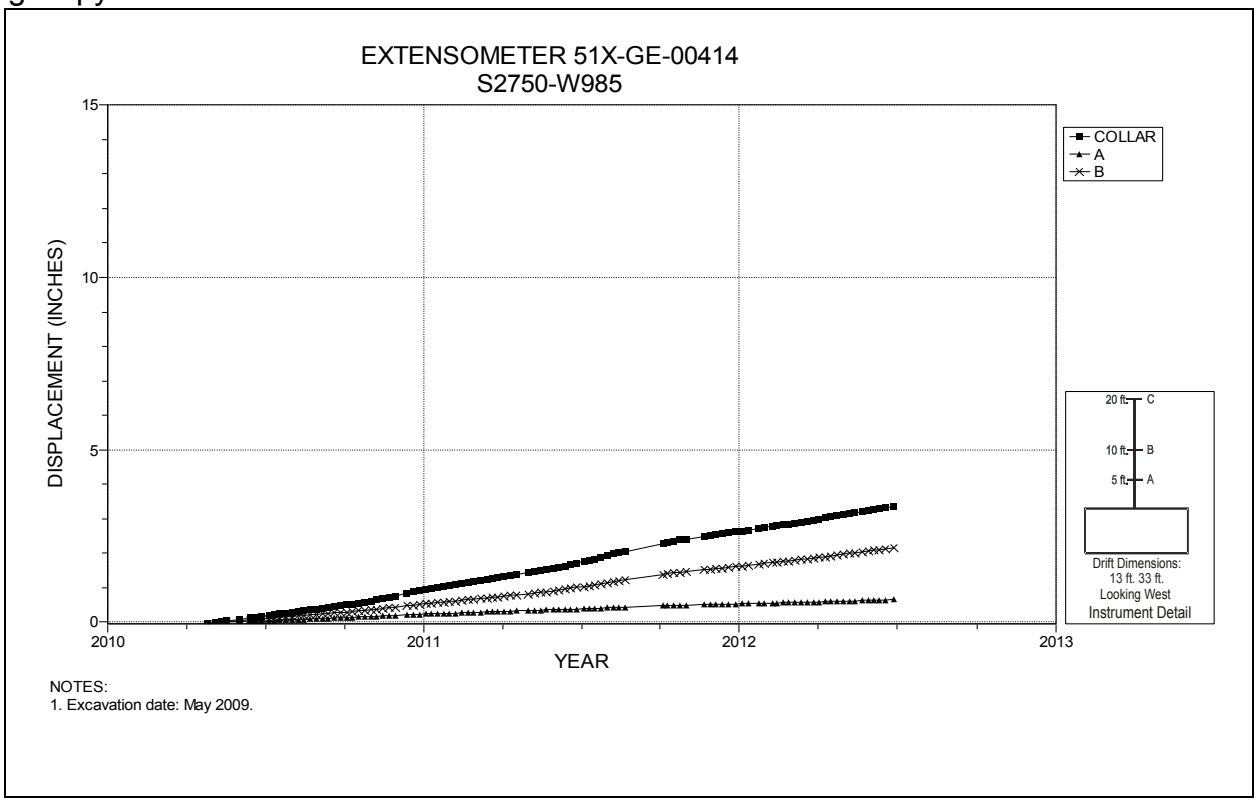


Figure 5-24 Extensometer 51X-GE-00414
S2750 W985 – Roof

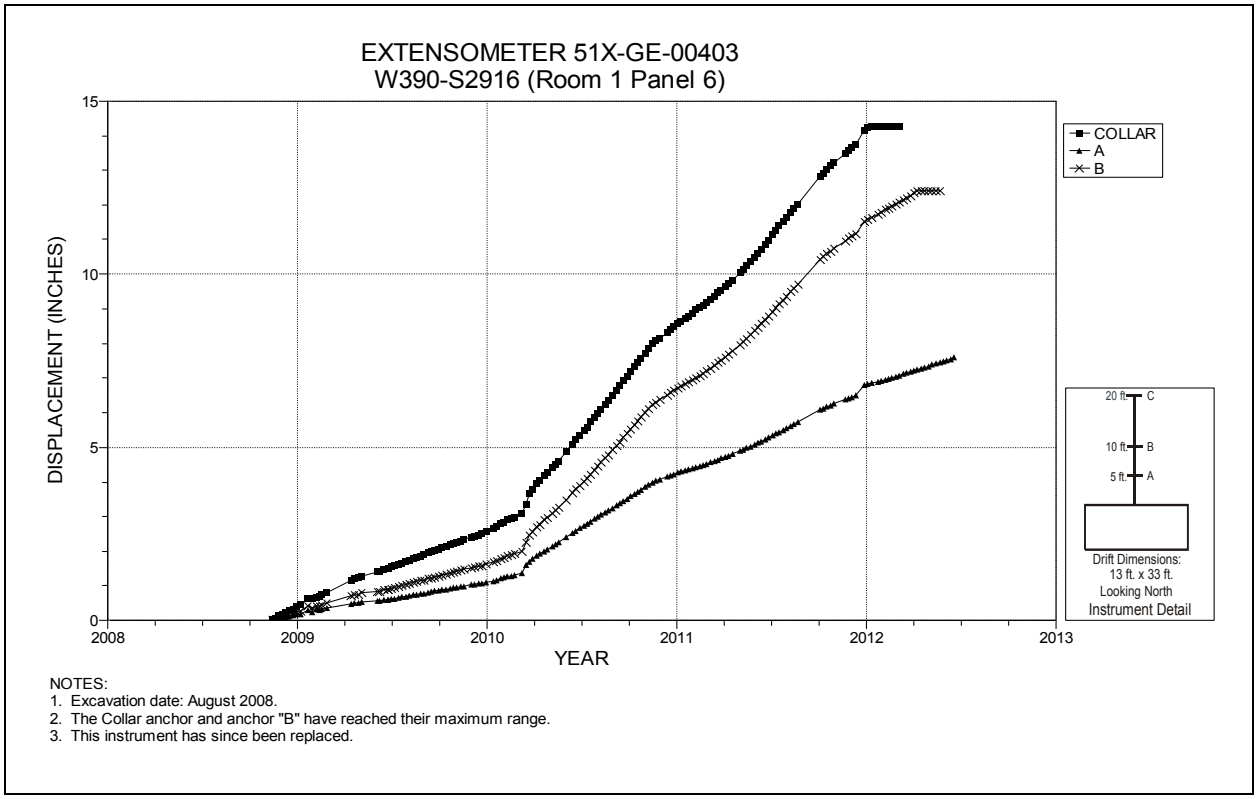


Figure 5-25 Extensometer 51X-GE-00403
Room 1, Panel 6 at W390 S2916 – Roof

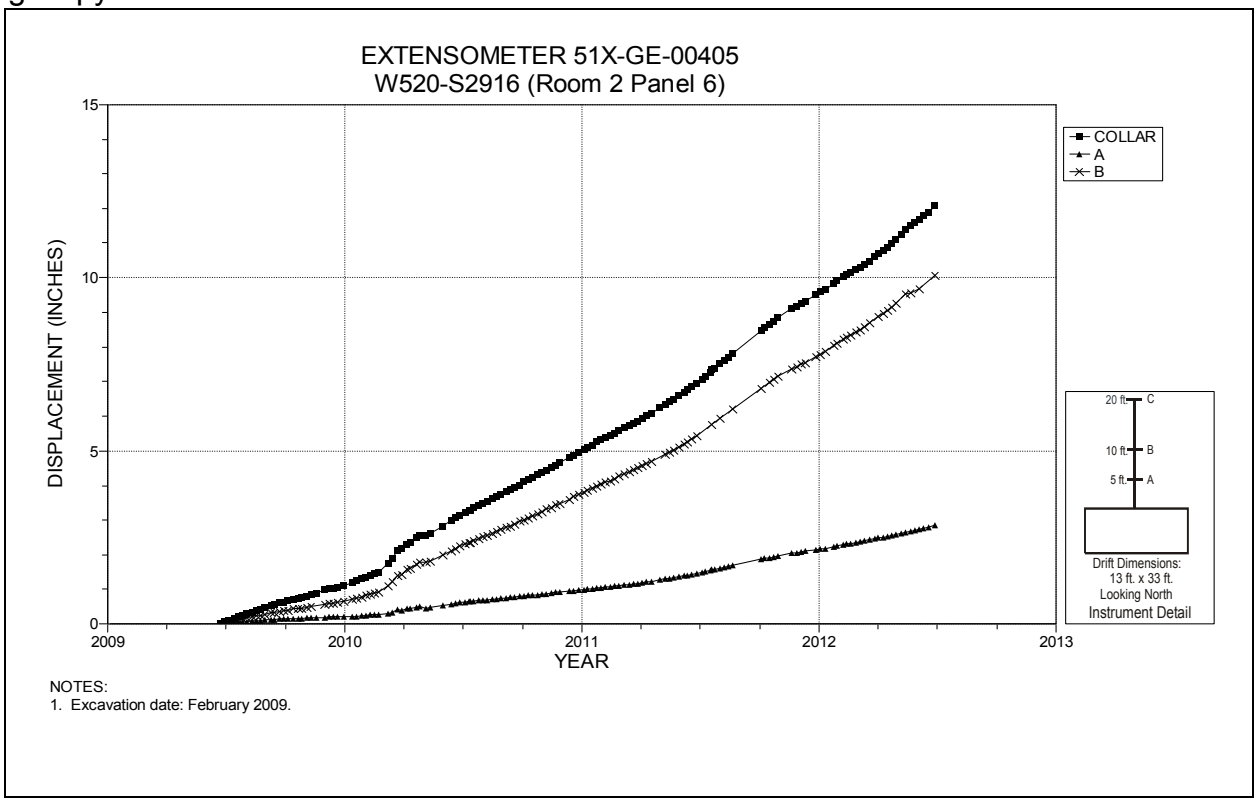


Figure 5-26 Extensometer 51X-GE-00405
Room 2, Panel 6 at W520 S2916 – Room Center – Roof

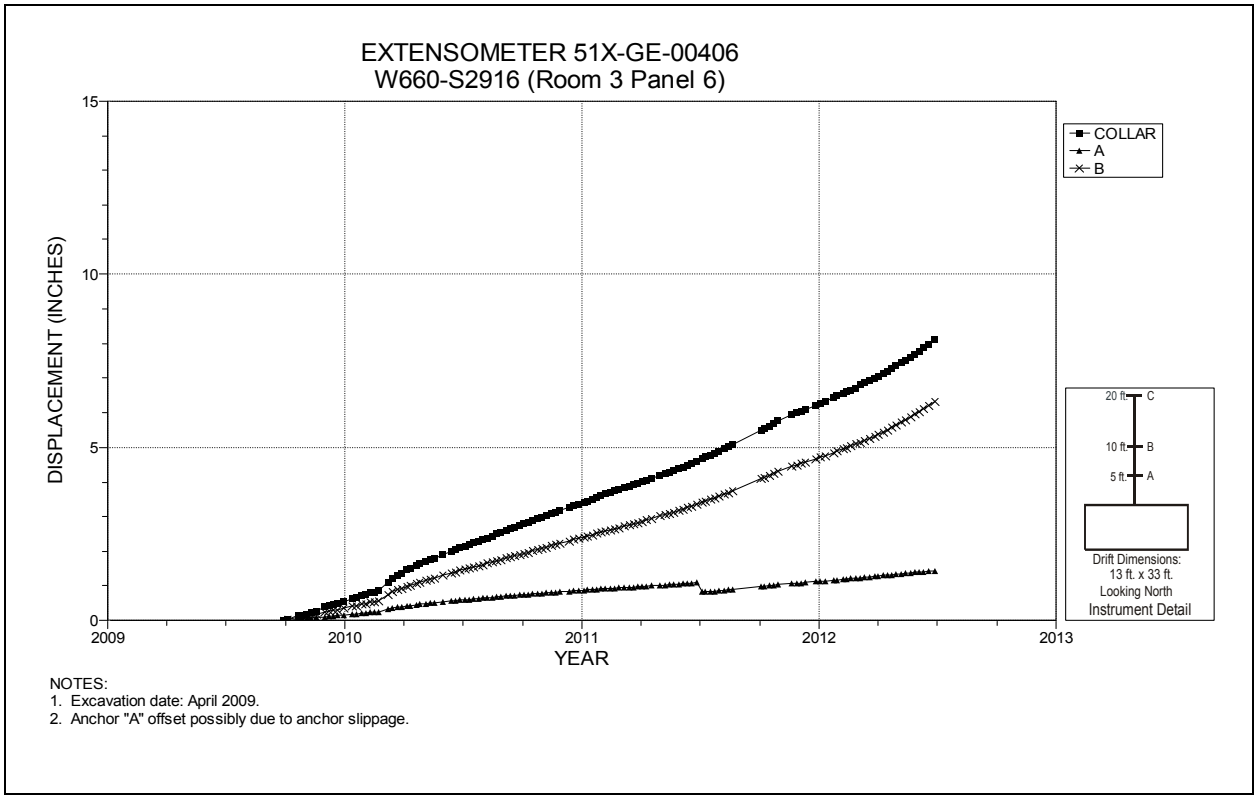


Figure 5-27 Extensometer 51X-GE-00406
Room 3, Panel 6 at W660 S2916– Room Center – Roof

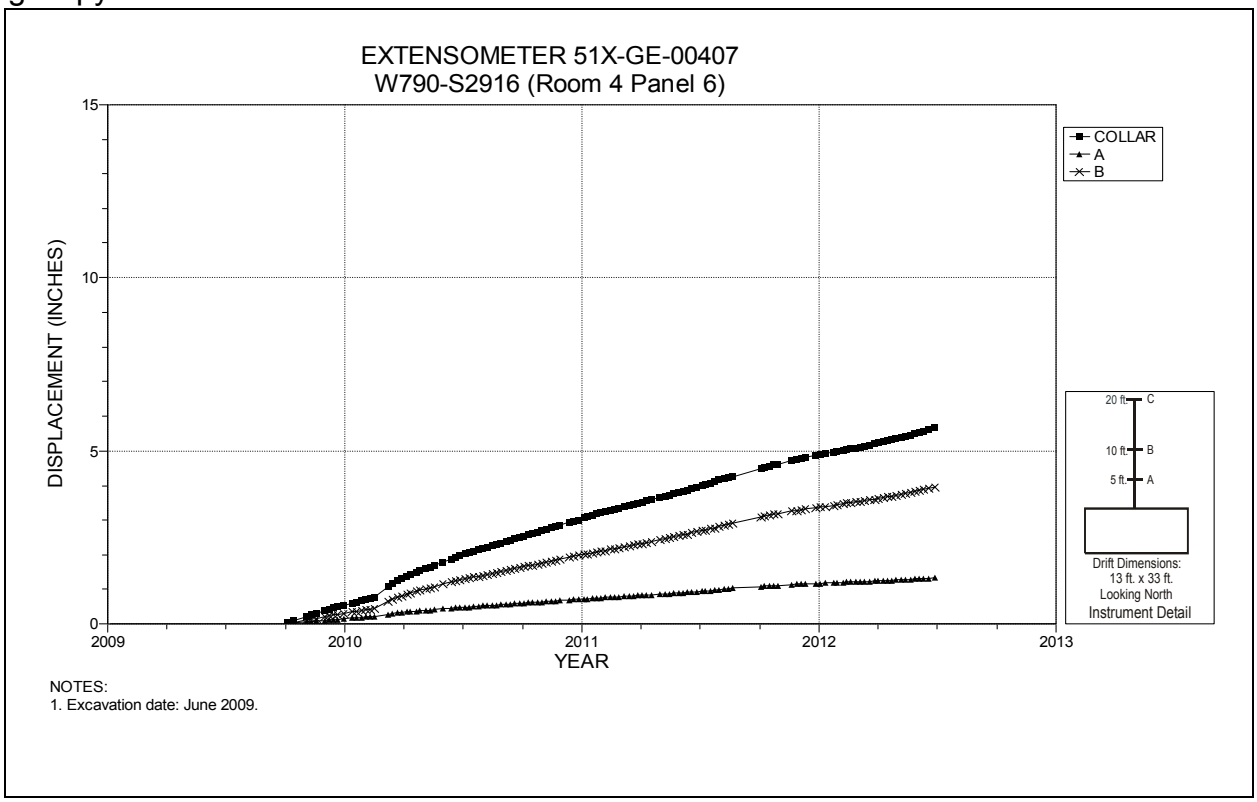


Figure 5-28 Extensometer 51X-GE-00407
Room 4, Panel 6 at W790 S2916 – Room Center – Roof

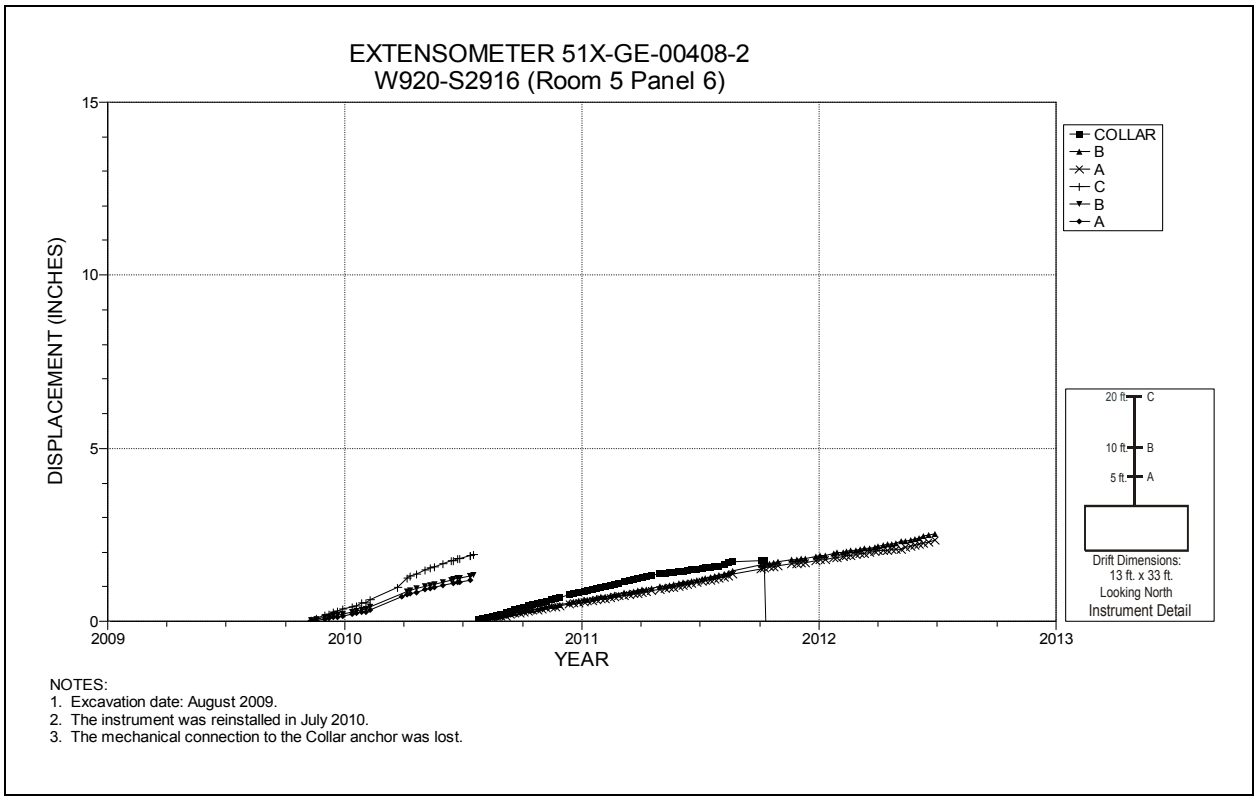


Figure 5-29 Extensometer 51X-GE-00408-2
Room 5, Panel 6 at W920 S2916– Room Center – Roof

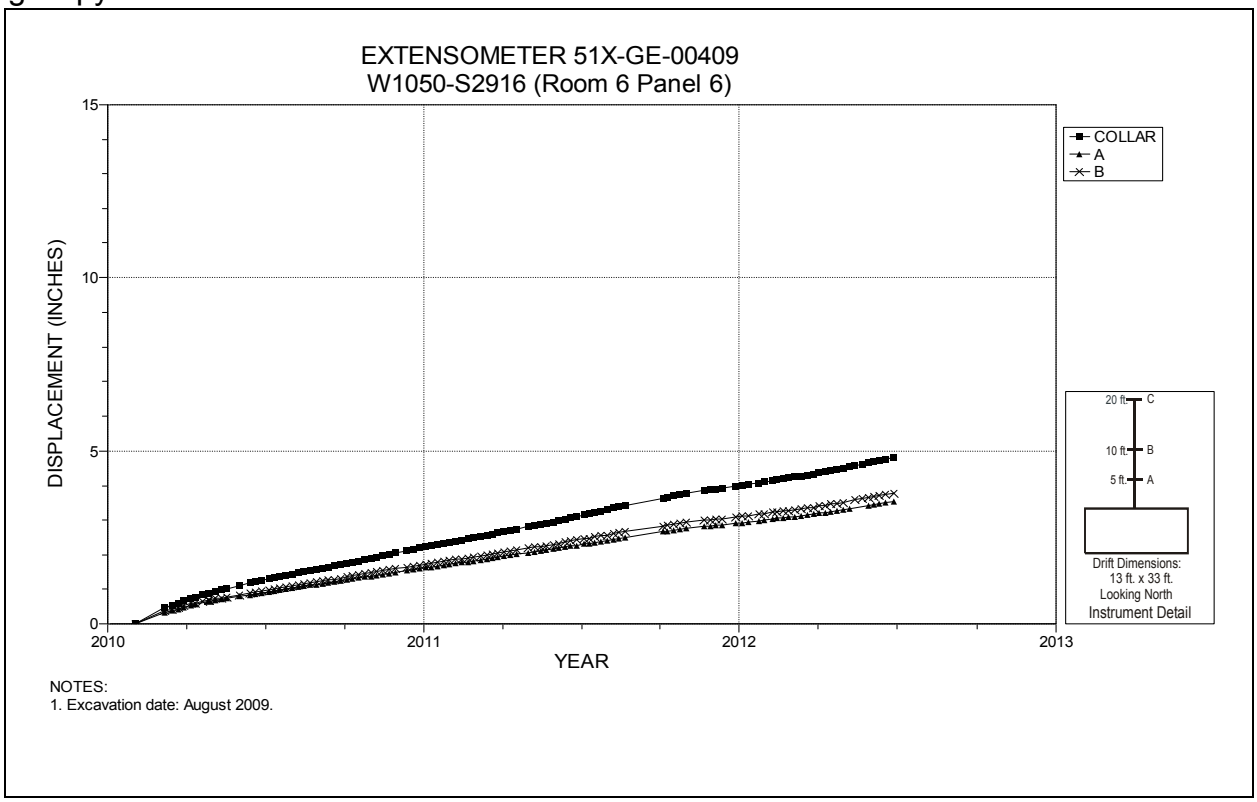


Figure 5-30 Extensometer 51X-GE-00409
Room 6, Panel 6 at W1050 S2916– Room Center – Roof

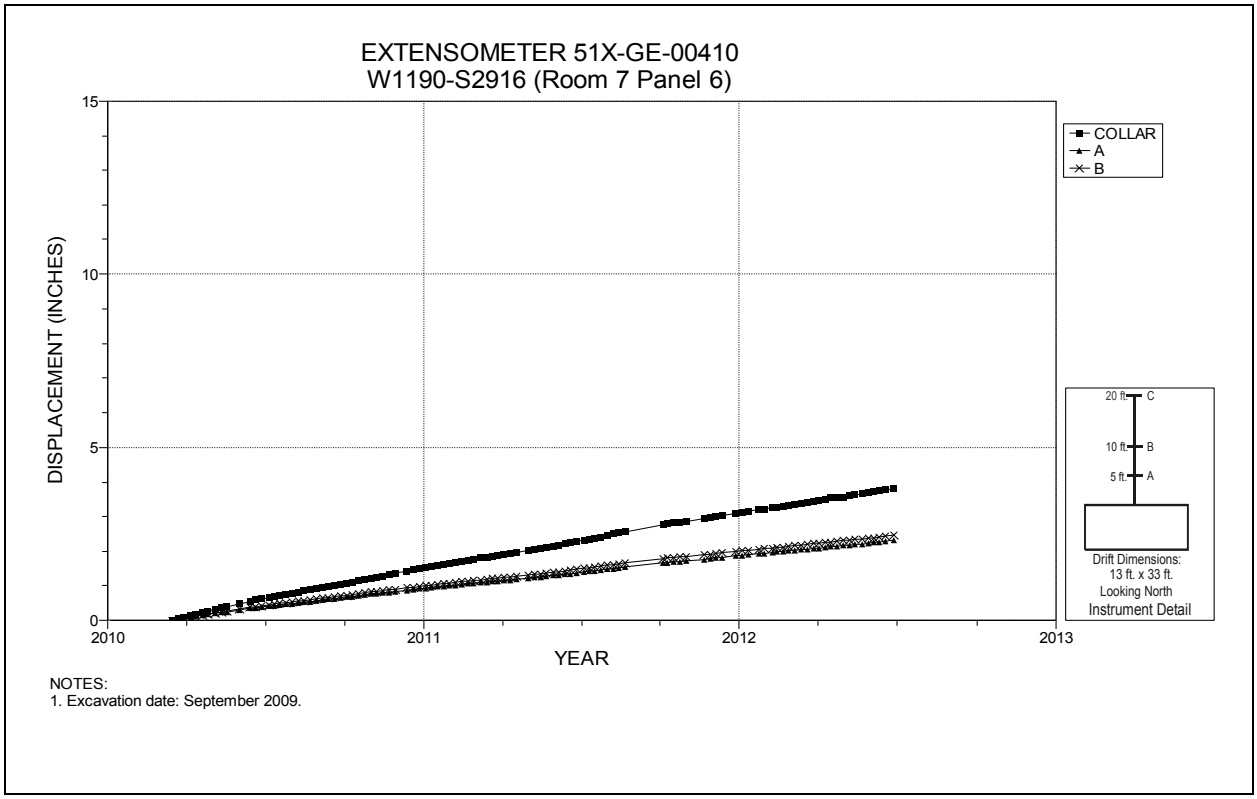


Figure 5-31 Extensometer 51X-GE-00410
Room 7, Panel 6 at W1190 S2916– Room Center – Roof

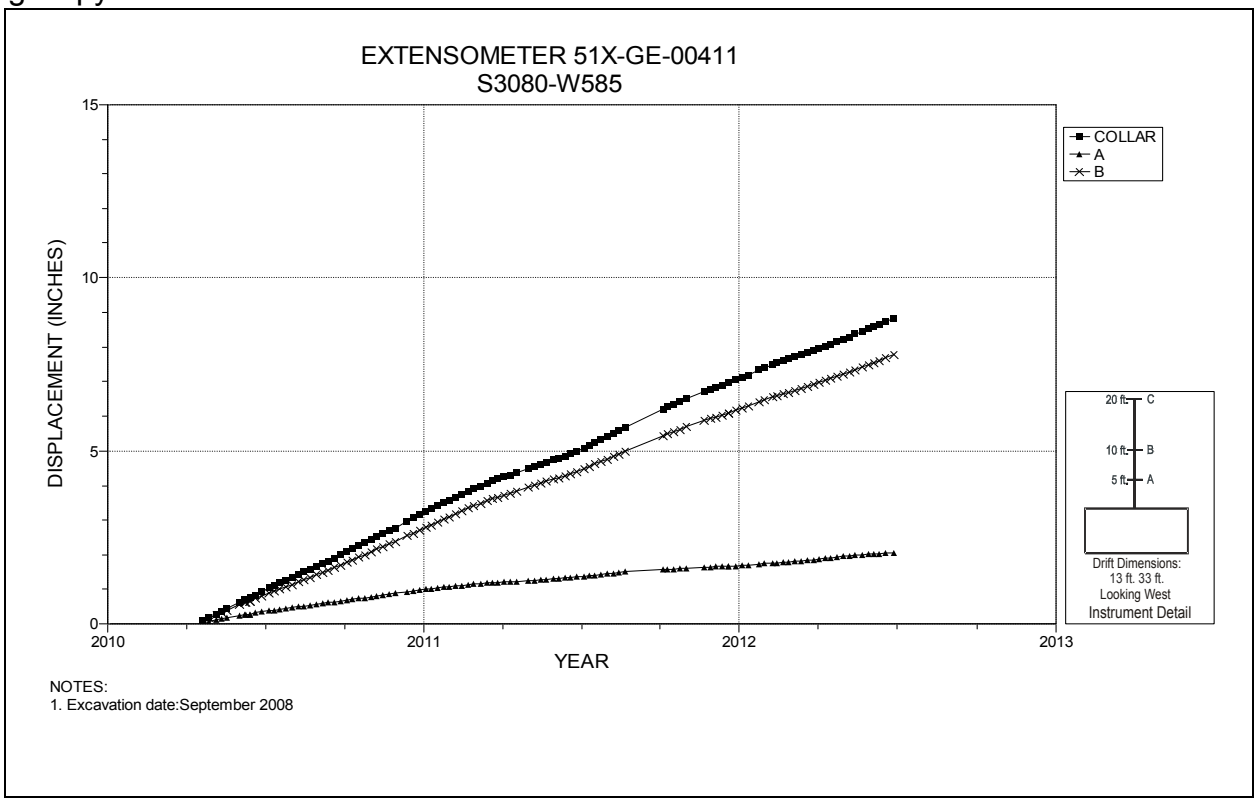


Figure 5-32 Extensometer 51X-GE-00411
S3080 W585 – Roof

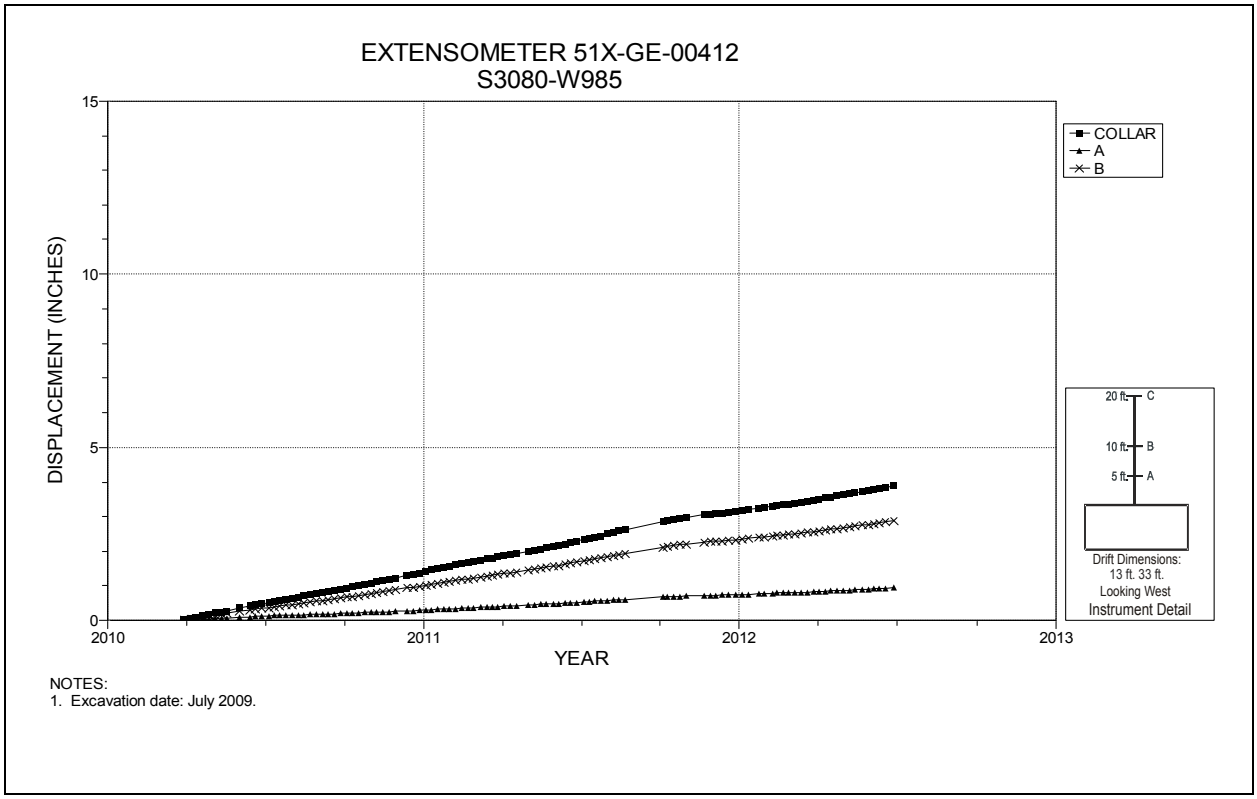


Figure 5-33 Extensometer 51X-GE-00412
S3080 W985 – Roof

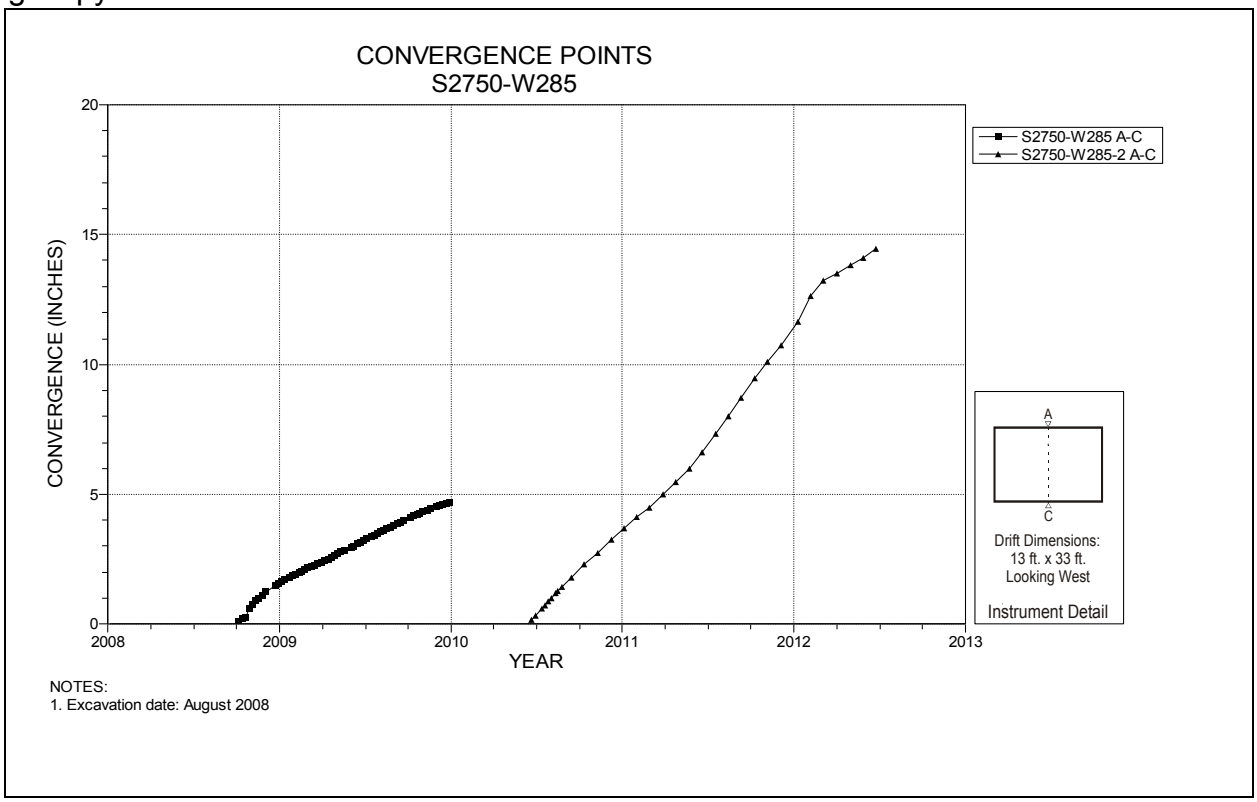


Figure 5-34 Convergence Point Array
S2750 W285 – Roof to Floor

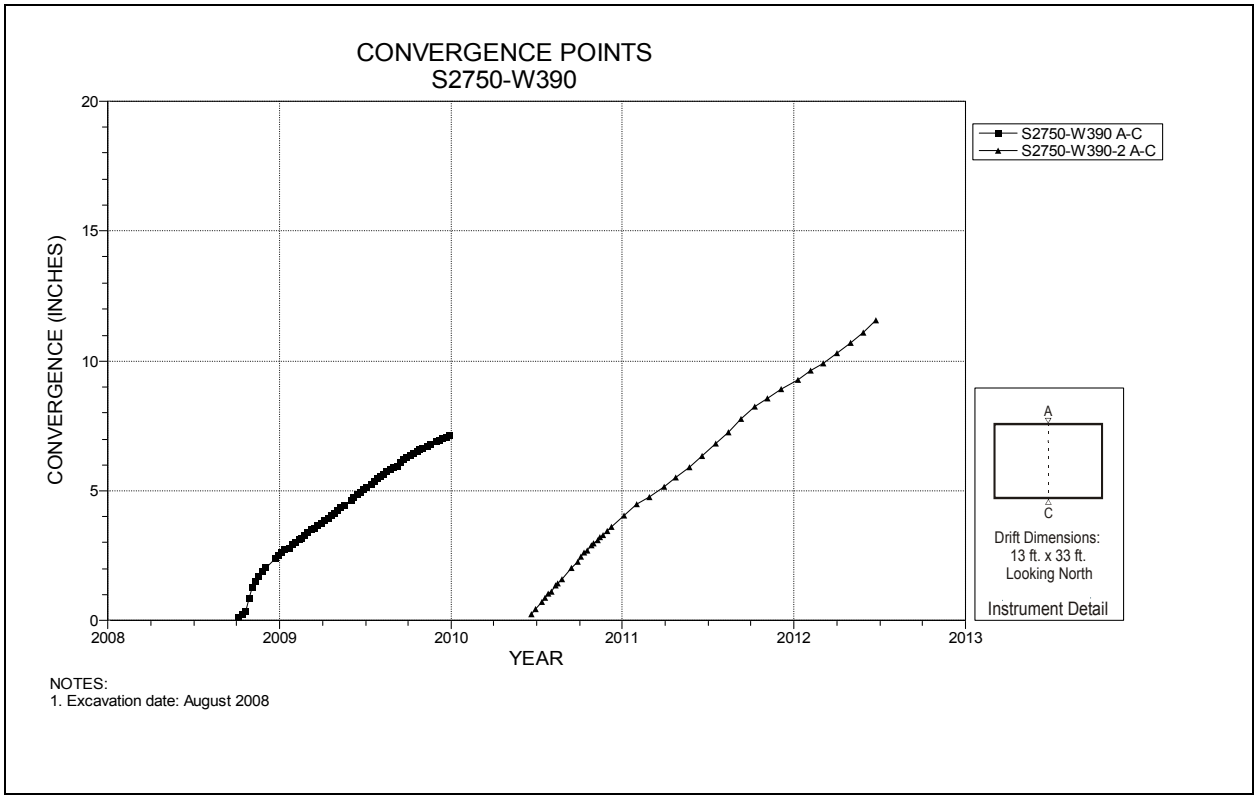


Figure 5-35 Convergence Point Array
S2750 W390 Intersection (Room 1, Panel 6) – Roof to Floor

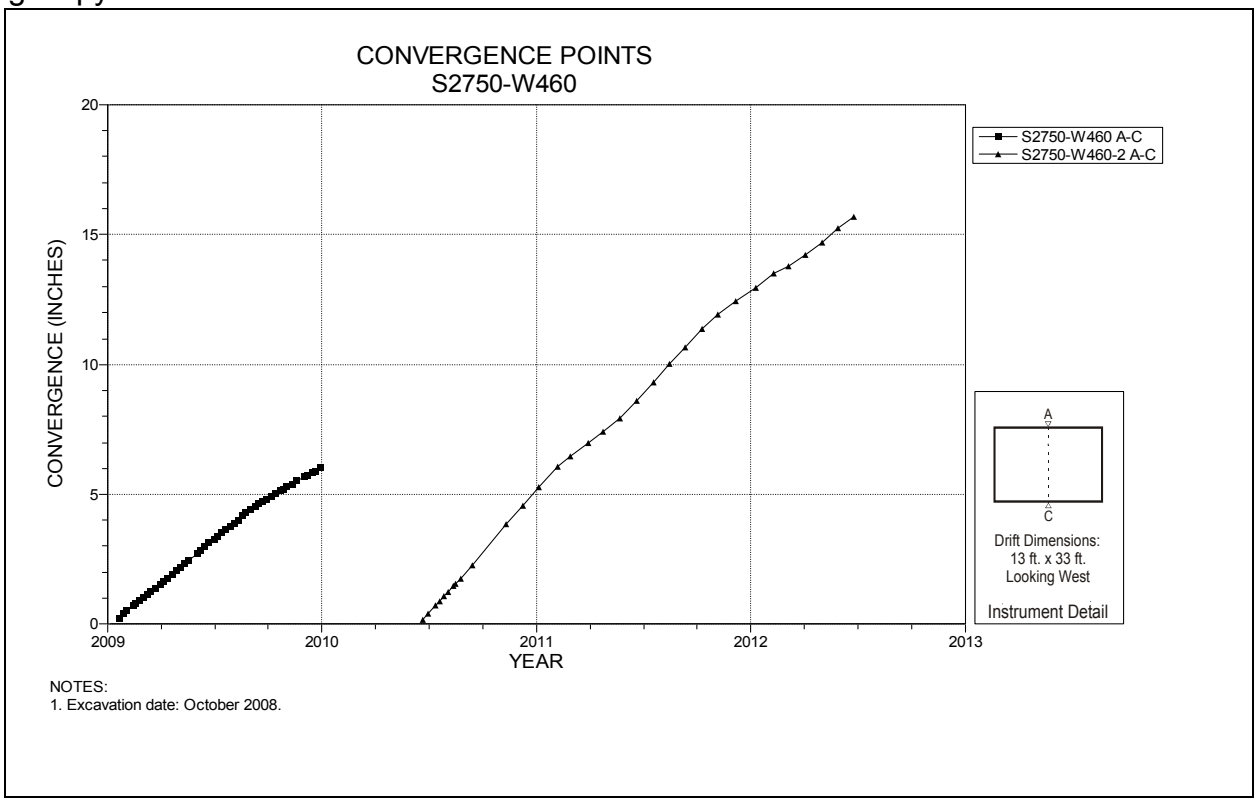


Figure 5-36 Convergence Point Array
S2750 W460 – Roof to Floor

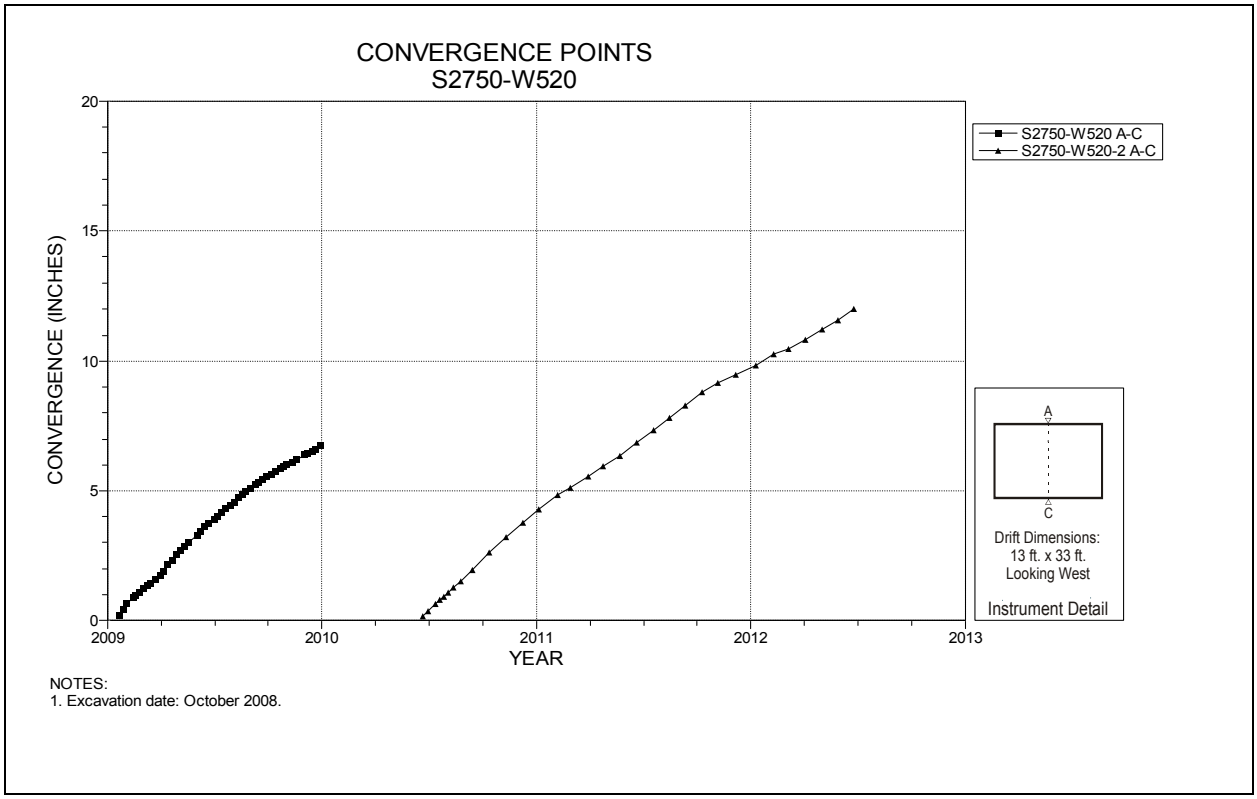


Figure 5-37 Convergence Point Array
S2750 W520 Intersection (Room 2, Panel 6) – Roof to Floor

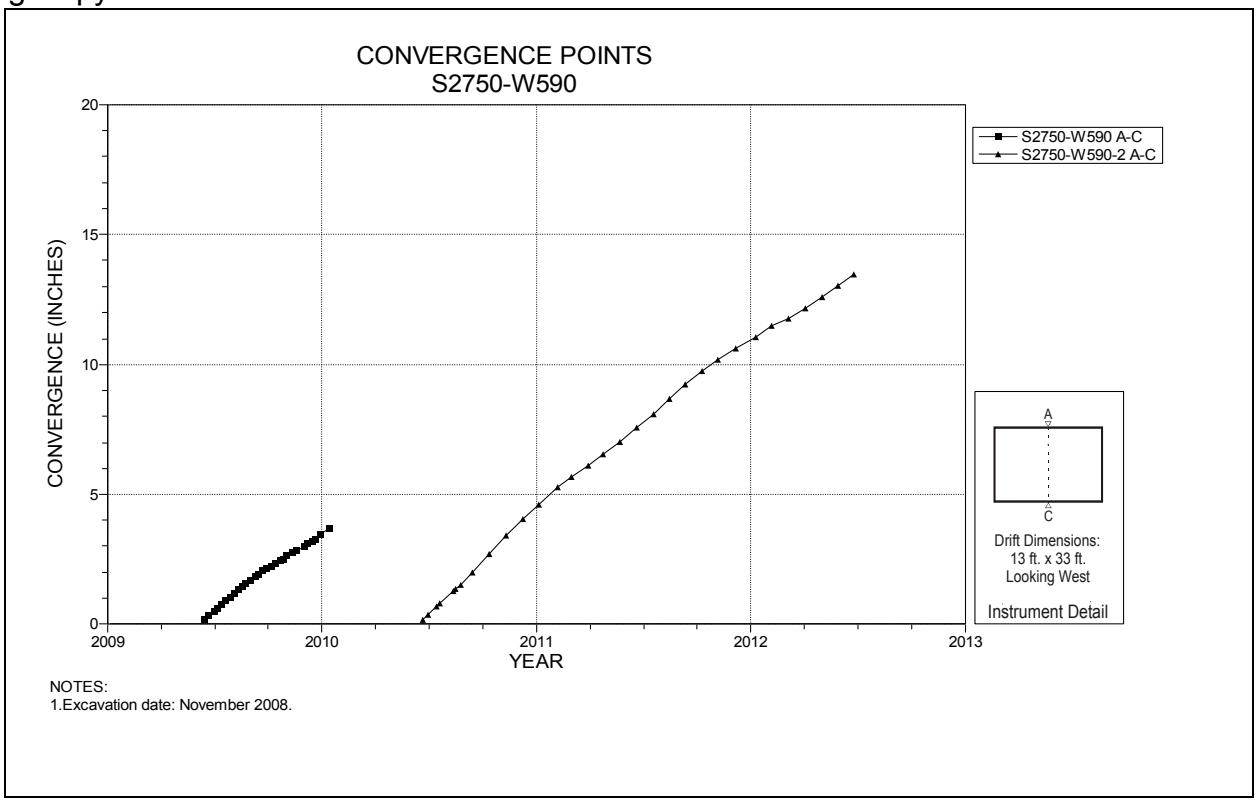


Figure 5-38 Convergence Point Array
S2750 W590 – Roof to Floor

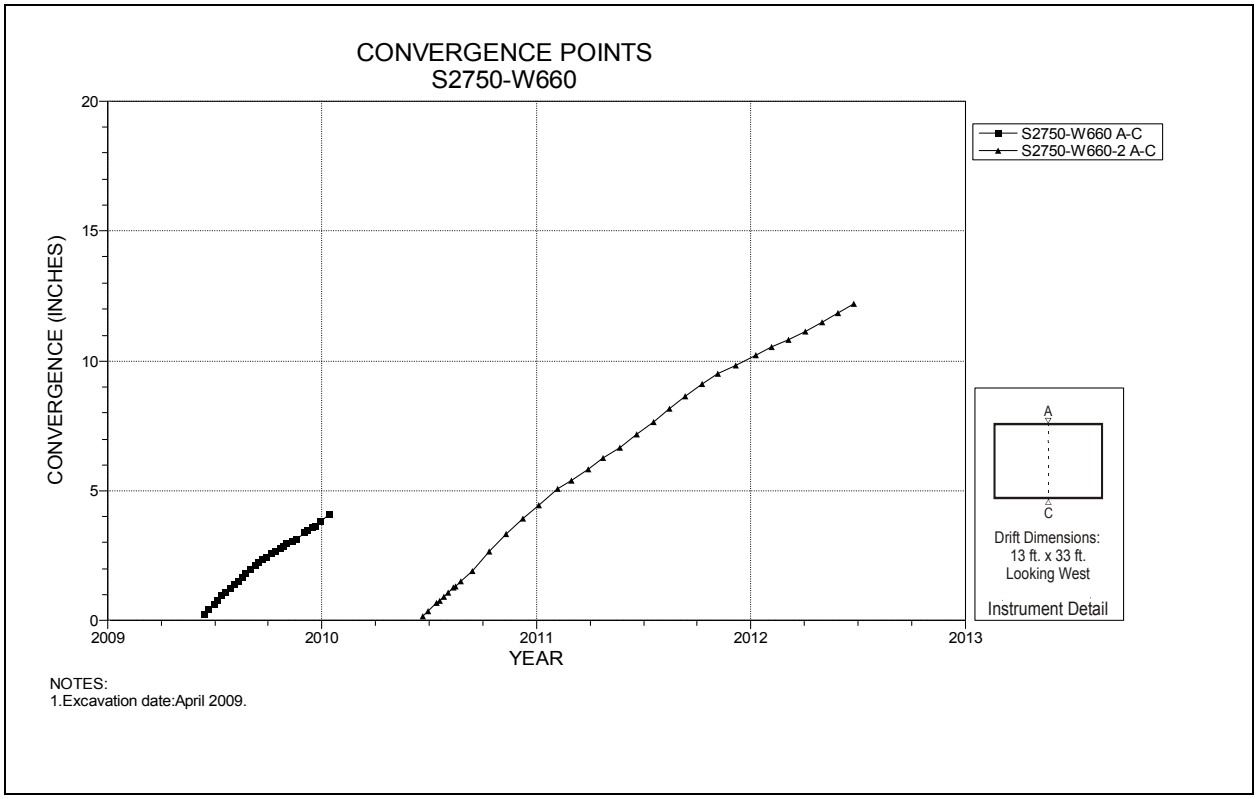


Figure 5-39 Convergence Point Array
S2750 W660 Intersection (Room 3, Panel 6) – Roof to Floor

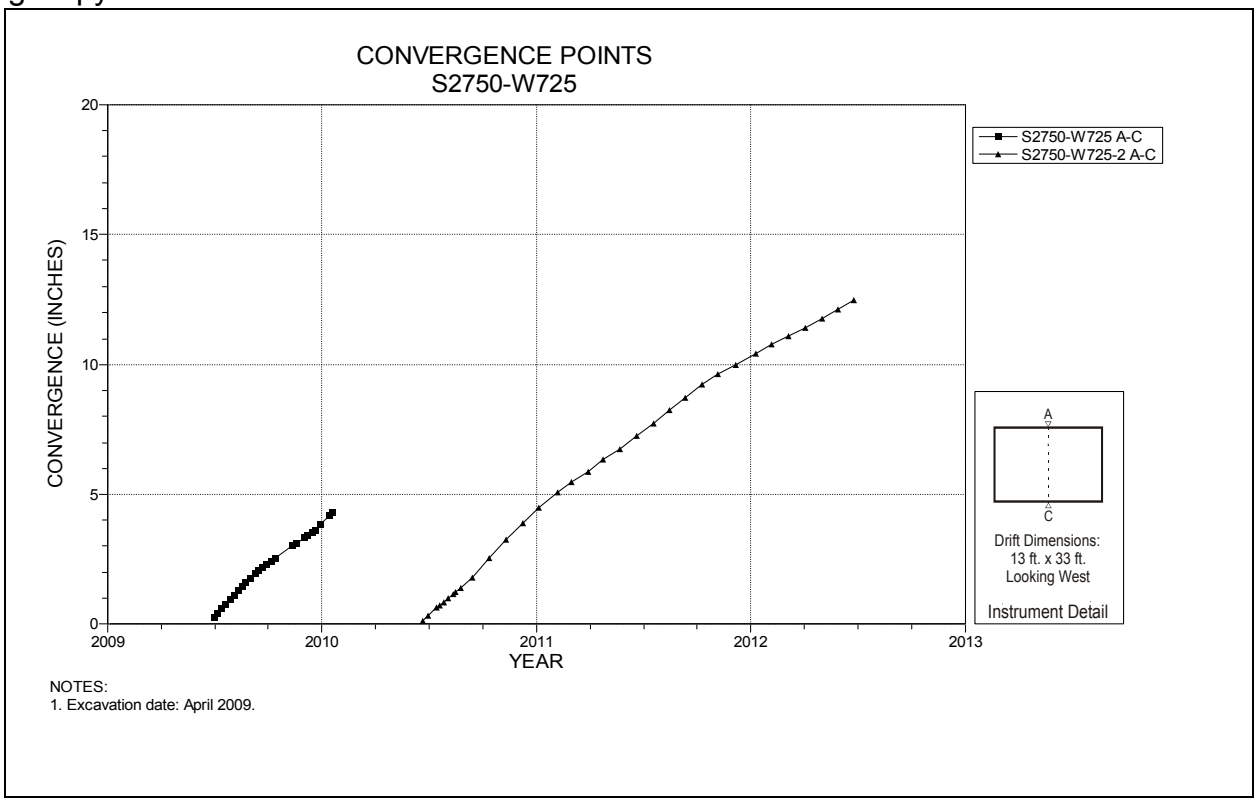


Figure 5-40 Convergence Point Array
S2750 W725 – Roof to Floor

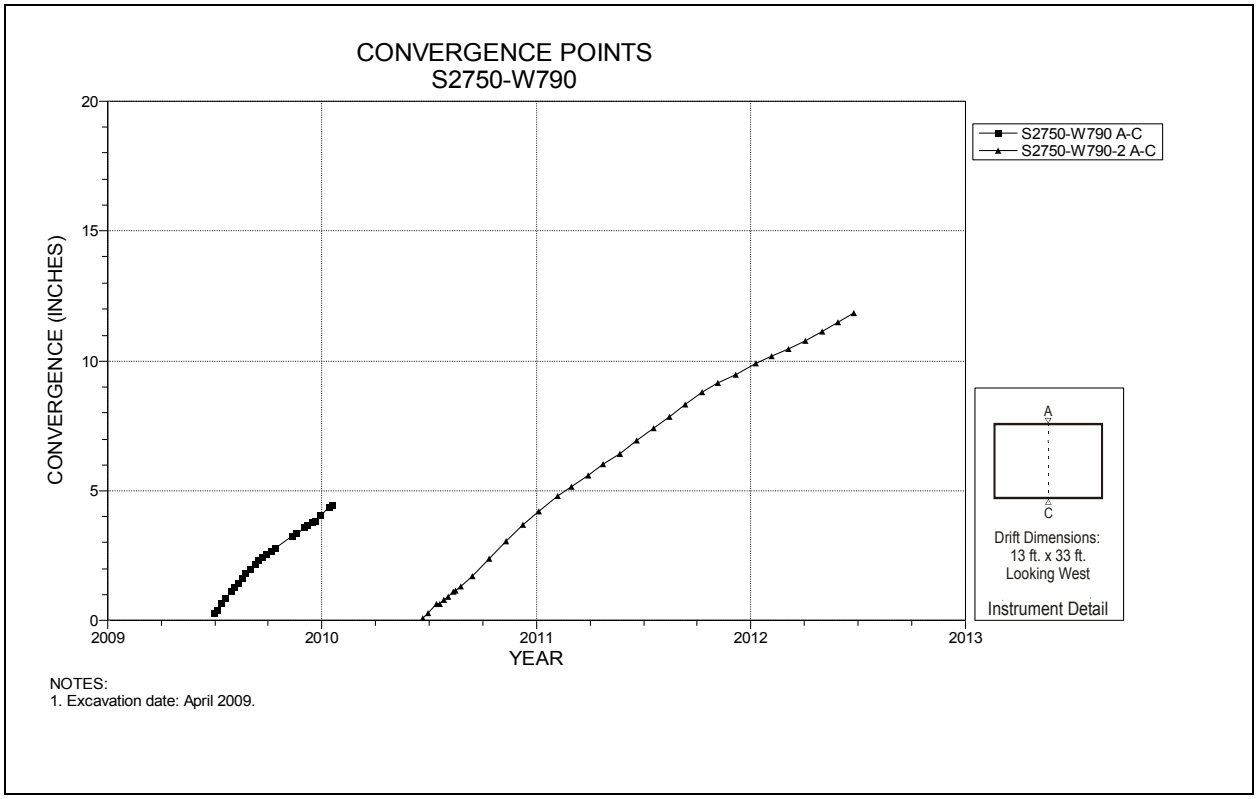


Figure 5-41 Convergence Point Array
S2750 W790 Intersection (Room 4, Panel 6) – Roof to Floor

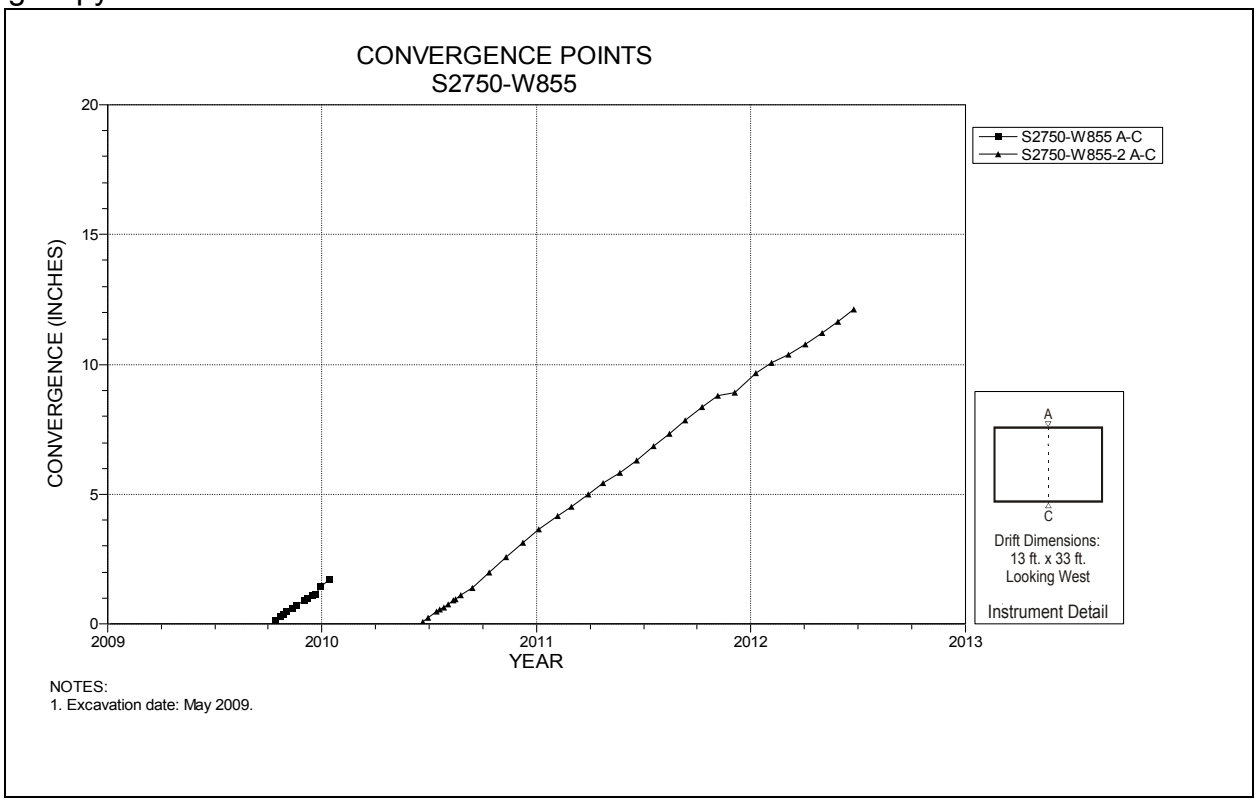


Figure 5-42 Convergence Point Array
S2750 W885 – Roof to Floor

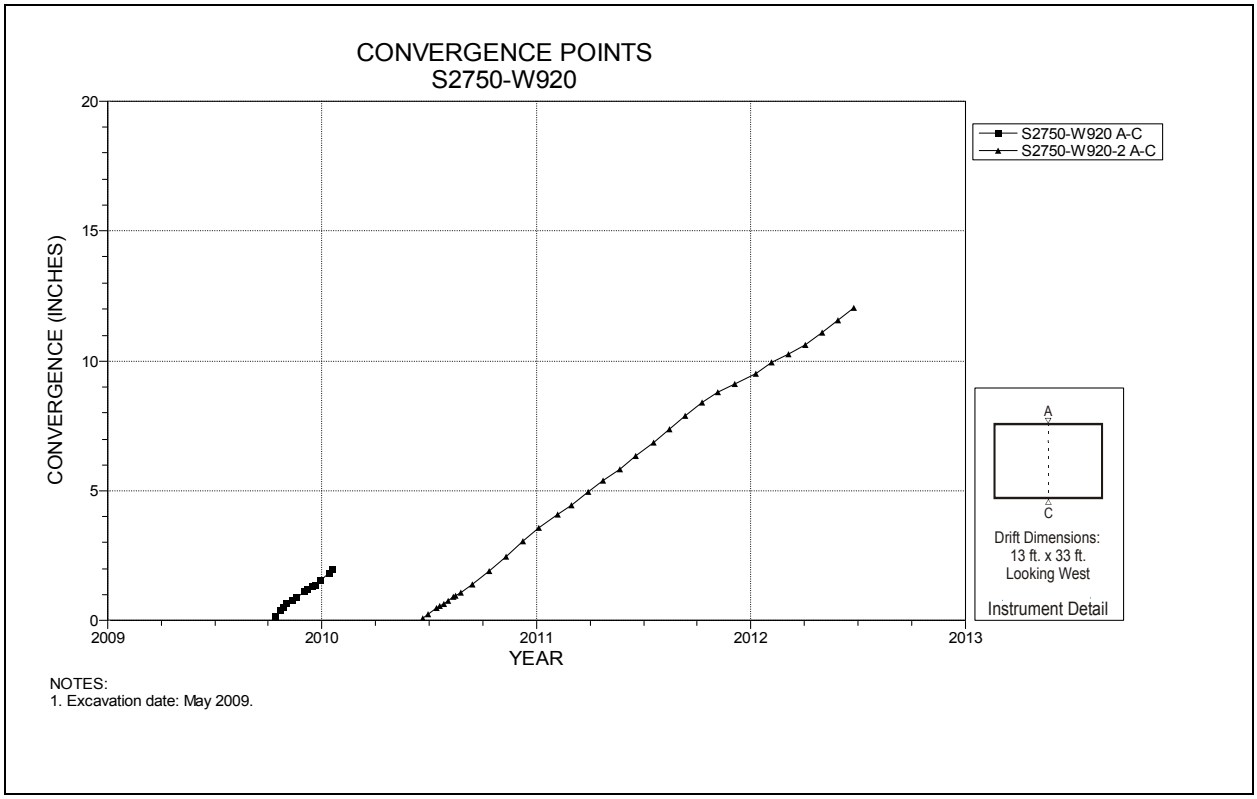


Figure 5-43 Convergence Point Array
S2750 W920 Intersection (Room 5, Panel 6) – Roof to Floor

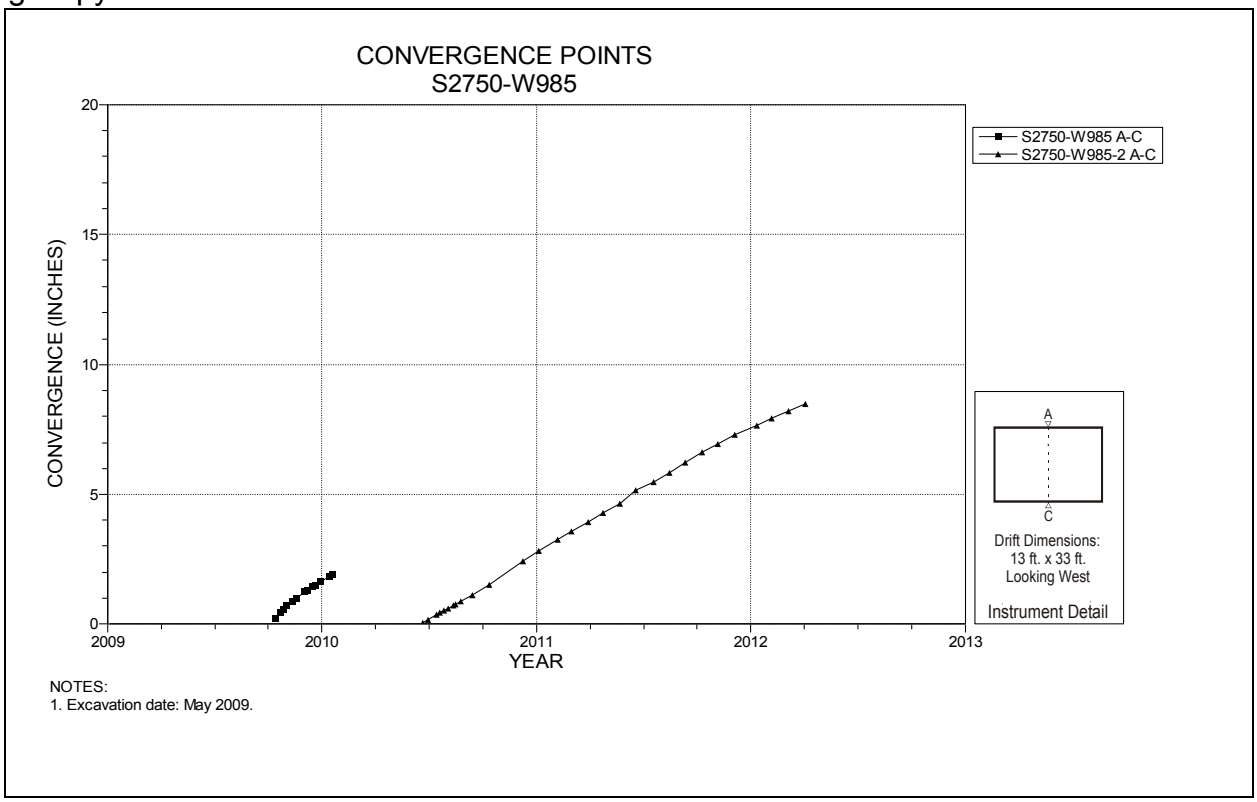


Figure 5-44 Convergence Point Array
S2750 W985 – Roof to Floor

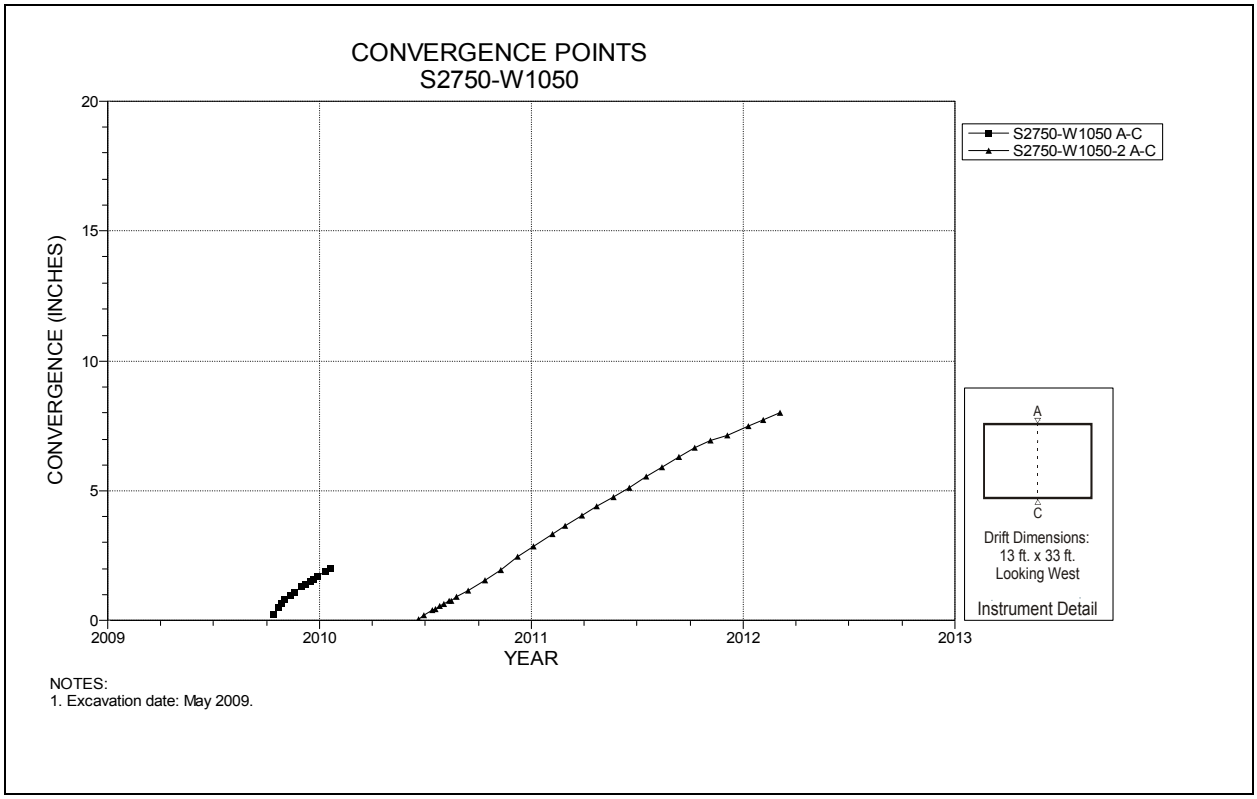


Figure 5-45 Convergence Point Array
S2750 W1050 Intersection (Room 6, Panel 6) – Roof to Floor

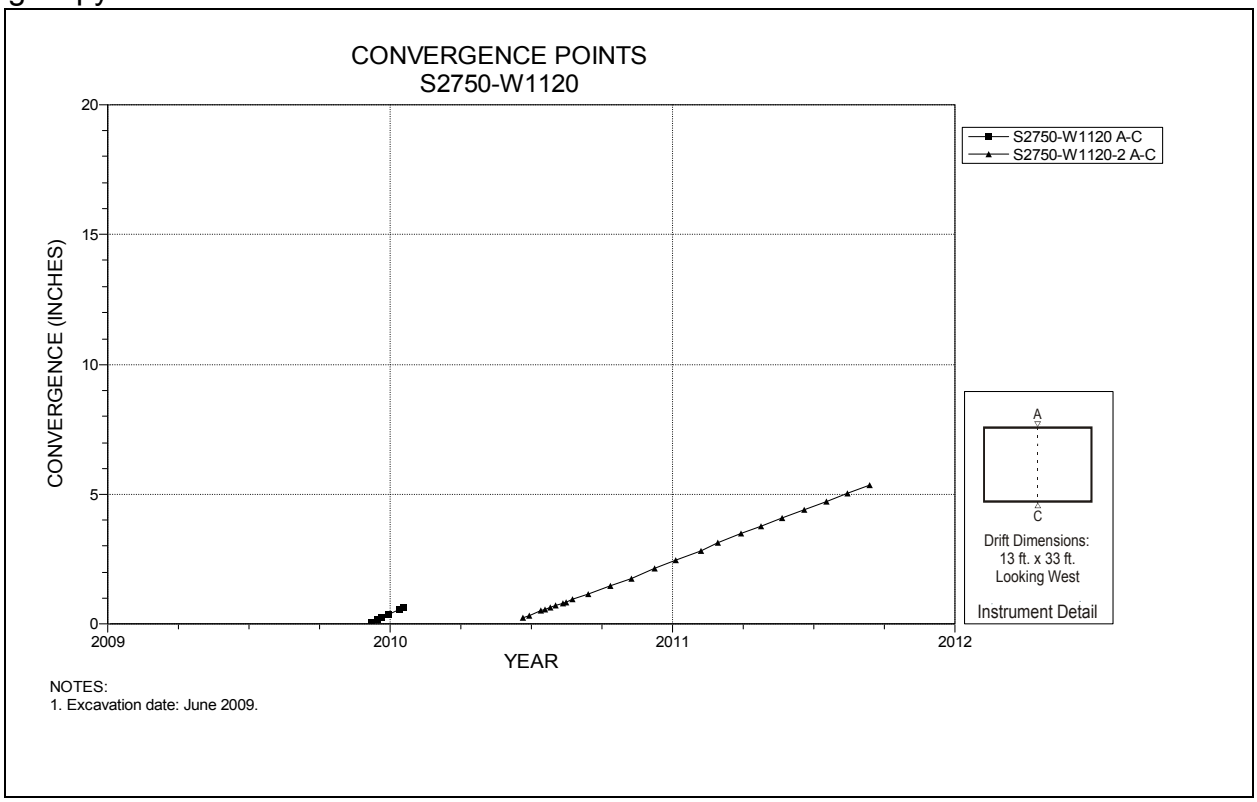


Figure 5-46 Convergence Point Array
S2750 W1120 – Roof to Floor

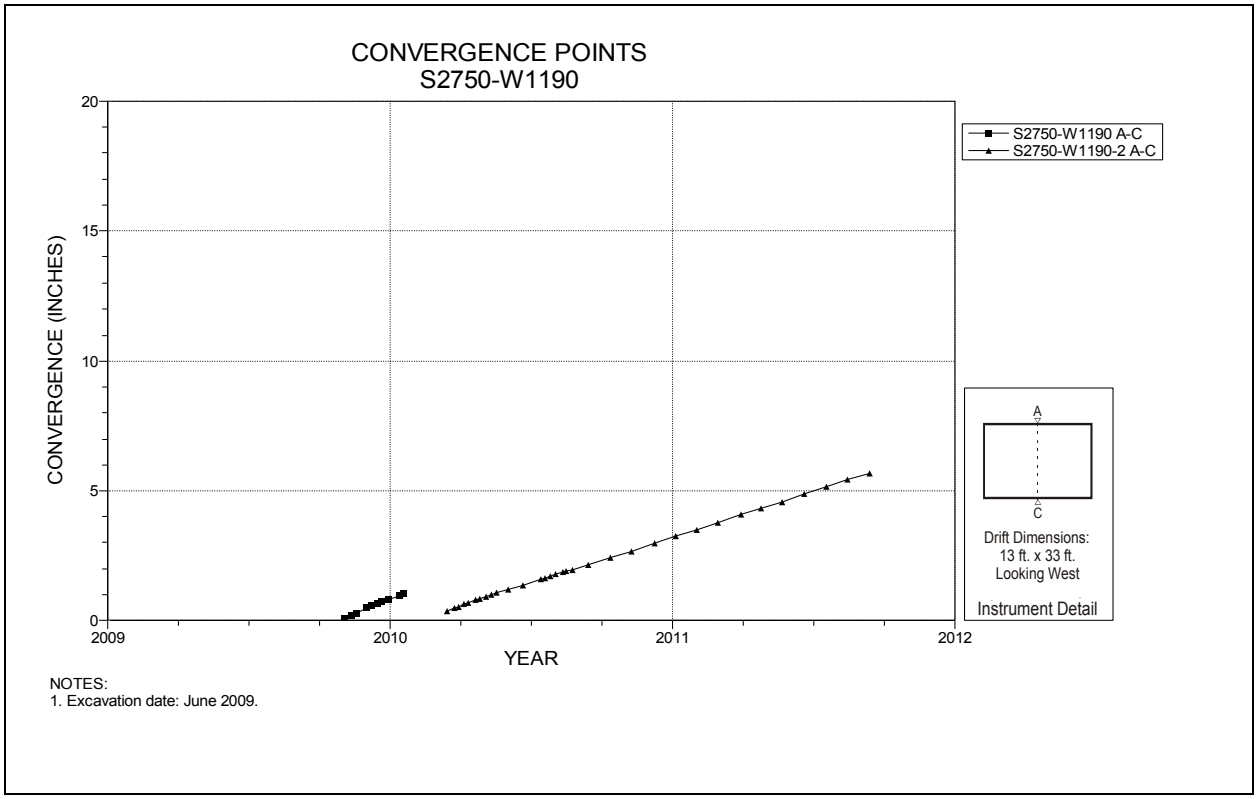


Figure 5-47 Convergence Point Array
S2750 W1190 Intersection (Room 7, Panel 6) – Roof to Floor

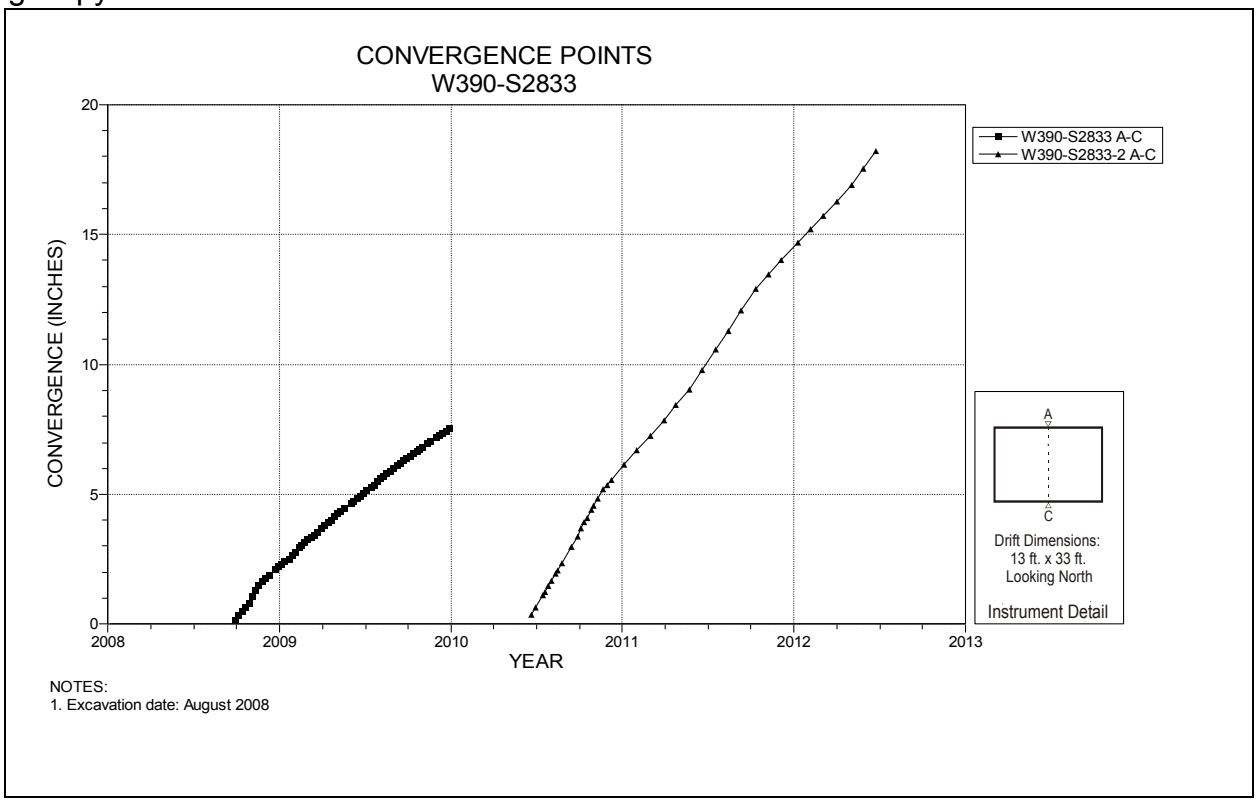


Figure 5-48 Convergence Point Array
Room 1, Panel 6 at W390 W2833 – Roof to Floor

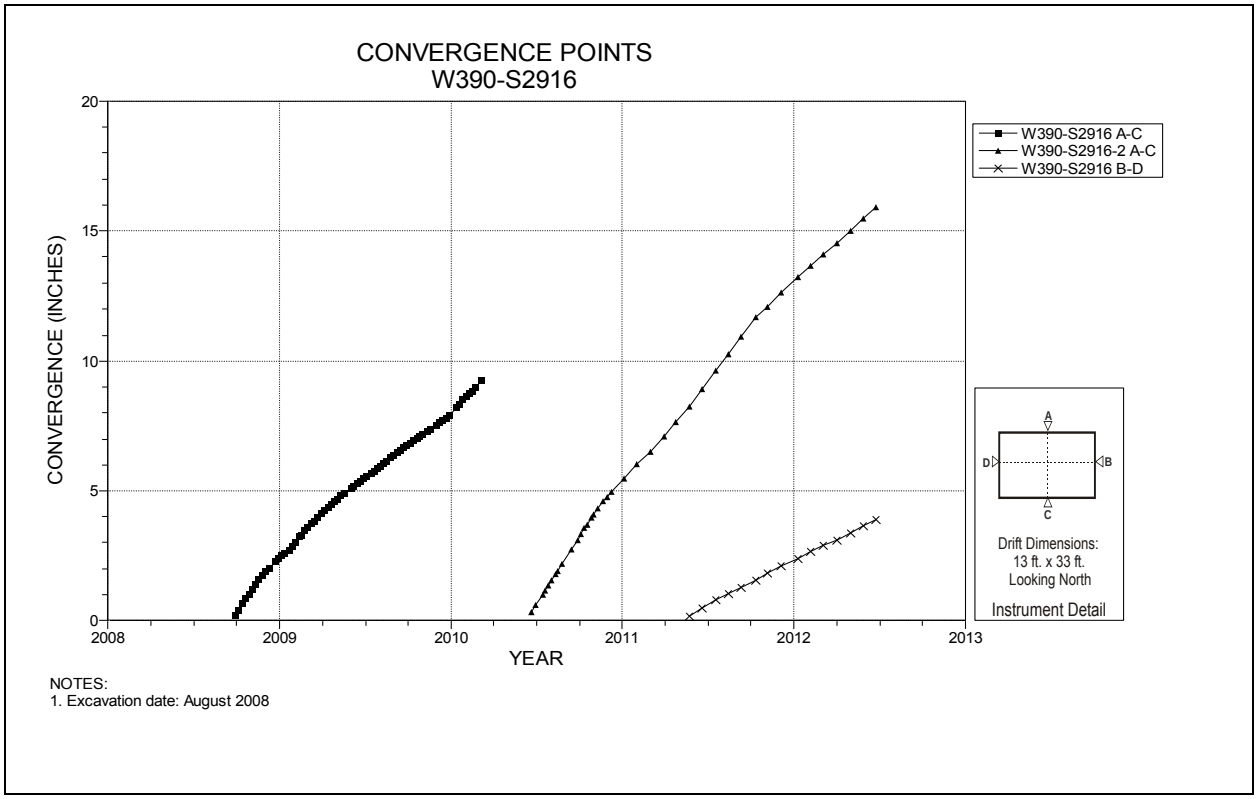


Figure 5-49 Convergence Point Array
Room 1, Panel 6 at W390 S2916– Room Center – All Chords

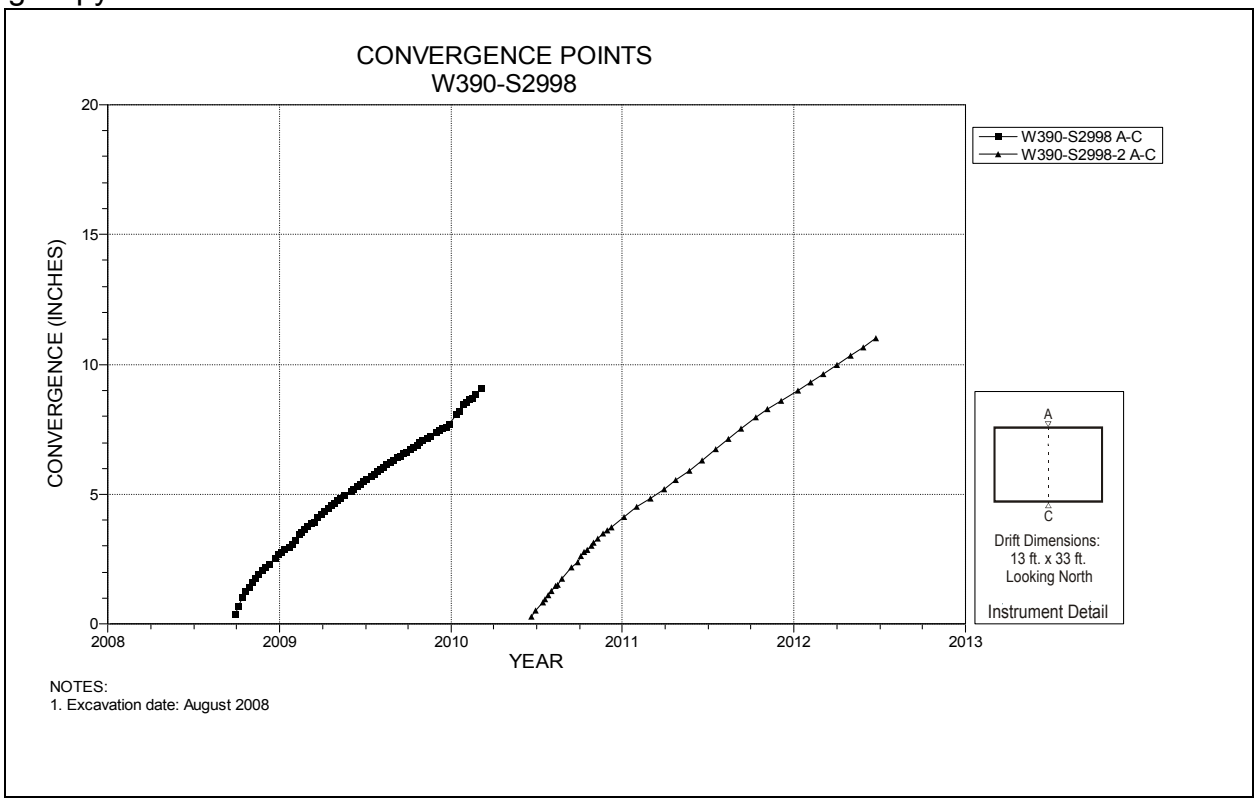


Figure 5-50 Convergence Point Array
Room 1, Panel 6 at W390 S2998 – Roof to Floor

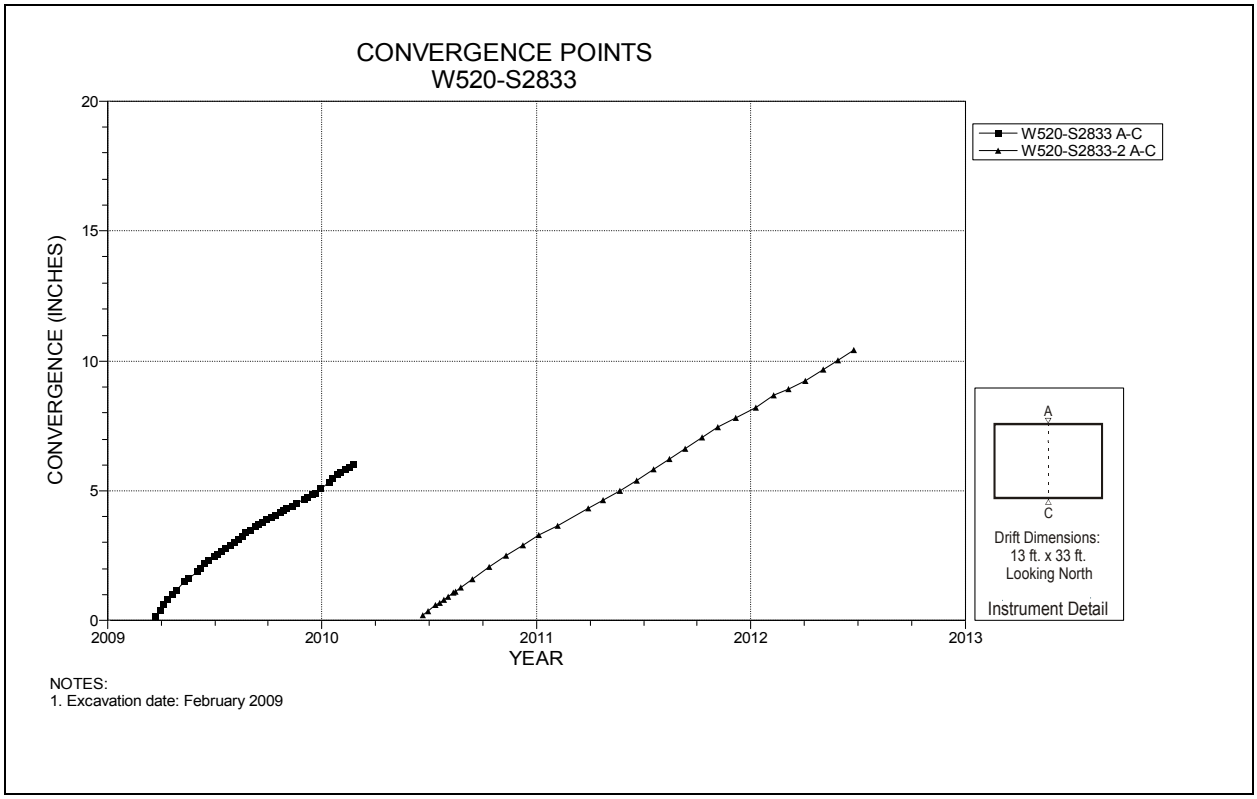


Figure 5-51 Convergence Point Array
Room 2, Panel 6 at W520 S2833 – Roof to Floor

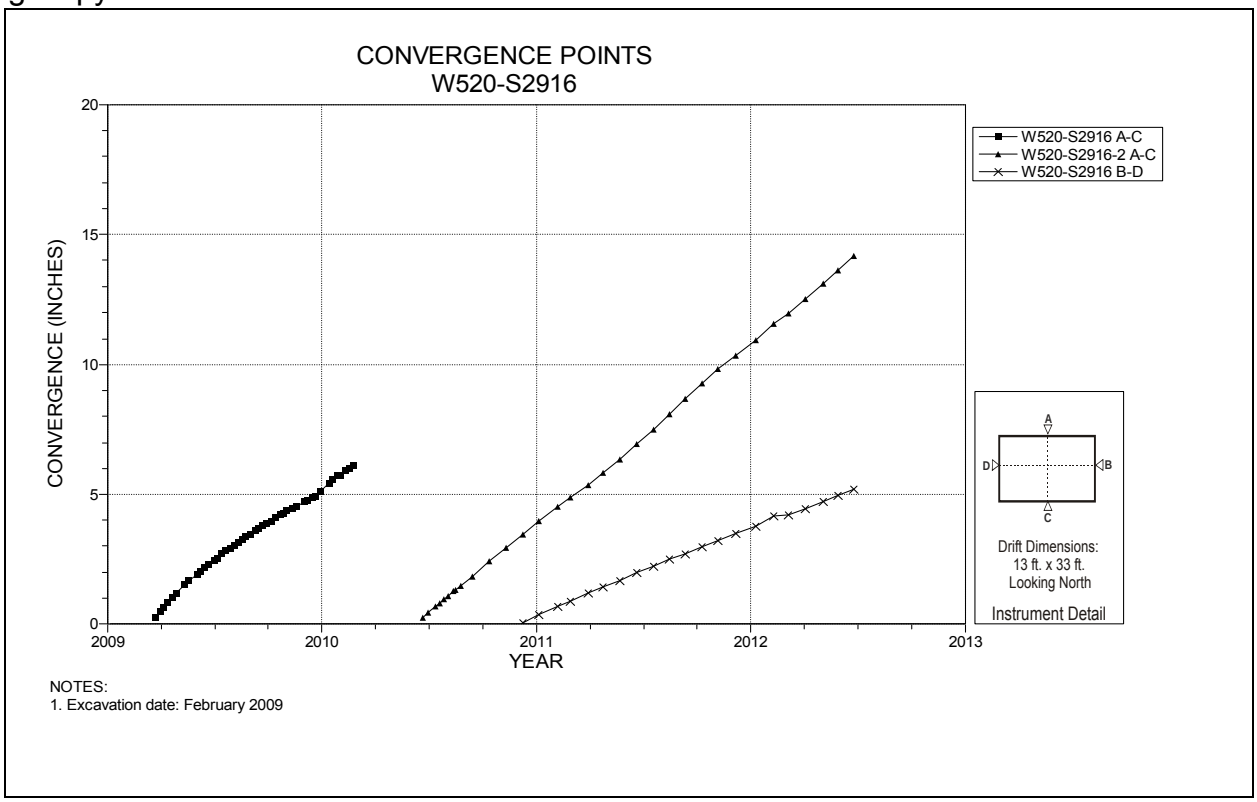


Figure 5-52 Convergence Point Array
Room 2, Panel 6 at W520 S2916– Room Center – All Chords

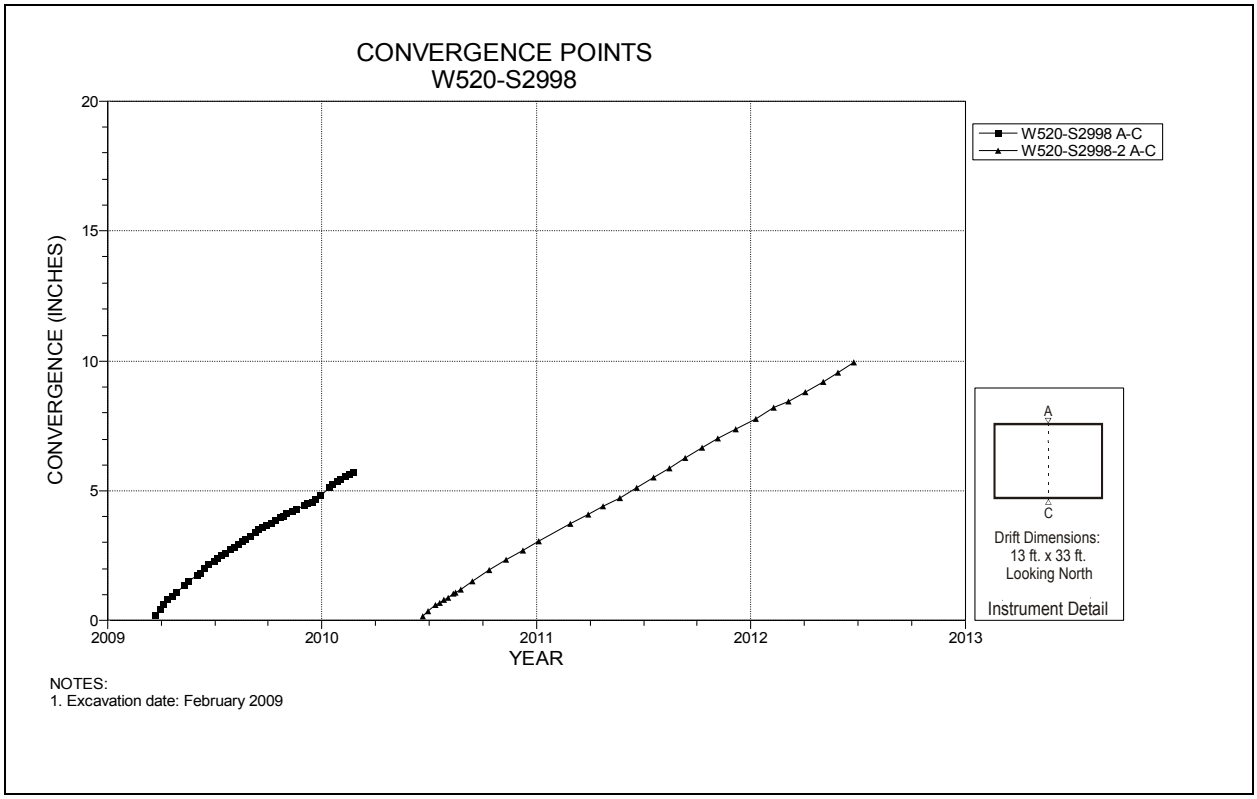


Figure 5-53 Convergence Point Array
Room 2, Panel 6 at W520 S2998 – Roof to Floor

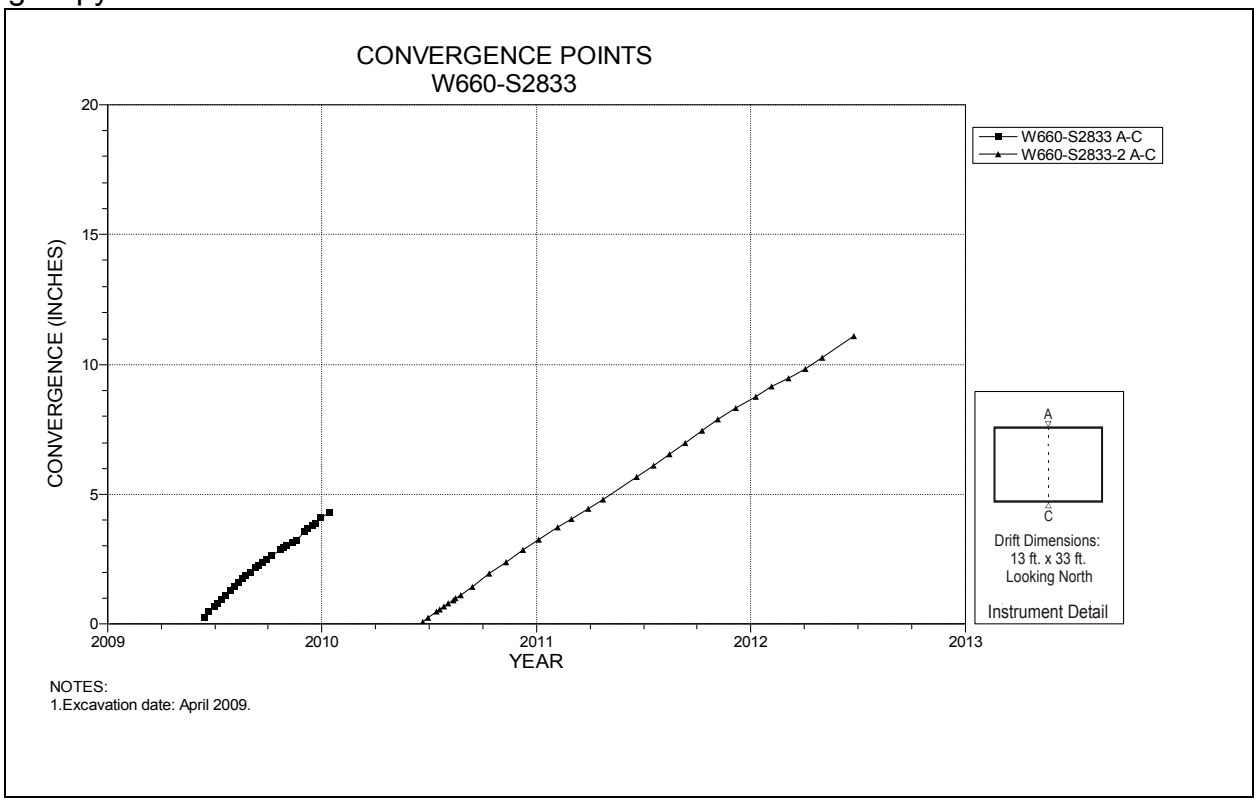


Figure 5-54 Convergence Point Array
Room 3, Panel 6 at W660 S2833 – Roof to Floor

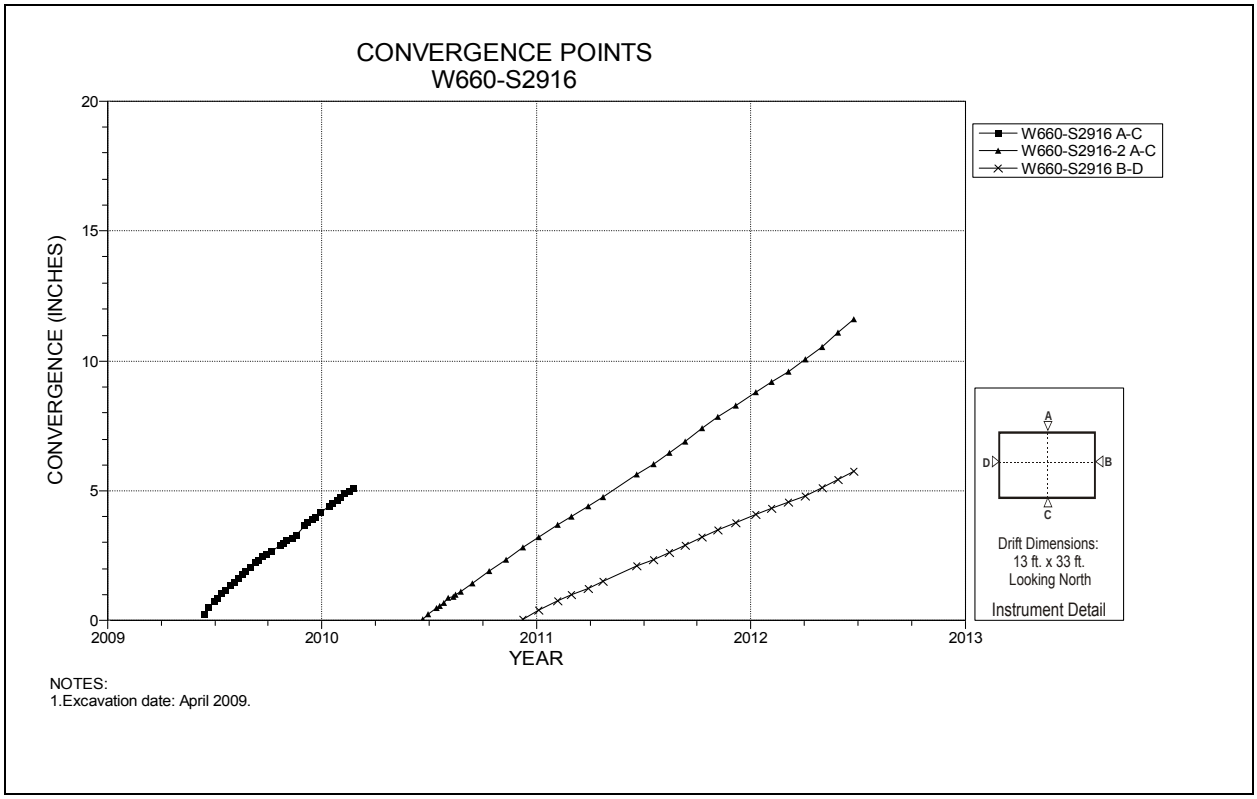


Figure 5-55 Convergence Point Array
Room 3, Panel 6 at W660 S2916– Room Center – All Chords

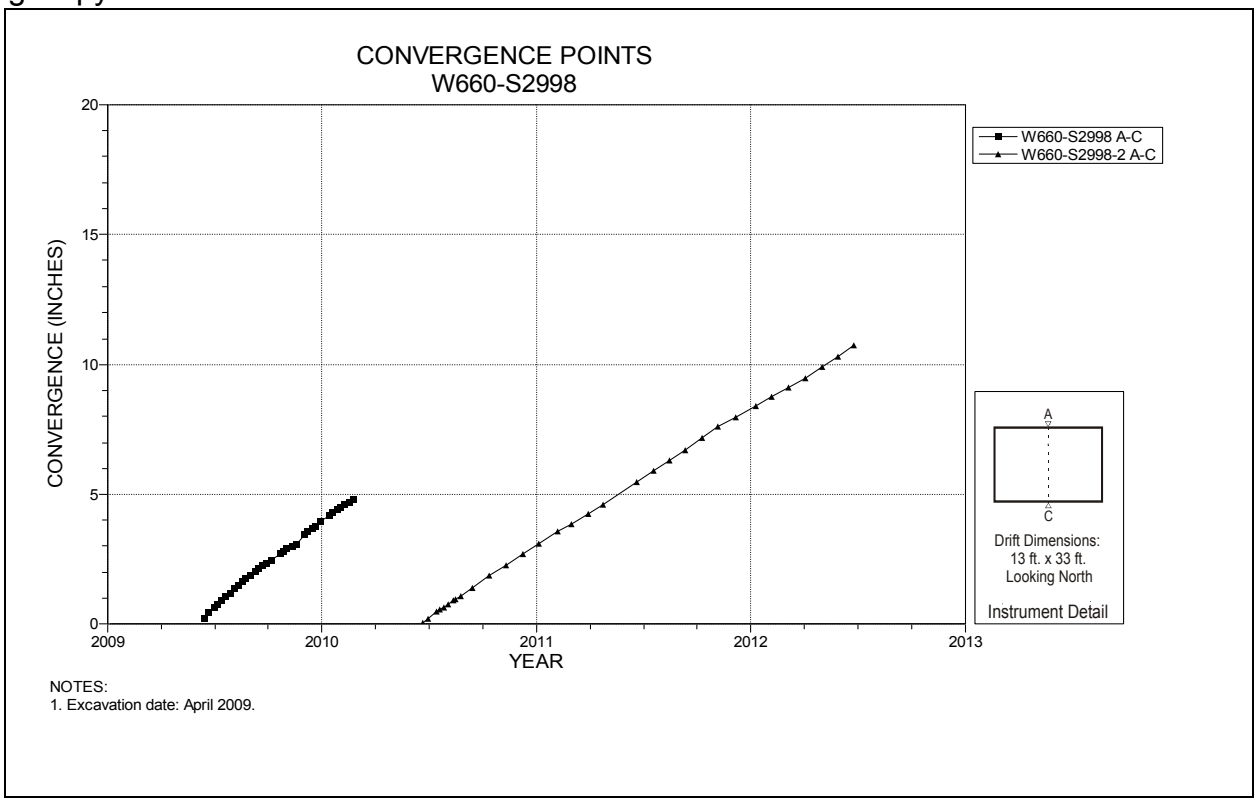


Figure 5-56 Convergence Point Array
Room 3, Panel 6 at W660 S2998 – Roof to Floor

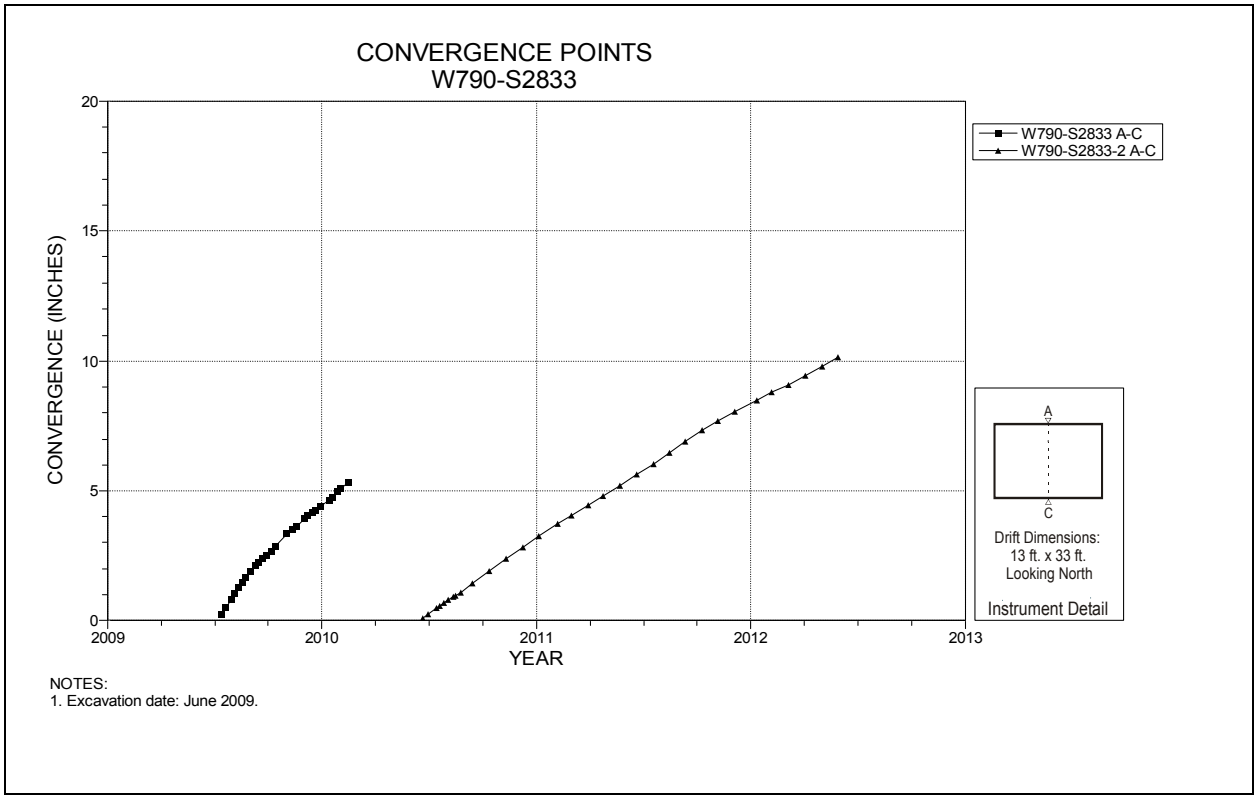


Figure 5-57 Convergence Point Array
Room 4, Panel 6 at W790 S2833 – Roof to Floor

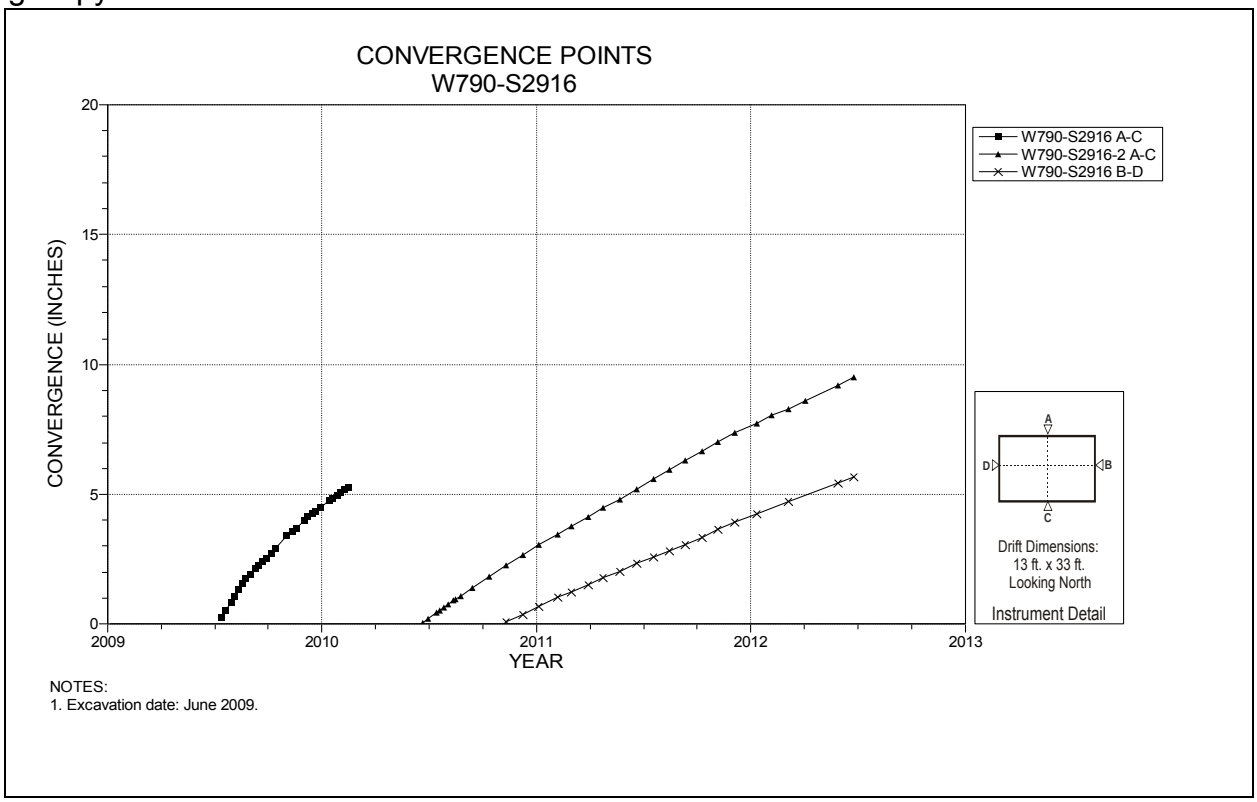


Figure 5-58 Convergence Point Array
Room 4, Panel 6 at W790 S2916– Room Center – All Chords

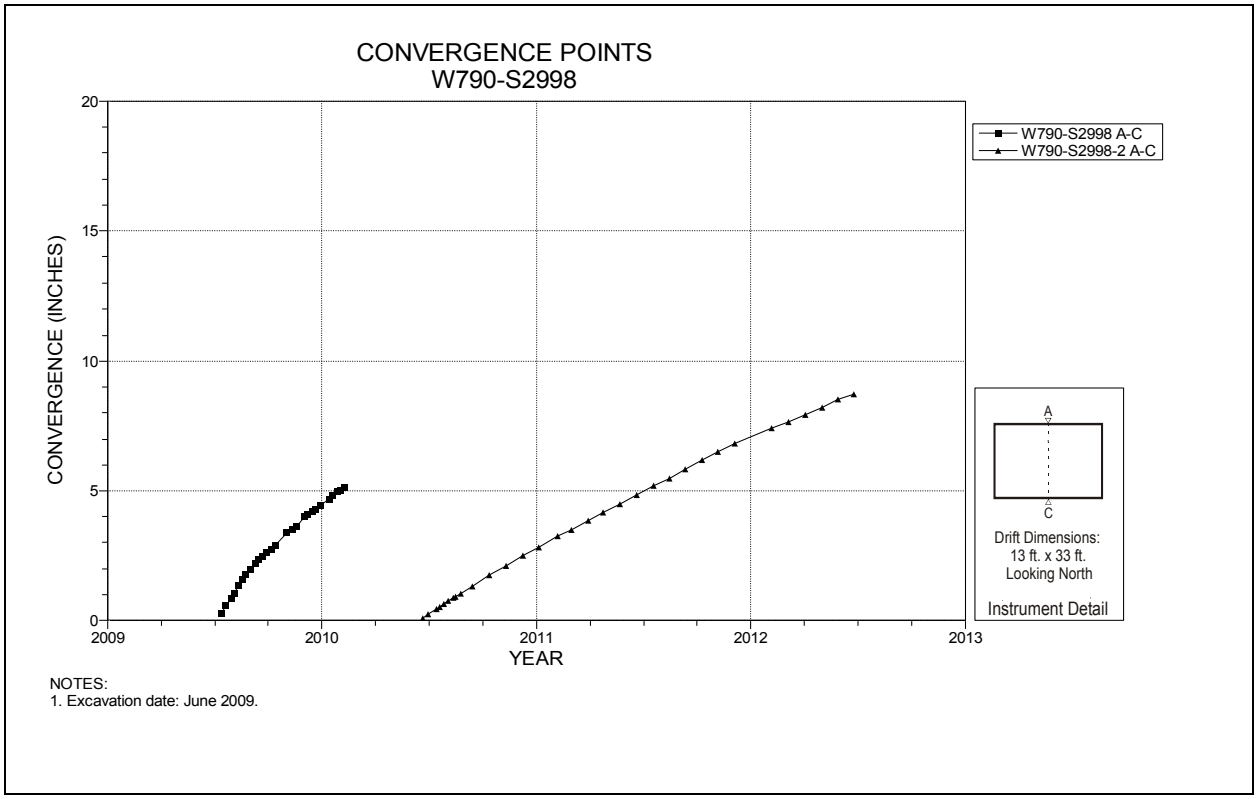


Figure 5-59 Convergence Point Array
Room 4, Panel 6 at W790 S2998 – Roof to Floor

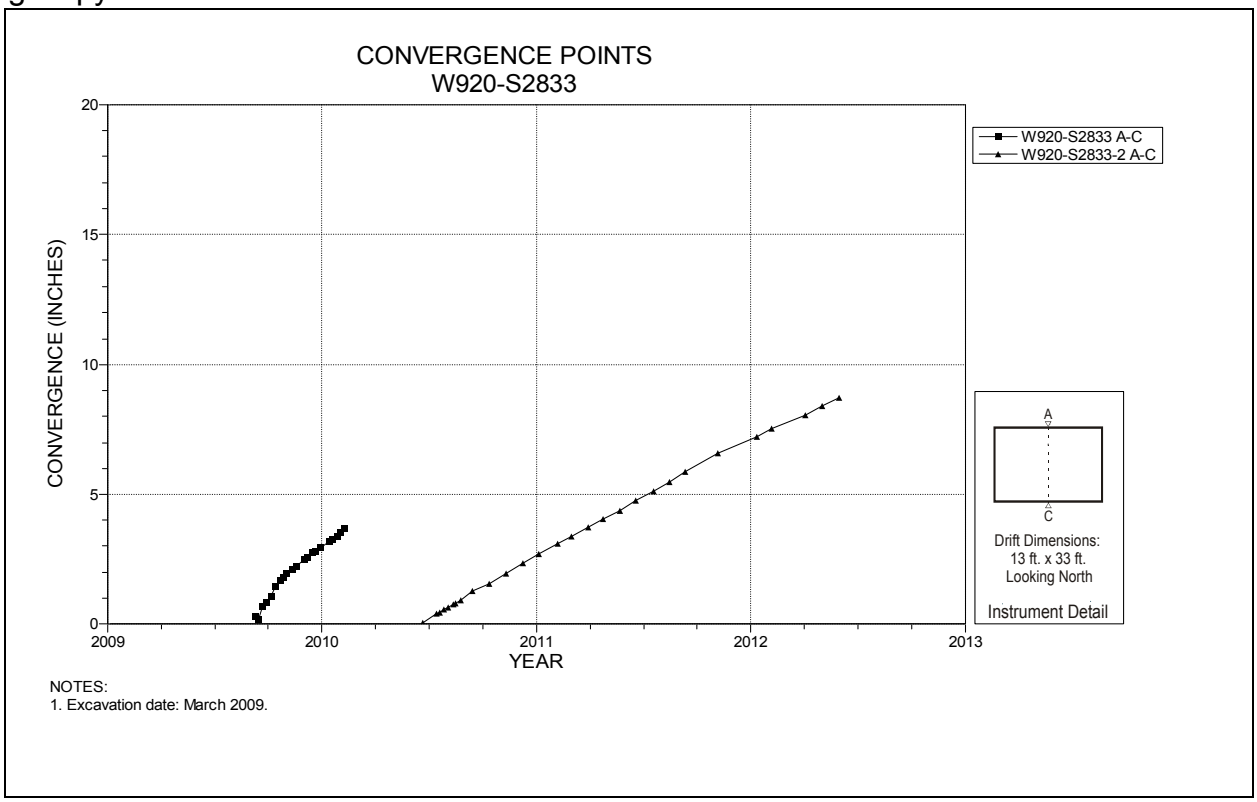


Figure 5-60 Convergence Point Array
Room 5, Panel 6 at W920 S2833 – Roof to Floor

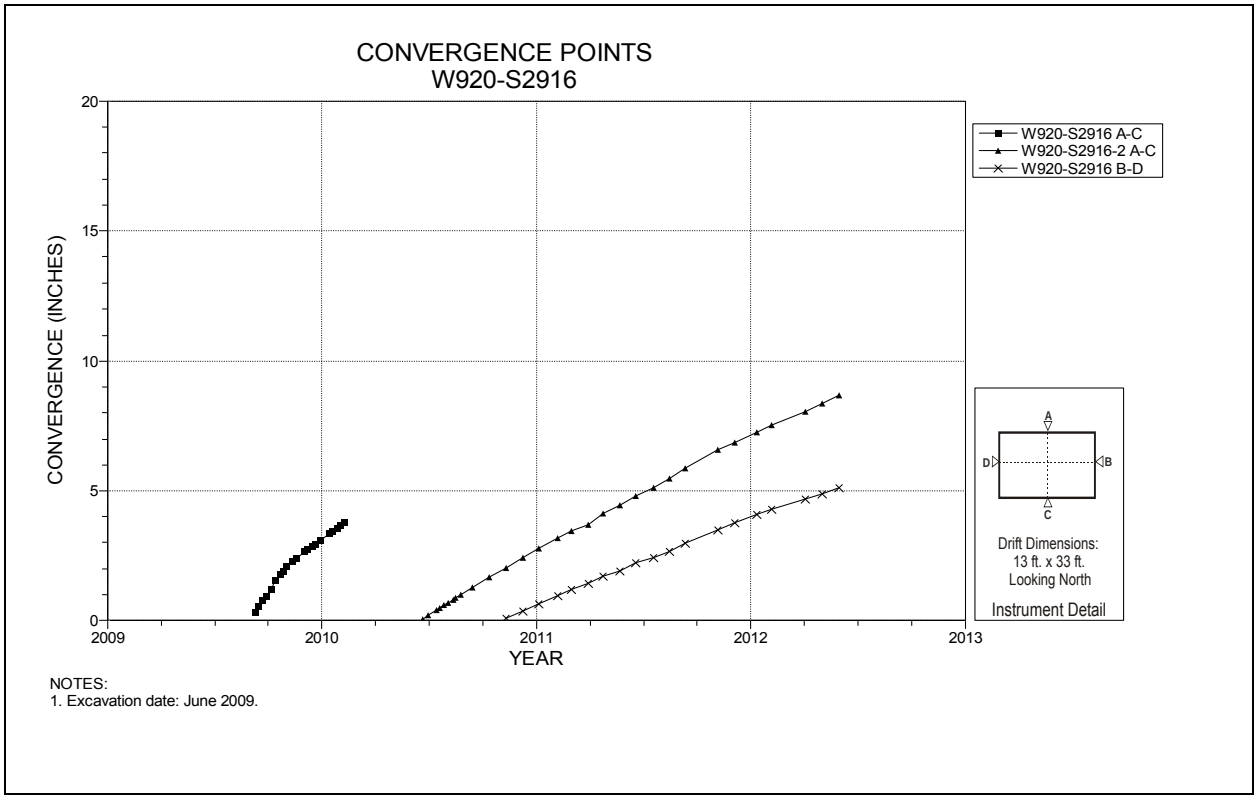


Figure 5-61 Convergence Point Array
Room 5, Panel 6 at W920 S2916– Room Center – All Chords

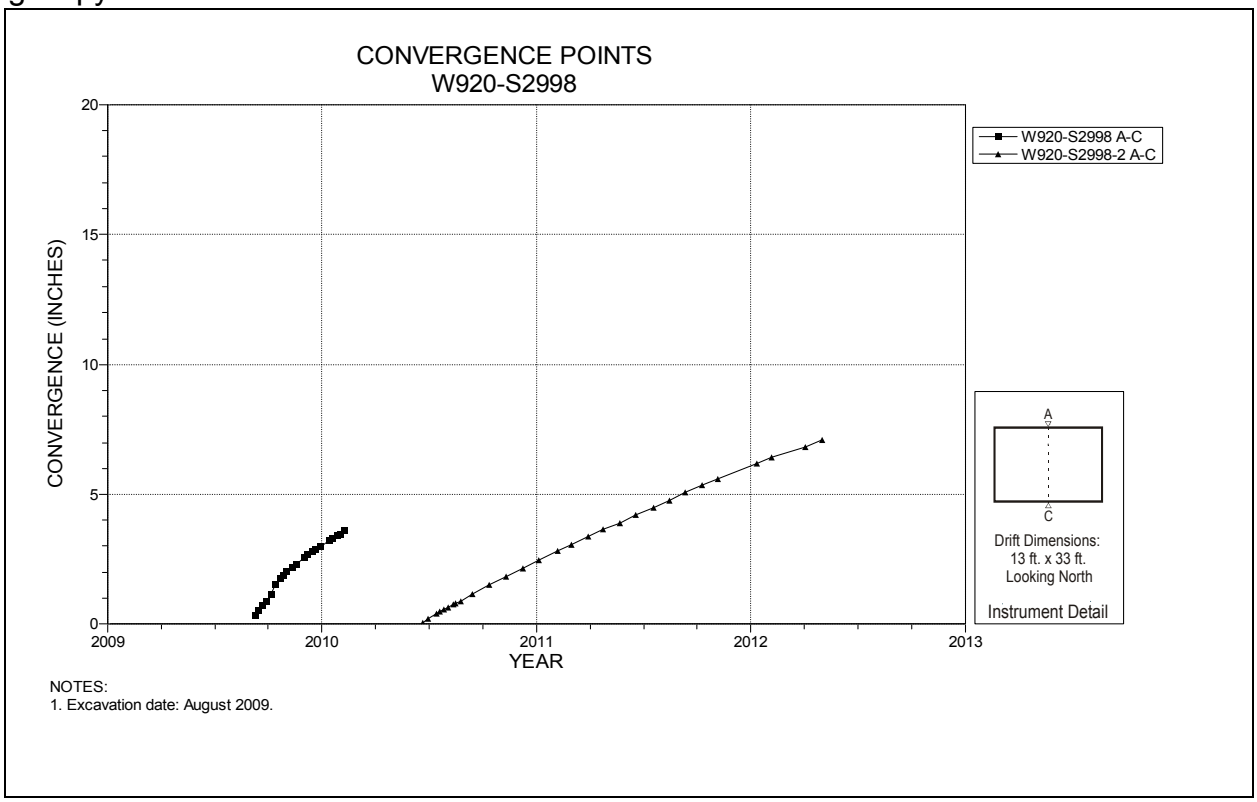


Figure 5-62 Convergence Point Array
Room 5, Panel 6 at W920 S2998 – Roof to Floor

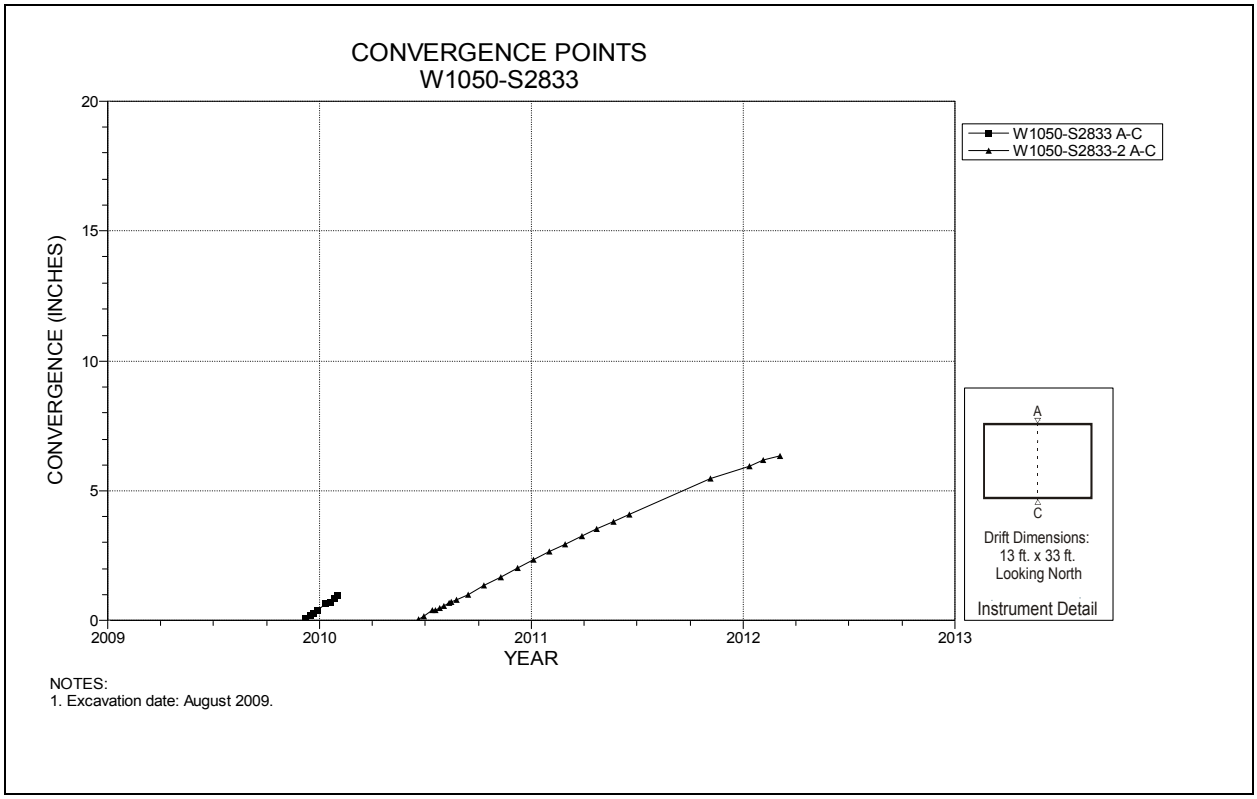
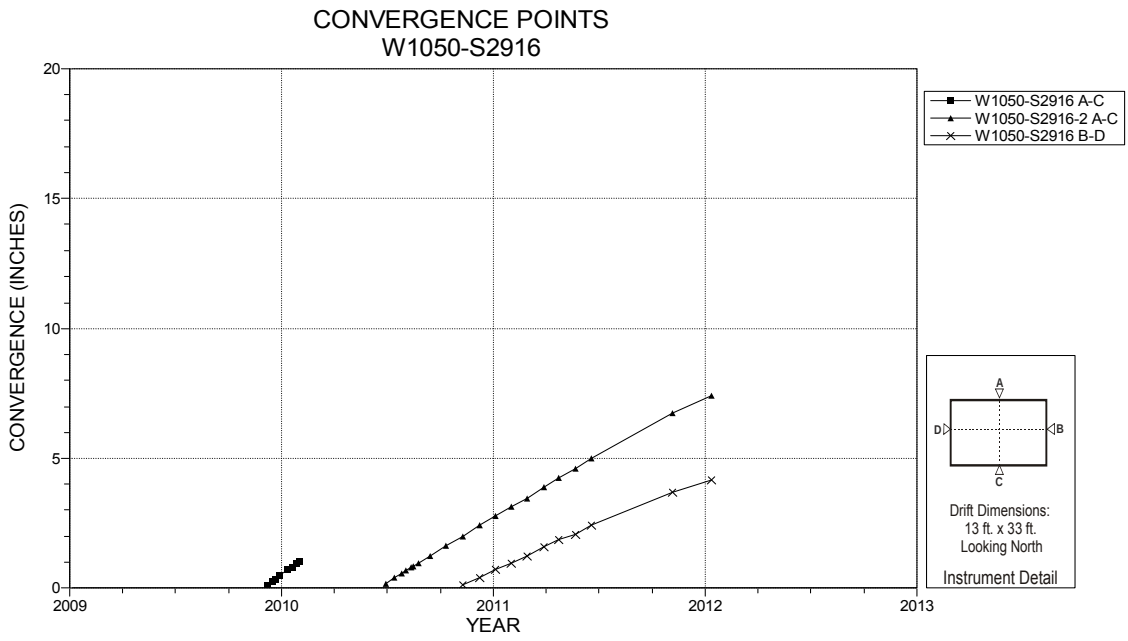
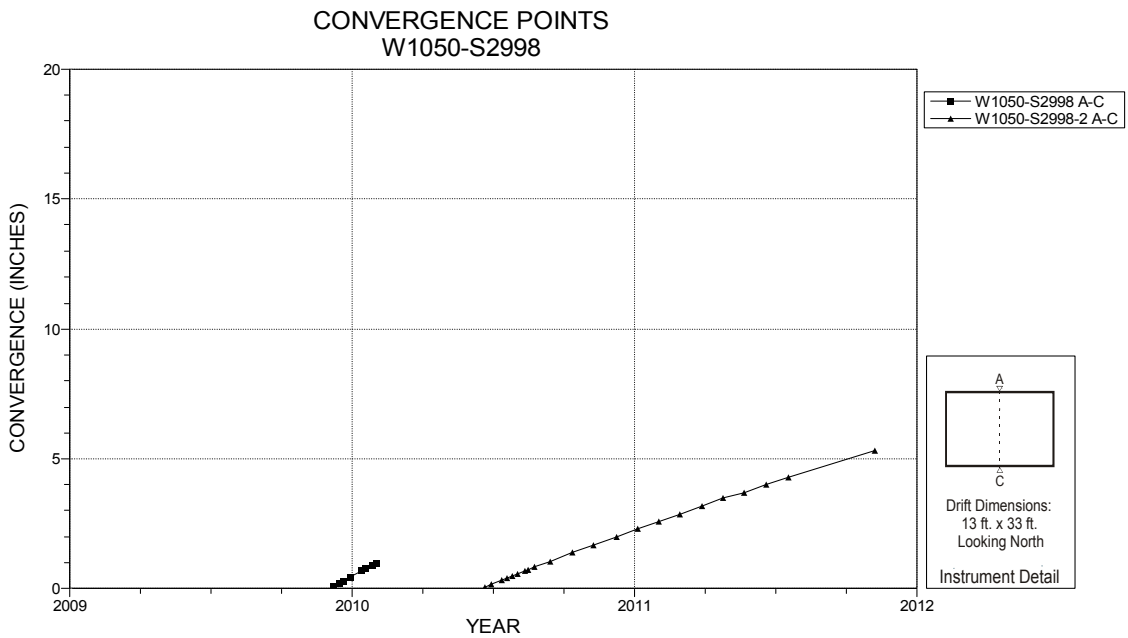


Figure 5-63 Convergence Point Array
Room 6, Panel 6 at W1050 S2833 – Roof to Floor



NOTES:
1. Excavation date: August 2009.
2. The instrument was destroyed by a bolter in May 2012 and a replacement was installed.

Figure 5-64 Convergence Point Array
Room 6, Panel 6 at W1050 S2916– Room Center – All Chords



NOTES:
1. Excavation date: August 2009.

Figure 5-65 Convergence Point Array
Room 6, Panel 6 at W1050 S2998 – Roof to Floor

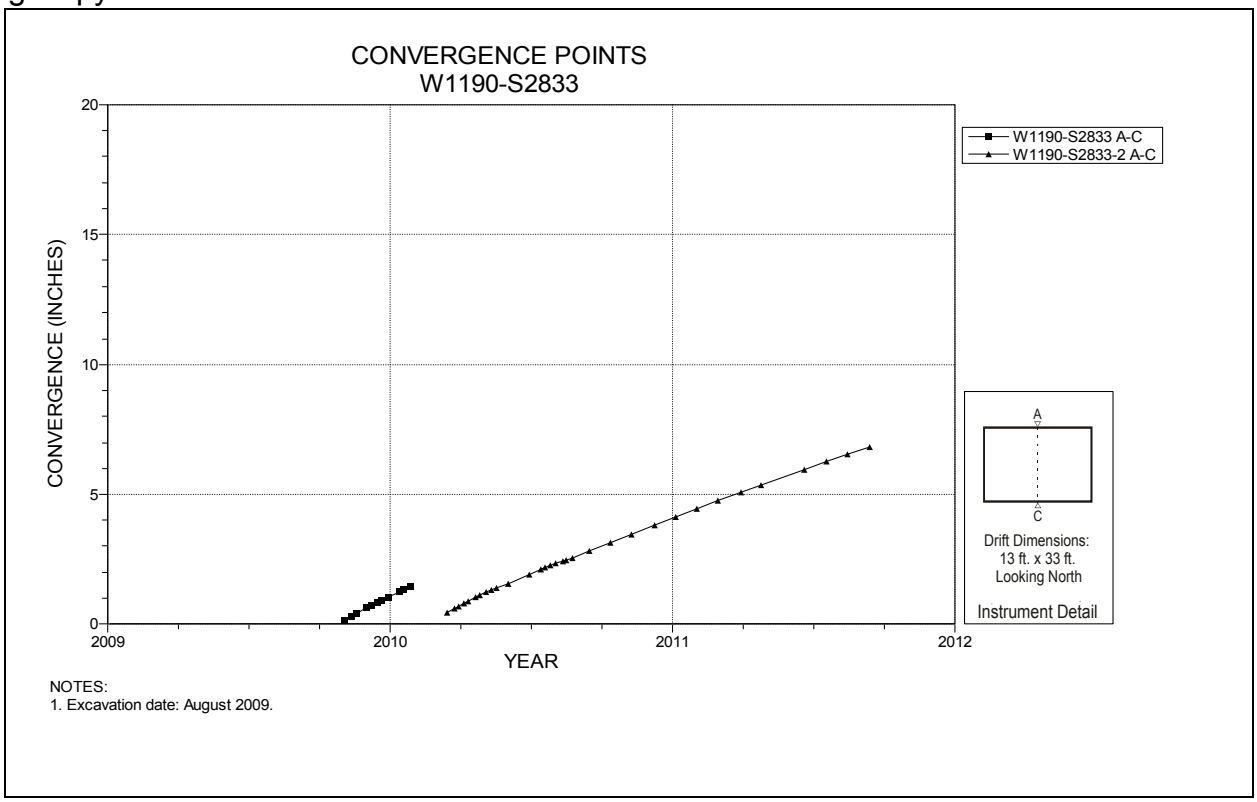


Figure 5-66 Convergence Point Array
Room 7, Panel 6 at W1190 S2833 – Roof to Floor

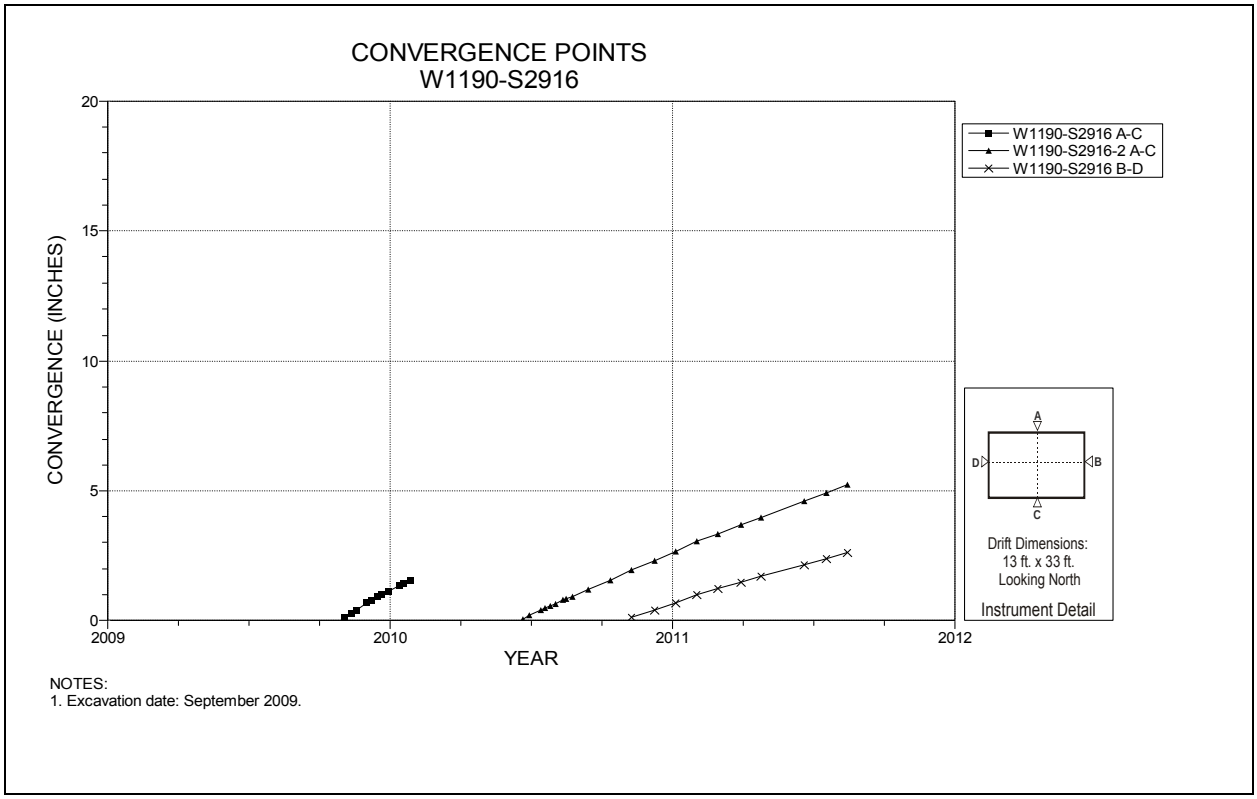
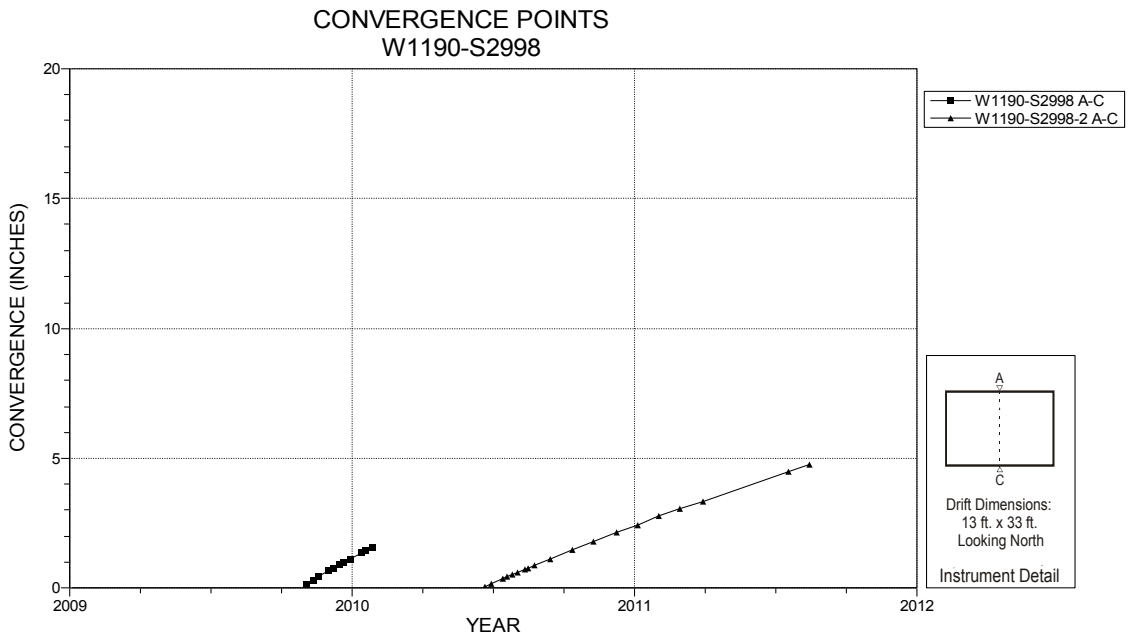
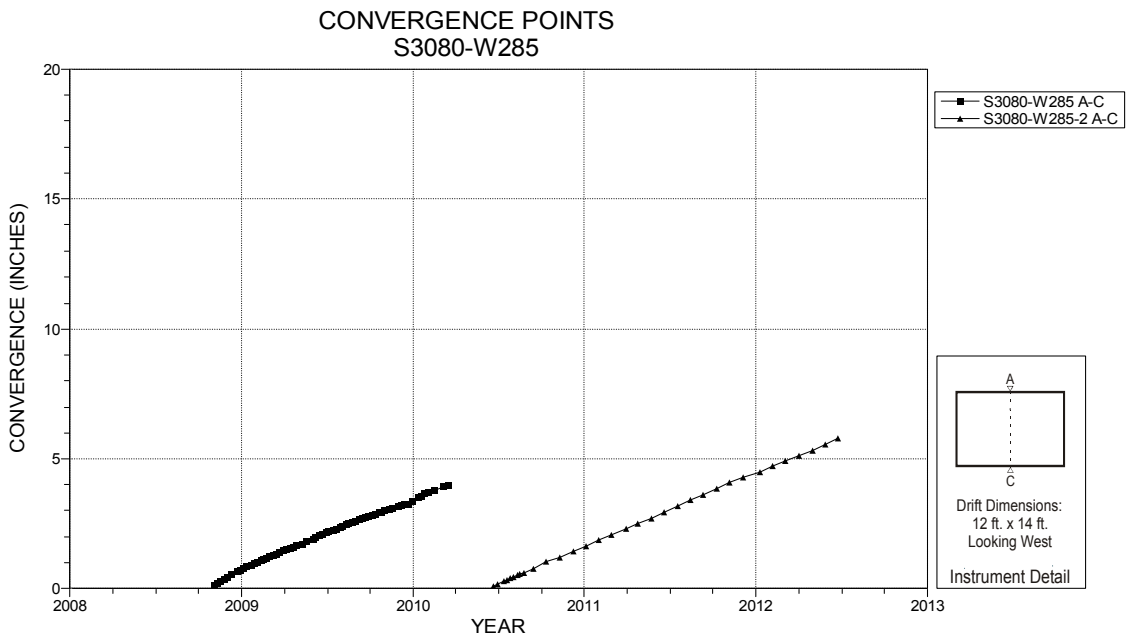


Figure 5-67 Convergence Point Array
Room 7, Panel 6 at W1190 S2916– Room Center – All Chords



NOTES:
1. Excavation date: September 2009.

Figure 5-68 Convergence Point Array
Room 7, Panel 6 at W1190 S2998 – Roof to Floor



NOTES:
1. Excavation date: September 2008

Figure 5-69 Convergence Point Array
S3080 W285 – Roof to Floor

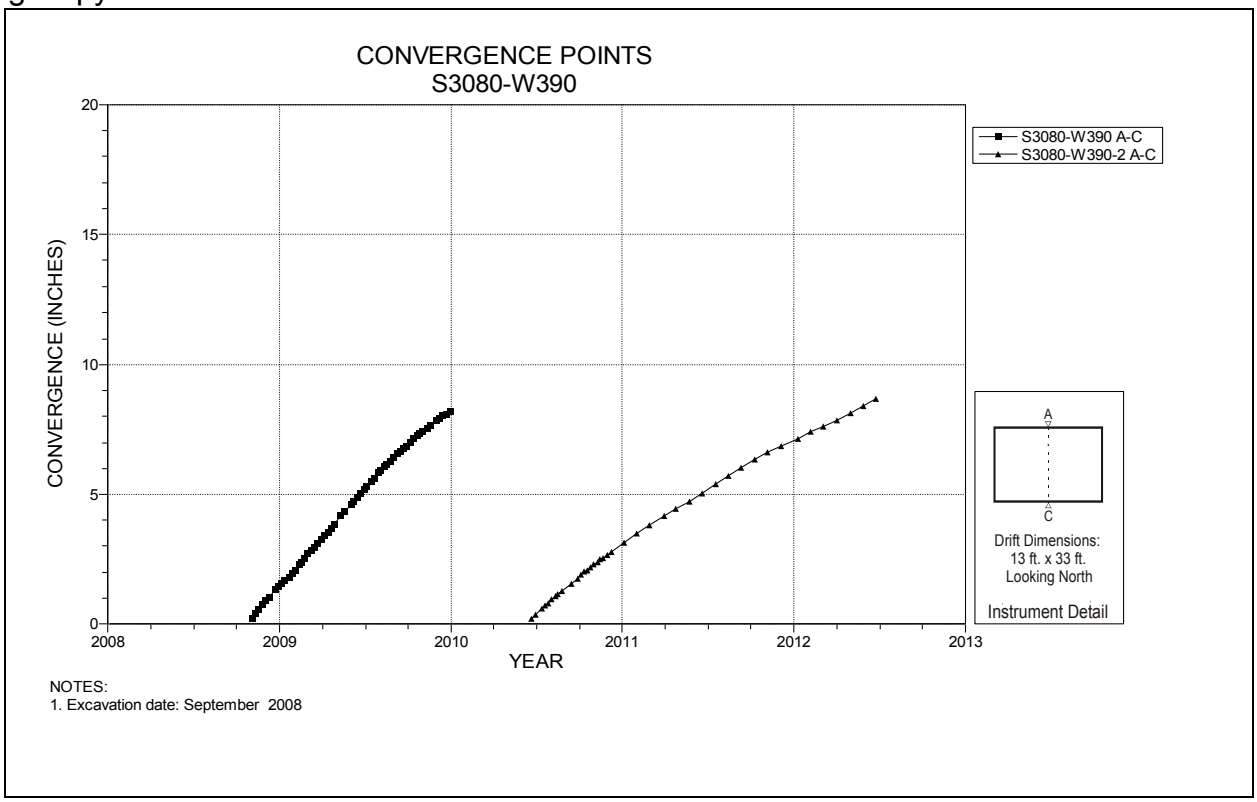


Figure 5-70 Convergence Point Array
S3080 W390 Intersection (Room 1, Panel 6) – Roof to Floor

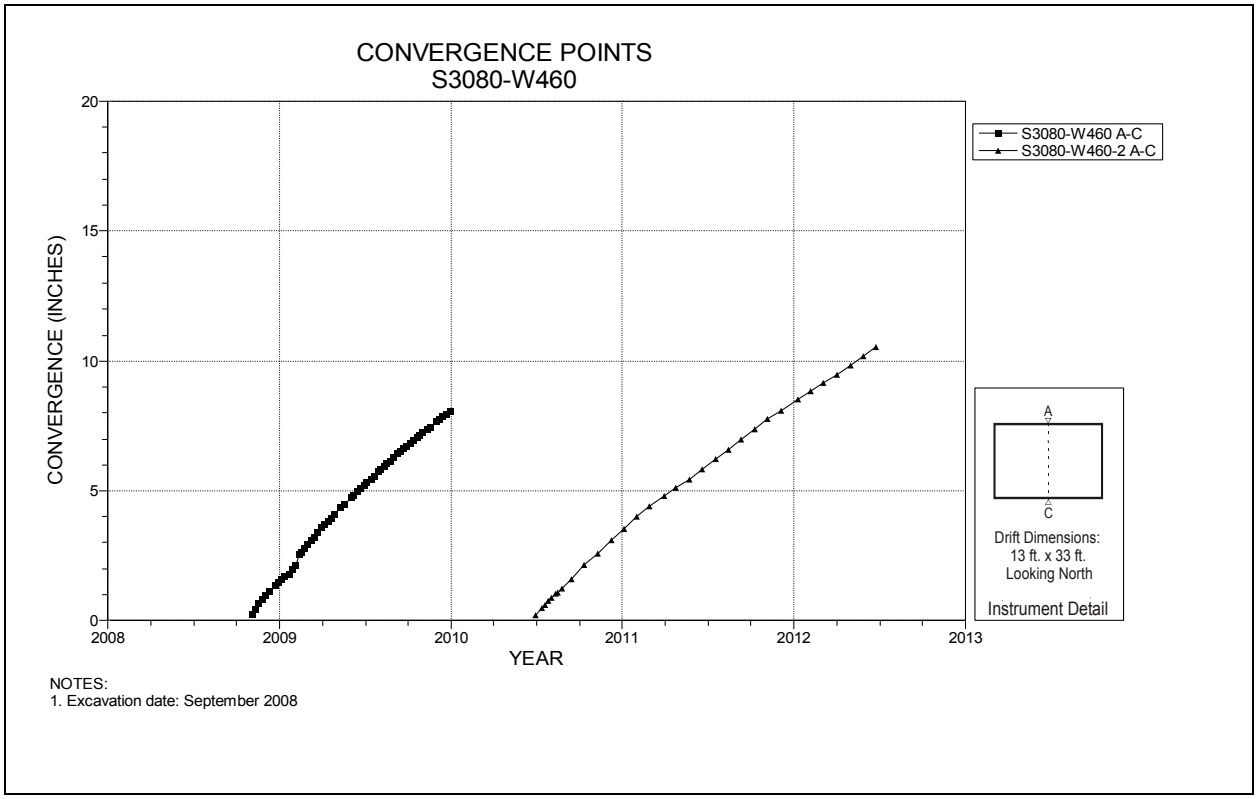


Figure 5-71 Convergence Point Array
S3080 W460 – Roof to Floor

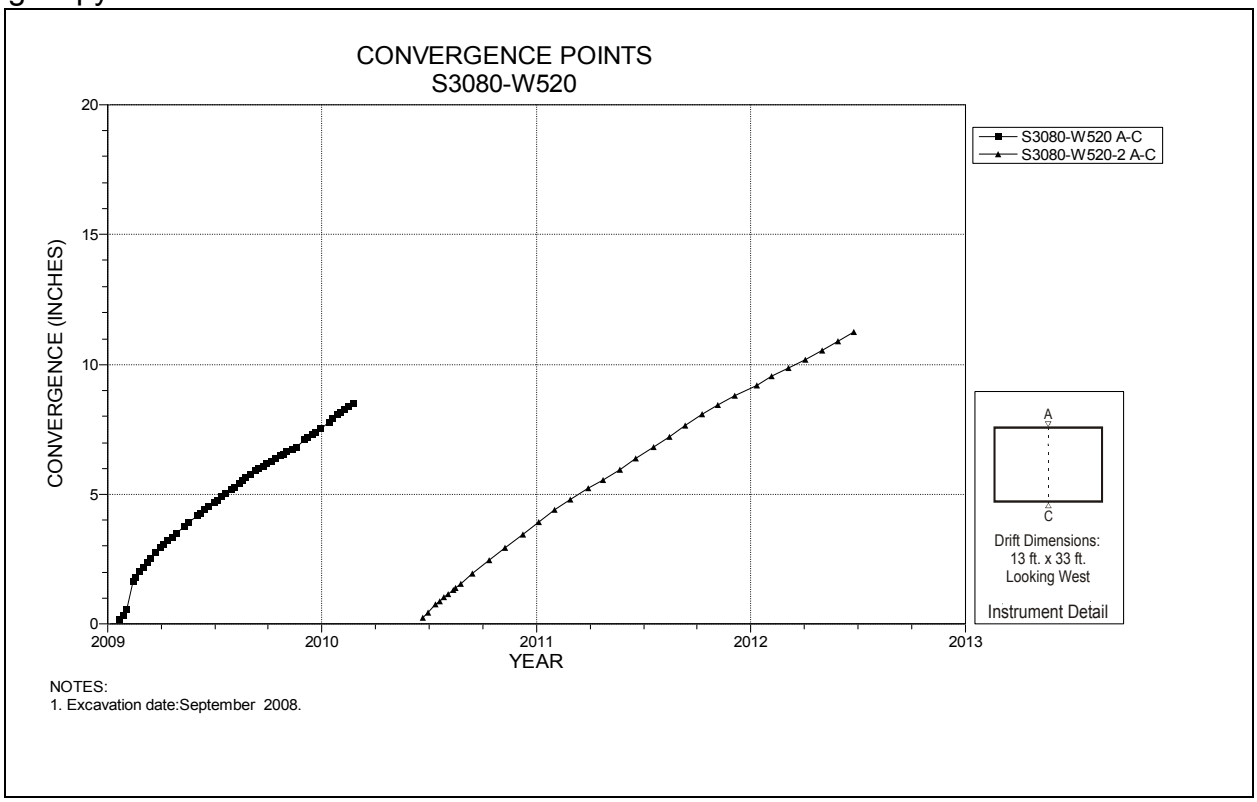


Figure 5-72 Convergence Point Array
S3080 W520 Intersection (Room 2, Panel 6) – Roof to Floor

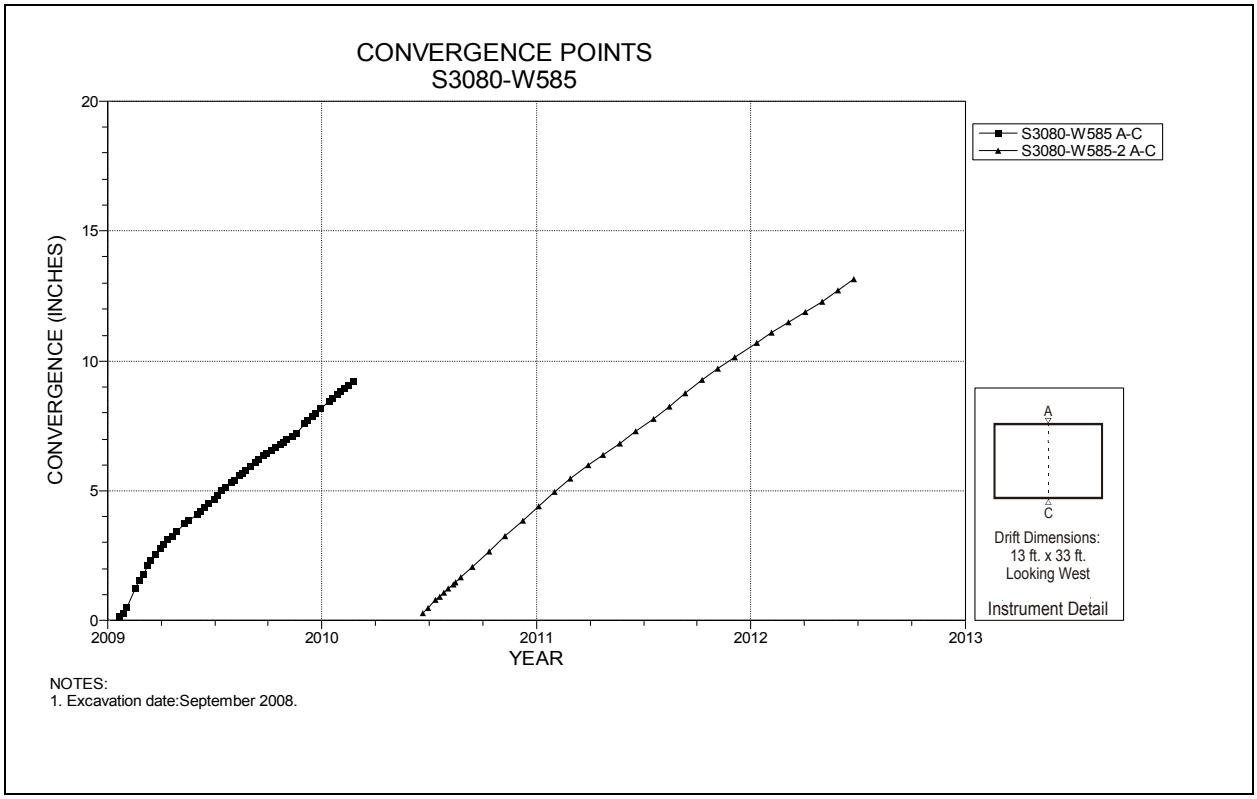


Figure 5-73 Convergence Point Array
S3080 W585 – Roof to Floor

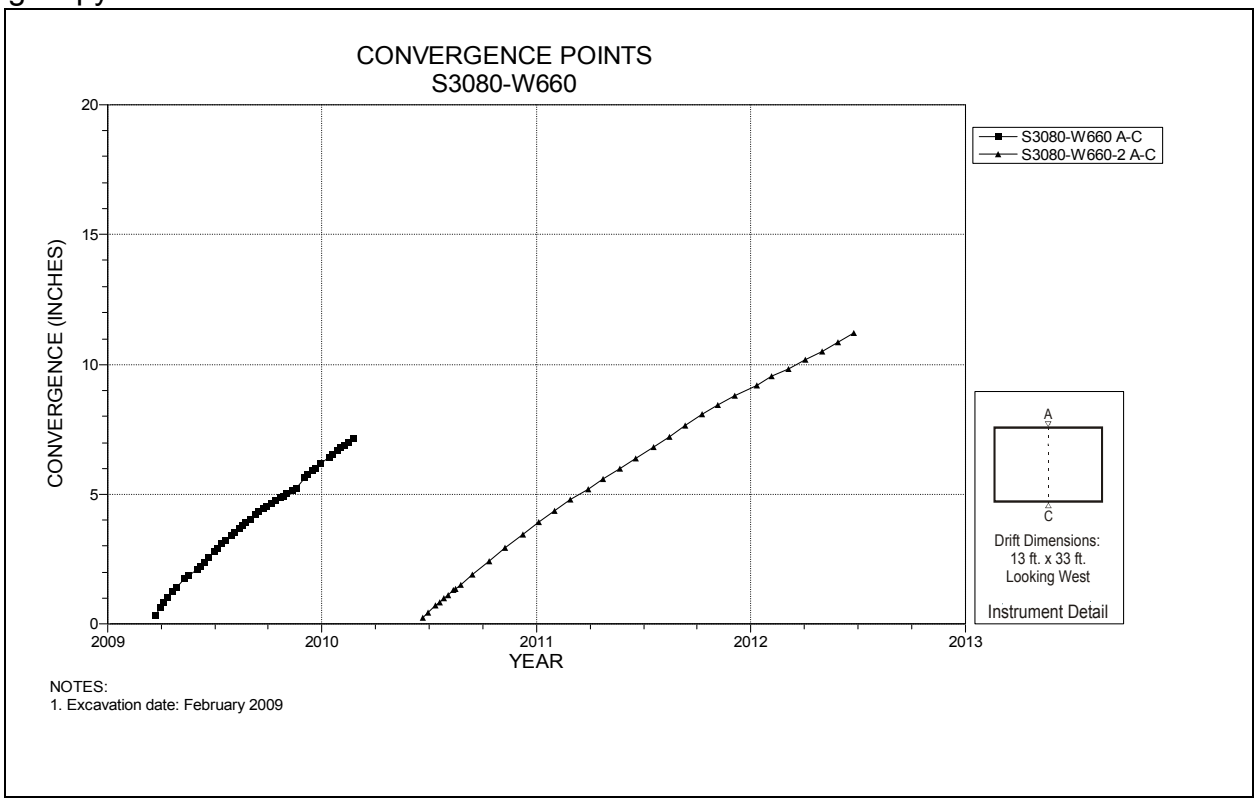


Figure 5-74 Convergence Point Array
S3080 W660 Intersection (Room 3, Panel 6) – Roof to Floor

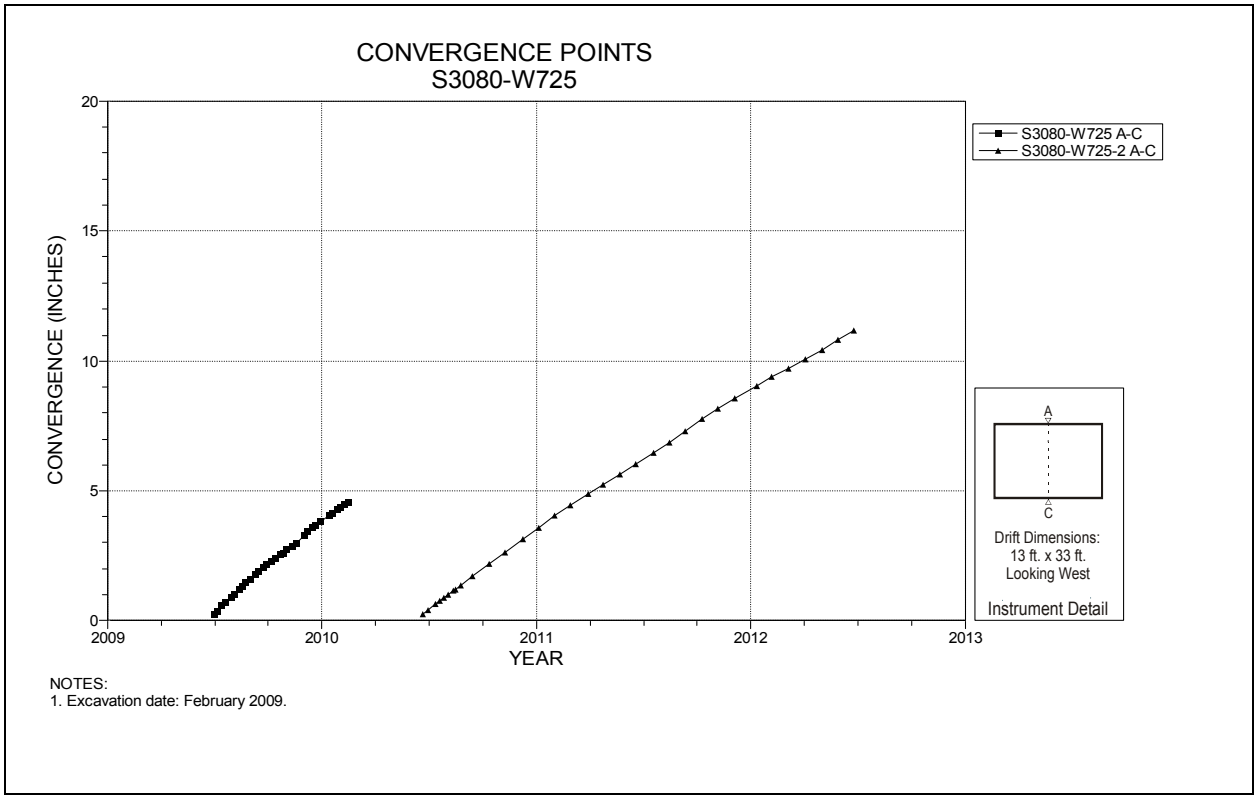


Figure 5-75 Convergence Point Array
S3080 W725 – Roof to Floor

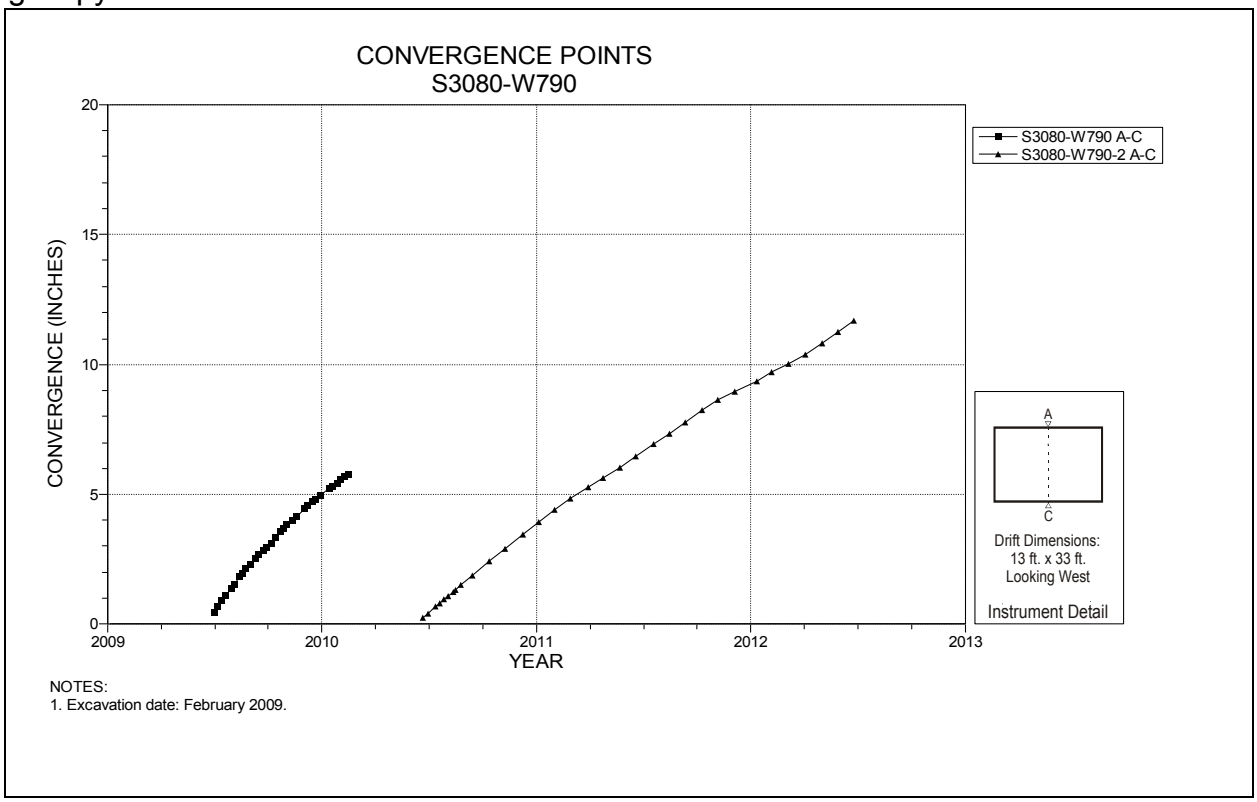


Figure 5-76 Convergence Point Array
S3080 W790 Intersection (Room 4, Panel 6) – Roof to Floor

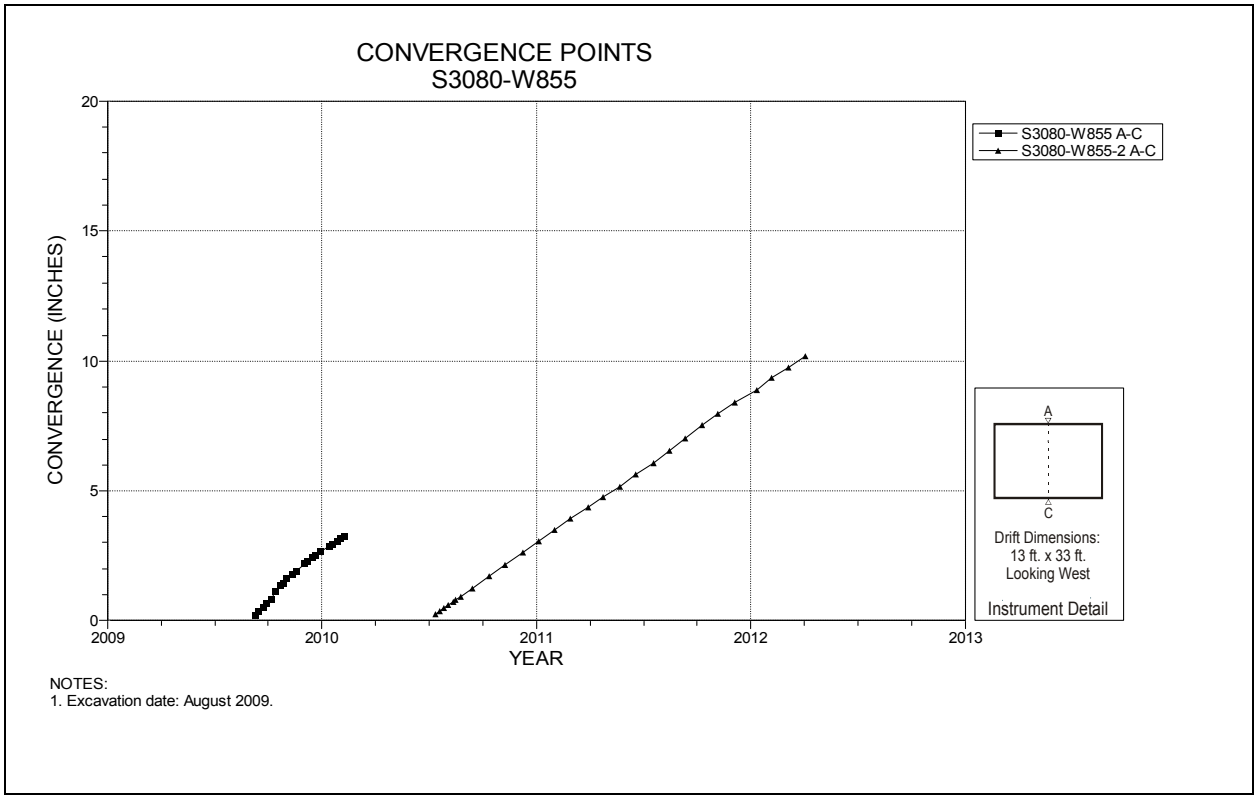


Figure 5-77 Convergence Point Array
S3080 W855 – Roof to Floor

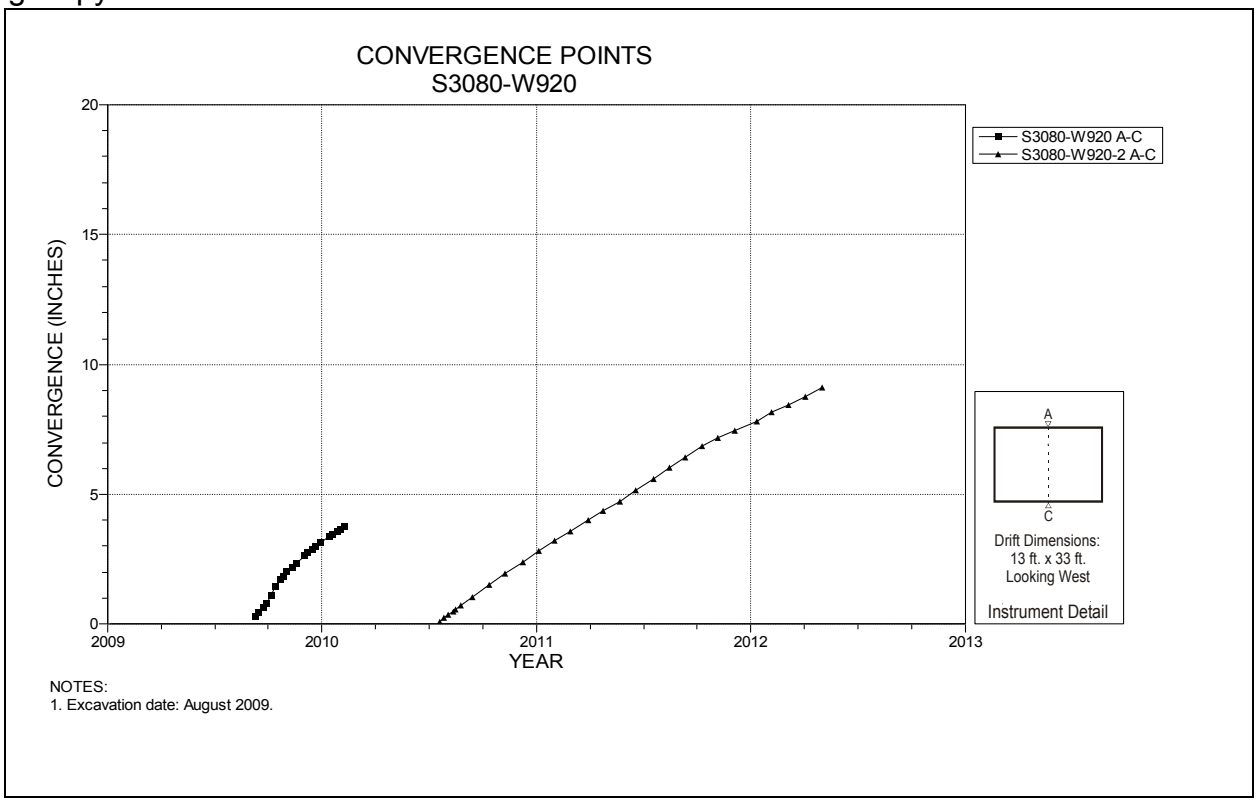


Figure 5-78 Convergence Point Array
S3080 W920 Intersection (Room 5, Panel 6) – Roof to Floor

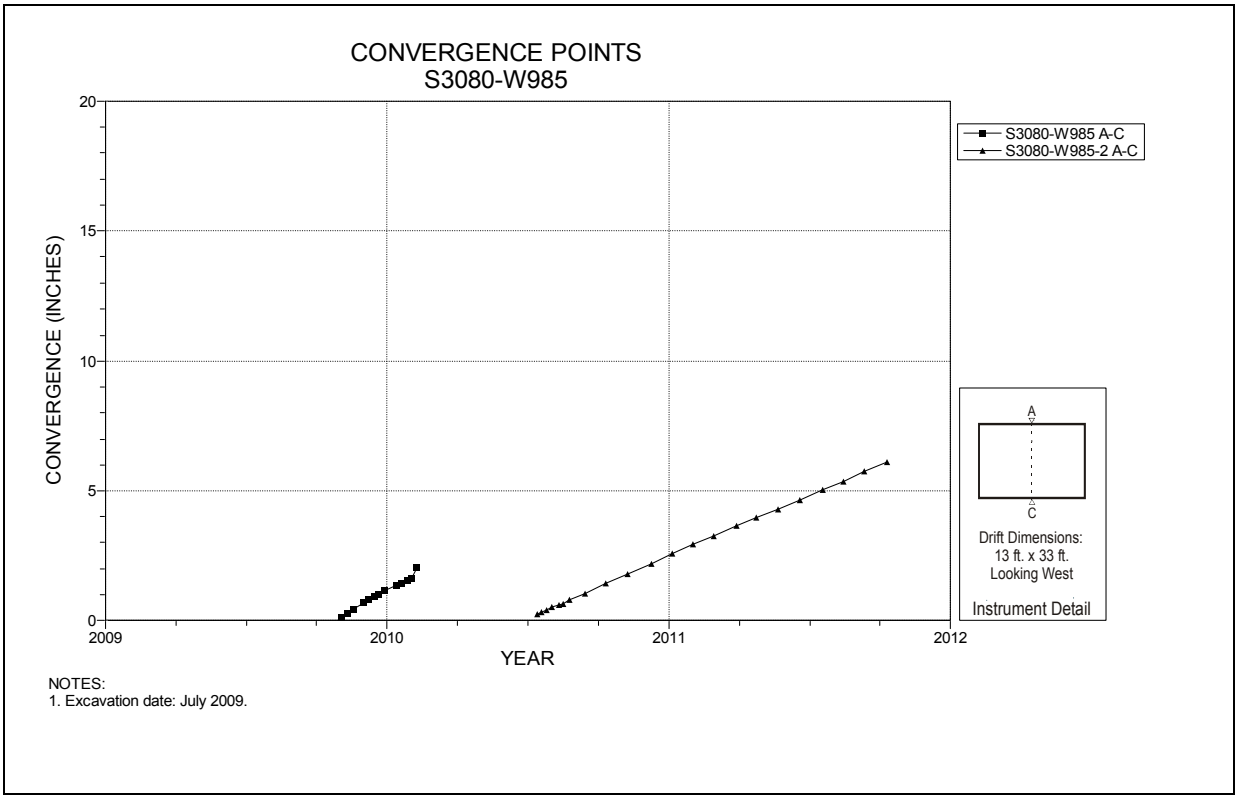


Figure 5-79 Convergence Point Array
S3080 W985 – Roof to Floor

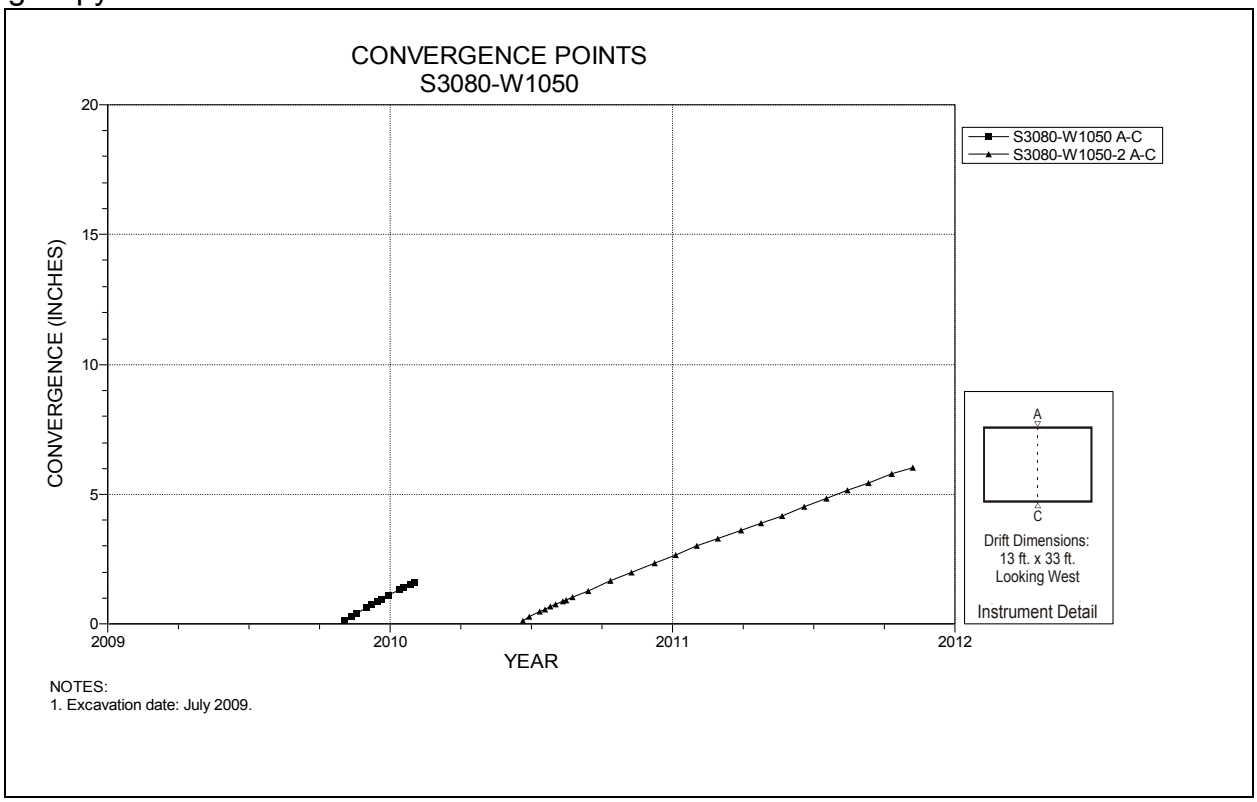


Figure 5-80 Convergence Point Array
S3080 W1050 Intersection (Room 6, Panel 6) – Roof to Floor

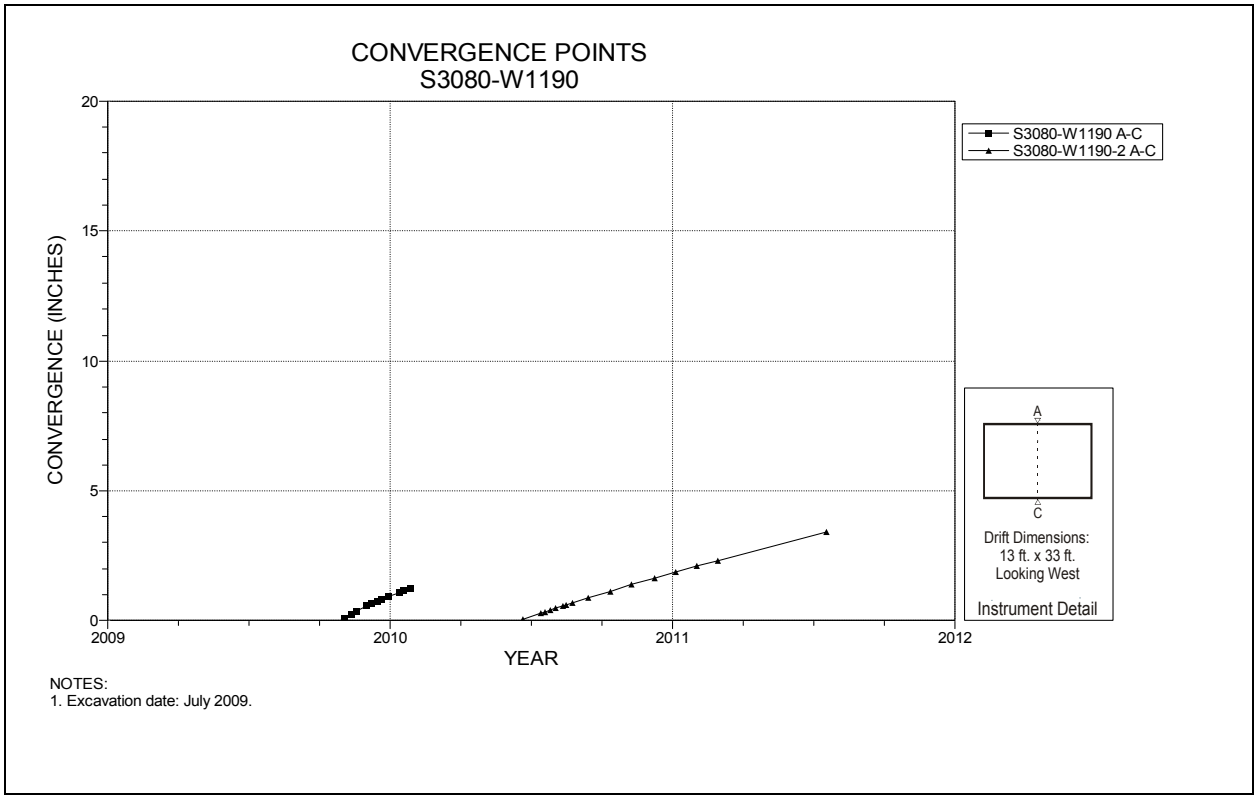


Figure 5-81 Convergence Point Array
S3080 W1190 Intersection (Room 7, Panel 6) – Roof to Floor

Table 5-7
Panel 7 Data Analysis

Extensometers								
Field Tag	Location	Figure Number	Date of Last Reading	Collar Displacement Relative to Deepest Anchor (inches)	Displacement Rate 2011 to 2012 (in/year)	Displacement Rate 2010 to 2011 (in/year)	Rate Change Percent	Comments
51X-GE-00416	S2180-W585	5-82	04/25/12	0.937	1.4	N/A	N/A	The Panel 7 extensometers were installed after the 10'-11' interval.
51X-GE-00417	S2180-W985	5-83	04/25/12	1.036	1.6	N/A	N/A	
51X-GE-00425	W390-S2350	5-84	02/15/12	0.433	1.2	N/A	N/A	
51X-GE-00426	W520-S2350	5-85	04/25/12	0.767	1.4	N/A	N/A	
51X-GE-00418	W660-S2350	5-86	04/25/12	0.941	1.6	N/A	N/A	
51X-GE-00419	W790-S2350	5-87	04/25/12	0.397	1.4	N/A	N/A	
51X-GE-00421	W1050-S2350	5-88	04/25/12	0.910	1.4	N/A	N/A	
51X-GE-00422	W1190-S2350	5-89	04/25/12	1.071	1.6	N/A	N/A	
51X-GE-00423	S2520-W585	5-90	04/25/12	0.840	1.5	N/A	N/A	
51X-GE-00424	S2520-W985	5-91	04/25/12	0.802	1.5	N/A	N/A	

Table 5-7
Panel 7 Data Analysis (Continued)

Convergence Points									
Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)[1]	Rate Change Percent[1]	Comments
			Date	Inches					
S2180-W285-2 A-C	S2180-W285	5-92	04/25/12	1.860	2.306	2.1	2.6	-19%	
S2180-W390-2 A-C	S2180-W390	5-93	04/25/12	4.769	5.700	5.4	N/A	N/A	
S2180-W460-2 A-C	S2180-W460	5-94	04/25/12	7.102	8.224	8.1	10.2	-21%	
S2180-W520-2 A-C	S2180-W520	5-95	04/25/12	9.408	10.910	10.6	13.2	-20%	
S2180-W585-3 A-C	S2180-W585	5-96	04/25/12	3.530	9.977	7.1	N/A	N/A	
S2180-W660-3 A-C	S2180-W660	5-97	04/25/12	5.099	9.409	8.2	N/A	N/A	
S2180-W725-3 A-C	S2180-W725	5-98	04/25/12	5.679	7.419	7.7	N/A	N/A	
S2180-W790-2 A-C	S2180-W790	5-99	04/25/12	9.266	10.572	10.4	13.9	-25%	
S2180-W855-2 A-C	S2180-W855	5-100	04/25/12	9.017	10.374	9.8	17.6	-44%	
S2180-W920-2 A-C	S2180-W920	5-101	04/25/12	8.378	9.881	9.2	16.7	-45%	
S2180-W985-3 A-C	S2180-W985	5-102	04/25/12	7.373	16.046	14.0	N/A	N/A	
S2180-W1050 A-C	S2180-W1050	5-103	04/25/12	8.573	8.573	9.1	22.9	-60%	
S2180-W1120-2 A-C	S2180-W1120	5-104	04/25/12	2.053	9.249	8.1	N/A	N/A	
S2180-W1190-2 A-C	S2180-W1190	5-104a	04/25/12	4.864	6.218	5.9	N/A	N/A	
W390-S2275-2 A-C	W390-S2275	5-105	02/15/12	3.059	7.934	9.1	N/A	N/A	
W390-S2350-2 A-C	W390-S2350	5-106	02/15/12	1.680	6.564	5.9	N/A	N/A	
W390-S2425-2 A-C	W390-S2425	5-107	02/15/12	3.680	10.067	10.8	N/A	N/A	
W520-S2275-2 A-C	W520-S2275	5-108	04/25/12	3.684	8.452	7.3	N/A	N/A	
W520-S2350-2 A-C	W520-S2350	5-109	04/25/12	7.757	12.869	15.2	N/A	N/A	
W520-S2425-2 A-C	W520-S2425	5-110	04/25/12	3.980	9.282	7.8	N/A	N/A	
W660-S2275-2 A-C	W660-S2275	5-111	04/25/12	3.948	9.016	7.8	N/A	N/A	
W660-S2350-2 A-C	W660-S2350	5-112	04/25/12	11.345	16.729	22.8	N/A	N/A	
W660-S2425-2 A-C	W660-S2425	5-113	04/25/12	7.024	12.554	14.0	N/A	N/A	
W790-S2275-2 A-C	W790-S2275	5-114	04/25/12	2.042	4.604	7.6	N/A	N/A	
W790-S2350-2 A-C	W790-S2350	5-115	04/25/12	1.950	4.291	7.3	N/A	N/A	
W790-S2425 A-C	W790-S2425	5-116	07/11/11	2.299	2.299	7.8	6.5	20%	
W920-S2275-2 A-C	W920-S2275	5-117	08/08/11	0.693	3.068	18.1	N/A	N/A	
W920-S2350-2 A-C	W920-S2350	5-118	08/08/11	0.740	3.016	19.2	N/A	N/A	
W920-S2425-2 A-C	W920-S2425	5-119	08/08/11	0.538	2.843	13.0	N/A	N/A	

Table 5-7
Panel 7 Data Analysis (Continued)

Convergence Points (Continued)

Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate 2011 to 2012 (in/year)	Closure Rate 2010 to 2011 (in/year)[1]	Rate Change Percent[1]	Comments
			Date	Inches					
W1050-S2275-2 A-C	W1050-S2275	5-120	04/25/12	7.495	9.629	9.7	N/A	N/A	
W1050-S2350-2 A-C	W1050-S2350	5-121	04/25/12	5.891	8.031	7.5	N/A	N/A	
W1050-S2425-2 A-C	W1050-S2425	5-122	04/25/12	7.380	9.521	9.4	N/A	N/A	
W1190-S2275-2 A-C	W1190-S2275	5-123	04/25/12	8.358	10.030	10.1	N/A	N/A	
W1190-S2350-3 A-C	W1190-S2350	5-124	04/25/12	1.800	3.714	7.1	N/A	N/A	
W1190-S2425-3 A-C	W1190-S2425	5-125	04/25/12	1.522	3.537	6.0	N/A	N/A	
S2520-W285-3 A-C	S2520-W285	5-126	02/13/12	2.380	4.975	7.2	N/A	N/A	
S2520-W390-2 A-C	S2520-W390	5-127	02/13/12	2.753	7.283	8.2	N/A	N/A	
S2520-W455-2 A-C	S2520-W455	5-128	02/13/12	2.591	7.690	7.9	N/A	N/A	
S2520-W520-2 A-C	S2520-W520	5-129	04/25/12	4.695	12.778	8.9	N/A	N/A	
S2520-W585-3 A-C	S2520-W585	5-130	01/30/12	1.830	7.666	95.5	N/A	N/A	
S2520-W660-2 A-C	S2520-W660	5-131	04/25/12	7.482	13.434	14.3	N/A	N/A	
S2520-W725-4 A-C	S2520-W725	5-132	04/25/12	2.027	8.951	8.0	N/A	N/A	
S2520-W790-2 A-C	S2520-W790	5-133	04/25/12	5.601	8.101	9.0	N/A	N/A	
S2520-W855-2 A-C	S2520-W855	5-134	04/25/12	11.466	13.933	18.7	N/A	N/A	
S2520-W920-3 A-C	S2520-W920	5-135	04/25/12	4.033	9.369	7.7	N/A	N/A	
S2520-W985-2 A-C	S2520-W985	5-136	04/25/12	7.840	10.214	10.1	N/A	N/A	
S2520-W1050-3 A-C	S2520-W1050	5-137	04/25/12	4.153	8.513	7.9	N/A	N/A	
S2520-W1120-3 A-C	S2520-W1120	5-138	04/25/12	4.473	15.072	17.6	N/A	N/A	
S2520-W1190-2 A-C	S2520-W1190	5-139	04/25/12	5.563	7.200	6.7	N/A	N/A	

[1] N/A – Insufficient data available to perform the calculation. This is usually due to the inability to read the instruments because of activities such as: the temporary removal of an instrument due to floor, rib or back trimming; locations blocked by equipment or waste disposal, etc.

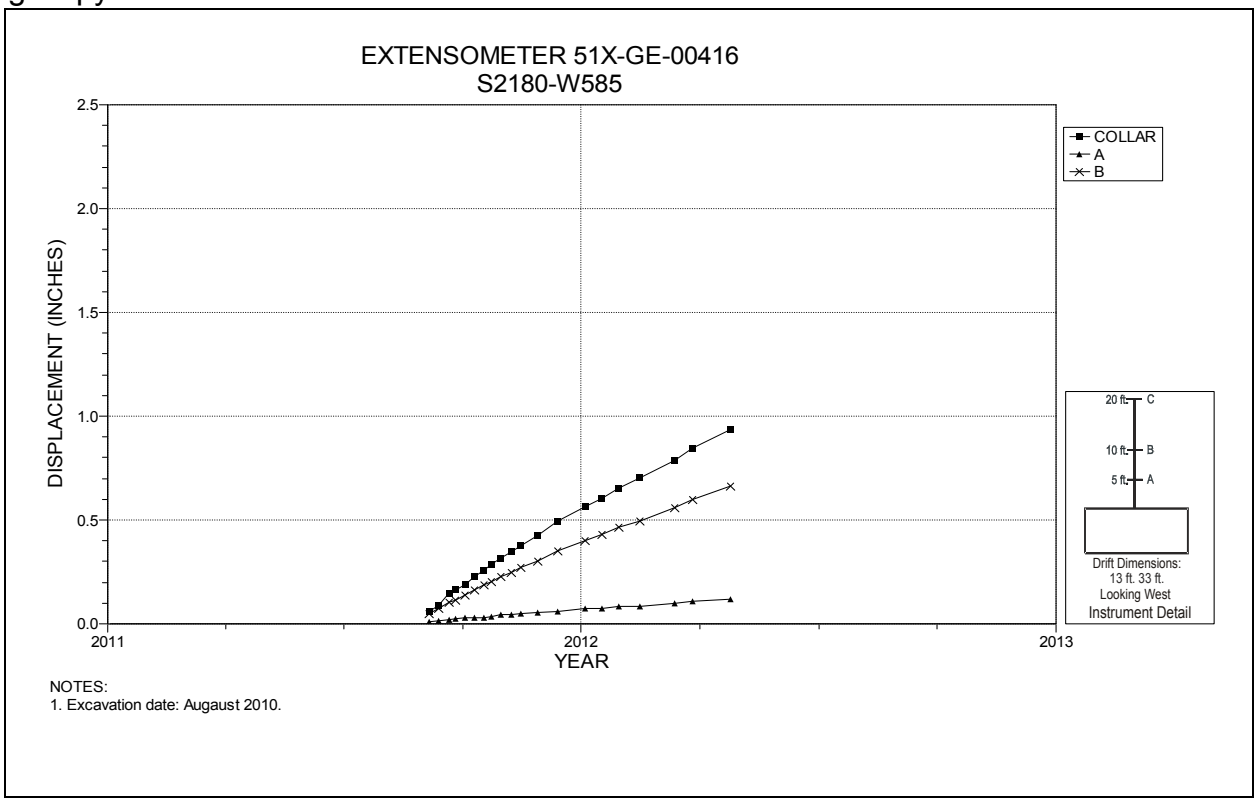


Figure 5-82 Extensometer 51X-GE-00416
S2180 W585 – Roof

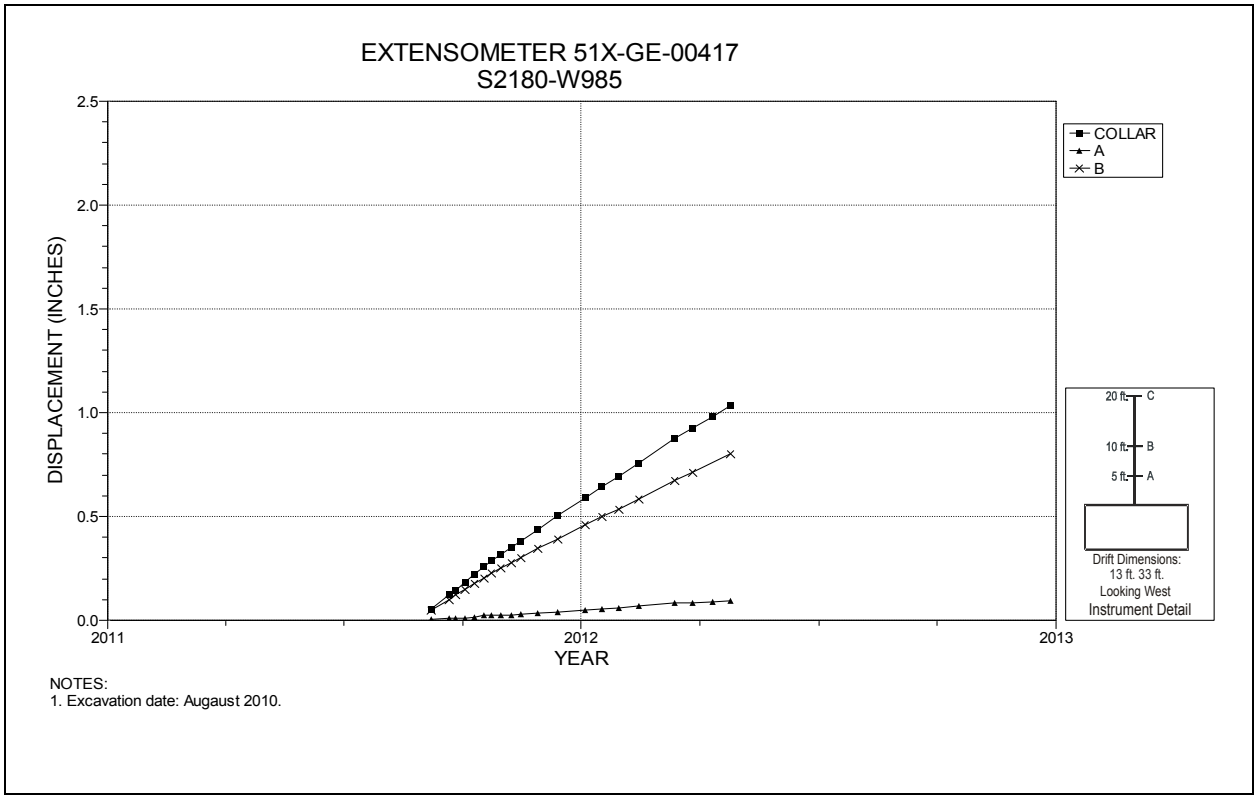


Figure 5-83 Extensometer 51X-GE-00417
S2180 W985 – Roof

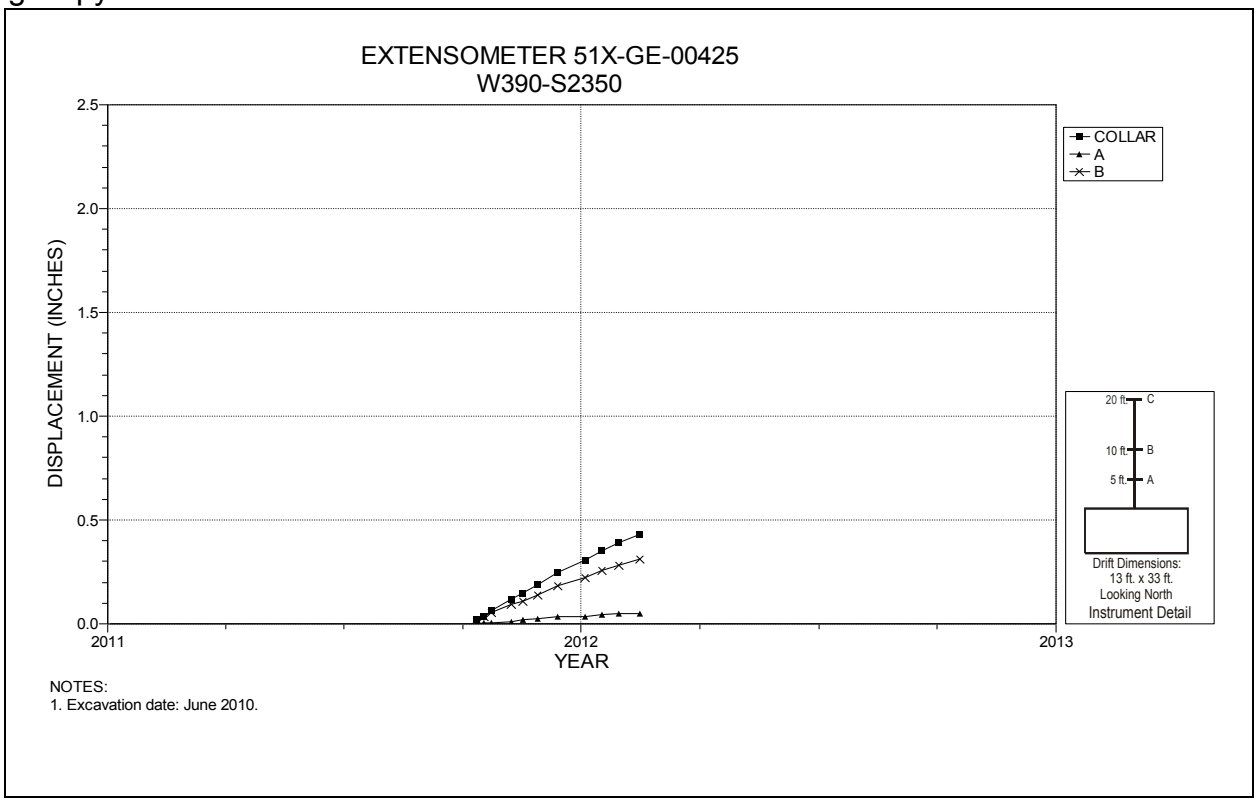


Figure 5-84 Extensometer 51X-GE-00425
W390 S2350 – Roof

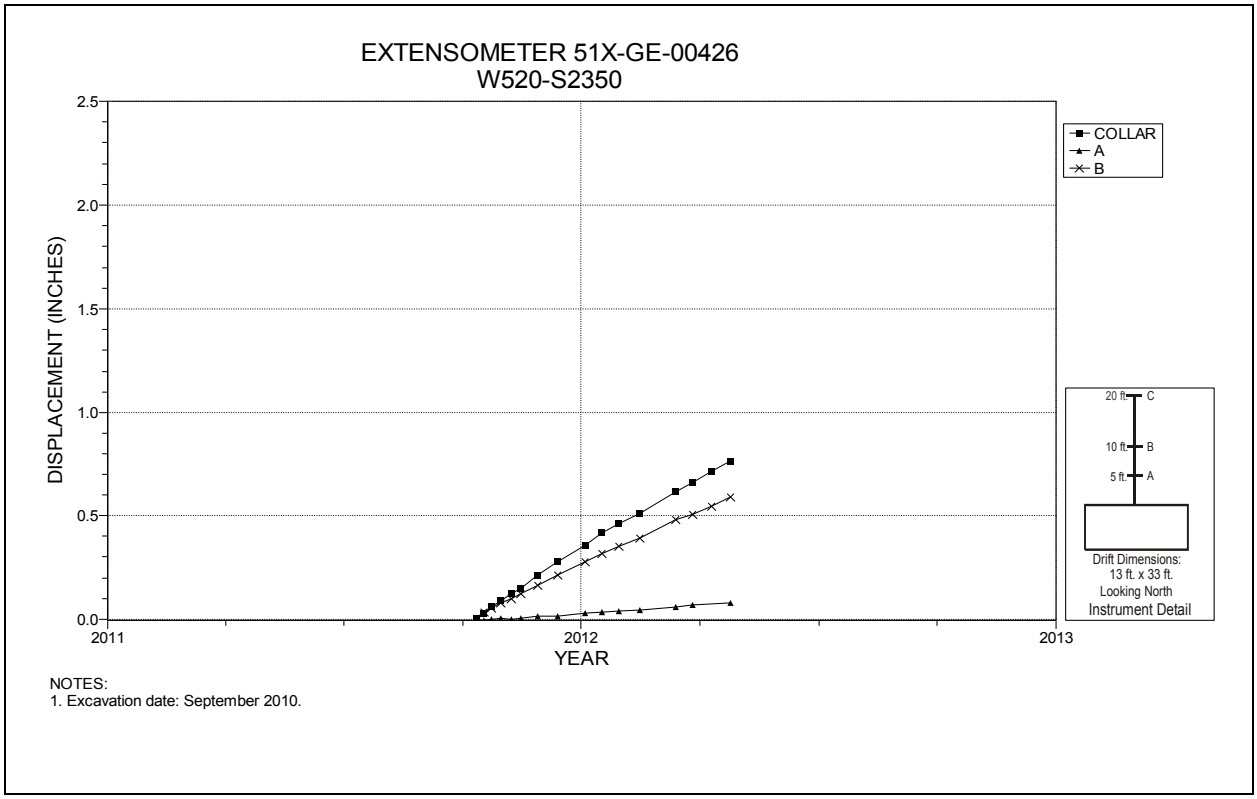


Figure 5-85 Extensometer 51X-GE-00426
W520 S2350 – Roof

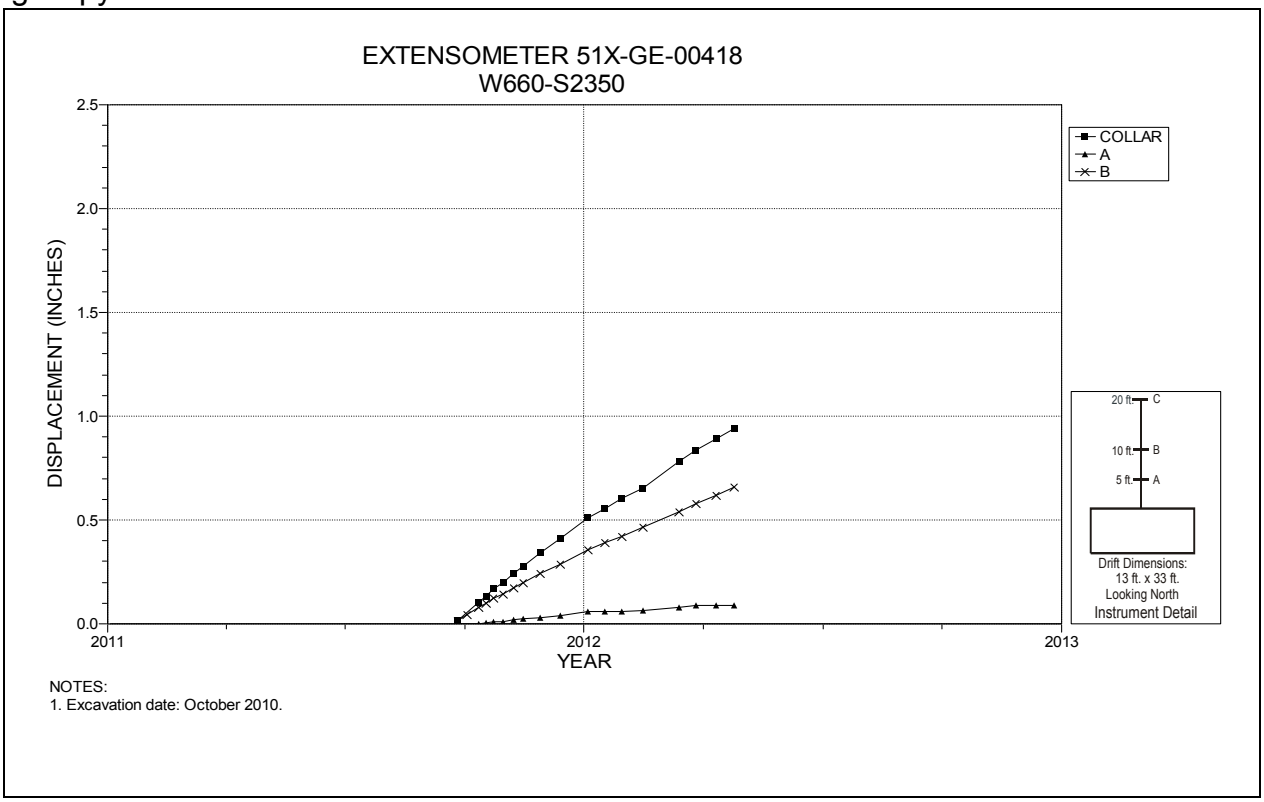


Figure 5-86 Extensometer 51X-GE-00418
W660 S2350 – Roof

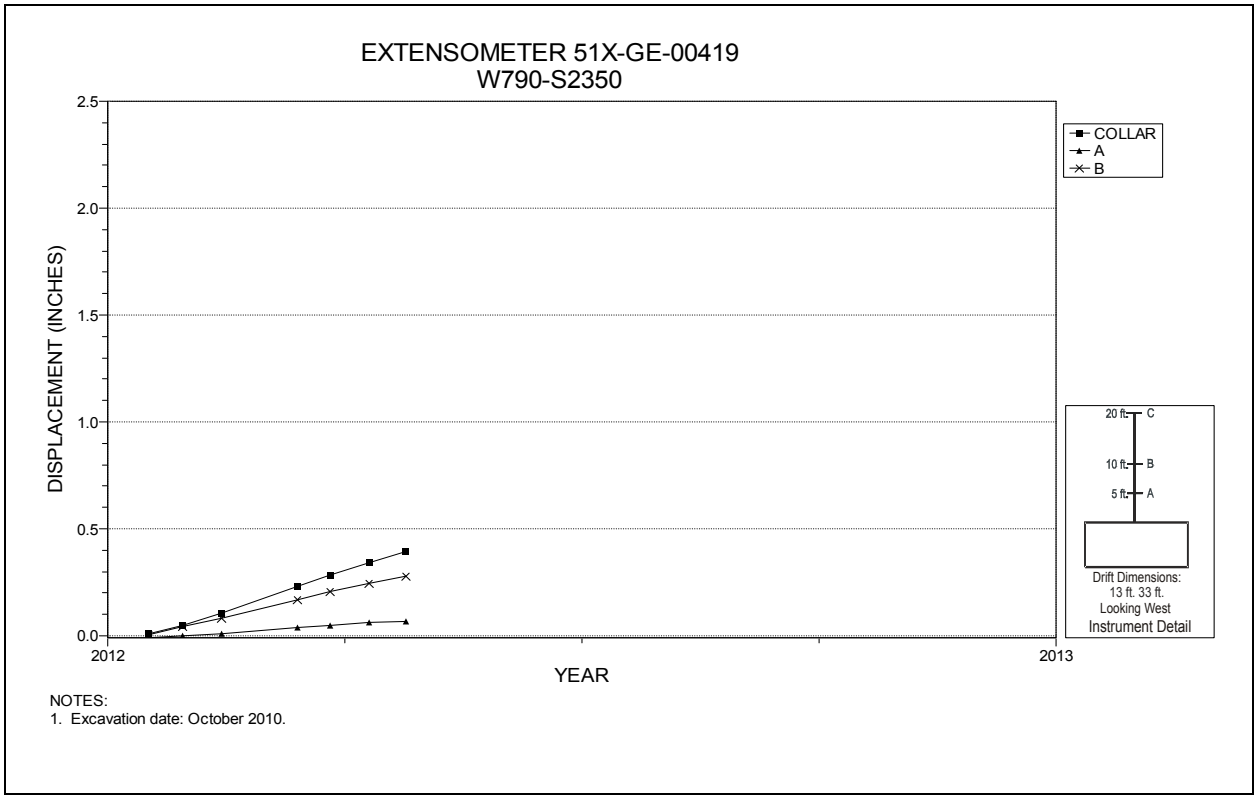
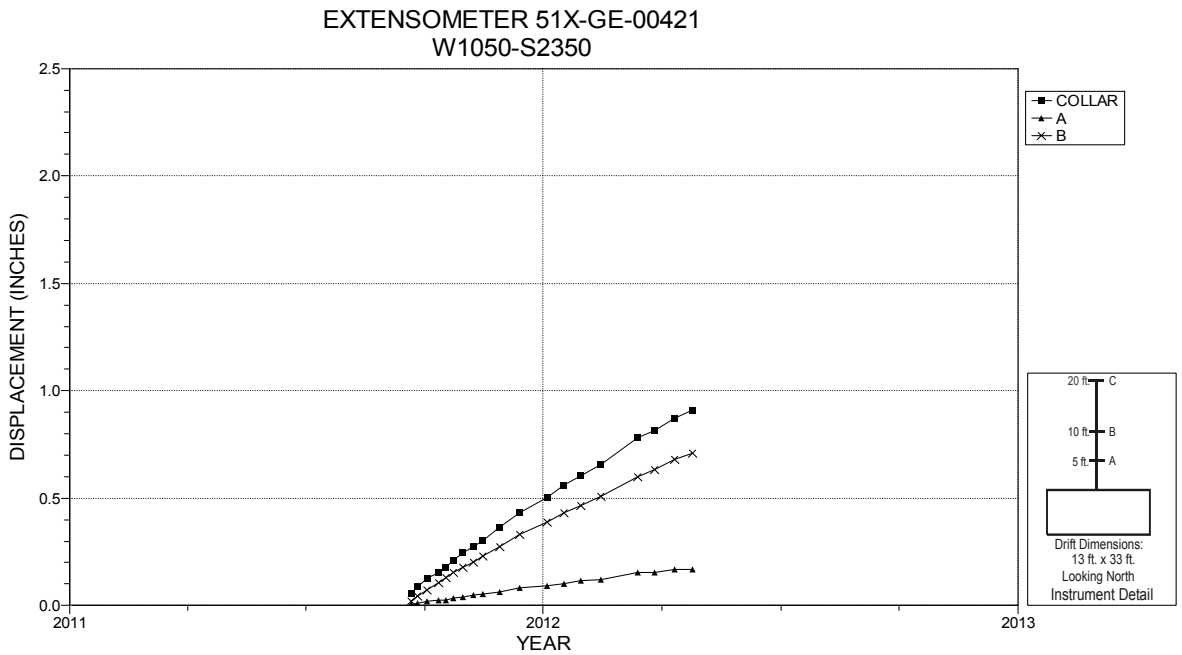
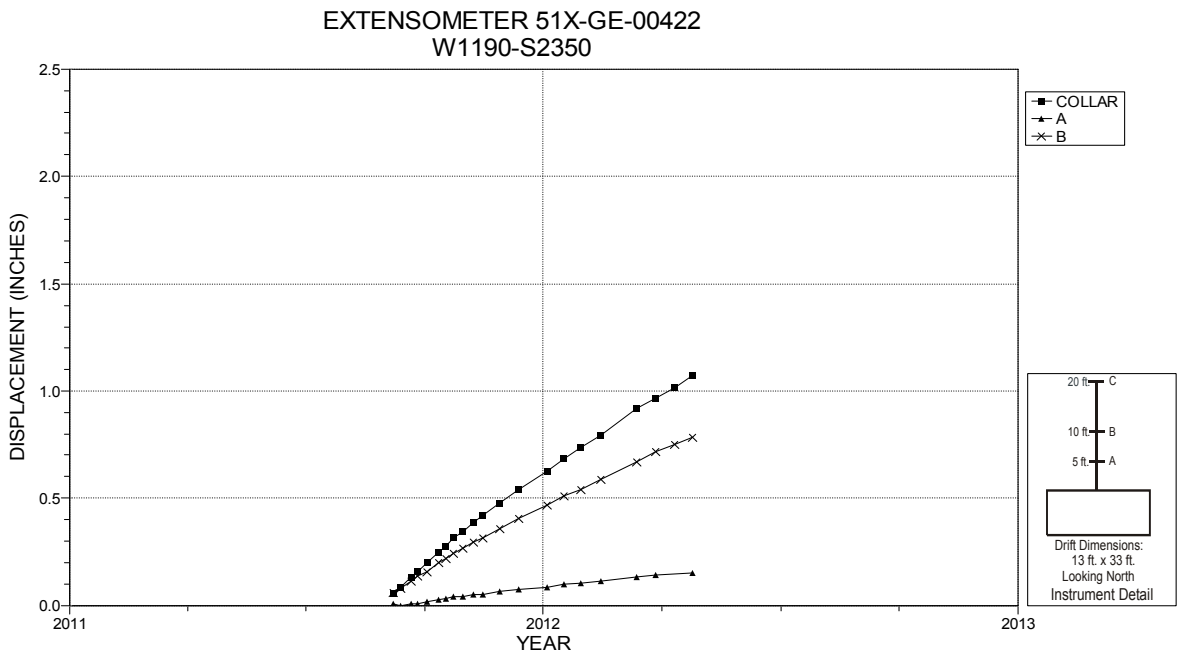


Figure 5-87 Extensometer 51X-GE-00419
W790 S2350 – Roof



NOTES:
1. Excavation date: November 2010.

Figure 5-88 Extensometer 51X-GE-00421
W1050 S2350 – Roof



NOTES:
1. Excavation date: February 2011.

Figure 5-89 Extensometer 51X-GE-00422
W1190 S2350 – Roof

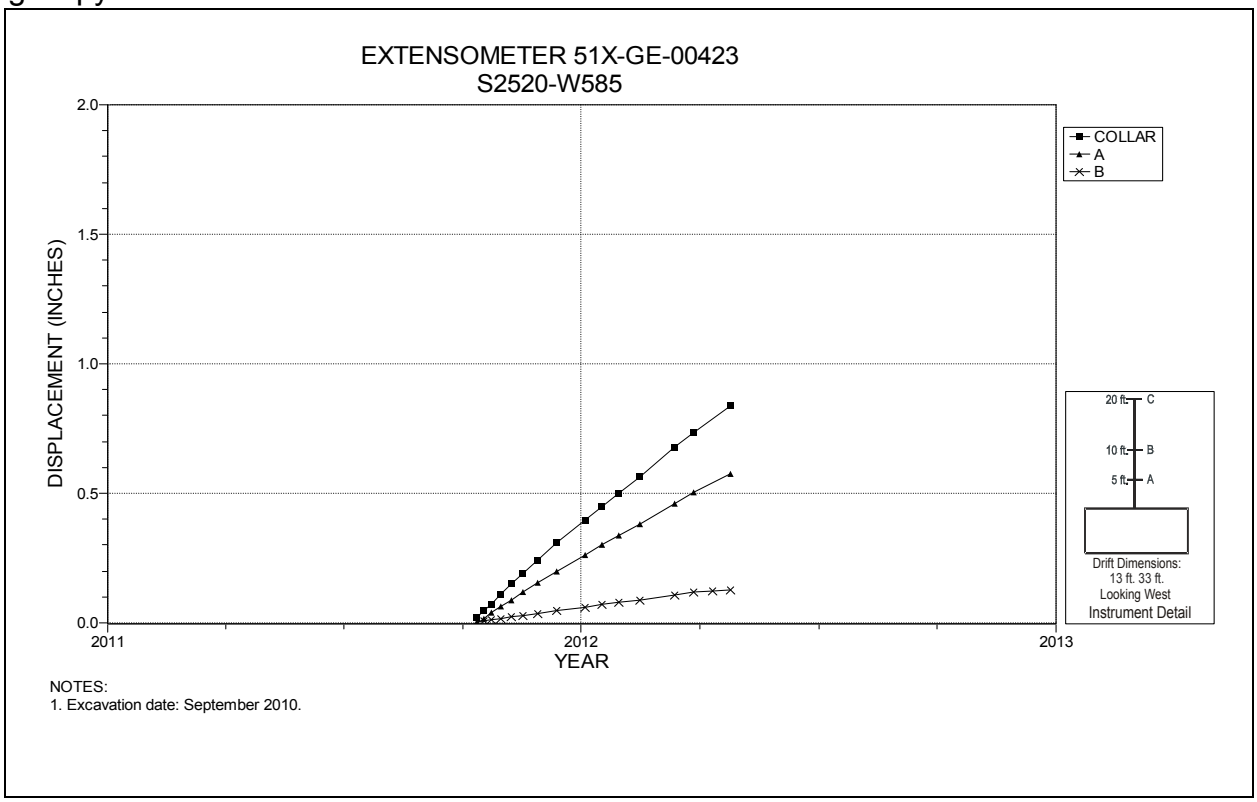


Figure 5-90 Extensometer 51X-GE-00423
S2520 W585 – Roof

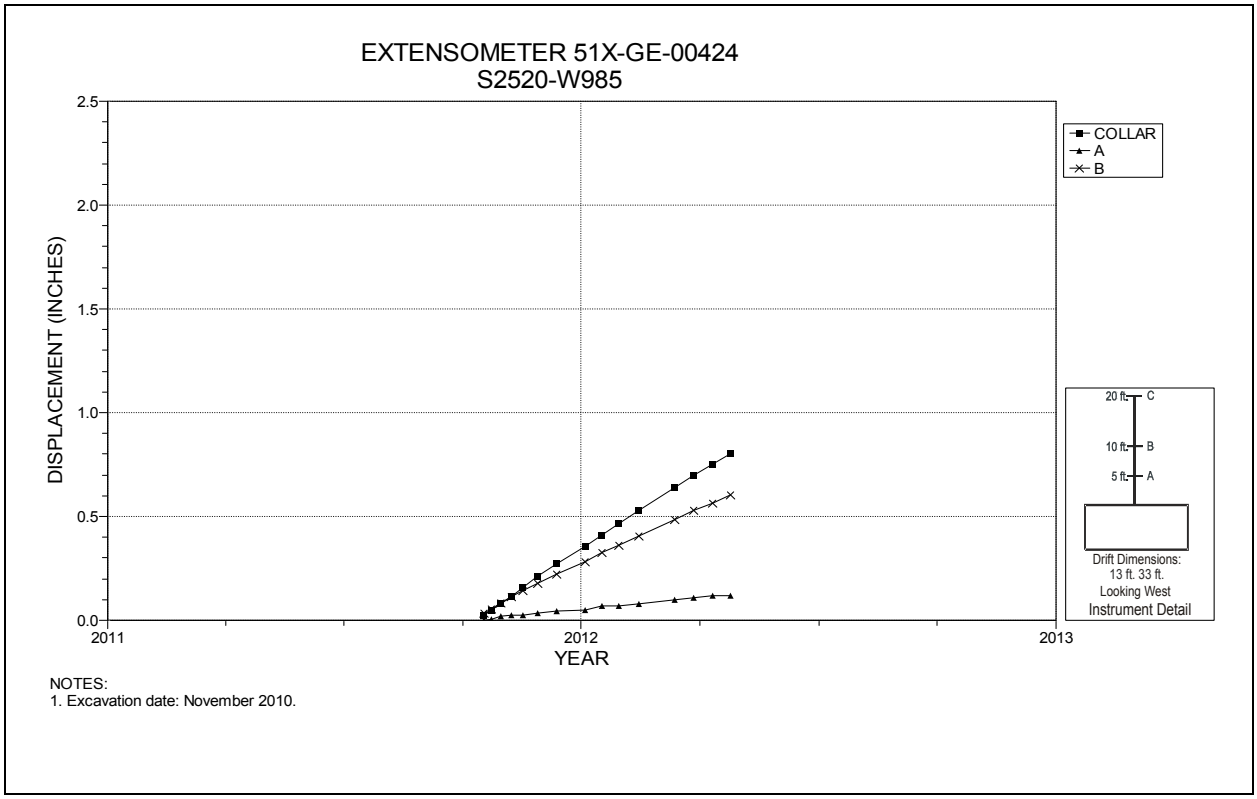


Figure 5-91 Extensometer 51X-GE-00424
S2520 W985 – Roof

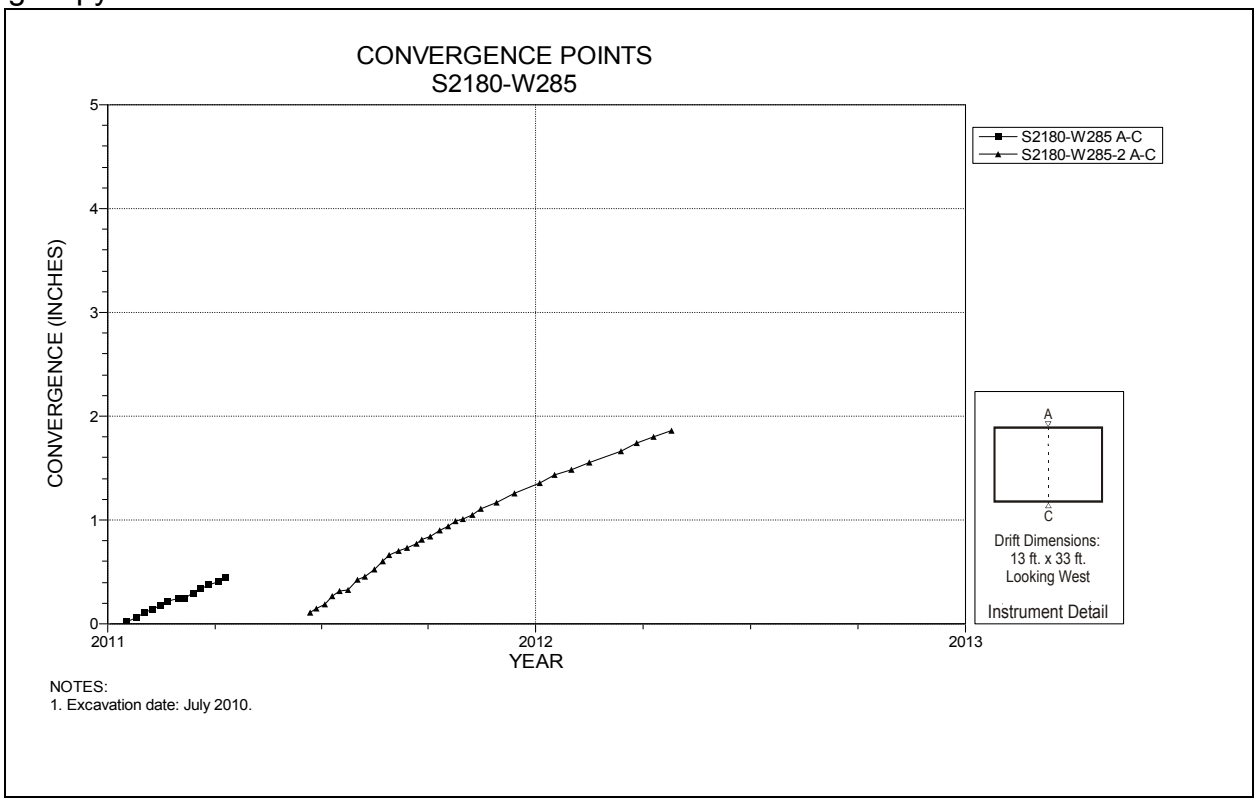


Figure 5-92 Convergence Point Array
S2180 W285 – Roof to Floor

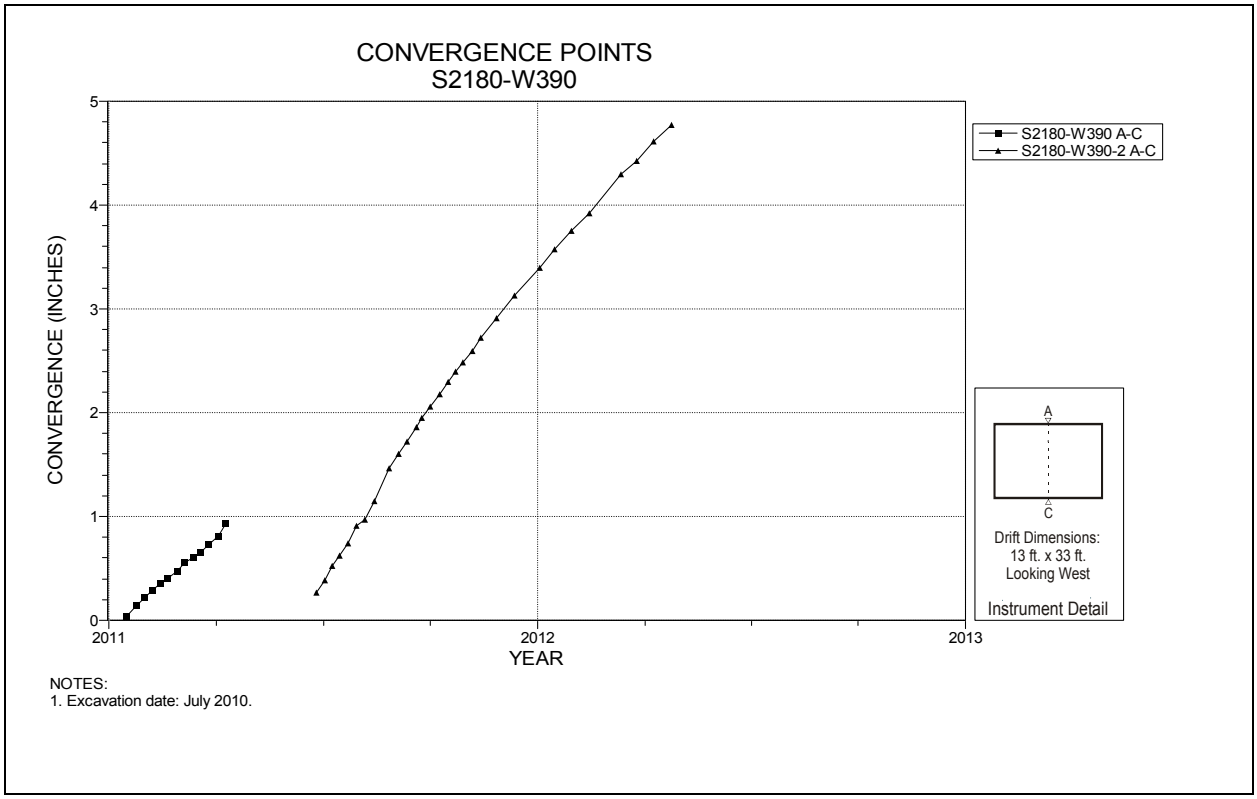


Figure 5-93 Convergence Point Array
S2180 W390 Intersection (Room 1, Panel 7) – Roof to Floor

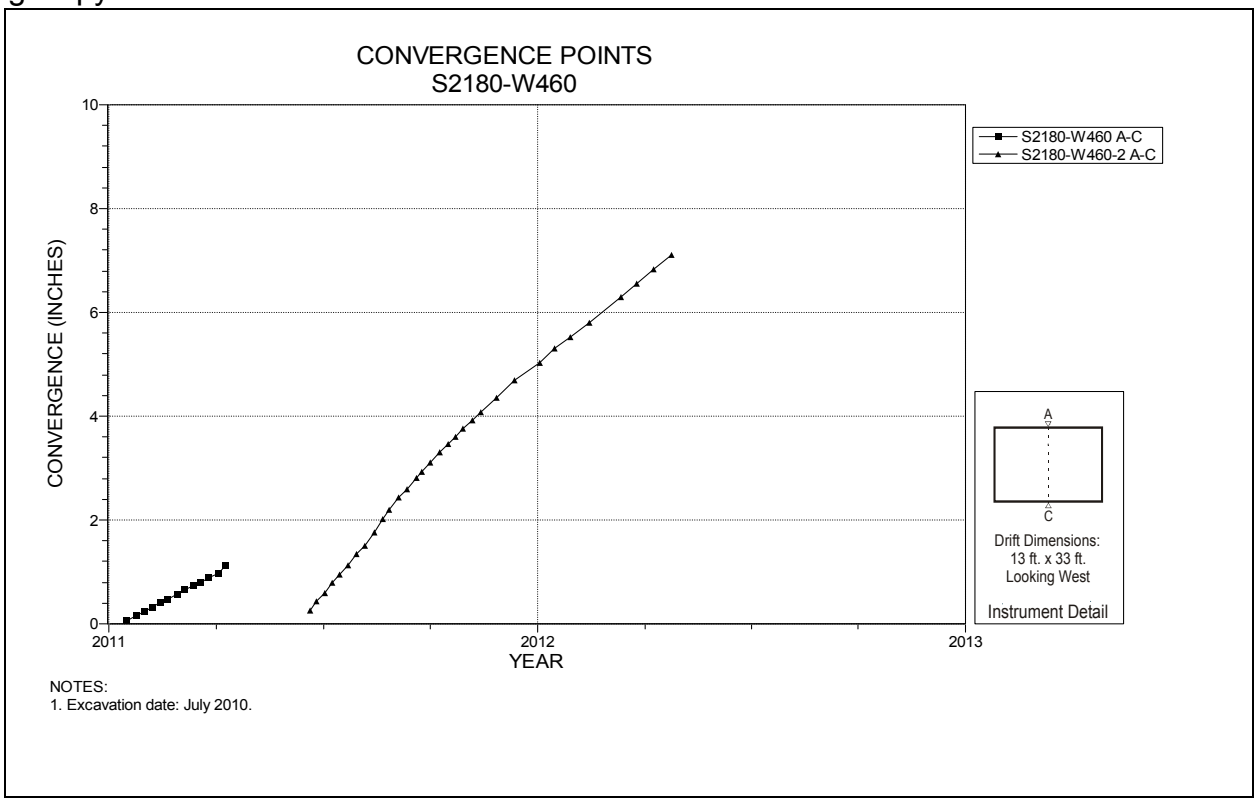


Figure 5-94 Convergence Point Array
S2180 W460 – Roof to Floor

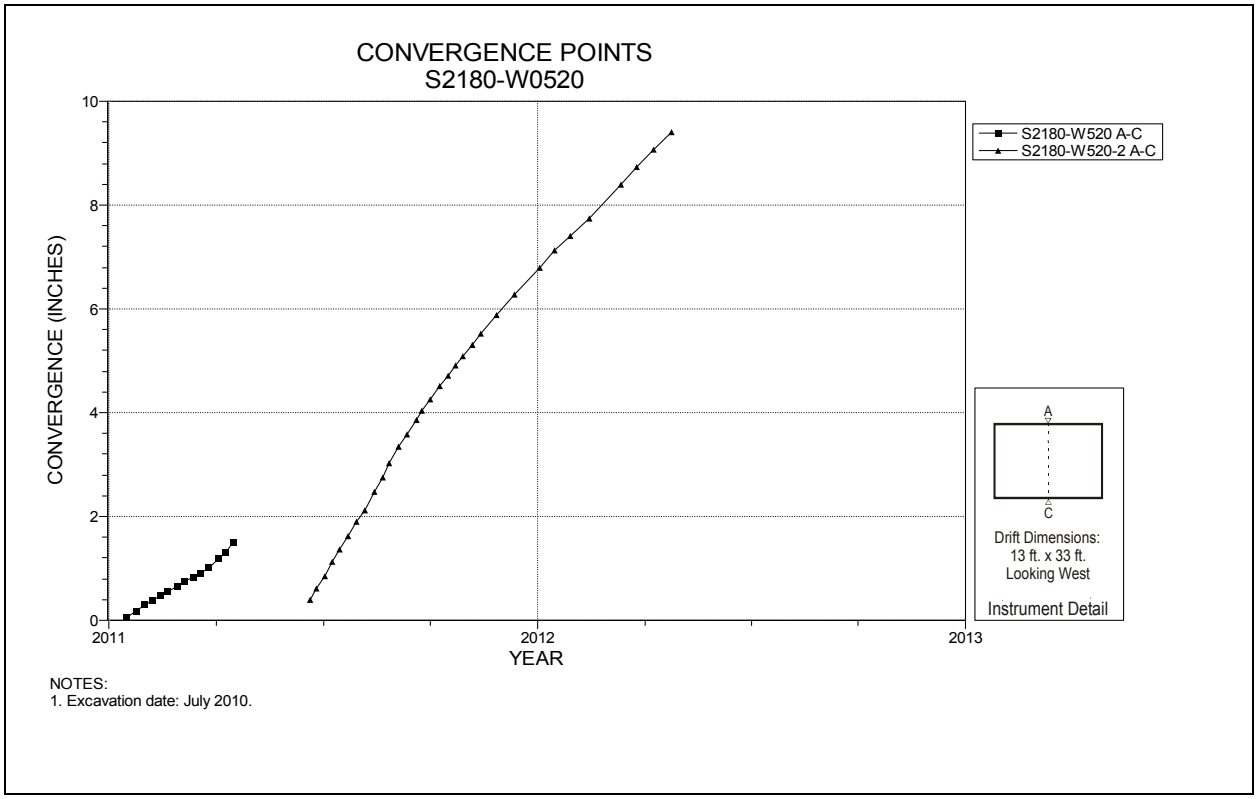


Figure 5-95 Convergence Point Array
S2180 W520 Intersection (Room 2, Panel 7) – Roof to Floor

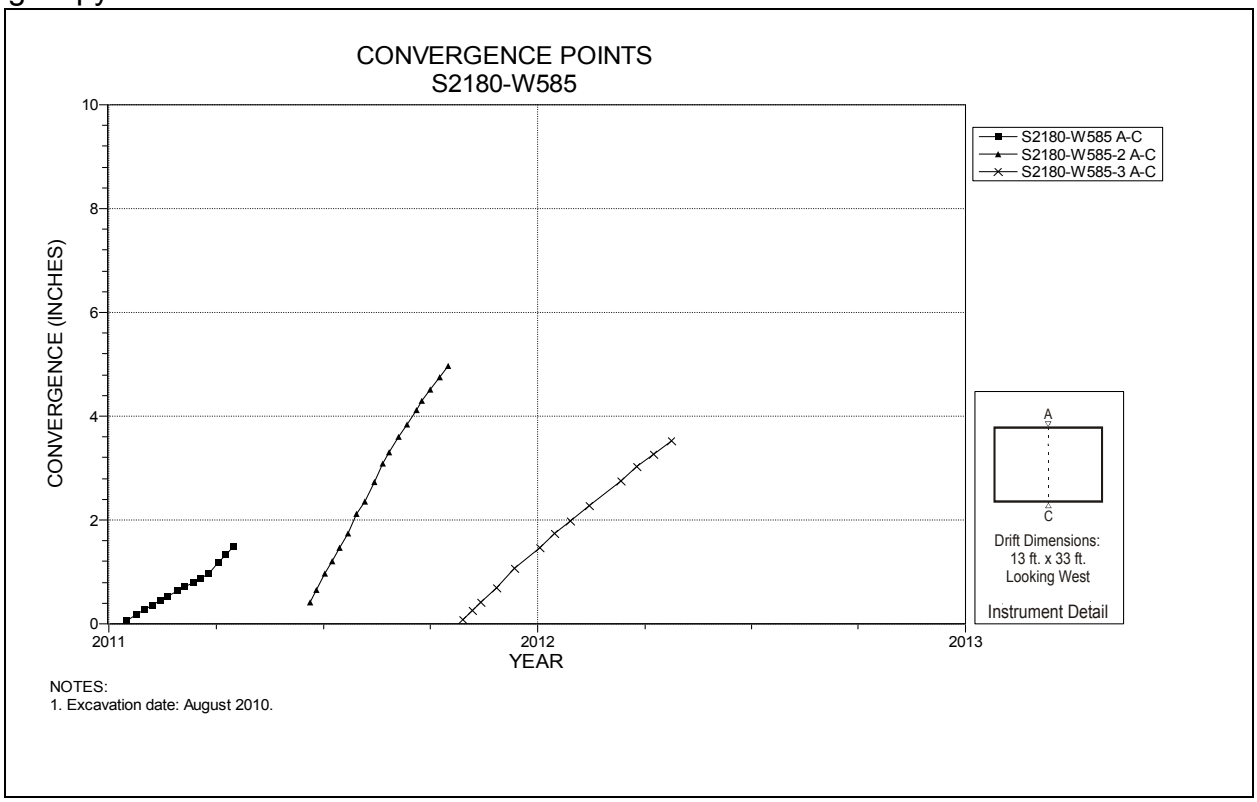


Figure 5-96 Convergence Point Array
S2180 W585 – Roof to Floor

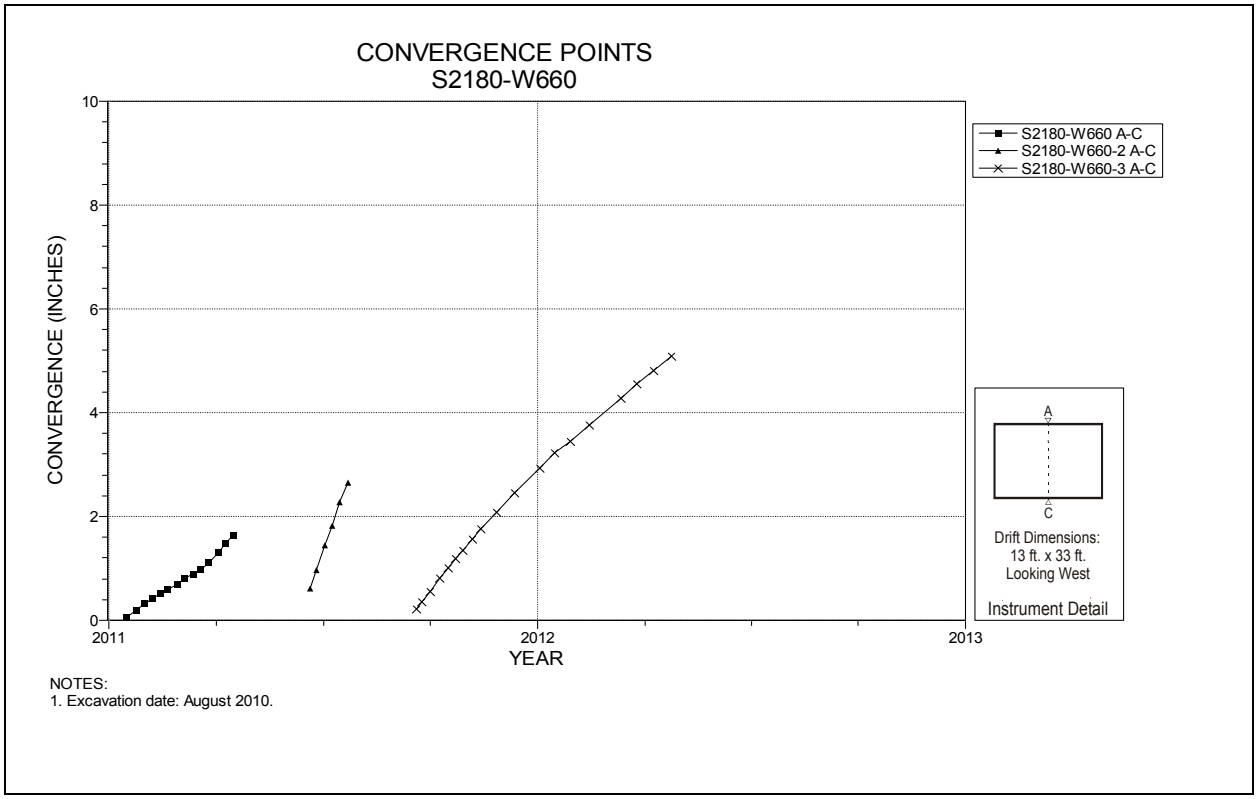


Figure 5-97 Convergence Point Array
S2180 W660 Intersection (Room 3 Panel 7) – Roof to Floor

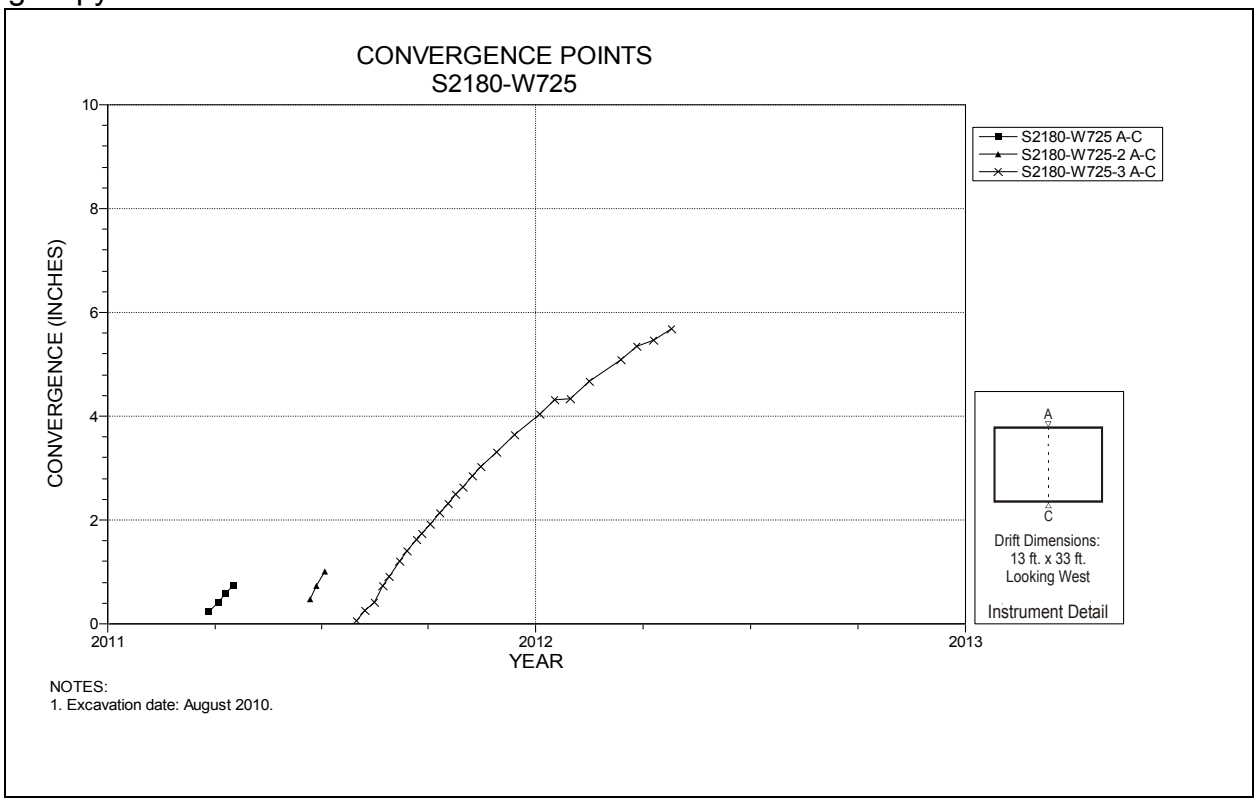


Figure 5-98 Convergence Point Array
S2180 W725 – Roof to Floor

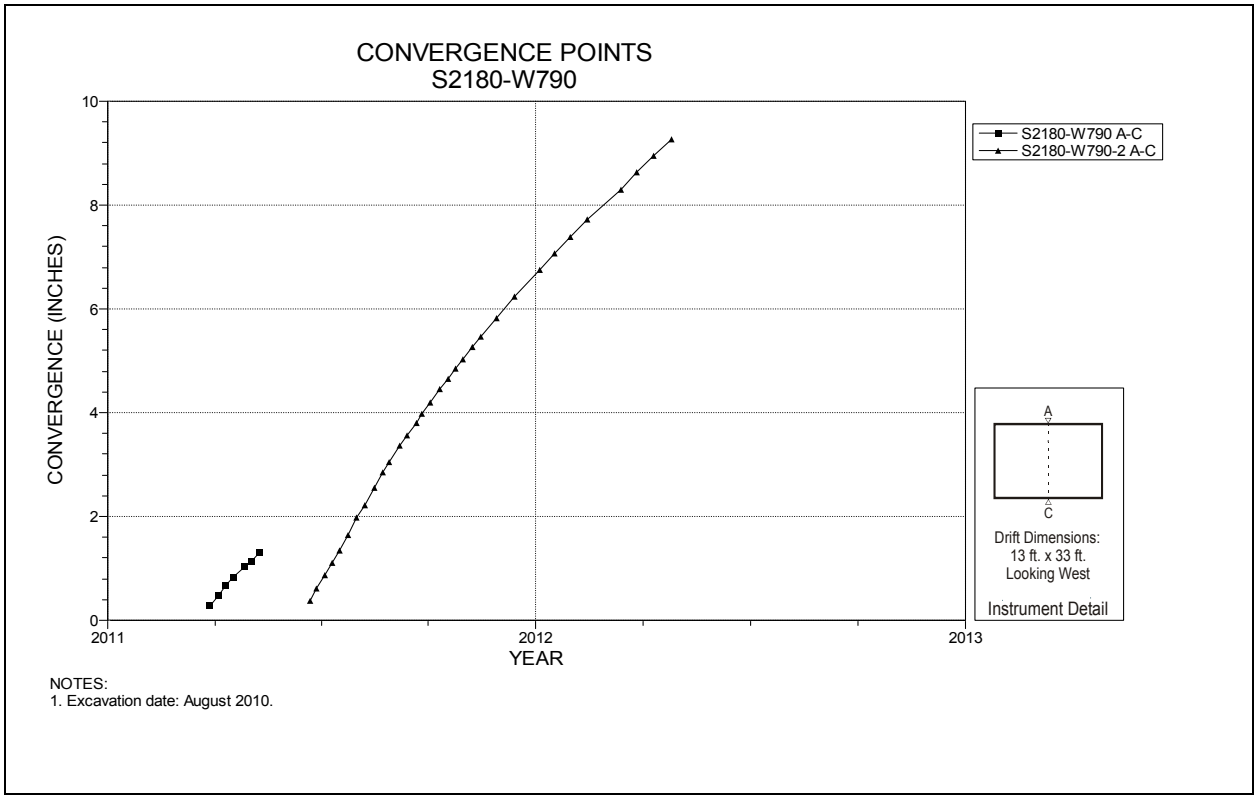


Figure 5-99 Convergence Point Array
S2180 W790 Intersection (Room 4, Panel 7) – Roof to Floor

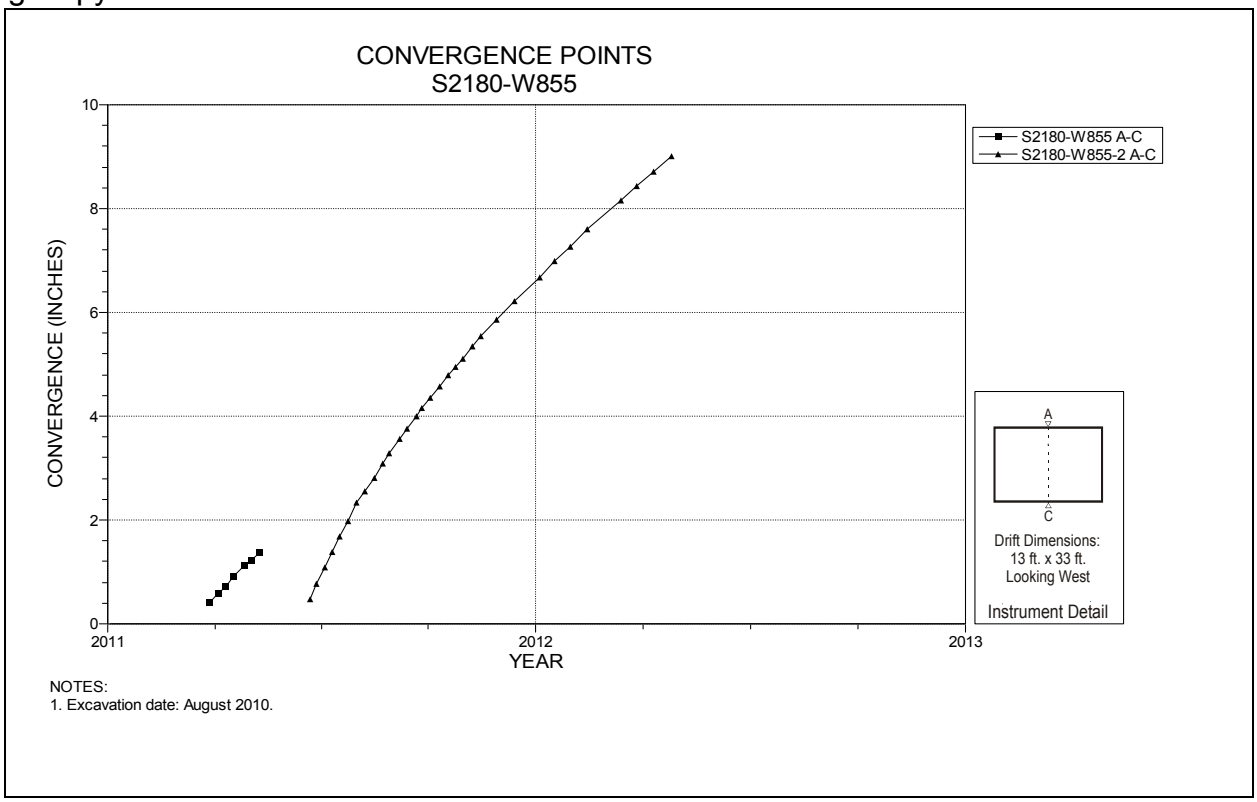


Figure 5-100 Convergence Point Array
S2180 W885 – Roof to Floor

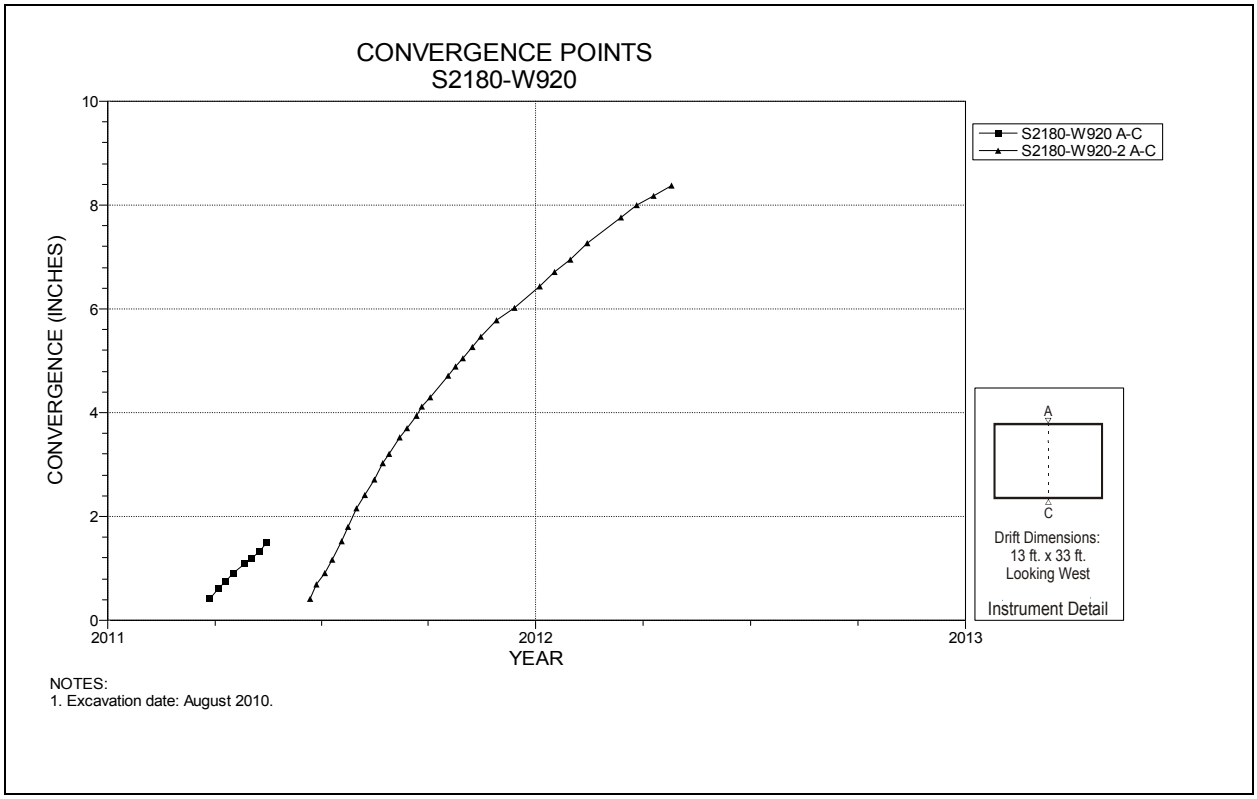


Figure 5-101 Convergence Point Array
S2180 W920 Intersection (Room 5, Panel 7) – Roof to Floor

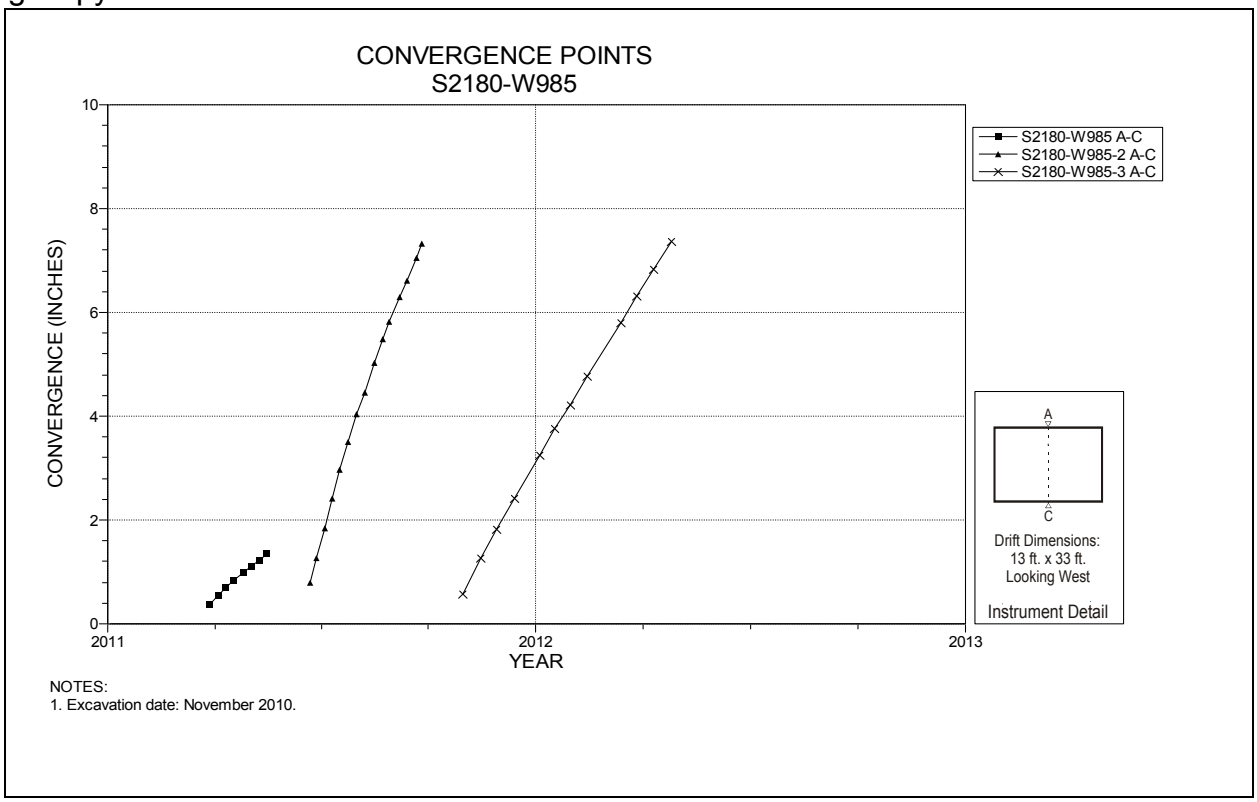


Figure 5-102 Convergence Point Array
S2180 W985 – Roof to Floor

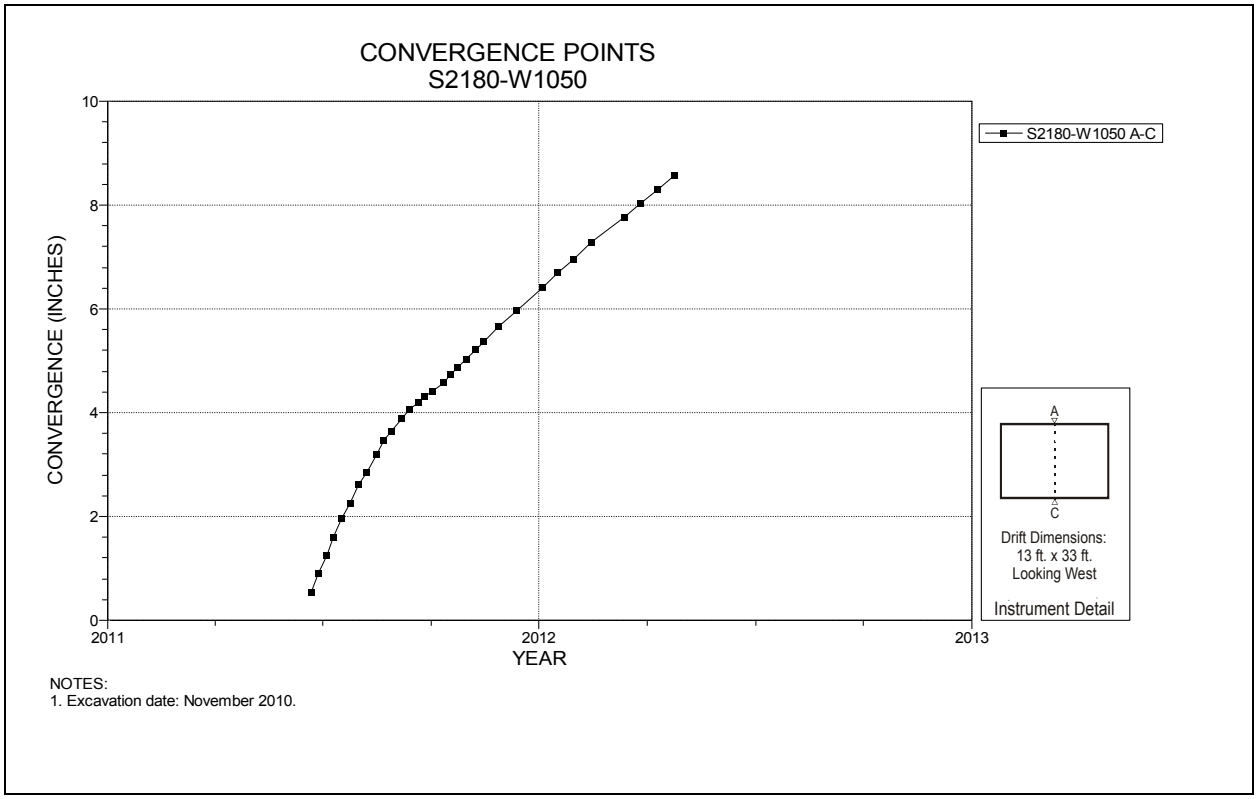


Figure 5-103 Convergence Point Array
S2180 W1050 Intersection (Room 6, Panel 7) – Roof to Floor

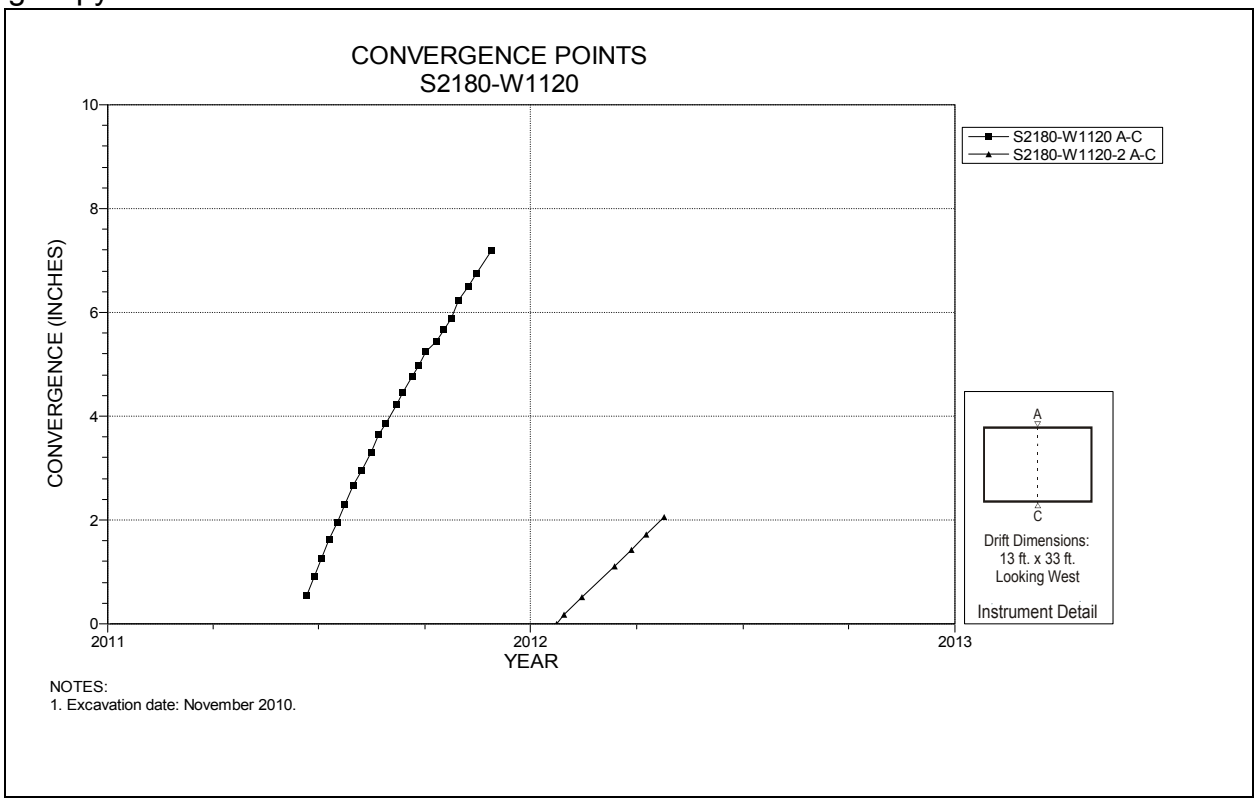


Figure 5-104 Convergence Point Array
S2180 W1120 – Roof to Floor

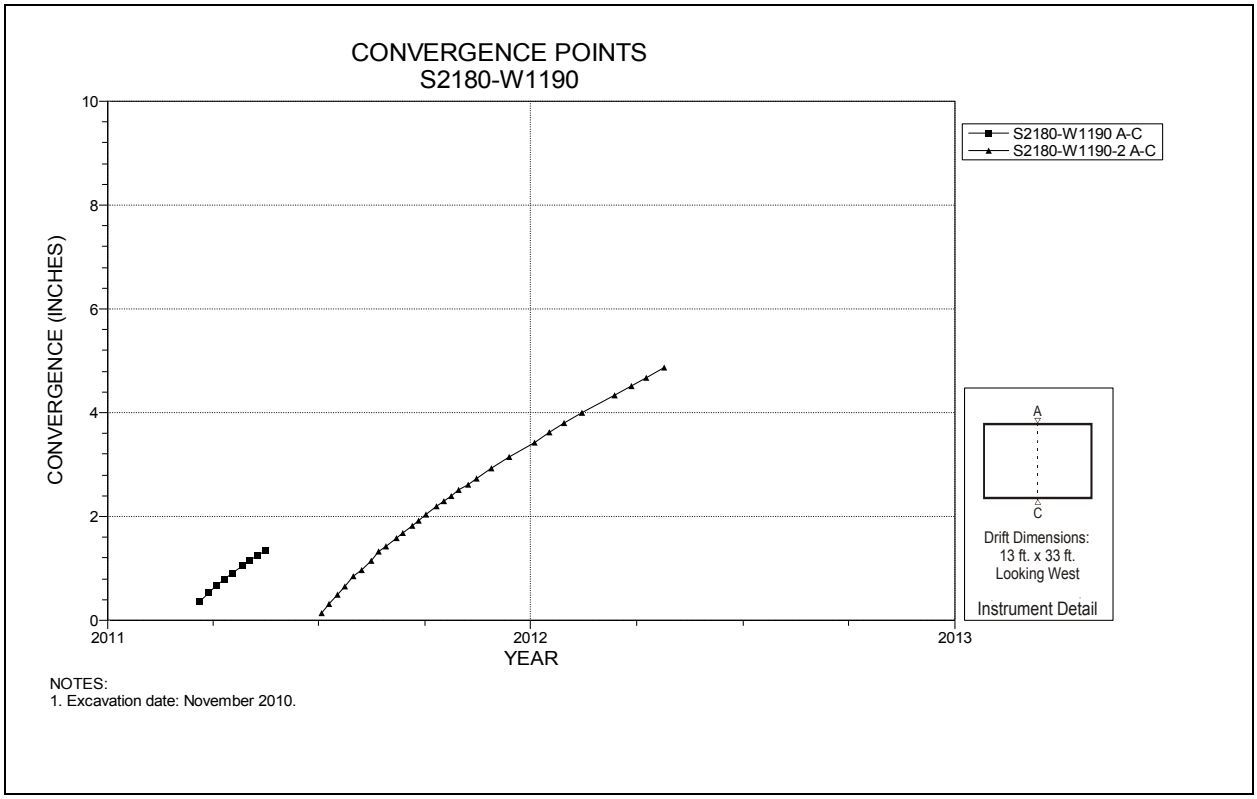


Figure 5-104a Convergence Point Array
S2180 W1190 Intersection (Room 7, Panel 7) – Roof to Floor

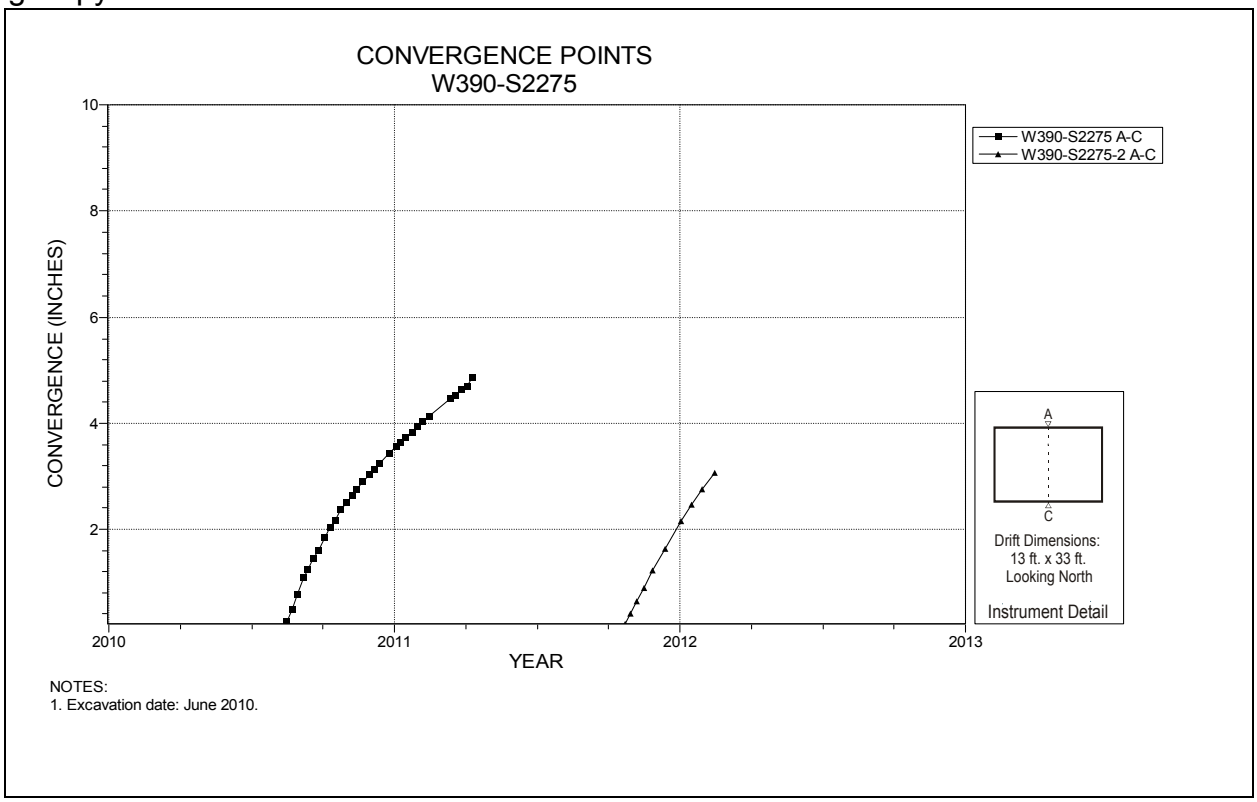


Figure 5-105 Convergence Point Array
Room 1, Panel 7 at W390 S2275 – Roof to Floor

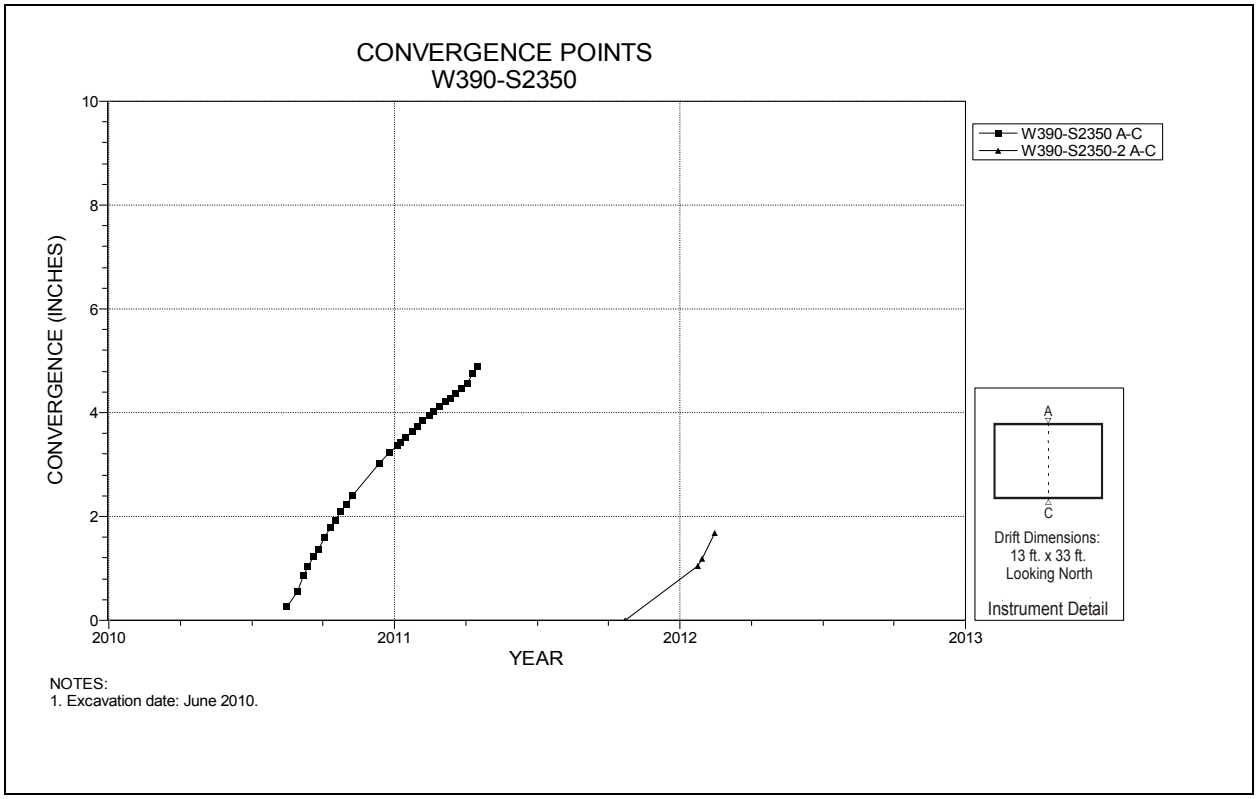


Figure 5-106 Convergence Point Array
Room 1, Panel 7 at W390 S2350– Room Center – Roof to Floor

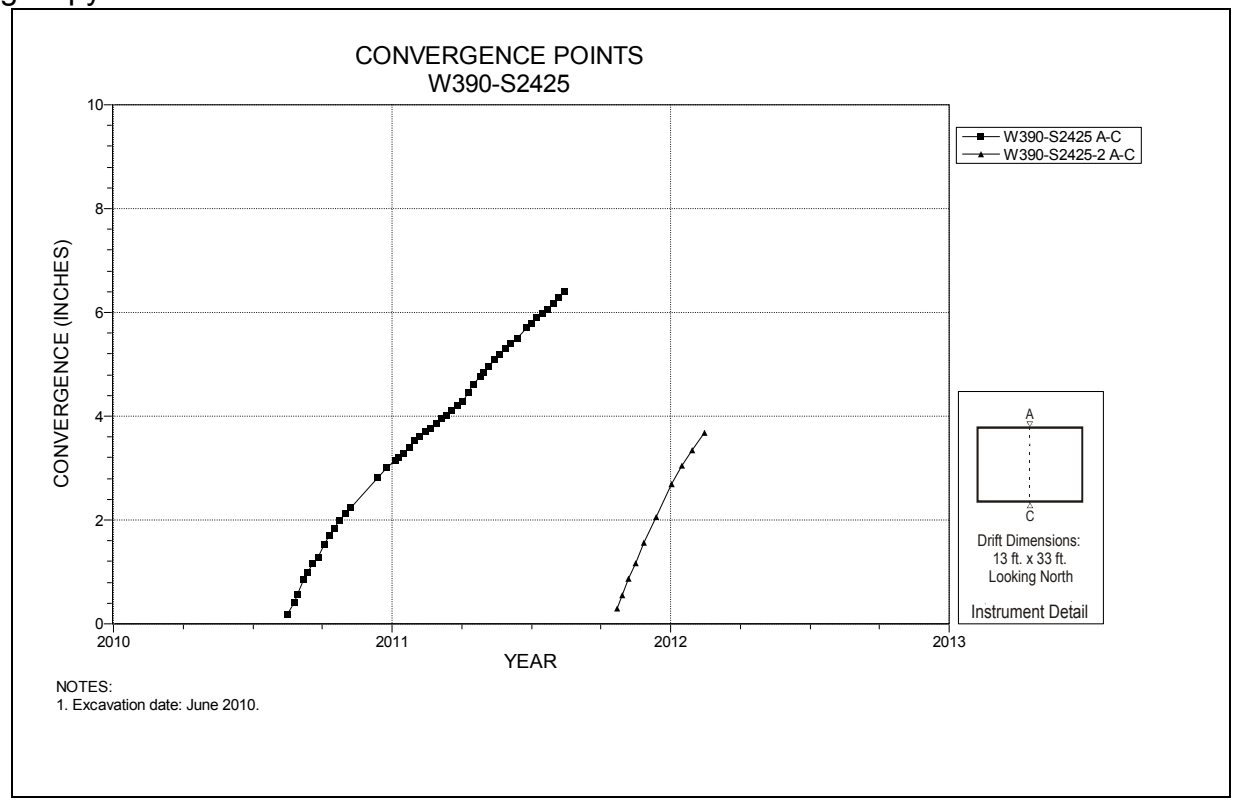


Figure 5-107 Convergence Point Array
Room 1, Panel 7 at W390 S2425 – Roof to Floor

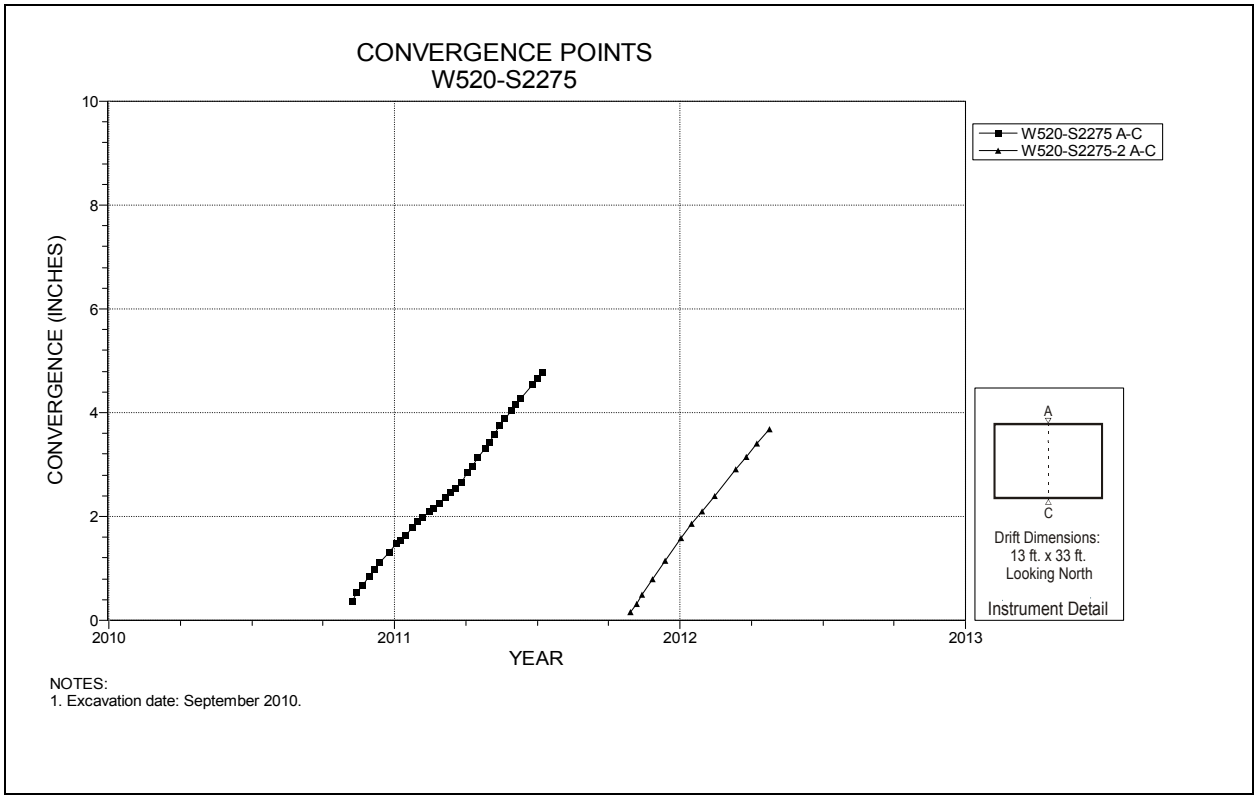


Figure 5-108 Convergence Point Array
Room 2, Panel 7 at W520 S2275 – Roof to Floor

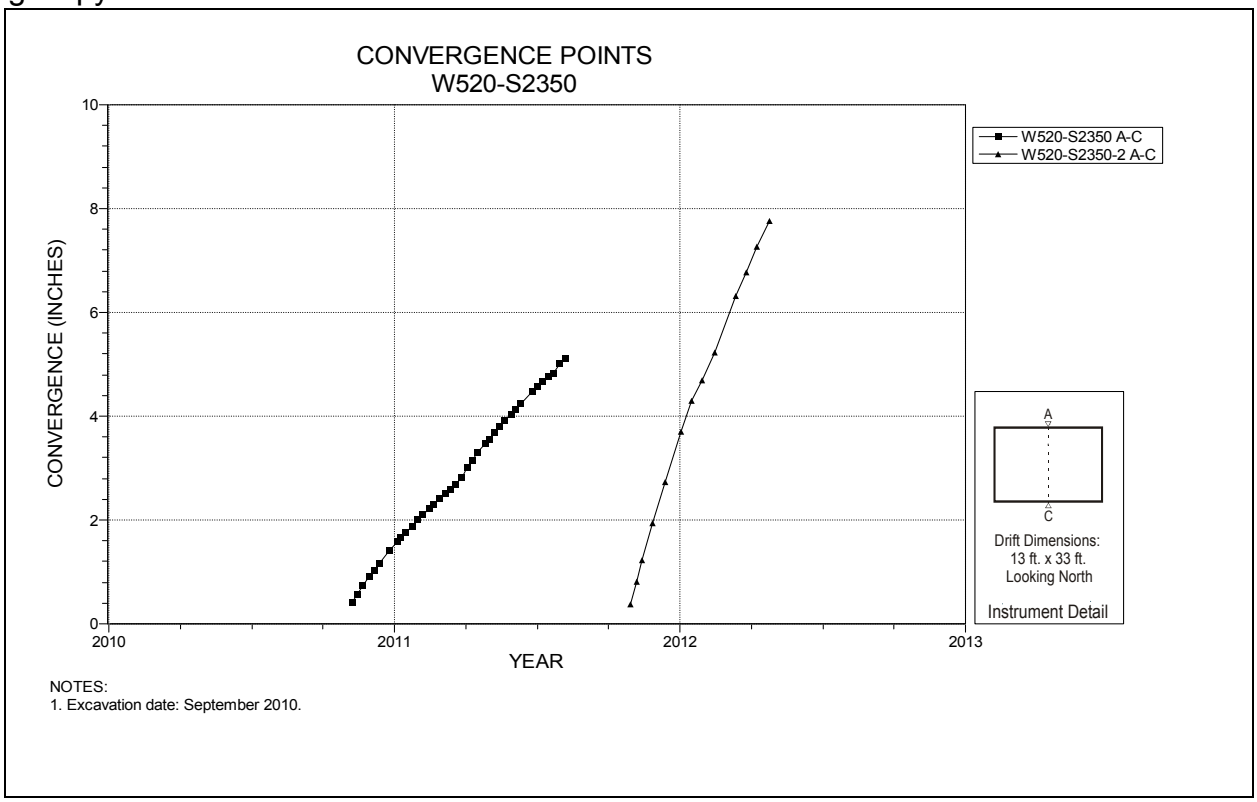


Figure 5-109 Convergence Point Array
Room 2, Panel 7 at W520 S2350– Room Center – Roof to Floor

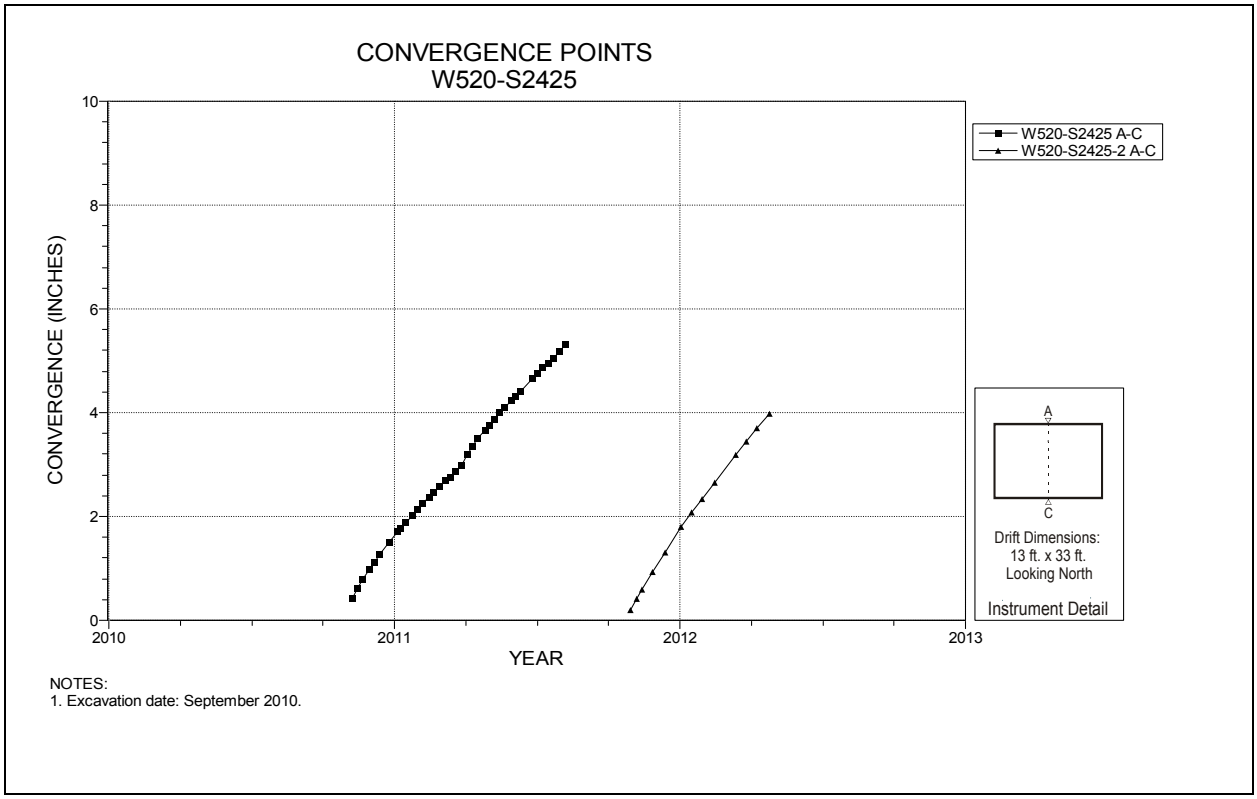


Figure 5-110 Convergence Point Array
Room 2, Panel 7 at W520 S2425 – Roof to Floor

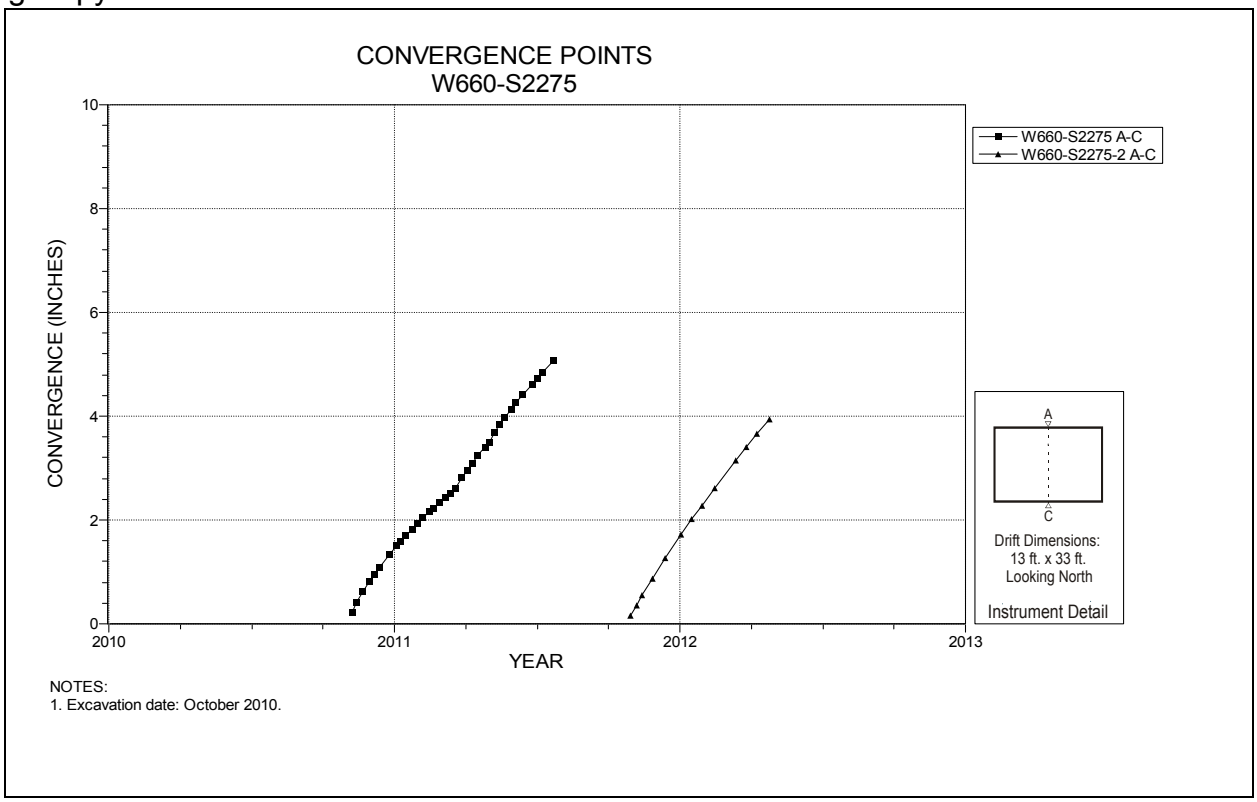


Figure 5-111 Convergence Point Array
Room 3, Panel 7 at W660 S2275 – Roof to Floor

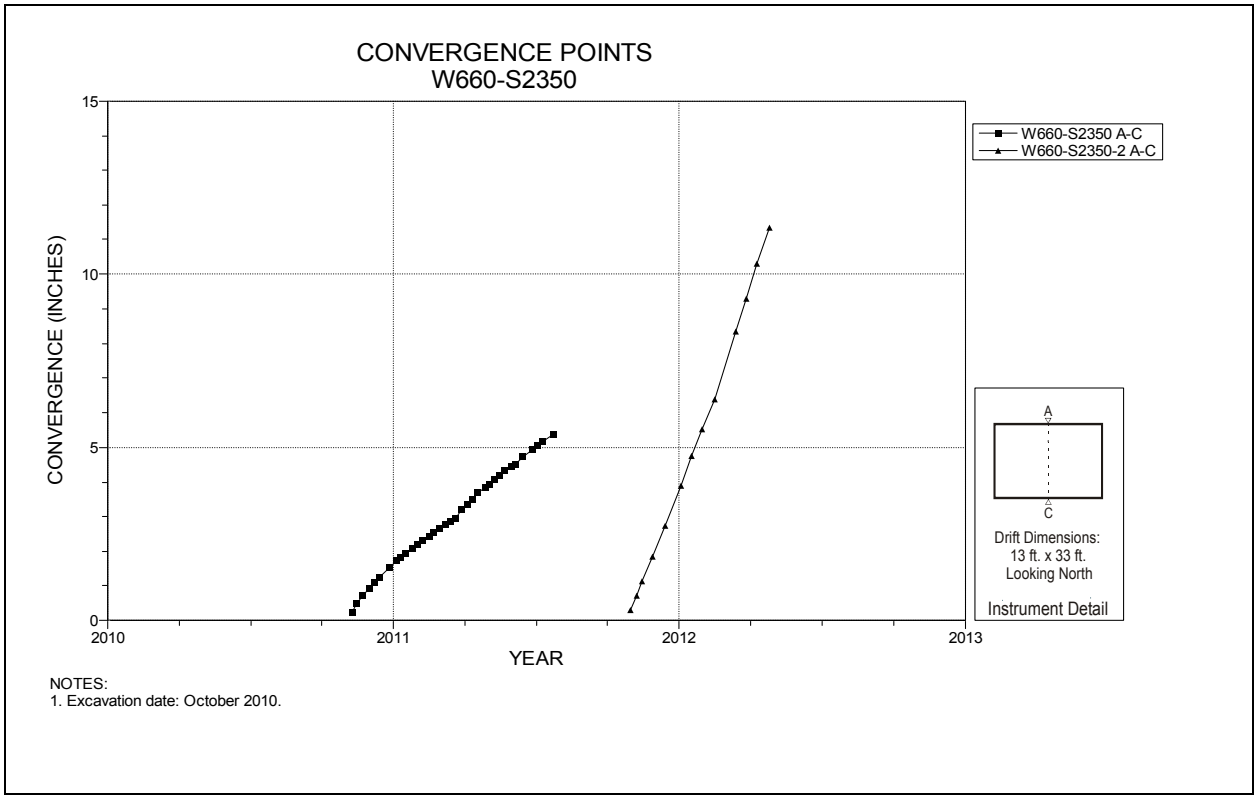
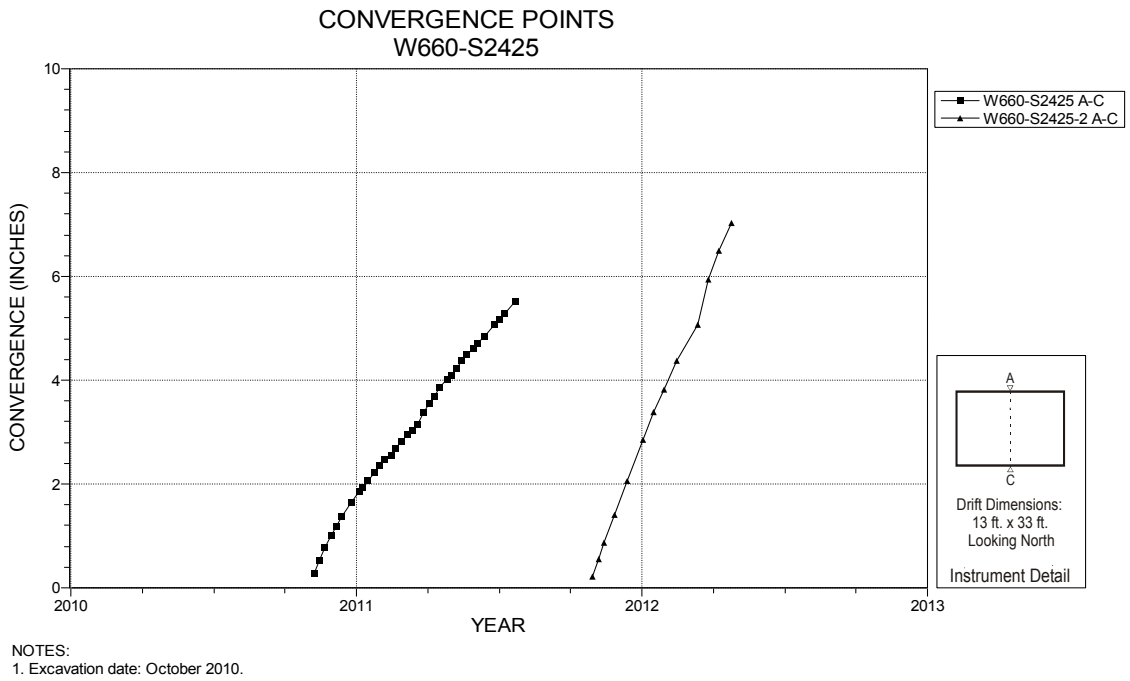
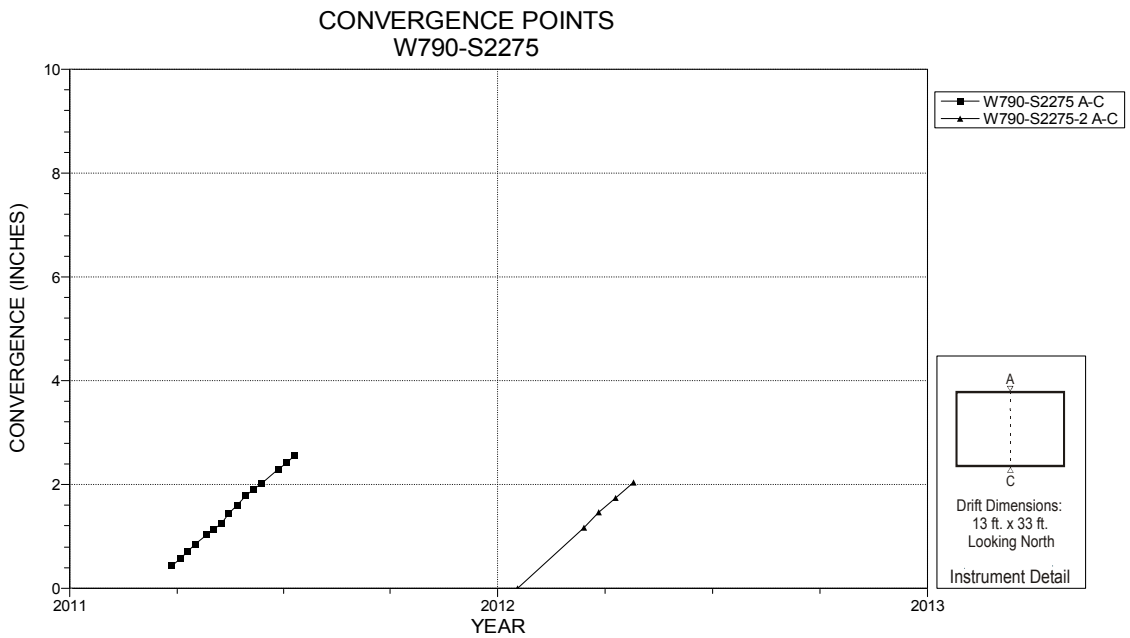


Figure 5-112 Convergence Point Array
Room 3, Panel 7 at W660 S2350– Room Center – Roof to Floor



NOTES:
1. Excavation date: October 2010.

Figure 5-113 Convergence Point Array
Room 3, Panel 7 at W660 S2425 – Roof to Floor



NOTES:
1. Excavation date: October 2010.

Figure 5-114 Convergence Point Array
Room 4, Panel 7 at W790 S2275 – Roof to Floor

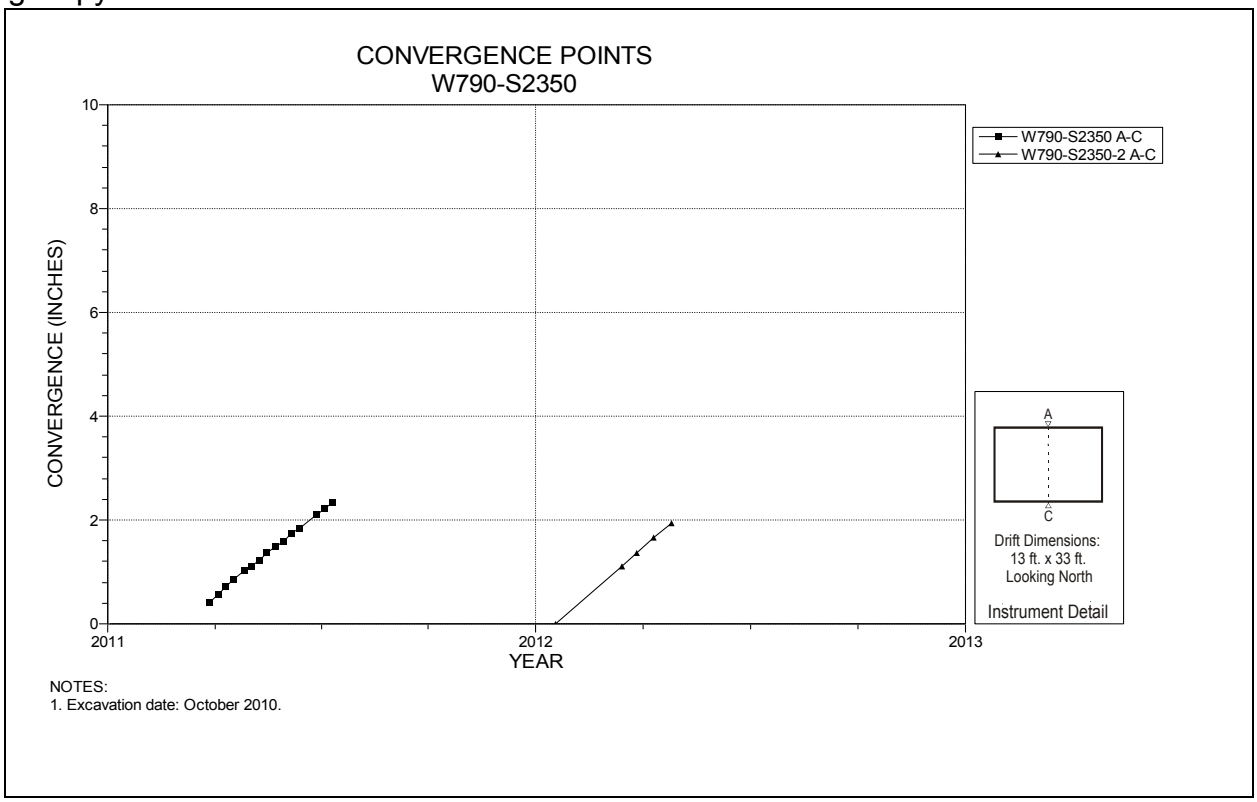


Figure 5-115 Convergence Point Array
Room 4, Panel 7 at W790 S2350– Room Center – Roof to Floor

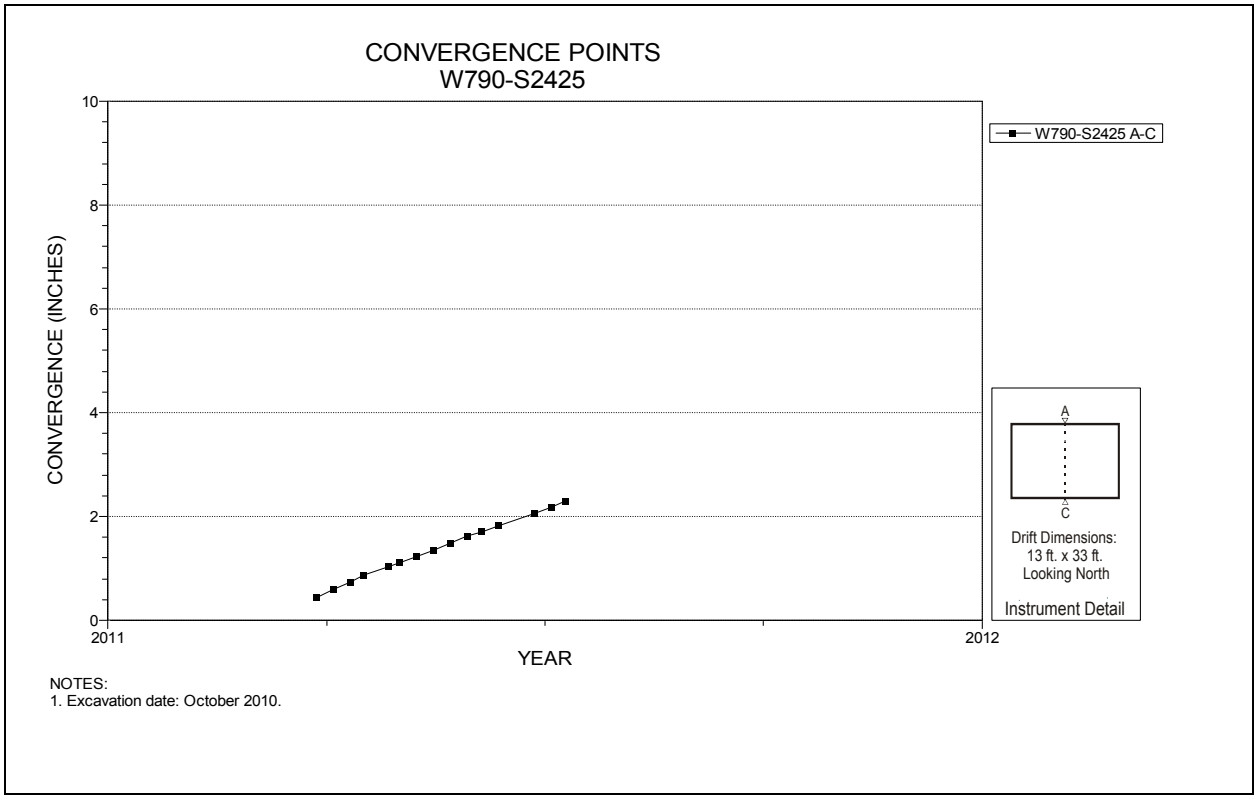


Figure 5-116 Convergence Point Array
Room 4, Panel 7 at W790 S2425 – Roof to Floor

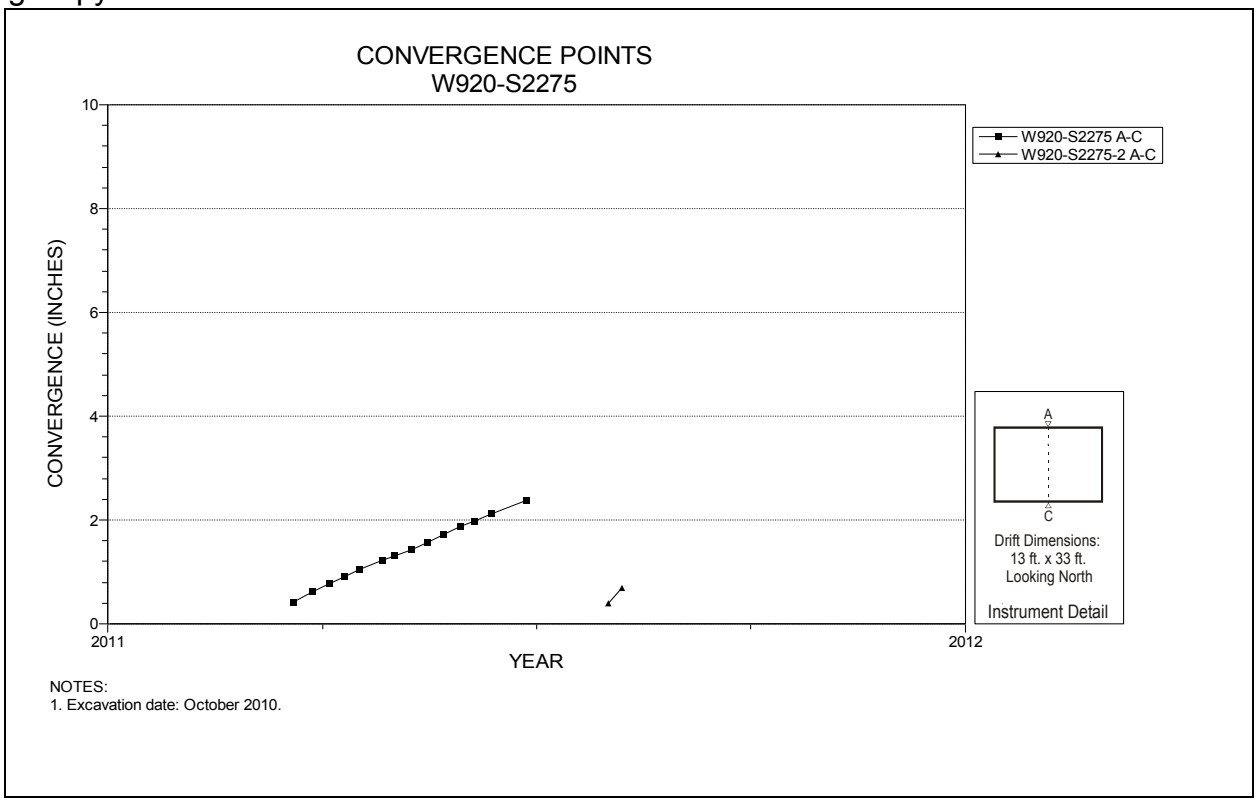


Figure 5-117 Convergence Point Array
Room 5, Panel 7 at W920 S2275 – Roof to Floor

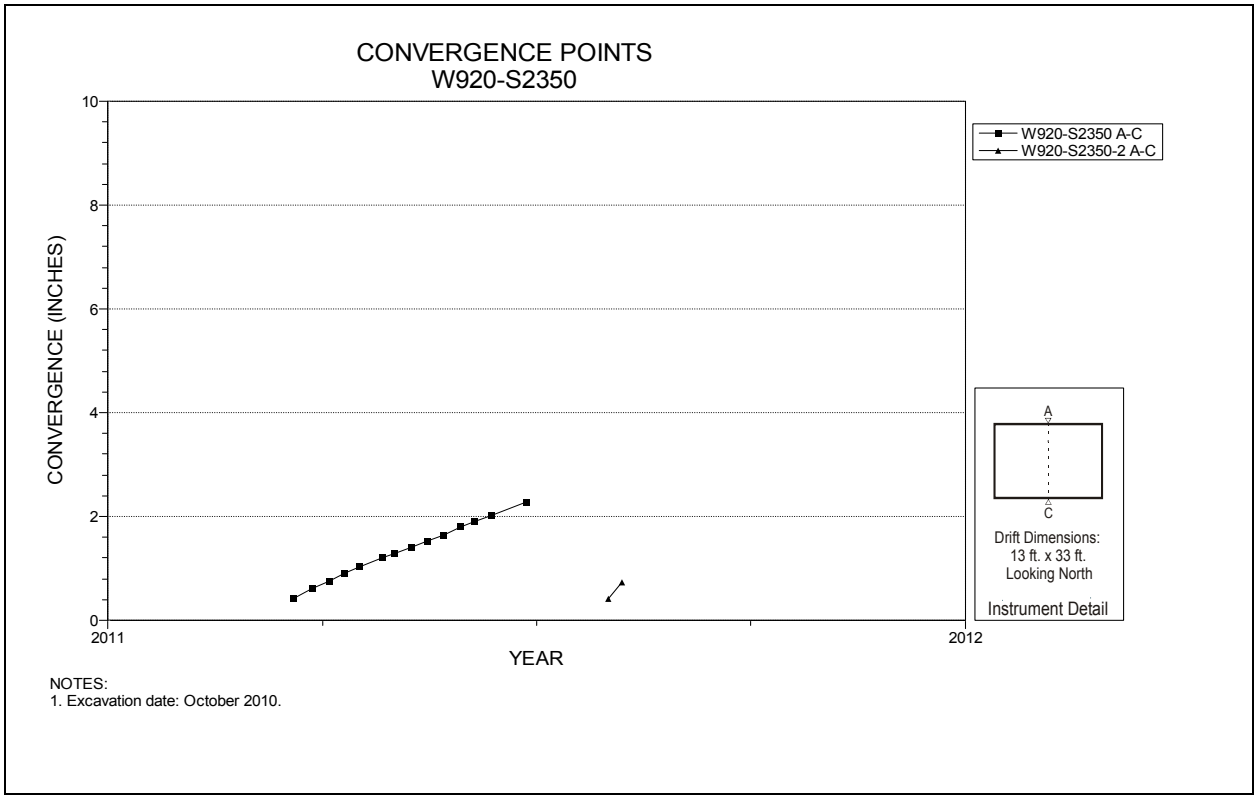


Figure 5-118 Convergence Point Array
Room 5, Panel 7 at W920 S2350– Room Center – Roof to Floor

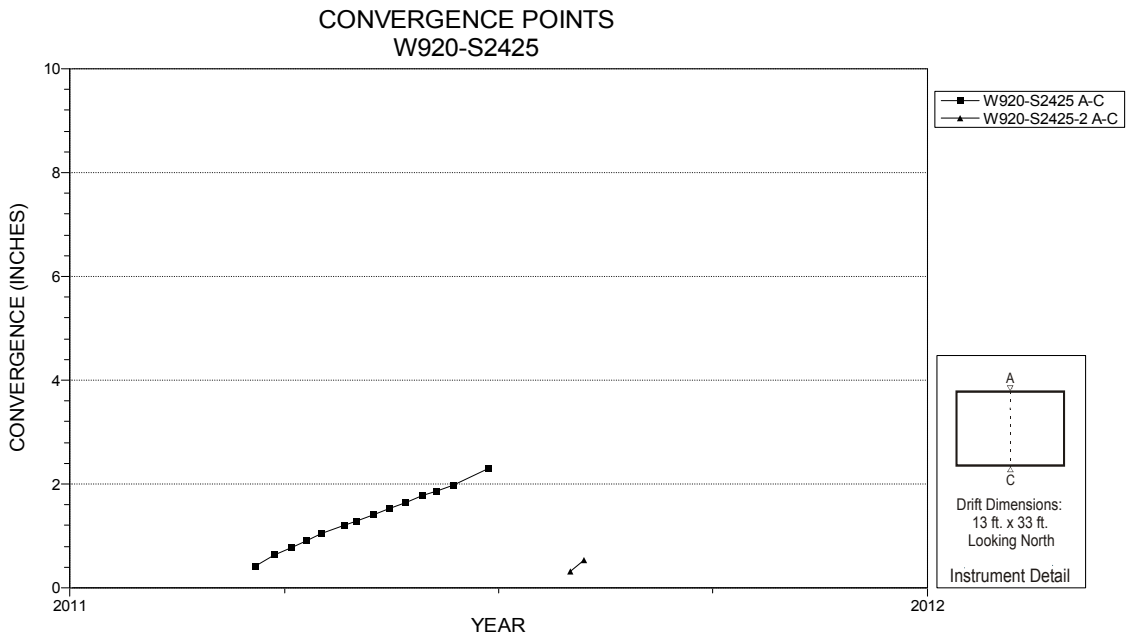


Figure 5-119 Convergence Point Array
Room 5, Panel 7 at W920 S2425 – Roof to Floor

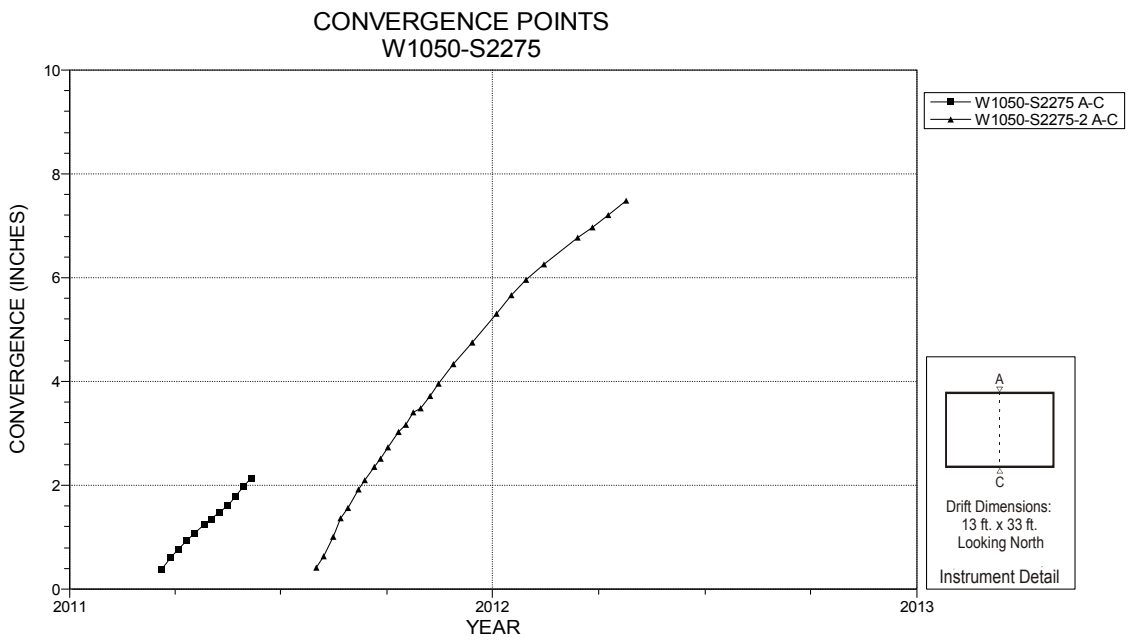
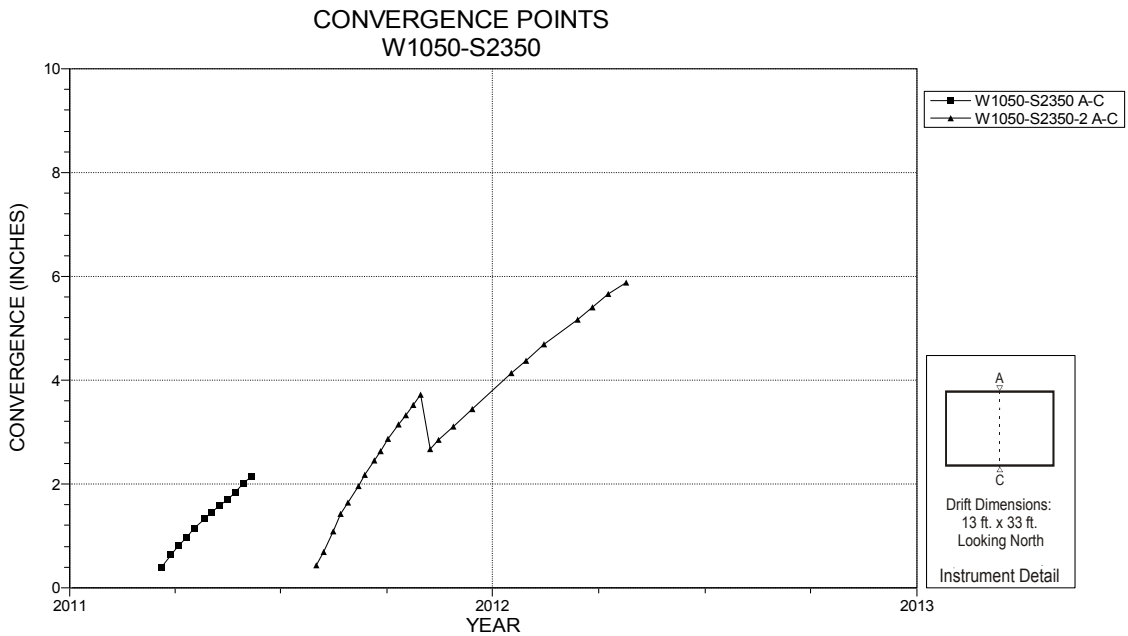
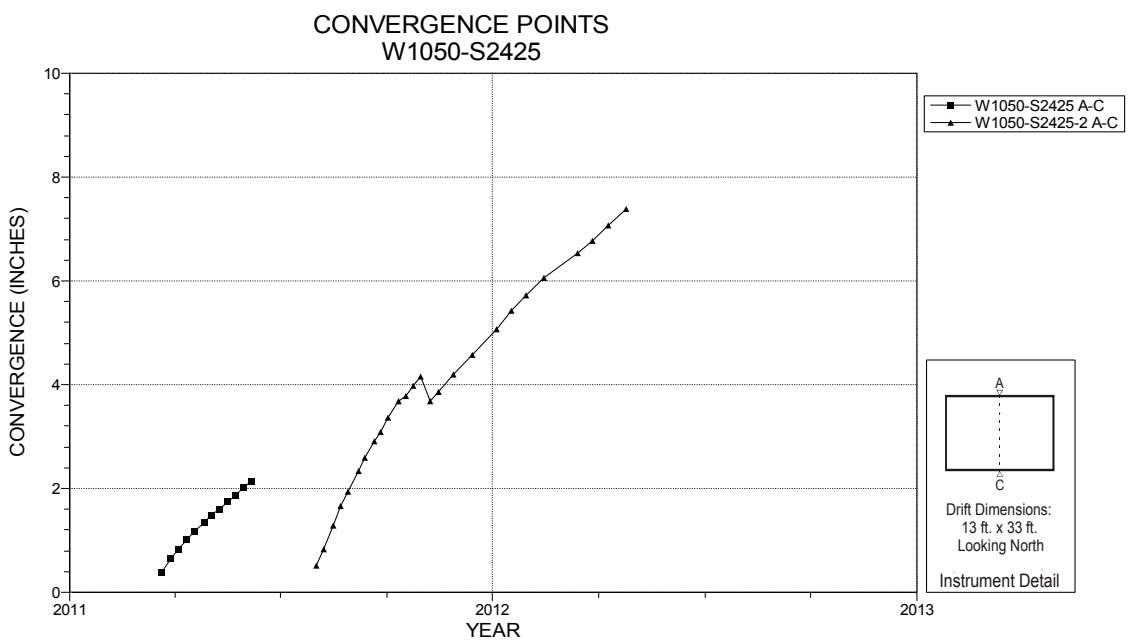


Figure 5-120 Convergence Point Array
Room 6, Panel 7 at W1050 S2275 – Roof to Floor



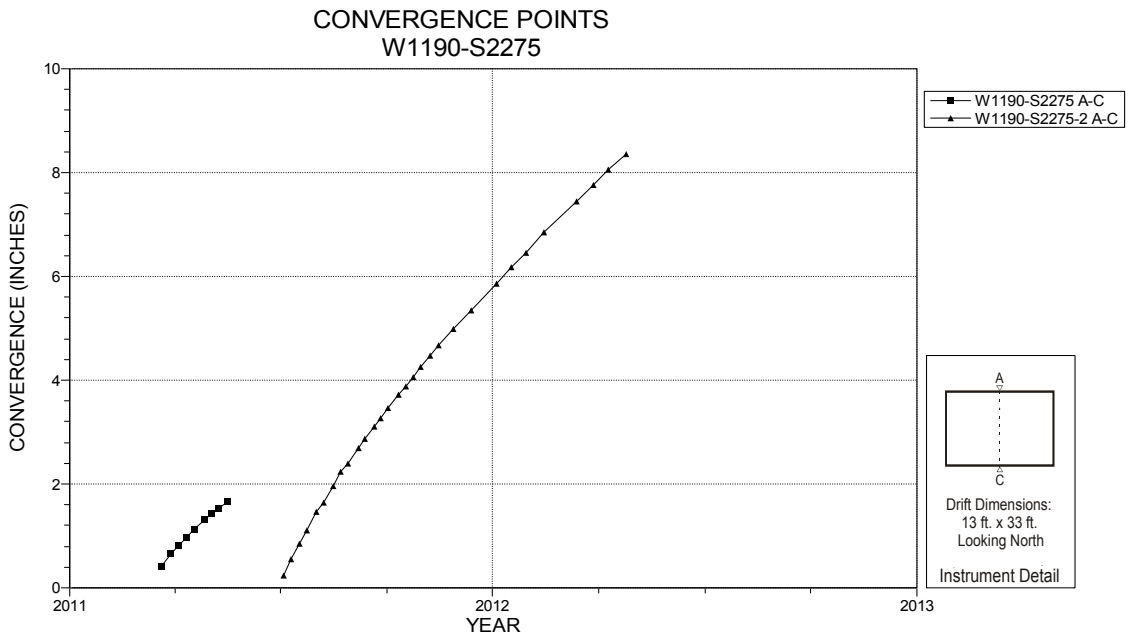
NOTES:
1. Excavation date: November 2010.
2. Floor heave is most likely the cause of the offset that occurred in the last quarter of 2011.

Figure 5-121 Convergence Point Array
Room 6, Panel 7 at W1050 S2350– Room Center – Roof to Floor



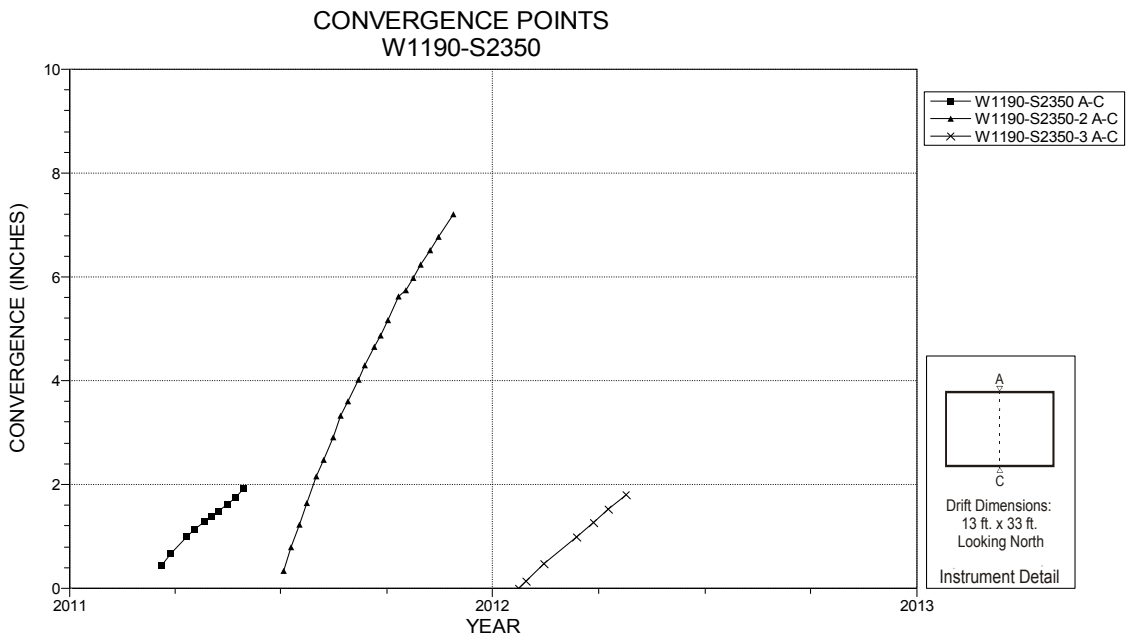
NOTES:
1. Excavation date: November 2010.
2. Floor heave is the most likely the cause of the offset that occurred in the last quarter of 2011.

Figure 5-122 Convergence Point Array
Room 6, Panel 7 at W1050 S2425 – Roof to Floor



NOTES:
1. Excavation date: February 2011.

Figure 5-123 Convergence Point Array
Room 7, Panel 7 at W1190 S2275 – Roof to Floor



NOTES:
1. Excavation date: February 2011.

Figure 5-124 Convergence Point Array
Room 7, Panel 7 at W1190 S2350– Room Center – Roof to Floor

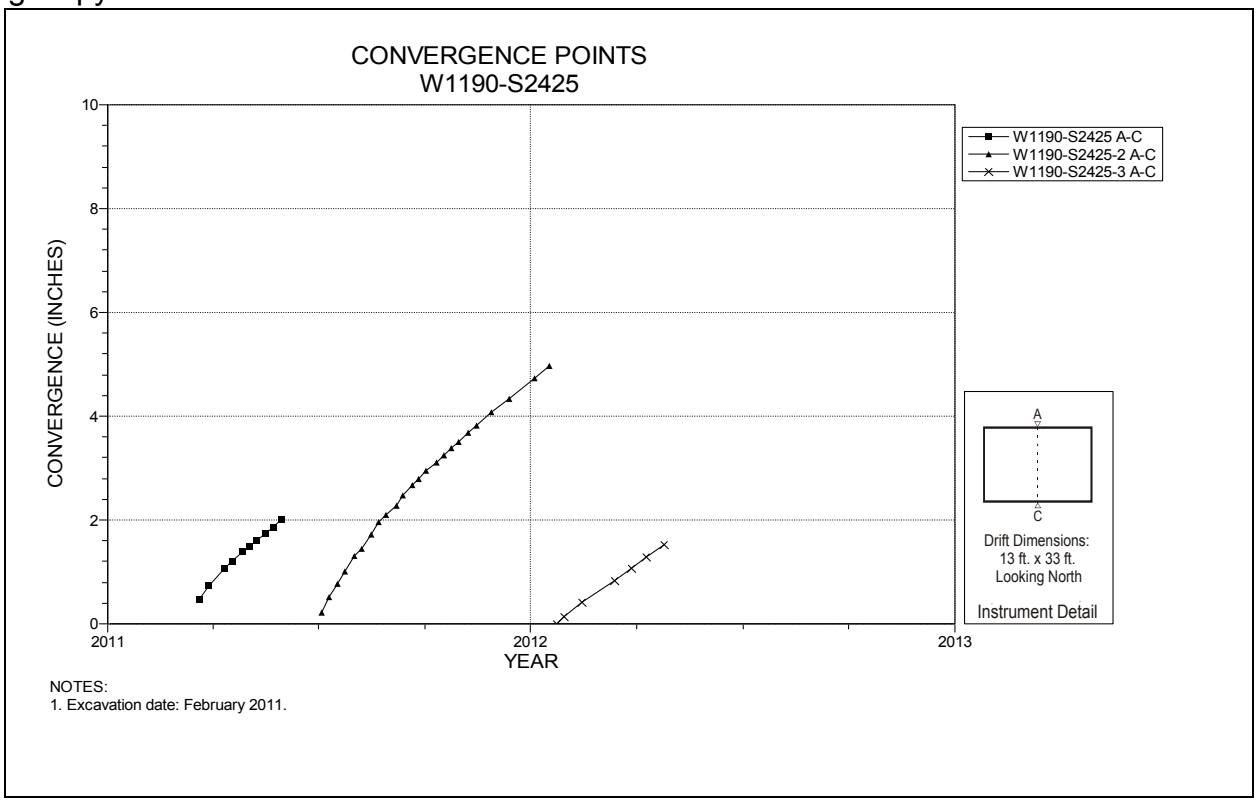


Figure 5-125 Convergence Point Array
Room 7, Panel 7 at W1190 S2425 – Roof to Floor

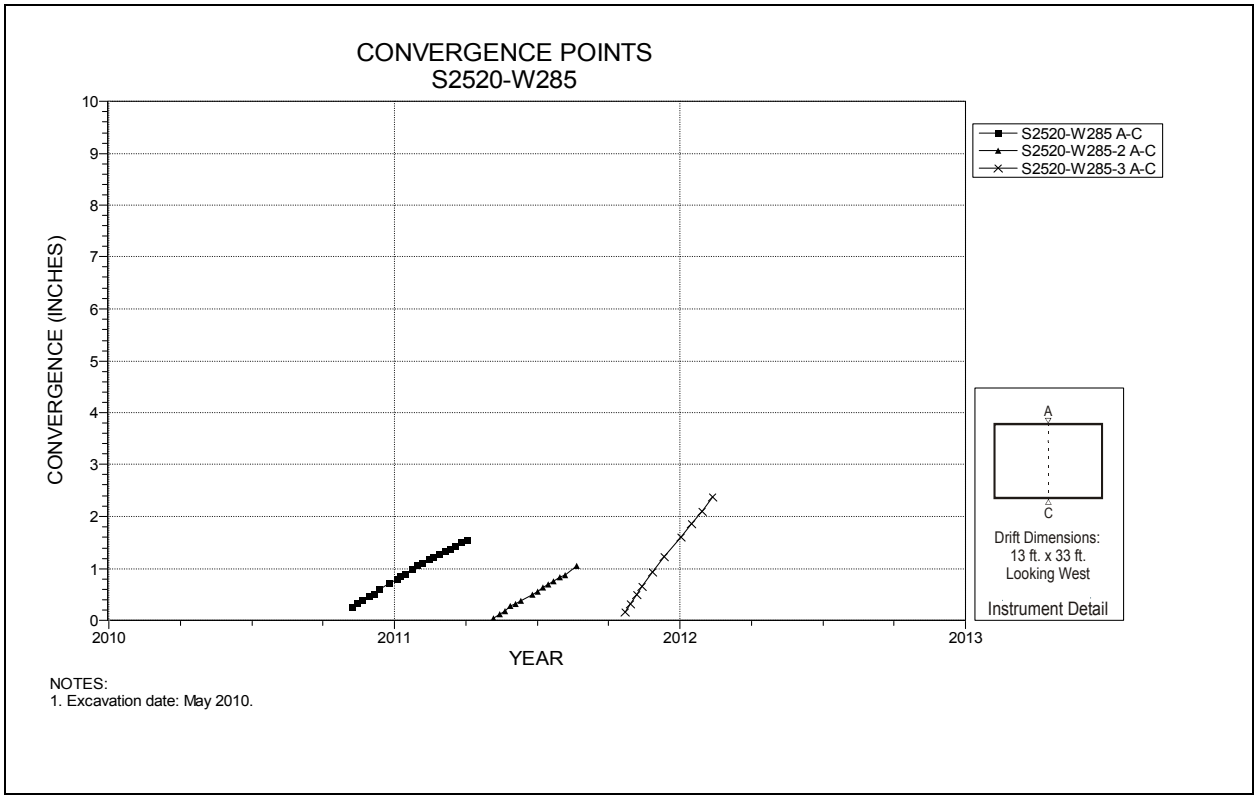


Figure 5-126 Convergence Point Array
S2520 W285 – Roof to Floor

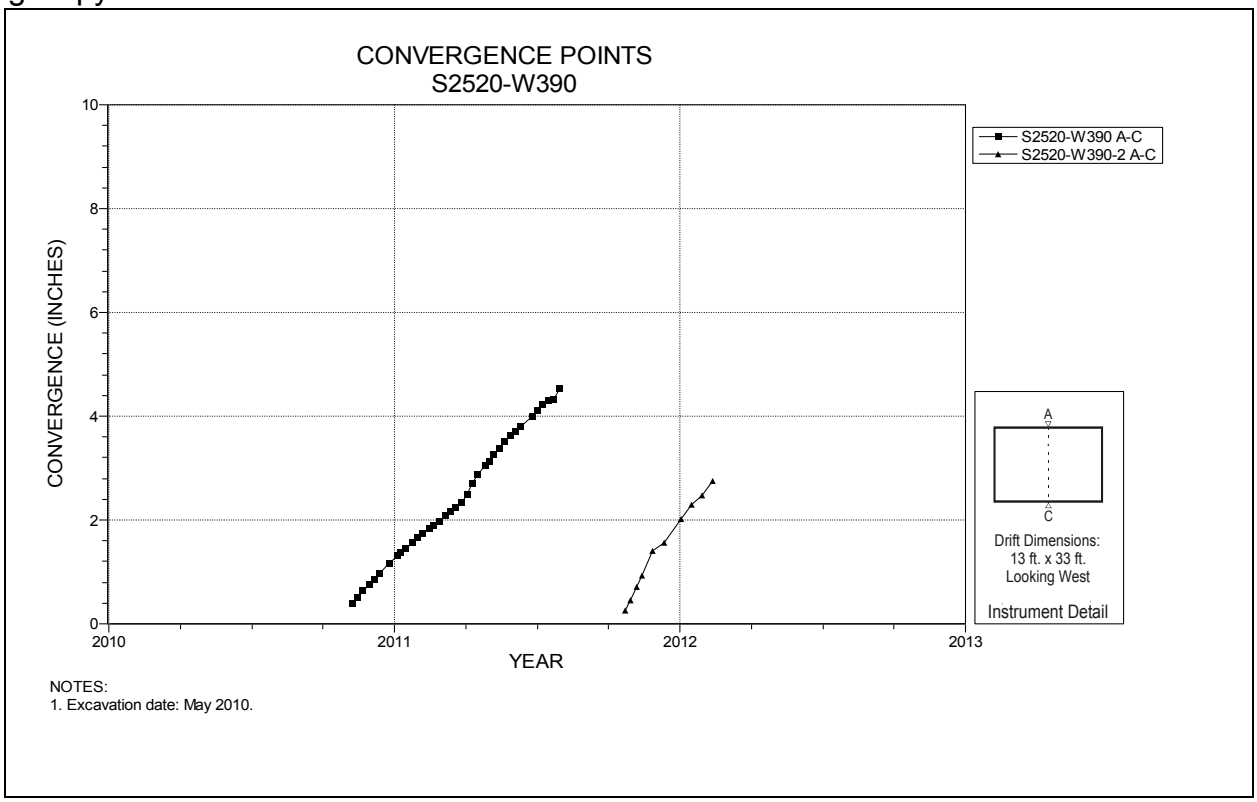


Figure 5-127 Convergence Point Array
S2520 W390 Intersection (Room 1, Panel 7) – Roof to Floor

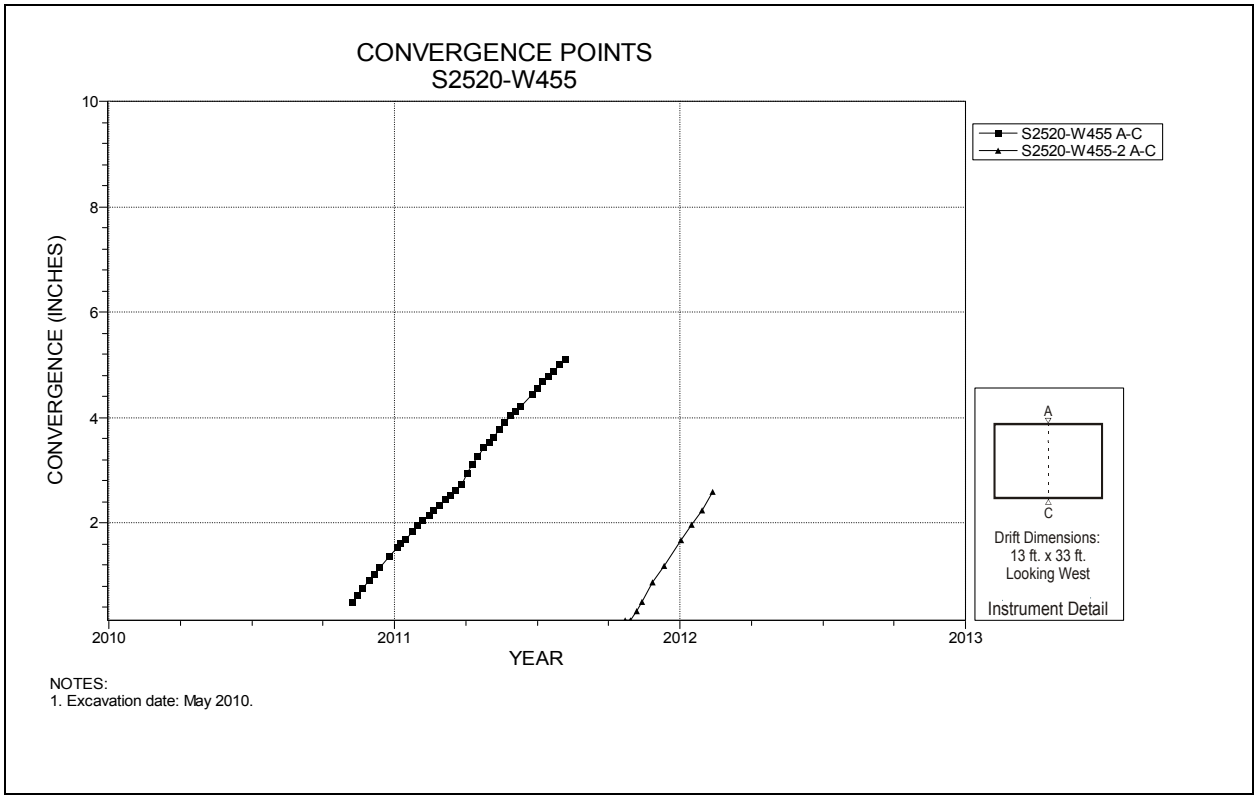
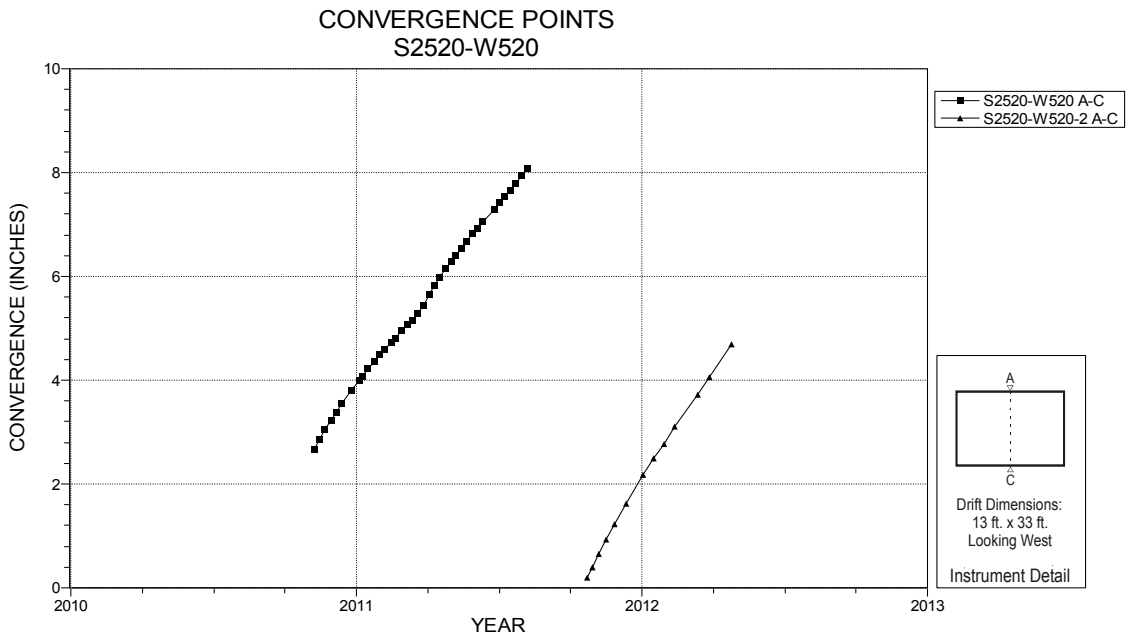
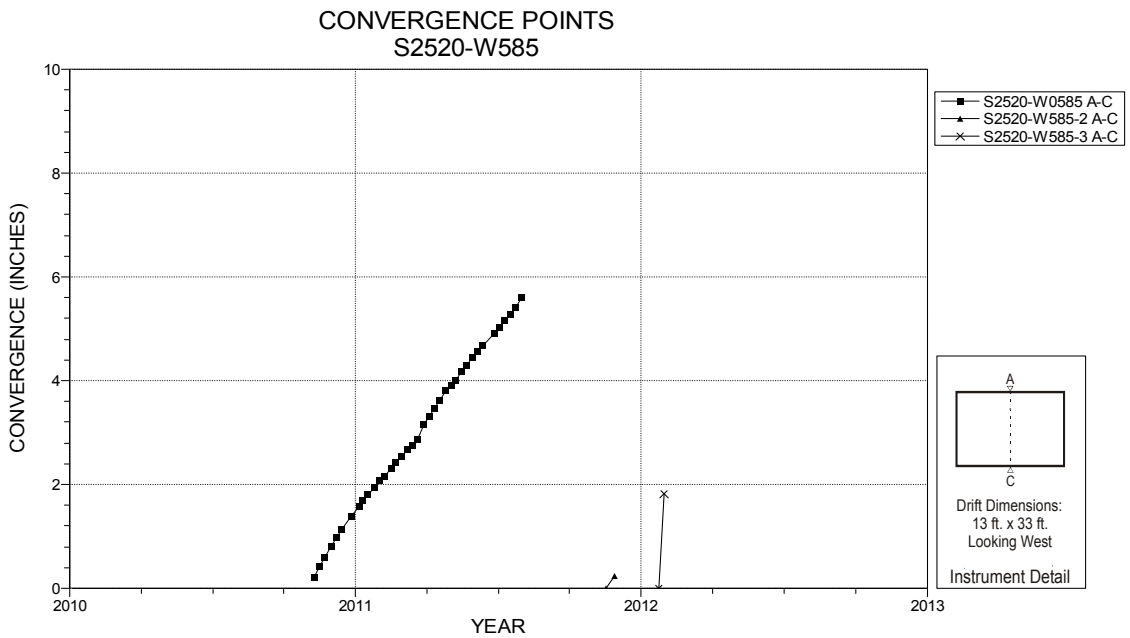


Figure 5-128 Convergence Point Array
S2520 W455 – Roof to Floor



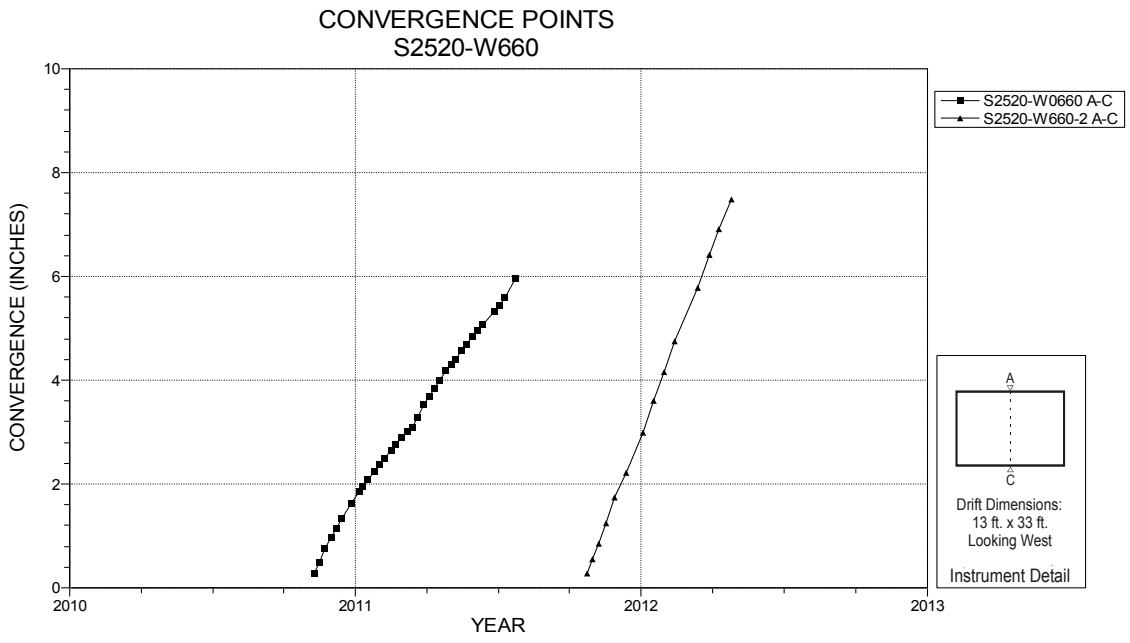
NOTES:
1. Excavation date: May 2010.

Figure 5-129 Convergence Point Array
S2520 W520 Intersection (Room 2, Panel 7) – Roof to Floor



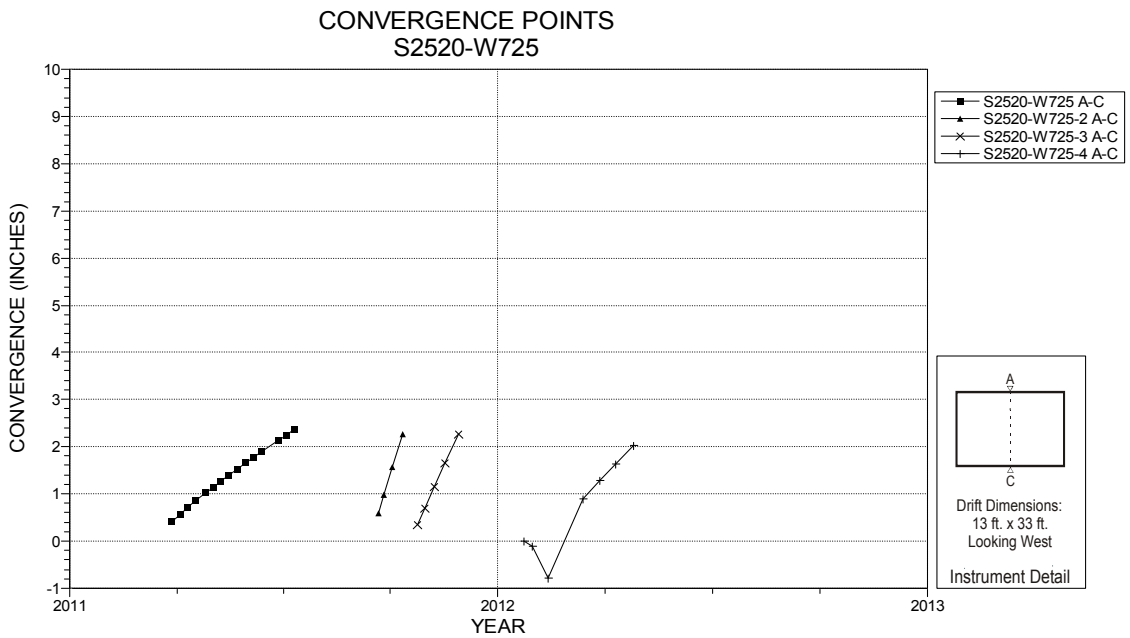
NOTES:
1. Excavation date: September 2010.
2. The second reading of 2012 is not vaild, it was most likely recorded incorrectly.

Figure 5-130 Convergence Point Array
S2520 W585 – Roof to Floor



NOTES:
1. Excavation date: September 2010.

Figure 5-131 Convergence Point Array
S2520 W660 Intersection (Room 3, Panel 7) – Roof to Floor



NOTES:
1. Excavation date: October 2010.
2. The negative readings are due to anchor slippage.

Figure 5-132 Convergence Point Array
S2520 W725 – Roof to Floor

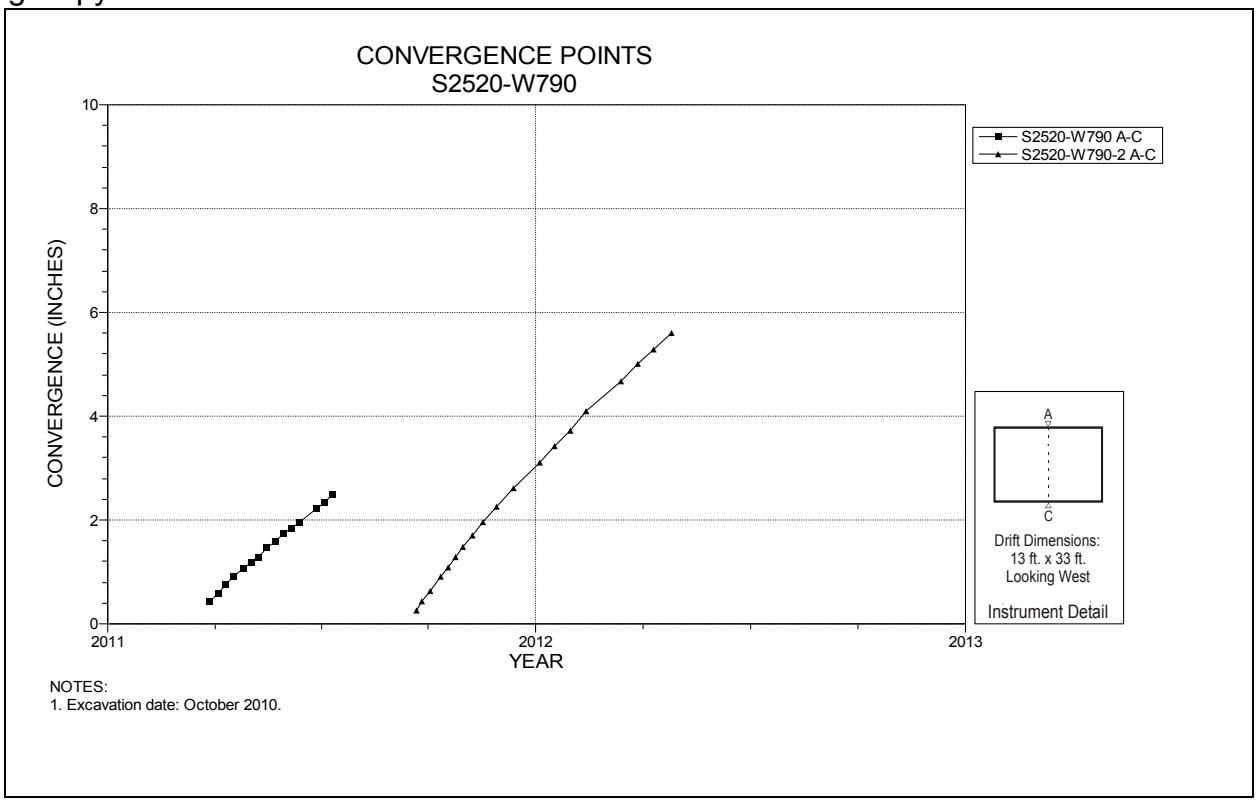


Figure 5-133 Convergence Point Array
S2520 W790 Intersection (Room 4, Panel 7) – Roof to Floor

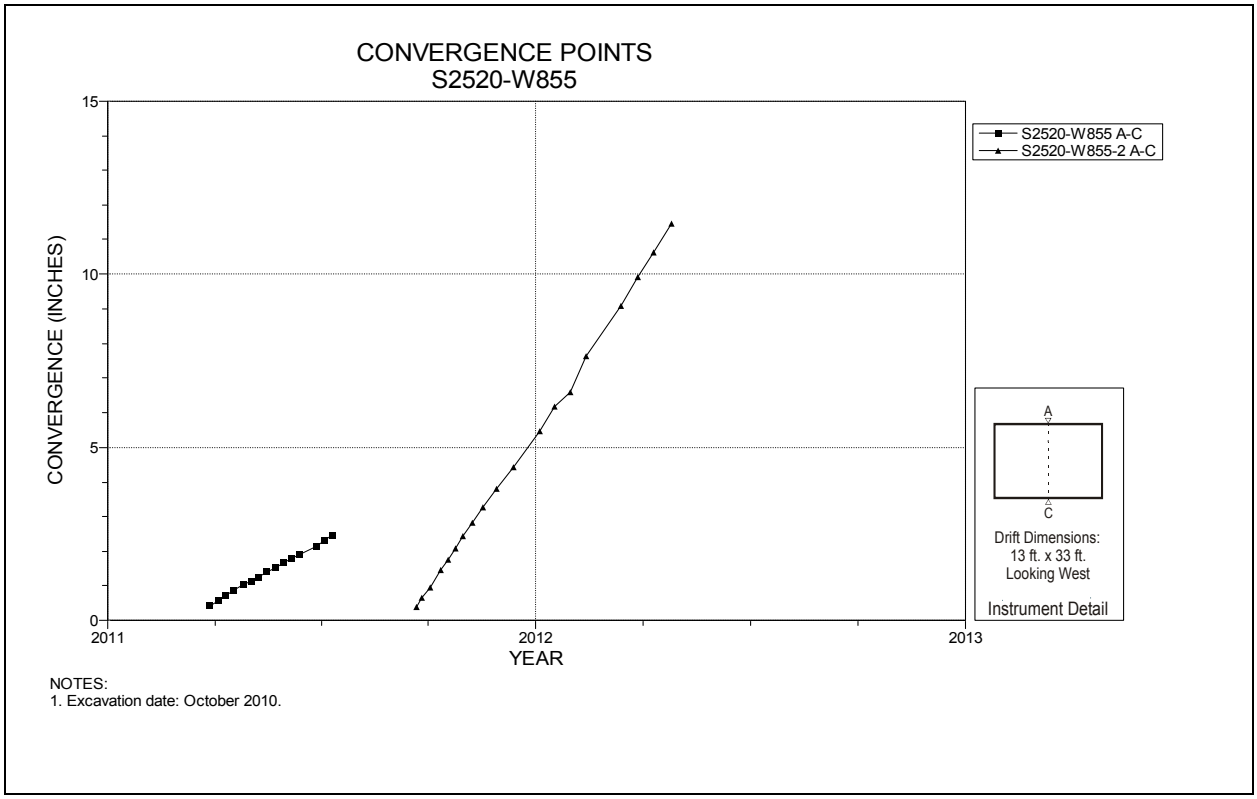


Figure 5-134 Convergence Point Array
S2520 W855 – Roof to Floor

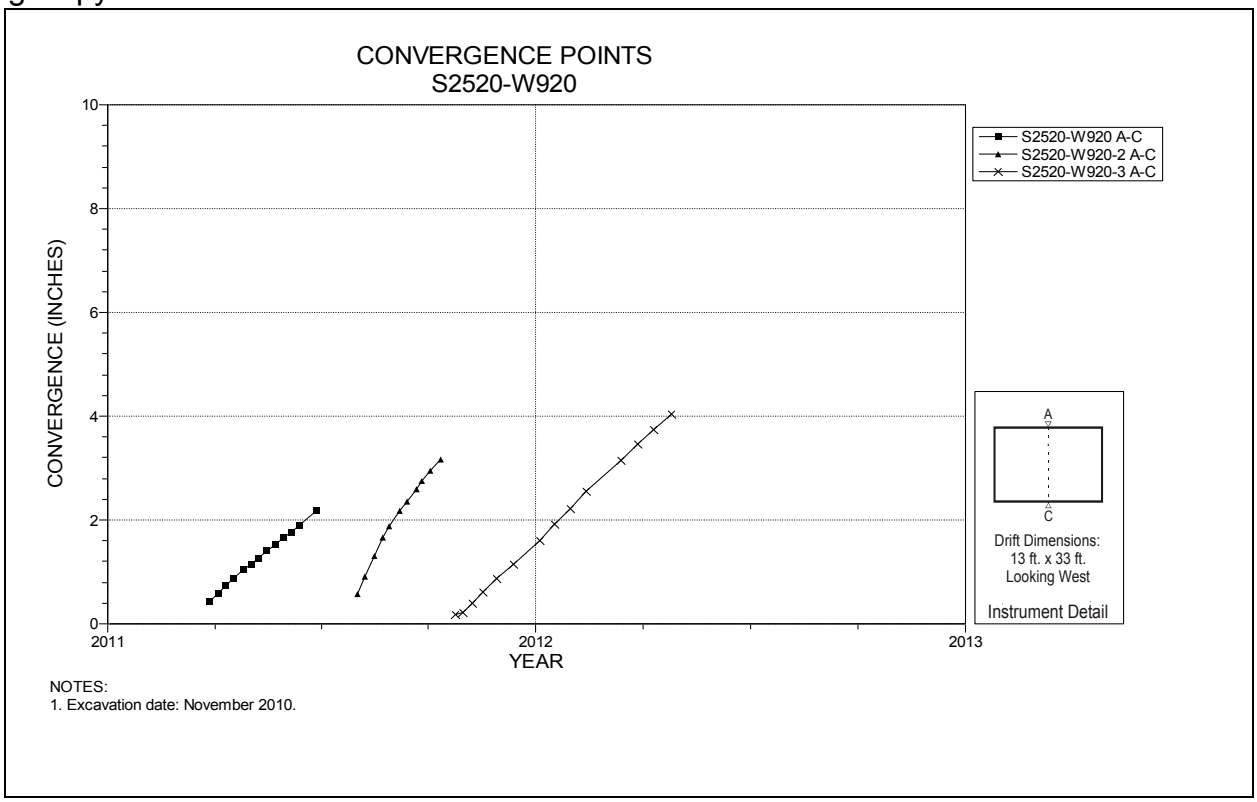


Figure 5-135 Convergence Point Array
S2520 W920 Intersection (Room 5, Panel 7) – Roof to Floor

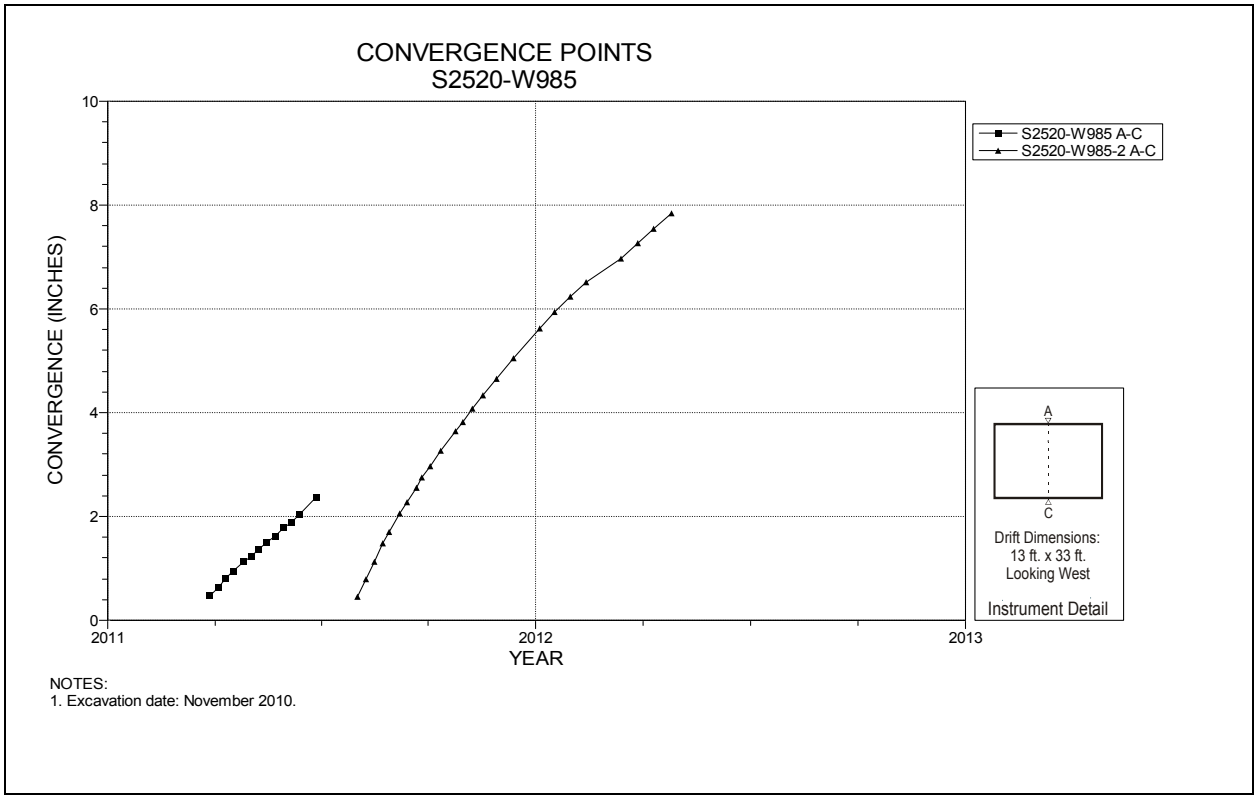
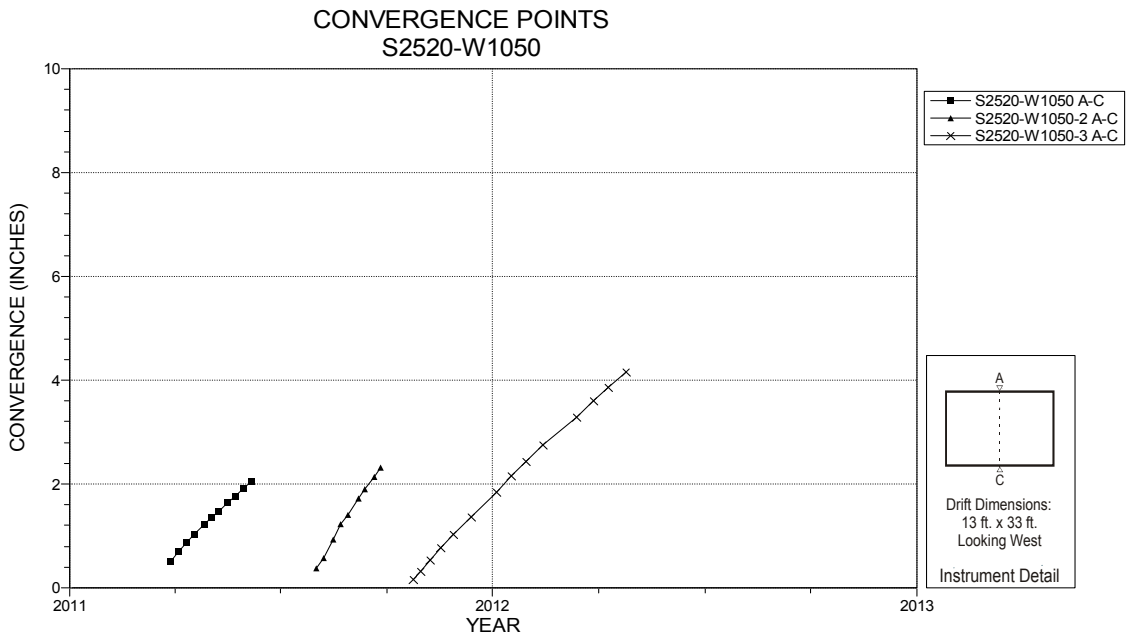
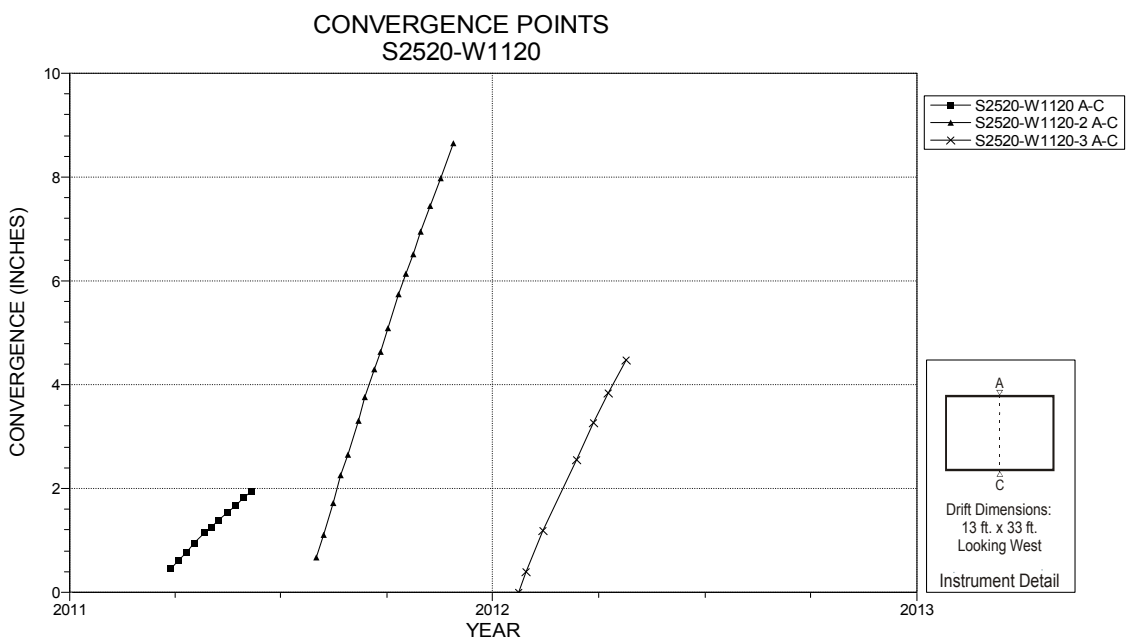


Figure 5-136 Convergence Point Array
S2520 W985 – Roof to Floor



NOTES:
1. Excavation date: January 2011.

Figure 5-137 Convergence Point Array
S2520 W1050 Intersection (Room 6, Panel 7) – Roof to Floor



NOTES:
1. Excavation date: February 2011.

Figure 5-138 Convergence Point Array
S2520 W1120 – Roof to Floor

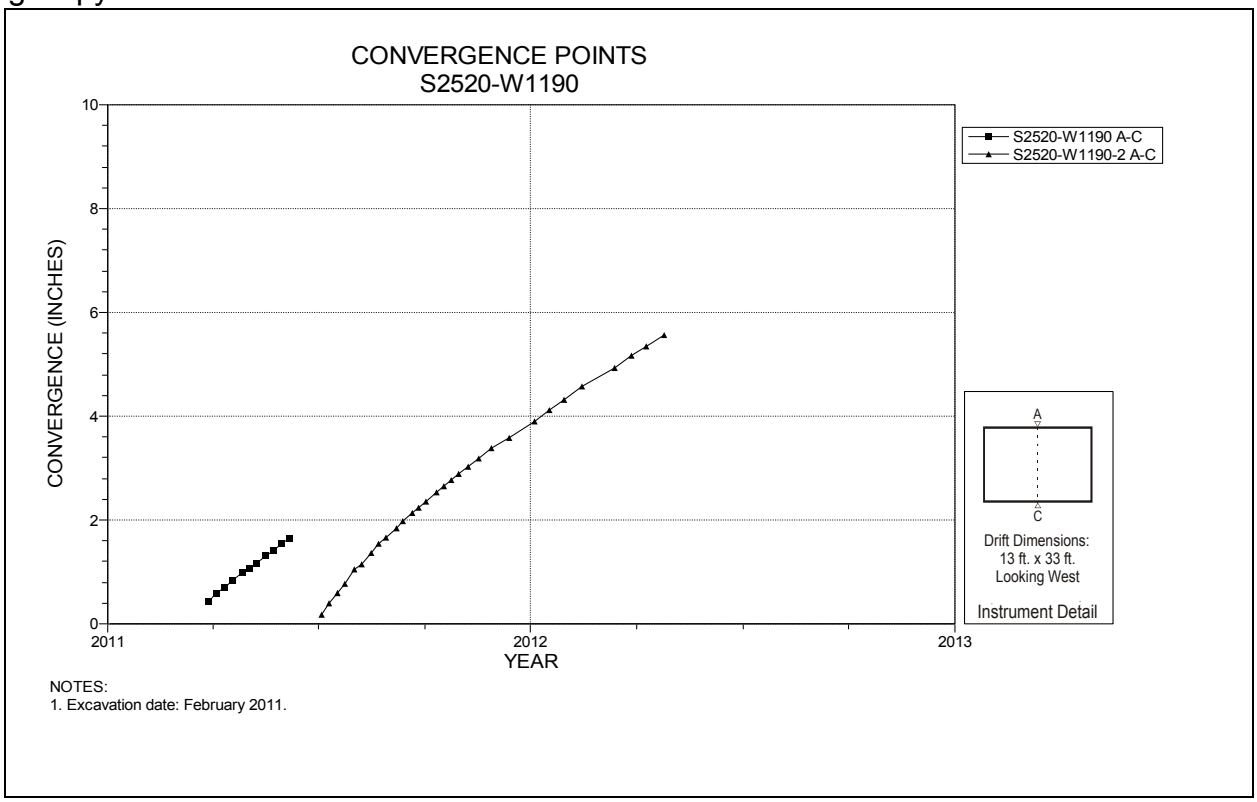


Figure 5-139 Convergence Point Array
S2520 W1190 Intersection (Room 7, Panel 7) – Roof to Floor

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6.0 Instrumentation Summary for the SDI Area

This chapter presents a summary of the data collected from radial convergence points located in the Storage Disposal Investigations (SDI) area at the WIPP. Table 6-1 presents data and analysis of the access drifts associated with the SDI area. Plots of the instrument data are presented as Figures 6-1 through 6-12.

Radial convergence points have been installed at the pillar midpoints, quarter points and drift intersections. The SDI area is still being mined. Hence, at times, access to many of the instruments may not be possible. Therefore, there will be intervals on some of the data plots void of any readings. Readings are resumed once access has been restored.

Table 6-1
SDI Data Analysis

Convergence Points

Field Tag	Location	Figure Number	Last Reading 2011 to 2012		Cumulative Displacement (inches)	Closure Rate[1] 2011 to 2012 (in/year)	Closure Rate[1] 2010 to 2011 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
E540-N350 A-C	E540-N350	Not plotted.	06/28/12	0.000	0.000	N/A	N/A	N/A	Only an initial reading this period.
E540-N500 A-C	E540-N500	Not plotted.	06/28/12	0.000	0.000	N/A	N/A	N/A	Only an initial reading this period
E540-N640 A-C	E540-N640	6-1	06/26/12	1.215	1.215	4.6	N/A	N/A	
E690-N640 A-C	E690-N640	Not plotted.	06/28/12	0.000	0.000	N/A	N/A	N/A	Only an initial reading this period
N780-E220-2 A-C	N780-E220	6-2	06/12/12	2.827	13.285	2.3	N/A	N/A	
N780-E420 A-C	N780-E420	6-3	05/07/12	2.417	2.417	6.4	N/A	N/A	
N780-E540 A-C	N780-E540	6-4	04/30/12	4.420	4.420	15.4	N/A	N/A	
N780-E615 A-C	N780-E615	6-5	06/26/12	2.105	2.105	5.5	N/A	N/A	
N780-E690 A-C	N780-E690	6-6	06/26/12	3.436	3.436	9.0	N/A	N/A	
N940-E220 A-C	N940-E220	6-7	06/26/12	0.675	0.675	3.2	N/A	N/A	
N940-E300 A-C	N940-E300	6-8	06/26/12	0.829	0.829	3.9	N/A	N/A	
N940-E420 A-C	N940-E420	6-9	06/26/12	1.238	1.238	5.9	N/A	N/A	
N940-E540 A-C	N940-E540	6-10	06/26/12	1.477	1.477	7.0	N/A	N/A	
N940-E615 A-C	N940-E615	6-11	06/26/12	1.511	1.511	7.8	N/A	N/A	
N940-E690-2 A-C	N940-E690	6-12	06/26/12	0.590	0.917	5.5	N/A	N/A	

[1] N/A – The convergence points above were installed after the 2010-2011 reporting period.

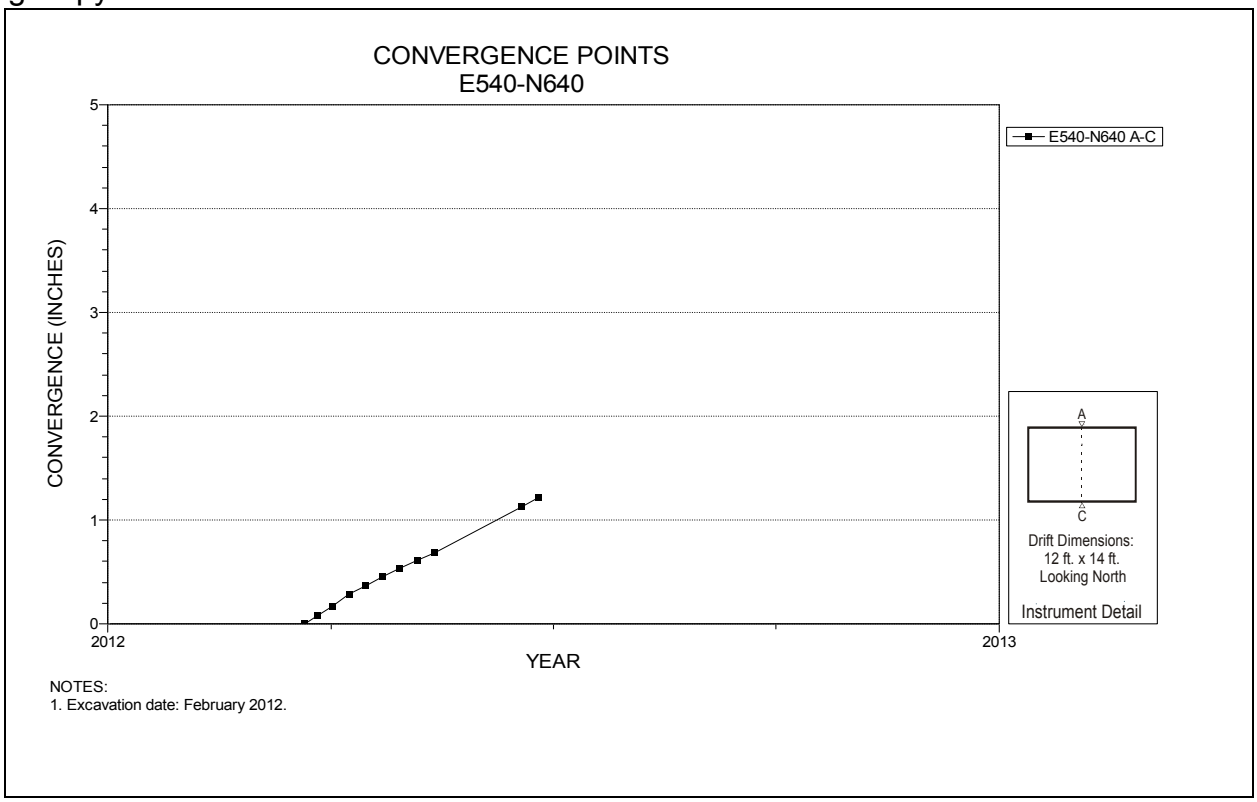

Figure 6-1 Convergence Point Array
E540 N640 – Roof to Floor

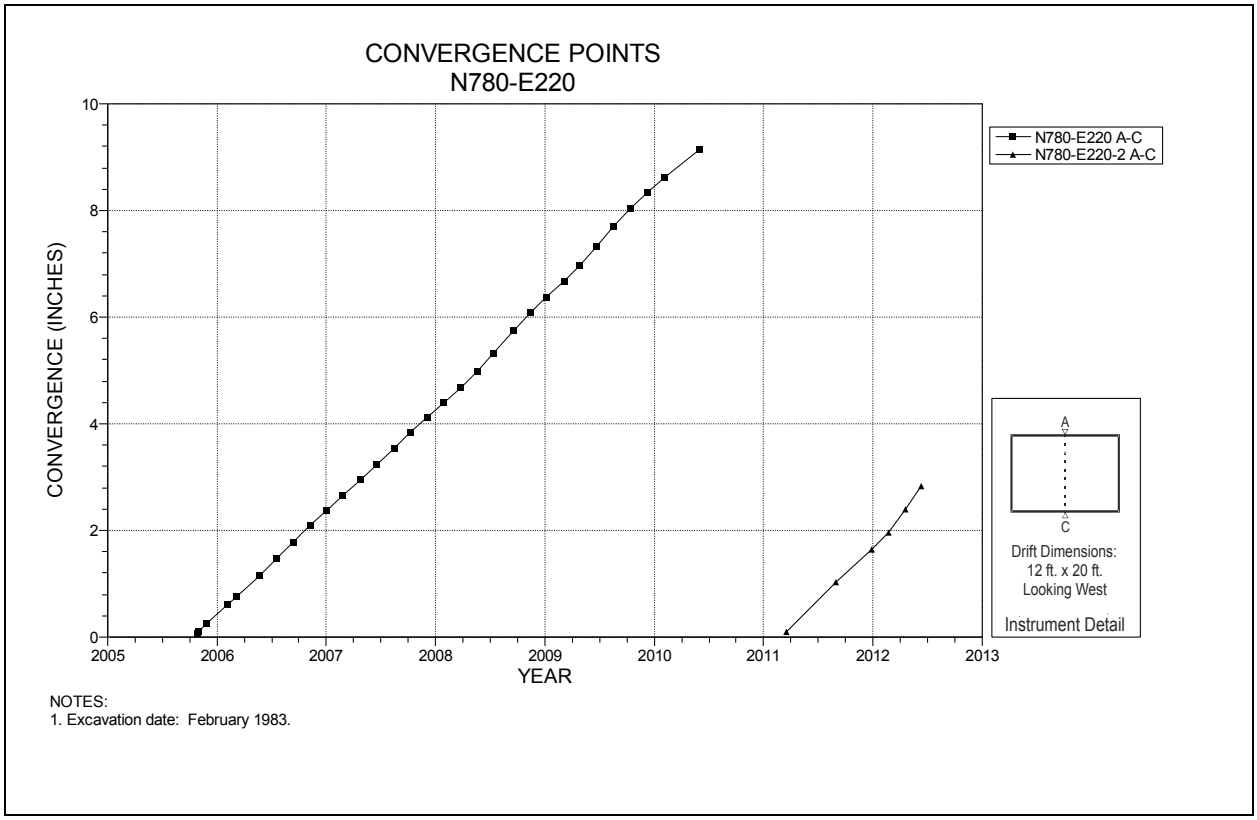

Figure 6-2 Convergence Point Array
N780 E220 – Roof to Floor

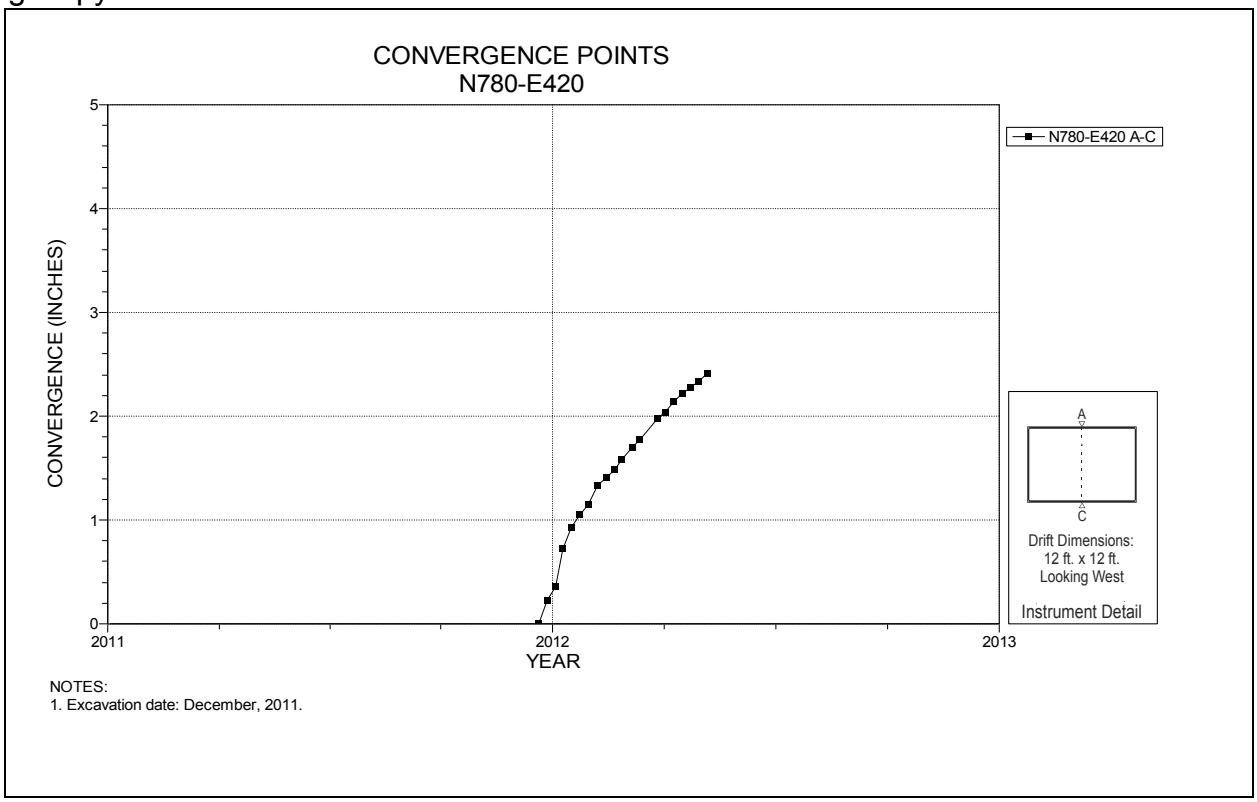

Figure 6-3 Convergence Point Array
N780 E420 – Roof to Floor

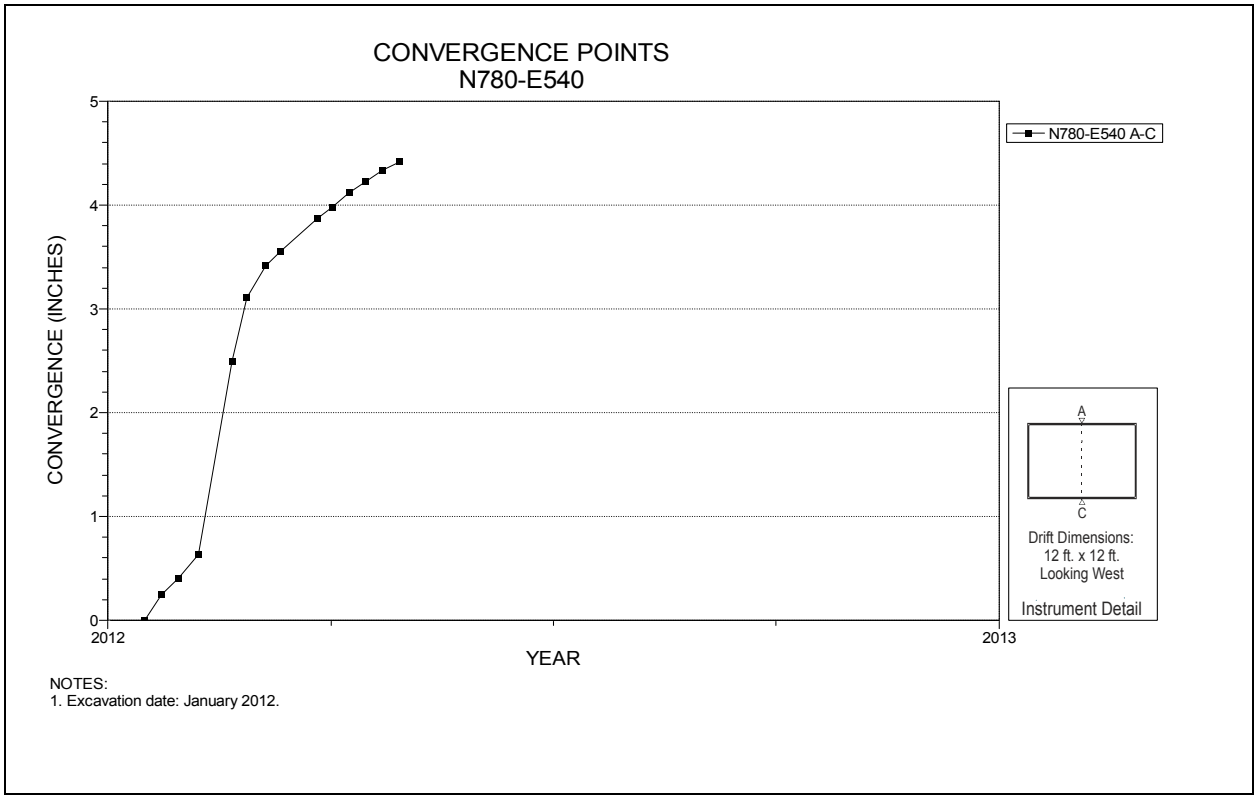

Figure 6-4 Convergence Point Array
N780 E540 – Roof to Floor

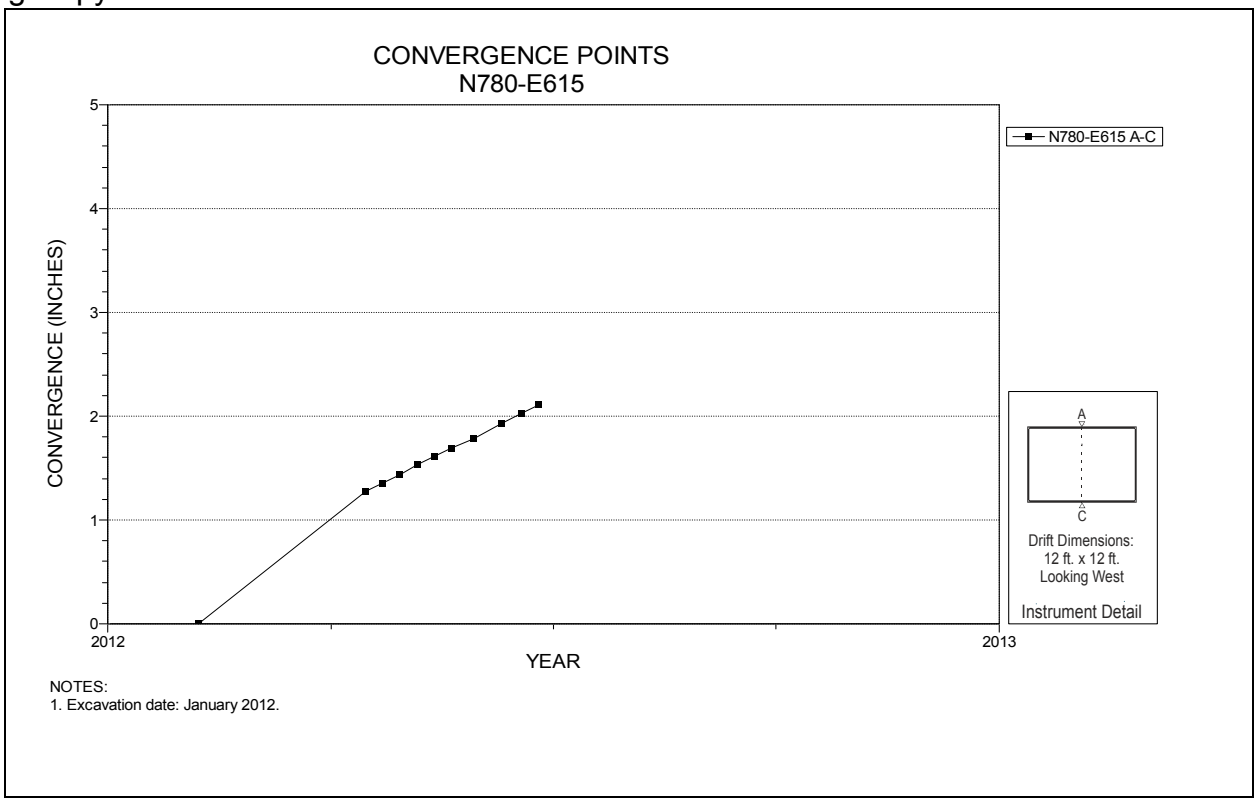

Figure 6-5 Convergence Point Array
N780 E615 – Roof to Floor

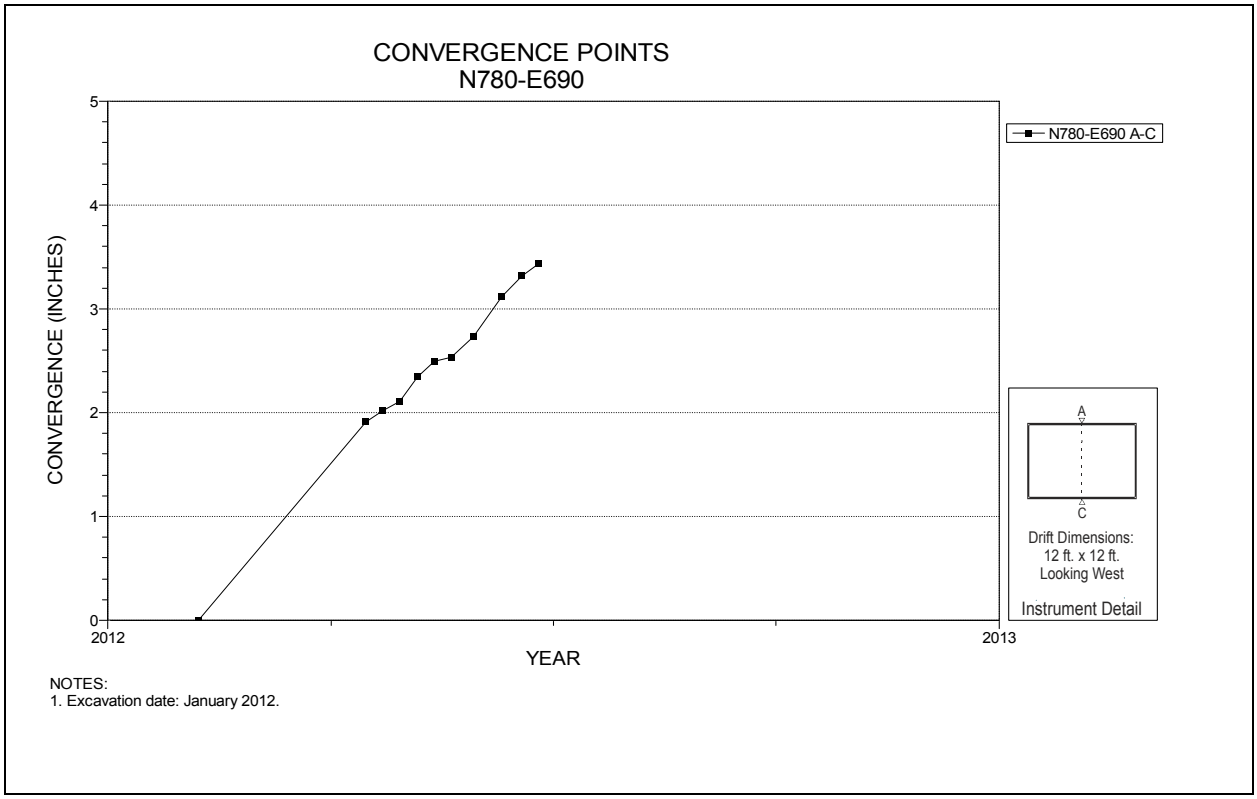

Figure 6-6 Convergence Point Array
N780 E690 – Roof to Floor

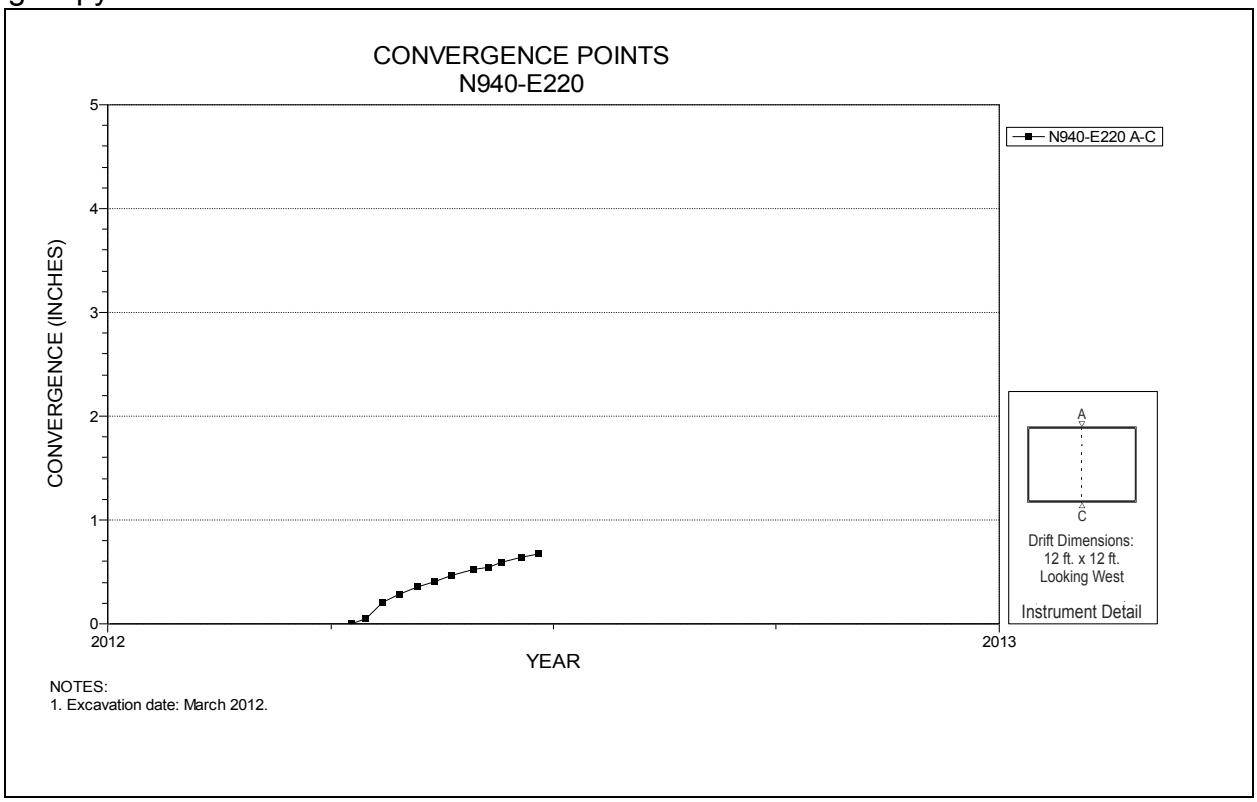

Figure 6-7 Convergence Point Array
N940 E220 – Roof to Floor

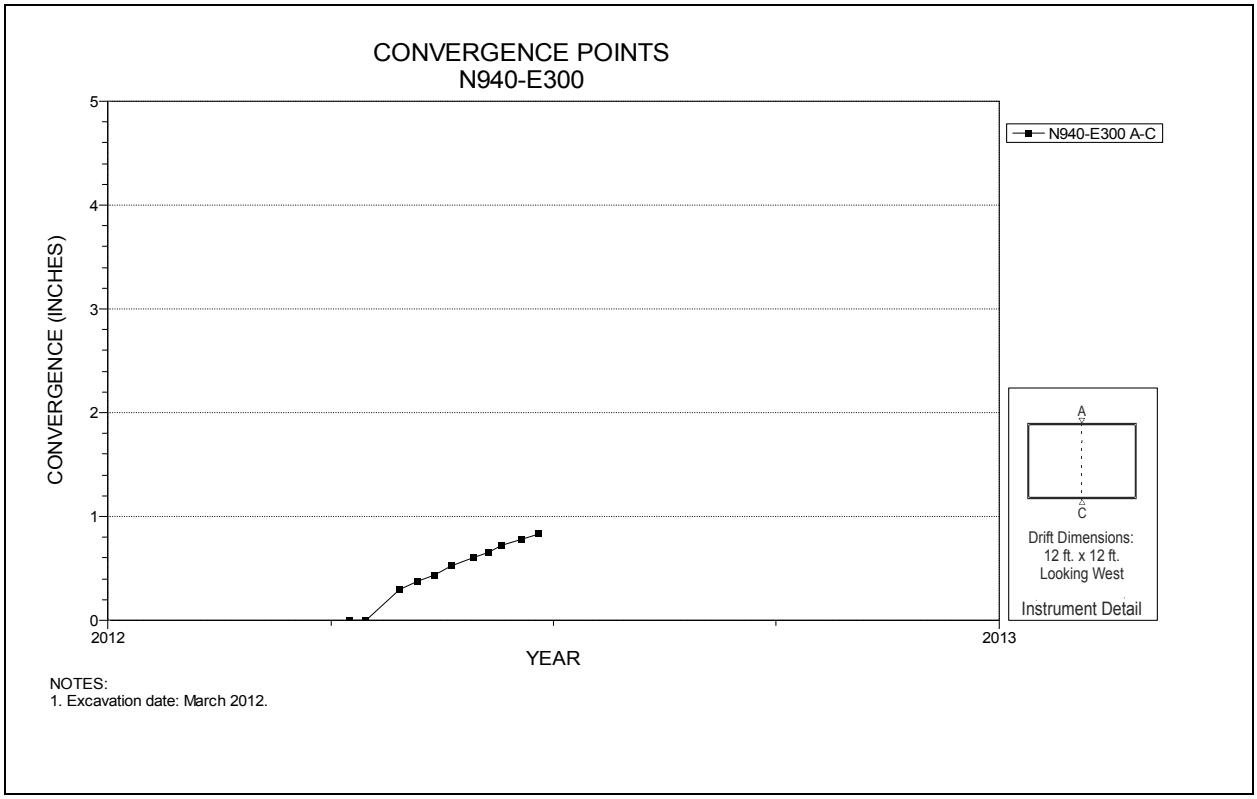

Figure 6-8 Convergence Point Array
N940 E300 – Roof to Floor

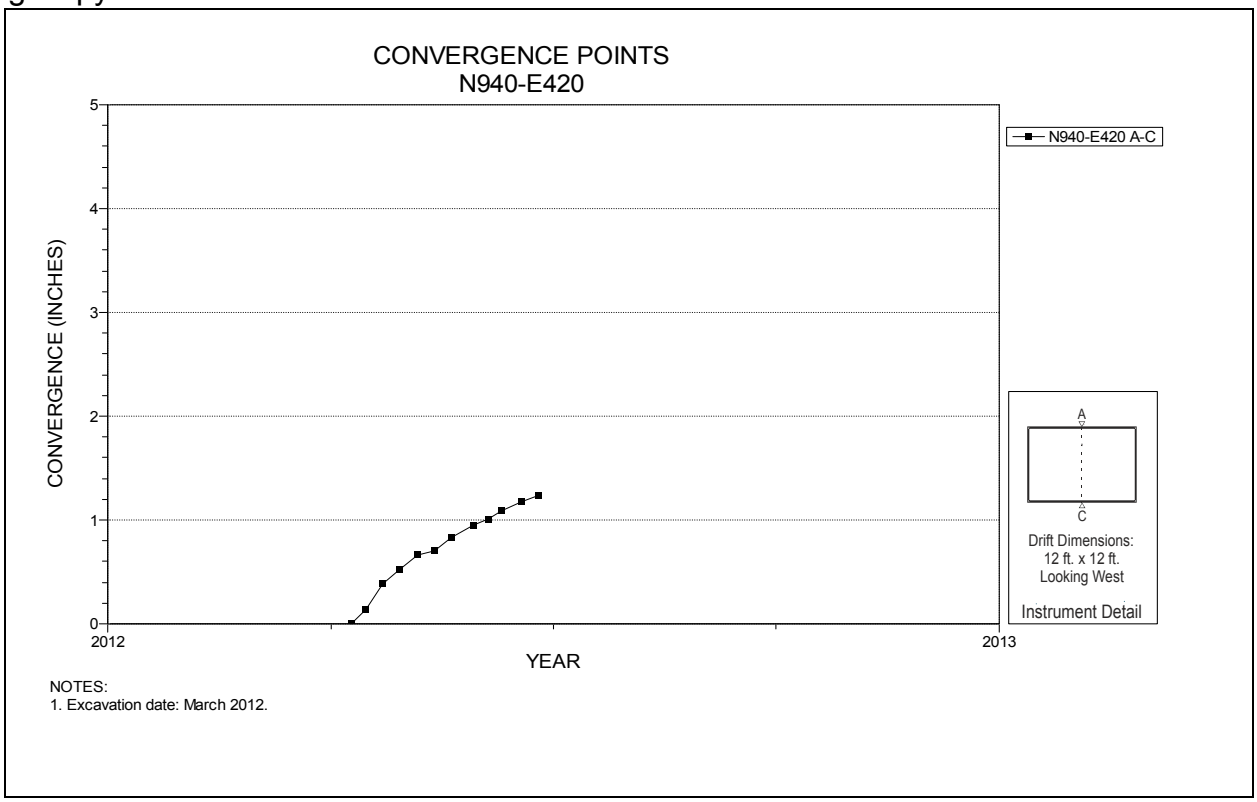

Figure 6-9 Convergence Point Array
N940 E420 – Roof to Floor

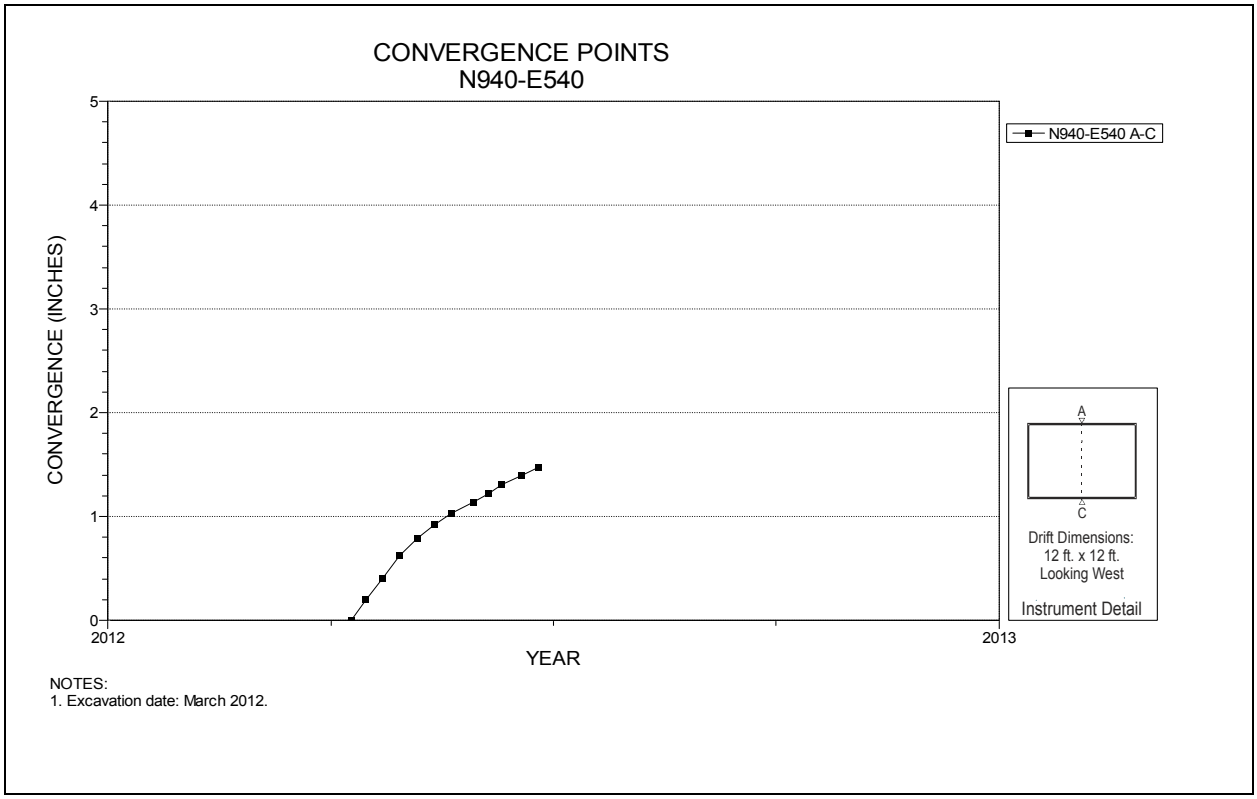

Figure 6-10 Convergence Point Array
N940 E540 – Roof to Floor

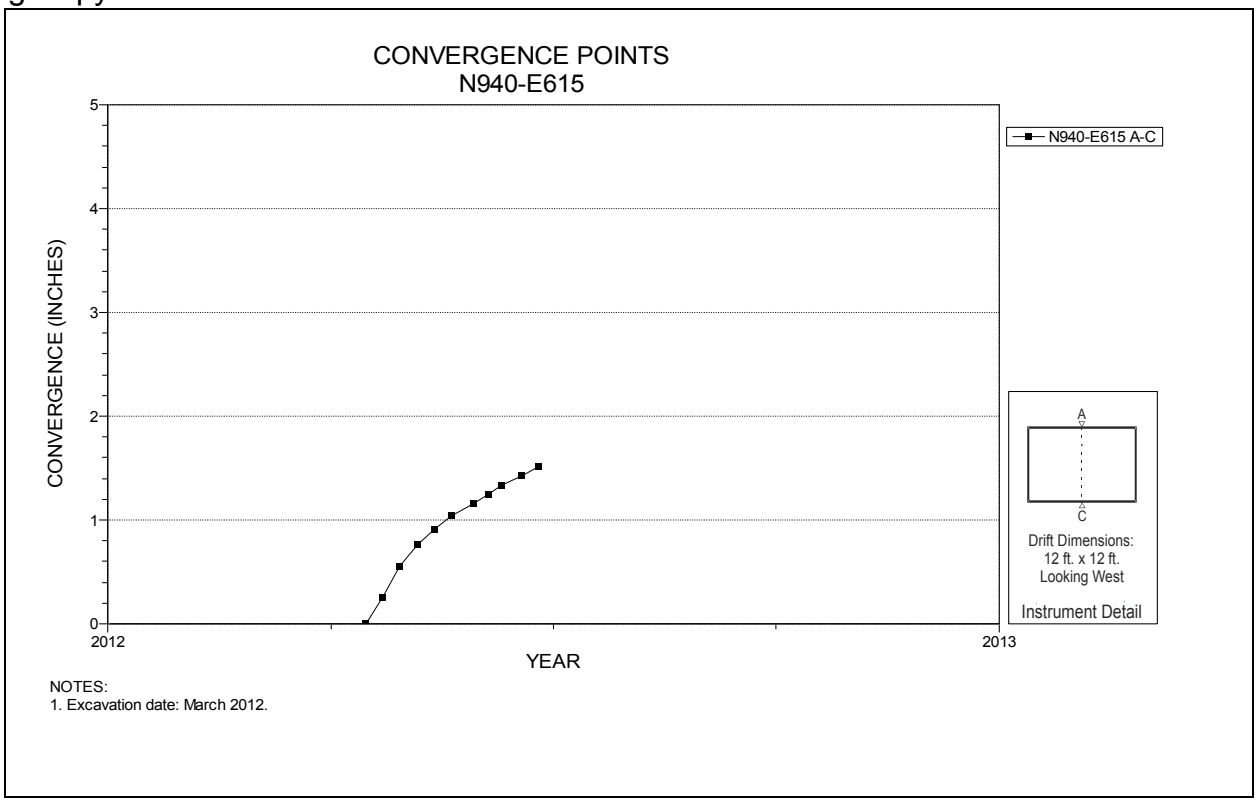

Figure 6-11 Convergence Point Array
N940 E615 – Roof to Floor

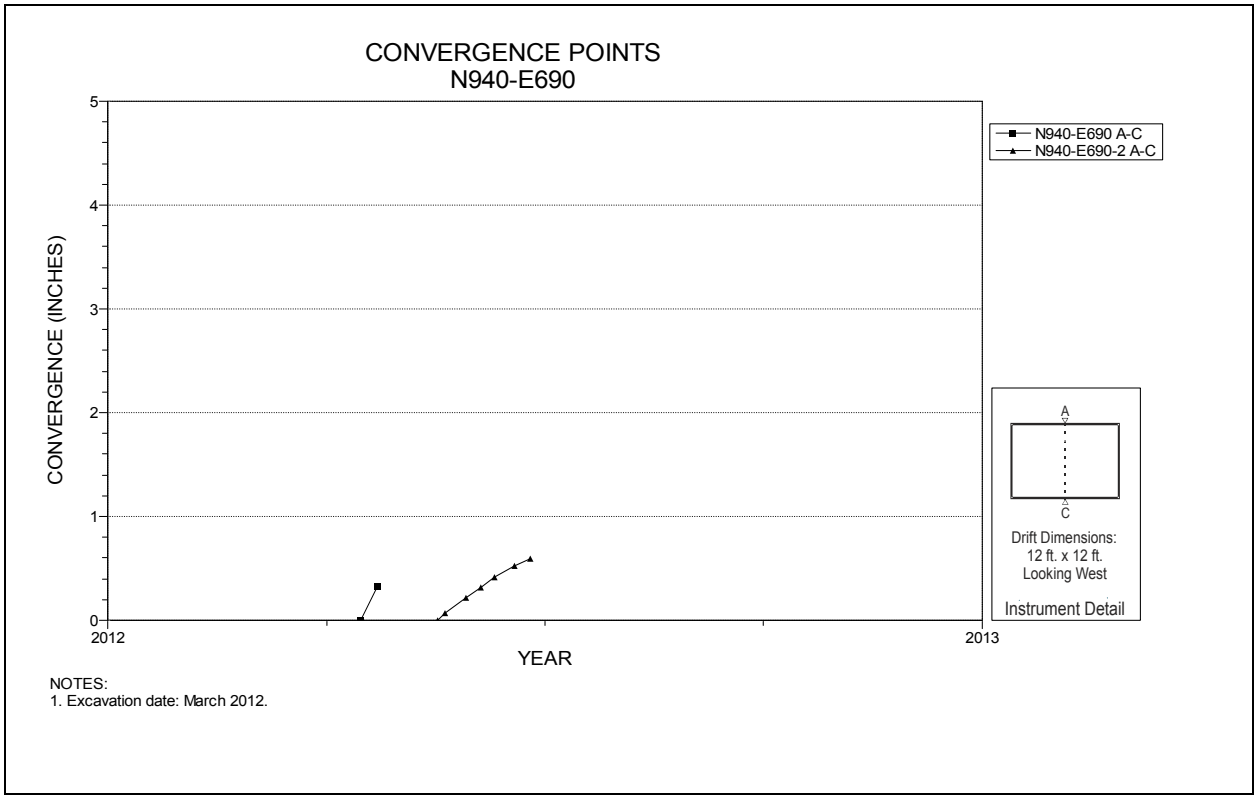

Figure 6-12 Convergence Point Array
N940 E690 – Roof to Floor

7.0 Geoscience Data Summary for the Waste Disposal Area

This chapter presents supporting data acquired as part of the Geoscience Program. It includes observations of clay seam displacements and other features in vertical observation holes, and fracture maps of excavation surfaces.

Borehole Inspections

This section presents a summary of the clay seam displacements (offsets) and fracture densities measured in observation boreholes located through the WIPP underground facility. Relative lateral displacement of rock strata above and below a clay layer is measured as offset within a borehole. Fracture density is a calculated parameter based on the number of fractures (separations) and fracture zones observed in an observation borehole. Fracture density is calculated to be the number of fractures plus twice the number of fracture zones in a roof beam divided by the thickness of the beam (in feet). Table 7-1 presents the observed offset data for boreholes, the observed fractures and fracture zones, and the calculated fracture densities. Table 7-2 is a summary of new boreholes drilled during this reporting period.

Fracture Mapping

This section presents graphical results of the fracture mapping done in Panel 6 and Panel 7 of the Waste Disposal Area. Figures 7-1 through 7-68 are plan view fracture maps for the roof.

Table 7-1 Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH485	E140-N1400	1/7/2004	12/20/2011				Separation		1.70	0.1250	0.0000		0	0.00
OH485	E140-N1400	1/7/2004	12/20/2011	1	0	6.60	Separation	0.15	6.60	0.1250	1.7500	S	58	0.22
OH485	E140-N1400	1/7/2004	12/20/2011				Hangup		16.10	0.0000	0.0000		0	0.00
OH485	E140-N1400	1/7/2004	12/20/2011				BOH		20.30	0.0000	0.0000		0	0.00
OH484	E140-N1265	1/7/2004	12/30/2011				Separation		1.60	0.5000	0.2500	W	8	0.03
OH484	E140-N1265	1/7/2004	12/30/2011				Separation		5.60	0.1250	0.0000		0	0.00
OH484	E140-N1265	1/7/2004	12/30/2011				Separation		5.90	0.1250	0.2500	W	8	0.03
OH484	E140-N1265	1/7/2004	12/30/2011	3	0	6.60	Separation	0.45	6.60	0.1250	0.0000		0	0.00
OH484	E140-N1265	1/7/2004	12/30/2011				BOH		20.50	0.0000	0.0000		0	0.00
OH483	E140-N940	1/7/2004	12/30/2011				Separation		1.40	0.3750	1.0000	W	33	0.13
OH483	E140-N940	1/7/2004	12/30/2011				Separation		1.90	0.3750	0.0625	W	2	0.01
OH483	E140-N940	1/7/2004	12/30/2011				Separation		2.70	0.1250	0.1250	W	4	0.02
OH483	E140-N940	1/7/2004	12/30/2011				Separation		5.30	0.1250	0.0000		0	0.00
OH483	E140-N940	1/7/2004	12/30/2011				Separation		6.40	0.1250	0.0000		0	0.00
OH483	E140-N940	1/7/2004	12/30/2011				Separation		6.80	0.1250	0.0000		0	0.00
OH483	E140-N940	1/7/2004	12/30/2011	6	0	7.00	Separation	0.86	7.00	0.1250	1.2500	W	42	0.16
OH483	E140-N940	1/7/2004	12/30/2011				BOH		17.00	0.0000	0.0000		0	0.00
OH492	E140-N790	1/9/2004	12/30/2011	0	0	6.80	Separation	0.00	6.80	0.1250	0.1250	W	4	0.02
OH492	E140-N790	1/9/2004	12/30/2011				BOH		20.40	0.0000	0.0000		0	0.00
OH521	E140-N40	11/22/2004	12/20/2011	0	0	6.80	Separation	0.00	6.80	0.2500	0.2500	E	8	0.04
OH521	E140-N40	11/22/2004	12/20/2011				Separation		8.30	0.1250	0.3750	S	13	0.05
OH521	E140-N40	11/22/2004	12/20/2011				Separation		9.00	0.1250	0.2500	S	8	0.04
OH521	E140-N40	11/22/2004	12/20/2011				BOH		20.30	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH523	E140-S164	11/22/2004	12/20/2011	0	0	5.50	Separation	0.00	5.50	0.1250	1.7500	E	58	0.25
OH523	E140-S164	11/22/2004	12/20/2011				Separation		6.60	0.1250	0.3750	W	13	0.05
OH523	E140-S164	11/22/2004	12/20/2011				Separation		6.90	0.1250	0.3750	E	13	0.05
OH523	E140-S164	11/22/2004	12/20/2011				Separation		7.10	0.1250	0.3750	E	13	0.05
OH523	E140-S164	11/22/2004	12/20/2011				Separation		7.40	0.1250	0.0000		0	0.00
OH523	E140-S164	11/22/2004	12/20/2011				Separation		8.10	0.1250	0.0000		0	0.00
OH523	E140-S164	11/22/2004	12/20/2011				Separation		8.40	0.1250	0.0000		0	0.00
OH523	E140-S164	11/22/2004	12/20/2011				Separation		8.70	0.1250	0.0000		0	0.00
OH523	E140-S164	11/22/2004	12/20/2011				BOH		20.30	0.0000	0.0000		0	0.00
OH498-1	E140-S415	3/2/2009	3/12/2012				BOH		8.00	0.0000	0.0000		0	0.00
OH499-1	E140-S520	3/2/2009	3/12/2012				BOH		12.50	0.0000	0.0000		0	0.00
OH620	E140-S700	11/17/2005	5/22/2012				Separation		4.70	0.1250	0.0000		0	0.00
OH620	E140-S700	11/17/2005	5/22/2012	1	0	5.80	Separation	0.17	5.80	0.1250	0.0000		0	0.00
OH620	E140-S700	11/17/2005	5/22/2012				Separation		5.90	0.1250	0.0000		0	0.00
OH620	E140-S700	11/17/2005	5/22/2012				BOH		16.80	0.0000	0.0000		0	0.00
OH750	E140-S773	9/29/2011	5/22/2012				Separation		4.10	0.1250	0.3750	E	13	0.58
OH750	E140-S773	9/29/2011	5/22/2012				Separation		4.20	0.2500	0.2500	E	8	0.39
OH750	E140-S773	9/29/2011	5/22/2012	2	0	6.60	Separation	0.30	6.60	0.1250	0.1250	W	4	0.19
OH750	E140-S773	9/29/2011	5/22/2012				BOH		20.70	0.0000	0.0000		0	0.00
OH874-1	E140-S850	9/29/2011	3/12/2012	0	0	5.80	Separation	0.00	5.80	3.0000	0.5000	W	17	1.11
OH874-1	E140-S850	9/29/2011	3/12/2012				Separation		6.10	0.2500	0.0000		0	0.00
OH874-1	E140-S850	9/29/2011	3/12/2012				Separation		6.90	0.1250	0.0000		0	0.00
OH874-1	E140-S850	9/29/2011	3/12/2012				BOH		20.10	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH751	E140-S920	9/29/2011	5/22/2012				Separation		3.50	0.1250	0.0000		0	0.00
OH751	E140-S920	9/29/2011	5/22/2012	1	0	4.70	Separation	0.21	4.70	2.0000	1.0000	W	33	1.55
OH751	E140-S920	9/29/2011	5/22/2012				Separation		5.30	0.1250	0.0000		0	0.00
OH751	E140-S920	9/29/2011	5/22/2012				Separation		5.40	0.1250	0.0000		0	0.00
OH751	E140-S920	9/29/2011	5/22/2012				Separation		6.20	0.2500	0.0000		0	0.00
OH751	E140-S920	9/29/2011	5/22/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH575-1	E140-S1000	9/29/2011	5/22/2012				Separation		3.30	0.1250	0.0000		0	0.00
OH575-1	E140-S1000	9/29/2011	5/22/2012				Separation		3.60	0.1250	0.0000		0	0.00
OH575-1	E140-S1000	9/29/2011	5/22/2012	2	0	4.30	Separation	0.47	4.30	0.5000	0.2500	E	8	0.39
OH575-1	E140-S1000	9/29/2011	5/22/2012				Separation		5.30	0.1250	0.0000		0	0.00
OH575-1	E140-S1000	9/29/2011	5/22/2012				Separation		5.60	0.1250	0.0000		0	0.00
OH575-1	E140-S1000	9/29/2011	5/22/2012				Rough Spot		5.90	0.0000	0.0000		0	0.00
OH575-1	E140-S1000	9/29/2011	5/22/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH752	E140-S1070	9/29/2011	5/22/2012				Separation		0.50	0.1250	0.0000		0	0.00
OH752	E140-S1070	9/29/2011	5/22/2012				Separation		0.90	0.1250	0.0000		0	0.00
OH752	E140-S1070	9/29/2011	5/22/2012	2	0	5.60	Separation	0.36	5.60	0.1250	0.0000		0	0.00
OH752	E140-S1070	9/29/2011	5/22/2012				Separation		6.50	0.1250	0.0000		0	0.00
OH752	E140-S1070	9/29/2011	5/22/2012				BOH		20.50	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH873-1	E140-S1145	9/29/2011	5/22/2012				Separation		4.00	1.0000	0.0000		0	0.00
OH873-1	E140-S1145	9/29/2011	5/22/2012				Separation		4.90	0.2500	0.0000		0	0.00
OH873-1	E140-S1145	9/29/2011	5/22/2012				Separation		5.40	0.7500	0.0000		0	0.00
OH873-1	E140-S1145	9/29/2011	5/22/2012				Separation		5.80	0.1250	0.0000		0	0.00
OH873-1	E140-S1145	9/29/2011	5/22/2012				Separation		6.20	0.1250	0.0000		0	0.00
OH873-1	E140-S1145	9/29/2011	5/22/2012	5	0	6.30	Separation	0.79	6.30	0.2500	1.2500	E	42	1.93
OH873-1	E140-S1145	9/29/2011	5/22/2012				Separation		6.50	0.2500	0.0000		0	0.00
OH873-1	E140-S1145	9/29/2011	5/22/2012				Separation		7.50	0.1250	0.0000		0	0.00
OH873-1	E140-S1145	9/29/2011	5/22/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH753	E140-S1226	9/29/2011	5/22/2012				Separation		1.40	0.5000	0.0000		0	0.00
OH753	E140-S1226	9/29/2011	5/22/2012				Separation		3.90	0.1250	0.0000		0	0.00
OH753	E140-S1226	9/29/2011	5/22/2012				Separation		4.40	0.1250	0.0000		0	0.00
OH753	E140-S1226	9/29/2011	5/22/2012				Separation		4.70	0.7500	0.0000		0	0.00
OH753	E140-S1226	9/29/2011	5/22/2012	4	0	5.00	Separation	0.80	5.00	0.1250	0.1875	E	6	0.29
OH753	E140-S1226	9/29/2011	5/22/2012				Separation		5.30	0.3750	0.1250	E	4	0.19
OH753	E140-S1226	9/29/2011	5/22/2012				Separation		7.20	0.1250	0.0000		0	0.00
OH753	E140-S1226	9/29/2011	5/22/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH578	E140-S1300	6/16/2005	5/22/2012				Separation		4.90	0.1250	0.0000		0	0.00
OH578	E140-S1300	6/16/2005	5/22/2012	1	0	6.00	Separation	0.17	6.00	0.1250	0.0000		0	0.00
OH578	E140-S1300	6/16/2005	5/22/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH872-1	E140-S1390	9/29/2011	5/22/2012				Separation		0.50	0.1250	0.0000		0	0.00
OH872-1	E140-S1390	9/29/2011	5/22/2012				Separation		2.90	0.1250	0.0000		0	0.00
OH872-1	E140-S1390	9/29/2011	5/22/2012				Separation		4.40	0.1250	0.0000		0	0.00
OH872-1	E140-S1390	9/29/2011	5/22/2012	3	0	5.50	Separation	0.55	5.50	0.5000	0.1250	E	4	0.19
OH872-1	E140-S1390	9/29/2011	5/22/2012				Separation		6.50	0.1250	0.0000		0	0.00
OH872-1	E140-S1390	9/29/2011	5/22/2012				BOH		20.50	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH580-2	E140-S1463	9/29/2011	5/22/2012				Separation		3.80	0.3750	0.0000		0	0.00
OH580-2	E140-S1463	9/29/2011	5/22/2012				Separation		4.10	2.0000	0.0000		0	0.00
OH580-2	E140-S1463	9/29/2011	5/22/2012				Separation		4.50	2.5000	0.0000		0	0.00
OH580-2	E140-S1463	9/29/2011	5/22/2012				Separation		5.00	3.5000	0.0000		0	0.00
OH580-2	E140-S1463	9/29/2011	5/22/2012				Separation		6.40	0.1250	0.0000		0	0.00
OH580-2	E140-S1463	9/29/2011	5/22/2012				Separation		7.20	0.1250	0.0000		0	0.00
OH580-2	E140-S1463	9/29/2011	5/22/2012	6	0	7.40	Separation	0.81	7.40	2.0000	0.0000		0	0.00
OH580-2	E140-S1463	9/29/2011	5/22/2012				Separation		7.50	0.1250	0.0000		0	0.00
OH580-2	E140-S1463	9/29/2011	5/22/2012				Separation		8.00	0.1250	0.0000		0	0.00
OH580-2	E140-S1463	9/29/2011	5/22/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH754	E140-S1526	9/29/2011	5/22/2012				Separation		1.00	1.5000	0.3750	E	13	0.58
OH754	E140-S1526	9/29/2011	5/22/2012				Separation		1.80	1.5000	0.2500	E	8	0.39
OH754	E140-S1526	9/29/2011	5/22/2012				Separation		2.80	6.0000	0.3750	E	13	0.58
OH754	E140-S1526	9/29/2011	5/22/2012				Separation		4.60	0.1250	0.0000		0	0.00
OH754	E140-S1526	9/29/2011	5/22/2012				Separation		6.20	0.1250	0.0000		0	0.00
OH754	E140-S1526	9/29/2011	5/22/2012	5	0	6.80	Separation	0.74	6.80	5.0000	1.2500	E	42	1.93
OH754	E140-S1526	9/29/2011	5/22/2012				Separation		7.40	0.2500	0.0000		0	0.00
OH754	E140-S1526	9/29/2011	5/22/2012				Separation		8.00	4.0000	0.0000		0	0.00
OH754	E140-S1526	9/29/2011	5/22/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH582	E140-S1600	6/16/2005	5/22/2012	0	0	6.30	Separation	0.00	6.30	0.1250	0.0000		0	0.00
OH582	E140-S1600	6/16/2005	5/22/2012				Separation		6.40	0.1250	0.0000		0	0.00
OH582	E140-S1600	6/16/2005	5/22/2012				Separation		6.80	0.1250	0.0000		0	0.00
OH582	E140-S1600	6/16/2005	5/22/2012				BOH		20.40	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH871-1	E140-S1680	9/29/2011	6/7/2012				Separation		1.60	2.0000	0.0000		0	0.00
OH871-1	E140-S1680	9/29/2011	6/7/2012				Separation		2.80	1.5000	0.0000		0	0.00
OH871-1	E140-S1680	9/29/2011	6/7/2012				Separation		4.00	0.2500	0.0000		0	0.00
OH871-1	E140-S1680	9/29/2011	6/7/2012				Separation		5.00	1.0000	0.0000		0	0.00
OH871-1	E140-S1680	9/29/2011	6/7/2012	4	0	5.90	Separation	0.68	5.90	6.0000	1.5000	W	50	2.17
OH871-1	E140-S1680	9/29/2011	6/7/2012				Separation		6.80	0.1250	0.0000		0	0.00
OH871-1	E140-S1680	9/29/2011	6/7/2012				Separation		6.90	0.1250	0.0000		0	0.00
OH871-1	E140-S1680	9/29/2011	6/7/2012				Separation		7.10	0.1250	0.0000		0	0.00
OH871-1	E140-S1680	9/29/2011	6/7/2012				Separation		7.60	0.1250	0.0000		0	0.00
OH871-1	E140-S1680	9/29/2011	6/7/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH143-4	E140-S1784	9/26/2011	3/8/2012				Separation		0.80	1.0000	0.0000		0	0.00
OH143-4	E140-S1784	9/26/2011	3/8/2012				Separation		2.50	0.2500	0.0000		0	0.00
OH143-4	E140-S1784	9/26/2011	3/8/2012				Separation		3.30	0.2500	0.0000		0	0.00
OH143-4	E140-S1784	9/26/2011	3/8/2012				Separation		3.70	1.0000	0.5000	W	17	1.11
OH143-4	E140-S1784	9/26/2011	3/8/2012				Rough Spot		4.10	0.0000	0.0000		0	0.00
OH143-4	E140-S1784	9/26/2011	3/8/2012				Separation		4.60	2.0000	1.0000	W	33	2.23
OH143-4	E140-S1784	9/26/2011	3/8/2012				Separation		5.20	1.0000	0.0000		0	0.00
OH143-4	E140-S1784	9/26/2011	3/8/2012	7	0	5.70	Separation	1.23	5.70	4.0000	0.0000		0	0.00
OH143-4	E140-S1784	9/26/2011	3/8/2012				Separation		7.70	0.5000	0.0000		0	0.00
OH143-4	E140-S1784	9/26/2011	3/8/2012				Separation		8.60	1.0000	0.0000		0	0.00
OH143-4	E140-S1784	9/26/2011	3/8/2012				BOH		20.50	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH146-4	E140-S1854	9/26/2011	6/7/2012				Separation		0.80	0.1250	0.0000		0	0.00
OH146-4	E140-S1854	9/26/2011	6/7/2012				Separation		1.40	0.1250	0.0000		0	0.00
OH146-4	E140-S1854	9/26/2011	6/7/2012				Separation		2.50	2.5000	0.0000		0	0.00
OH146-4	E140-S1854	9/26/2011	6/7/2012				Separation		2.70	0.2500	0.0000		0	0.00
OH146-4	E140-S1854	9/26/2011	6/7/2012				Separation		4.50	12.0000	0.3750	W	13	0.54
OH146-4	E140-S1854	9/26/2011	6/7/2012	5	0	7.40	Separation	0.68	7.40	3.0000	2.0000	W	67	2.86
OH146-4	E140-S1854	9/26/2011	6/7/2012				Separation		8.00	0.1250	0.0000		0	0.00
OH146-4	E140-S1854	9/26/2011	6/7/2012				Separation		8.20	0.1250	0.0000		0	0.00
OH146-4	E140-S1854	9/26/2011	6/7/2012				Separation		8.30	0.1250	0.0000		0	0.00
OH146-4	E140-S1854	9/26/2011	6/7/2012				BOH		20.70	0.0000	0.0000		0	0.00
OH583	E140-S1950	6/16/2005	6/7/2012				Separation		2.00	0.1250	0.3750	E	13	0.05
OH583	E140-S1950	6/16/2005	6/7/2012				Separation		5.10	0.1250	0.1875	E	6	0.03
OH583	E140-S1950	6/16/2005	6/7/2012				Rough Spot		5.20	0.0000	0.1875	W	6	0.03
OH583	E140-S1950	6/16/2005	6/7/2012	3	0	5.60	Separation	0.54	5.60	3.5000	1.5000	E	50	0.21
OH583	E140-S1950	6/16/2005	6/7/2012				Separation		6.50	0.1250	0.0000		0	0.00
OH583	E140-S1950	6/16/2005	6/7/2012				Separation		6.80	0.1250	0.0000		0	0.00
OH583	E140-S1950	6/16/2005	6/7/2012				BOH		20.80	0.0000	0.0000		0	0.00
OH472-2	E140-S2167	6/1/2009	6/7/2012				Separation		4.90	0.1250	0.0000		0	0.00
OH472-2	E140-S2167	6/1/2009	6/7/2012				Separation		5.00	0.1250	0.0000		0	0.00
OH472-2	E140-S2167	6/1/2009	6/7/2012				Separation		5.30	0.7500	0.0000		0	0.00
OH472-2	E140-S2167	6/1/2009	6/7/2012				Separation		5.70	0.1250	0.0000		0	0.00
OH472-2	E140-S2167	6/1/2009	6/7/2012	4	0	6.00	Separation	0.67	6.00	0.5000	0.1875	SE	6	0.06
OH472-2	E140-S2167	6/1/2009	6/7/2012				Separation		6.30	0.2500	0.0000		0	0.00
OH472-2	E140-S2167	6/1/2009	6/7/2012				Separation		6.60	0.1250	0.0000		0	0.00
OH472-2	E140-S2167	6/1/2009	6/7/2012				BOH		20.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH471-2	E140-S2300	9/26/2011	6/7/2012				Separation		1.30	0.5000	1.0000	E	33	1.43
OH471-2	E140-S2300	9/26/2011	6/7/2012				Separation		2.30	0.7500	1.2500	E	42	1.79
OH471-2	E140-S2300	9/26/2011	6/7/2012				Separation		3.50	3.2500	0.0000		0	0.00
OH471-2	E140-S2300	9/26/2011	6/7/2012				Separation		4.70	1.5000	0.0000		0	0.00
OH471-2	E140-S2300	9/26/2011	6/7/2012				Separation		5.30	0.1250	0.0000		0	0.00
OH471-2	E140-S2300	9/26/2011	6/7/2012				Separation		5.40	0.1250	0.0000		0	0.00
OH471-2	E140-S2300	9/26/2011	6/7/2012				Separation		5.60	0.0000	0.0000		0	0.00
OH471-2	E140-S2300	9/26/2011	6/7/2012	7	0	6.20	BOH	1.13	6.20	4.0000	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		1.90	1.0000	0.3750	E	13	1.73
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		2.90	4.0000	0.1875	E	6	0.87
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		4.50	0.1250	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		5.20	2.0000	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		5.50	7.0000	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		6.10	0.1250	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		6.80	2.5000	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		7.00	0.1250	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011	8	0	7.20	Separation	1.11	7.20	6.0000	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		8.30	5.5000	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		9.00	0.1250	0.0000		0	0.00
OH586-2	E140-S2358	9/26/2011	12/14/2011				Separation		20.90	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH870	E140-S2456	6/1/2009	6/11/2012				Separation		1.20	0.2500	0.0000		0	0.00
OH870	E140-S2456	6/1/2009	6/11/2012				Separation		1.60	0.1250	0.0000		0	0.00
OH870	E140-S2456	6/1/2009	6/11/2012				Separation		2.50	1.2500	0.0000		0	0.00
OH870	E140-S2456	6/1/2009	6/11/2012				Separation		4.60	12.0000	1.0000	E	33	0.33
OH870	E140-S2456	6/1/2009	6/11/2012				Separation		5.70	0.1250	0.0000		0	0.00
OH870	E140-S2456	6/1/2009	6/11/2012				Separation		6.60	0.1250	0.5000	W	17	0.17
OH870	E140-S2456	6/1/2009	6/11/2012				Separation		7.10	0.1250	0.0000		0	0.00
OH870	E140-S2456	6/1/2009	6/11/2012	7	0	7.30	Rubble Zone	0.96	7.30	2.0000	0.3750	W	13	0.12
OH870	E140-S2456	6/1/2009	6/11/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH588-1	E140-S2520	9/26/2011	6/11/2012				Separation		1.50	0.5000	0.0000		0	0.00
OH588-1	E140-S2520	9/26/2011	6/11/2012	1	0	5.30	Separation	0.19	5.30	2.5000	0.7500	E	25	1.06
OH588-1	E140-S2520	9/26/2011	6/11/2012				Separation		6.40	0.5000	0.0000		0	0.00
OH588-1	E140-S2520	9/26/2011	6/11/2012				BOH		20.50	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		0.90	1.0000	0.1250	E	4	0.18
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		1.70	2.5000	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		2.00	0.2500	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		2.10	2.0000	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		2.40	3.0000	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		4.50	2.5000	1.0000	E	33	1.41
OH468-2	E140-S2640	9/26/2011	6/11/2012				Hangup		6.00	0.0000	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		6.70	0.5000	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012	8	0	7.10	Separation	1.13	7.10	3.0000	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		7.70	0.2500	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		7.80	1.0000	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		9.00	0.1250	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Hangup		9.20	0.0000	0.0000		0	0.00
OH468-2	E140-S2640	9/26/2011	6/11/2012				Separation		20.40	0.0000	0.0000		0	0.00
OH589-1	E140-S2750	6/1/2009	6/11/2012				Separation		5.60	0.2500	0.0000		0	0.00
OH589-1	E140-S2750	6/1/2009	6/11/2012				Separation		6.80	0.2500	0.0000		0	0.00
OH589-1	E140-S2750	6/1/2009	6/11/2012				Separation		7.90	1.0000	0.0000		0	0.00
OH589-1	E140-S2750	6/1/2009	6/11/2012				BOH		20.30	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH500-2	E140-S2920	9/26/2011	6/11/2012				Separation		0.90	2.0000	0.1250	W	4	0.18
OH500-2	E140-S2920	9/26/2011	6/11/2012				Separation		1.90	0.2500	0.1250	W	4	0.18
OH500-2	E140-S2920	9/26/2011	6/11/2012				Separation		2.00	1.0000	0.0000		0	0.00
OH500-2	E140-S2920	9/26/2011	6/11/2012				Separation		4.70	0.2500	0.0000		0	0.00
OH500-2	E140-S2920	9/26/2011	6/11/2012				Separation		4.90	0.2500	0.0000		0	0.00
OH500-2	E140-S2920	9/26/2011	6/11/2012				Separation		5.30	1.5000	0.0000		0	0.00
OH500-2	E140-S2920	9/26/2011	6/11/2012				Separation		5.70	1.0000	0.0000		0	0.00
OH500-2	E140-S2920	9/26/2011	6/11/2012	7	0	6.10	Separation	1.15	6.10	5.0000	0.0000		0	0.00
OH500-2	E140-S2920	9/26/2011	6/11/2012				Separation		7.70	2.5000	0.0000		0	0.00
OH500-2	E140-S2920	9/26/2011	6/11/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		0.80	1.0000	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		1.70	3.2500	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		5.00	0.1250	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		5.50	0.2500	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012	4	0	5.60	Separation	0.71	5.60	0.1250	1.7500	E	58	2.47
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		5.70	0.1250	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		5.90	2.0000	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		6.20	0.3750	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		6.60	1.0000	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		7.30	0.5000	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		7.80	3.0000	0.0000		0	0.00
OH501-2	E140-S2935	9/26/2011	6/11/2012				Separation		20.50	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH590-1	E140-S3080	6/1/2009	5/21/2012				Separation		1.50	0.3750	0.2500	S	8	0.08
OH590-1	E140-S3080	6/1/2009	5/21/2012				Separation		5.40	0.5000	0.5000	E	17	0.17
OH590-1	E140-S3080	6/1/2009	5/21/2012				Separation		5.90	0.3750	0.0000		0	0.00
OH590-1	E140-S3080	6/1/2009	5/21/2012				Separation		6.10	0.2500	0.0000		0	0.00
OH590-1	E140-S3080	6/1/2009	5/21/2012				Separation		6.50	0.1250	0.0000		0	0.00
OH590-1	E140-S3080	6/1/2009	5/21/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH493-2	E140-S3199	9/26/2011	5/21/2012				Separation		0.90	4.0000	0.2500	NW	8	0.38
OH493-2	E140-S3199	9/26/2011	5/21/2012				Separation		2.00	0.1250	0.0000		0	0.00
OH493-2	E140-S3199	9/26/2011	5/21/2012				Separation		2.30	0.1250	0.0675	W	2	0.10
OH493-2	E140-S3199	9/26/2011	5/21/2012				Separation		2.50	1.0000	0.0000		0	0.00
OH493-2	E140-S3199	9/26/2011	5/21/2012				Separation		5.10	0.1250	0.5000	W	17	0.77
OH493-2	E140-S3199	9/26/2011	5/21/2012	5	0	5.50	Separation	0.91	5.50	2.5000	0.3750	W	13	0.58
OH493-2	E140-S3199	9/26/2011	5/21/2012				Separation		5.90	0.5000	0.0000		0	0.00
OH493-2	E140-S3199	9/26/2011	5/21/2012				Separation		6.10	2.0000	0.0000		0	0.00
OH493-2	E140-S3199	9/26/2011	5/21/2012				Separation		6.50	0.3750	0.0000		0	0.00
OH493-2	E140-S3199	9/26/2011	5/21/2012				Separation		7.90	0.3750	0.0000		0	0.00
OH493-2	E140-S3199	9/26/2011	5/21/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH605-2	E140-S3394	9/26/2011	5/21/2012				Separation		1.30	0.7500	0.1250	E	4	0.19
OH605-2	E140-S3394	9/26/2011	5/21/2012				Separation		2.20	0.1250	0.1250	E	4	0.19
OH605-2	E140-S3394	9/26/2011	5/21/2012				Separation		5.10	4.0000	0.1250	E	4	0.19
OH605-2	E140-S3394	9/26/2011	5/21/2012	3	0	5.60	Separation	0.54	5.60	4.0000	1.7500	E	58	2.68
OH605-2	E140-S3394	9/26/2011	5/21/2012				Separation		6.20	1.5000	0.0000		0	0.00
OH605-2	E140-S3394	9/26/2011	5/21/2012				Separation		6.50	0.1250	0.0000		0	0.00
OH605-2	E140-S3394	9/26/2011	5/21/2012				Hangup		6.70	0.0000	0.0000		0	0.00
OH605-2	E140-S3394	9/26/2011	5/21/2012				BOH		20.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH606-2	E140-S3480	9/26/2011	5/21/2012				Separation		0.40	0.1250	0.0000		0	0.00
OH606-2	E140-S3480	9/26/2011	5/21/2012				Separation		1.60	0.1250	0.0000		0	0.00
OH606-2	E140-S3480	9/26/2011	5/21/2012				Separation		4.40	0.7500	1.5000	W	50	2.30
OH606-2	E140-S3480	9/26/2011	5/21/2012				Separation		4.70	0.1250	0.0000		0	0.00
OH606-2	E140-S3480	9/26/2011	5/21/2012				Separation		5.20	1.0000	0.0000		0	0.00
OH606-2	E140-S3480	9/26/2011	5/21/2012	5	0	5.60	Separation	0.89	5.60	1.0000	0.0000		0	0.00
OH606-2	E140-S3480	9/26/2011	5/21/2012				Separation		5.70	0.1250	0.0000		0	0.00
OH606-2	E140-S3480	9/26/2011	5/21/2012				Separation		5.80	0.1250	0.0000		0	0.00
OH606-2	E140-S3480	9/26/2011	5/21/2012				Separation		6.50	0.1250	0.0000		0	0.00
OH606-2	E140-S3480	9/26/2011	5/21/2012				Separation		7.10	0.5000	0.0000		0	0.00
OH606-2	E140-S3480	9/26/2011	5/21/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH571-1	E140-S3527	9/26/2011	2/22/2012				Separation		4.20	0.1250	0.2500	W	8	0.61
OH571-1	E140-S3527	9/26/2011	2/22/2012				Separation		4.30	0.1250	0.2500	W	8	0.61
OH571-1	E140-S3527	9/26/2011	2/22/2012				Separation		4.80	0.5000	0.0000		0	0.00
OH571-1	E140-S3527	9/26/2011	2/22/2012	3	0	5.10	Separation	0.59	5.10	3.0000	0.0000		0	0.00
OH571-1	E140-S3527	9/26/2011	2/22/2012				Separation		6.90	0.2500	0.0000		0	0.00
OH571-1	E140-S3527	9/26/2011	2/22/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH607-1	E140-S3580	9/26/2011	2/22/2012				Separation		0.90	0.2500	0.0000		0	0.00
OH607-1	E140-S3580	9/26/2011	2/22/2012	1	0	4.70	Separation	0.21	4.70	0.2500	0.0000		0	0.00
OH607-1	E140-S3580	9/26/2011	2/22/2012				Separation		7.10	1.5000	0.0000		0	0.00
OH607-1	E140-S3580	9/26/2011	2/22/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH567-1	E140-S3650	9/26/2011	5/21/2012				Separation		4.70	0.1250	0.0000		0	0.00
OH567-1	E140-S3650	9/26/2011	5/21/2012	1	0	6.70	Separation	0.15	6.70	0.2500	0.0000		0	0.00
OH567-1	E140-S3650	9/26/2011	5/21/2012				Separation		8.20	0.2500	0.0000		0	0.00
OH567-1	E140-S3650	9/26/2011	5/21/2012				BOH		20.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH901-2	W395-S2832	5/15/2012	5/15/2012				Separation		1.00	0.1250	0.0000		0	N/A
OH901-2		5/15/2012	5/15/2012				Separation		1.80	0.5000	0.0000		0	N/A
OH901-2		5/15/2012	5/15/2012				Separation		2.00	0.1250	0.0000		0	N/A
OH901-2		5/15/2012	5/15/2012				Separation		4.20	0.5000	0.0000		0	N/A
OH901-2		5/15/2012	5/15/2012				Separation		4.70	1.0000	0.0000		0	N/A
OH901-2		5/15/2012	5/15/2012				Separation		5.20	2.0000	0.0000		0	N/A
OH901-2		5/15/2012	5/15/2012	6		5.50	Separation	1.09	5.50	5.0000	0.2500	N	8	N/A
OH901-2		5/15/2012	5/15/2012				Separation		6.10	2.5000	0.0000		0	N/A
OH901-2		5/15/2012	5/15/2012				Separation		7.80	1.5000	0.0000		0	N/A
OH901-2		5/15/2012	5/15/2012				BOH		20.10	0.0000	0.0000		0	N/A
OH902-2	W393-S2912	5/15/2012	5/15/2012				Separation		1.30	0.2500	0.0000		0	N/A
OH902-2		5/15/2012	5/15/2012				Separation		2.20	0.2500	0.0000		0	N/A
OH902-2		5/15/2012	5/15/2012				Separation		4.90	0.1250	0.0000		0	N/A
OH902-2		5/15/2012	5/15/2012				Separation		5.00	0.1250	0.1250	W	4	N/A
OH902-2		5/15/2012	5/15/2012	4	0	5.20	Separation	0.77	5.20	1.2500	0.0000		0	N/A
OH902-2		5/15/2012	5/15/2012				Hangup		6.50	0.0000	0.1250	W	4	N/A
OH902-2		5/15/2012	5/15/2012				BOH		20.10	0.0000	0.0000		0	N/A

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH903-2	W393-S2994	5/15/2012	5/15/2012				Separation		0.50	0.3750	0.0000		0	N/A
OH903-2	W393-S2994	5/15/2012	5/15/2012				Separation		1.10	0.1250	0.0000		0	N/A
OH903-2	W393-S2994	5/15/2012	5/15/2012				Separation		4.20	0.2500	0.0000		0	N/A
OH903-2	W393-S2994	5/15/2012	5/15/2012				Separation		4.80	2.0000	0.0000		0	N/A
OH903-2	W393-S2994	5/15/2012	5/15/2012	2	0	5.10	Separation	0.39	5.10	2.0000	0.0000		0	N/A
OH903-2	W393-S2994	5/15/2012	5/15/2012				Separation		5.20	0.1250	0.0000		0	N/A
OH903-2	W393-S2994	5/15/2012	5/15/2012				Rough Spot		5.30	0.0000	0.0000		0	N/A
OH903-2	W393-S2994	5/15/2012	5/15/2012				Separation		5.50	2.5000	0.0000		0	N/A
OH903-2	W393-S2994	5/15/2012	5/15/2012				BOH		20.20	0.0000	0.0000		0	N/A
OH904	W525-S2843	12/16/2008	6/11/2012				Separation		1.00	0.5000	0.0000		0	0.00
OH904	W525-S2843	12/16/2008	6/11/2012				Separation		4.80	2.0000	0.2500	SE	8	0.07
OH904	W525-S2843	12/16/2008	6/11/2012	2	0	5.40	Separation	0.37	5.40	2.5000	0.2500	SE	8	0.07
OH904	W525-S2843	12/16/2008	6/11/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH905-1	W525-S2912	5/15/2012	5/15/2012				Separation		0.50	0.2500	0.0000		0	N/A
OH905-1	W525-S2912	5/15/2012	5/15/2012				Separation		2.90	0.1250	0.0000		0	N/A
OH905-1	W525-S2912	5/15/2012	5/15/2012	2	0	5.10	Separation	0.39	5.10	0.5000	0.0000		0	N/A
OH905-1	W525-S2912	5/15/2012	5/15/2012				Separation		5.40	0.1250	0.0000		0	N/A
OH905-1	W525-S2912	5/15/2012	5/15/2012				Separation		5.70	0.3750	0.0000		0	N/A
OH905-1	W525-S2912	5/15/2012	5/15/2012				Separation		5.80	0.3750	0.0000		0	N/A
OH905-1	W525-S2912	5/15/2012	5/15/2012				Separation		6.10	5.0000	0.1250	E	4	N/A
OH905-1	W525-S2912	5/15/2012	5/15/2012				Separation		6.80	0.2500	0.0000		0	N/A
OH905-1	W525-S2912	5/15/2012	5/15/2012				BOH		20.00	0.0000	0.0000		0	N/A

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH906-1	W525-S2994	5/15/2012	5/15/2012				Separation		1.10	0.2500	0.0000		0	N/A
OH906-1	W525-S2994	5/15/2012	5/15/2012				Separation		4.80	0.1250	0.0000		0	N/A
OH906-1	W525-S2994	5/15/2012	5/15/2012	2	0	5.30	Separation	0.38	5.30	4.0000	0.0000		0	N/A
OH906-1	W525-S2994	5/15/2012	5/15/2012				BOH		20.00	0.0000	0.0000		0	N/A
OH907	W656-S2800	6/5/2009	3/8/2012				Separation		1.00	0.2500	1.0000	E	33	0.36
OH907	W656-S2800	6/5/2009	3/8/2012	1	0	5.30	Separation	0.19	5.30	2.0000	1.5000	E	50	0.54
OH907	W656-S2800	6/5/2009	3/8/2012				BOH		21.00	0.0000	0.0000		0	0.00
OH908	W656-S2895	6/5/2009	3/8/2012				Separation		0.80	0.1250	0.0000		0	0.00
OH908	W656-S2895	6/5/2009	3/8/2012				Separation		0.90	0.1250	0.0000		0	0.00
OH908	W656-S2895	6/5/2009	3/8/2012	2	0	5.00	Separation	0.40	5.00	4.0000	1.5000	E	50	0.54
OH908	W656-S2895	6/5/2009	3/8/2012				Separation		5.90	0.1250	0.0000		0	0.00
OH908	W656-S2895	6/5/2009	3/8/2012				BOH		21.00	0.0000	0.0000		0	0.00
OH909	W656-S3000	6/5/2009	3/8/2012				Separation		1.80	0.1250	0.5000	E	17	0.18
OH909	W656-S3000	6/5/2009	3/8/2012				Separation		5.00	0.2500	0.0000		0	0.00
OH909	W656-S3000	6/5/2009	3/8/2012				Separation		5.40	0.2500	0.0000		0	0.00
OH909	W656-S3000	6/5/2009	3/8/2012	3	0	5.90	Separation	0.51	5.90	3.0000	2.5000	E	83	0.91
OH909	W656-S3000	6/5/2009	3/8/2012				BOH		21.00	0.0000	0.0000		0	0.00
OH910	W790-S2800	9/17/2009	12/13/2011				Separation		5.00	0.1250	0.0000		0	0.00
OH910	W790-S2800	9/17/2009	12/13/2011				Separation		5.10	0.1250	0.0000		0	0.00
OH910	W790-S2800	9/17/2009	12/13/2011	2	0	5.50	Separation	0.36	5.50	1.2500	1.0000	E	33	0.45
OH910	W790-S2800	9/17/2009	12/13/2011				Separation		5.70	0.1250	0.0000		0	0.00
OH910	W790-S2800	9/17/2009	12/13/2011				Separation		5.80	2.0000	0.0000		0	0.00
OH910	W790-S2800	9/17/2009	12/13/2011				BOH		20.60	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH911	W790-S2895	9/17/2009	12/13/2011				Separation		4.70	0.1250	0.0000		0	0.00
OH911	W790-S2895	9/17/2009	12/13/2011				Separation		4.90	0.1250	0.0000		0	0.00
OH911	W790-S2895	9/17/2009	12/13/2011	2	0	5.50	Separation	0.36	5.50	1.5000	0.7500	E	25	0.34
OH911	W790-S2895	9/17/2009	12/13/2011				BOH		20.50	0.0000	0.0000		0	0.00
OH912	W790-S3000	9/17/2009	12/13/2011				Separation		5.10	0.3750	0.0000		0	0.00
OH912	W790-S3000	9/17/2009	12/13/2011	1	0	5.50	Separation	0.18	5.50	1.2500	0.3750	E	13	0.17
OH912	W790-S3000	9/17/2009	12/13/2011				BOH		20.70	0.0000	0.0000		0	0.00
OH913	W920-S2800	9/17/2009	9/14/2011				Separation		4.50	0.7500	0.1250	E	4	0.06
OH913	W920-S2800	9/17/2009	9/14/2011	1	0	5.20	Separation	0.19	5.20	1.0000	0.0000		0	0.00
OH913	W920-S2800	9/17/2009	9/14/2011				BOH		20.50	0.0000	0.0000		0	0.00
OH914	W920-S2895	9/17/2009	9/14/2011				Separation		4.70	0.1250	0.0000		0	0.00
OH914	W920-S2895	9/17/2009	9/14/2011	1	0	5.20	Separation	0.19	5.20	1.5000	0.0000		0	0.00
OH914	W920-S2895	9/17/2009	9/14/2011				BOH		20.50	0.0000	0.0000		0	0.00
OH915	W920-S3000	9/17/2009	9/14/2011				Separation		4.00	0.1250	0.0625	E	2	0.03
OH915	W920-S3000	9/17/2009	9/14/2011				Separation		4.40	0.1250	0.0000		0	0.00
OH915	W920-S3000	9/17/2009	9/14/2011	2	0	4.90	Separation	0.41	4.90	0.1250	1.0000	E	33	0.50
OH915	W920-S3000	9/17/2009	9/14/2011				Separation		5.40	0.1250	0.0625	W	2	0.03
OH915	W920-S3000	9/17/2009	9/14/2011				BOH		20.50	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH922-1	S2750-W394	2/11/2011	5/23/2012				Separation		1.00	0.5000	0.1875	S	6	0.15
OH922-1	S2750-W394	2/11/2011	5/23/2012				Separation		4.50	1.2500	0.2500	N	8	0.20
OH922-1	S2750-W394	2/11/2011	5/23/2012	2	0	5.40	Separation	0.37	5.40	2.0000	0.1250	N	4	0.10
OH922-1	S2750-W394	2/11/2011	5/23/2012				Separation		5.80	0.5000	0.3750	S	13	0.29
OH922-1	S2750-W394	2/11/2011	5/23/2012				Separation		7.30	0.5000	0.0000		0	0.00
OH922-1	S2750-W394	2/11/2011	5/23/2012				Separation		9.00	0.1250	0.0000		0	0.00
OH922-1	S2750-W394	2/11/2011	5/23/2012				Hangup		10.10	0.0000	0.0000		0	0.00
OH922-1	S2750-W394	2/11/2011	5/23/2012				Hangup		15.20	0.0000	0.0000		0	0.00
OH922-1	S2750-W394	2/11/2011	5/23/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH923-1	S2750-W461	2/11/2011	5/23/2012				Separation		1.20	0.3750	0.7500	S	25	0.59
OH923-1	S2750-W461	2/11/2011	5/23/2012				Separation		1.30	0.1250	0.0000		0	0.00
OH923-1	S2750-W461	2/11/2011	5/23/2012				Separation		2.20	0.1250	0.1250	S	4	0.10
OH923-1	S2750-W461	2/11/2011	5/23/2012				Separation		2.70	0.1250	0.1250	S	4	0.10
OH923-1	S2750-W461	2/11/2011	5/23/2012				Separation		2.80	0.3750	0.1250	S	4	0.10
OH923-1	S2750-W461	2/11/2011	5/23/2012				Separation		4.00	0.2500	0.0000		0	0.00
OH923-1	S2750-W461	2/11/2011	5/23/2012				Separation		4.70	0.1250	0.0000		0	0.00
OH923-1	S2750-W461	2/11/2011	5/23/2012	7	0	5.50	Separation	1.27	5.50	6.0000	2.5000	S	83	1.95
OH923-1	S2750-W461	2/11/2011	5/23/2012				Separation		6.40	3.5000	0.0000		0	0.00
OH923-1	S2750-W461	2/11/2011	5/23/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH924-1	S2750-W528	2/11/2011	5/23/2012				Separation		1.00	0.2500	0.2500	S	8	0.20
OH924-1	S2750-W528	2/11/2011	5/23/2012				Separation		4.30	0.1250	0.0000		0	0.00
OH924-1	S2750-W528	2/11/2011	5/23/2012				Separation		5.20	1.5000	0.7500	S	25	0.59
OH924-1	S2750-W528	2/11/2011	5/23/2012	3	0	5.80	Separation	0.52	5.80	4.0000	0.1875	S	6	0.15
OH924-1	S2750-W528	2/11/2011	5/23/2012				BOH		20.40	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH925-1	S2750-W618	2/11/2011	5/23/2012				Separation		4.50	0.2500	0.0000		0	0.00
OH925-1	S2750-W618	2/11/2011	5/23/2012				Separation		4.80	1.5000	0.0000		0	0.00
OH925-1	S2750-W618	2/11/2011	5/23/2012	2	0	5.20	Separation	0.38	5.20	4.0000	2.5000	S	83	1.95
OH925-1	S2750-W618	2/11/2011	5/23/2012				Separation		6.50	0.2500	0.0000		0	0.00
OH925-1	S2750-W618	2/11/2011	5/23/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH926-1	S2750-W656	2/11/2011	5/23/2012				Separation		1.20	0.1250	0.1250	S	4	0.10
OH926-1	S2750-W656	2/11/2011	5/23/2012				Separation		4.90	0.1250	0.0000		0	0.00
OH926-1	S2750-W656	2/11/2011	5/23/2012	2	0	5.60	Separation	0.36	5.60	4.5000	1.7500	S	58	1.37
OH926-1	S2750-W656	2/11/2011	5/23/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH927-1	S2750-W725	2/11/2011	5/23/2012				Separation		1.00	0.1250	0.1875	S	6	0.15
OH927-1	S2750-W725	2/11/2011	5/23/2012				Separation		4.20	0.1250	0.0000		0	0.00
OH927-1	S2750-W725	2/11/2011	5/23/2012				Separation		4.40	0.1250	0.0000		0	0.00
OH927-1	S2750-W725	2/11/2011	5/23/2012				Separation		4.80	0.5000	0.0000		0	0.00
OH927-1	S2750-W725	2/11/2011	5/23/2012				Separation		5.10	0.1250	0.0000		0	0.00
OH927-1	S2750-W725	2/11/2011	5/23/2012	5	0	5.30	Separation	0.94	5.30	3.0000	0.1875	S	6	0.15
OH927-1	S2750-W725	2/11/2011	5/23/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH928-1	S2750-W790	2/11/2011	12/13/2011				Separation		1.10	0.1250	0.0000		0	0.00
OH928-1	S2750-W790	2/11/2011	12/13/2011				Separation		5.30	0.5000	0.1250	S	4	0.15
OH928-1	S2750-W790	2/11/2011	12/13/2011	2	0	5.80	Separation	0.34	5.80	2.0000	0.0625	S	2	0.07
OH928-1	S2750-W790	2/11/2011	12/13/2011				Separation		7.30	0.1250	0.0000		0	0.00
OH928-1	S2750-W790	2/11/2011	12/13/2011				BOH		20.10	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH929-1	S2750-W860	2/11/2011	12/13/2011				Separation		4.10	0.1250	0.0000		0	0.00
OH929-1	S2750-W860	2/11/2011	12/13/2011				Separation		4.50	0.1250	0.0000		0	0.00
OH929-1	S2750-W860	2/11/2011	12/13/2011				Separation		5.10	0.2500	0.0000		0	0.00
OH929-1	S2750-W860	2/11/2011	12/13/2011				Separation		5.30	0.1250	0.0000		0	0.00
OH929-1	S2750-W860	2/11/2011	12/13/2011	4	0	5.50	Separation	0.73	5.50	1.5000	0.0000		0	0.00
OH929-1	S2750-W860	2/11/2011	12/13/2011				BOH		20.40	0.0000	0.0000		0	0.00
OH930-1	S2750-W920	2/11/2011	9/14/2011				Separation		1.10	0.3750	0.0625	S	2	0.11
OH930-1	S2750-W920	2/11/2011	9/14/2011	1	0	5.20	Separation		5.20	1.0000	0.1875	N	6	0.32
OH930-1	S2750-W920	2/11/2011	9/14/2011				Separation		5.40	0.1250	0.1250	S	4	0.21
OH930-1	S2750-W920	2/11/2011	9/14/2011				Separation		5.90	0.1250	0.0000		0	0.00
OH930-1	S2750-W920	2/11/2011	9/14/2011				Separation		7.00	0.3750	0.1250	S	4	0.21
OH930-1	S2750-W920	2/11/2011	9/14/2011				BOH		20.10	0.0000	0.0000		0	0.00
OH931-1	S2750-W985	2/11/2011	9/14/2011				Separation		4.80	0.1250	0.0000		0	0.00
OH931-1	S2750-W985	2/11/2011	9/14/2011				Separation		5.80	1.2500	0.0000		0	0.00
OH931-1	S2750-W985	2/11/2011	9/14/2011				BOH		20.10	0.0000	0.0000		0	0.00
OH935-1	S3080-W395	2/11/2011	3/12/2012				Separation		4.90	0.1250	0.0000		0	0.00
OH935-1	S3080-W395	2/11/2011	3/12/2012				Separation		5.40	0.2500	0.1250	N	4	0.12
OH935-1	S3080-W395	2/11/2011	3/12/2012	2	0	5.70	Separation	0.35	5.70	4.0000	0.3750	N	13	0.35
OH935-1	S3080-W395	2/11/2011	3/12/2012				BOH		20.00	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH936-1	S3080-W463	2/11/2011	6/11/2012				Separation		1.00	2.0000	0.7500	S	25	0.56
OH936-1	S3080-W463	2/11/2011	6/11/2012				Separation		1.90	1.0000	0.1250	N	4	0.09
OH936-1	S3080-W463	2/11/2011	6/11/2012				Separation		4.70	0.1250	0.0000		0	0.00
OH936-1	S3080-W463	2/11/2011	6/11/2012				Separation		5.00	0.2500	0.0000		0	0.00
OH936-1	S3080-W463	2/11/2011	6/11/2012	4	0	5.20	Separation	0.77	5.20	3.0000	0.0000		0	0.00
OH936-1	S3080-W463	2/11/2011	6/11/2012				Separation		5.50	1.5000	0.0000		0	0.00
OH936-1	S3080-W463	2/11/2011	6/11/2012				Separation		5.70	0.5000	0.0000		0	0.00
OH936-1	S3080-W463	2/11/2011	6/11/2012				Separation		5.90	2.0000	0.0000		0	0.00
OH936-1	S3080-W463	2/11/2011	6/11/2012				Separation		6.30	2.0000	0.0000		0	0.00
OH936-1	S3080-W463	2/11/2011	6/11/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH937-1	S3080-W529	2/11/2011	6/11/2012				Separation		1.20	0.1250	0.1250	S	4	0.09
OH937-1	S3080-W529	2/11/2011	6/11/2012				Separation		4.90	0.2500	0.0000		0	0.00
OH937-1	S3080-W529	2/11/2011	6/11/2012	2	0	5.40	Separation	0.37	5.40	5.0000	0.7500	N	25	0.56
OH937-1	S3080-W529	2/11/2011	6/11/2012				Separation		6.10	0.7500	0.0000		0	0.00
OH937-1	S3080-W529	2/11/2011	6/11/2012				Separation		7.30	0.1250	0.0000		0	0.00
OH937-1	S3080-W529	2/11/2011	6/11/2012				Separation		16.20	0.1250	0.0000		0	0.00
OH937-1	S3080-W529	2/11/2011	6/11/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH938-1	S3080-W592	2/11/2011	6/11/2012				Separation		1.00	0.2500	0.0000		0	0.00
OH938-1	S3080-W592	2/11/2011	6/11/2012				Separation		4.70	0.5000	0.0000		0	0.00
OH938-1	S3080-W592	2/11/2011	6/11/2012	2	0	5.10	Separation	0.39	5.10	2.0000	0.5000	S	17	0.38
OH938-1	S3080-W592	2/11/2011	6/11/2012				Separation		5.50	1.0000	0.0000		0	0.00
OH938-1	S3080-W592	2/11/2011	6/11/2012				Separation		6.00	7.0000	0.0000		0	0.00
OH938-1	S3080-W592	2/11/2011	6/11/2012				BOH		20.30	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH939-1	S3080-W662	2/11/2011	6/11/2012				Separation		1.30	0.2500	0.1250	N	4	0.09
OH939-1	S3080-W662	2/11/2011	6/11/2012				Separation		4.90	0.2500	1.2500	N	42	0.94
OH939-1	S3080-W662	2/11/2011	6/11/2012	2	0	5.40	Separation	0.37	5.40	5.0000	0.0000		0	0.00
OH939-1	S3080-W662	2/11/2011	6/11/2012				Separation		5.90	0.2500	0.0000		0	0.00
OH939-1	S3080-W662	2/11/2011	6/11/2012				Hangup		16.00	0.0000	0.0000		0	0.00
OH939-1	S3080-W662	2/11/2011	6/11/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH940-1	S3080-W725	2/11/2011	3/12/2012				Separation		1.60	0.1250	0.0675	S	2	0.06
OH940-1	S3080-W725	2/11/2011	3/12/2012	1	0	5.00	Separation	0.20	5.00	1.2500	0.5000	S	17	0.46
OH940-1	S3080-W725	2/11/2011	3/12/2012				Separation		5.70	0.5000	0.2500	S	8	0.23
OH940-1	S3080-W725	2/11/2011	3/12/2012				Separation		6.00	2.5000	0.1250	E	4	0.12
OH940-1	S3080-W725	2/11/2011	3/12/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH941-1	S3080-W795	2/11/2011	12/19/2011				Separation		0.90	0.1250	0.0000		0	0.00
OH941-1	S3080-W795	2/11/2011	12/19/2011	1	0	4.80	Separation	0.21	4.80	2.5000	0.3750	S	13	0.44
OH941-1	S3080-W795	2/11/2011	12/19/2011				Separation		5.40	0.2500	0.0000		0	0.00
OH941-1	S3080-W795	2/11/2011	12/19/2011				Separation		5.50	0.1250	0.0000		0	0.00
OH941-1	S3080-W795	2/11/2011	12/19/2011				Separation		5.70	0.2500	0.0000		0	0.00
OH941-1	S3080-W795	2/11/2011	12/19/2011				Separation		5.90	0.7500	0.0000		0	0.00
OH941-1	S3080-W795	2/11/2011	12/19/2011				Separation		6.80	0.1250	0.0000		0	0.00
OH941-1	S3080-W795	2/11/2011	12/19/2011				Separation		7.00	1.0000	0.1250	S	4	0.15
OH941-1	S3080-W795	2/11/2011	12/19/2011				BOH		20.10	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH942-1	S3080-W860	2/11/2011	12/19/2011				Separation		0.90	0.1250	0.0000		0	0.00
OH942-1	S3080-W860	2/11/2011	12/19/2011				Separation		1.70	0.1250	0.0000		0	0.00
OH942-1	S3080-W860	2/11/2011	12/19/2011				Separation		4.10	1.5000	1.0000	N	33	1.17
OH942-1	S3080-W860	2/11/2011	12/19/2011				Separation		5.00	1.0000	0.0000		0	0.00
OH942-1	S3080-W860	2/11/2011	12/19/2011	4	0	5.30	Separation	0.75	5.30	2.0000	0.7500	E	25	0.88
OH942-1	S3080-W860	2/11/2011	12/19/2011				Separation		5.70	0.1250	0.0000		0	0.00
OH942-1	S3080-W860	2/11/2011	12/19/2011				BOH		20.30	0.0000	0.0000		0	0.00
OH943	S3080-W920	9/19/2009	9/15/2011				Separation		0.90	0.1250	0.0000		0	0.00
OH943	S3080-W920	9/19/2009	9/15/2011	1	0	5.00	Separation	0.20	5.00	3.5000	0.5000	N	17	0.25
OH943	S3080-W920	9/19/2009	9/15/2011				Separation		5.70	0.2500	0.0000		0	0.00
OH943	S3080-W920	9/19/2009	9/15/2011				BOH		20.00	0.0000	0.0000		0	0.00
OH944	S3080-W980	9/18/2009	9/15/2011				Separation		5.30	1.5000	0.0000		0	0.00
OH944	S3080-W980	9/18/2009	9/15/2011				BOH		20.30	0.0000	0.0000		0	0.00
OH1001	W390-S2271	9/23/2010	6/25/2012				Hole Closed		0.00	0.0000	0.0000		0	0.00
OH1002	W390-S2350	9/23/2010	6/25/2012	0	0	8.70	Separation	0.00	8.70	0.1250	0.0000		0	0.00
OH1002	W390-S2350	9/23/2010	6/25/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH1003	W390-S2422	9/23/2010	6/25/2012	0	0	7.90	Hangup	0.00	7.90	0.0000	0.0000		0	0.00
OH1003	W390-S2422	9/23/2010	6/25/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH1004	W520-S2271	9/14/2010	6/4/2012				Separation		1.20	0.1250	0.0675	W	2	0.04
OH1004	W520-S2271	9/14/2010	6/4/2012				Separation		3.00	0.1250	0.1250	W	4	0.07
OH1004	W520-S2271	9/14/2010	6/4/2012				Separation		6.00	0.1250	0.0000		0	0.00
OH1004	W520-S2271	9/14/2010	6/4/2012	3	0	8.10	Hangup	0.37	8.10	0.0000	0.0000		0	0.00
OH1004	W520-S2271	9/14/2010	6/4/2012				BOH		20.60	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH1005	W520-S2350	9/14/2010	6/4/2012	0	0	8.80	Rough Spot	0.00	8.80	0.0000	0.1250	E	4	0.07
OH1005	W520-S2350	9/14/2010	6/4/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH1006	W520-S2422	9/14/2010	6/4/2012				Separation		0.50	0.2500	0.1250	W	4	0.07
OH1006	W520-S2422	9/14/2010	6/4/2012	0	0	7.90	Rough Spot	0.00	7.90	0.0000	0.0000		0	0.00
OH1006	W520-S2422	9/14/2010	6/4/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH1007	W660-S2271	11/15/2010	6/4/2012	0	0	8.30	Separation	0.00	8.30	0.1250	0.0000		0	0.00
OH1007	W660-S2271	11/15/2010	6/4/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1008	W660-S2350	11/15/2010	6/4/2012	0	0	7.60	Separation	0.00	7.60	0.1250	0.0000		0	0.00
OH1008	W660-S2350	11/15/2010	6/4/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1009	W660-S2422	11/15/2010	6/4/2012	0	0	8.00	Hangup	0.00	8.00	0.0000	0.0000		0	0.00
OH1009	W660-S2422	11/15/2010	6/4/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1010	W790-S2271	11/15/2010	6/4/2012	0	0	8.00	Hangup	0.00	8.00	0.0000	0.3750	E	13	0.24
OH1010	W790-S2271	11/15/2010	6/4/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH1011	W790-S2350	11/15/2010	6/4/2012				Separation		6.10	0.1250	0.1250	E	4	0.08
OH1011	W790-S2350	11/15/2010	6/4/2012	0	0	7.50	Hangup	0.00	7.50	0.0000	0.2500	E	8	0.16
OH1011	W790-S2350	11/15/2010	6/4/2012				Hangup		13.50	0.0000	0.1875	W	6	0.12
OH1011	W790-S2350	11/15/2010	6/4/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH1012	W790-S2422	12/21/2010	12/30/2011	0	0	6.60	Separation	0.00	6.60	0.1250	0.2500	E	8	0.24
OH1012	W790-S2422	12/21/2010	12/30/2011				BOH		20.50	0.0000	0.0000		0	0.00
OH1013	W920-S2271	3/1/2011	6/4/2012	0	0	7.30	Hangup	0.00	7.30	0.0000	0.0000		0	0.00
OH1013	W920-S2271	3/1/2011	6/4/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1014	W920-S2350	3/1/2011	6/4/2012	0	0	7.50	Separation	0.00	7.50	0.1250	0.0000		0	0.00
OH1014	W920-S2350	3/1/2011	6/4/2012				BOH		20.50	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR+ 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH1015	W920-S2422	3/1/2011	6/4/2012	0	0	7.20	Hangup	0.00	7.20	0.0000	0.0000		0	0.00
OH1015	W920-S2422	3/1/2011	6/4/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1016	W1050-S2271	3/1/2011	5/31/2012	0	0	7.80	Separation	0.00	7.80	0.2500	0.2500	E	8	0.20
OH1016	W1050-S2271	3/1/2011	5/31/2012				Separation		8.90	0.2500	0.0000		0	0.00
OH1016	W1050-S2271	3/1/2011	5/31/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH1017	W1050-S2350	3/1/2011	6/4/2012	0	0	8.00	Hangup	0.00	8.00	0.0000	0.0000		0	0.00
OH1017	W1050-S2350	3/1/2011	6/4/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH1018	W1050-S2422	3/1/2011	6/4/2012	0	0	7.70	Hangup	0.00	7.70	0.0000	0.0000		0	0.00
OH1018	W1050-S2422	3/1/2011	6/4/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH1019	W1190-S2271	3/21/2011	5/31/2012				Separation		6.80	0.1250	0.0000		0	0.00
OH1019	W1190-S2271	3/21/2011	5/31/2012	0	0	7.90	Separation	0.00	7.90	0.1250	0.0000		0	0.00
OH1019	W1190-S2271	3/21/2011	5/31/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH1020	W1190-S2350	3/21/2011	5/31/2012	0	0	7.60	Separation	0.00	7.60	0.1250	0.0000		0	0.00
OH1020	W1190-S2350	3/21/2011	5/31/2012				Separation		7.90	0.1250	0.0000		0	0.00
OH1020	W1190-S2350	3/21/2011	5/31/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1021	W1190-S2422	3/21/2011	5/31/2012	0	0	7.10	Separation	0.00	7.10	0.1250	0.0000		0	0.00
OH1021	W1190-S2422	3/21/2011	5/31/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1022	W390-S2180	9/14/2010	2/28/2012	0	0	8.40	Separation	0.00	8.40	0.2500	1.2500	S	42	0.86
OH1022	W390-S2180	9/14/2010	2/28/2012				Hangup		14.70	0.0000	0.0000		0	0.00
OH1022	W390-S2180	9/14/2010	2/28/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH1023	W455-S2180	9/14/2010	2/28/2012	0	0	8.50	Separation	0.00	8.50	0.2500	0.5000	N	17	0.34
OH1023	W455-S2180	9/14/2010	2/28/2012				BOH		20.40	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH1024	W520-S2180	9/14/2010	5/30/2012				Separation		0.70	0.1250	0.1250	S	4	0.07
OH1024	W520-S2180	9/14/2010	5/30/2012	0	0	8.50	Separation	0.00	8.50	0.1250	1.0000	S	33	0.58
OH1024	W520-S2180	9/14/2010	5/30/2012				Separation		14.80	0.1250	1.0000	S	33	0.58
OH1024	W520-S2180	9/14/2010	5/30/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1025	W590-S2180	9/14/2010	5/30/2012				Separation		6.20	0.1250	0.2500	N	8	0.15
OH1025	W590-S2180	9/14/2010	5/30/2012	0	0	8.70	Separation	0.00	8.70	0.1250	0.1250	N	4	0.07
OH1025	W590-S2180	9/14/2010	5/30/2012				Hangup		15.00	0.0000	0.0000		0	0.00
OH1025	W590-S2180	9/14/2010	5/30/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1026	W660-S2180	9/14/2010	5/30/2012	0	0	8.10	Separation	0.00	8.10	0.1250	1.2500	S	42	0.73
OH1026	W660-S2180	9/14/2010	5/30/2012				Separation		14.30	0.1250	0.7500	S	25	0.44
OH1026	W660-S2180	9/14/2010	5/30/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH1027	W725-S2180	9/14/2010	5/30/2012				Separation		6.40	0.1250	0.0000		0	0.00
OH1027	W725-S2180	9/14/2010	5/30/2012				Separation		7.80	0.1250	0.0000		0	0.00
OH1027	W725-S2180	9/14/2010	5/30/2012	2	0	8.00	Separation	0.25	8.00	0.1250	1.5000	N	50	0.88
OH1027	W725-S2180	9/14/2010	5/30/2012				Hangup		14.40	0.0000	0.0000		0	0.00
OH1027	W725-S2180	9/14/2010	5/30/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH1028	W790-S2180	9/14/2010	5/30/2012				Separation		2.30	0.1250	0.0000		0	0.00
OH1028	W790-S2180	9/14/2010	5/30/2012	0	0	8.20	Separation	0.00	8.20	0.1250	1.0000	S	33	0.58
OH1028	W790-S2180	9/14/2010	5/30/2012				Separation		14.40	0.0000	1.0000	S	33	0.58
OH1028	W790-S2180	9/14/2010	5/30/2012				BOH		20.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH1029	W855-S2180	9/14/2010	5/30/2012				Separation		5.60	0.1250	0.0000		0	0.00
OH1029	W855-S2180	9/14/2010	5/30/2012				Separation		5.90	0.1250	0.0000		0	0.00
OH1029	W855-S2180	9/14/2010	5/30/2012				Separation		6.30	0.1250	0.0000		0	0.00
OH1029	W855-S2180	9/14/2010	5/30/2012				Rough Spot		7.30	0.0000	0.0000		0	0.00
OH1029	W855-S2180	9/14/2010	5/30/2012	4	0	8.30	Separation	0.48	8.30	0.1250	2.2500	N	75	1.32
OH1029	W855-S2180	9/14/2010	5/30/2012				Hangup		14.30	0.0000	0.0000		0	0.00
OH1029	W855-S2180	9/14/2010	5/30/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH1030	W920-S2180	9/14/2010	5/30/2012	0	0	8.30	Separation	0.00	8.30	0.1250	1.2500	S	42	0.73
OH1030	W920-S2180	9/14/2010	5/30/2012				Hangup		14.60	0.0000	0.1875	S	6	0.11
OH1030	W920-S2180	9/14/2010	5/30/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH1031	W985-S2180	9/14/2010	5/30/2012				Separation		7.30	0.1250	0.0000		0	0.00
OH1031	W985-S2180	9/14/2010	5/30/2012				Separation		7.70	0.1250	0.0000		0	0.00
OH1031	W985-S2180	9/14/2010	5/30/2012	2	0	8.10	Separation	0.25	8.10	0.1250	0.0000		0	0.00
OH1031	W985-S2180	9/14/2010	5/30/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH1032	W1050-S2180	9/14/2010	5/30/2012				Separation		6.60	0.1250	0.0000		0	0.00
OH1032	W1050-S2180	9/14/2010	5/30/2012	1	0	7.30	Separation	0.14	7.30	0.1250	1.0000	S	33	0.58
OH1032	W1050-S2180	9/14/2010	5/30/2012				Separation		13.80	0.1250	1.0000	S	33	0.58
OH1032	W1050-S2180	9/14/2010	5/30/2012				BOH		20.70	0.0000	0.0000		0	0.00
OH1033	W1120-S2180	3/1/2011	5/30/2012				Separation		5.80	0.1250	0.0000		0	0.00
OH1033	W1120-S2180	3/1/2011	5/30/2012				Separation		6.10	0.1250	0.0000		0	0.00
OH1033	W1120-S2180	3/1/2011	5/30/2012				Separation		6.80	0.1250	0.0000		0	0.00
OH1033	W1120-S2180	3/1/2011	5/30/2012				Separation		6.90	0.1250	0.0000		0	0.00
OH1033	W1120-S2180	3/1/2011	5/30/2012	4	0	7.00	Separation	0.57	7.00	0.1250	0.0000		0	0.00
OH1033	W1120-S2180	3/1/2011	5/30/2012				BOH		20.40	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH1034	W1190-S2180	3/21/2011	5/30/2012	1	0	6.90	Separation	0.14	6.90	0.1250	1.2500	SE	42	1.05
OH1034	W1190-S2180	3/21/2011	5/30/2012				Separation		12.30	0.1250	0.3750	E	13	0.31
OH1034	W1190-S2180	3/21/2011	5/30/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH1035	W390-S2520	9/10/2010	6/25/2012	0	0	7.80	Separation	0.00	7.80	0.1250	0.0000		0	0.00
OH1035	W390-S2520	9/10/2010	6/25/2012				Hangup		13.80	0.0000	1.2500	N	42	0.70
OH1035	W390-S2520	9/10/2010	6/25/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH1036	W455-S2520	9/10/2010	2/28/2012				BOH		19.60	0.0000	0.0000		0	0.00
OH1037	W520-S2520	11/15/2010	5/31/2012	0	0	7.80	Separation	0.00	7.80	0.1250	1.2500	N	42	0.81
OH1037	W520-S2520	11/15/2010	5/31/2012				Separation		13.90	0.1250	1.2500	N	42	0.81
OH1037	W520-S2520	11/15/2010	5/31/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH1038	W590-S2520	11/15/2010	5/31/2012				Rough Spot		6.40	0.0000	0.0000		0	0.00
OH1038	W590-S2520	11/15/2010	5/31/2012	0	0	8.00	Separation	0.00	8.10	0.1250	0.1250	SE	4	0.08
OH1038	W590-S2520	11/15/2010	5/31/2012				Hangup		14.30	0.0000	0.1250	SE	4	0.08
OH1038	W590-S2520	11/15/2010	5/31/2012				BOH		21.80	0.0000	0.0000		0	0.00
OH1039	W660-S2520	11/15/2010	5/31/2012	0	0	7.70	Separation	0.00	7.70	0.1250	0.7500	N	25	0.49
OH1039	W660-S2520	11/15/2010	5/31/2012				Separation		13.70	0.1250	0.5000	N	17	0.32
OH1039	W660-S2520	11/15/2010	5/31/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH1040	W725-S2520	11/15/2010	5/31/2012	0	0	7.20	Separation	0.00	7.20	0.1250	0.0625	N	2	0.04
OH1040	W725-S2520	11/15/2010	5/31/2012				Separation		7.30	0.1250	0.0000		0	0.00
OH1040	W725-S2520	11/15/2010	5/31/2012				Hangup		13.80	0.0000	0.1250	N	4	0.08
OH1040	W725-S2520	11/15/2010	5/31/2012				BOH		20.40	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH1041	W790-S2520	11/15/2010	5/31/2012				Separation		2.20	0.1250	0.1250	N	4	0.08
OH1041	W790-S2520	11/15/2010	5/31/2012	1	0	7.80	Separation	0.13	7.80	0.1250	1.7500	N	58	1.13
OH1041	W790-S2520	11/15/2010	5/31/2012				Separation		7.90	0.1250	0.0000		0	0.00
OH1041	W790-S2520	11/15/2010	5/31/2012				Hangup		14.20	0.0000	1.5000	N	50	0.97
OH1041	W790-S2520	11/15/2010	5/31/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH1042	W855-S2520	11/15/2010	5/31/2012				Separation		6.50	0.1250	0.1250	N	4	0.08
OH1042	W855-S2520	11/15/2010	5/31/2012				Separation		6.60	0.1250	0.0000		0	0.00
OH1042	W855-S2520	11/15/2010	5/31/2012				Separation		6.80	0.1250	0.0000		0	0.00
OH1042	W855-S2520	11/15/2010	5/31/2012	3	0	7.00	Separation	0.43	7.00	0.1250	0.3750	N	13	0.24
OH1042	W855-S2520	11/15/2010	5/31/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1043	W920-S2520	3/1/2011	5/31/2012	0	0	8.00	Separation	0.00	8.00	0.1250	2.0000	N	67	1.60
OH1043	W920-S2520	3/1/2011	5/31/2012				Hangup		14.50	0.0000	0.2500	W	8	0.20
OH1043	W920-S2520	3/1/2011	5/31/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH1044	W985-S2520	3/1/2011	5/31/2012	0	0	7.40	Separation	0.00	7.40	0.1250	0.0675	N	2	0.05
OH1044	W985-S2520	3/1/2011	5/31/2012				Rough Spot		13.50	0.0000	0.0000		0	0.00
OH1044	W985-S2520	3/1/2011	5/31/2012				BOH		20.40	0.0000	0.0000		0	0.00
OH1045	W1050-S2520	3/1/2011	5/31/2012	0	0	7.50	Separation	0.00	7.50	0.1250	2.0000	N	67	1.60
OH1045	W1050-S2520	3/1/2011	5/31/2012				Hangup		13.90	0.0000	1.0000	N	33	0.80
OH1045	W1050-S2520	3/1/2011	5/31/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH1046	W1120-S2520	3/21/2011	5/31/2012				BOH		0.00	0.0000	0.0000		0	0.00
OH1046	W1120-S2520	3/21/2011	5/31/2012				Hangup		7.50	0.0000	0.0675	N	2	0.06
OH1047	W1190-S2520	3/21/2011	5/31/2012	0	0	7.30	Separation	0.00	7.30	0.2500	1.2500	NE	42	1.04
OH1047	W1190-S2520	3/21/2011	5/31/2012				Hangup		13.50	0.0000	0.0000		0	0.00
OH1047	W1190-S2520	3/21/2011	5/31/2012				BOH		20.30	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH860	0E-N1266	3/8/2009	12/20/2011				Separation		1.60	1.5000	0.0000		0	0.00
OH860	0E-N1266	3/8/2009	12/20/2011				Separation		3.10	2.5000	0.0625	W	2	0.02
OH860	0E-N1266	3/8/2009	12/20/2011				Separation		5.80	0.1250	0.0000		0	0.00
OH860	0E-N1266	3/8/2009	12/20/2011	3	0	6.20	Separation	0.48	6.20	0.1250	0.0000		0	0.00
OH860	0E-N1266	3/8/2009	12/20/2011				Separation		6.80	0.1250	0.0000		0	0.00
OH860	0E-N1266	3/8/2009	12/20/2011				Separation		7.20	0.3750	0.0000		0	0.00
OH860	0E-N1266	3/8/2009	12/20/2011				BOH		20.20	0.0000	0.0000		0	0.00
OH488	E0-N1100	1/7/2004	5/18/2012				Separation		1.10	0.5000	0.0000		0	0.00
OH488	E0-N1100	1/7/2004	5/18/2012	1	0	6.20	Separation	0.16	6.20	0.3750	0.1250	W	4	0.01
OH488	E0-N1100	1/7/2004	5/18/2012				Separation		6.60	0.1250	0.1875	W	6	0.02
OH488	E0-N1100	1/7/2004	5/18/2012				BOH		20.30	0.0000	0.0000		0	0.00
OH859	0E-N920	3/8/2009	12/27/2011				Separation		1.10	0.5000	0.0000		0	0.00
OH859	0E-N920	3/8/2009	12/27/2011				Separation		5.30	0.1250	0.0000		0	0.00
OH859	0E-N920	3/8/2009	12/27/2011	2	0	6.10	Separation	0.33	6.10	0.1250	0.0000		0	0.00
OH859	0E-N920	3/8/2009	12/27/2011				Separation		6.40	0.3750	0.0000		0	0.00
OH859	0E-N920	3/8/2009	12/27/2011				BOH		20.20	0.0000	0.0000		0	0.00
OH490	E0-N780	1/9/2004	5/18/2012				Separation		1.30	0.1250	0.0000		0	0.00
OH490	E0-N780	1/9/2004	5/18/2012				Separation		2.10	0.2500	0.0000		0	0.00
OH490	E0-N780	1/9/2004	5/18/2012	2	0	6.60	Separation	0.30	6.60	0.1250	2.5000	E	83	0.30
OH490	E0-N780	1/9/2004	5/18/2012				Hangup		16.30	0.0000	0.0000		0	0.00
OH490	E0-N780	1/9/2004	5/18/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH491-1	E0-N620	5/18/2012	5/18/2012				Separation		1.50	2.0000	0.0000		0	N/A
OH491-1	E0-N620	5/18/2012	5/18/2012				Separation		2.60	0.1250	0.0000		0	N/A
OH491-1	E0-N620	5/18/2012	5/18/2012	2	0	6.50	Separation	0.31	6.50	0.1250	1.7500	W	58	N/A
OH491-1	E0-N620	5/18/2012	5/18/2012				Separation		6.80	0.1250	0.0000		0	N/A
OH491-1	E0-N620	5/18/2012	5/18/2012				BOH		19.90	0.0000	0.0000		0	N/A

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH888	W30-S700	3/8/2009	5/17/2012				Separation		6.50	0.1250	0.1250	W	4	0.04
OH888	W30-S700	3/8/2009	5/17/2012	1	0	8.50	Separation	0.12	8.50	0.1250	0.0000		0	0.00
OH888	W30-S700	3/8/2009	5/17/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH887	W30-S850	3/10/2009	5/17/2012	0	0	8.60	Hangup	0.00	8.60	0.0000	0.1875	W	6	0.06
OH887	W30-S850	3/10/2009	5/17/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH886	W30-S1000	3/3/2009	5/17/2012	0	0	8.00	Separation	0.00	8.00	0.1250	0.1875	S	6	0.06
OH886	W30-S1000	3/3/2009	5/17/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH885	W30-S1150	3/3/2009	5/17/2012				Separation		0.50	0.1250	0.0000		0	0.00
OH885	W30-S1150	3/3/2009	5/17/2012				Separation		0.70	0.1250	0.2500	W	8	0.08
OH885	W30-S1150	3/3/2009	5/17/2012				Separation		1.00	0.1250	0.2500	W	8	0.08
OH885	W30-S1150	3/3/2009	5/17/2012				Separation		1.60	0.1250	0.1875	W	6	0.06
OH885	W30-S1150	3/3/2009	5/17/2012				Separation		2.00	0.1250	0.1250	W	4	0.04
OH885	W30-S1150	3/3/2009	5/17/2012				Separation		6.20	0.1250	0.7500	W	25	0.23
OH885	W30-S1150	3/3/2009	5/17/2012	6	0	8.30	Separation	0.72	8.30	0.1250	0.2500	W	8	0.08
OH885	W30-S1150	3/3/2009	5/17/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH884	W30-S1300	3/3/2009	5/17/2012				Separation		0.80	0.1250	0.0000		0	0.00
OH884	W30-S1300	3/3/2009	5/17/2012	1	0	8.30	Separation	0.12	8.30	0.1250	0.7500	NW	25	0.23
OH884	W30-S1300	3/3/2009	5/17/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH883	W30-S1485	3/3/2009	5/17/2012	1	0	8.60	Separation	0.12	8.60	0.1250	0.0000		0	0.00
OH883	W30-S1485	3/3/2009	5/17/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH882	W30-S1600	3/3/2009	5/17/2012				Separation		0.50	0.1250	0.0000		0	0.00
OH882	W30-S1600	3/3/2009	5/17/2012	1	0	7.60	Separation	0.13	7.60	0.1250	0.0000		0	0.00
OH882	W30-S1600	3/3/2009	5/17/2012				BOH		20.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH881	W30-S1780	3/3/2009	5/17/2012	0	0	8.30	Separation	0.00	8.30	0.1250	0.0000		0	0.00
OH881	W30-S1780	3/3/2009	5/17/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH880	W30-S1950	3/3/2009	5/17/2012	0	0	8.30	Separation	0.00	8.30	0.1250	0.0000		0	0.00
OH880	W30-S1950	3/3/2009	5/17/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH879	W30-S2060	3/3/2009	5/17/2012	0	0	7.60	Separation	0.00	7.60	0.1250	0.0000		0	0.00
OH879	W30-S2060	3/3/2009	5/17/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH877	W30-S2350	3/11/2009	5/17/2012				Separation		0.90	0.1250	0.0000		0	0.00
OH877	W30-S2350	3/11/2009	5/17/2012	1	0	7.90	Separation	0.13	7.90	0.1250	0.0000		0	0.00
OH877	W30-S2350	3/11/2009	5/17/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH876	W30-S2520	3/3/2009	5/17/2012				Separation		0.80	0.1250	0.0000		0	0.00
OH876	W30-S2520	3/3/2009	5/17/2012				Separation		2.60	0.1250	0.0000		0	0.00
OH876	W30-S2520	3/3/2009	5/17/2012				Separation		5.30	0.1250	0.0000		0	0.00
OH876	W30-S2520	3/3/2009	5/17/2012				Separation		7.20	0.1250	0.0000		0	0.00
OH876	W30-S2520	3/3/2009	5/17/2012	4	0	7.50	Separation	0.53	7.50	0.1250	0.0000		0	0.00
OH876	W30-S2520	3/3/2009	5/17/2012				BOH		17.90	0.0000	0.0000		0	0.00
OH875	W30-S2750	3/3/2009	5/17/2012	0	0	5.50	Separation	0.00	5.50	0.1250	0.2500	W	8	0.08
OH875	W30-S2750	3/3/2009	5/17/2012				Separation		5.80	0.1250	0.0000		0	0.00
OH875	W30-S2750	3/3/2009	5/17/2012				Separation		6.30	0.1250	0.0000		0	0.00
OH875	W30-S2750	3/3/2009	5/17/2012				Separation		6.50	0.3750	0.3750	N	13	0.12
OH875	W30-S2750	3/3/2009	5/17/2012				Separation		6.80	0.1250	0.0000		0	0.00
OH875	W30-S2750	3/3/2009	5/17/2012				BOH		20.30	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH899	W170-S1000	3/24/2009	5/18/2012				Separation		0.90	0.1250	0.0000		0	0.00
OH899	W170-S1000	3/24/2009	5/18/2012	1	0	9.20	Hangup	0.11	9.20	0.0000	0.5000	E	17	0.16
OH899	W170-S1000	3/24/2009	5/18/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH898	W170-S1150	3/24/2009	5/18/2012	0	0	8.90	Rough Spot	0.00	8.90	0.0000	0.0000		0	0.00
OH898	W170-S1150	3/24/2009	5/18/2012				BOH		21.10	0.0000	0.0000		0	0.00
OH897	W170-S1300	6/8/2009	5/18/2012	0	0	8.40	Separation	0.00	8.40	0.1250	0.0000		0	0.00
OH897	W170-S1300	6/8/2009	5/18/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH896	W170-S1482	6/8/2009	5/18/2012	0	0	7.20	Separation	0.00	7.20	0.2500	0.1250	W	4	0.04
OH896	W170-S1482	6/8/2009	5/18/2012				Hangup		15.00	0.0000	0.0000		0	0.00
OH896	W170-S1482	6/8/2009	5/18/2012				BOH		17.30	0.0000	0.0000		0	0.00
OH895	W170-S1600	6/8/2009	5/18/2012	0	0	8.60	Separation	0.00	8.60	0.1250	0.0000		0	0.00
OH895	W170-S1600	6/8/2009	5/18/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH894	W170-S1780	6/8/2009	5/18/2012	0	0	9.50	Separation	0.00	9.50	0.2500	0.2500	E	8	0.08
OH894	W170-S1780	6/8/2009	5/18/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH893	W170-S1950	6/8/2009	5/18/2012	0	0	8.40	Separation	0.00	8.40	0.1250	0.1875	W	6	0.06
OH893	W170-S1950	6/8/2009	5/18/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH892	W170-S2055	6/8/2009	6/12/2012				Separation		1.10	0.1250	0.0000		0	0.00
OH892	W170-S2055	6/8/2009	6/12/2012				Separation		1.70	0.1250	0.0000		0	0.00
OH892	W170-S2055	6/8/2009	6/12/2012	2	0	7.80	Separation	0.26	7.80	0.1250	0.0000		0	0.00
OH892	W170-S2055	6/8/2009	6/12/2012				BOH		19.60	0.0000	0.0000		0	0.00
OH891	W170-S2180	6/8/2009	6/12/2012	0	0	7.70	Separation	0.00	7.70	0.1250	0.1875	E	6	0.06
OH891	W170-S2180	6/8/2009	6/12/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH890	W170-S2345	3/11/2009	6/12/2012	0	0	7.90	Hangup	0.00	7.90	0.0000	0.3750	E	13	0.12
OH890	W170-S2345	3/11/2009	6/12/2012				BOH		20.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH889	W170-S2520	3/11/2009	6/12/2012				Separation		1.70	0.1250	0.0000		0	0.00
OH889	W170-S2520	3/11/2009	6/12/2012				Rough Spot		2.70	0.0000	0.0000		0	0.00
OH889	W170-S2520	3/11/2009	6/12/2012	2	0	8.00	Separation	0.25	8.00	0.1250	0.1875	E	6	0.06
OH889	W170-S2520	3/11/2009	6/12/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH900	W170-S2635	3/17/2010	6/12/2012				Separation		2.70	0.1250	0.0000		0	0.00
OH900	W170-S2635	3/17/2010	6/12/2012				Separation		3.20	0.2500	0.0000		0	0.00
OH900	W170-S2635	3/17/2010	6/12/2012				Separation		4.00	3.5000	2.7500	W	92	1.23
OH900	W170-S2635	3/17/2010	6/12/2012				BOH		4.30	0.0000	0.0000		0	0.00
OH855	S90-W380	3/4/2009	5/18/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH856	S90-W620	3/4/2009	5/18/2012				Separation		1.10	0.1250	0.0000		0	0.00
OH856	S90-W620	3/4/2009	5/18/2012				Separation		1.20	0.1250	0.0000		0	0.00
OH856	S90-W620	3/4/2009	5/18/2012	2	0	9.00	Separation	0.22	9.00	0.1250	0.0000		0	0.00
OH856	S90-W620	3/4/2009	5/18/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH857	S90-W880	3/4/2009	5/18/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH850	N300-W80	3/8/2009	5/18/2012				Separation		4.30	0.1250	0.0000		0	0.00
OH850	N300-W80	3/8/2009	5/18/2012	1	0	7.00	Separation	0.14	7.00	0.1250	1.2500	S	42	0.39
OH850	N300-W80	3/8/2009	5/18/2012				Separation		8.00	0.1250	0.0000		0	0.00
OH850	N300-W80	3/8/2009	5/18/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH858	W469-N216	3/11/2009	5/18/2012				Separation		5.60	0.1250	0.0000		0	0.00
OH858	W469-N216	3/11/2009	5/18/2012	1	0	8.50	Separation	0.12	8.50	0.1250	0.3750	S	13	0.12
OH858	W469-N216	3/11/2009	5/18/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH852	N785-E195	6/8/2009	12/30/2011				Separation		6.10	0.1250	0.0000		0	0.00
OH852	N785-E195	6/8/2009	12/30/2011				Separation		6.20	0.1250	0.0000		0	0.00
OH852	N785-E195	6/8/2009	12/30/2011	2	0	6.40	Separation	0.31	6.40	0.1250	1.2500	S	42	0.49
OH852	N785-E195	6/8/2009	12/30/2011				Separation		7.10	0.1250	0.0000		0	0.00
OH852	N785-E195	6/8/2009	12/30/2011				BOH		20.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH869	E300-S1430	6/15/2009	6/28/2012	0	0	8.20	Hangup	0.00	8.20	0.0000	0.0000		0	0.00
OH869	E300-S1430	6/15/2009	6/28/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH868	E300-S1780	6/15/2009	6/28/2012				Separation		1.30	0.1250	0.0000		0	0.00
OH868	E300-S1780	6/15/2009	6/28/2012	1	0	7.80	Hangup	0.13	7.80	0.0000	0.0000		0	0.00
OH868	E300-S1780	6/15/2009	6/28/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH867	E300-S2060	6/15/2009	6/25/2012	0	0	8.70	Separation	0.00	8.70	0.3750	0.0000		0	0.00
OH867	E300-S2060	6/15/2009	6/25/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH866	E300-S2340	6/15/2009	6/11/2012				Separation		1.30	0.1250	0.1250	W	4	0.04
OH866	E300-S2340	6/15/2009	6/11/2012	1	0	8.40	Rough Spot	0.12	8.40	0.0000	0.0000		0	0.00
OH866	E300-S2340	6/15/2009	6/11/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH865	E300-S2630	6/15/2009	6/11/2012				BOH		4.00	0.0000	0.0000		0	0.00
OH422	E300-S2825	8/6/2003	6/12/2012				Separation		1.50	0.1250	1.2500	W	42	0.14
OH422	E300-S2825	8/6/2003	6/12/2012				Separation		2.40	3.2500	1.2500	W	42	0.14
OH422	E300-S2825	8/6/2003	6/12/2012				Separation		3.00	0.1250	0.0000		0	0.00
OH422	E300-S2825	8/6/2003	6/12/2012				Separation		4.00	0.1250	0.0000		0	0.00
OH422	E300-S2825	8/6/2003	6/12/2012				Separation		4.40	0.1250	0.0000		0	0.00
OH422	E300-S2825	8/6/2003	6/12/2012				Separation		5.40	0.1250	0.0000		0	0.00
OH422	E300-S2825	8/6/2003	6/12/2012				Separation		5.60	0.1250	0.0000		0	0.00
OH422	E300-S2825	8/6/2003	6/12/2012	7	0	5.70	Rubbly	1.23	5.70	0.0000	0.0000		0	0.00
OH423	E300-S2890	8/6/2003	6/11/2012				Separation		1.00	0.1250	0.0000		0	0.00
OH423	E300-S2890	8/6/2003	6/11/2012				Separation		1.70	1.5000	1.0000	E	33	0.11
OH423	E300-S2890	8/6/2003	6/11/2012				Separation		1.80	0.2500	0.1875	E	6	0.02
OH423	E300-S2890	8/6/2003	6/11/2012				Rough Spot		4.90	0.0000	0.0000		0	0.00
OH423	E300-S2890	8/6/2003	6/11/2012	4	0	5.50	Separation	0.73	5.50	0.0000	3.0000	W	100	0.34

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH424	E300-S2950	8/6/2003	6/11/2012				BOH		2.00	0.0000	0.0000		0	0.00
OH425	E300-S3020	8/6/2003	6/11/2012				Separation		1.60	0.1250	0.0000		0	0.00
OH425	E300-S3020	8/6/2003	6/11/2012				Separation		1.70	0.1250	0.1250	E	4	0.01
OH425	E300-S3020	8/6/2003	6/11/2012				Separation		1.90	0.1250	0.0000		0	0.00
OH425	E300-S3020	8/6/2003	6/11/2012				Separation		2.40	2.0000	0.1250	N	4	0.01
OH425	E300-S3020	8/6/2003	6/11/2012				Separation		3.00	4.0000	0.0000		0	0.00
OH425	E300-S3020	8/6/2003	6/11/2012				Separation		4.70	0.1250	0.0000		0	0.00
OH425	E300-S3020	8/6/2003	6/11/2012	6	0	5.90	Separation	1.02	5.90	0.1250	1.5000	E	50	0.17
OH425	E300-S3020	8/6/2003	6/11/2012				Separation		6.30	0.1250	0.0000		0	0.00
OH425	E300-S3020	8/6/2003	6/11/2012				BOH		20.10	0.0000	0.0000		0	0.00
OH457	E300-S3260	8/28/2003	6/18/2012				Separation		0.70	0.1250	0.0000		0	0.00
OH457	E300-S3260	8/28/2003	6/18/2012				Separation		1.00	0.1250	0.1250	E	4	0.01
OH457	E300-S3260	8/28/2003	6/18/2012				Separation		1.20	0.3750	0.0000		0	0.00
OH457	E300-S3260	8/28/2003	6/18/2012				Rough Spot		4.70	0.0000	0.0000		0	0.00
OH457	E300-S3260	8/28/2003	6/18/2012				Separation		4.90	0.1250	0.0000		0	0.00
OH457	E300-S3260	8/28/2003	6/18/2012				Separation		5.10	0.1250	0.0000		0	0.00
OH457	E300-S3260	8/28/2003	6/18/2012				Separation		5.50	0.2500	0.0000		0	0.00
OH457	E300-S3260	8/28/2003	6/18/2012	7	0	6.10	Separation	1.15	6.10	0.1250	0.3750	W	13	0.04
OH457	E300-S3260	8/28/2003	6/18/2012				BOH		21.10	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH458	E300-S3295	8/28/2003	6/18/2012				Separation		1.60	1.0000	0.1875	E	6	0.02
OH458	E300-S3295	8/28/2003	6/18/2012				Rough Spot		4.70	0.0000	0.0000		0	0.00
OH458	E300-S3295	8/28/2003	6/18/2012				Rough Spot		4.80	0.0000	0.0000		0	0.00
OH458	E300-S3295	8/28/2003	6/18/2012				Separation		5.20	0.2500	0.0000		0	0.00
OH458	E300-S3295	8/28/2003	6/18/2012	4	0	5.90	Hangup	0.68	5.90	0.0000	0.3750	E	13	0.04
OH458	E300-S3295	8/28/2003	6/18/2012				Hangup		6.20	0.0000	0.0000		0	0.00
OH458	E300-S3295	8/28/2003	6/18/2012				BOH		20.70	0.0000	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012				Separation		1.00	0.1250	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012				Separation		1.50	0.2500	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012				Separation		4.60	0.1250	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012				Separation		4.70	0.1250	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012				Separation		4.90	0.1250	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012				Separation		5.10	0.1250	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012				Rough Spot		5.30	0.0000	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012	6	0	5.60	Separation	1.07	5.60	0.1250	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012				Rough Spot		5.90	0.0000	0.0000		0	0.00
OH459	E300-S3140	8/28/2003	6/18/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH453	E300-S3310	8/18/2003	6/18/2012				Separation		5.10	0.1250	0.0000		0	0.00
OH453	E300-S3310	8/18/2003	6/18/2012	1	0	6.10	Separation	0.16	6.10	0.2500	1.5000	S	50	0.17
OH453	E300-S3310	8/18/2003	6/18/2012				Separation		6.40	0.1250	0.0000		0	0.00
OH453	E300-S3310	8/18/2003	6/18/2012				Separation		6.70	0.1250	0.0000		0	0.00
OH453	E300-S3310	8/18/2003	6/18/2012				Rough Spot		7.80	0.0000	1.0000	S	33	0.11
OH453	E300-S3310	8/18/2003	6/18/2012				BOH		21.00	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH622	E300-S3400	6/15/2006	6/25/2012				Separation		1.30	0.2500	1.0000	E	33	0.17
OH622	E300-S3400	6/15/2006	6/25/2012				Hangup		4.40	0.0000	0.0000		0	0.00
OH622	E300-S3400	6/15/2006	6/25/2012				Hangup		4.60	0.0000	0.0000		0	0.00
OH622	E300-S3400	6/15/2006	6/25/2012				Separation		5.20	0.1250	0.0000		0	0.00
OH622	E300-S3400	6/15/2006	6/25/2012	4	0	5.60	Separation	0.71	5.60	0.1250	0.0000		0	0.00
OH622	E300-S3400	6/15/2006	6/25/2012				BOH		20.70	0.0000	0.0000		0	0.00
OH623	E300-S3450	6/15/2006	6/25/2012				Separation		1.30	0.1250	0.3750	E	13	0.06
OH623	E300-S3450	6/15/2006	6/25/2012				Separation		4.30	0.1250	0.0000		0	0.00
OH623	E300-S3450	6/15/2006	6/25/2012				Separation		4.60	0.1250	0.0000		0	0.00
OH623	E300-S3450	6/15/2006	6/25/2012	3	0	5.60	Separation	0.54	5.60	0.1250	0.2500	E	8	0.04
OH623	E300-S3450	6/15/2006	6/25/2012				BOH		20.60	0.0000	0.0000		0	0.00
OH604	E300-S3480	7/18/2005	6/25/2012				Separation		1.20	0.7500	2.5000	E	83	0.36
OH604	E300-S3480	7/18/2005	6/25/2012				Hangup		4.00	0.0000	0.0000		0	0.00
OH604	E300-S3480	7/18/2005	6/25/2012				Separation		4.20	0.1250	0.0000		0	0.00
OH604	E300-S3480	7/18/2005	6/25/2012				Hangup		4.80	0.0000	0.0000		0	0.00
OH604	E300-S3480	7/18/2005	6/25/2012				Hangup		5.10	0.0000	0.0000		0	0.00
OH604	E300-S3480	7/18/2005	6/25/2012				Hangup		5.30	0.0000	0.0000		0	0.00
OH604	E300-S3480	7/18/2005	6/25/2012	2	0	5.40	Separation	0.37	5.40	0.1250	0.3750	E	13	0.05
OH604	E300-S3480	7/18/2005	6/25/2012				Separation		5.70	0.1250	0.0000		0	0.00
OH604	E300-S3480	7/18/2005	6/25/2012				Separation		5.80	0.1250	0.0000		0	0.00
OH604	E300-S3480	7/18/2005	6/25/2012				Separation		6.20	0.1250	0.3750	E	13	0.05
OH604	E300-S3480	7/18/2005	6/25/2012				BOH		20.80	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH624	E300-S3550	6/15/2006	6/25/2012				Separation		4.50	0.1250	0.0000		0	0.00
OH624	E300-S3550	6/15/2006	6/25/2012				Hangup		4.70	0.0000	0.0000		0	0.00
OH624	E300-S3550	6/15/2006	6/25/2012				Hangup		4.90	0.0000	0.0000		0	0.00
OH624	E300-S3550	6/15/2006	6/25/2012				Separation		5.10	0.1250	0.0000		0	0.00
OH624	E300-S3550	6/15/2006	6/25/2012				Separation		5.20	0.1250	0.0000		0	0.00
OH624	E300-S3550	6/15/2006	6/25/2012				Separation		5.30	0.1250	0.0000		0	0.00
OH624	E300-S3550	6/15/2006	6/25/2012				Separation		5.60	0.1250	0.0000		0	0.00
OH624	E300-S3550	6/15/2006	6/25/2012	5	0	6.00	Hangup	0.83	6.00	0.0000	0.2500	E	8	0.04
OH624	E300-S3550	6/15/2006	6/25/2012				Separation		6.30	0.1250	0.0000		0	0.00
OH624	E300-S3550	6/15/2006	6/25/2012				Rough Spot		16.60	0.0000	0.0000		0	0.00
OH624	E300-S3550	6/15/2006	6/25/2012				BOH		20.70	0.0000	0.0000		0	0.00
OH573	S3650-W170	4/14/2005	6/25/2012	0	0	5.10	Separation	0.00	5.10	0.2500	0.0000		0	0.00
OH573	S3650-W170	4/14/2005	6/25/2012				Surveyed to		50	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		1.30	1.0000	1.0000	S	33	0.14
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		2.20	2.0000	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Hangup		3.00	0.0000	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		3.50	1.0000	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		3.90	0.1250	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		4.00	1.0000	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		4.10	0.1250	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		4.30	0.1250	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		4.50	0.1250	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		4.80	0.1250	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		4.90	0.1250	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		5.00	0.1250	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		5.30	0.1250	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		5.40	0.1250	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012	14	0	5.60	Separation	2.50	5.60	0.2500	0.0000		0	0.00
OH564	S3650-W90	4/20/2005	6/25/2012				Separation		6.00	0.2500	0.0000		0	0.00
OH565	S3650-W30	2/23/2005	6/25/2012				Separation		1.40	0.2500	0.0000		0	0.00
OH565	S3650-W30	2/23/2005	6/25/2012				Separation		5.10	0.2500	0.0000		0	0.00
OH565	S3650-W30	2/23/2005	6/25/2012				Separation		5.60	0.2500	2.0000	N	67	0.27
OH565	S3650-W30	2/23/2005	6/25/2012				Hangup		7.30	0.0000	0.0000		0	0.00
OH565	S3650-W30	2/23/2005	6/25/2012				Hangup		16.20	0.0000	0.0000		0	0.00
OH565	S3650-W30	2/23/2005	6/25/2012				BOH		20.70	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH566	S3650-E50	4/20/2005	12/21/2011				Separation		1.40	0.2500	0.0000		0	0.00
OH566	S3650-E50	4/20/2005	12/21/2011				Separation		3.80	0.2500	0.5000	S	17	0.07
OH566	S3650-E50	4/20/2005	12/21/2011	2	0	6.30	Separation	0.32	6.30	0.1250	0.0000		0	0.00
OH566	S3650-E50	4/20/2005	12/21/2011				BOH		20.90	0.0000	0.0000		0	0.00
OH567-1	S3650-E140	9/26/2011	5/21/2012	0	0	4.70	Separation	0.00	4.70	0.1250	0.0000		0	0.00
OH567-1	S3650-E140	9/26/2011	5/21/2012				Separation		6.70	0.2500	0.0000		0	0.00
OH567-1	S3650-E140	9/26/2011	5/21/2012				Separation		8.20	0.2500	0.0000		0	0.00
OH567-1	S3650-E140	9/26/2011	5/21/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH568	S3650-E235	4/20/2005	6/25/2012				BOH		20.80	0.0000	0.0000		0	0.00
OH569	S3650-E300	4/20/2005	6/25/2012	0	0	5.10	Separation	0.00	5.10	0.5000	0.7500	N	25	0.10
OH569	S3650-E300	4/20/2005	6/25/2012				Separation		5.70	0.1250	0.0000		0	0.00
OH569	S3650-E300	4/20/2005	6/25/2012				Separation		5.80	0.2500	0.0000		0	0.00
OH569	S3650-E300	4/20/2005	6/25/2012				BOH		20.80	0.0000	0.0000		0	0.00
OH503	S3080-E230	4/12/2004	12/30/2011				Separation		0.20	0.1250	0.0000		0	0.00
OH503	S3080-E230	4/12/2004	12/30/2011				Separation		1.30	1.5000	1.2500	S	42	0.16
OH503	S3080-E230	4/12/2004	12/30/2011				Separation		2.30	0.3750	0.1250	S	4	0.02
OH503	S3080-E230	4/12/2004	12/30/2011				Separation		3.70	0.3750	0.0000		0	0.00
OH503	S3080-E230	4/12/2004	12/30/2011				Separation		3.80	0.1250	0.0000		0	0.00
OH503	S3080-E230	4/12/2004	12/30/2011				Separation		4.10	0.1250	0.0000		0	0.00
OH503	S3080-E230	4/12/2004	12/30/2011				Separation		4.40	0.1250	0.0000		0	0.00
OH503	S3080-E230	4/12/2004	12/30/2011				Separation		4.90	0.1250	0.0000		0	0.00
OH503	S3080-E230	4/12/2004	12/30/2011	8	0	5.30	Separation	1.51	5.30	0.1250	0.2500	S	8	0.03
OH503	S3080-E230	4/12/2004	12/30/2011				Separation		5.80	0.1250	0.0000		0	0.00
OH503	S3080-E230	4/12/2004	12/30/2011				BOH		20.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH452	S3310-E230	8/18/2003	12/30/2011				Separation		1.30	4.5000	2.2500	S	75	0.27
OH452	S3310-E230	8/18/2003	12/30/2011				Separation		2.70	0.2500	0.0000		0	0.00
OH452	S3310-E230	8/18/2003	12/30/2011				Separation		5.90	0.1250	0.0000		0	0.00
OH452	S3310-E230	8/18/2003	12/30/2011	3	0	6.10	Separation	0.49	6.10	0.1250	1.0000	N	33	0.12
OH452	S3310-E230	8/18/2003	12/30/2011				Separation		6.20	0.1250	0.0000		0	0.00
OH452	S3310-E230	8/18/2003	12/30/2011				Separation		6.80	0.1250	0.0000		0	0.00
OH452	S3310-E230	8/18/2003	12/30/2011				BOH		20.80	0.0000	0.0000		0	0.00
OH450	S3310-E65	8/18/2003	6/25/2012				Hangup		4.40	0.0000	0.5000	S	17	0.06
OH450	S3310-E65	8/18/2003	6/25/2012				Separation		4.70	0.1250	0.0000		0	0.00
OH450	S3310-E65	8/18/2003	6/25/2012				Hangup		4.90	0.0000	0.0000		0	0.00
OH450	S3310-E65	8/18/2003	6/25/2012				Hangup		5.20	0.0000	0.0000		0	0.00
OH450	S3310-E65	8/18/2003	6/25/2012				Separation		5.30	0.1250	0.0000		0	0.00
OH450	S3310-E65	8/18/2003	6/25/2012	5	0	5.40	Separation	0.93	5.40	0.1250	2.0000	S	67	0.23
OH450	S3310-E65	8/18/2003	6/25/2012				BOH		5.70	0.0000	0.0000		0	0.00
OH450	S3310-E65	8/18/2003	6/25/2012				Separation		5.70	0.2500	0.0000		0	0.00
OH514-1	W30-S3400	6/5/2009	12/21/2011	1	0	5.20	Separation	0.19	1.30	0.2500	0.5000	S	17	0.20
OH514-1	W30-S3400	6/5/2009	12/21/2011				BOH		22.00	0.0000	0.0000		0	0.00
OH515-1	W30-S3490	6/5/2009	6/25/2012				Separation		1.40	0.5000	0.0000		0	0.00
OH515-1	W30-S3490	6/5/2009	6/25/2012	1	0	5.30	Separation	0.19	5.30	0.2500	0.2500	E	8	0.08
OH515-1	W30-S3490	6/5/2009	6/25/2012				Separation		5.40	0.1250	0.0000		0	0.00
OH515-1	W30-S3490	6/5/2009	6/25/2012				Separation		6.10	0.1250	0.0000		0	0.00
OH515-1	W30-S3490	6/5/2009	6/25/2012				BOH		20.30	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH526-1	W30-S3583	6/5/2009	6/25/2012				Separation		1.40	0.2500	0.2500	E	8	0.08
OH526-1	W30-S3583	6/5/2009	6/25/2012				Hangup		4.40	0.0000	0.0000		0	0.00
OH526-1	W30-S3583	6/5/2009	6/25/2012	2	0	5.50	Separation	0.36	5.50	0.2500	0.0000		0	0.00
OH526-1	W30-S3583	6/5/2009	6/25/2012				Separation		5.90	0.5000	0.0000		0	0.00
OH526-1	W30-S3583	6/5/2009	6/25/2012				BOH		20.20	0.0000	0.0000		0	0.00
OH608-1	W170-S3395	6/10/2009	6/25/2012				Separation		0.50	0.1250	1.0000	E	33	0.33
OH608-1	W170-S3395	6/10/2009	6/25/2012				Separation		1.00	0.1250	0.5000	E	17	0.16
OH608-1	W170-S3395	6/10/2009	6/25/2012				Separation		1.10	0.1250	0.0000		0	0.00
OH608-1	W170-S3395	6/10/2009	6/25/2012				Separation		2.00	4.0000	0.5000	E	17	0.16
OH608-1	W170-S3395	6/10/2009	6/25/2012				Separation		2.30	0.1250	0.0000		0	0.00
OH608-1	W170-S3395	6/10/2009	6/25/2012	4	0	5.10	Separation	0.78	5.10	0.1250	0.0000		0	0.00
OH608-1	W170-S3395	6/10/2009	6/25/2012				Separation		6.30	0.1250	0.0000		0	0.00
OH608-1	W170-S3395	6/10/2009	6/25/2012				BOH		20.70	0.0000	0.0000		0	0.00
OH609-1	W170-S3485	6/10/2009	6/25/2012				Separation		1.10	0.2500	0.0000		0	0.00
OH609-1	W170-S3485	6/10/2009	6/25/2012				Hangup		2.10	0.0000	0.0000		0	0.00
OH609-1	W170-S3485	6/10/2009	6/25/2012				Hangup		2.40	0.0000	0.0000		0	0.00
OH609-1	W170-S3485	6/10/2009	6/25/2012	1	0	5.40	Separation	0.19	5.40	0.1250	0.0000		0	0.00
OH609-1	W170-S3485	6/10/2009	6/25/2012				Rubble Zone		6.90	1.0000	0.0000		0	0.00
OH609-1	W170-S3485	6/10/2009	6/25/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH610-1	W170-S3580	6/10/2009	6/25/2012				Separation		1.30	0.1250	0.0000		0	0.00
OH610-1	W170-S3580	6/10/2009	6/25/2012	1	0	5.60	Separation	0.18	5.60	0.1250	0.0000		0	0.00
OH610-1	W170-S3580	6/10/2009	6/25/2012				BOH		20.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH455	W30-S2850	8/28/2003	12/21/2011				Separation		1.70	1.0000	0.5000	W	17	0.06
OH455	W30-S2850	8/28/2003	12/21/2011				Separation		4.60	0.1250	0.0000		0	0.00
OH455	W30-S2850	8/28/2003	12/21/2011	2	0	5.70	Separation	0.35	5.70	0.2500	0.0000		0	0.00
OH455	W30-S2850	8/28/2003	12/21/2011				BOH		19.00	0.0000	0.0000		0	0.00
OH456	W30-S2950	8/28/2003	5/21/2012				Separation		1.30	0.1250	0.0000		0	0.00
OH456	W30-S2950	8/28/2003	5/21/2012				Separation		1.80	0.1250	1.0000	W	33	0.11
OH456	W30-S2950	8/28/2003	5/21/2012				Separation		2.70	3.5000	1.0000	W	33	0.11
OH456	W30-S2950	8/28/2003	5/21/2012				Separation		4.30	0.1250	0.0000		0	0.00
OH456	W30-S2950	8/28/2003	5/21/2012	4	0	4.70	Separation	0.85	4.70	0.1250	1.0000	W	33	0.11
OH456	W30-S2950	8/28/2003	5/21/2012				Separation		5.00	0.1250	0.0000		0	0.00
OH456	W30-S2950	8/28/2003	5/21/2012				Separation		5.80	0.1250	0.0000		0	0.00
OH456	W30-S2950	8/28/2003	5/21/2012				Separation		6.20	0.1250	0.0000		0	0.00
OH456	W30-S2950	8/28/2003	5/21/2012				Separation		6.80	3.0000	0.0000		0	0.00
OH456	W30-S2950	8/28/2003	5/21/2012				BOH		20.50	0.0000	0.0000		0	0.00
OH463	W30-S3080	9/3/2003	6/12/2012				Separation		1.50	5.0000	2.0000	E	67	0.23
OH463	W30-S3080	9/3/2003	6/12/2012				Separation		3.80	0.1250	2.0000	E	67	0.23
OH463	W30-S3080	9/3/2003	6/12/2012				Separation		5.20	0.2500	0.0000		0	0.00
OH463	W30-S3080	9/3/2003	6/12/2012				Separation		5.80	0.1250	0.0000		0	0.00
OH463	W30-S3080	9/3/2003	6/12/2012	4	0	6.00	Separation	0.67	6.00	0.2500	0.0000		0	0.00
OH463	W30-S3080	9/3/2003	6/12/2012				Separation		6.20	0.2500	0.0000		0	0.00
OH463	W30-S3080	9/3/2003	6/12/2012				Separation		6.60	0.1250	0.0000		0	0.00
OH463	W30-S3080	9/3/2003	6/12/2012				Separation		7.70	0.1250	0.0000		0	0.00
OH463	W30-S3080	9/3/2003	6/12/2012				BOH		21.40	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH465	W30-S3200	9/3/2003	6/12/2012				Separation		1.00	0.2500	1.2500	E	42	0.14
OH465	W30-S3200	9/3/2003	6/12/2012				Separation		2.40	0.3750	0.5000	E	17	0.06
OH465	W30-S3200	9/3/2003	6/12/2012				Separation		2.50	0.7500	0.1250	E	4	0.01
OH465	W30-S3200	9/3/2003	6/12/2012				Separation		5.10	0.1250	0.0000		0	0.00
OH465	W30-S3200	9/3/2003	6/12/2012				Separation		5.30	0.1250	0.0000		0	0.00
OH465	W30-S3200	9/3/2003	6/12/2012	5	0	5.50	Separation	0.91	5.50	0.1250	0.0000		0	0.00
OH465	W30-S3200	9/3/2003	6/12/2012				Separation		5.60	0.1250	0.0000		0	0.00
OH465	W30-S3200	9/3/2003	6/12/2012				Separation		6.00	0.1250	0.0000		0	0.00
OH465	W30-S3200	9/3/2003	6/12/2012				Separation		16.80	0.0000	0.0000		0	0.00
OH465	W30-S3200	9/3/2003	6/12/2012				Separation		22.80	0.0000	0.0000		0	0.00
OH449	W30-S3310	8/18/2003	6/25/2012				Separation		5.00	0.1250	0.0000		0	0.00
OH449	W30-S3310	8/18/2003	6/25/2012				Separation		5.70	0.1250	0.0000		0	0.00
OH449	W30-S3310	8/18/2003	6/25/2012	2	0	6.00	Separation	0.33	6.00	0.2500	0.2500		8	0.03
OH449	W30-S3310	8/18/2003	6/25/2012				Separation		6.50	0.1250	0.0000		0	0.00
OH449	W30-S3310	8/18/2003	6/25/2012				BOH		21.70	0.0000	0.0000		0	0.00
OH460	S2750-W100	9/3/2003	6/12/2012				Separation		1.60	1.2500	0.7500	S	25	0.09
OH460	S2750-W100	9/3/2003	6/12/2012				Separation		2.70	8.0000	0.7500	S	25	0.09
OH460	S2750-W100	9/3/2003	6/12/2012				Separation		5.00	0.1250	0.0000		0	0.00
OH460	S2750-W100	9/3/2003	6/12/2012				Separation		5.40	0.2500	0.0000		0	0.00
OH460	S2750-W100	9/3/2003	6/12/2012	4	0	7.10	Separation	0.56	7.10	3.5000	0.0000		0	0.00
OH460	S2750-W100	9/3/2003	6/12/2012				BOH		10.20	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		1.30	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		1.60	0.1250	0.3750	S	13	0.04
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		1.80	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		2.60	0.7500	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		4.00	3.2500	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		4.30	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		4.50	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		4.70	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		5.00	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		5.20	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		5.50	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		5.80	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		5.90	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012				Separation		6.10	0.1250	0.0000		0	0.00
OH462	S3080-W100	9/3/2003	6/12/2012	14	0	6.30	BOH	2.22	6.30	0.1250	3.0000	N	100	0.34
OH442	W170-S2820	8/18/2003	1/23/2012				Separation		1.50	0.1250	1.2500	W	42	0.15
OH442	W170-S2820	8/18/2003	1/23/2012				Separation		2.40	3.5000	1.2500	W	42	0.15
OH442	W170-S2820	8/18/2003	1/23/2012				Separation		3.00	0.1250	0.0000		0	0.00
OH442	W170-S2820	8/18/2003	1/23/2012				Separation		4.70	0.5000	0.0000		0	0.00
OH442	W170-S2820	8/18/2003	1/23/2012	4	0	5.20	Separation	0.77	5.20	0.1250	0.0000		0	0.00
OH442	W170-S2820	8/18/2003	1/23/2012				BOH		13.50	0.0000	0.0000		0	0.00

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		1.00	0.1250	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		1.50	1.0000	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		1.60	0.1250	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		2.30	6.0000	0.3750	S	13	1.42
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		3.30	0.2500	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		4.50	0.1250	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012	6	0	4.70	Separation	1.28	4.70	5.0000	0.0000		0	0.00
OH445-1	W170-S3000	6/12/2012	6/12/2012				Separation		0.50	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Hangup		1.10	0.0000	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Separation		5.10	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012	3	0	5.20	Separation	0.58	5.20	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Separation		5.30	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Separation		5.50	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Separation		6.60	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				BOH		22.00	0.0000	0.0000		0	N/A

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-1
Observation Borehole Fractures and Offset Data Summary

Hole	Location	Initial Inspection Date	Recent Inspection Date	FR[1]	FZ[2]	Beam Height (ft)	Feature	Fracture Density	Feature Depth (ft)	Separation (in)	Offset (in)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		1.00	0.1250	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		1.50	1.0000	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		1.60	0.1250	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		2.30	6.0000	0.3750	S	13	1.42
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		3.30	0.2500	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012				Separation		4.50	0.1250	0.0000		0	0.00
OH444	W170-S3000	8/18/2003	6/12/2012	6	0	4.70	Separation	1.28	4.70	5.0000	0.0000		0	0.00
OH445-1	W170-S3000	6/12/2012	6/12/2012				Separation		0.50	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Hangup		1.10	0.0000	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Separation		5.10	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012	3	0	5.20	Separation	0.58	5.20	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Separation		5.30	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Separation		5.50	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				Separation		6.60	0.1250	0.0000		0	N/A
OH445-1	W170-S3080	6/12/2012	6/12/2012				BOH		22.00	0.0000	0.0000		0	N/A

[1] Number of fractures (FR) in immediate roof beam

[2] Number of fracture zones (FZ) in immediate roof beam

[3] Fracture Density = (FR + 2 FZ)/Beam Height

Table 7-2 Summary of New Boreholes

Hole	Location	Northing	Easting	Drill Date	Depth (ft)	Diameter (in)	Purpose
OH750	E140-S773	8914	7035	9/29/2011	20.5	3	Observation
OH874-1	E140-S850	8837	7035	9/29/2011	20.0	3	Observation
OH751	E140-S920	8767	7035	9/29/2011	20.5	3	Observation
OH575-1	E140-S1000	8687	7035	9/29/2011	20.7	3	Observation
OH752	E140-S1070	8617	7035	9/29/2011	20.5	3	Observation
OH873-1	E140-S1145	8542	7035	9/29/2011	20.5	3	Observation
OH753	E140-S1226	8461	7035	9/29/2011	20.1	3	Observation
OH872-1	E140-S1390	8297	7035	9/29/2011	20.4	3	Observation
OH580-2	E140-S1463	8224	7035	9/29/2011	20.4	3	Observation
OH754	E140-S1526	8161	7035	9/29/2011	20.5	3	Observation
OH871-1	E140-S1680	8007	7035	9/29/2011	20.5	3	Observation
OH143-4	E140-S1784	7905	7035	9/26/2011	20.7	3	Observation
OH143-4	E140-S1784	7833	7035	9/26/2011	20.1	3	Observation
OH473-3	E140-S2091	7596	7035	9/26/2011	20.5	3	Observation
OH471-2	E140-S2300	7342	7035	9/26/2011	20.1	3	Observation
OH586-2	E140-S2358	7329	7035	9/26/2011	20.6	3	Observation
OH588-1	E140-S2520	7167	7035	9/26/2011	20.4	3	Observation
OH468-2	E140-S2640	7053	7035	9/26/2011	20.2	3	Observation
OH500-2	E140-S2920	6767	7035	9/26/2011	20.1	3	Observation
OH501-2	E140-S2935	6703	7035	9/26/2011	20.4	3	Observation
OH493-2	E140-S3199	6507	7035	9/26/2011	20.1	3	Observation
OH605-2	E140-S3394	6307	7044	9/26/2011	20.0	3	Observation
OH606-2	E140-S3480	6207	7035	9/26/2011	20.1	3	Observation
OH571-1	E140-S3527	6160	7035	9/26/2011	20.1	3	Observation
OH607-1	E140-S3580	6107	7044	9/26/2011	20.2	3	Observation
OH567-1	E140-S3650	6039	7035	9/26/2011	20.2	3	Observation
OH901-2	W395-S2832	6855	6500	5/15/2012	20.1	3	Observation
OH902-2	W393-S2912	6775	6500	5/15/2012	20.1	3	Observation
OH903-2	W393-S2994	6693	6500	5/15/2012	20.2	3	Observation
OH905-1	W525-S2912	6775	6370	5/15/2012	20.0	3	Observation
OH906-1	W525-S2994	6693	6370	5/15/2012	20.0	3	Observation
OH950	E0-N460	6895	10307	5/18/2012	20.1	3	Observation

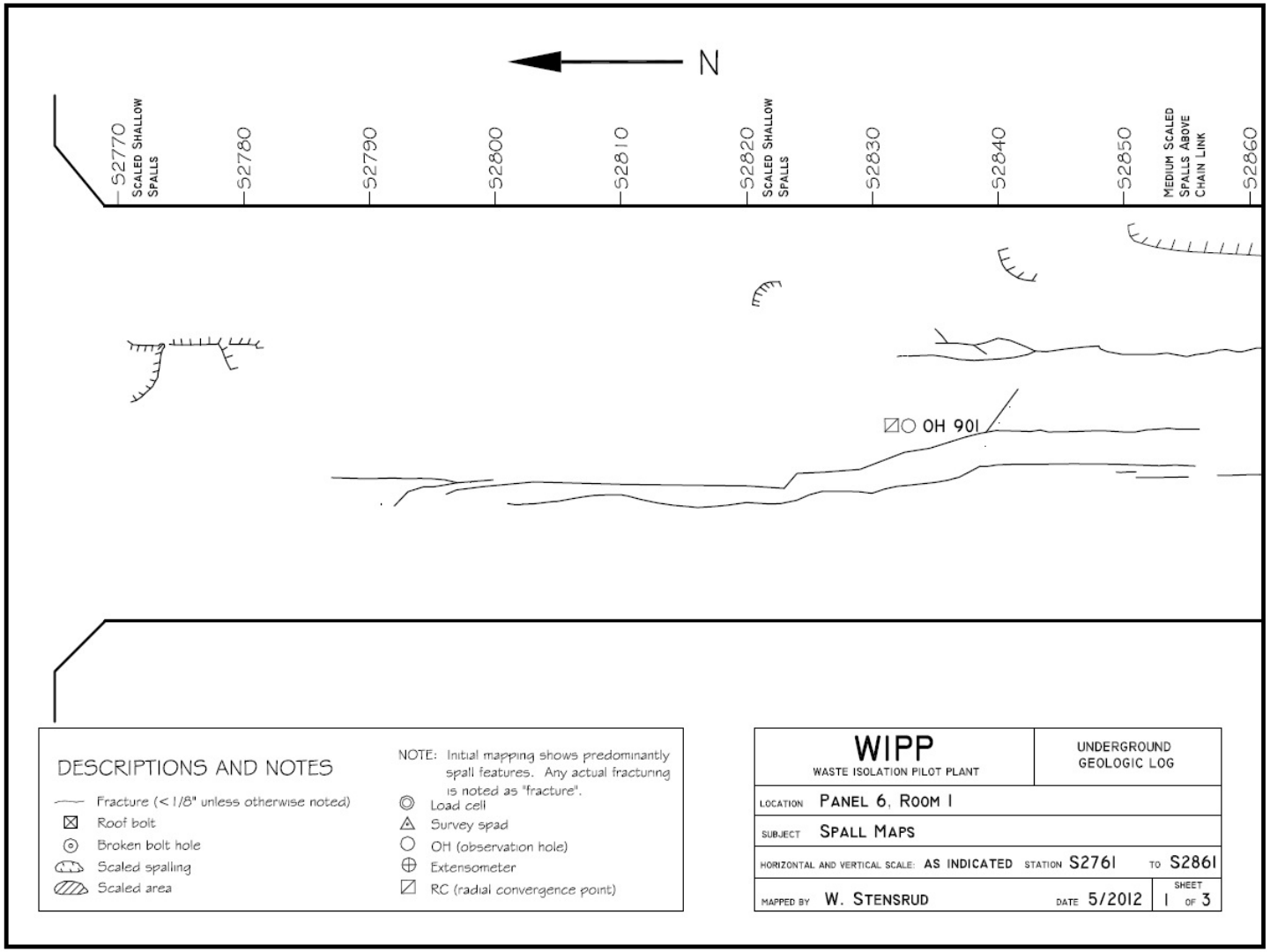

Figure 7-1
Panel 6 Room 1, S2761-S2861 Roof Fractures

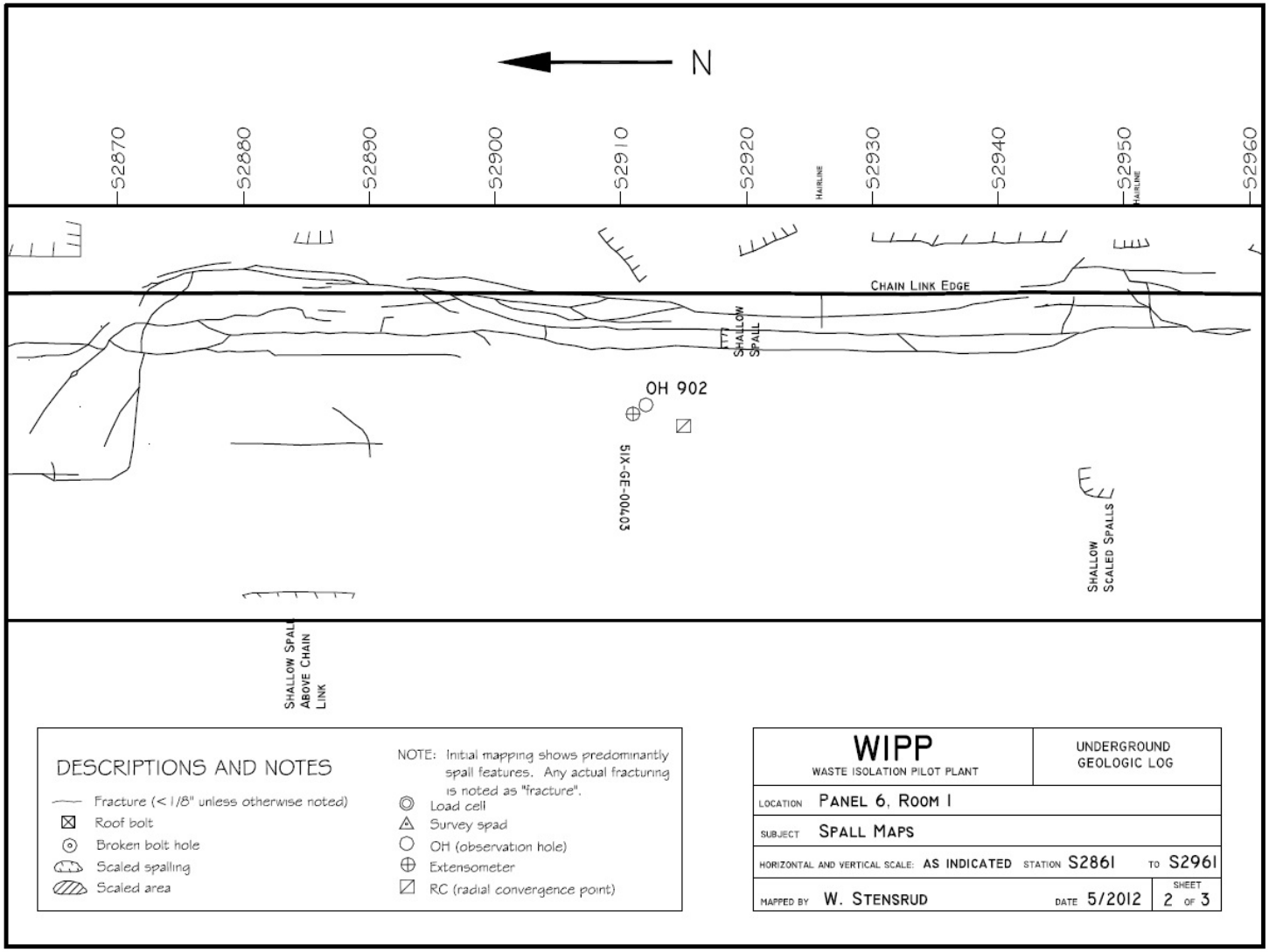

Figure 7-2
Panel 6, Room 1, S2861-S2961 Roof Fractures

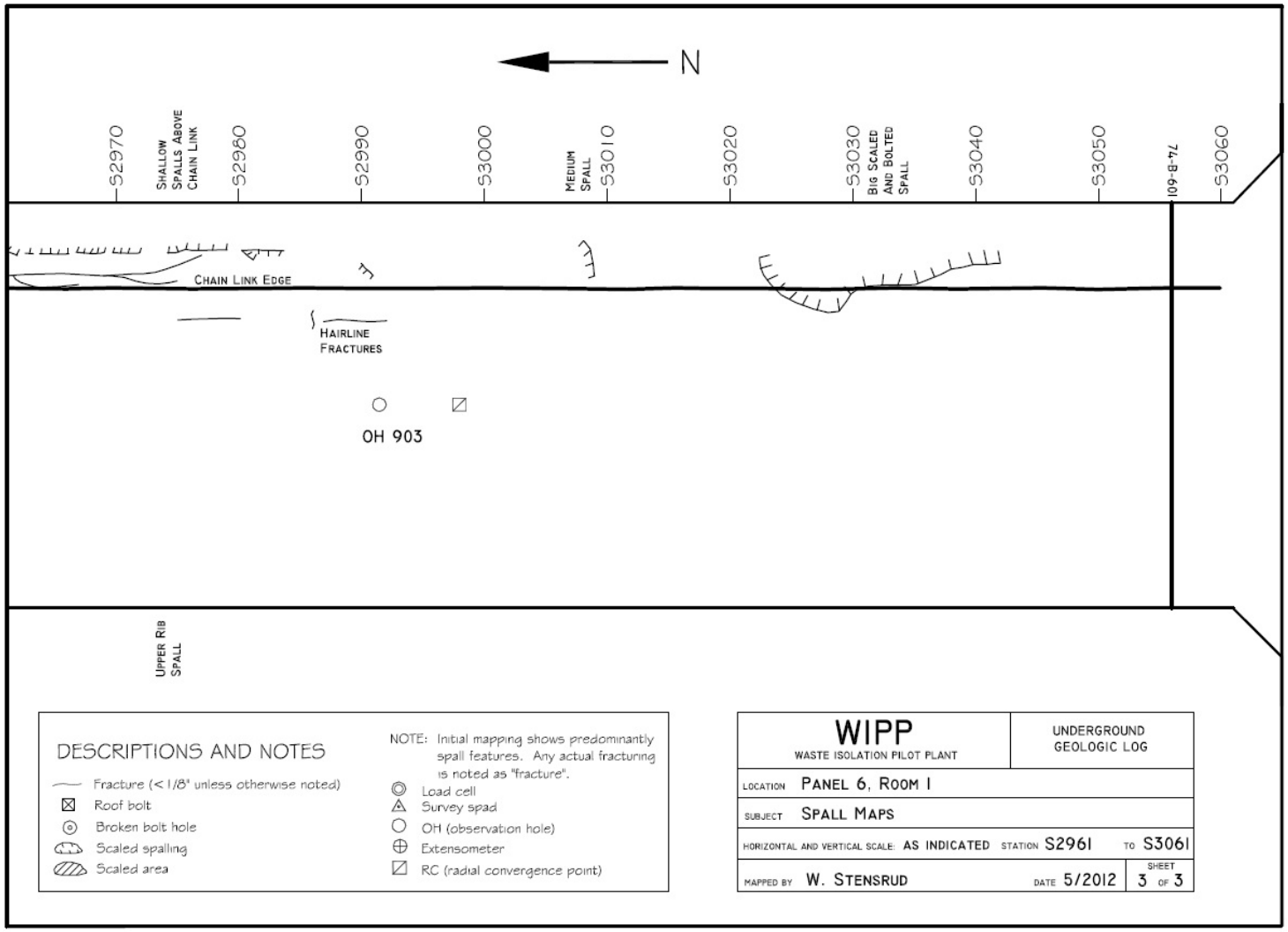

Figure 7-3
Panel 6 Room 1, S2961-S3061 Roof Fractures

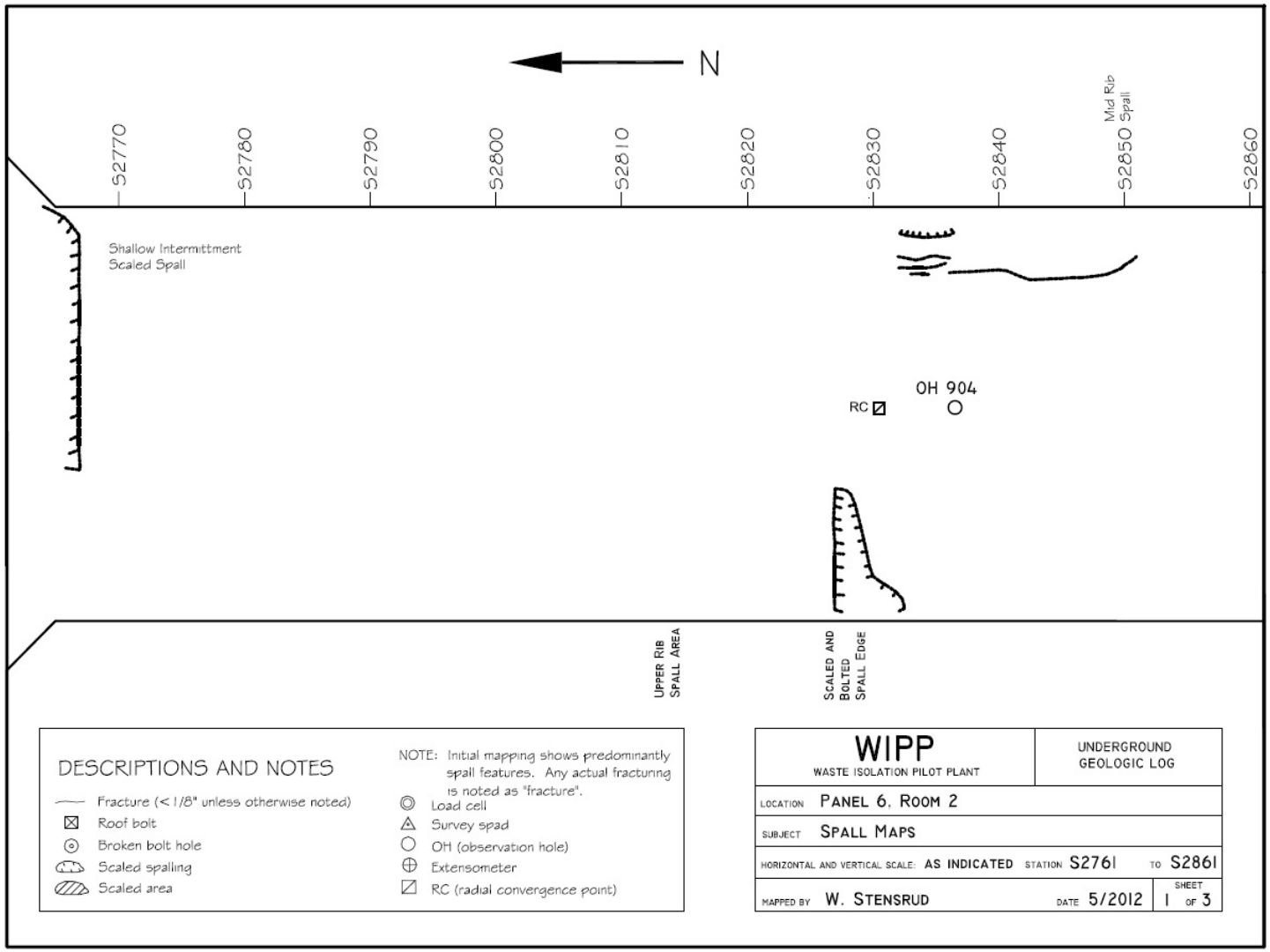

Figure 7-4
Panel 6 Room 2, S2761-S2861 Roof Fractures

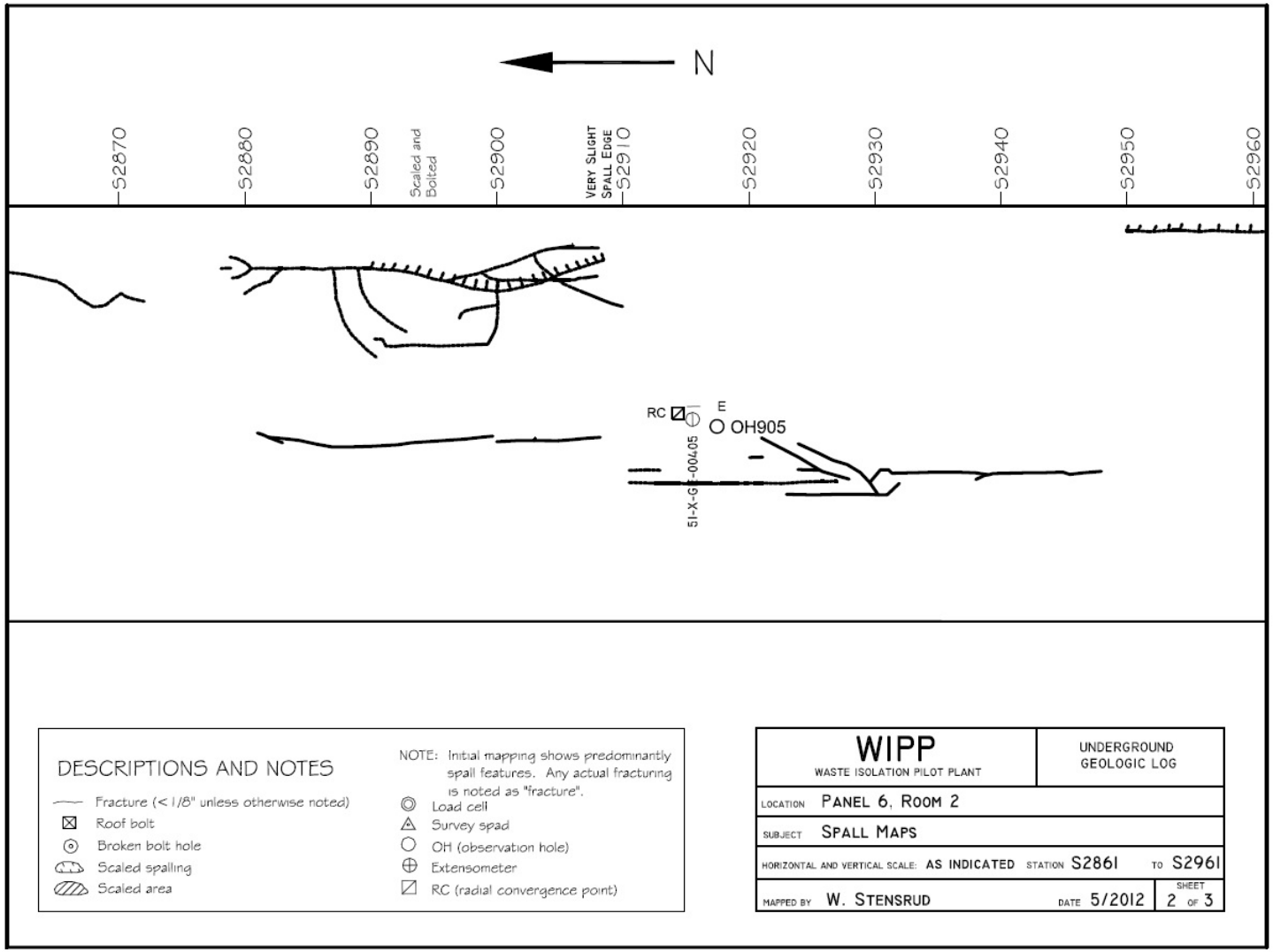

Figure 7-5
Panel 6 Room 2, S2861-S2961 Roof Fractures

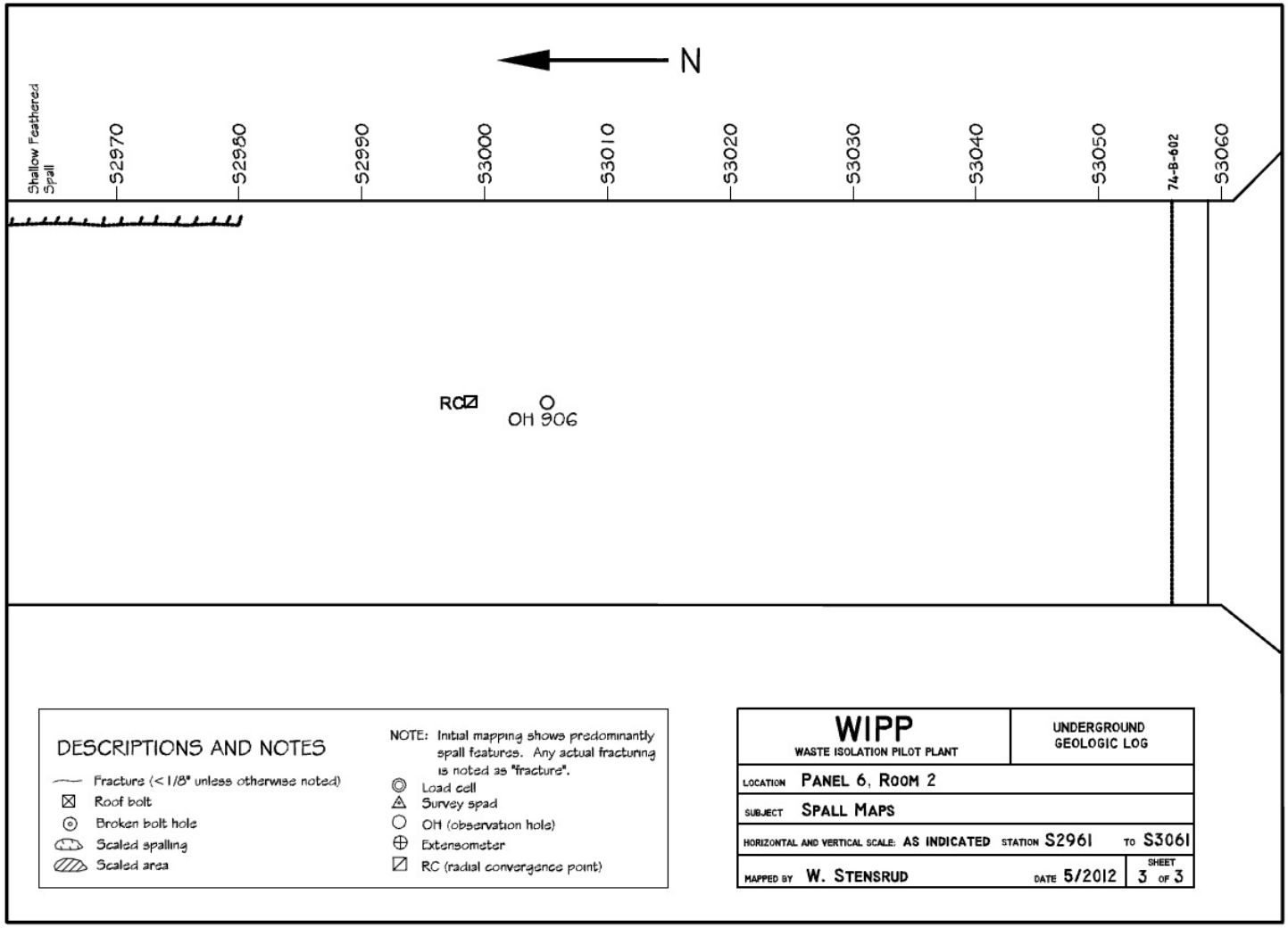

Figure 7-6
Panel 6 Room 2, S2961-S3061 Roof Fractures

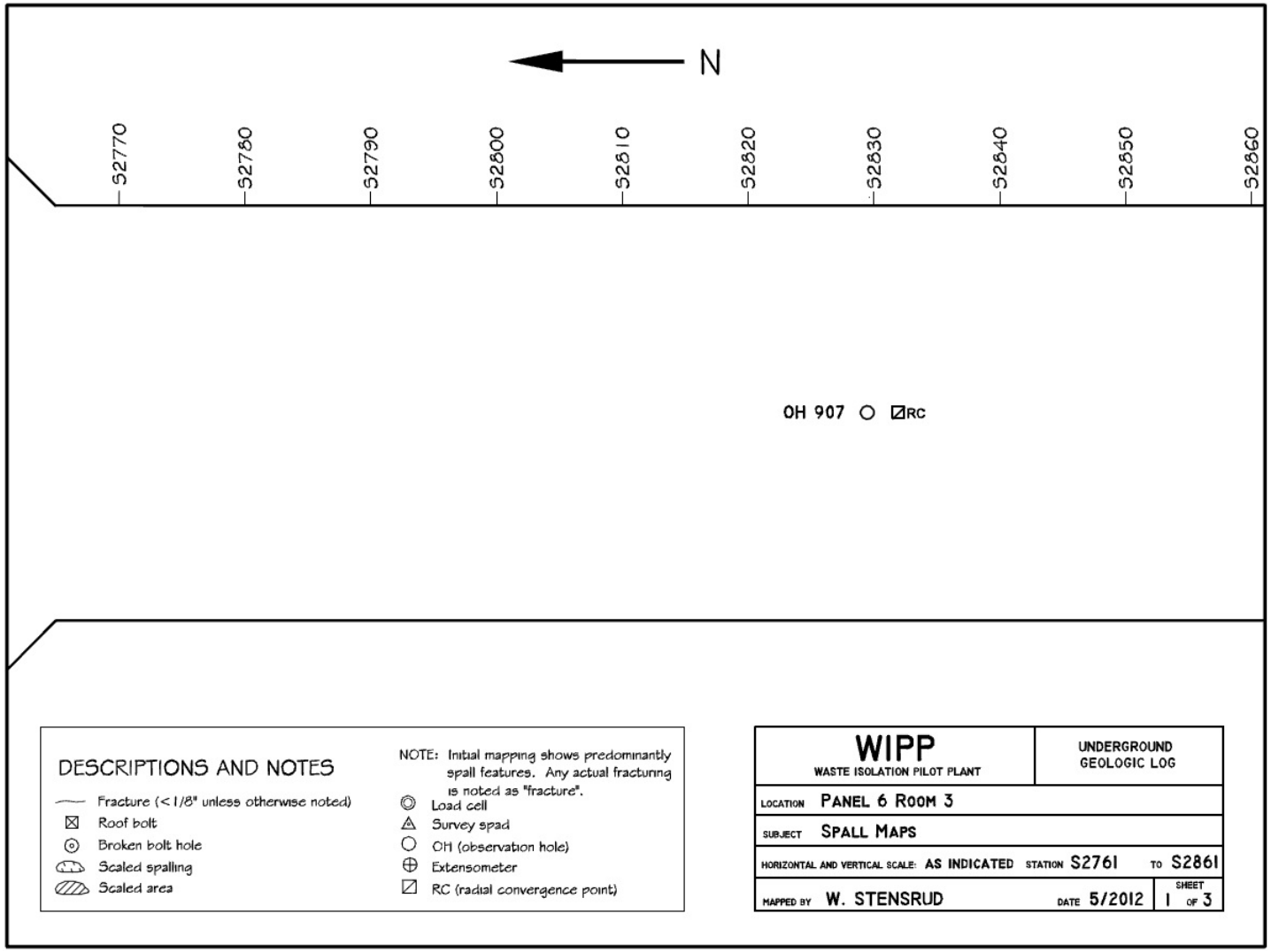

Figure 7-7
Panel 6 Room 3, S2761-S2861 Roof Fractures

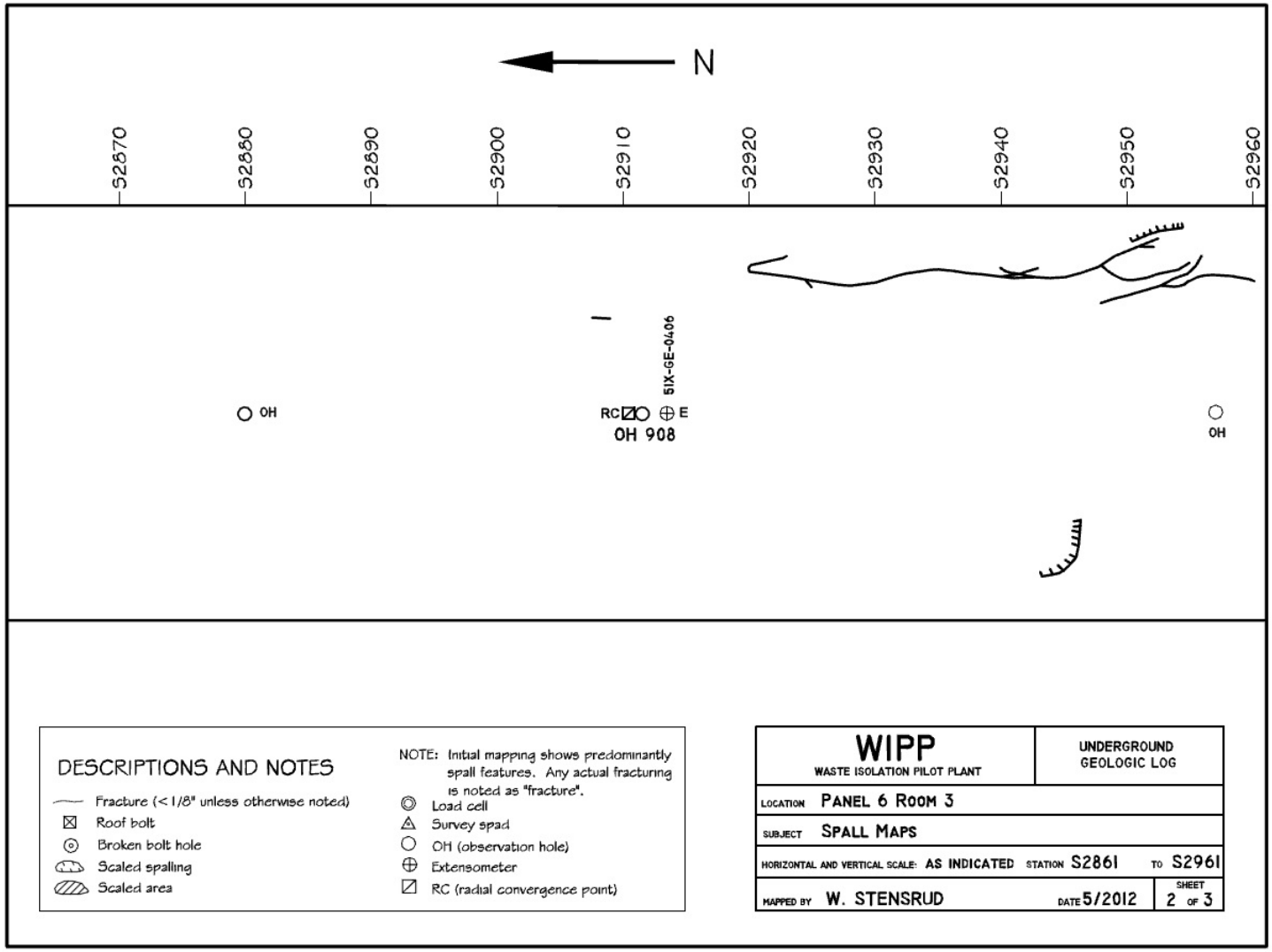

Figure 7-8
Panel 6 Room 3, S2861-S2961 Roof Fractures

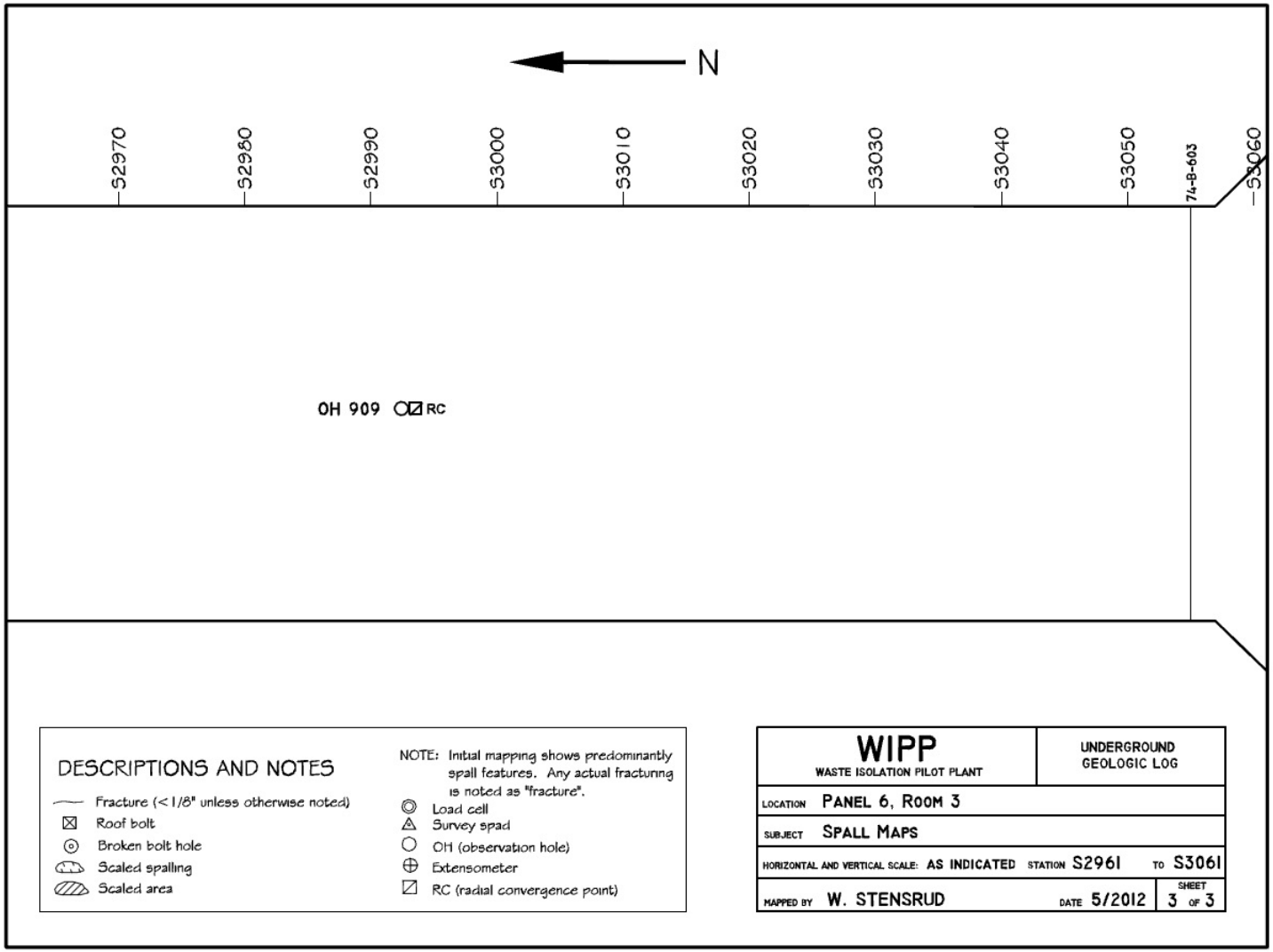

Figure 7-9
Panel 6 Room 3, S2961-S3061 Roof Fractures

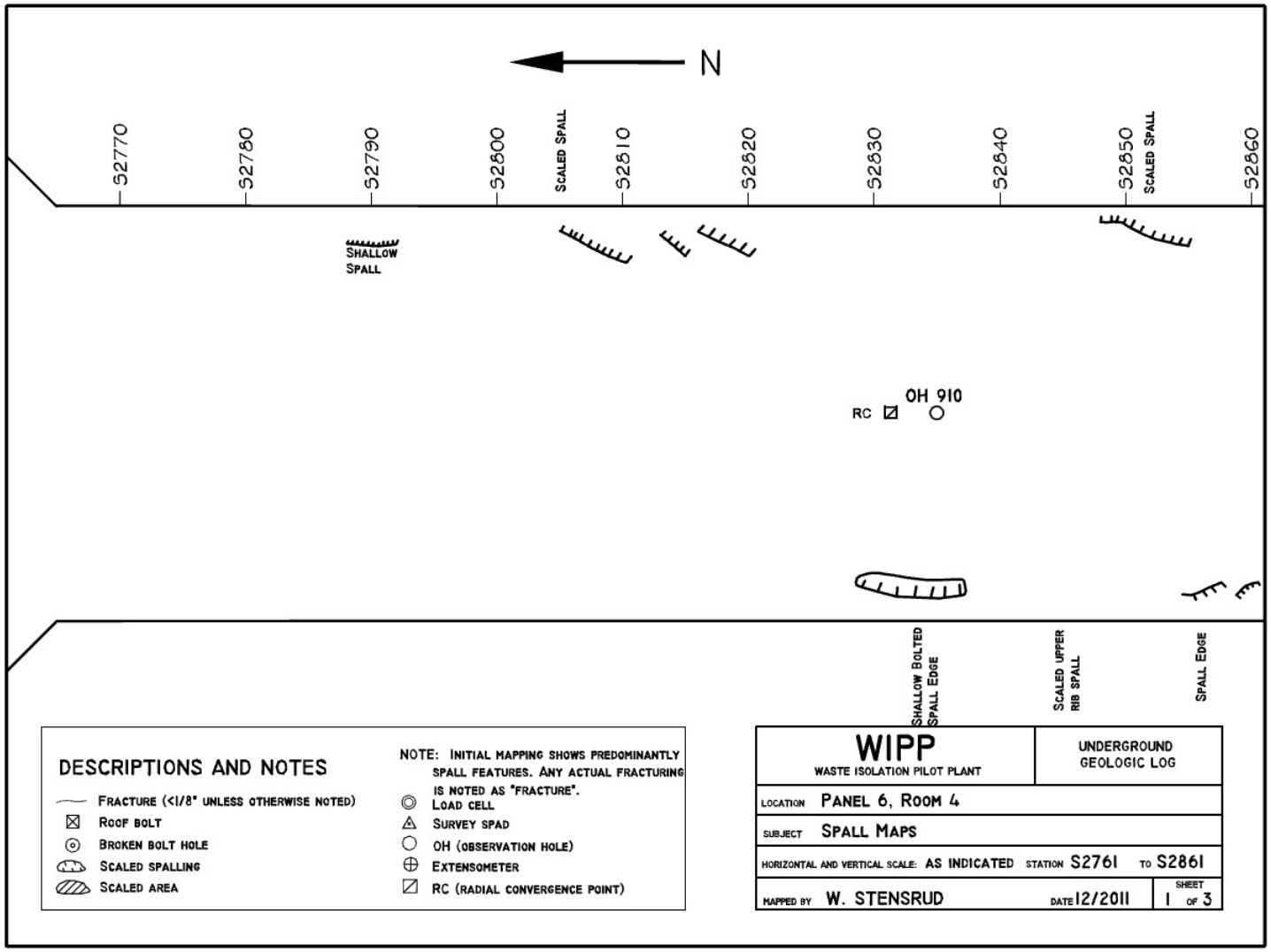

Figure 7-10
Panel 6 Room 4, S2761-S2861 Roof Fractures

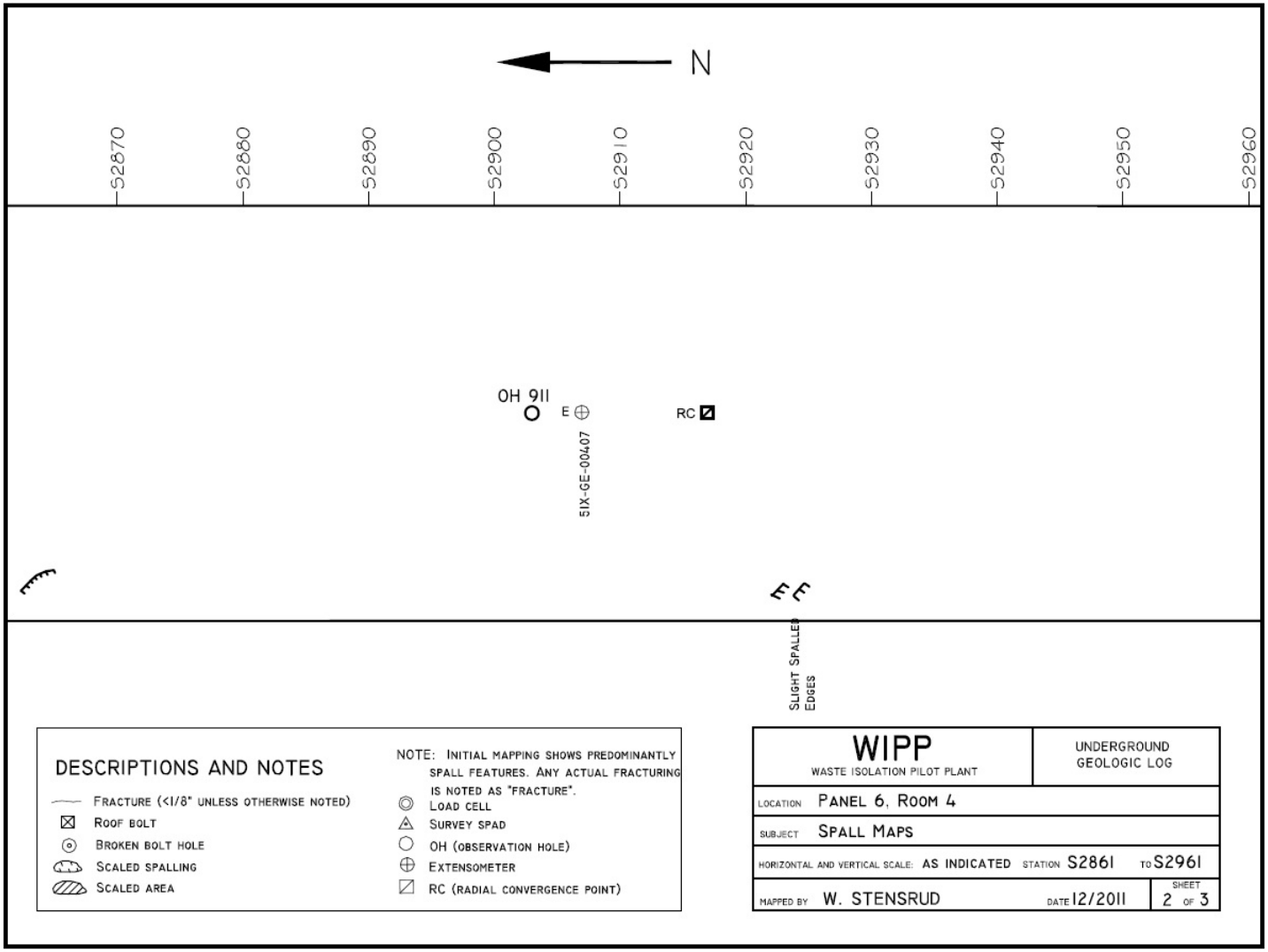

Figure 7-11
Panel 6 Room 4, S2861-S2961 Roof Fractures

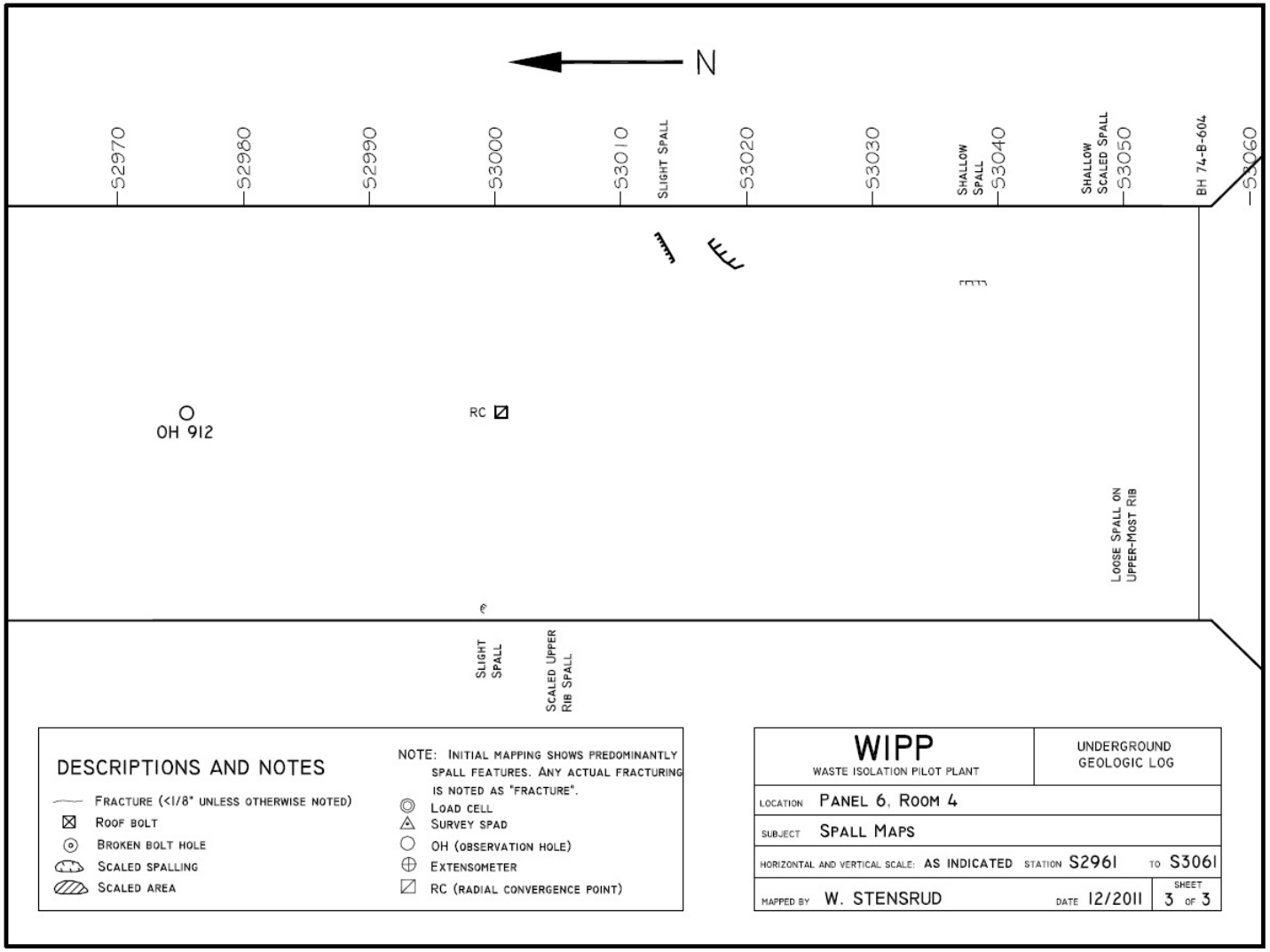

Figure 7-12
Panel 6 Room 4, S2961-S3061 Roof Fractures

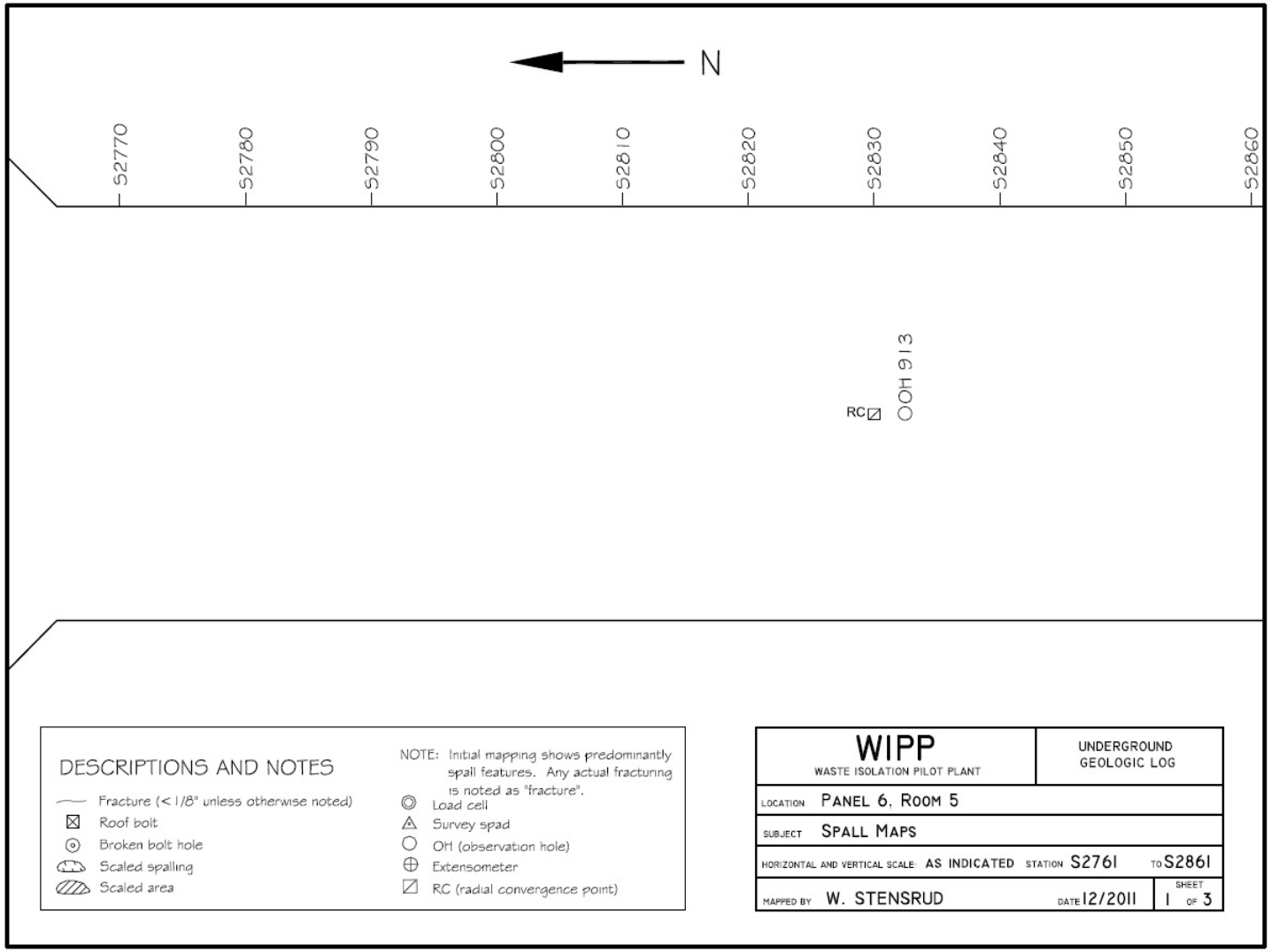

Figure 7-13
Panel 6 Room 5, S2761-S2861 Roof Fractures

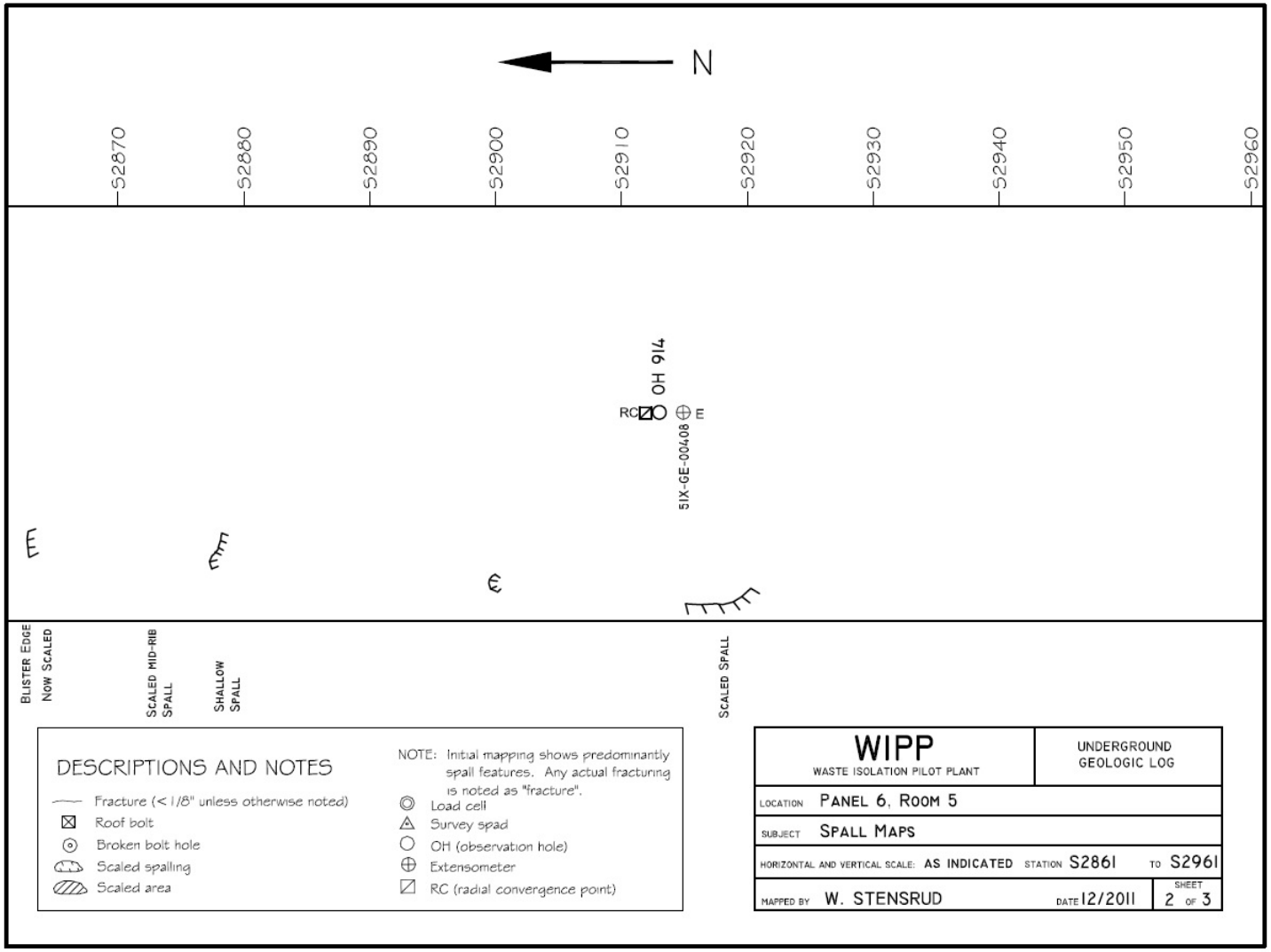

Figure 7-14
Panel 6 Room 5, S2861-S2961 Roof Fractures

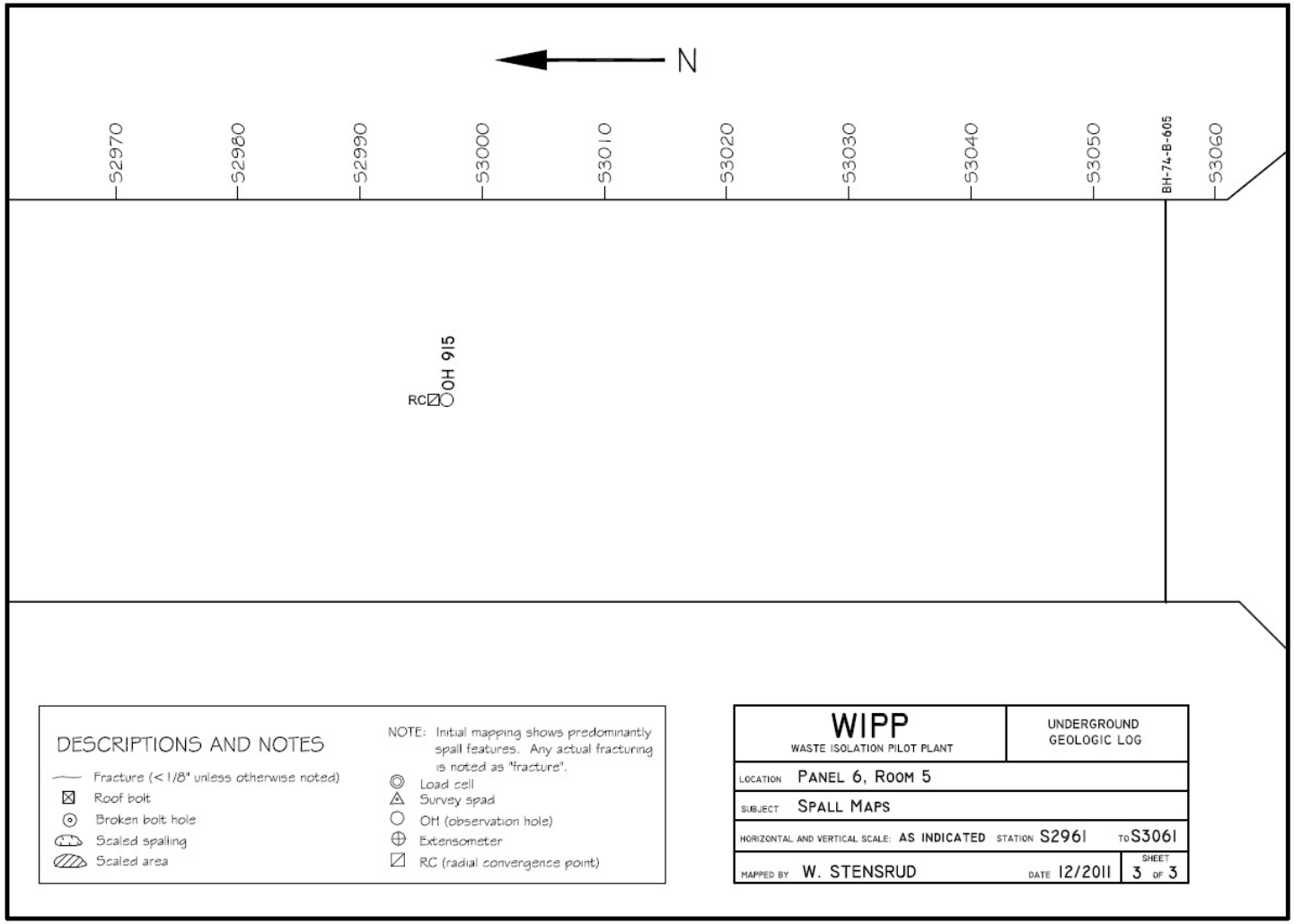

Figure 7-15
Panel 6 Room 5, S2961-S3061 Roof Fractures

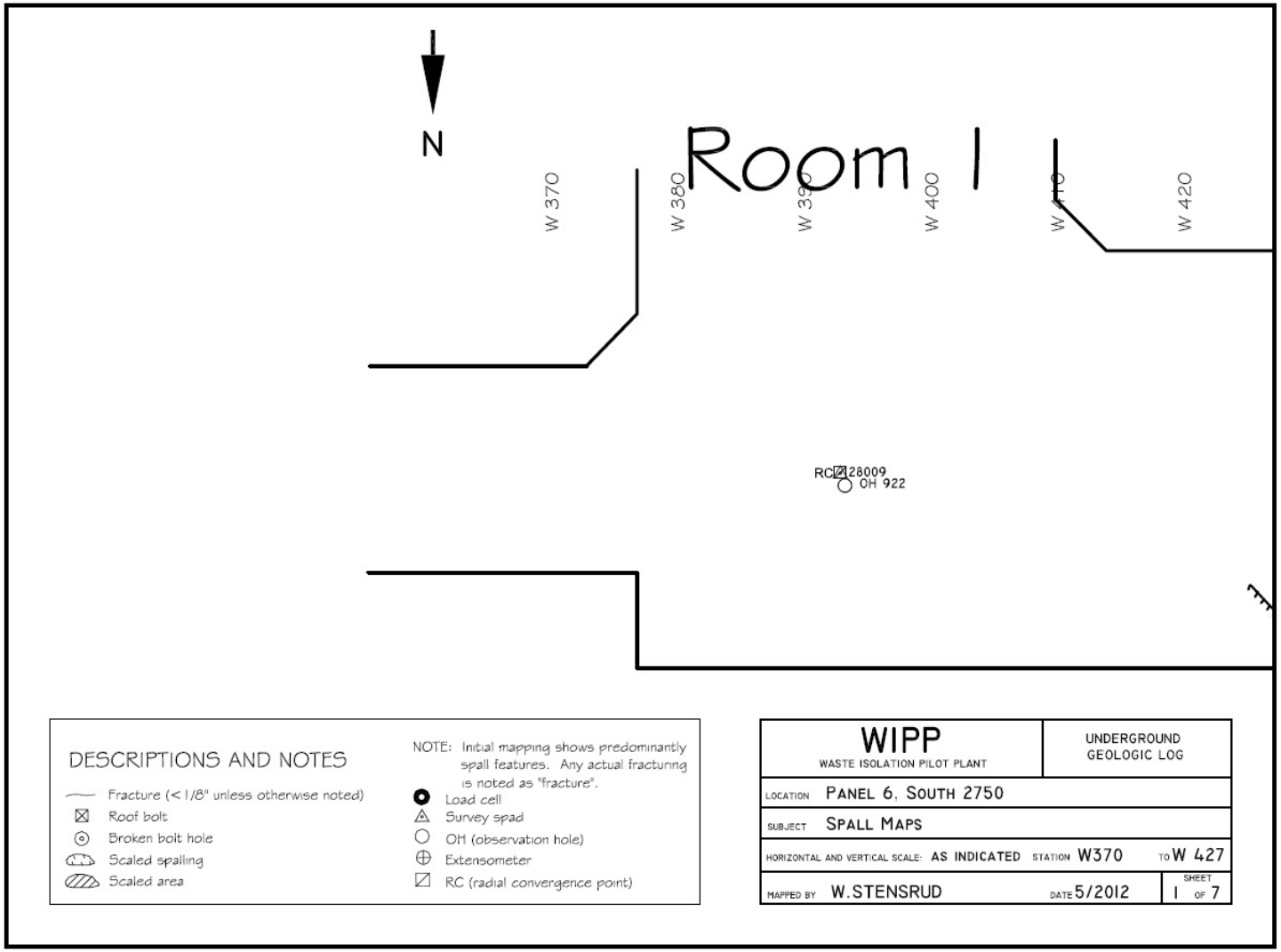

Figure 7-16
Panel 6 South 2750, W370-W427 Roof Fractures

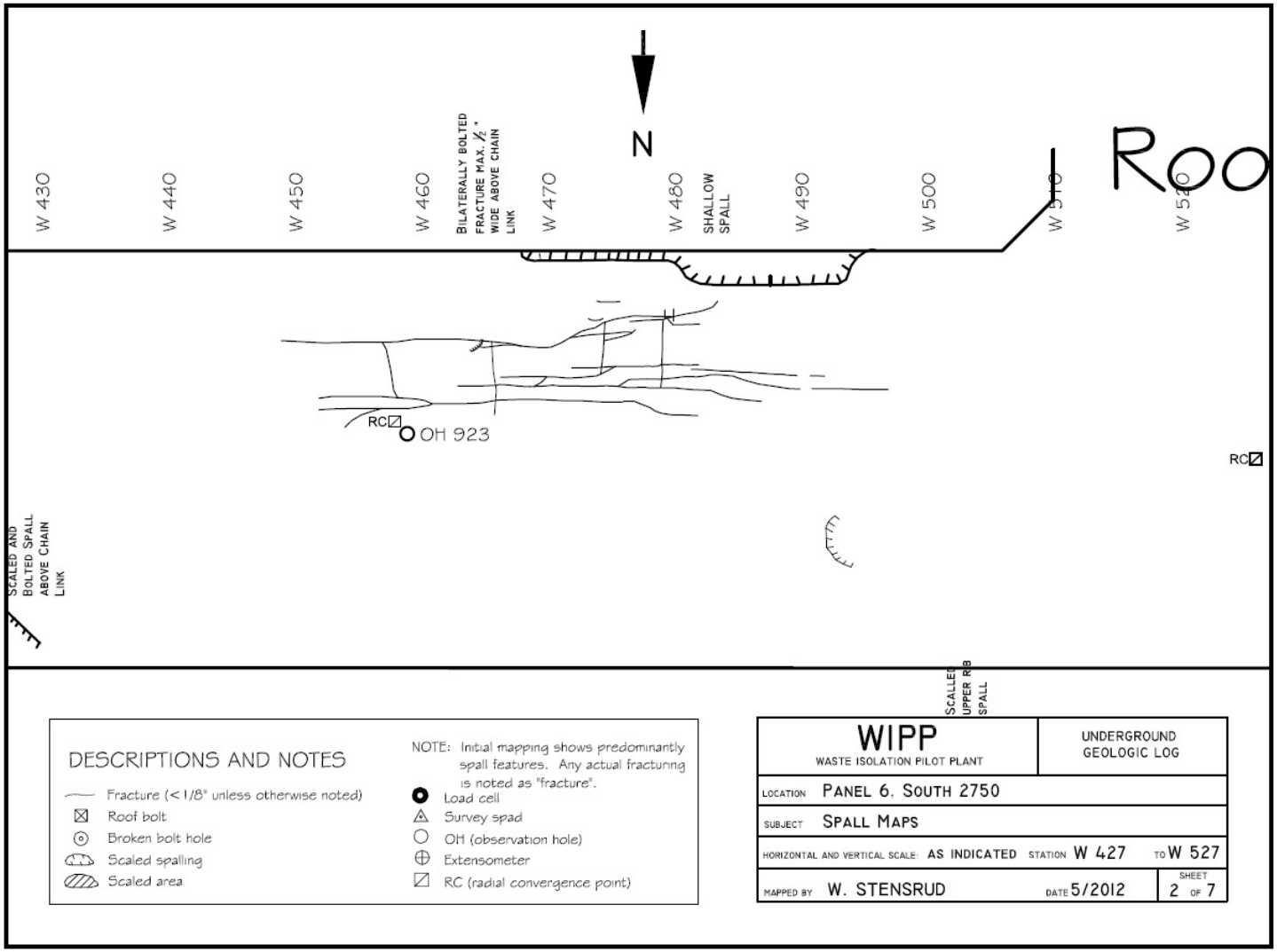

Figure 7-17
Panel 6 South 2750, W427-W527 Roof Fractures

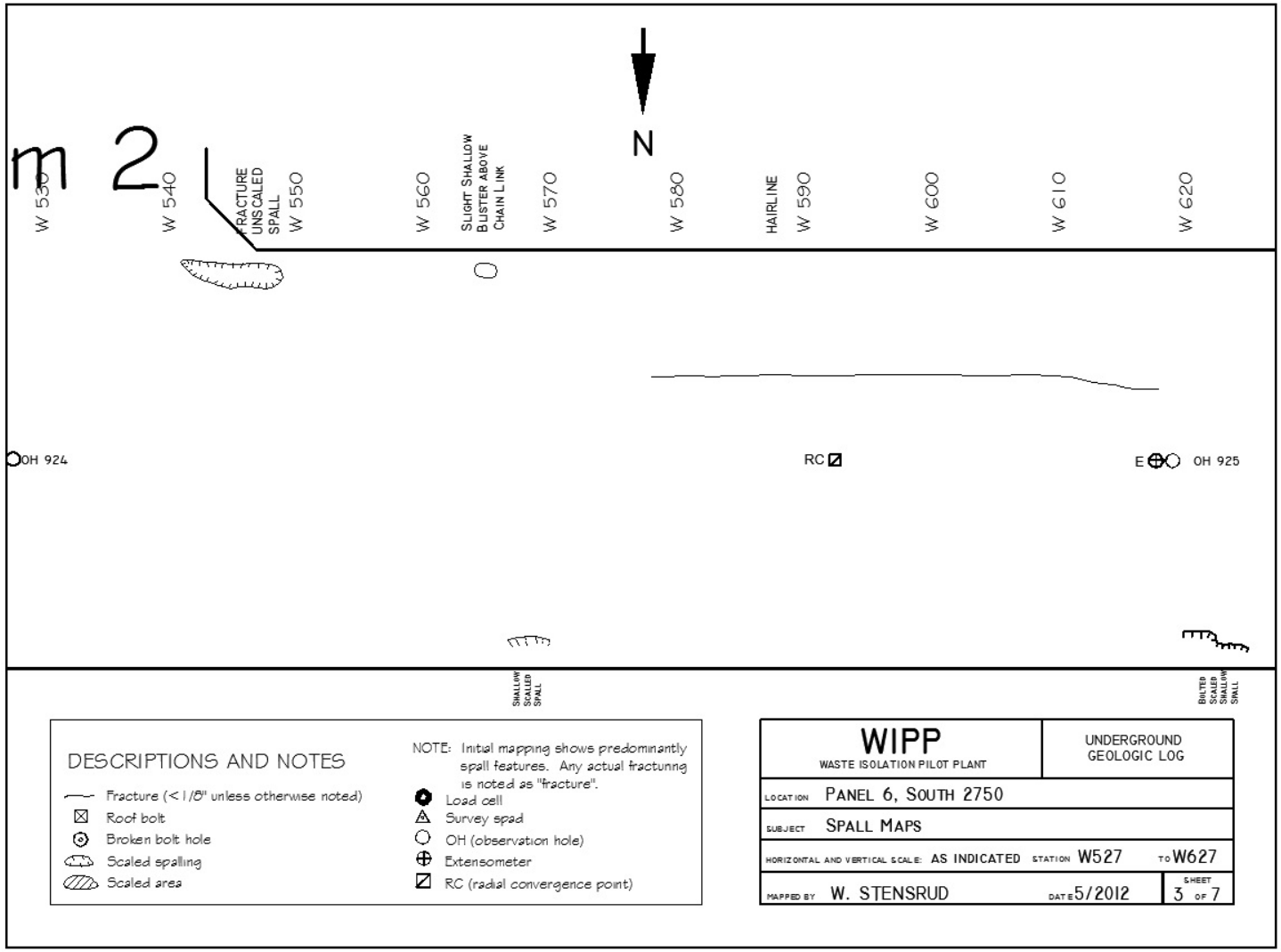

Figure 7-18
Panel 6 South 2750, W527-W627 Roof Fractures

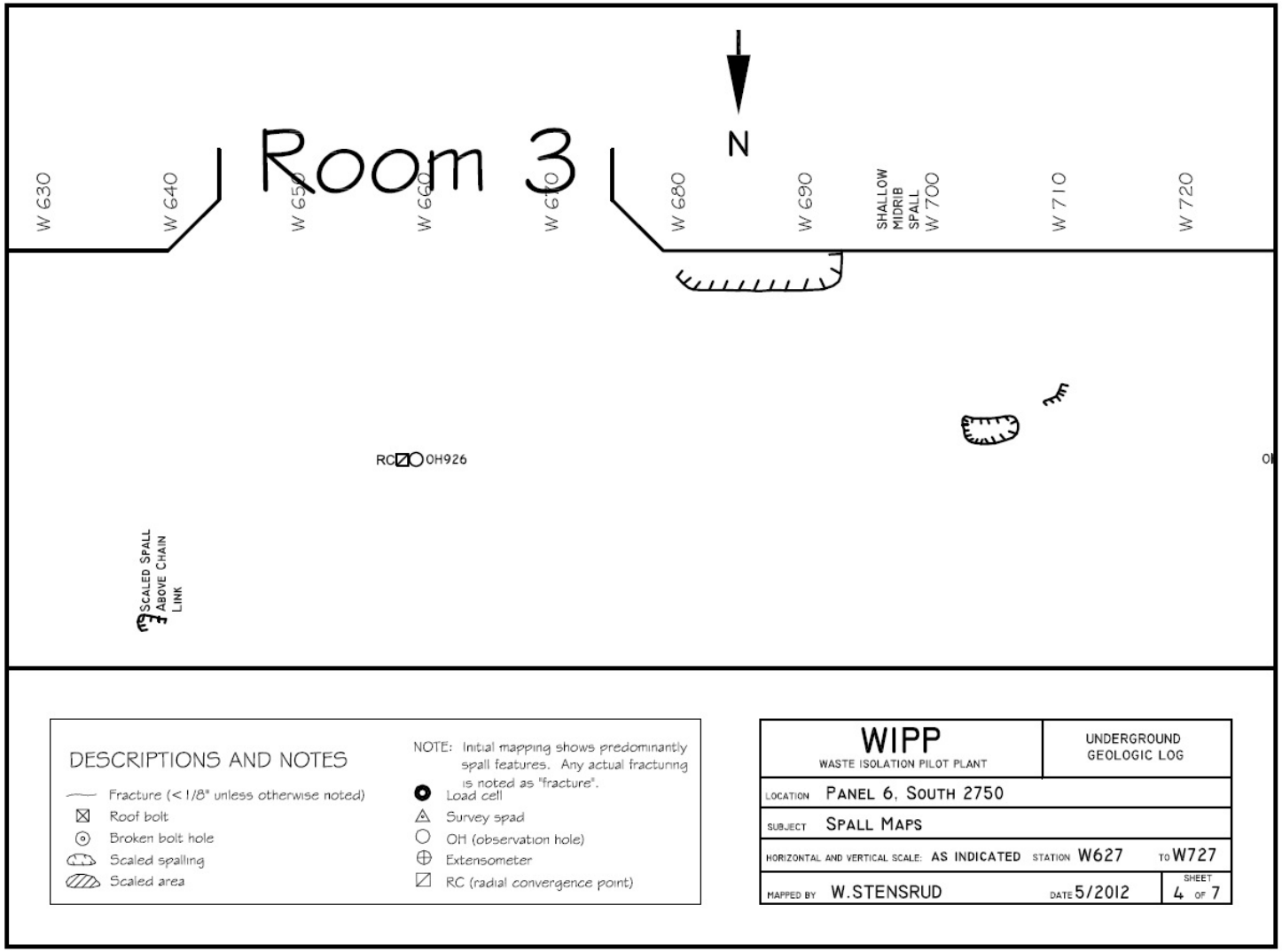

Figure 7-19
Panel 6 South 2750, W627-W727 Roof Fractures

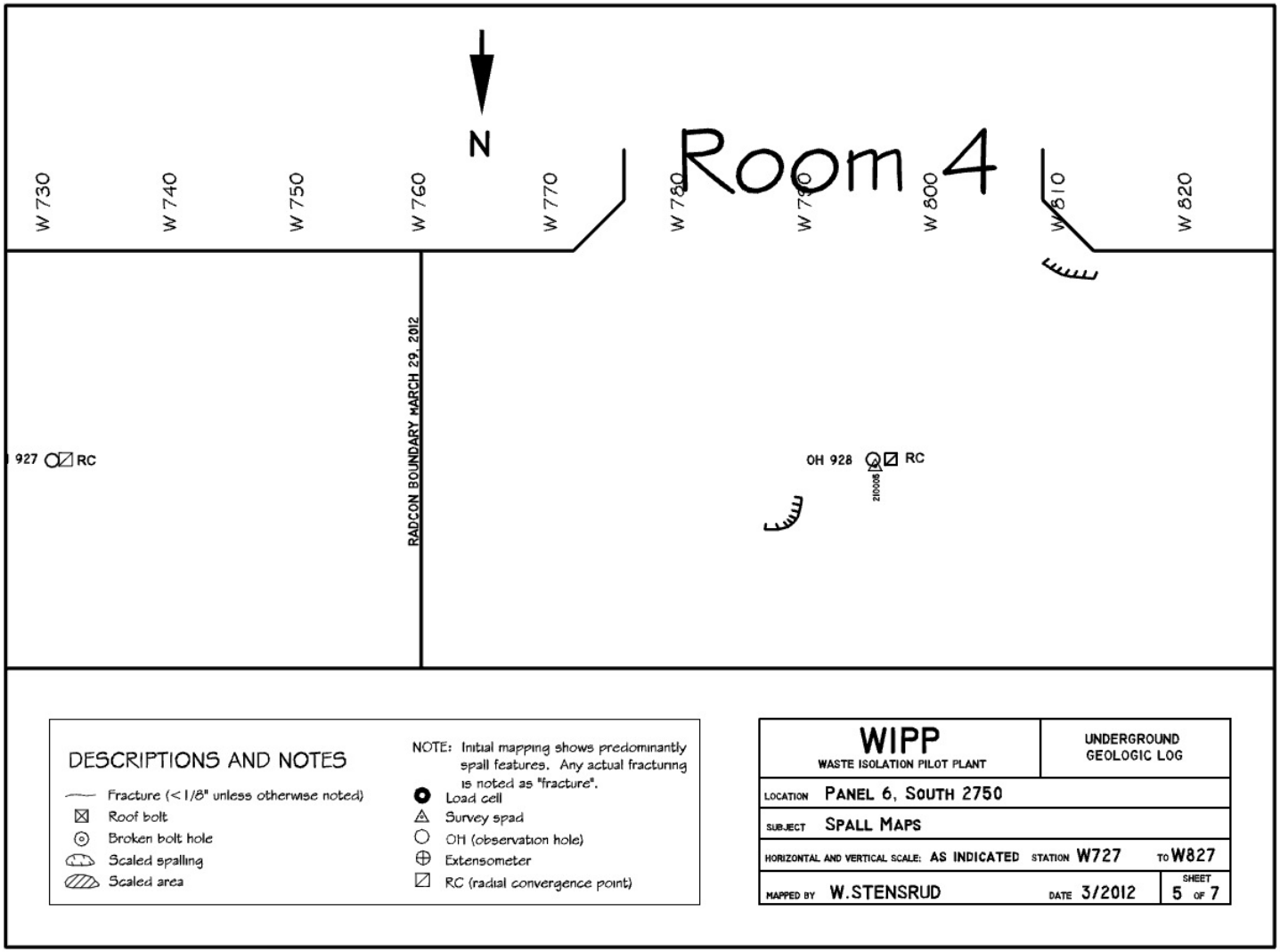

Figure 7-20
Panel 6 South 2750, W727-W827 Roof Fractures

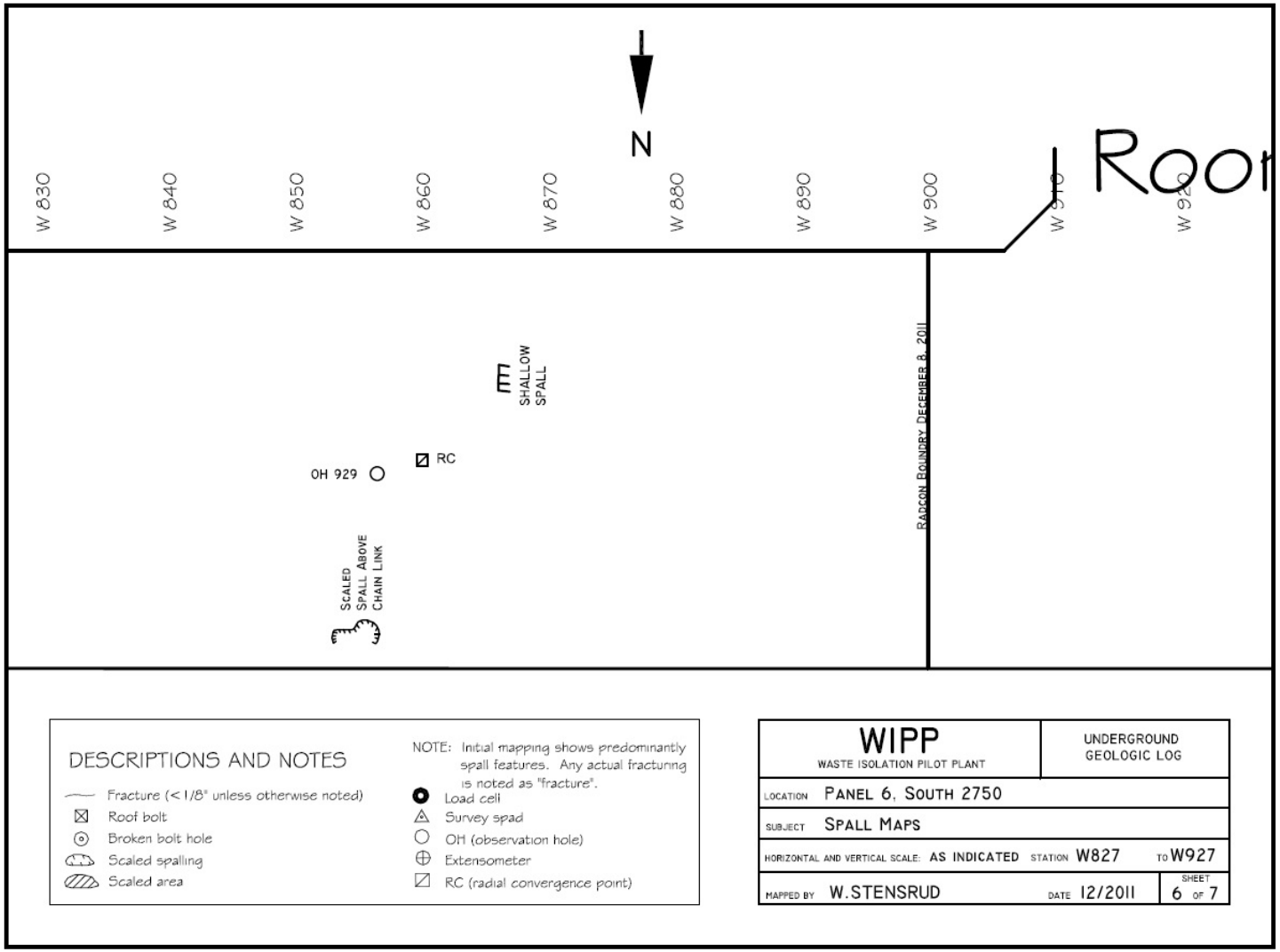

Figure 7-21
Panel 6 South 2750, W827-W927 Roof Fractures

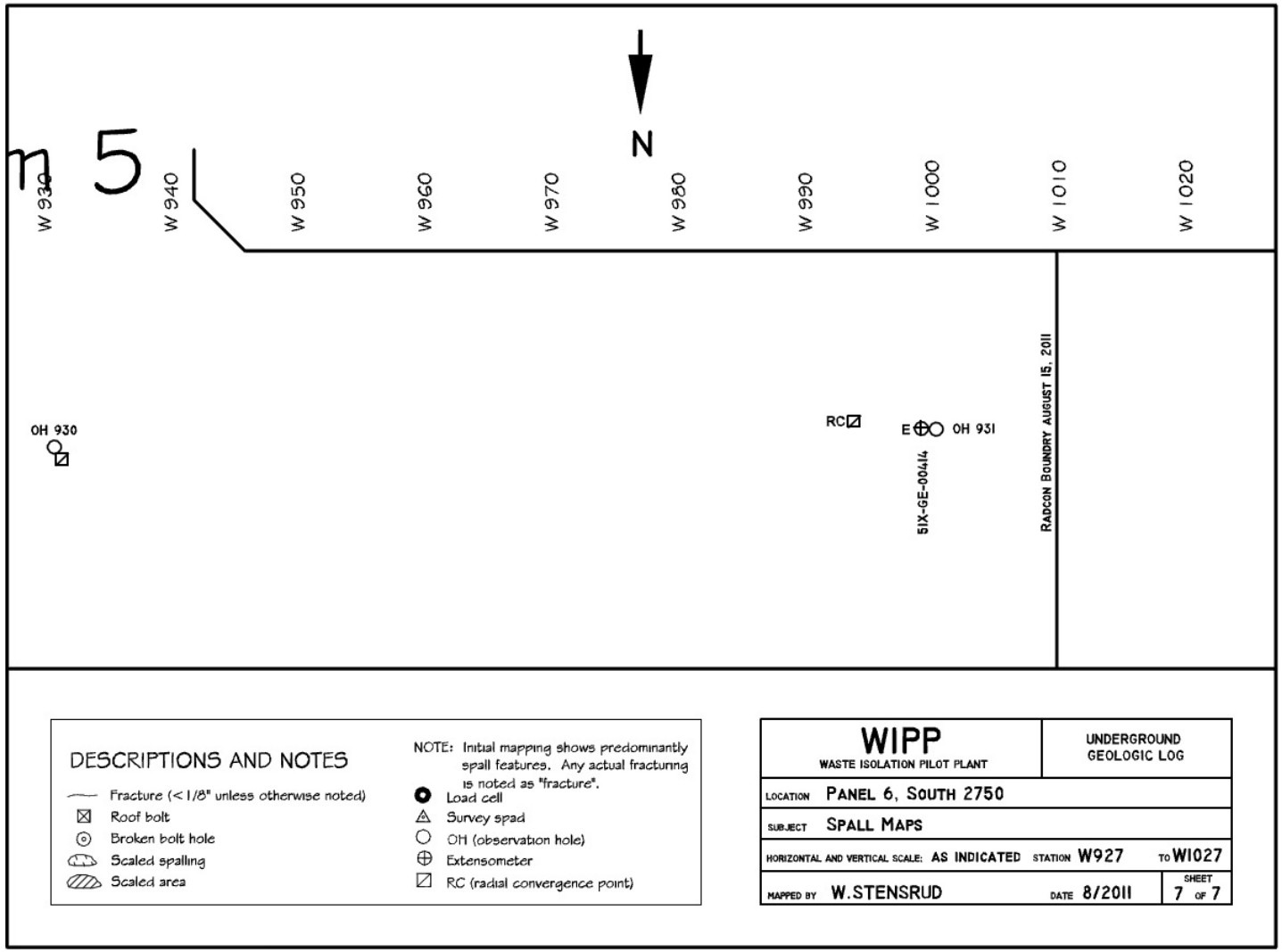

Figure 7-22
Panel 6 South 2750, W927-W1027 Roof Fractures

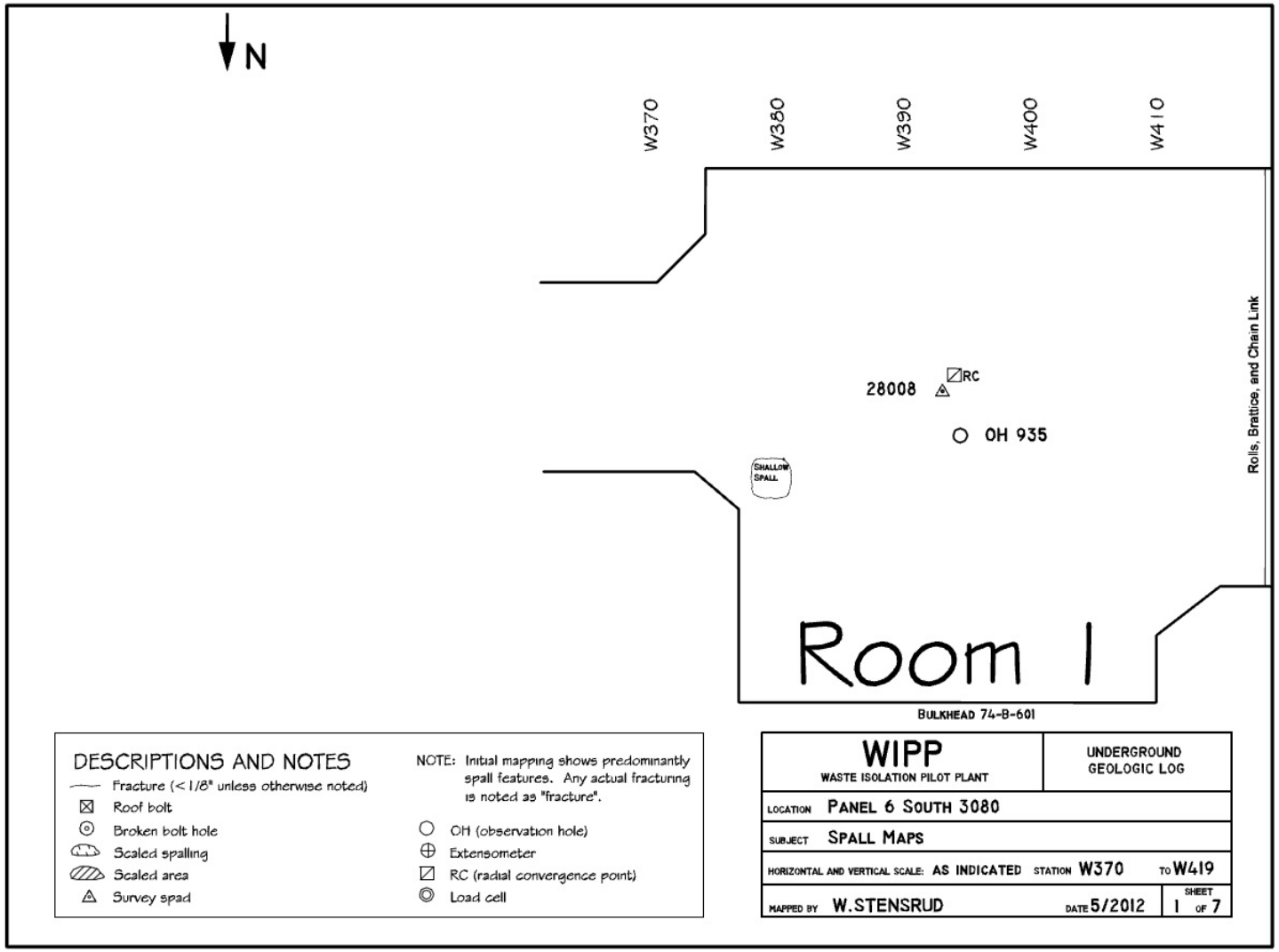

Figure 7-23
Panel 6 South 3080, W370-W419 Roof Fractures

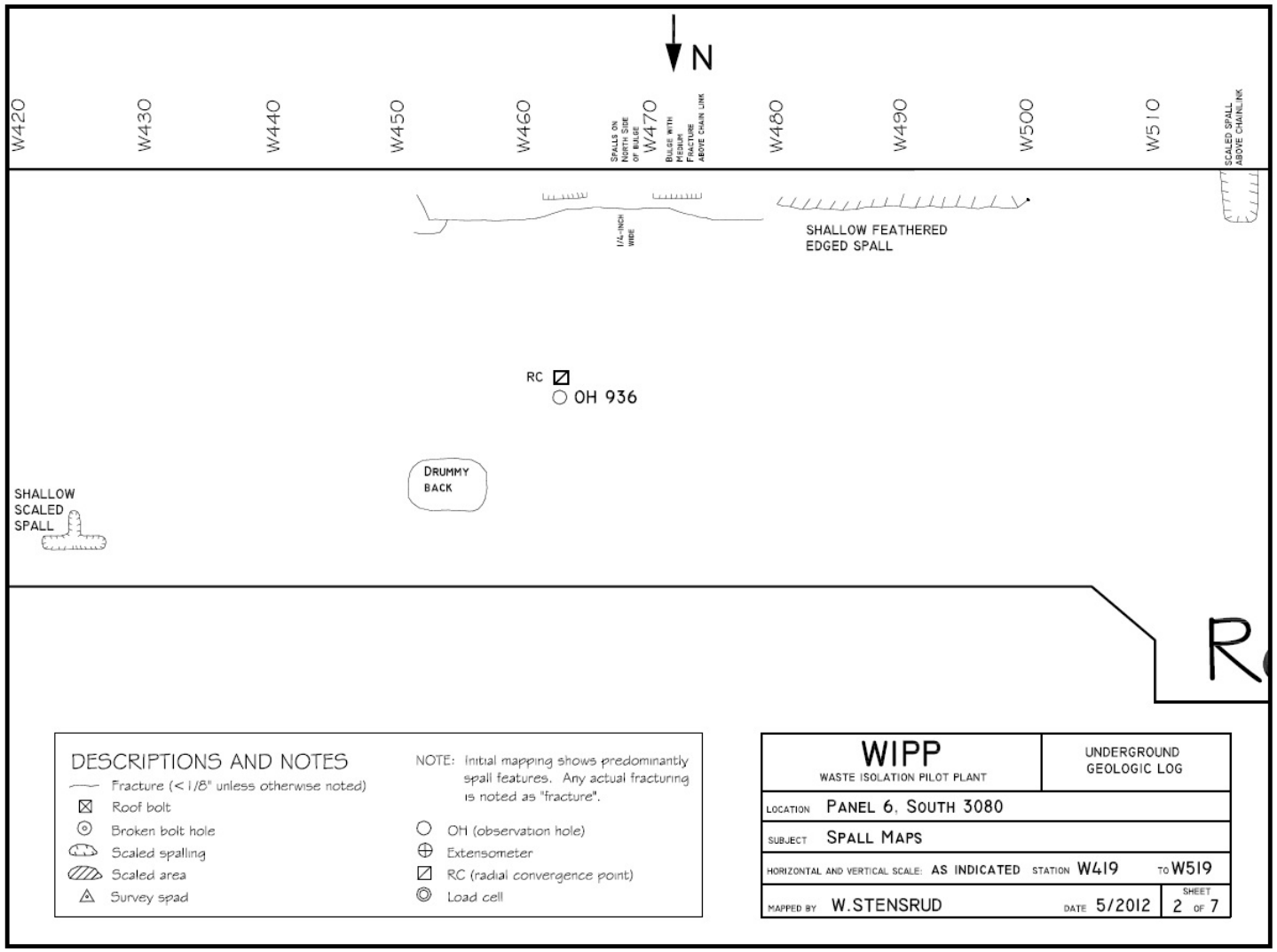

Figure 7-24
Panel 6 South 3080, W419-W519 Roof Fractures

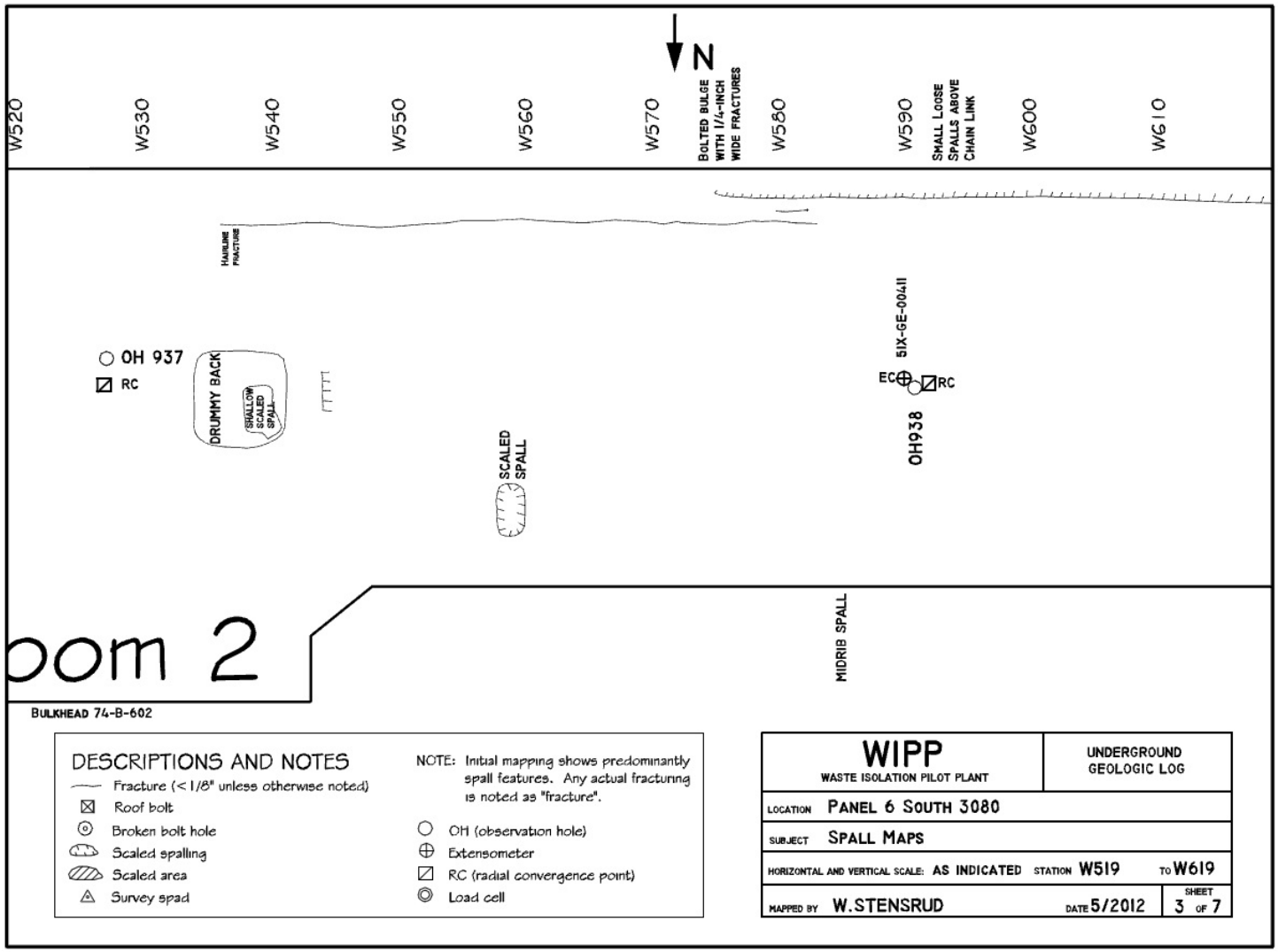

Figure 7-25
Panel 6 South 3080, W519-W619 Roof Fractures

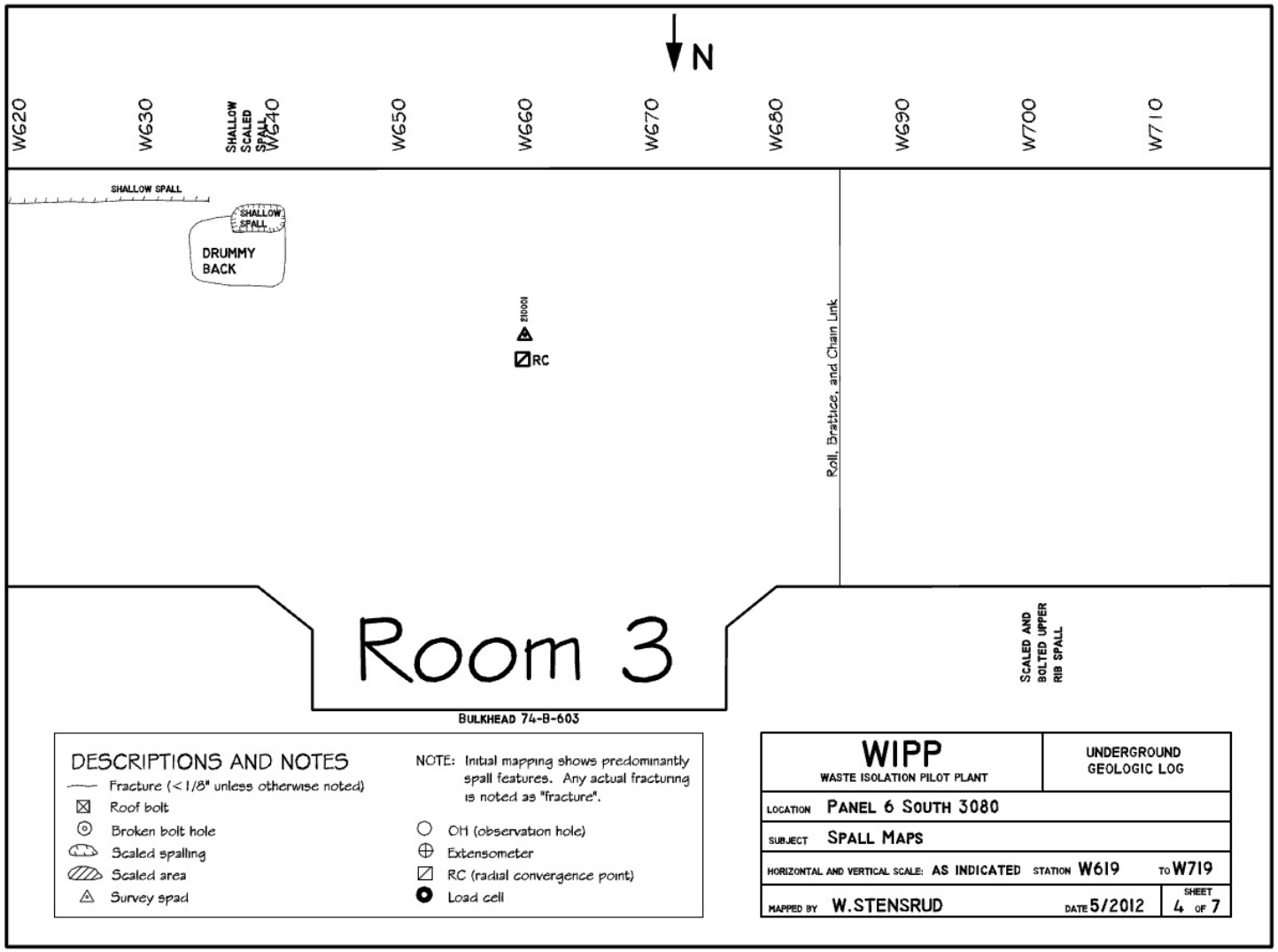

Figure 7-26
Panel 6 South 3080, W619-W719 Roof Fractures

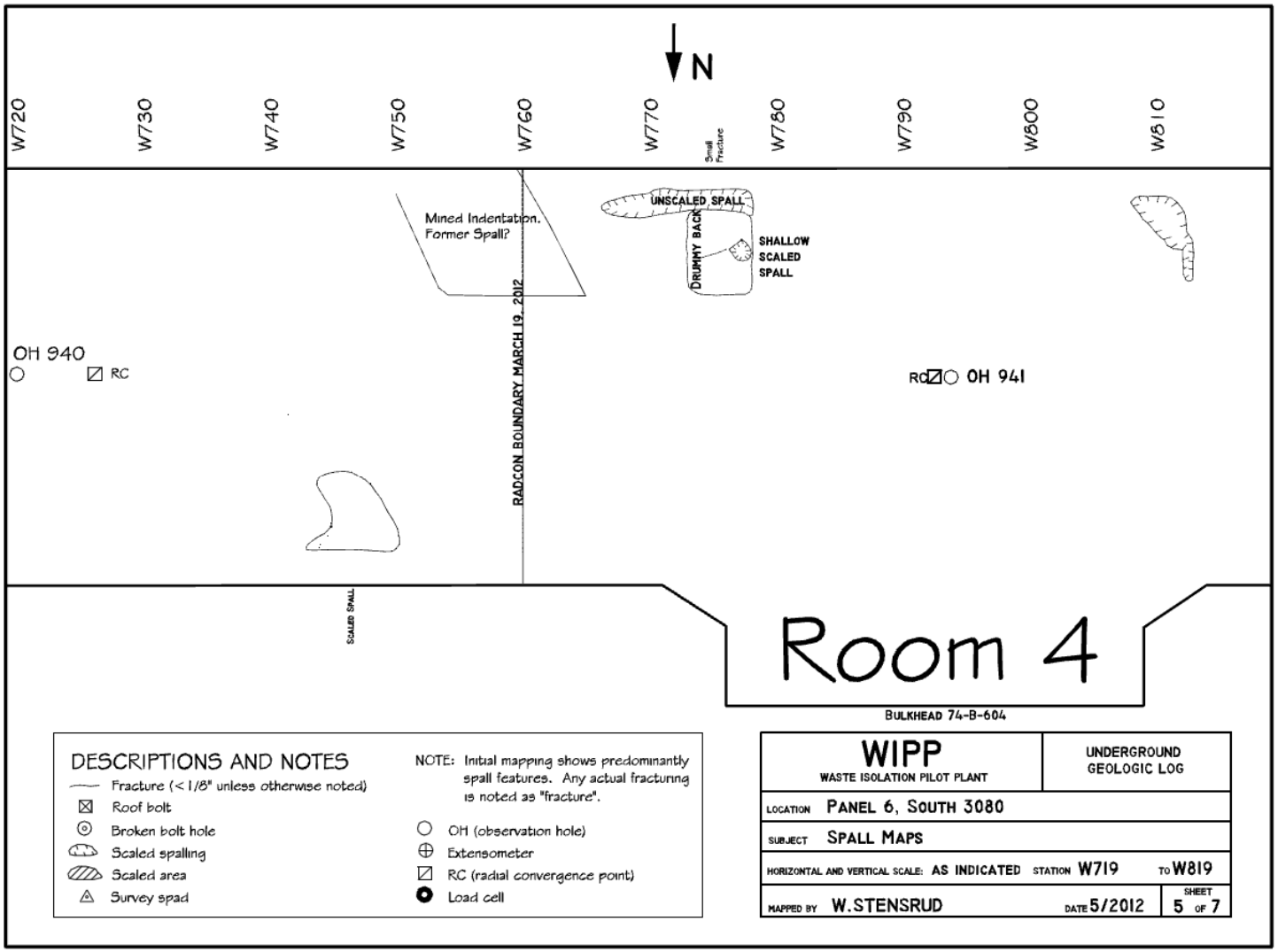

Figure 7-27
Panel 6 South 3080, W719-W819 Roof Fractures

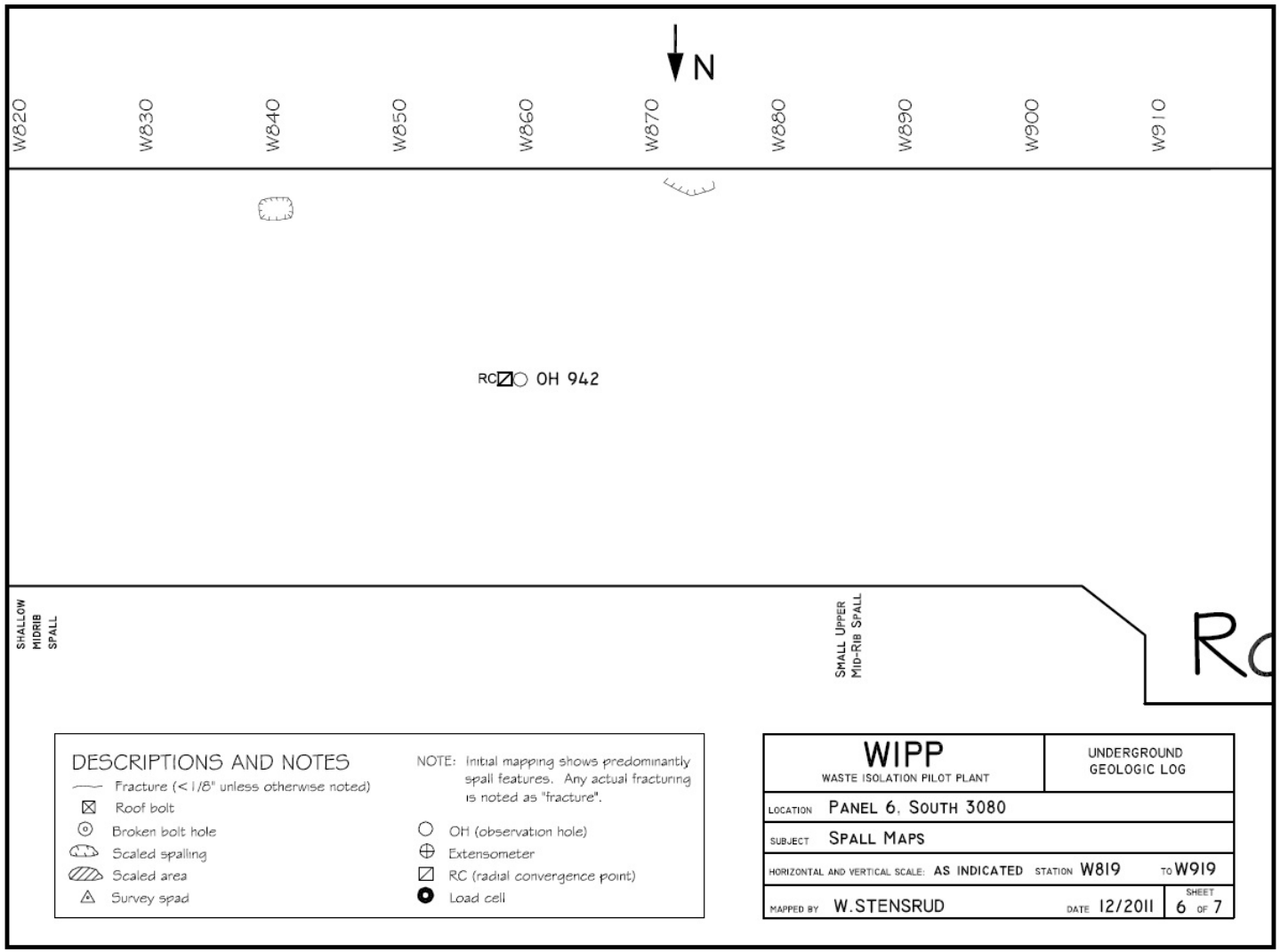

Figure 7-28
Panel 6 South 3080, W819-W919 Roof Fractures

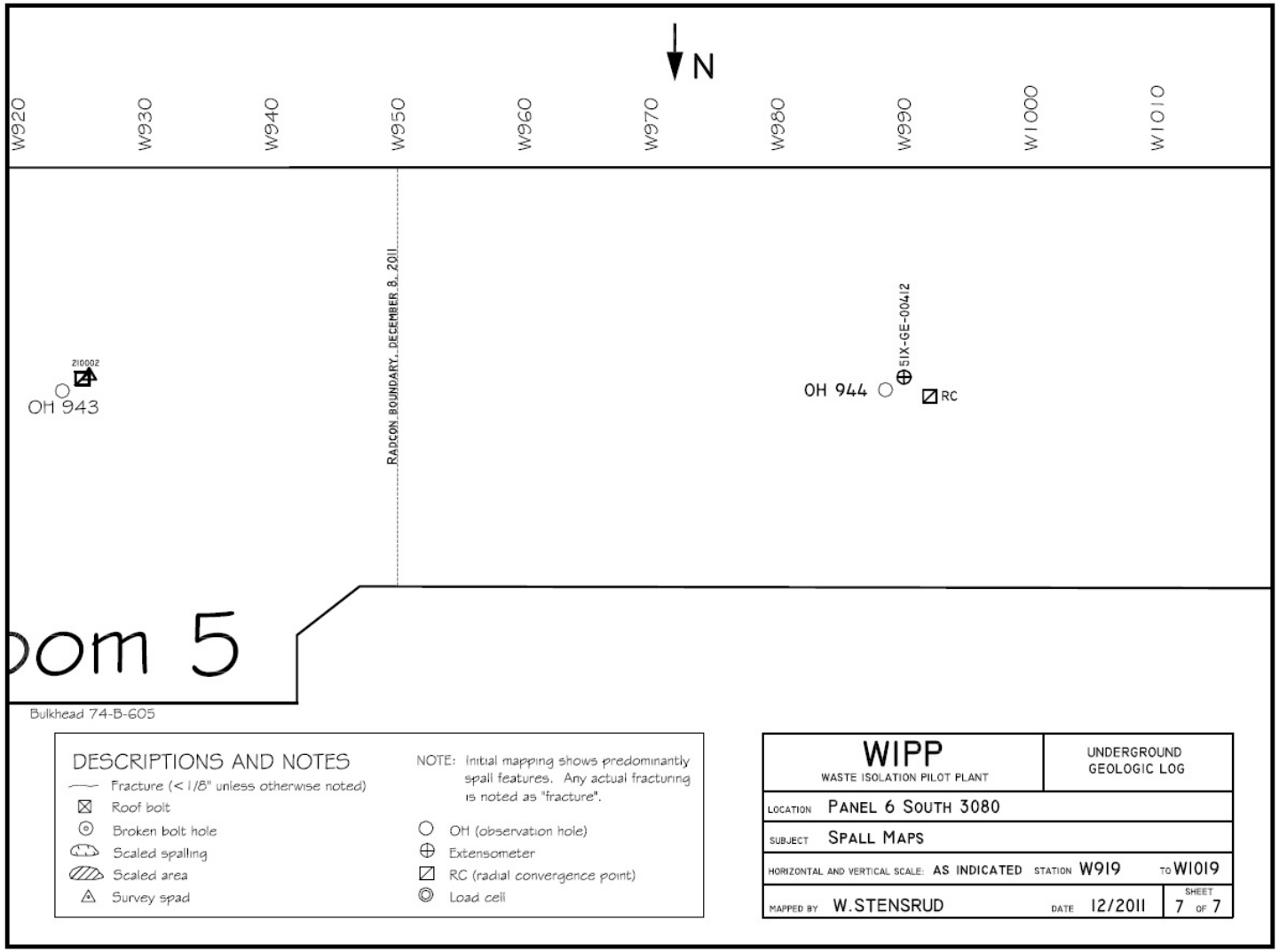

Figure 7-29
Panel 6 South 3080, W919-W1019 Roof Fractures

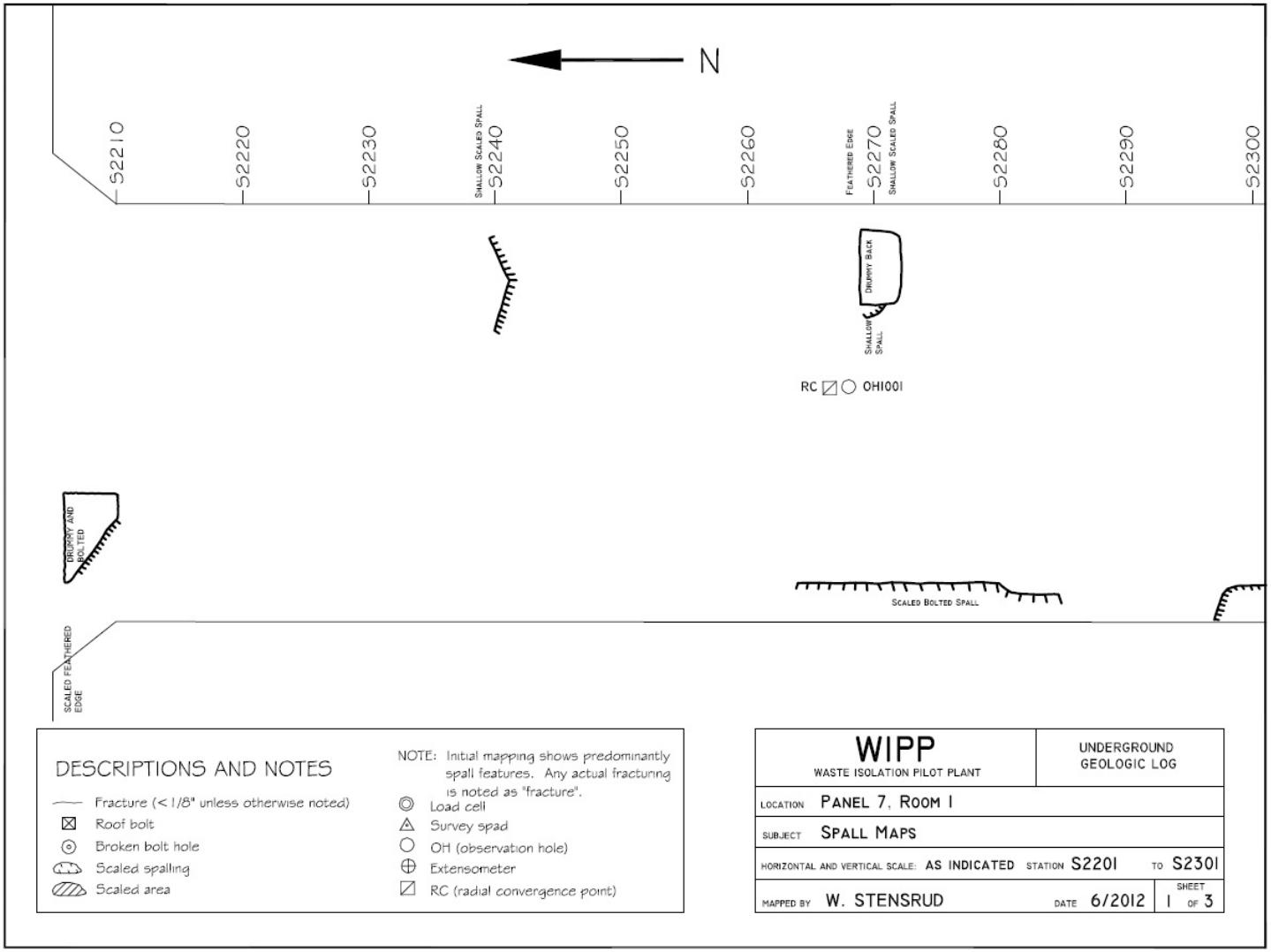

Figure 7-30
Panel 7 Room 1, S2201-S2301 Roof Fractures

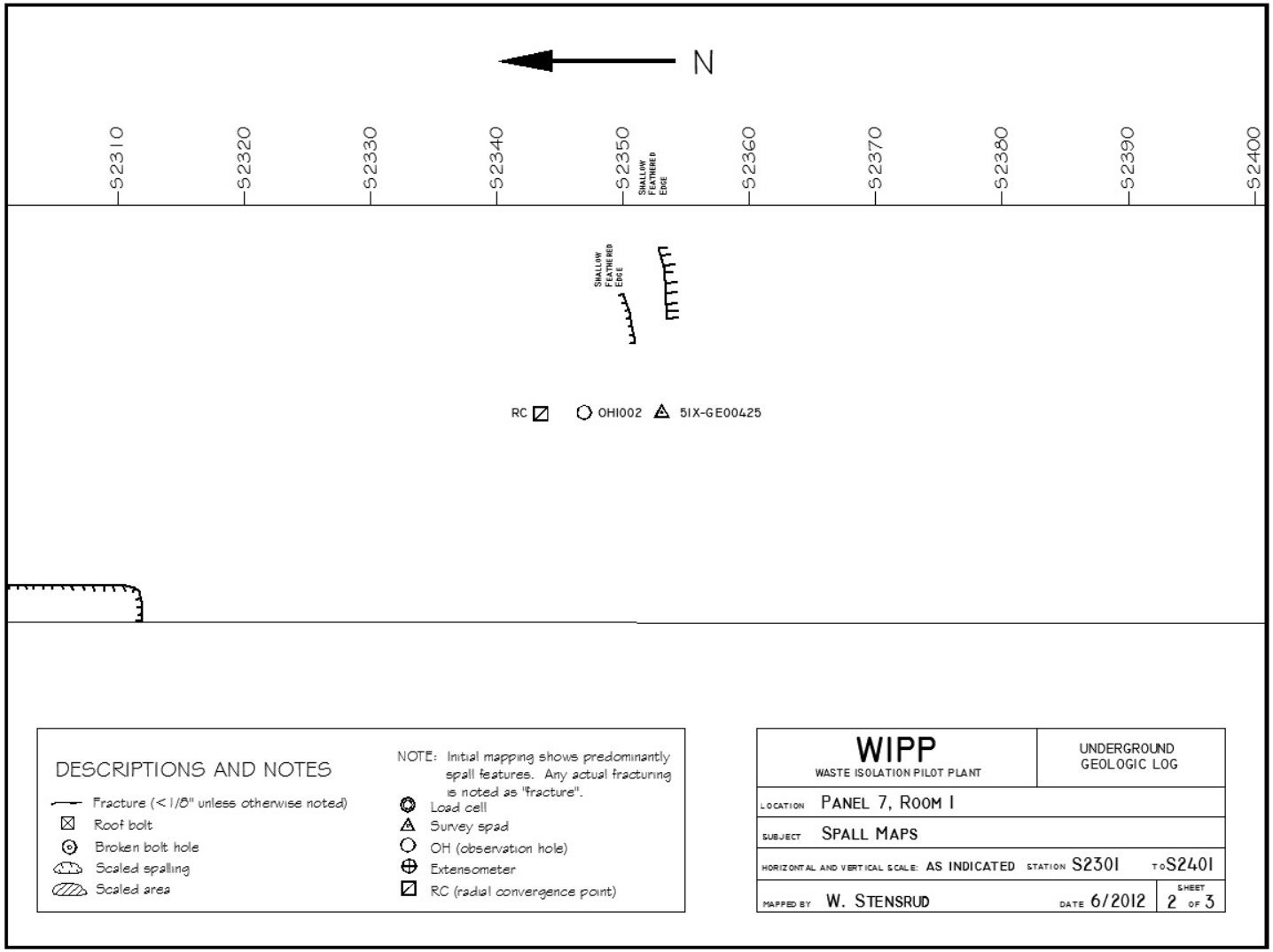

Figure 7-31
Panel 7 Room 1, S2301-S2401 Roof Fractures

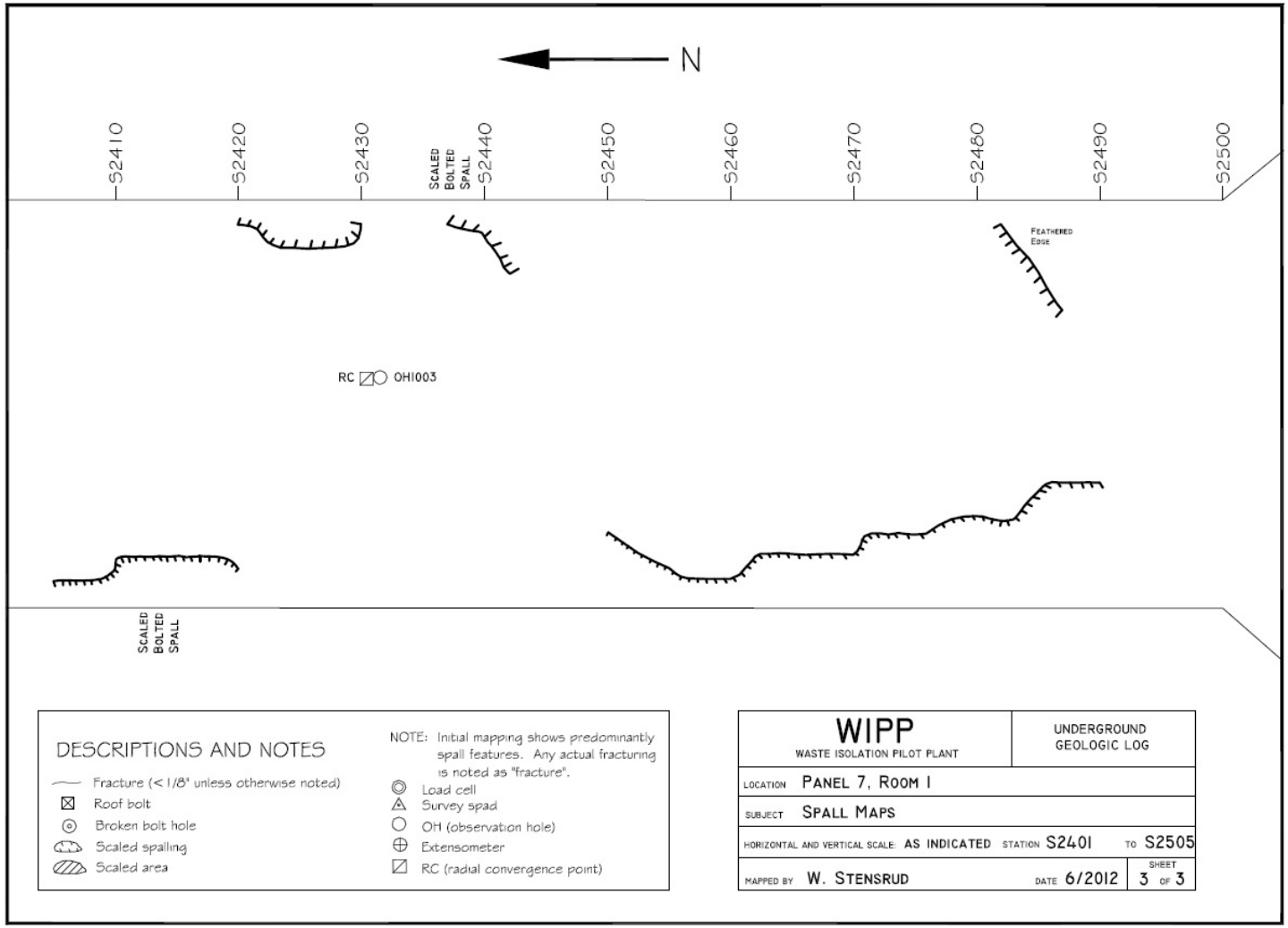

Figure 7-32
Panel 7 Room 1, S2401-S2505 Roof Fractures

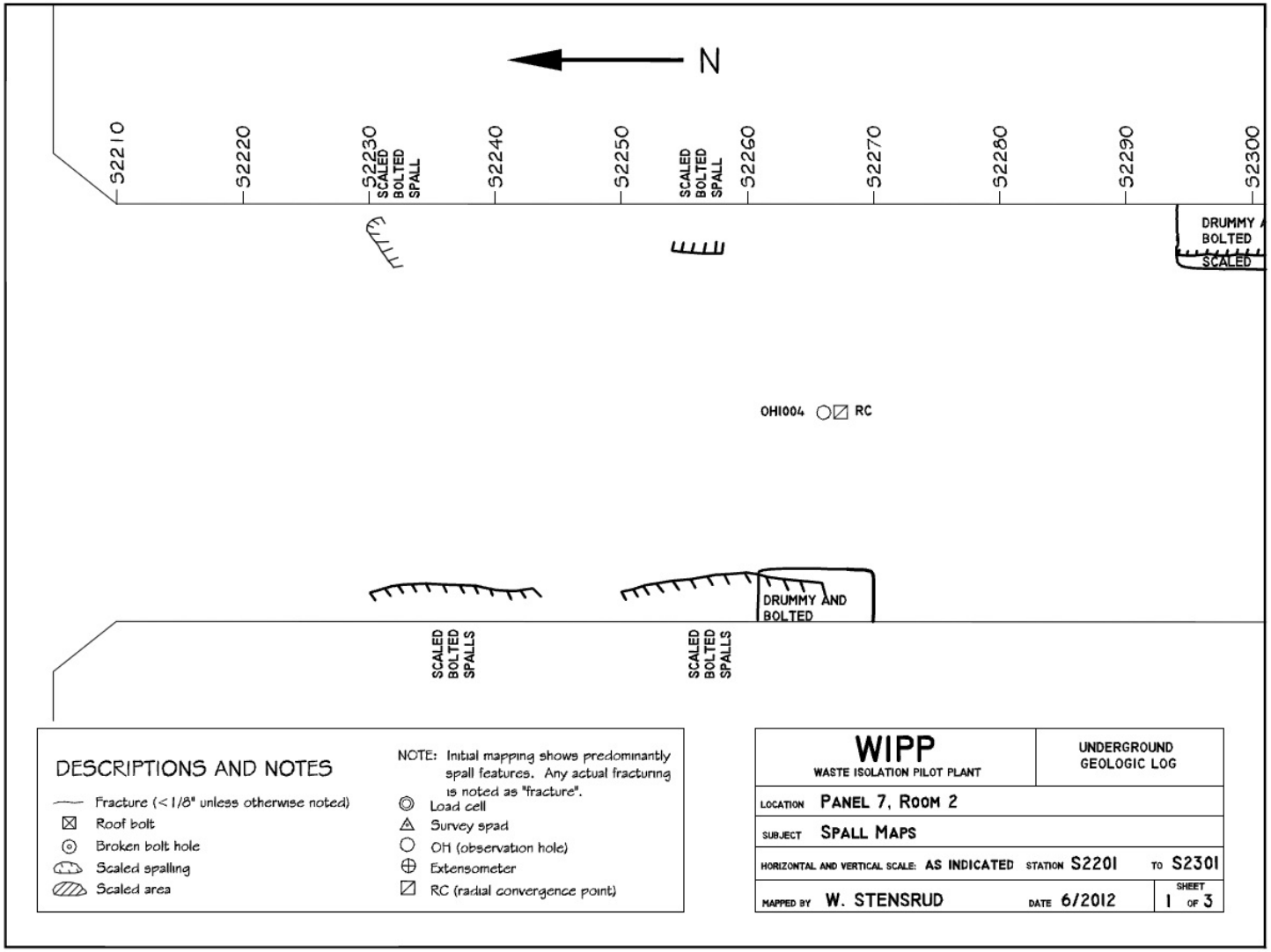

Figure 7-33
Panel 7 Room 2, S2201-S2301 Roof Fractures

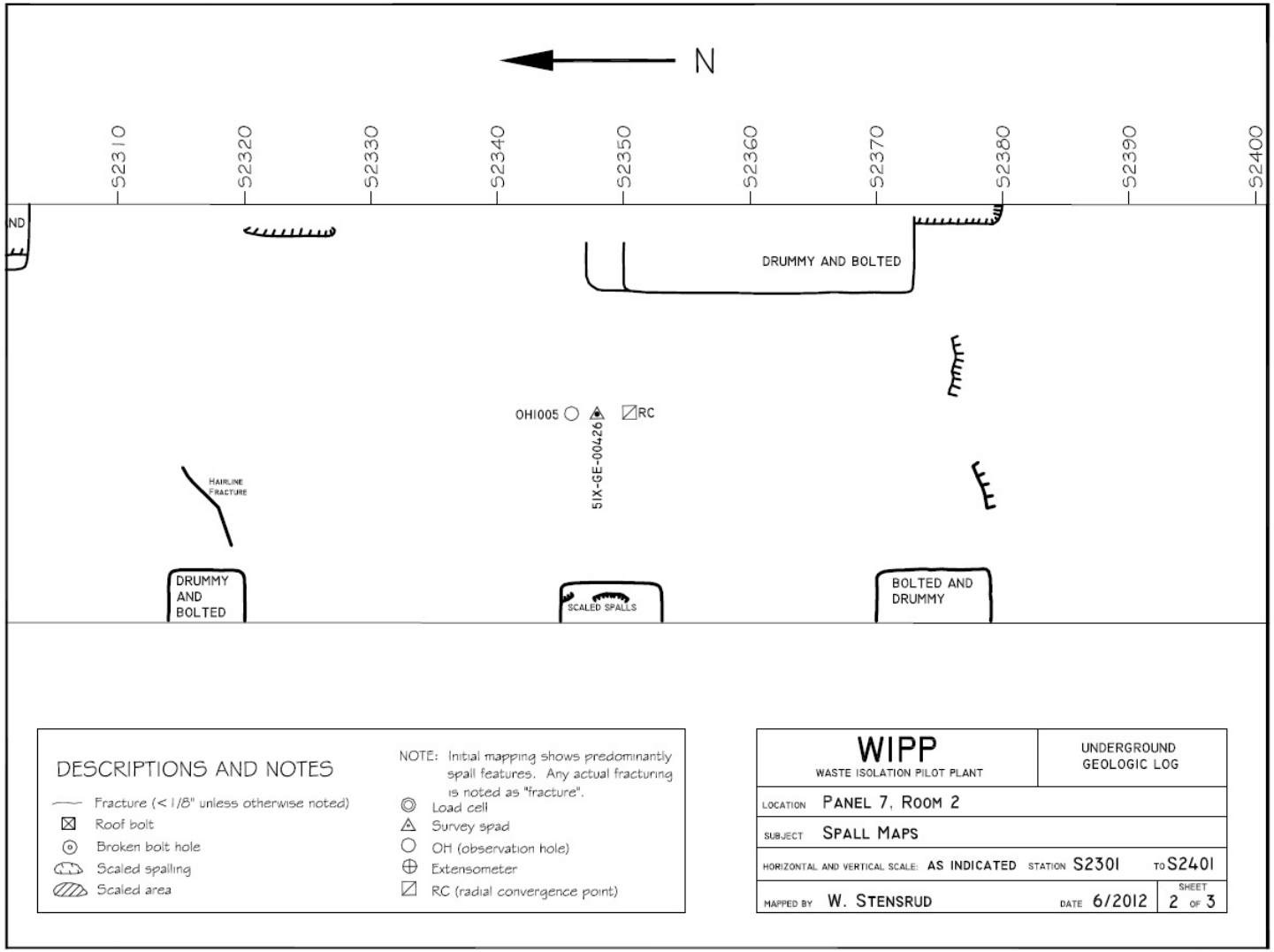

Figure 7-34
Panel 7 Room 2, S2301-S2401 Roof Fractures

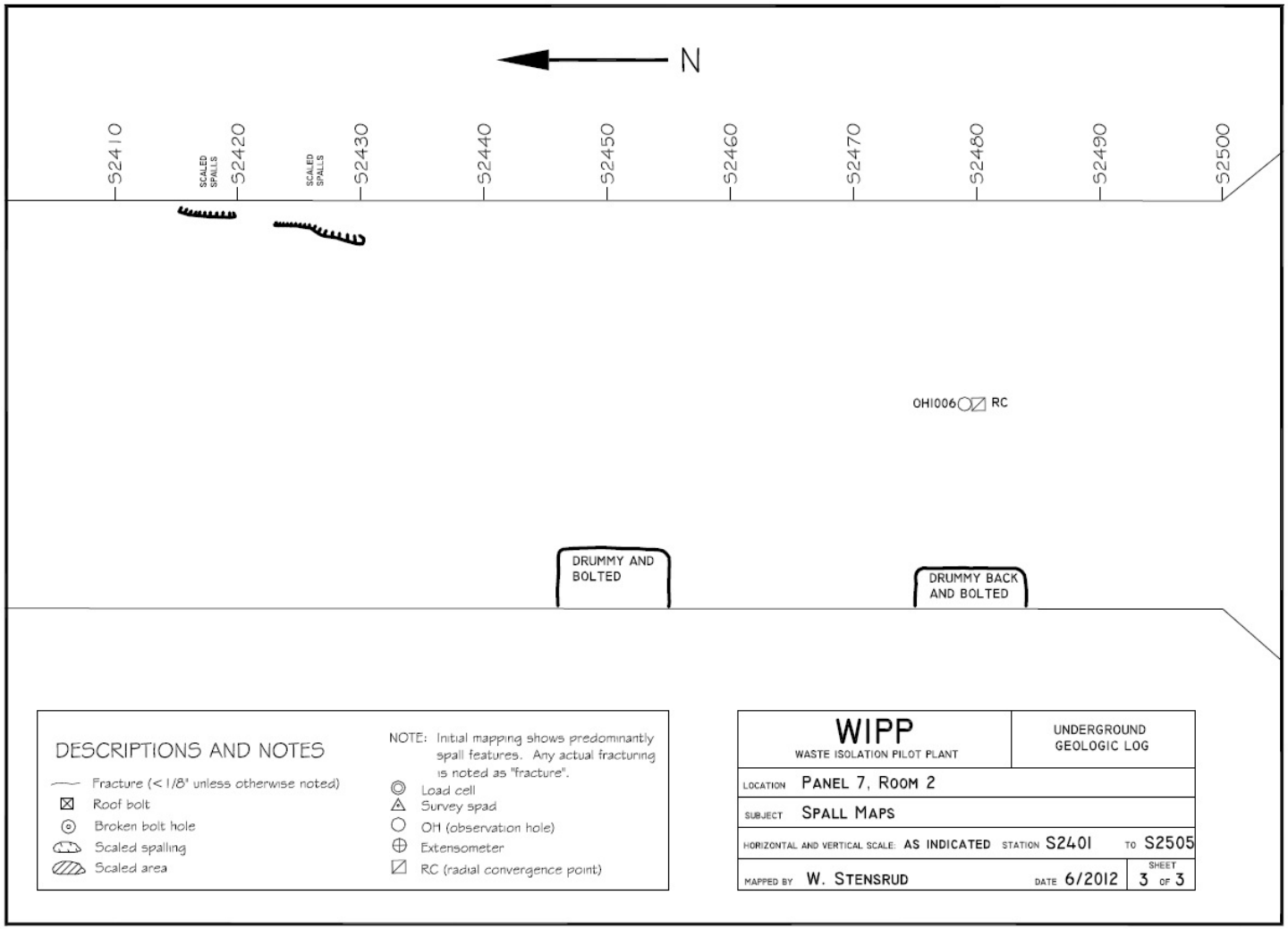

Figure 7-35
Panel 7 Room 2, S2401-S2505 Roof Fractures

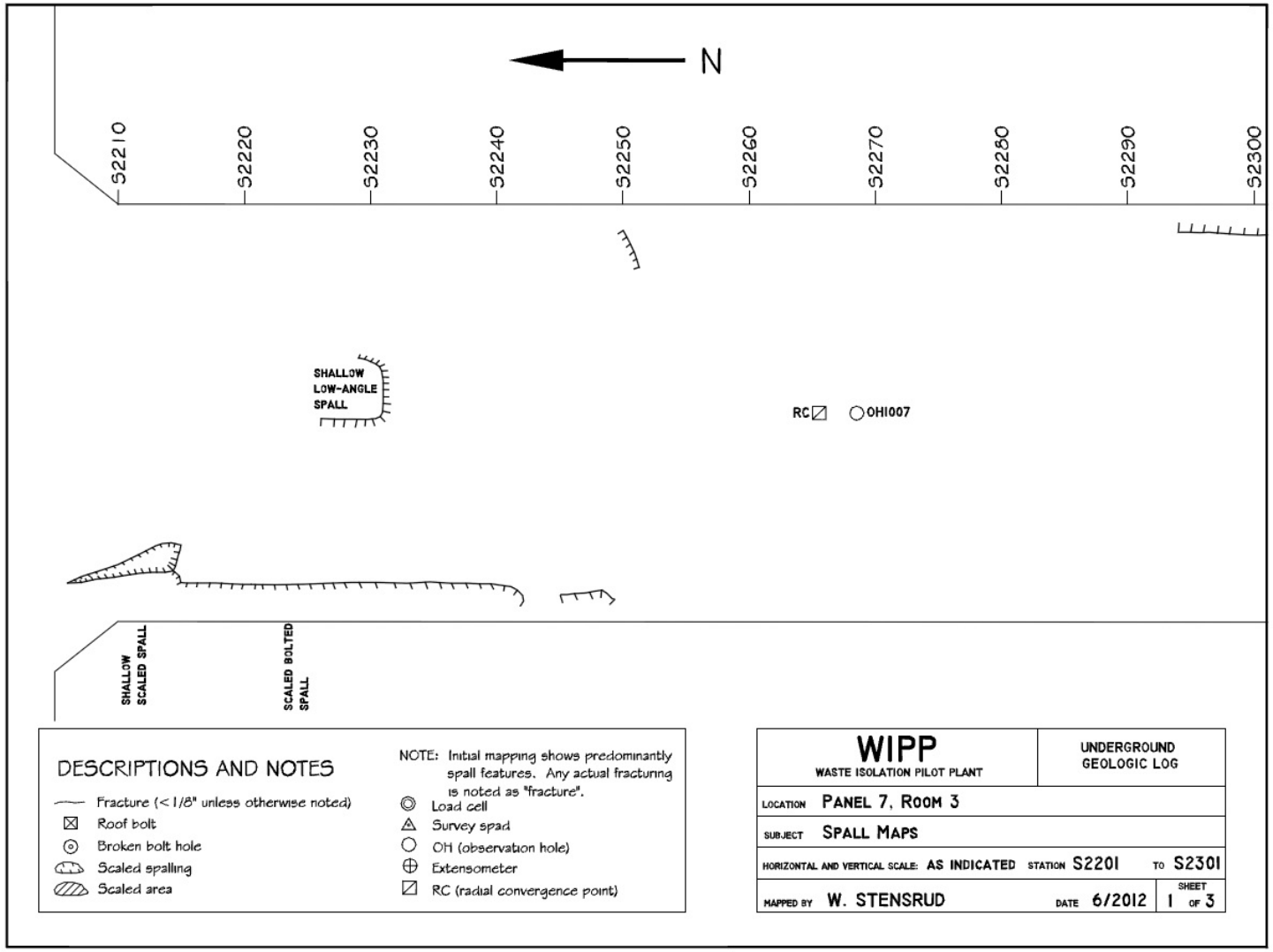

Figure 7-36
Panel 7 Room 3, S2201-S2301 Roof Fractures

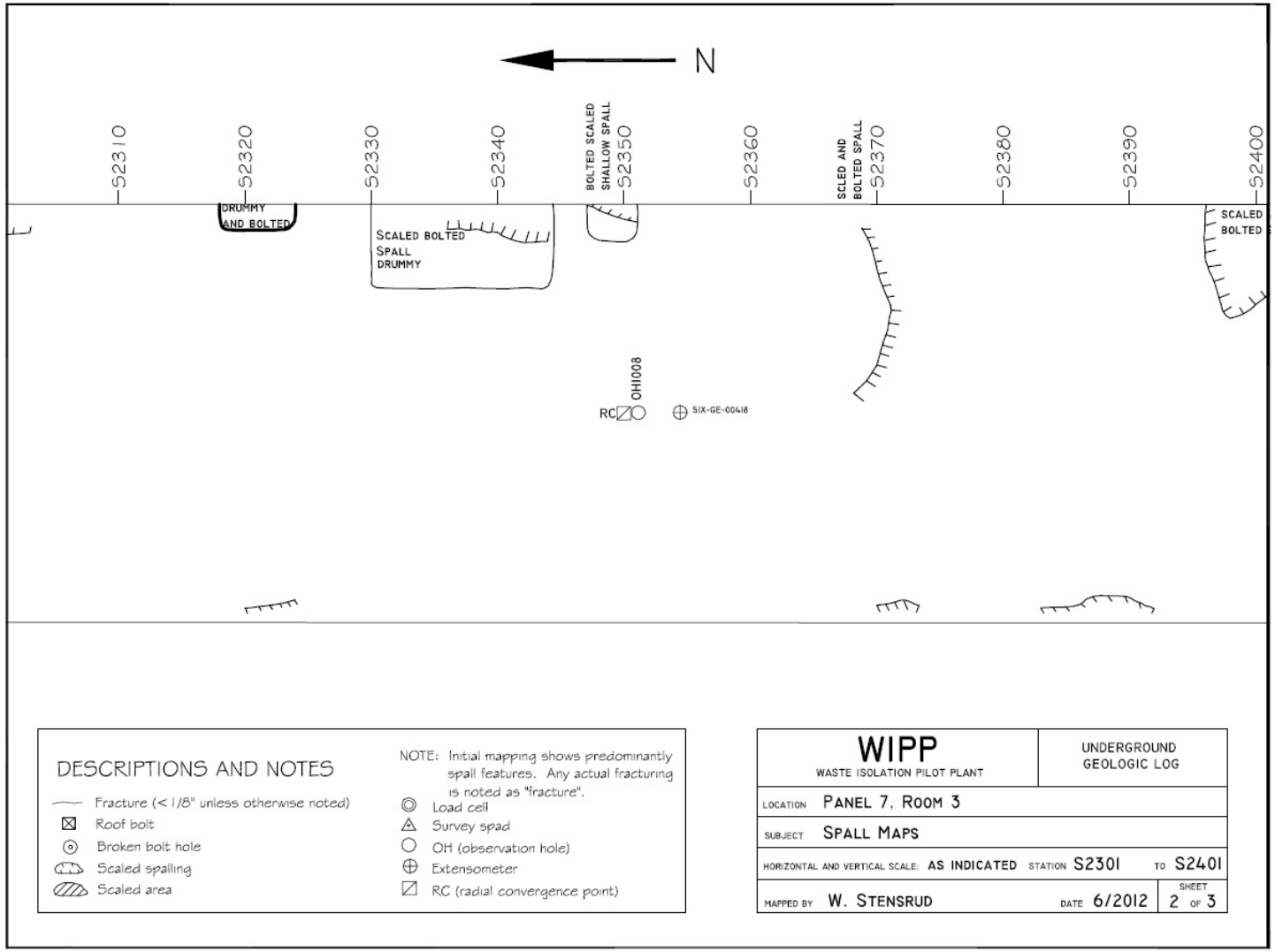

Figure 7-37
Panel 7 Room 3, S2301-S2401 Roof Fractures

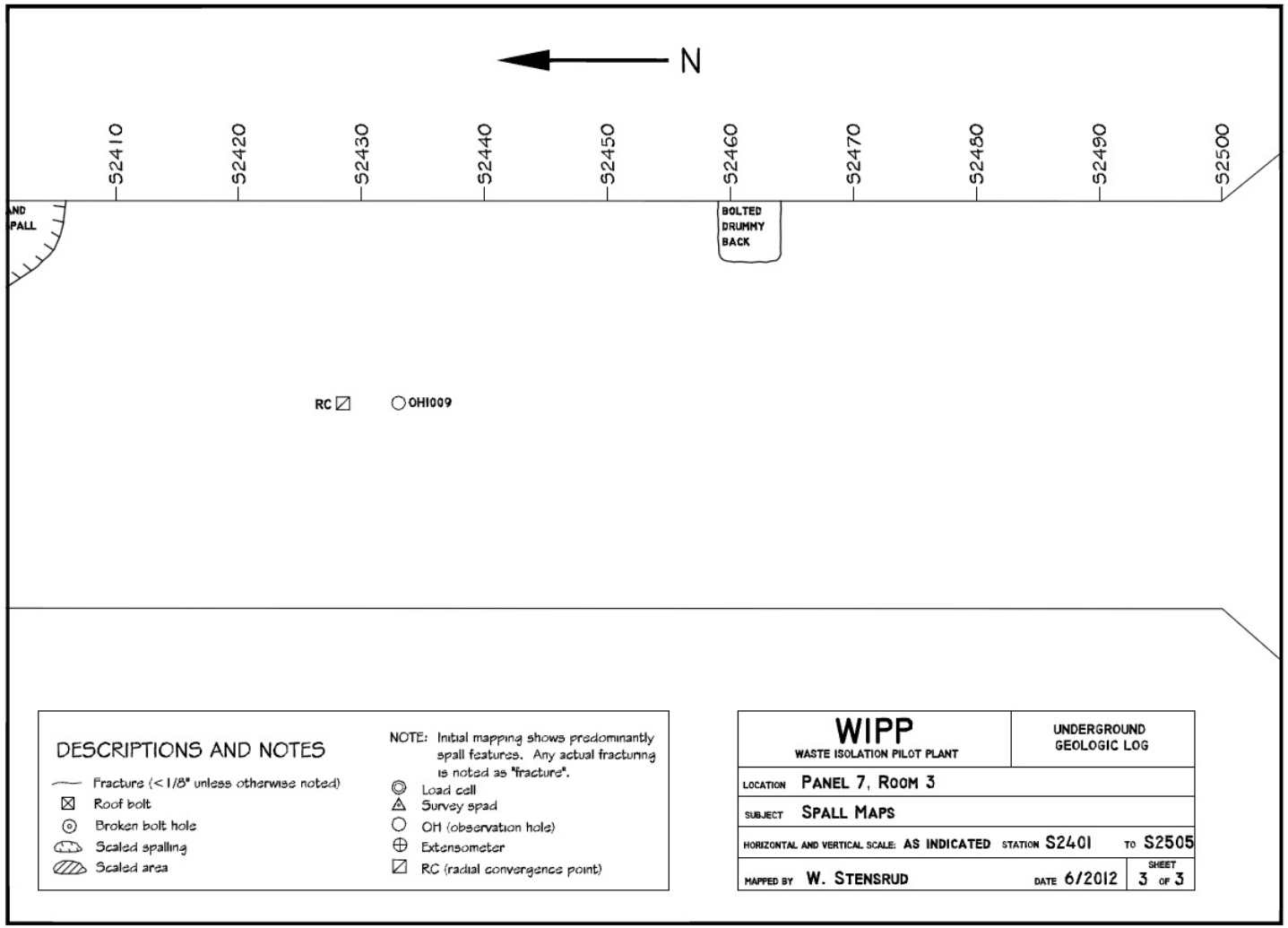

Figure 7-38
Panel 7 Room 3, S2401-S2505 Roof Fractures

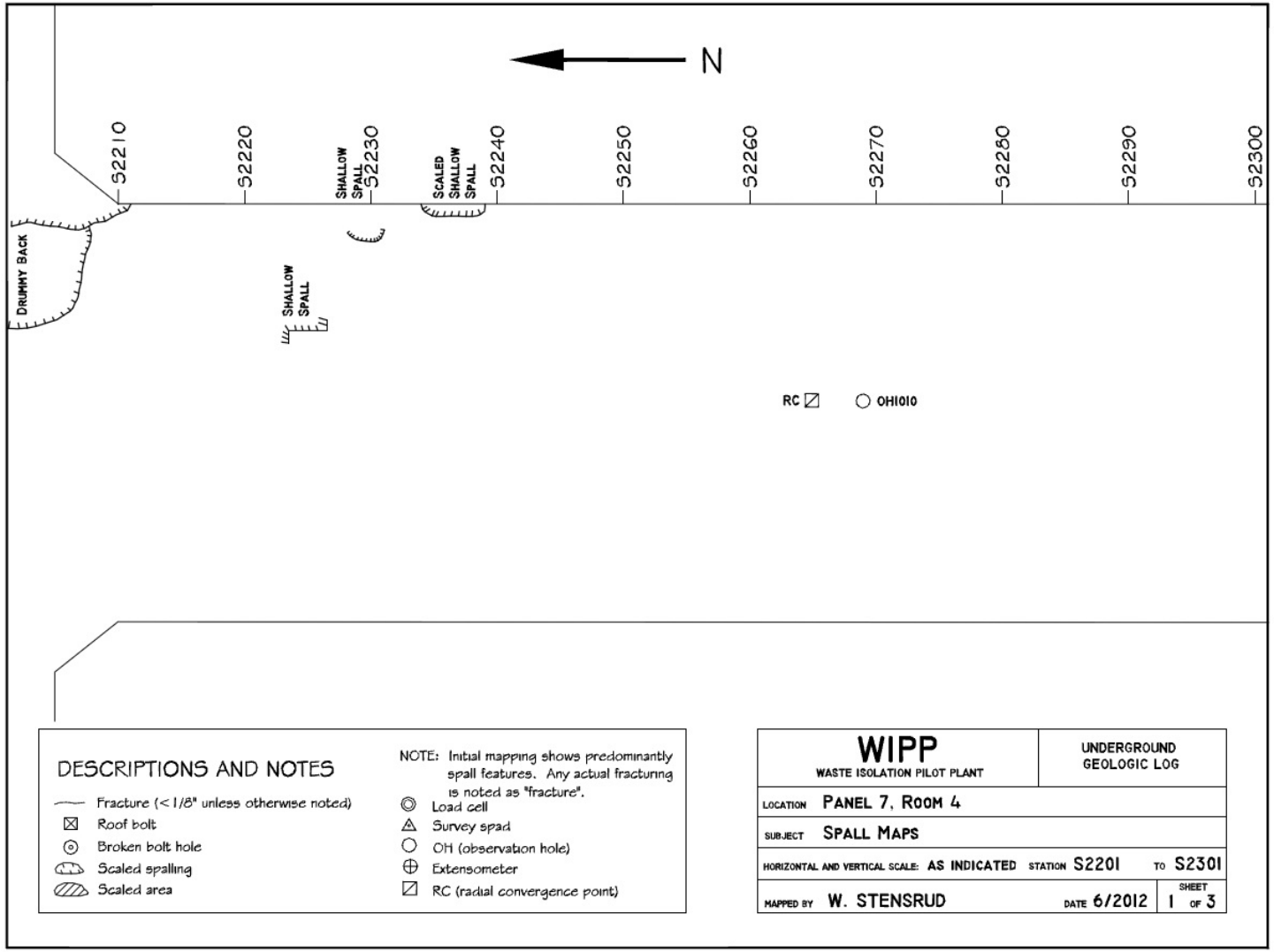

Figure 7-39
Panel 7 Room 4, S2201-S2301 Roof Fractures

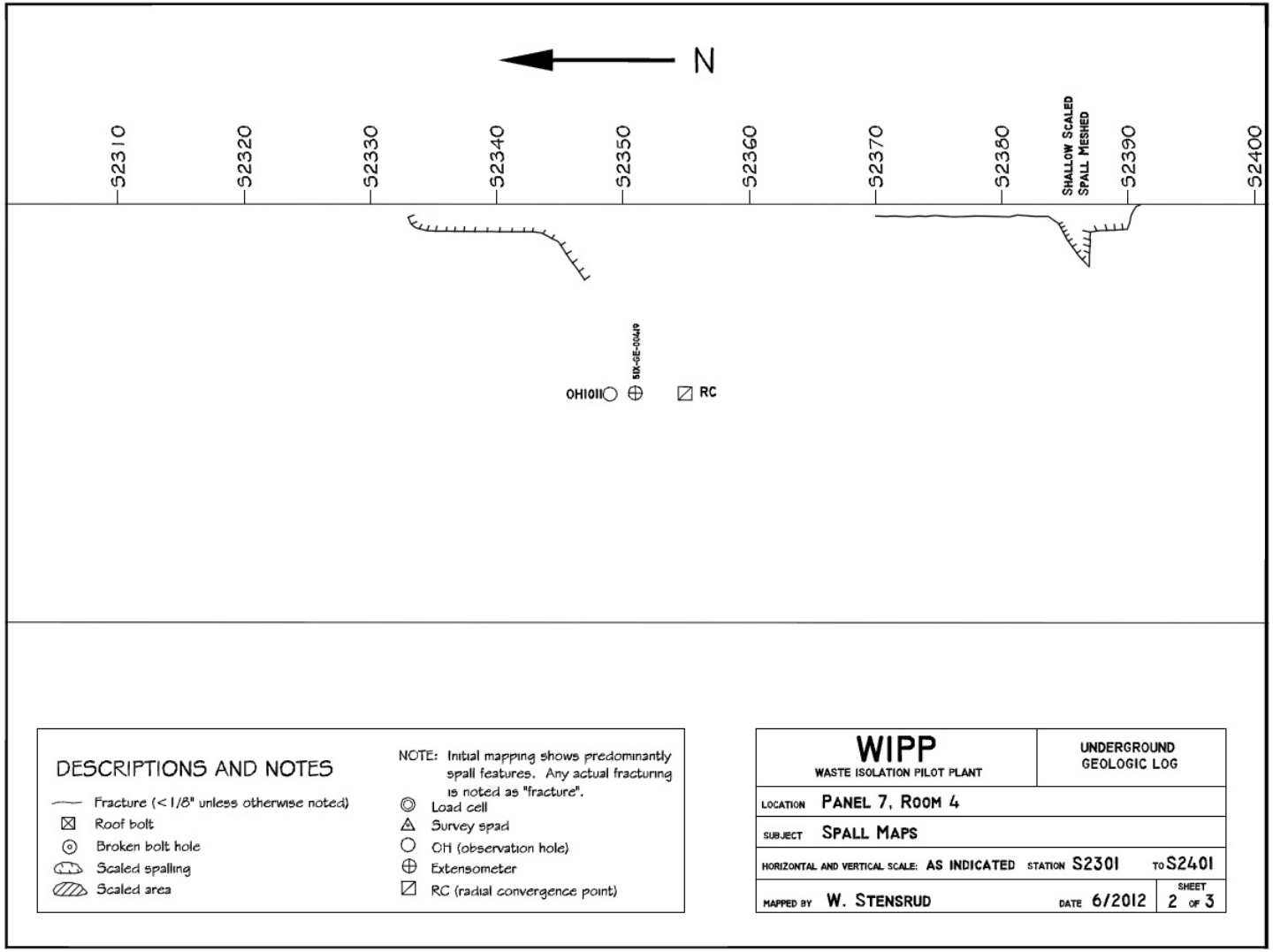

Figure 7-40
Panel 7 Room 4, S2301-S2401 Roof Fractures

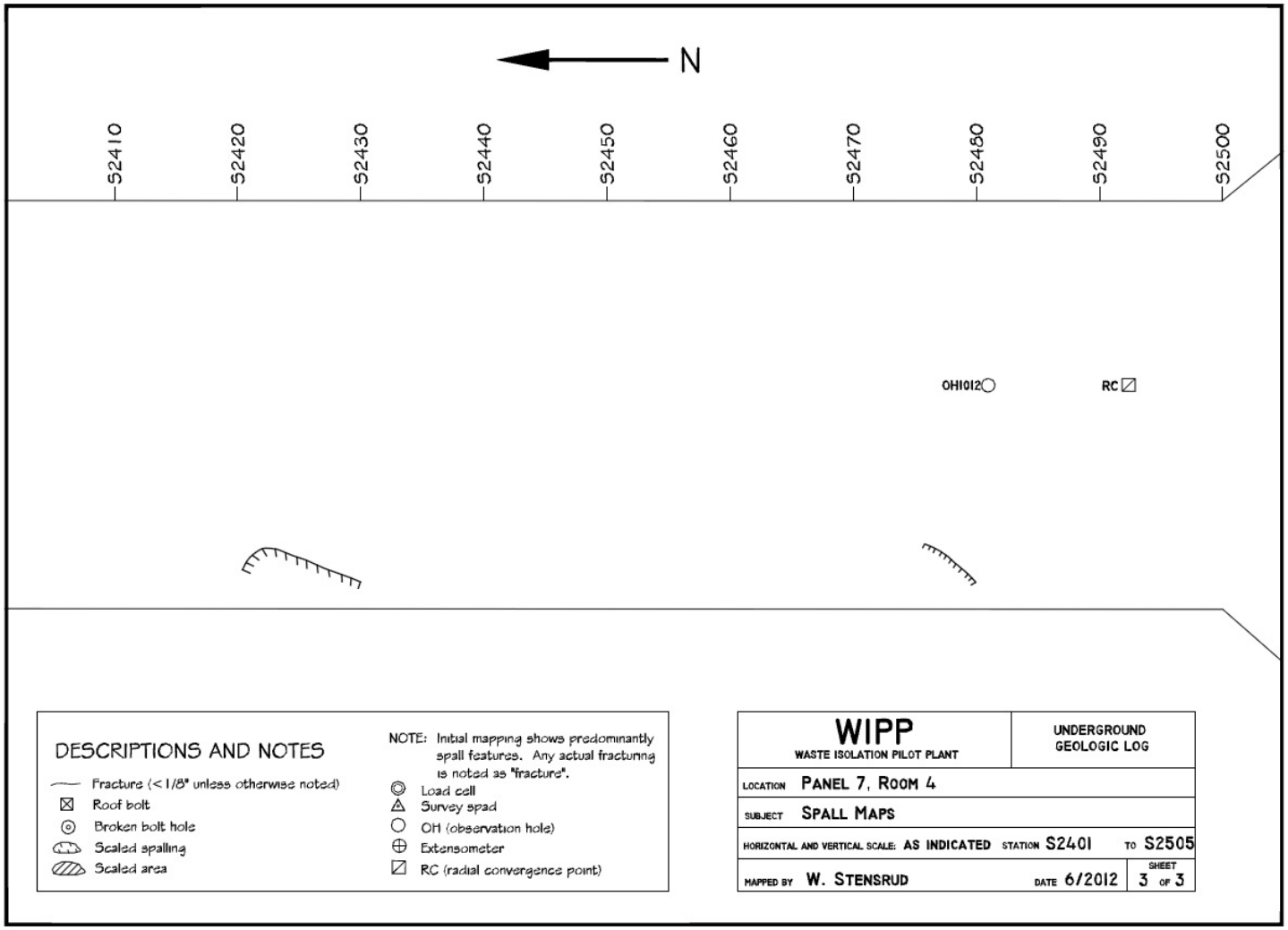

Figure 7-41
Panel 7 Room 4, S2401-S2505 Roof Fractures

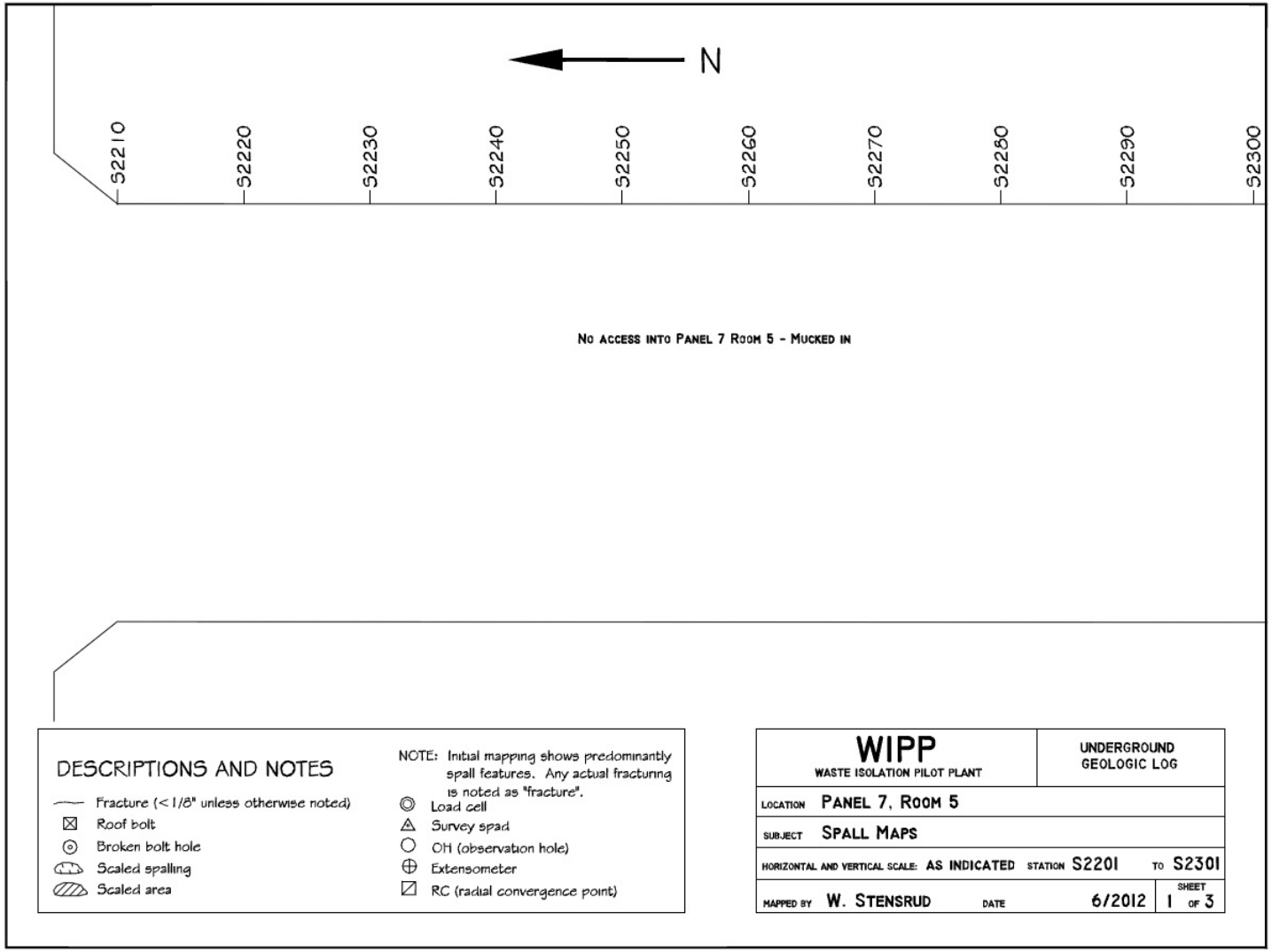

Figure 7-42
Panel 7 Room 5, S2201-S2301 Roof Fractures

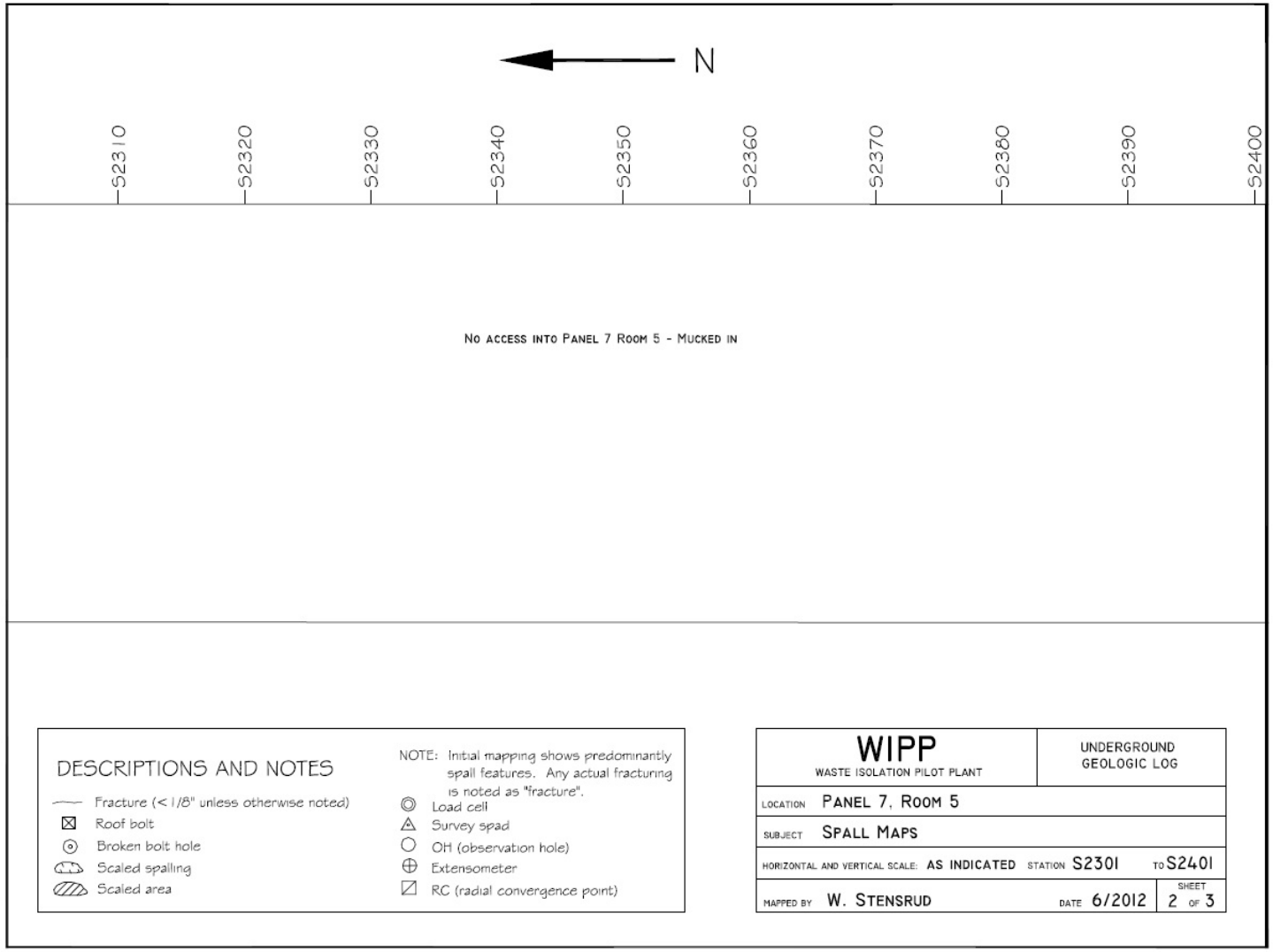

Figure 7-43
Panel 7 Room 5, S2301-S2401 Roof Fractures

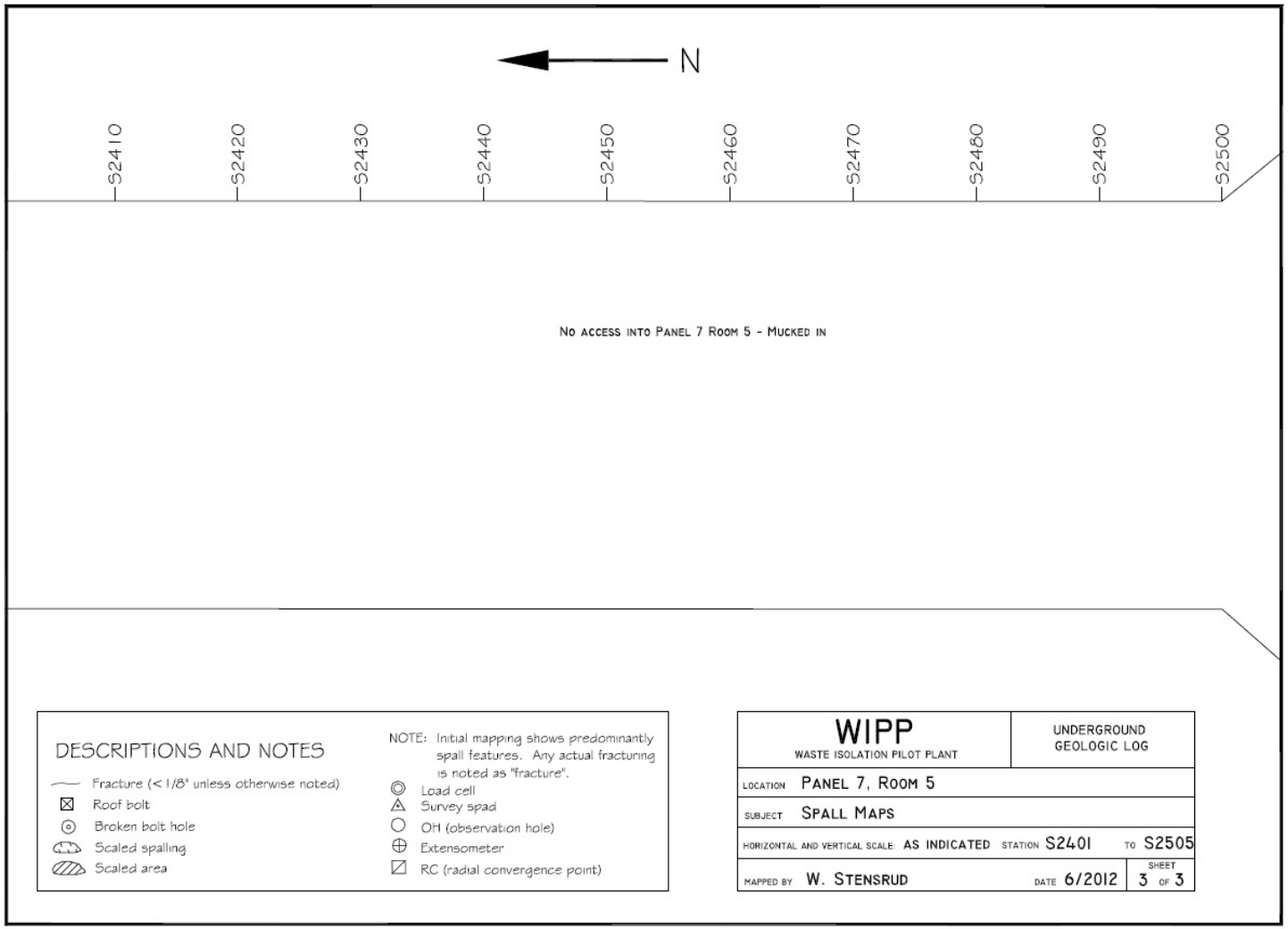

Figure 7-44
Panel 7 Room 5, S2401-S2505 Roof Fractures

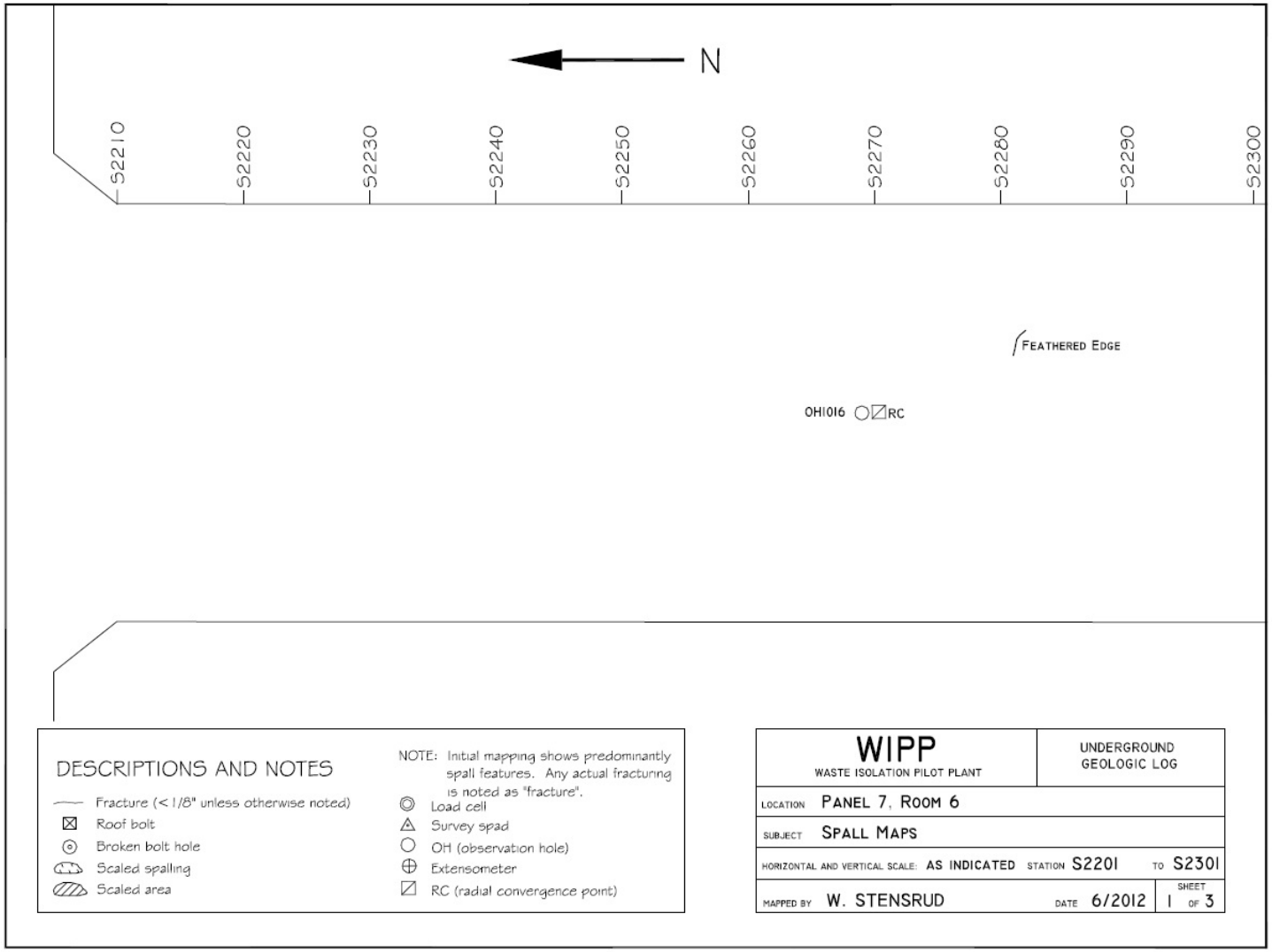

Figure 7-45
Panel 7 Room 6, S2201-S2301 Roof Fractures

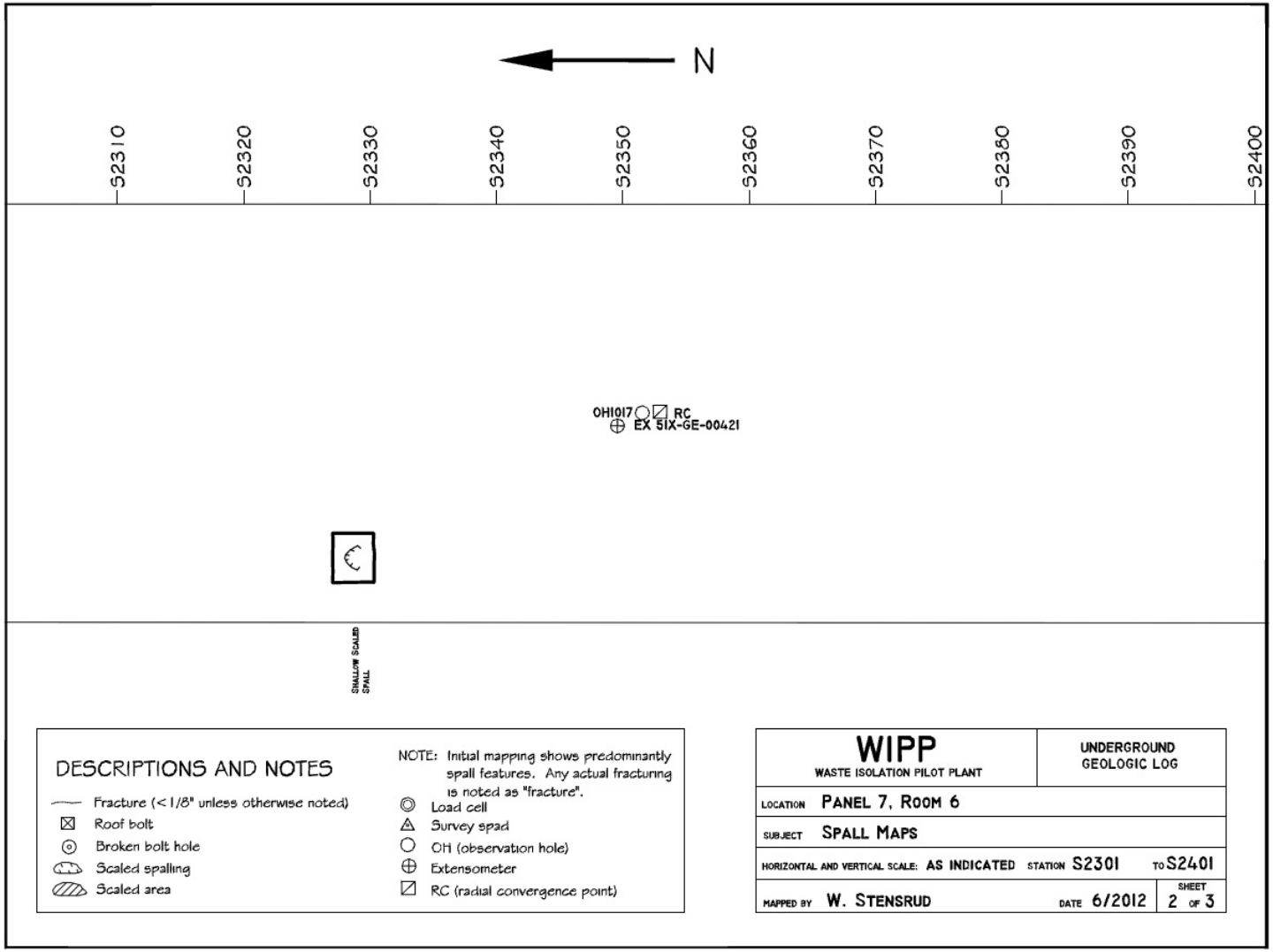

Figure 7-46
Panel 7 Room 6, S2301-S2401 Roof Fractures

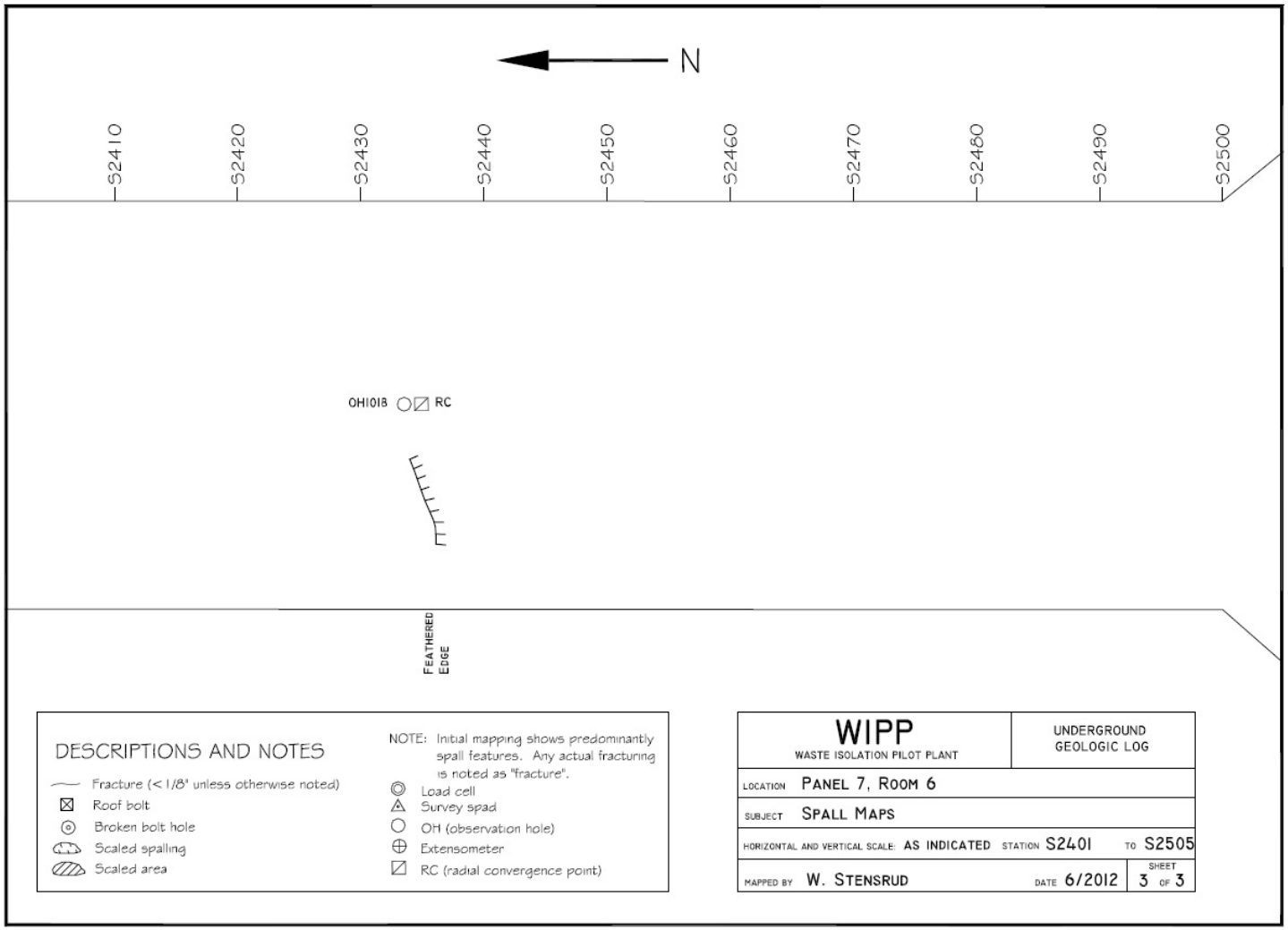

Figure 7-47
Panel 7 Room 6, S2401-S2505 Roof Fractures

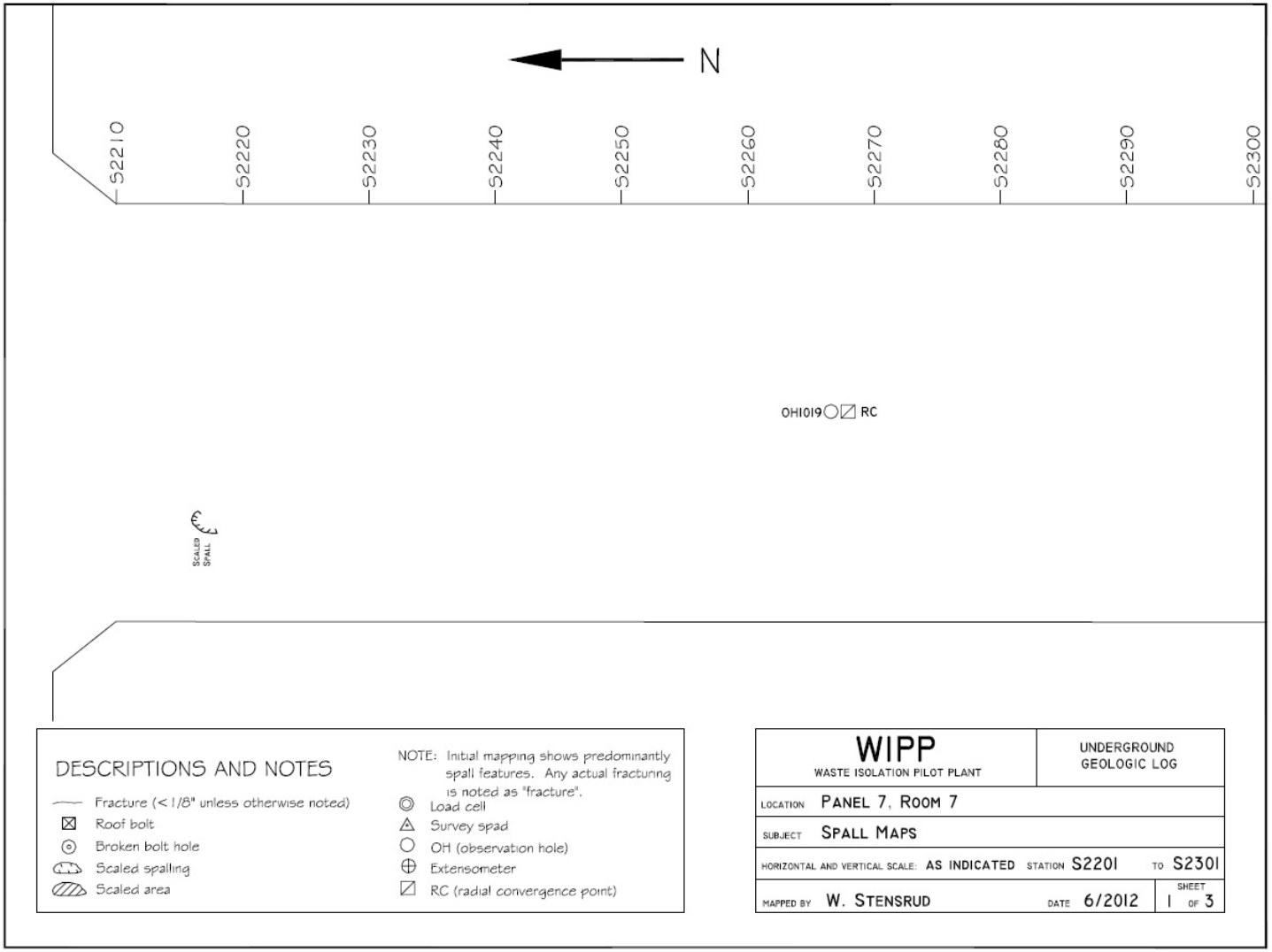

Figure 7-48
Panel 7 Room 7, S2201-S2301 Roof Fractures

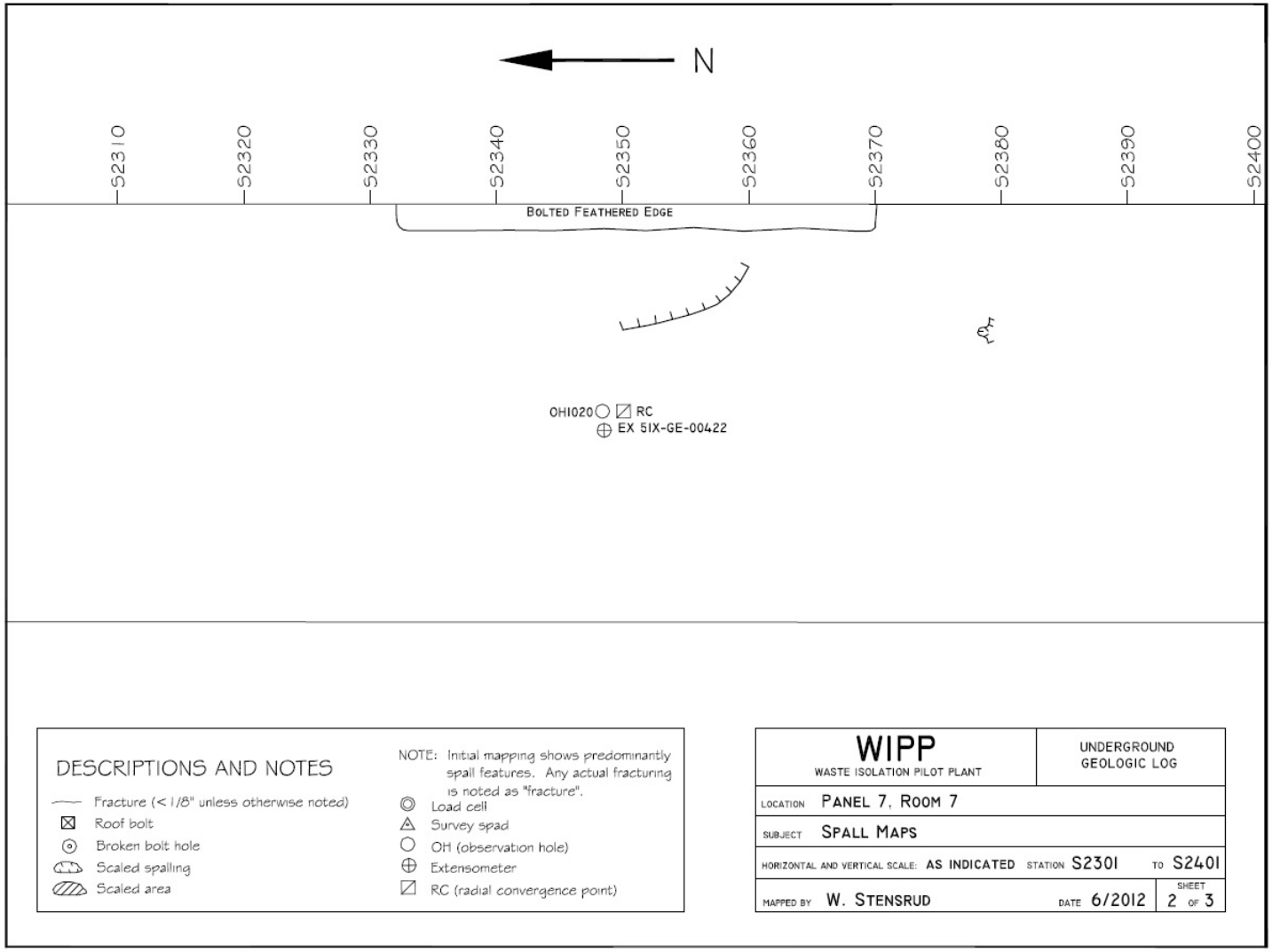

Figure 7-49
Panel 7 Room 7, S2301-S2401 Roof Fractures

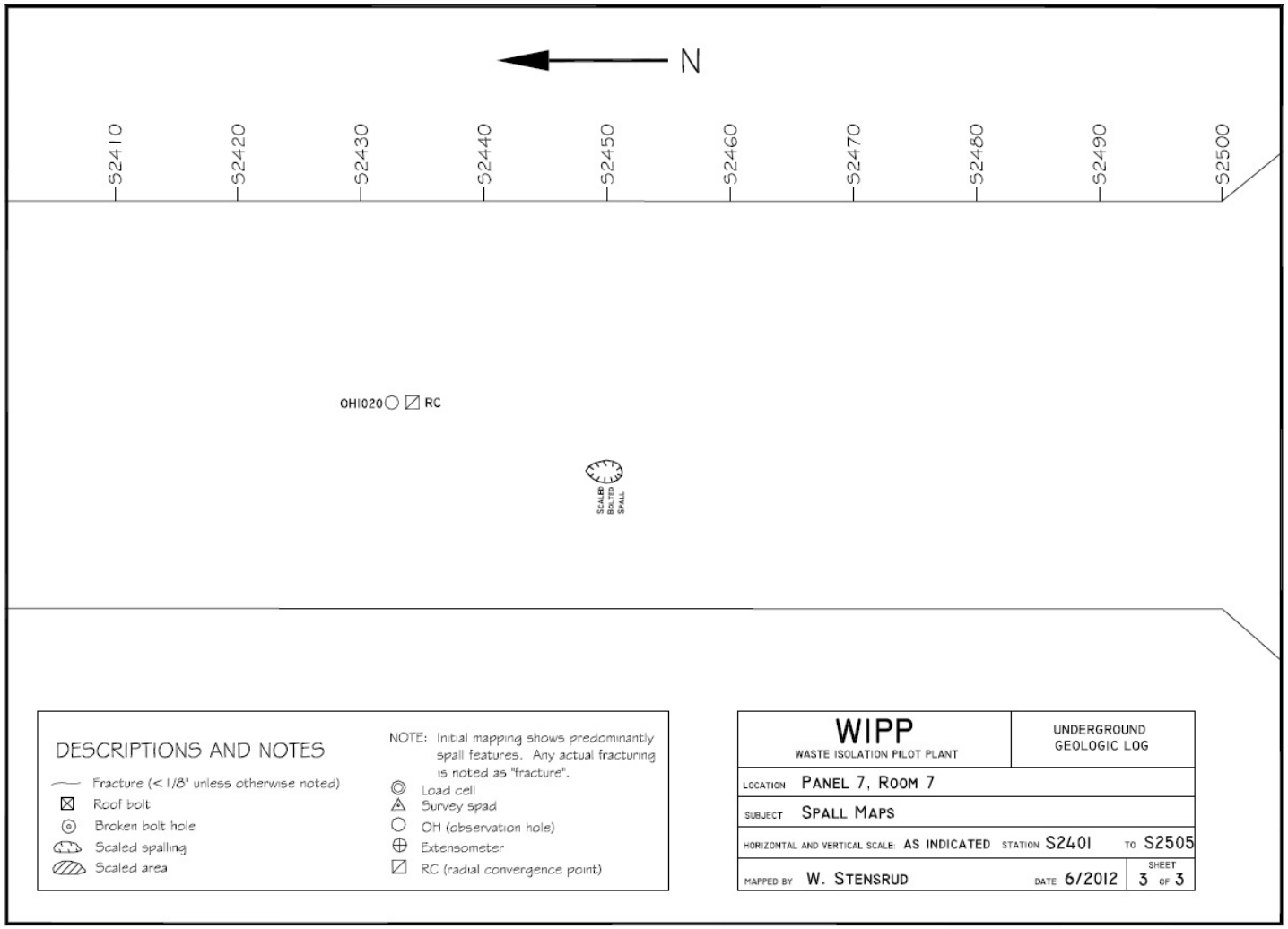

Figure 7-50
Panel 7 Room 7, S2401-S2505 Roof Fractures

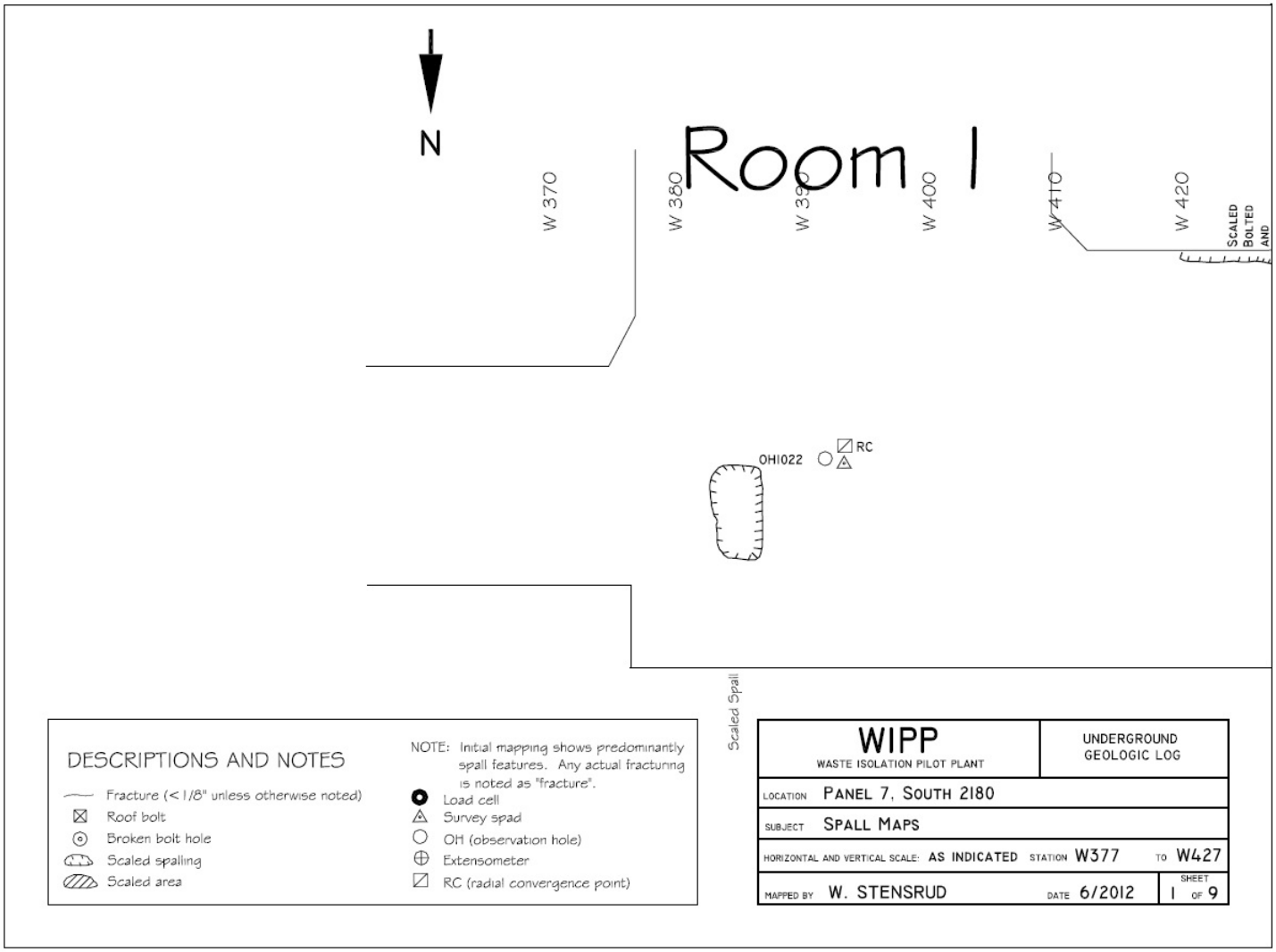

Figure 7-51
Panel 7 South 2180, W377-W427 Roof Fractures

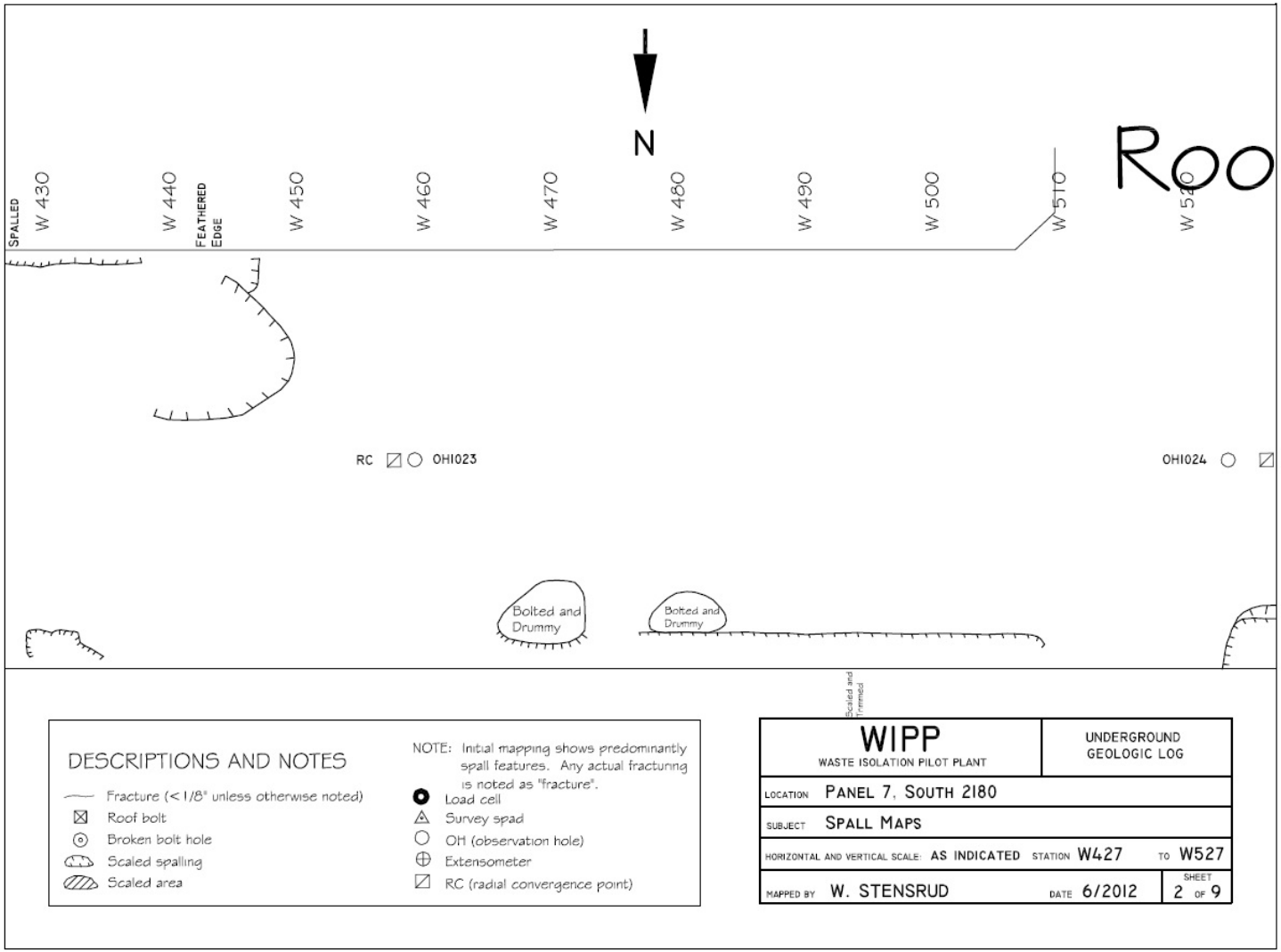

Figure 7-52
Panel 7 South 2180, W427-W527 Roof Fractures

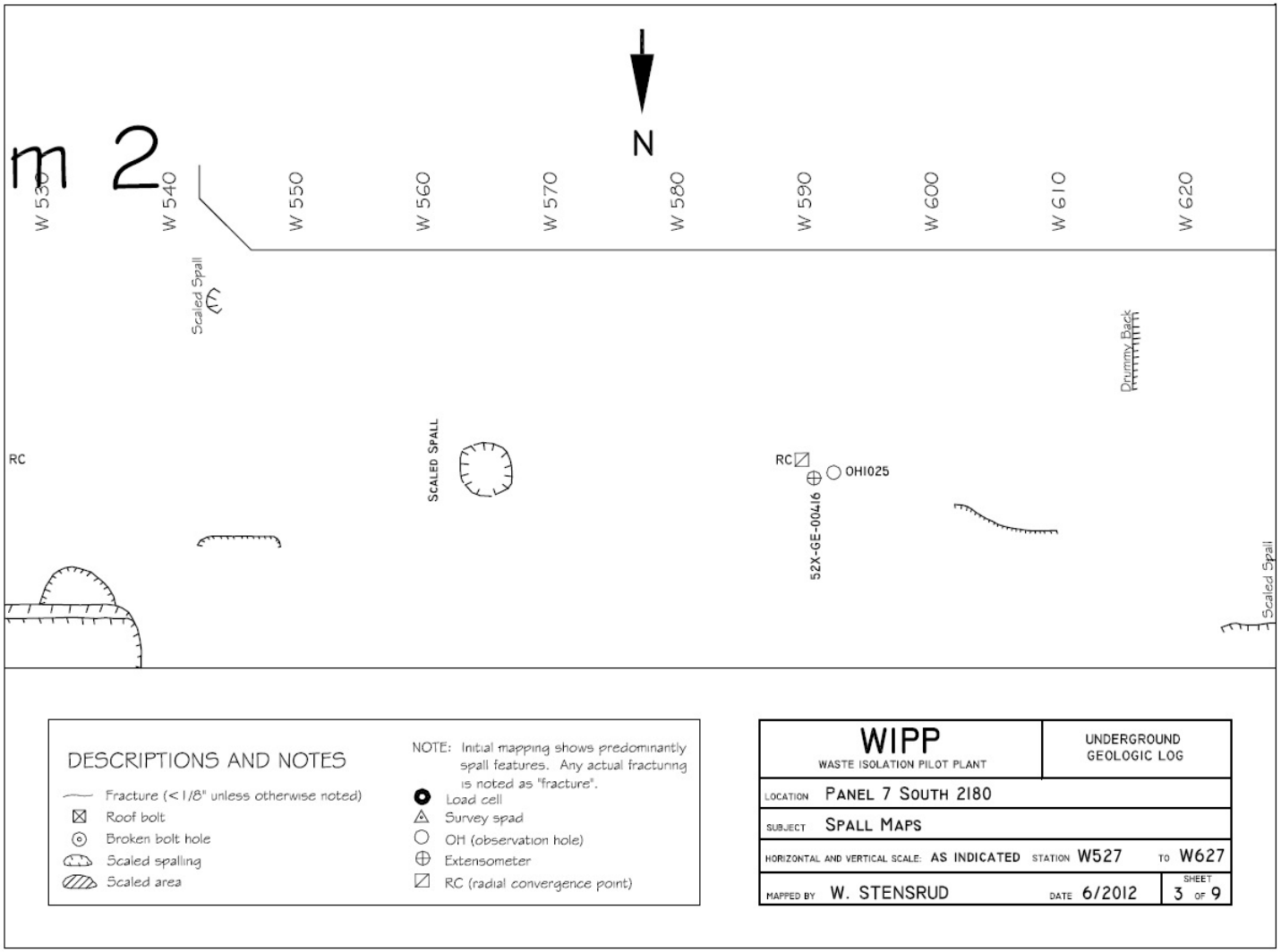

Figure 7-53
Panel 7 South 2180, W527-W627 Roof Fractures

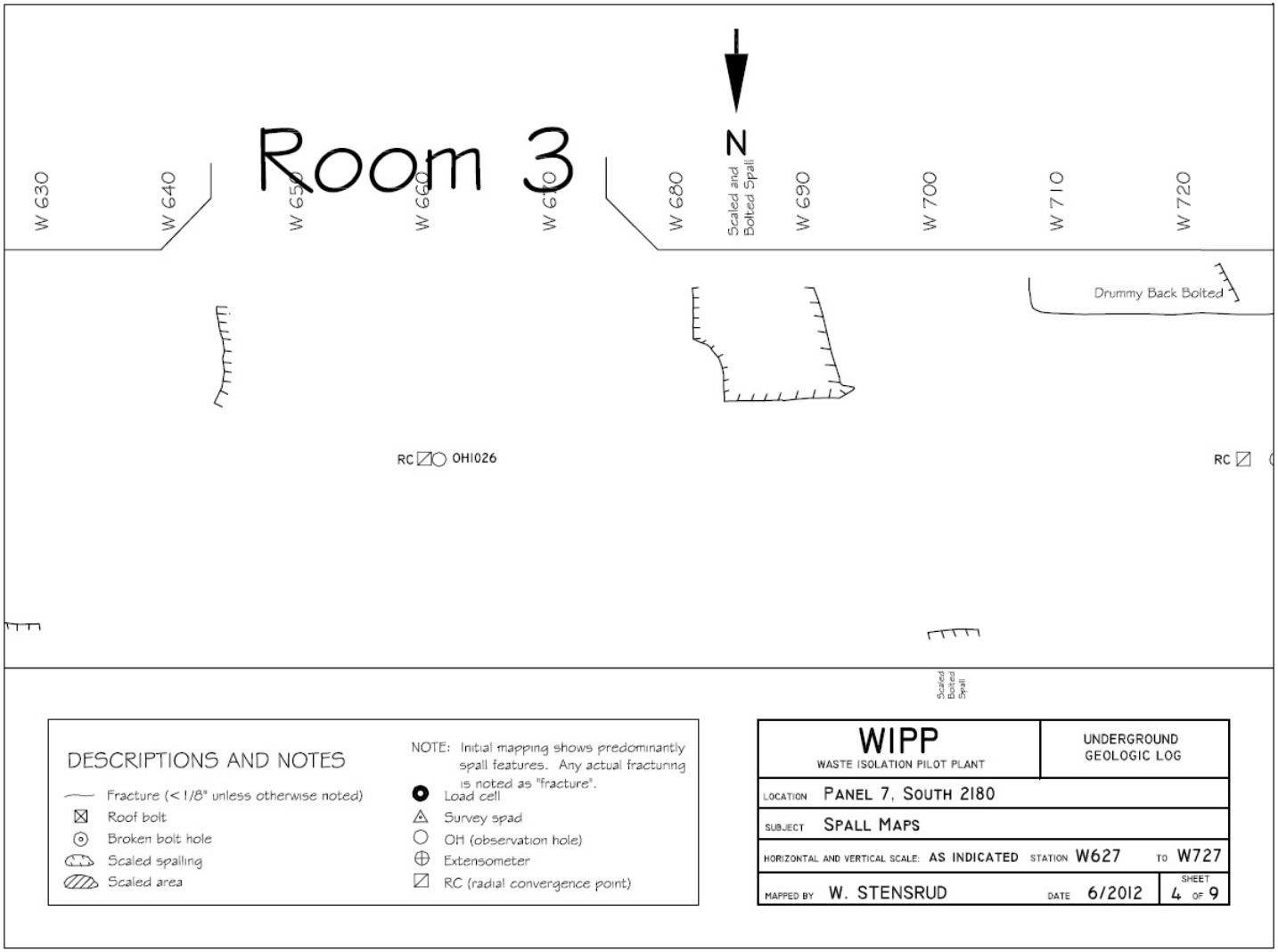

Figure 7-54
Panel 7 South 2180, W627-W727 Roof Fractures

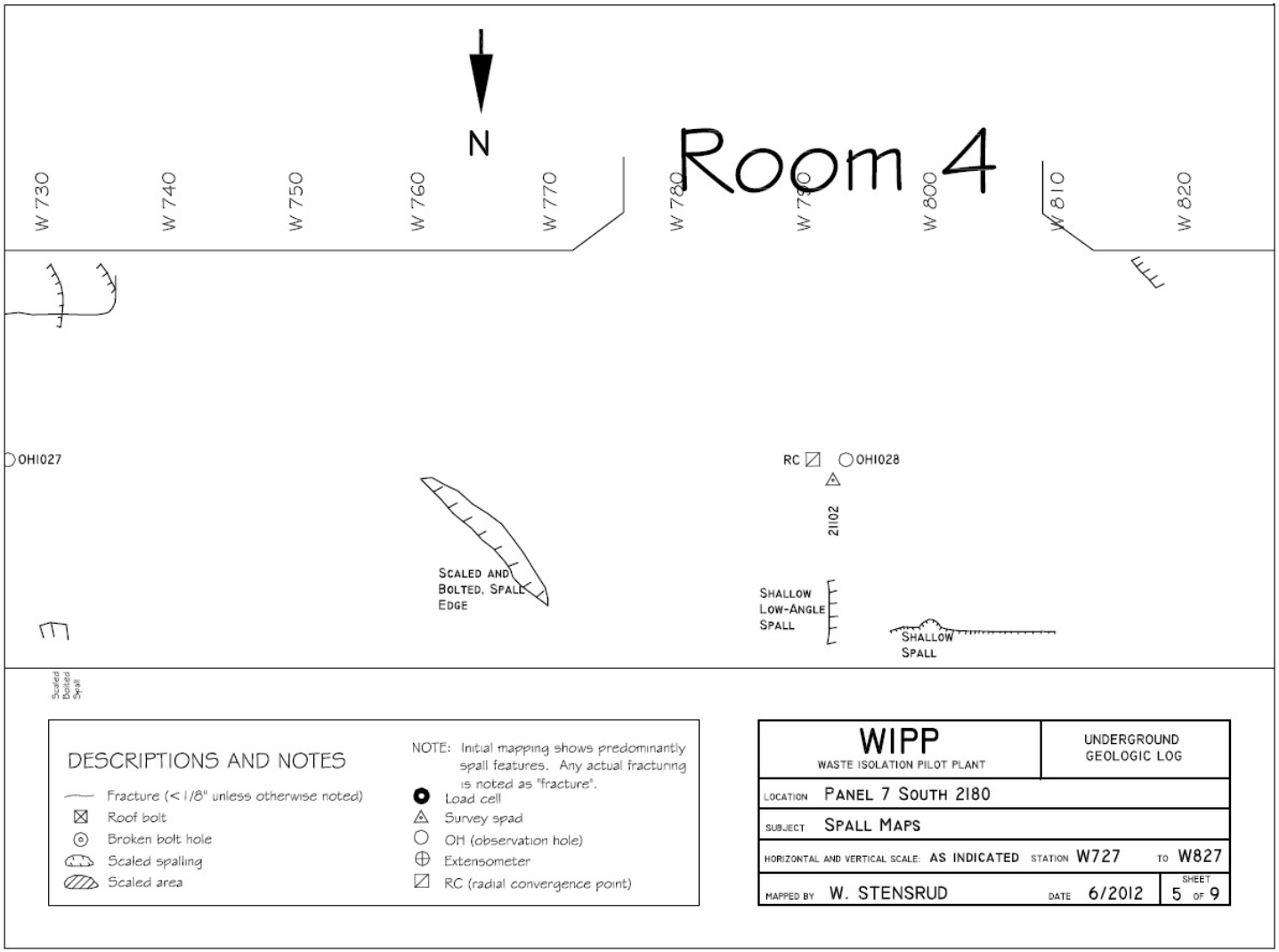

Figure 7-55
Panel 7 South 2180, W727-W827 Roof Fractures

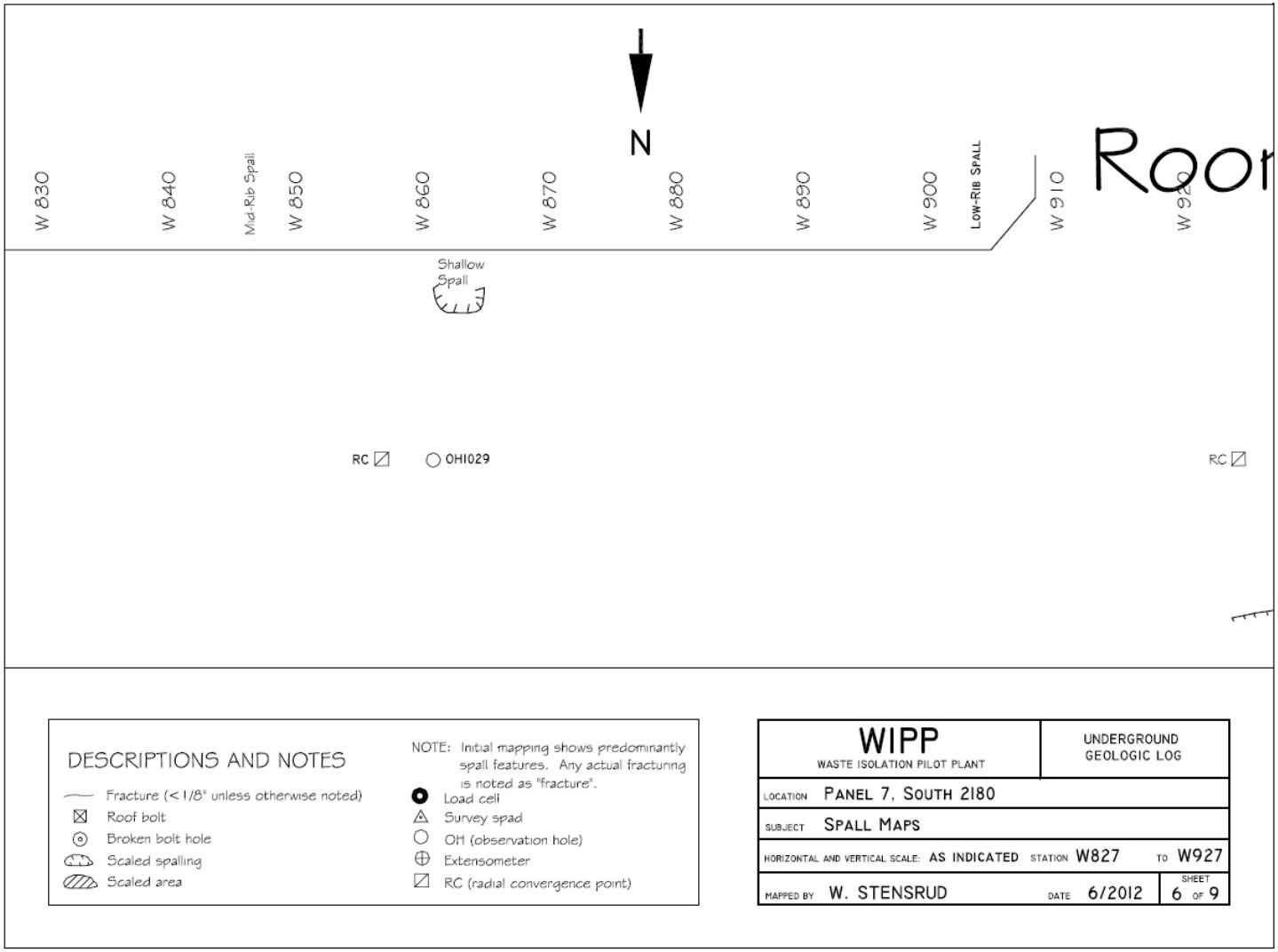

Figure 7-56
Panel 7 South 2180, W827-W927 Roof Fractures

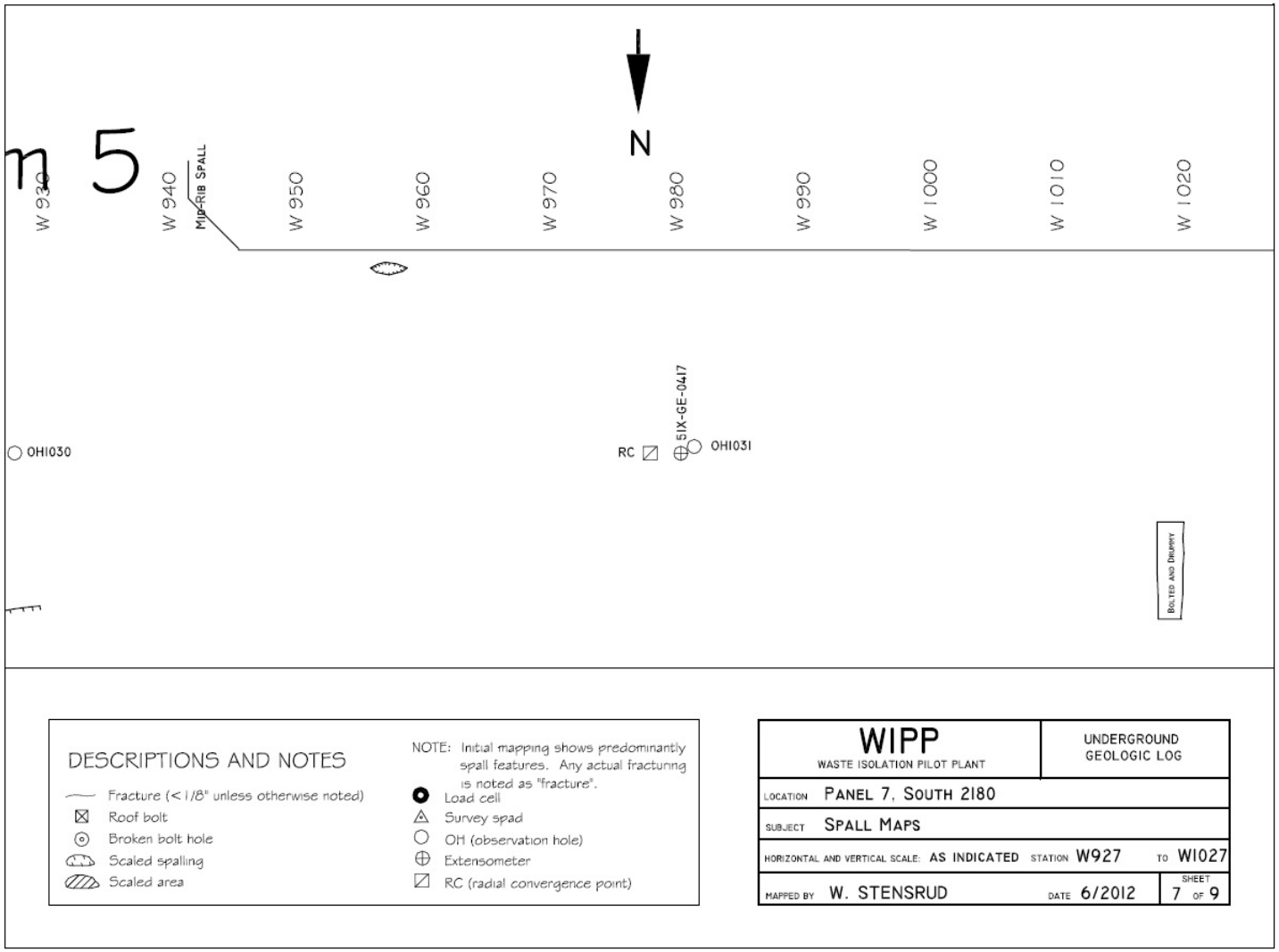

Figure 7-57
Panel 7 South 2180, W927-W1027 Roof Fractures

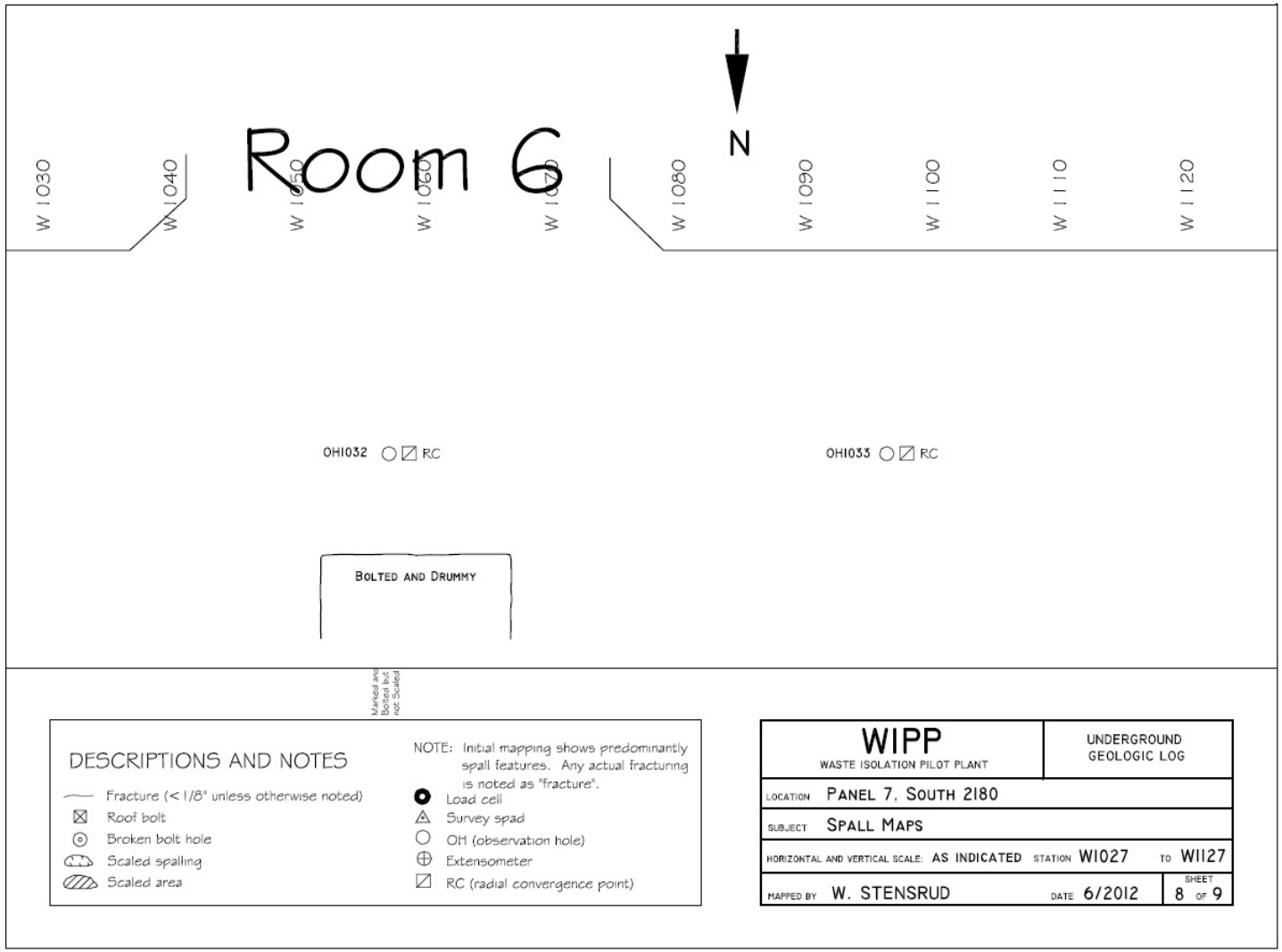

Figure 7-58
Panel 7 South 2180, W1027-W1127 Roof Fractures

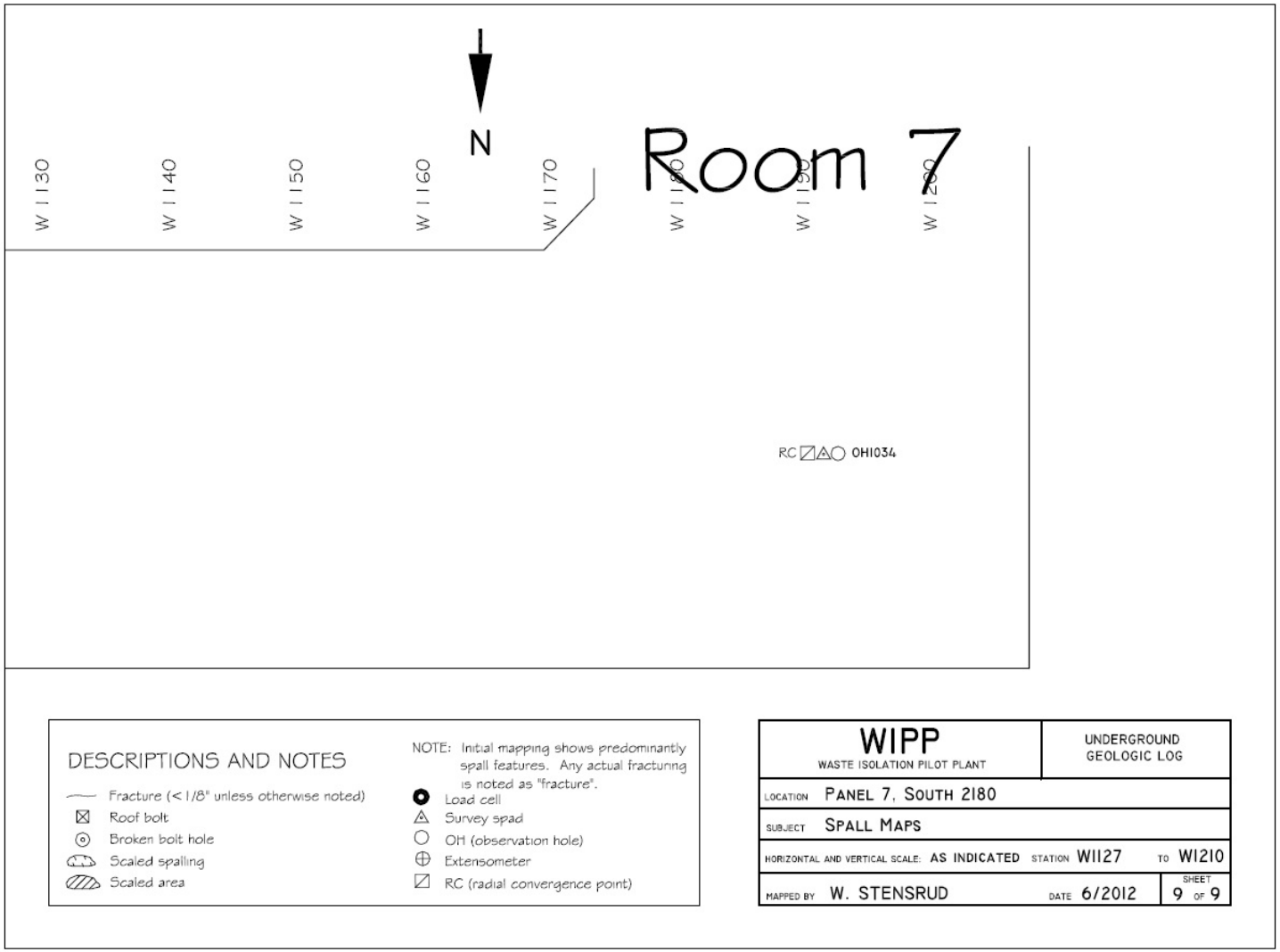

Figure 7-59
Panel 7 South 2180, W1127-W1210 Roof Fractures

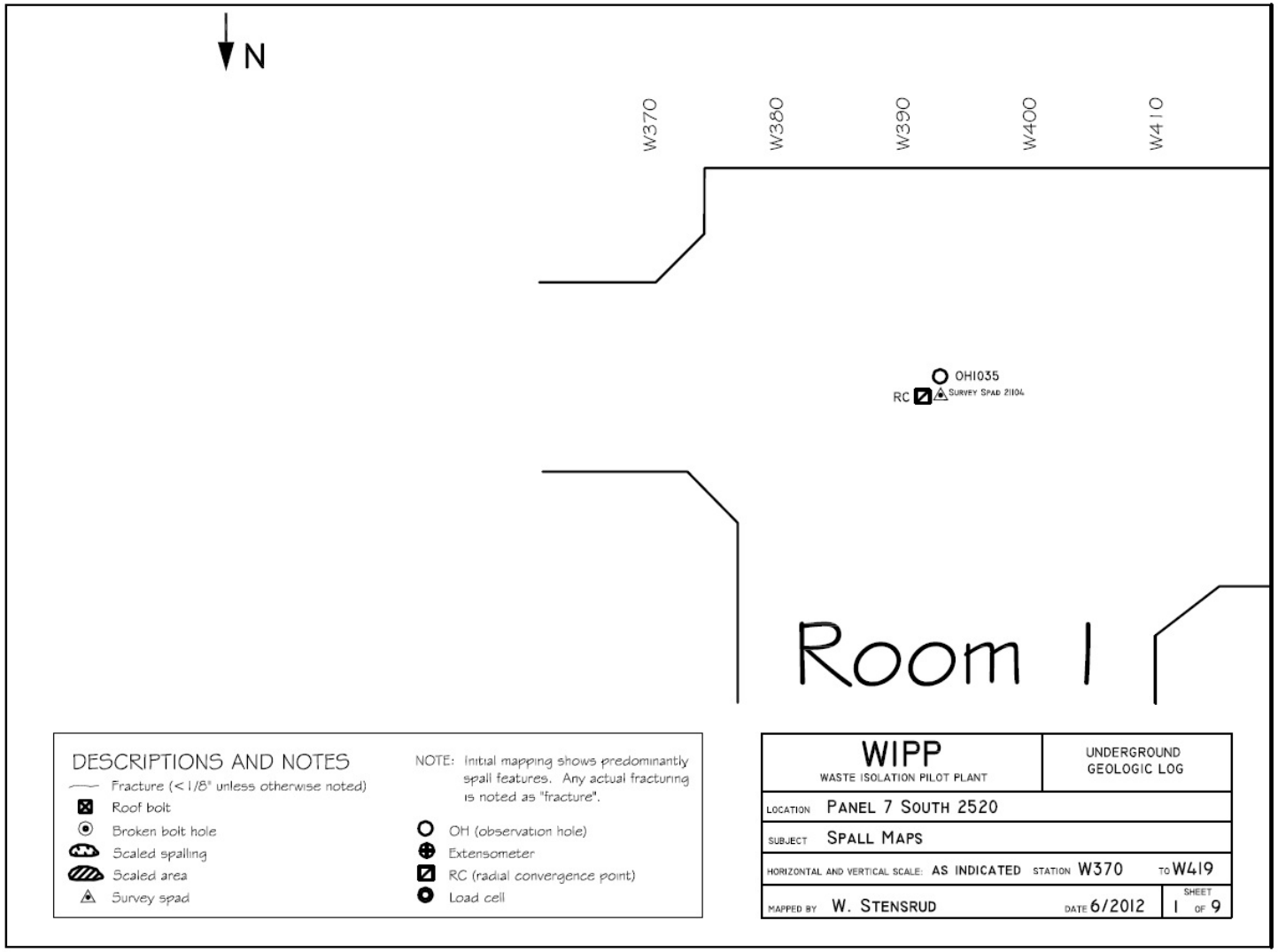

Figure 7-60
Panel 7 South 2520, W370-W419 Roof Fractures

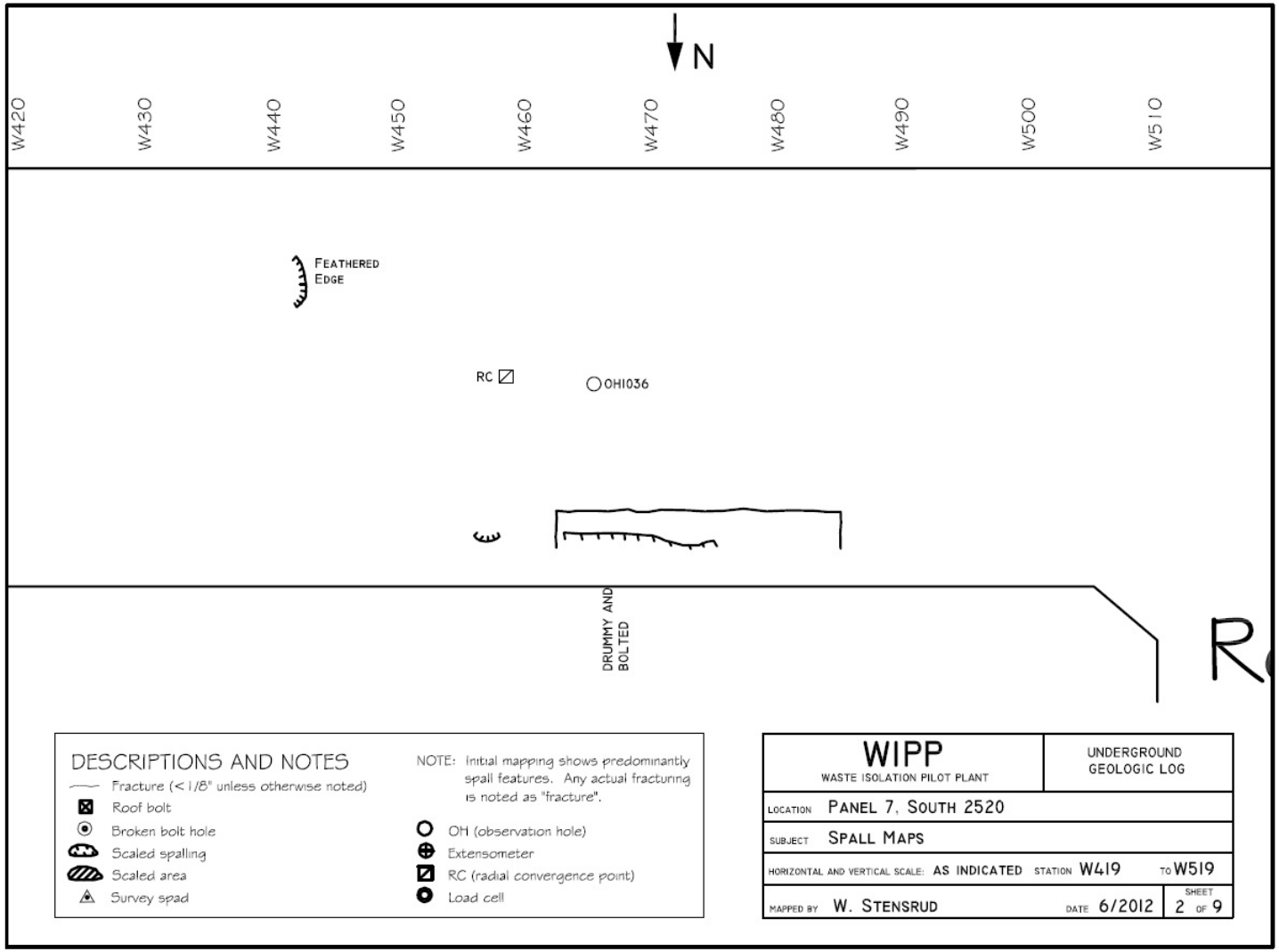

Figure 7-61
Panel 7 South 2520, W419-W519 Roof Fractures

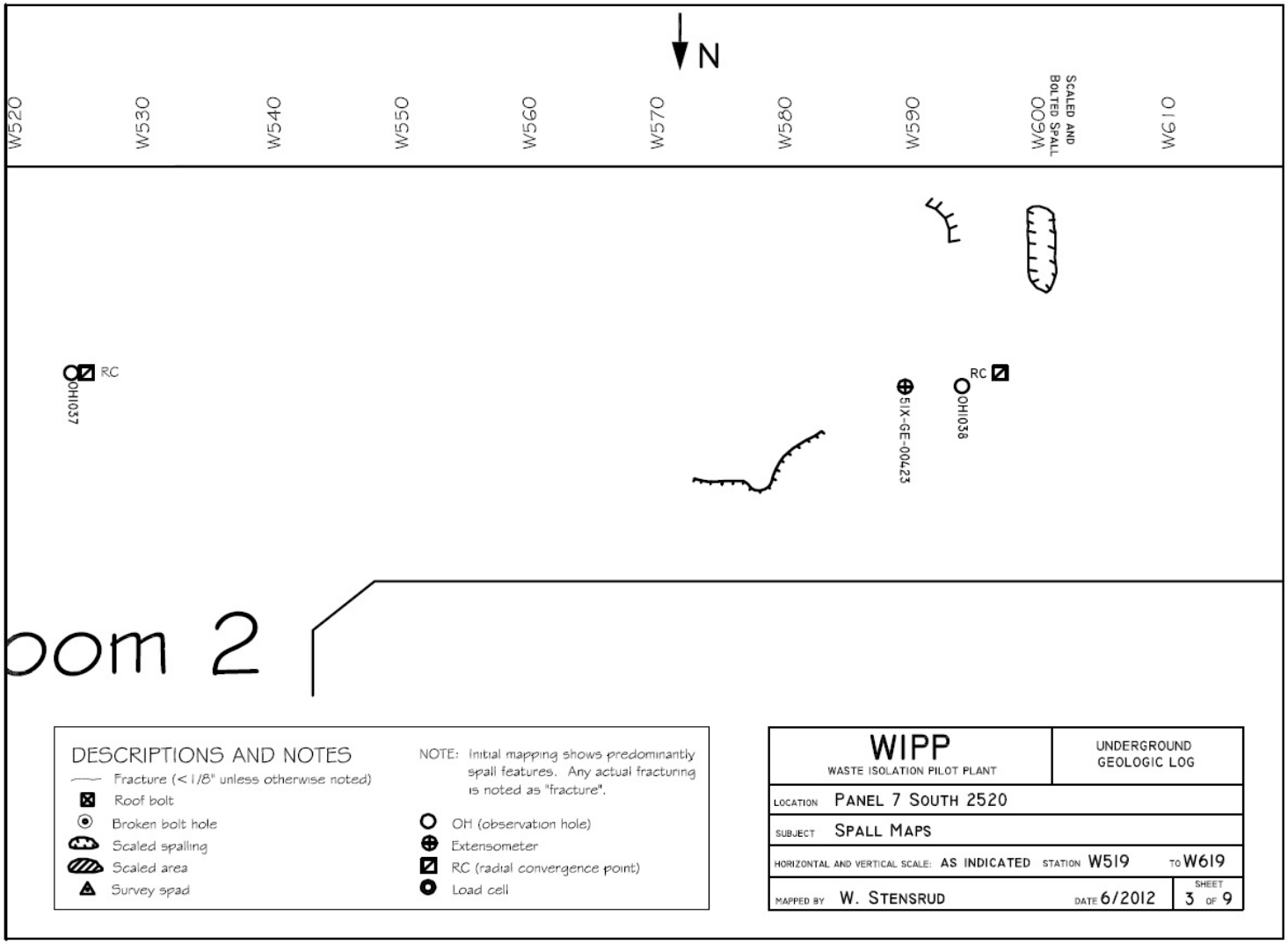

Figure 7-62
Panel 7 South 2520, W519-W619 Roof Fractures

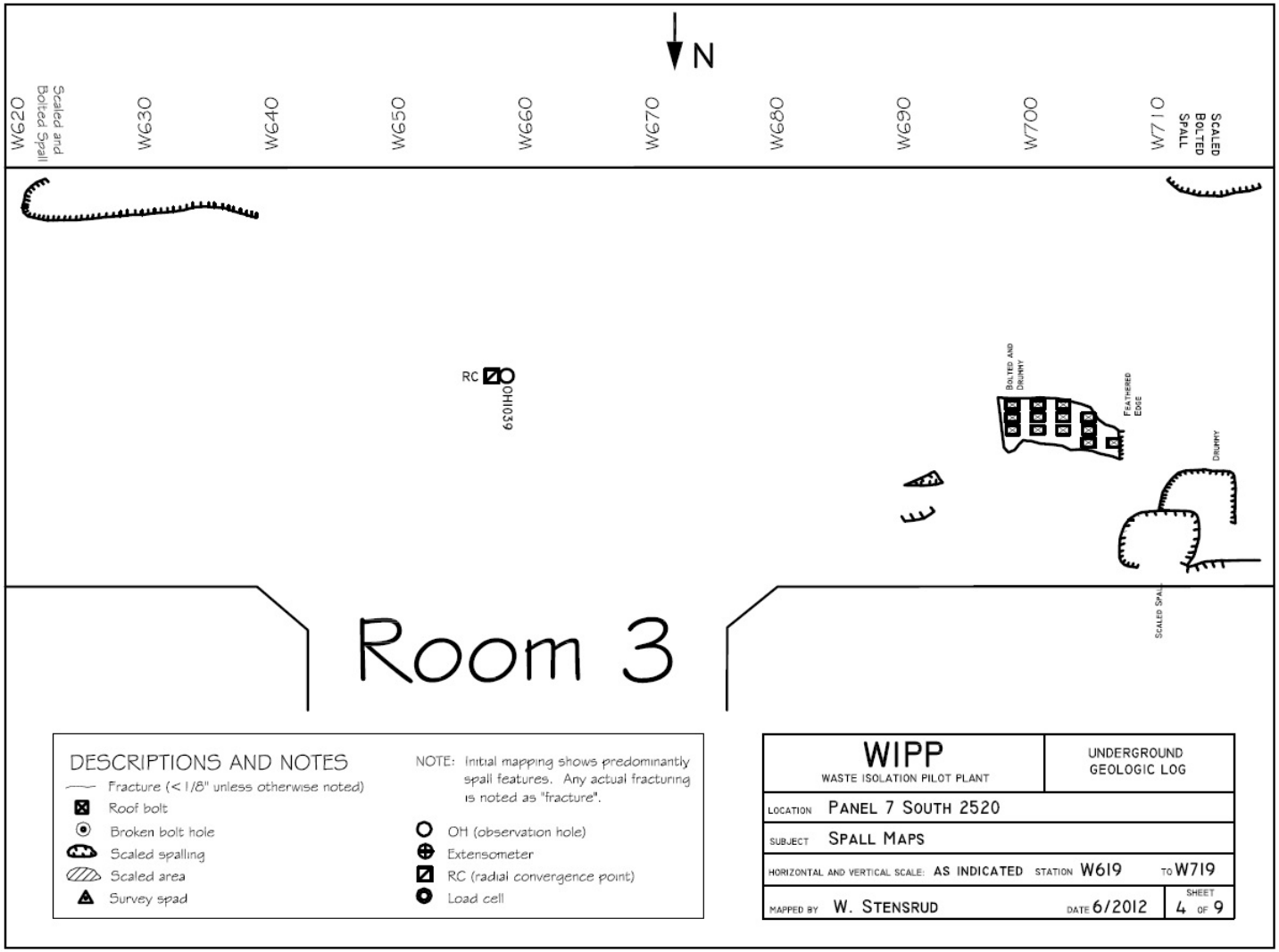

Figure 7-63
Panel 7 South 2520, W619-W719 Roof Fractures

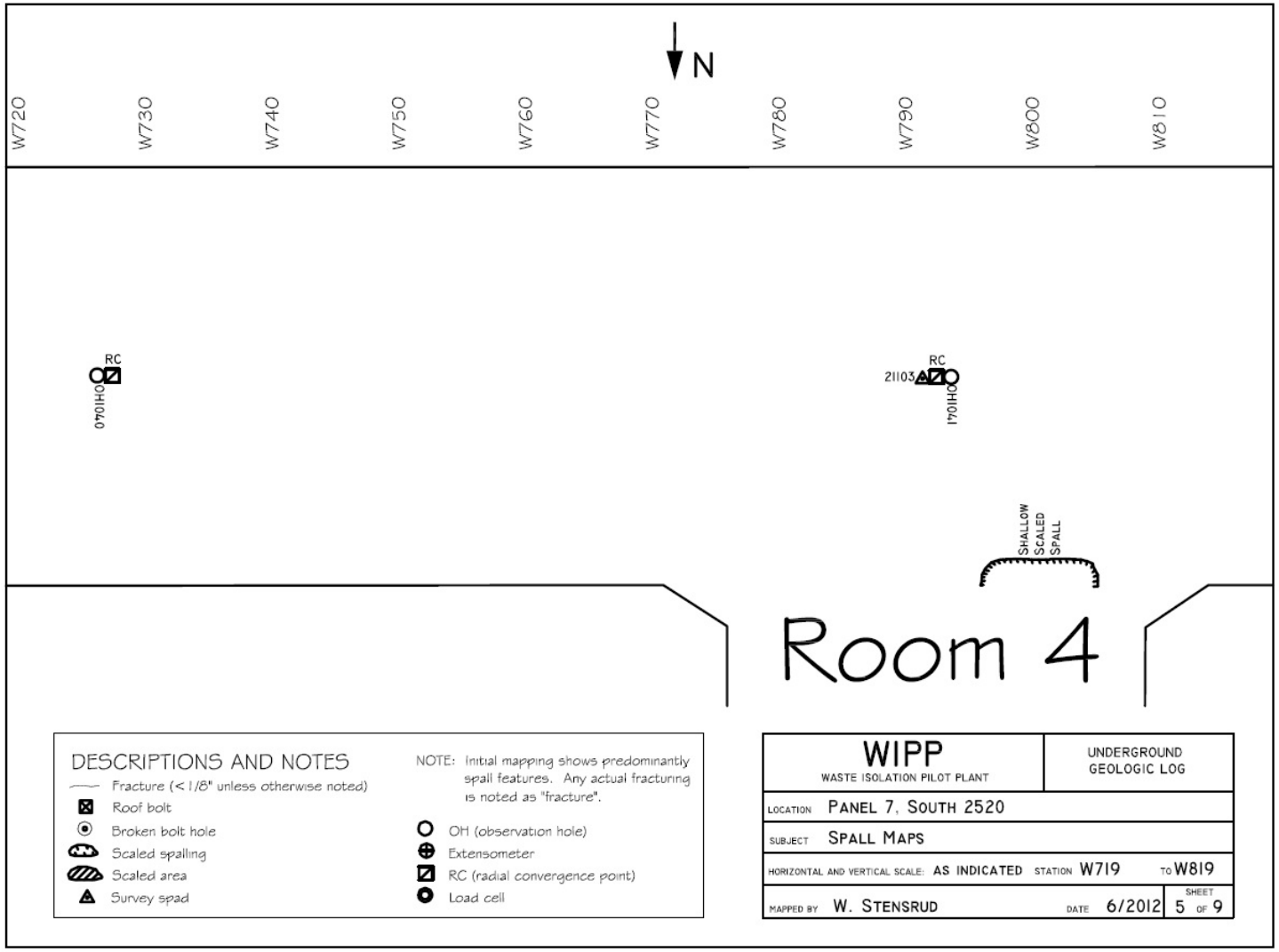

Figure 7-64
Panel 7 South 2520, W719-W819 Roof Fractures

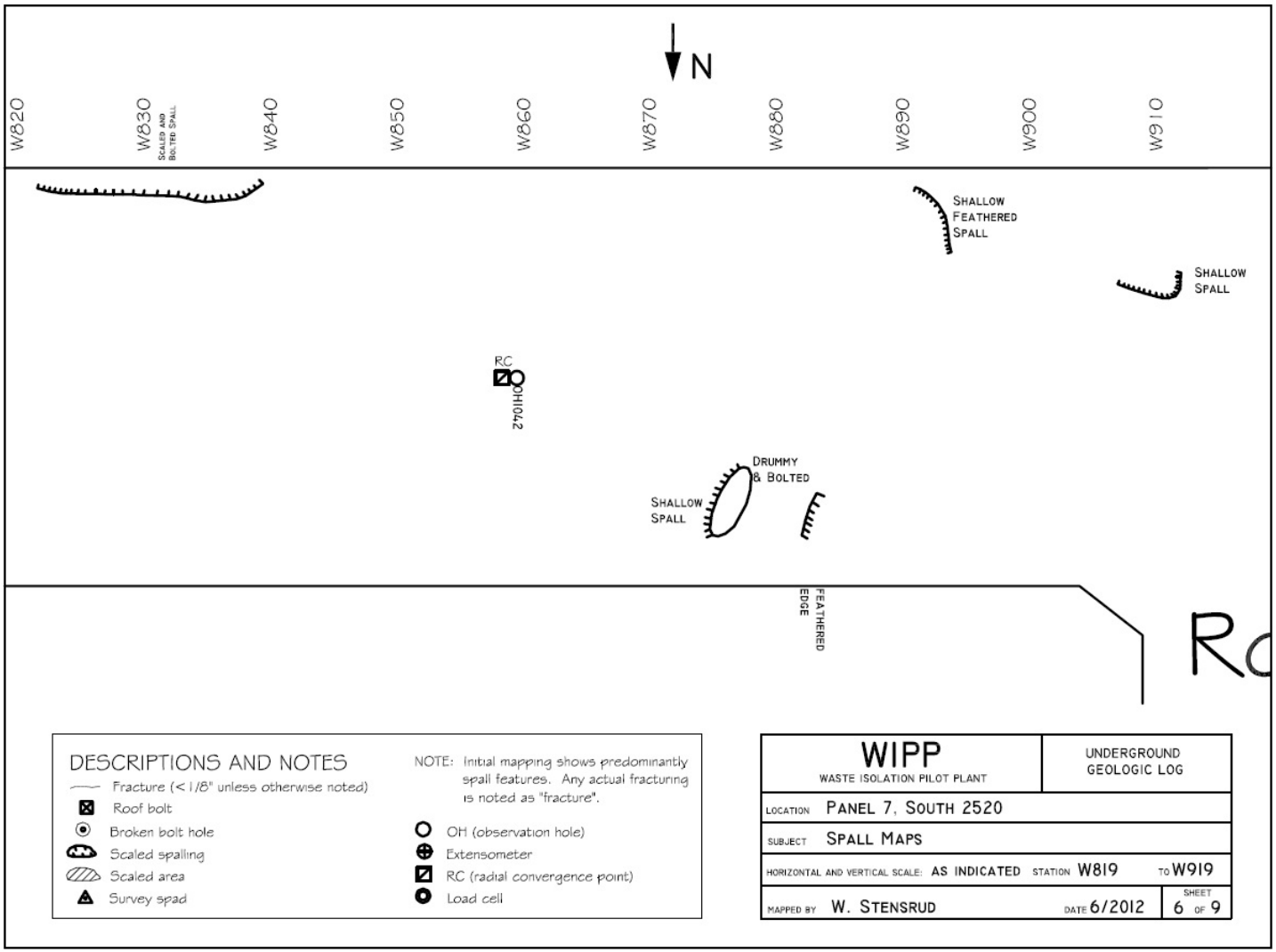

Figure 7-65
Panel 7 South 2520, W819-W919 Roof Fractures

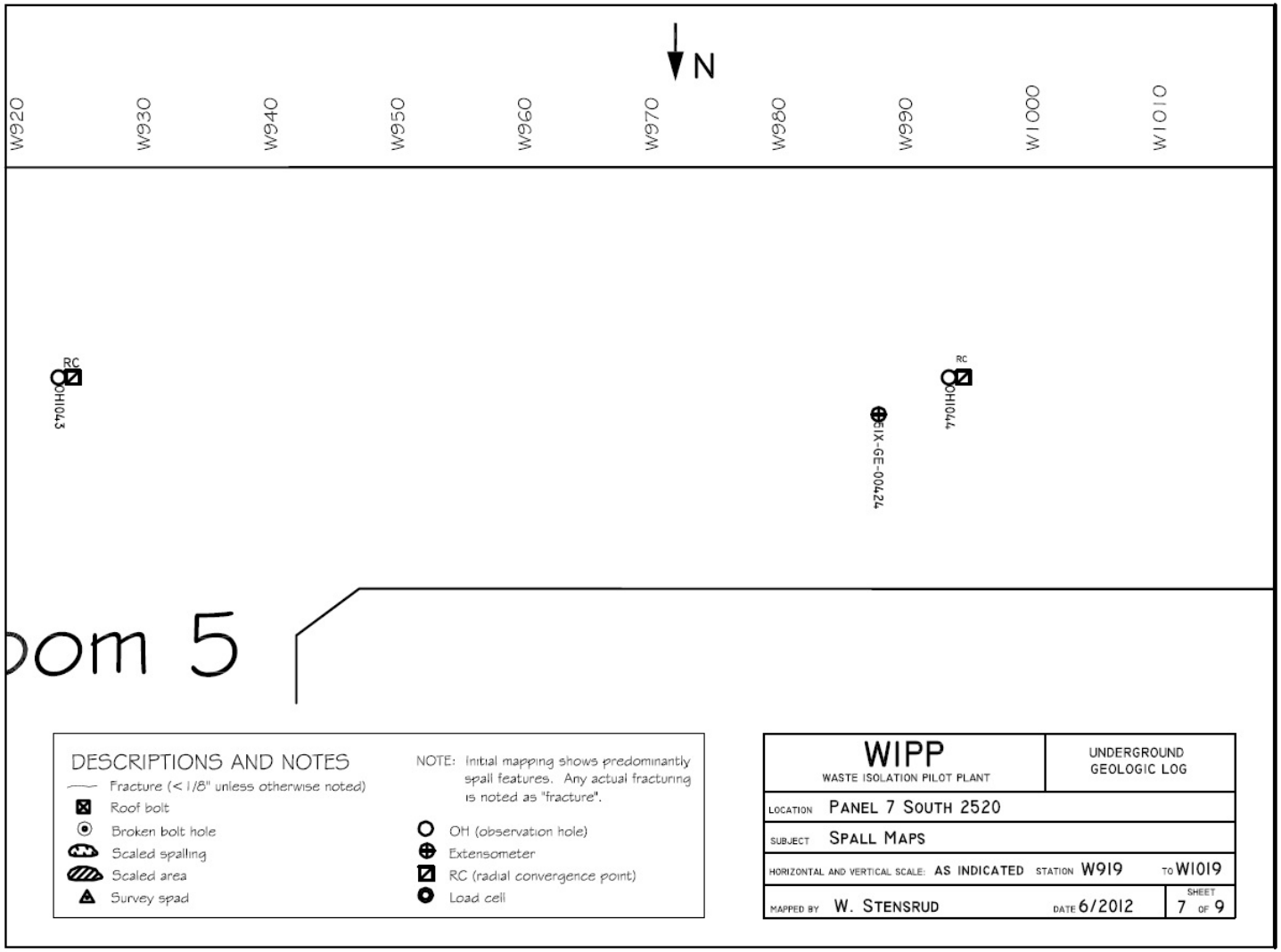

Figure 7-66
Panel 7 South 2520, W919-W1019 Roof Fractures

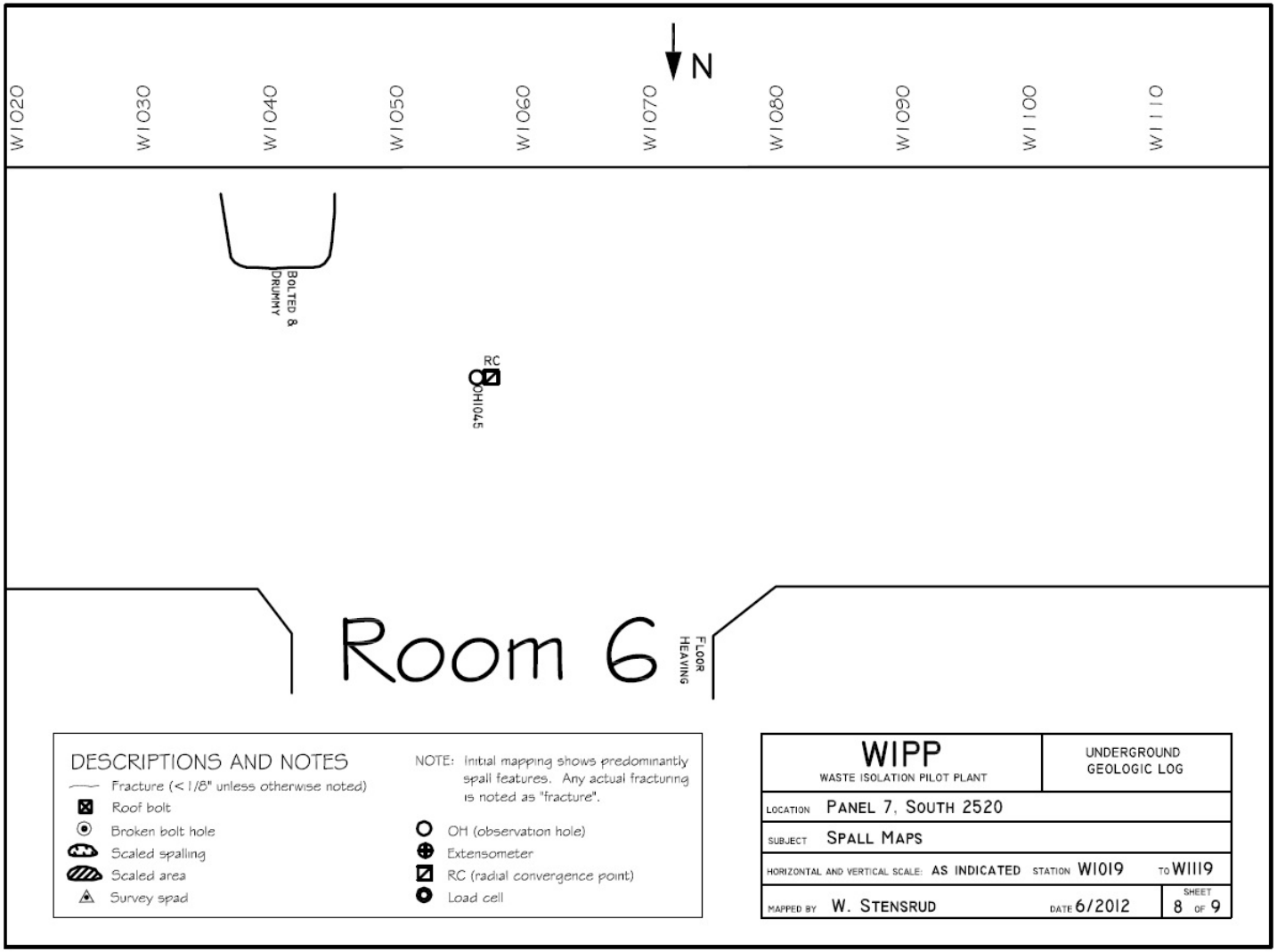

Figure 7-67
Panel 7 South 2520, W1019-W1119 Roof Fractures

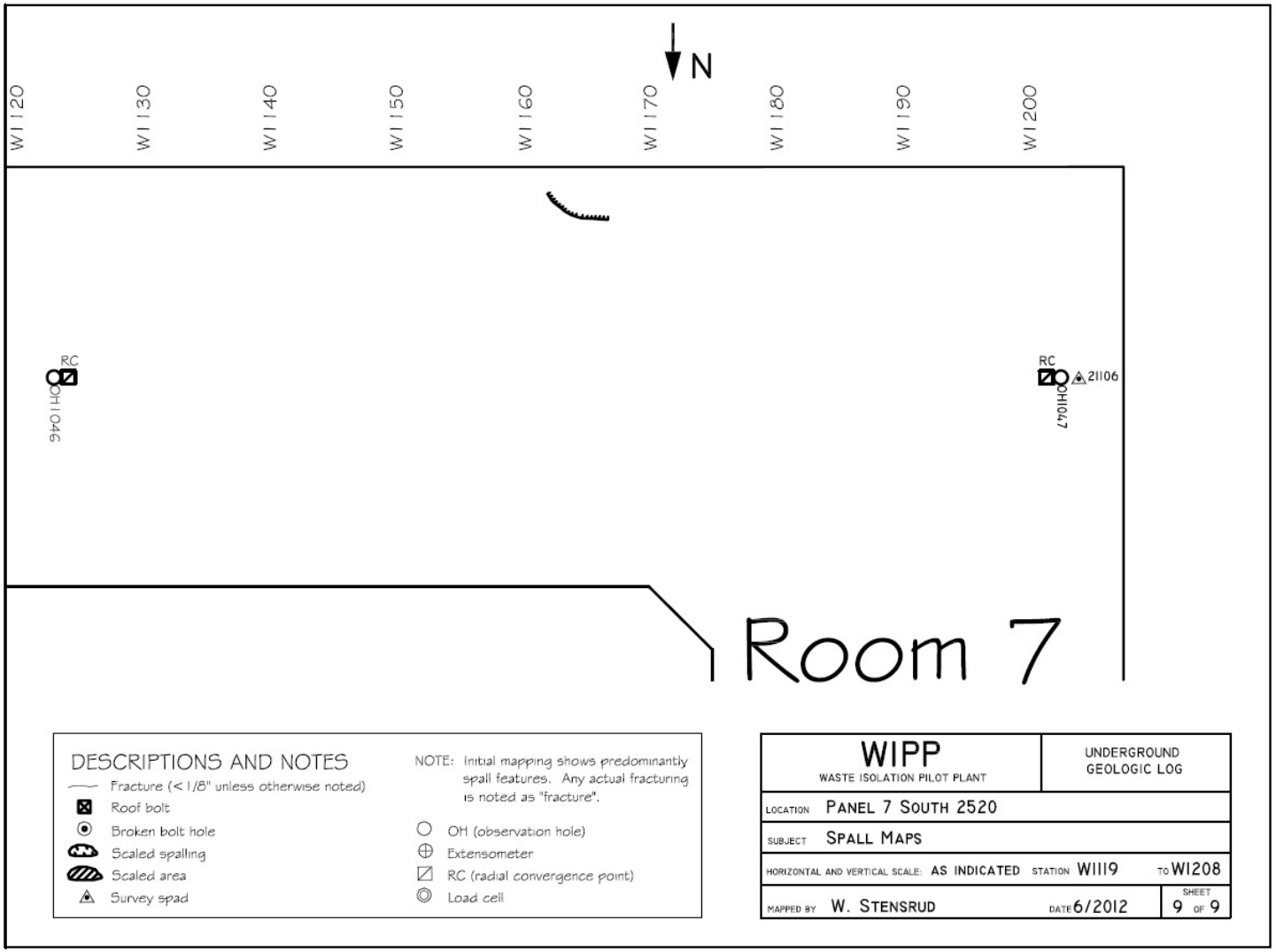

Figure 7-68
Panel 7 South 2520, W1119-W1208 Roof Fractures