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Supporting Data

MAY 2012

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, 2011. 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 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. Plots of the instrument data are presented as Figures 2-13 through 2-16.

Table 2-3 presents data and analysis of the Exhaust Shaft. Plots of the instrument data are presented as Figures 2-17 through 2-23.

Table 2-1
Salt Handling Shaft Data Analysis

PIEZOMETERS

Field Tag	Level feet	Figure Number	Date of 2010-2011 Max. Reading	2010-2011 Maximum Pressure Readings (psi)	Date of 2009-2010 Max. Reading	2009-2010 Maximum Pressure Readings (psi)	Change in Maximum Pressure From Previous Year (psi)	Comments
37X-PE-00201	580	2-1	08/02/10	79	04/05/10	99	-20	
37X-PE-00202	580	2-1	08/02/10	86	04/05/10	107	-21	
37X-PE-00203	620	2-2	08/02/10	154	04/05/10	231	-77	
37X-PE-00204	620	2-2	08/02/10	157	04/05/10	188	-31	
37X-PE-00205	691	2-3	06/06/11	188	06/03/10	188	0	
37X-PE-00206	691	2-3	06/06/11	182	06/03/10	183	-1	
37X-PE-00209	802	2-4	09/07/10	61	08/03/09	64	-3	
37X-PE-00210	802	2-4	09/07/10	60	09/01/09	65	-5	
37X-PE-00211	850	2-5	06/06/11	91	06/03/10	105	-14	
37X-PE-00212	850	2-5	06/06/11	108	06/03/10	122	-14	

EARTH PRESSURE CELLS

Field Tag	Level feet	Figure Number	Date of 2010-2011 Max. Reading	2010-2011 Maximum Pressure Readings (psi)	Date of 2009-2010 Max. Reading	2009-2010 Maximum Pressure Readings (psi)	Change in Maximum Pressure From Previous Year (psi)	Comments
37X- WE-00201	860	2-6	08/02/10	-7	09/01/09	-6	-1	
37X- WE-00202	860	2-6	08/02/10	-25	07/06/09	-24	-1	
37X- WE-00203	860	2-6	04/04/11	7	04/05/10	7	0	

Salt Handling Shaft Data Analysis

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

SPOT WELDED STRAIN GAGES

Field Tag	Level Feet	Figure Number	Date of 2010-2011 Max. Reading	2010-2011 Maximum Strain Readings (με)	Date of 2009-2010 Max. Reading	2009-2010 Maximum Strain Readings (με)	Change in Maximum Strain From Previous Year (με)	Comments
37X-ZE-00201	856.3	2-7	09/07/10	746	09/01/09	747	-1	
37X-ZE-00206	856.3	2-7	08/02/10	653	08/03/09	646	7	
37X-ZE-00220	862.4	2-8	10/04/10	906	09/01/09	893	13	
37X-ZE-00223	862.4	2-8	08/02/10	705	08/03/09	696	9	

EMBEDMENT STRAIN GAGES

Field Tag	Level feet	Figure Number	Date of 2010-2011 Max. Reading	2010-2011 Maximum Strain Readings (με)	Date of 2009-2010 Max. Reading	2009-2010 Maximum Strain Readings (με)	Change in Maximum Strain From Previous Year (με)	Comments
37X-ZE-00209	856.3	2-9	03/08/11	-540	01/19/10	-552	12	
37X-ZE-00210	856.3	2-9	08/02/10	998	08/03/09	994	4	
37X-ZE-00211	856.3	2-9	06/06/11	338	09/01/09	333	5	
37X-ZE-00212	856.3	2-9	02/07/11	-891	02/01/10	-818	-73	
37X-ZE-00213	856.3	2-9	06/06/11	376	07/06/09	365	11	
37X-ZE-00214	856.3	2-9	06/06/11	106	02/01/10	-83	189	
37X-ZE-00215	856.3	2-9	06/06/11	131	07/06/09	119	12	
37X-ZE-00216	856.3	2-9	06/06/11	660	06/03/10	629	31	
37X-ZE-00225	862.4	2-10	06/06/11	271	09/01/09	256	15	
37X-ZE-00235	856.3	2-11	02/07/11	-413	01/19/10	-420	7	
37X-ZE-00236	856.3	2-11	02/07/11	-145	08/03/09	107	-252	
37X-ZE-00237	856.3	2-11	06/06/11	124	06/03/10	115	9	
37X-ZE-00238	856.3	2-11	06/06/11	545	06/03/10	525	20	
37X-ZE-00239	862.4	2-12	09/07/10	391	09/01/09	383	8	

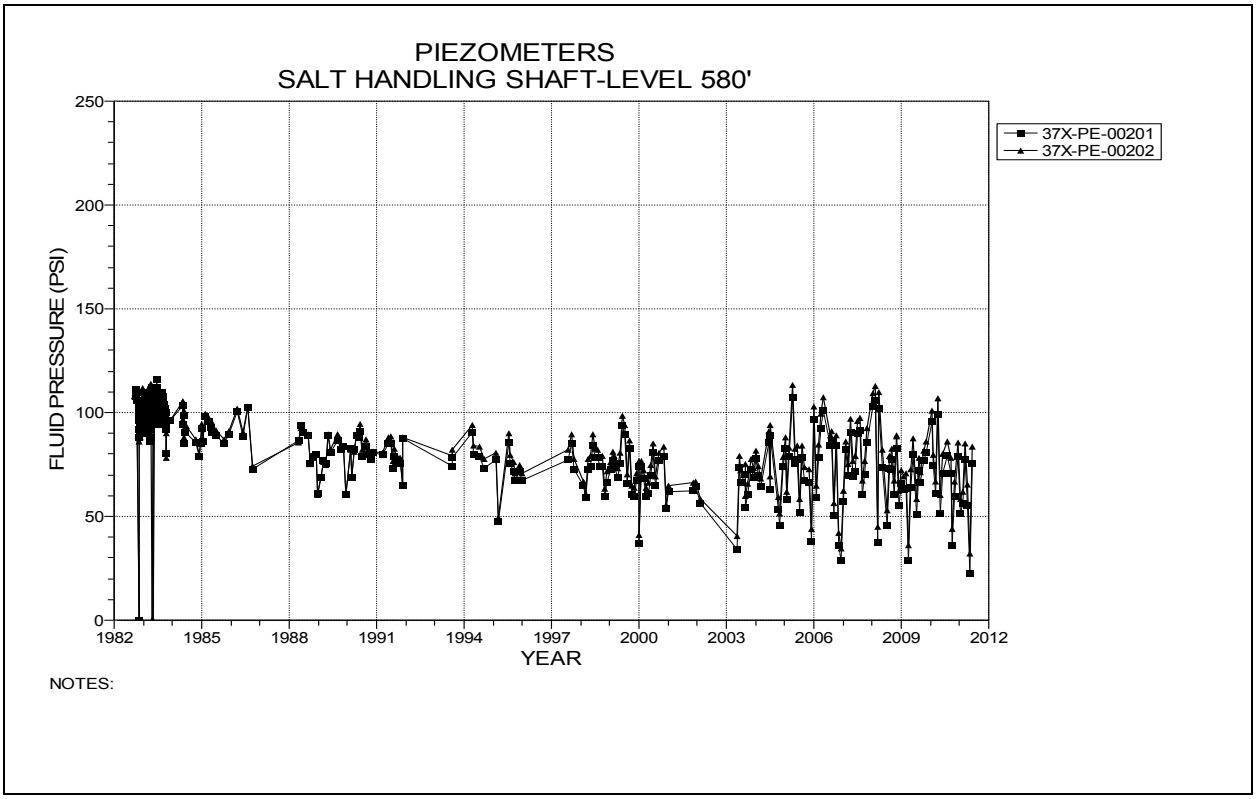


Figure 2-1 Piezometers 37X-PE-00201 and 37X-PE-00202
Salt Handling Shaft – Level 580 at the Forty-niner Member

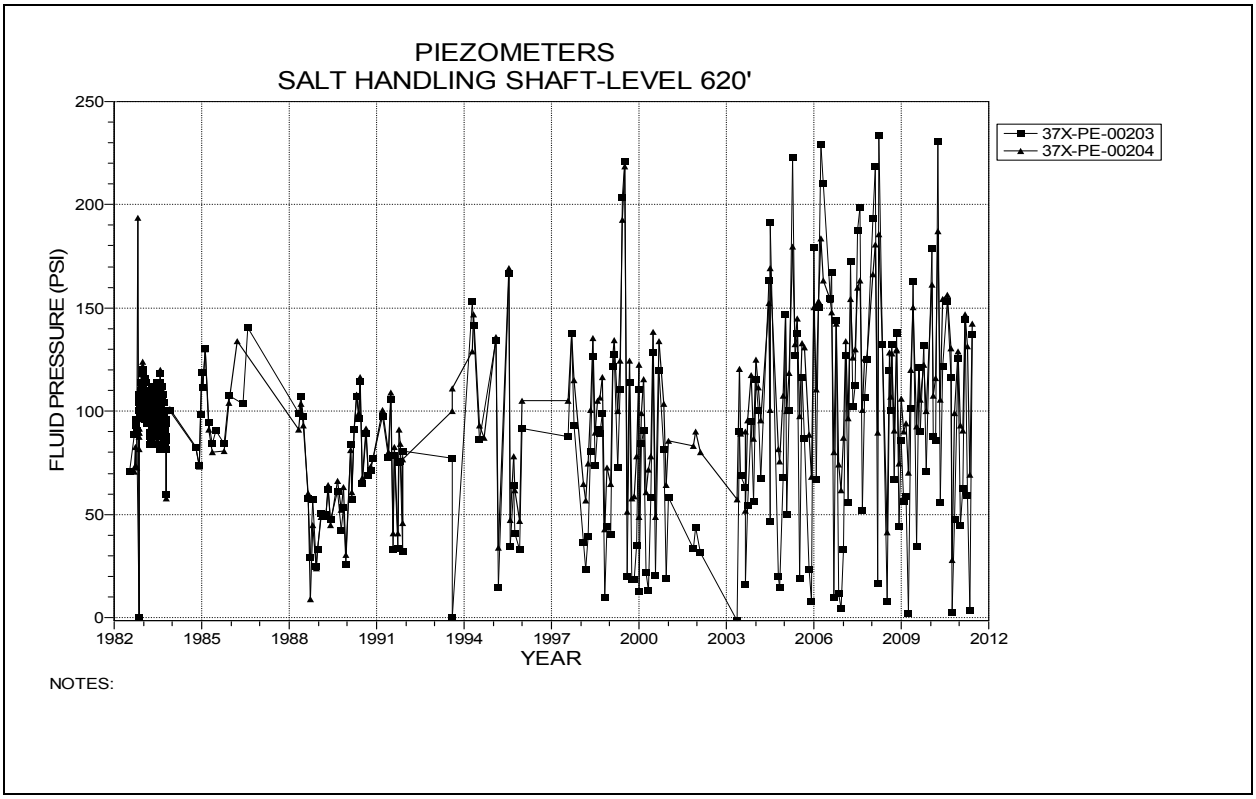


Figure 2-2 Piezometers 37X-PE-00203 and 37X-PE-00204
Salt Handling Shaft – Level 620 at the Magenta Dolomite Member

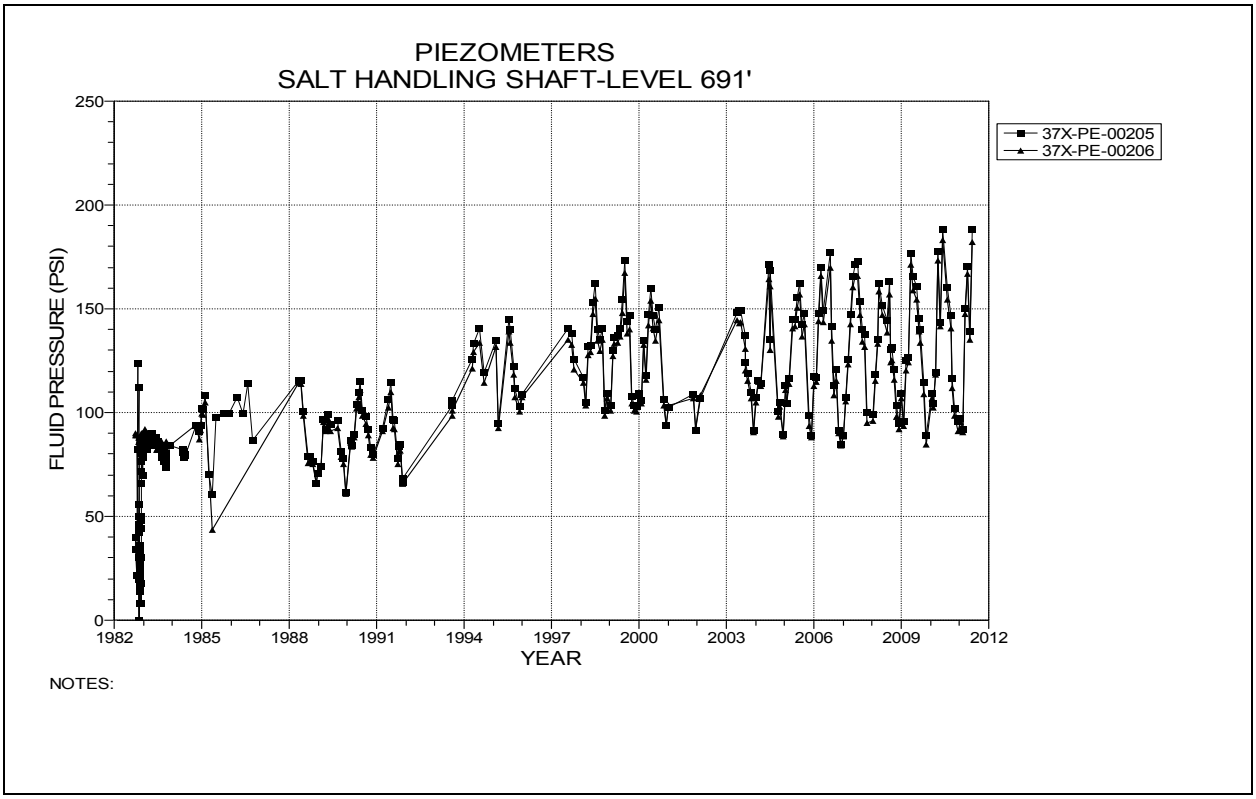


Figure 2-3 Piezometers 37X-PE-00205 and 37X-PE-00206
Salt Handling Shaft – Level 691 at the Tamarisk Member

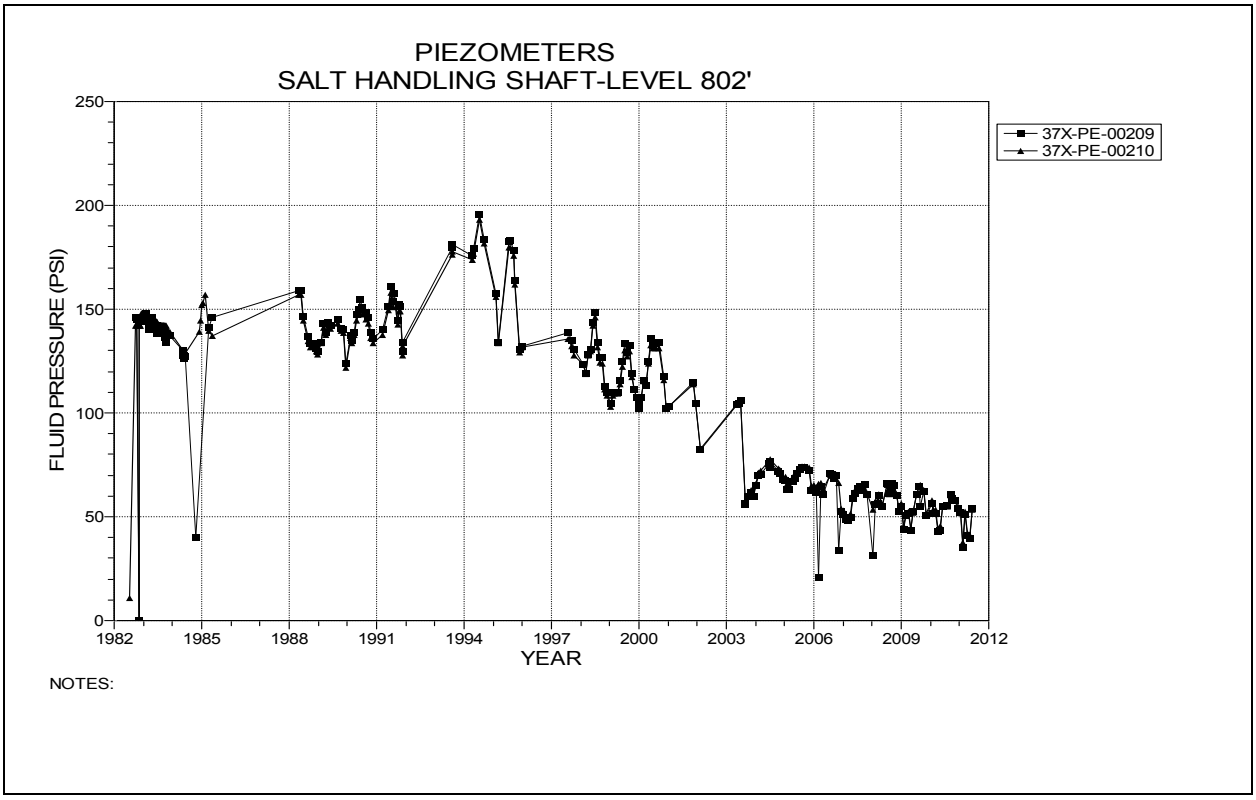


Figure 2-4 Piezometers 37X-PE-00209 and 37X-PE-00210
Salt Handling Shaft – Level 802 at the Los Medaños Member

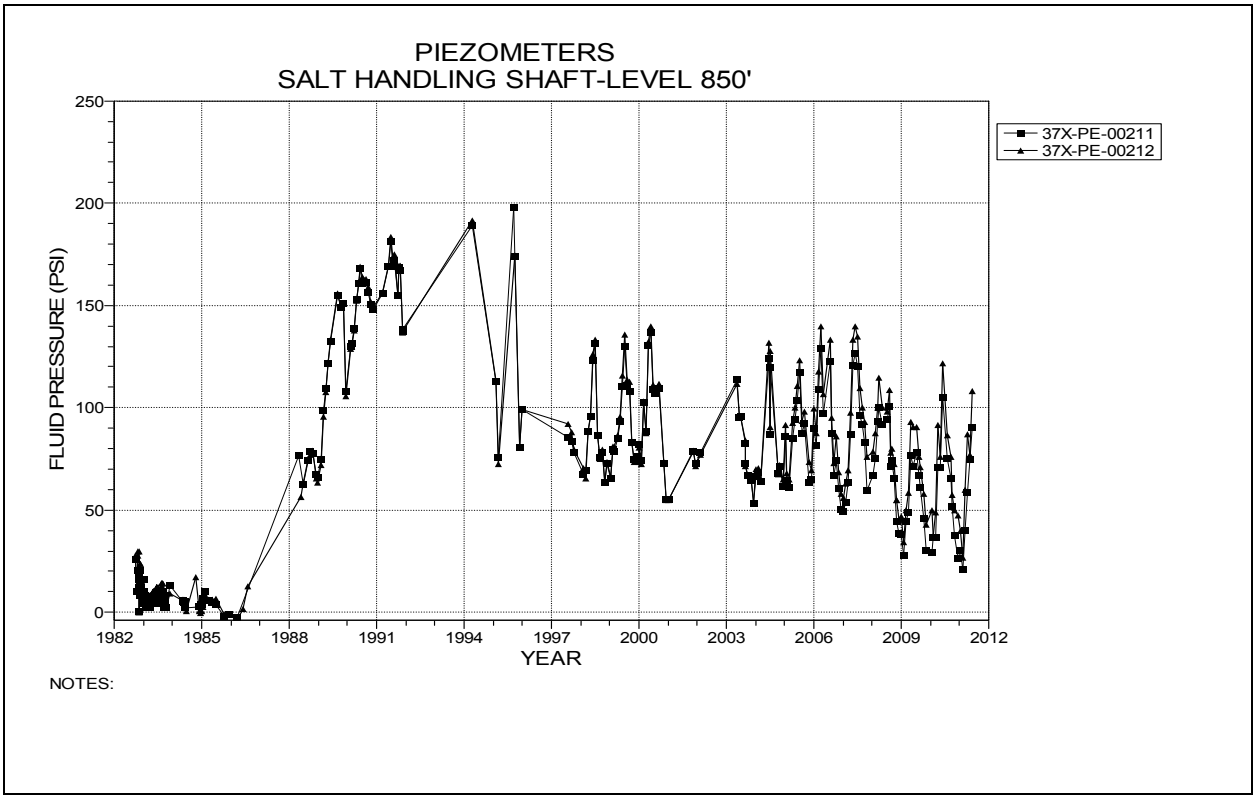


Figure 2-5 Piezometers 37X-PE-00211 and 37X-PE-00212
Salt Handling Shaft – Level 850 at the Rustler-Salado Contact

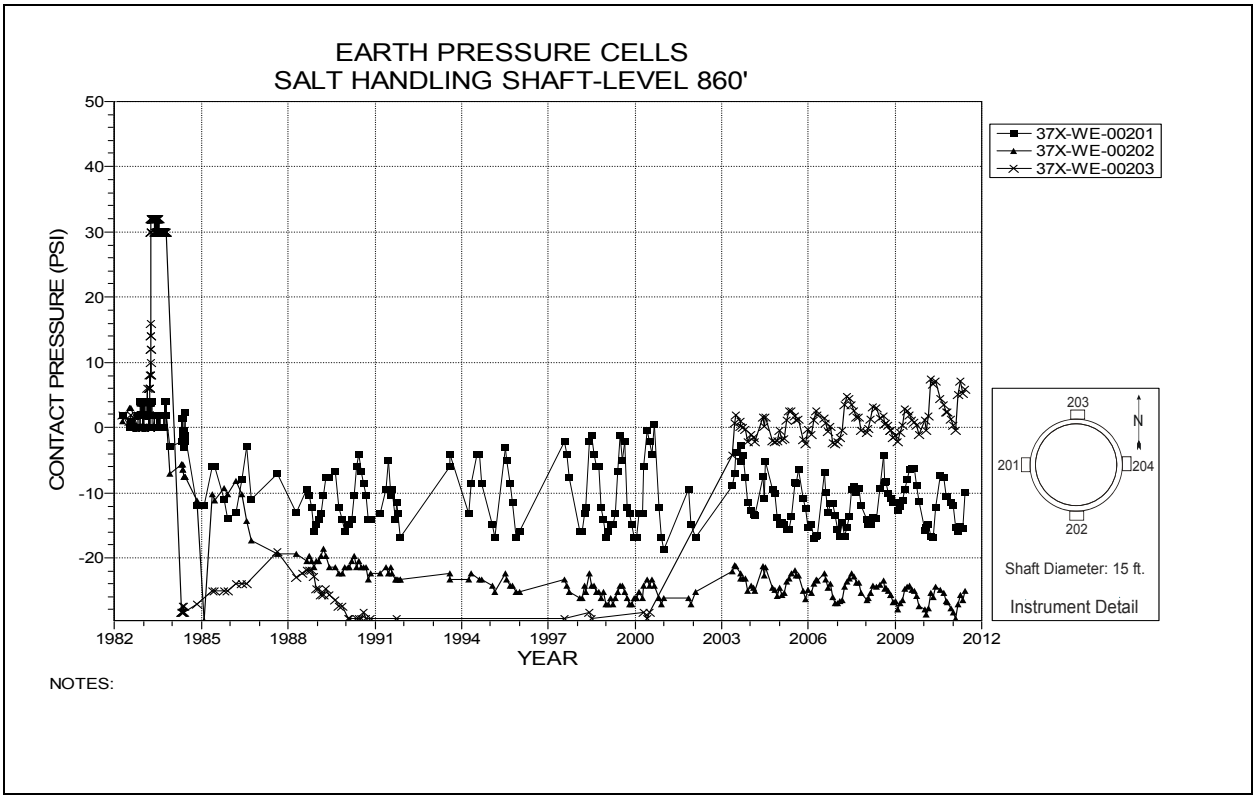


Figure 2-6 Earth Pressure Cells Behind Shaft Key
Salt Handling Shaft Key – Level 860

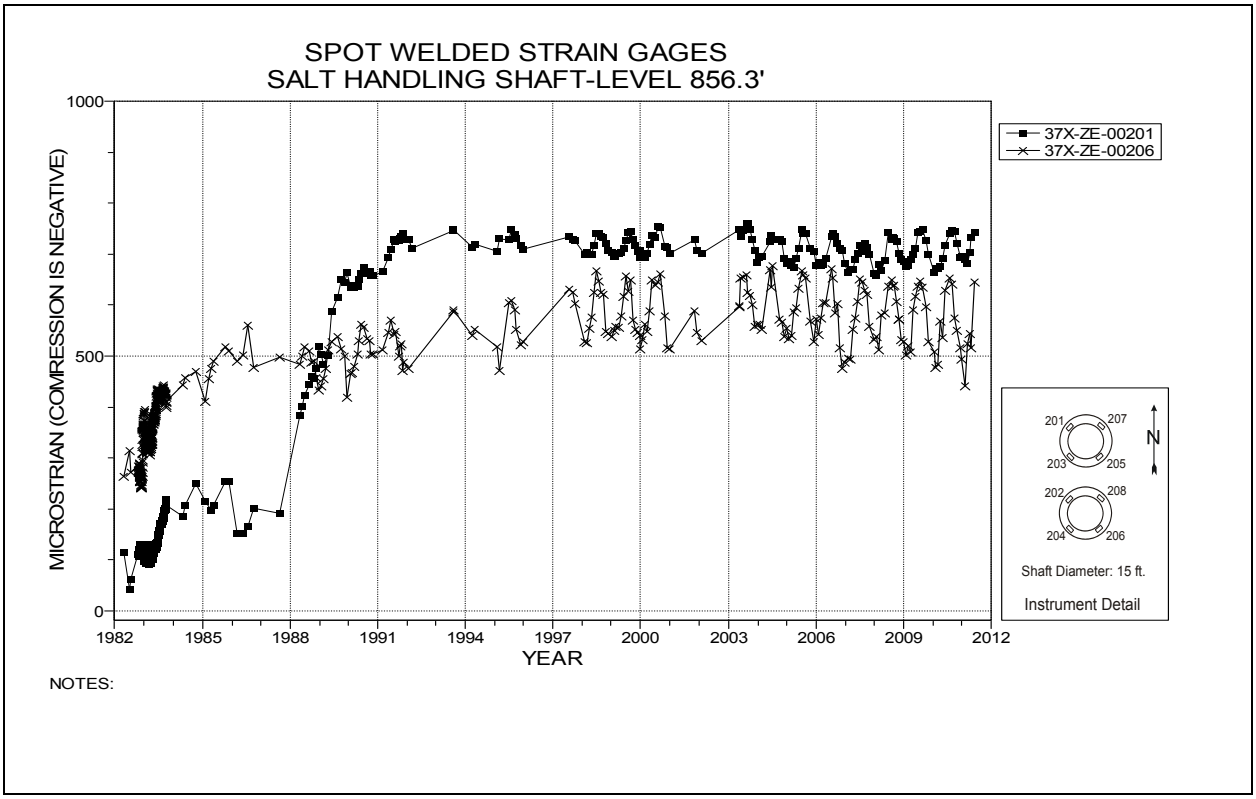


Figure 2-7 Spot-Welded Strain Gages
Salt Handling Shaft Key – Level 856.3

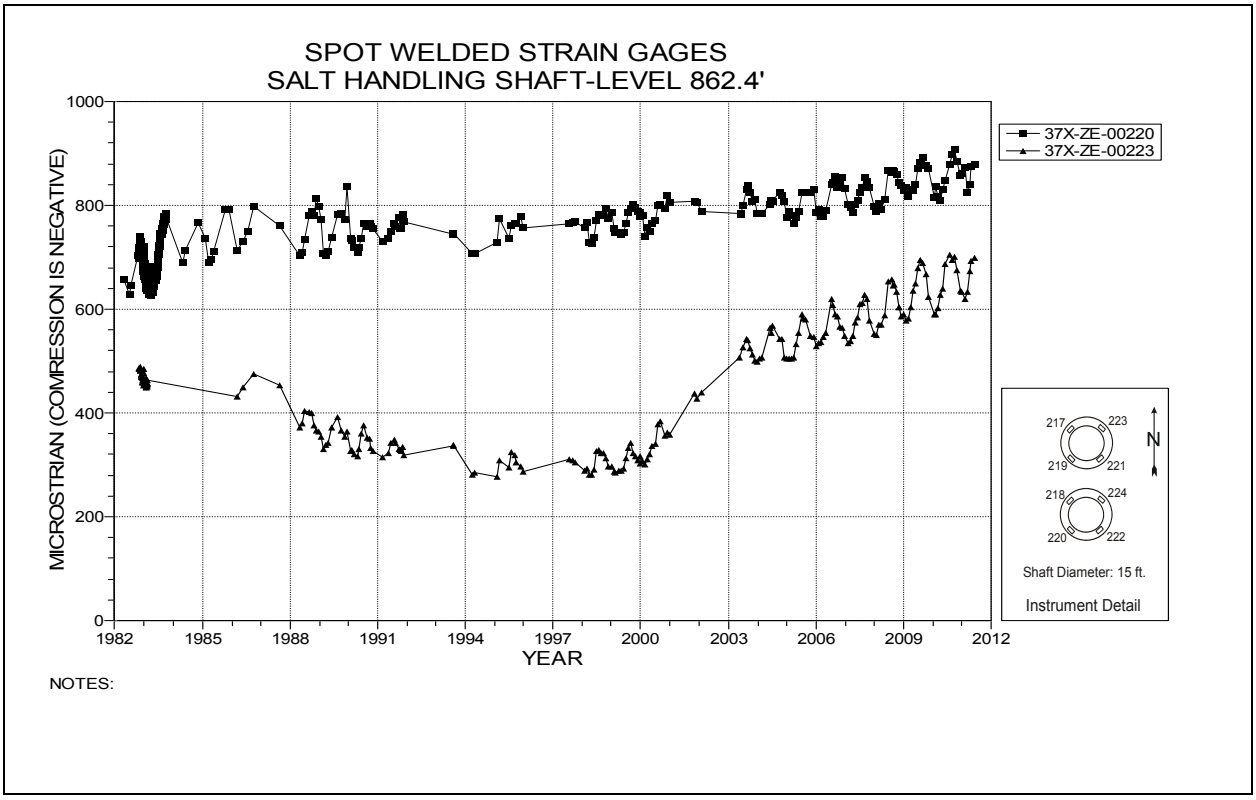


Figure 2-8 Spot-Welded Strain Gages
Salt Handling Shaft Key – Level 862.4

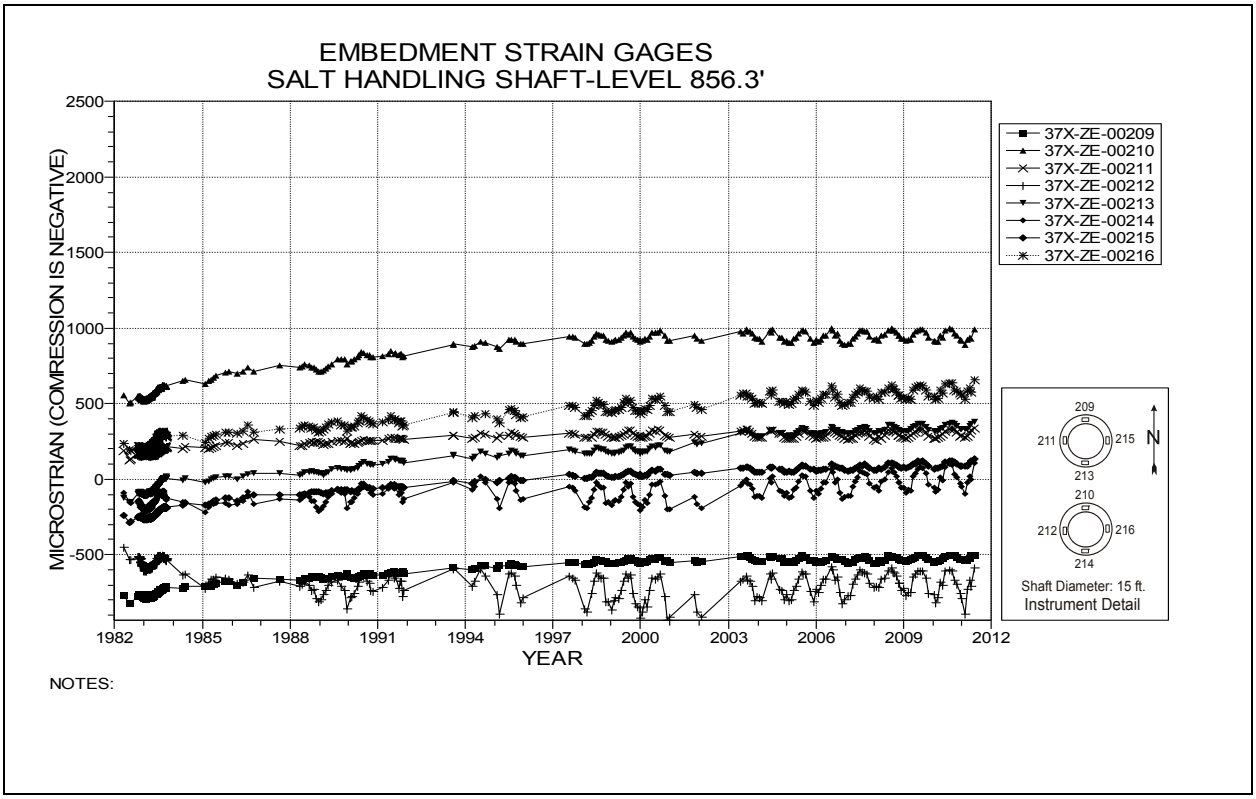


Figure 2-9 Embedment Strain Gages
Salt Handling Shaft Key – Level 856.3

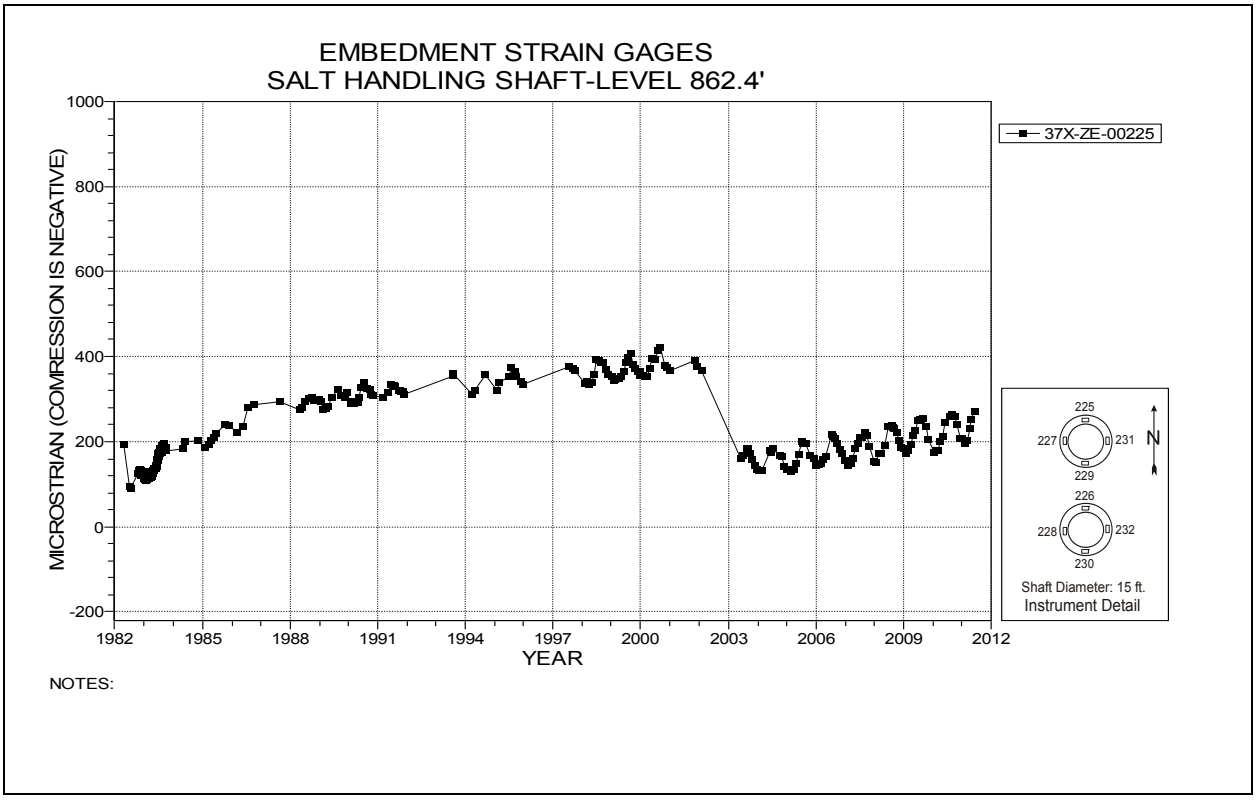


Figure 2-10 Embedment Strain Gage
Salt Handling Shaft Key Level 862.4

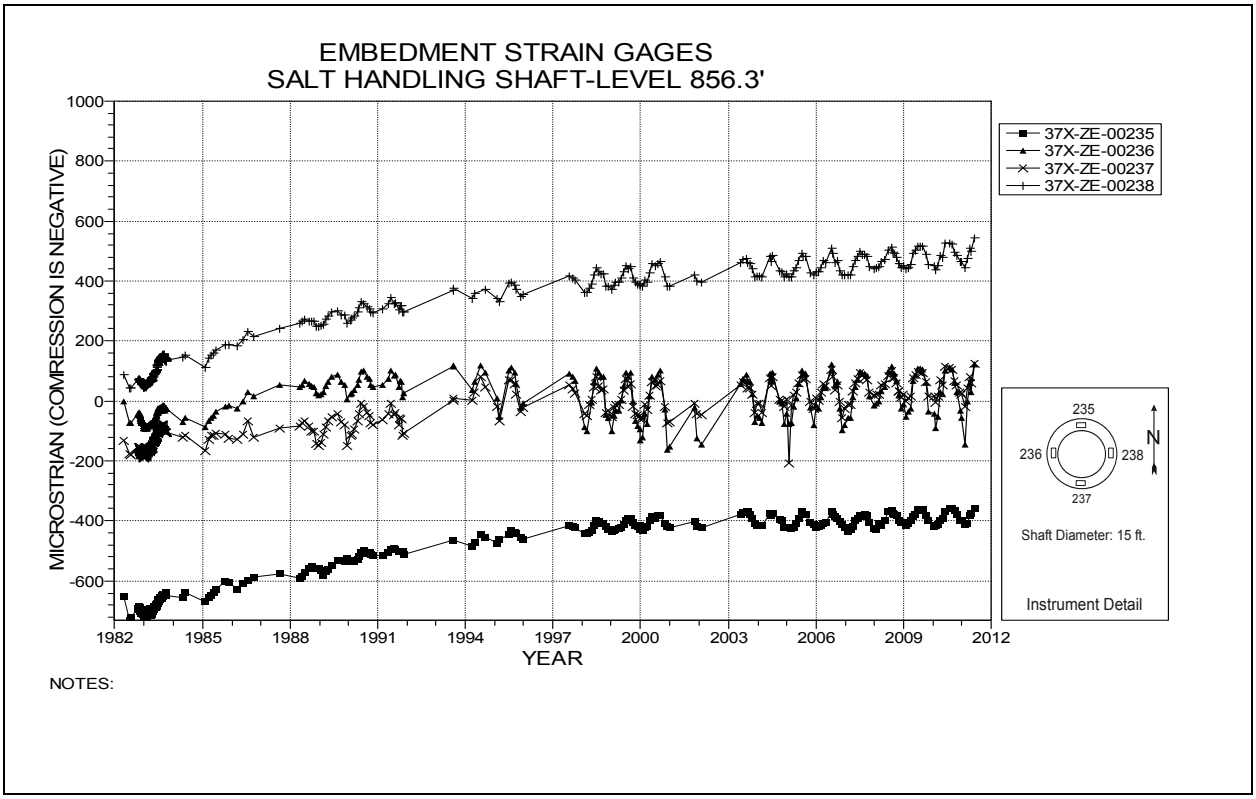


Figure 2-11 Embedment Strain Gages
Salt Handling Shaft Key Level 856.3

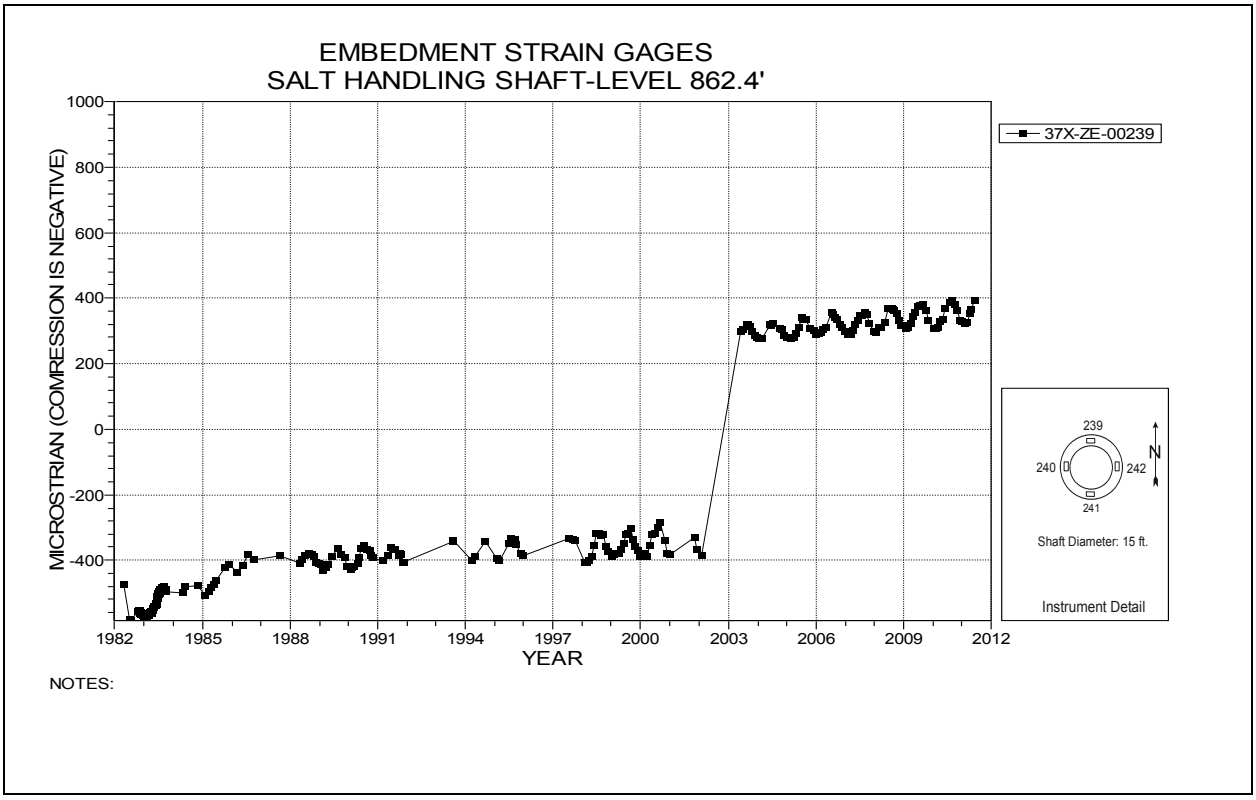


Figure 2-12 Embedment Strain Gage
Salt Handling Shaft Key – Level 862

Table 2-2
Waste Shaft Data Analysis

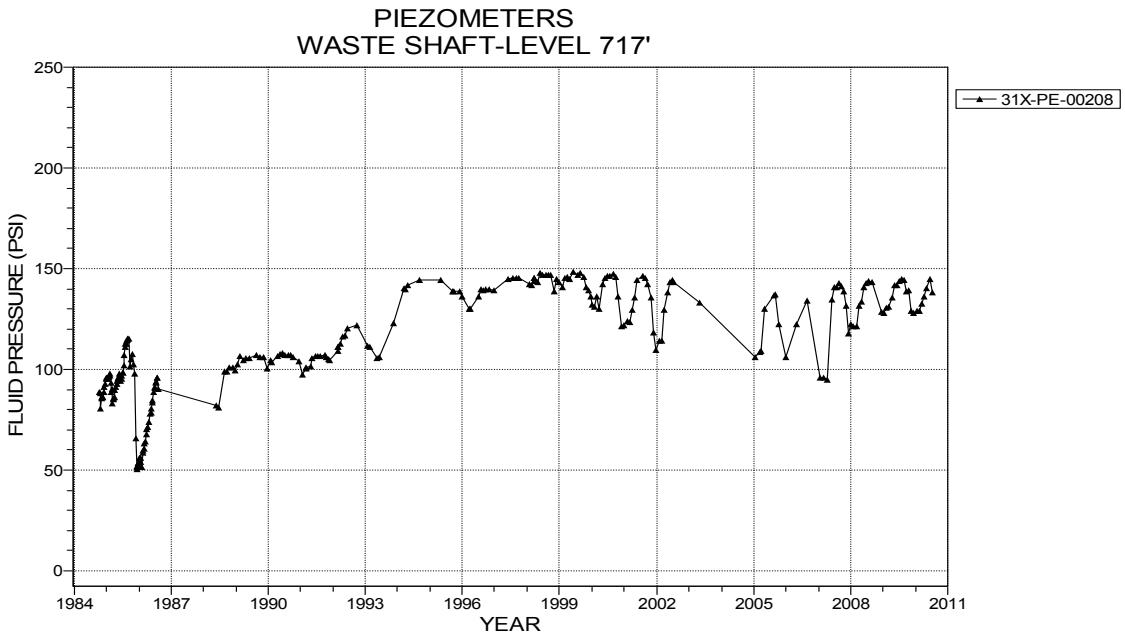
PIEZOMETERS

Field Tag	Level feet	Figure Number	Date of 2010-2011 Max. Reading	2010-2011 Maximum Pressure Readings (psi)	Date of 2009-2010 Max. Reading	2009-2010 Maximum Pressure Reading (psi)	Change in Maximum Pressure From Previous Year (psi)	Comments
31X-PE-00208	717	2-13	07/16/10	138	06/16/10	145	-7	
31X-PE-00209	758	2-14	08/09/10	52	06/16/10	51	1	
31X-PE-00211	845	2-15	07/16/10	60	09/25/09	67	-7	
31X-PE-00212	845	2-15	8/9/2010	68	07/29/09	72	-4	

EARTH PRESSURE CELLS

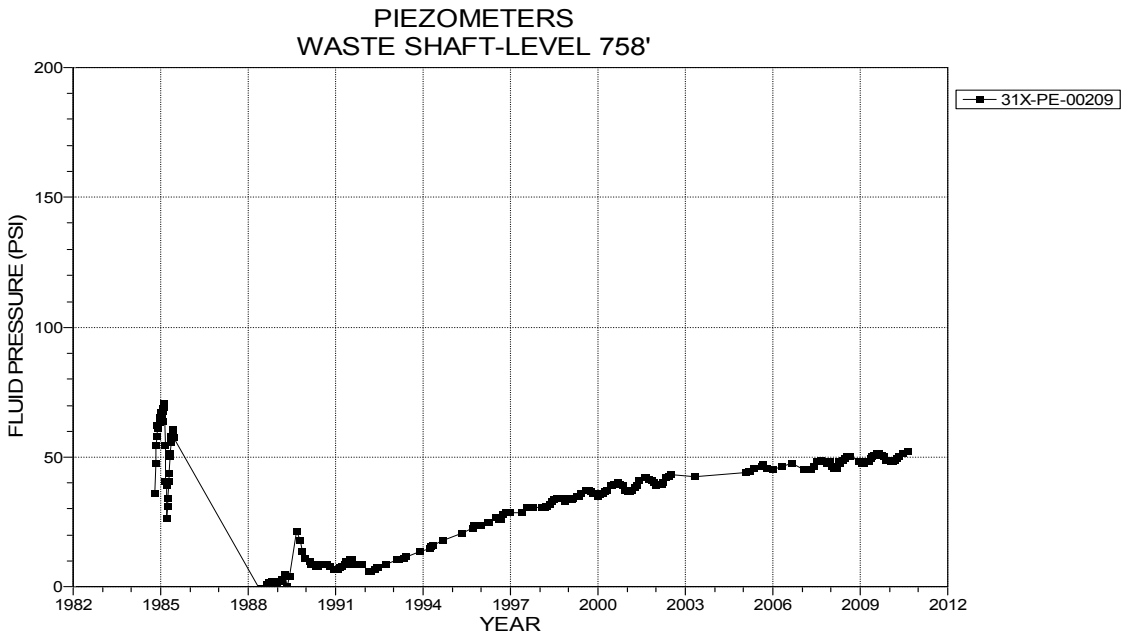
Field Tag	Level feet	Figure Number	Date of 2010-2011 Max. Reading	2010-2011 Maximum Pressure Readings (psi)	Date of 2009-2010 Max. Reading	2009-2010 Maximum Pressure Reading (psi)	Change in Maximum Pressure From Previous Year (psi)	Comments
31X- WE-00203	866	2-16	06/16/11	118	08/27/09	125	-7	

Table 2- Waste Shaft Data Analysis



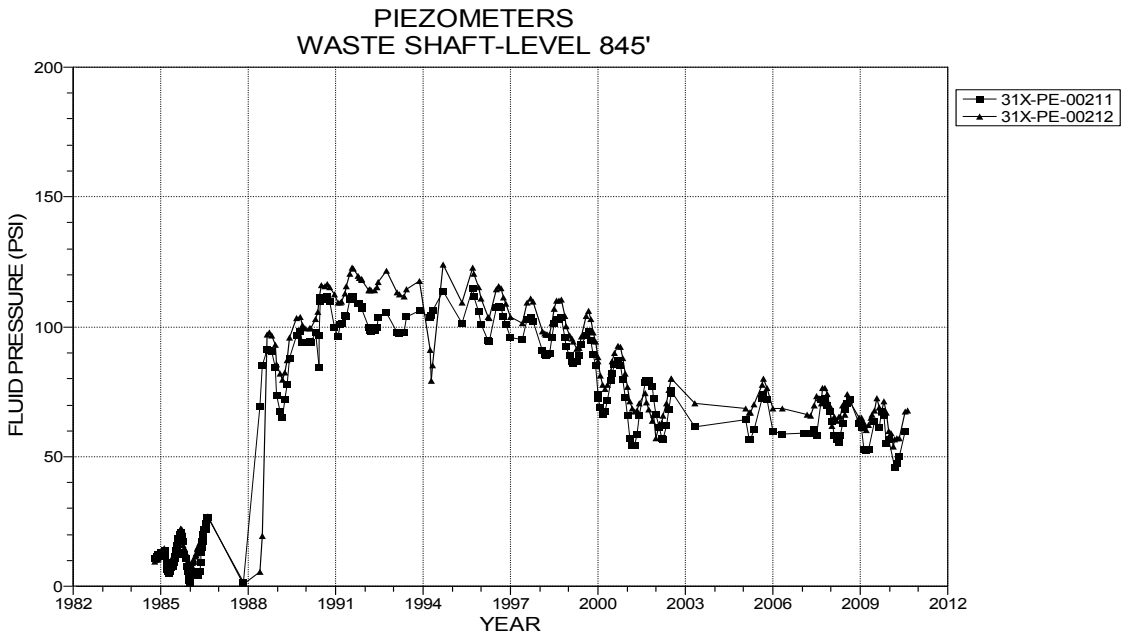
NOTES:
1. Excavation date: February 1984.

Figure 2-13 Piezometer 31X-PE-00208
Waste Shaft – Level 717 at the Culebra Dolomite Member



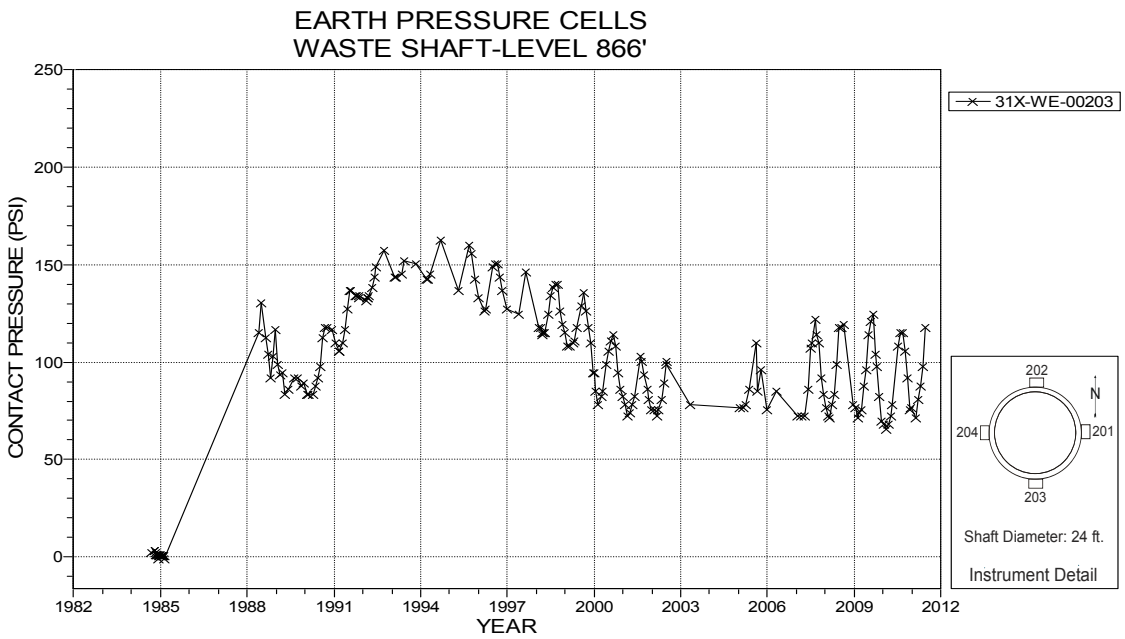
NOTES:
1. Excavation date: March 1984.
2. 31X-PE-00209 is no longer reading and a cabling/connection problem is the suspected cause.

Figure 2-14 Piezometer 31X-PE-00209 Waste Shaft – Level 758 at the Los Medaños Member



NOTES:
1. Excavation date: March 1984.
2. Instruments are no longer reading; probably due to an electrical connection.

Figure 2-15 Piezometers 31X-PE-00211 and 31X-PE-00212
Waste Shaft – Level 845 at the Rustler-Salado Contact



NOTES:
1. Excavation date: March 1984.
2. 31X-WE-00201, 202 & 204 are no longer reading, suspect cabling/connection problem.

Figure 2-16 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 2010-2011 Max. Reading	2010-2011 Maximum Pressure Readings (psi)	Date of 2009-2010 Max. Reading	2009-2010 Maximum Pressure Readings (psi)	Change in Maximum Pressure From Previous Year (psi)	Comments
35X-PE-00202	544	2-17	06/06/11	-3	06/03/10	-3	0	
35X-PE-00204	615	2-18	06/06/11	125	10/05/09	126	-1	
35X-PE-00208	673	2-19	06/06/11	5	09/01/09	6	-1	
35X-PE-00210	721	2-20	06/06/11	141	09/01/09	141	0	
35X-PE-00213	768	2-21	06/06/11	8	09/01/09	9	-1	
35X-PE-00214	768	2-21	06/06/11	6	08/03/09	7	-1	
35X-PE-00218	850	2-22	05/02/11	46	01/04/10	27	19	
35X-PE-00219	887	2.23	06/06/11	25	10/05/09	27	-2	

Table 2- Exhaust Shaft Data Analysis

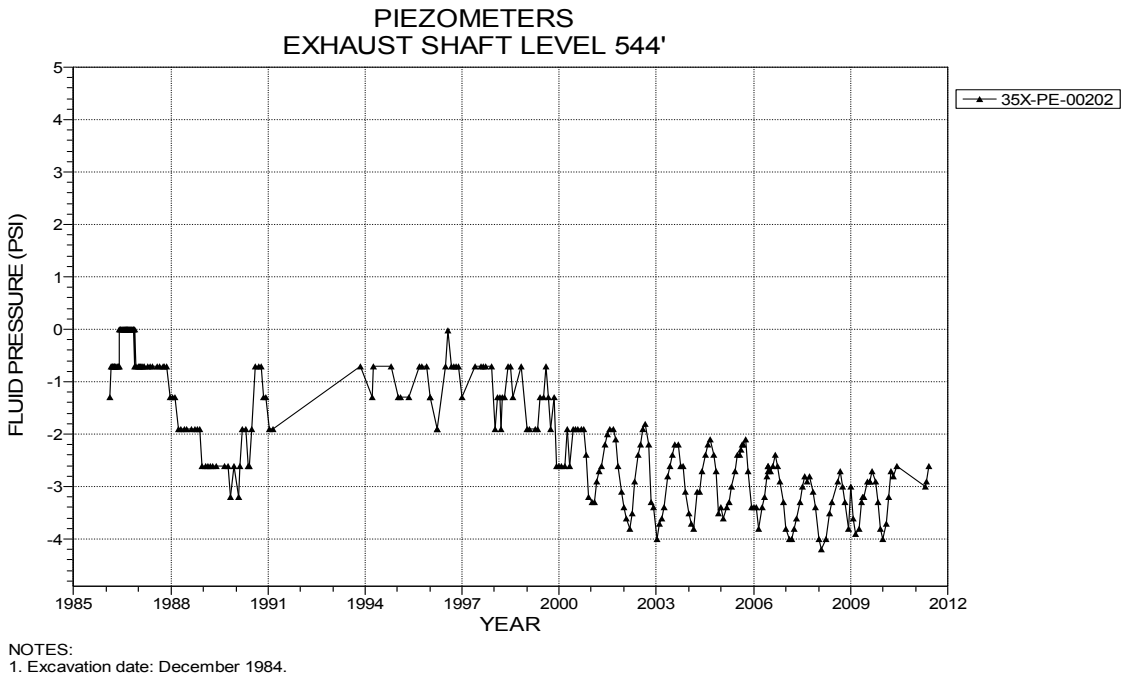


Figure 2-15 Piezometer 35X-PE-00202
Exhaust Shaft – Level 544 at the Base of Dewey Lake Redbeds

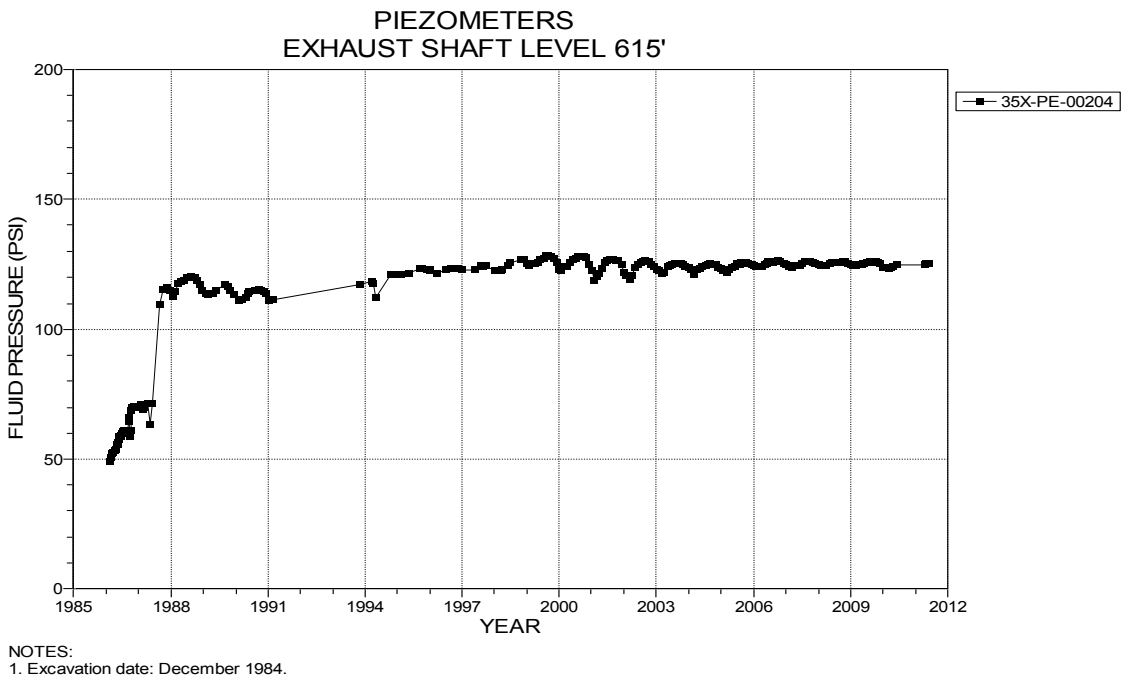


Figure 2- 16 Piezometer 35X-PE-00204
Exhaust Shaft – Level 615 at the Magenta Dolomite Member

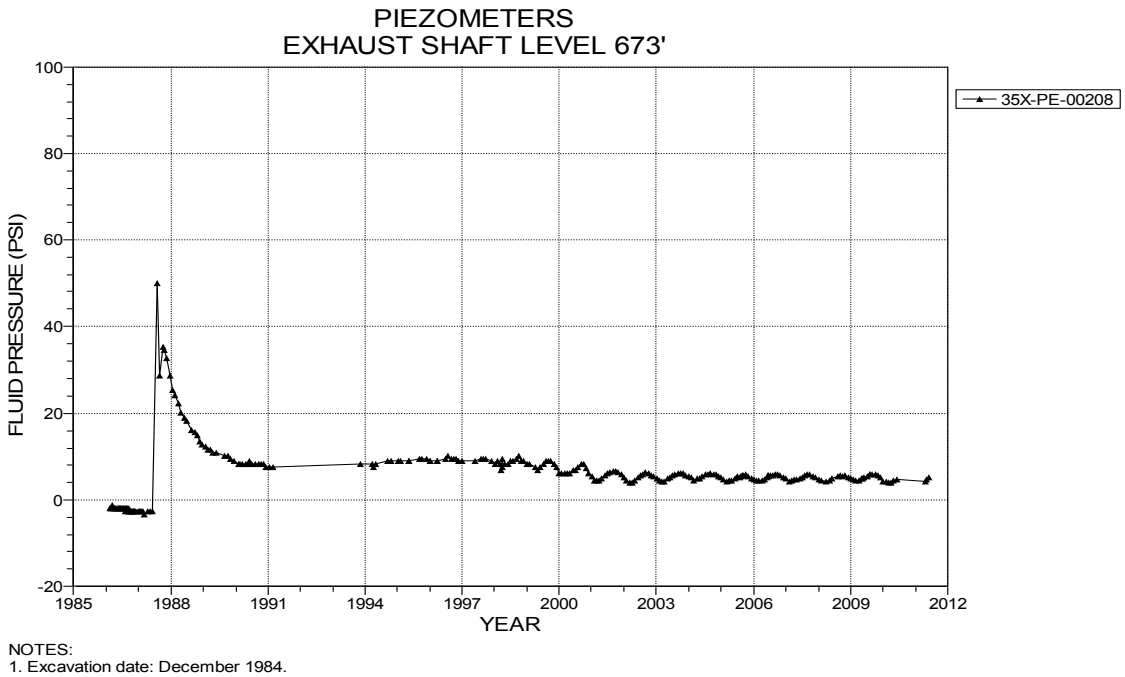


Figure 2-17 Piezometer 35X-PE-00208
Exhaust Shaft – Level 673 at the Tamarisk Member

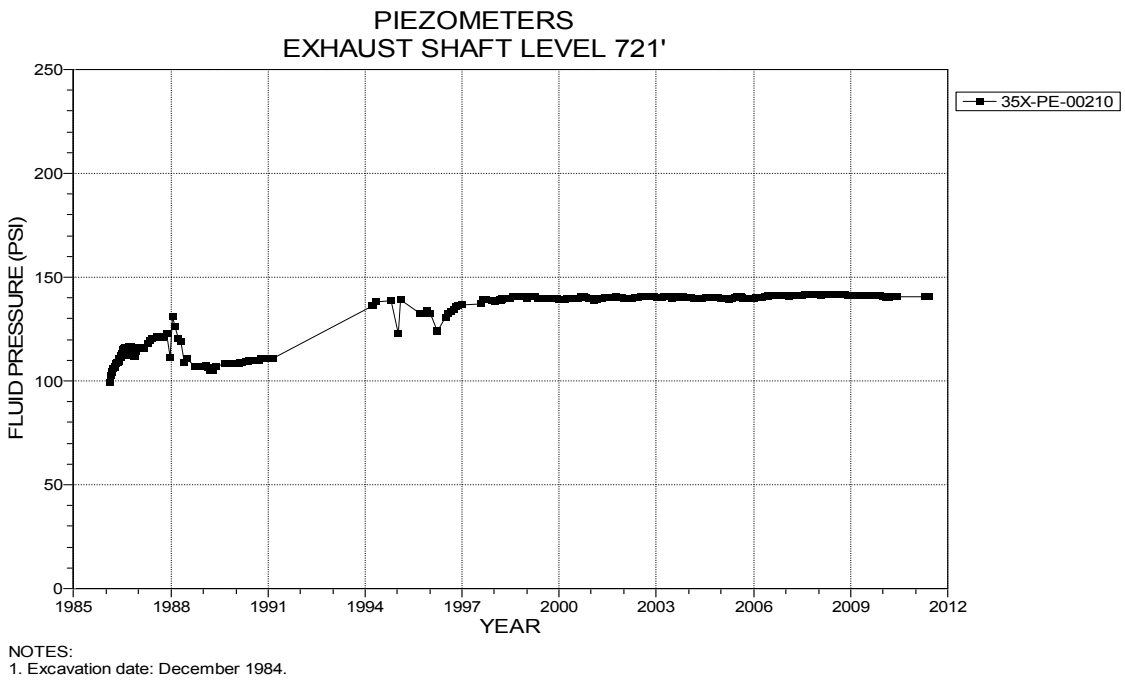


Figure 2-20 Piezometer 35X-PE-00210
Exhaust Shaft – Level 721 at the Culebra Dolomite Member

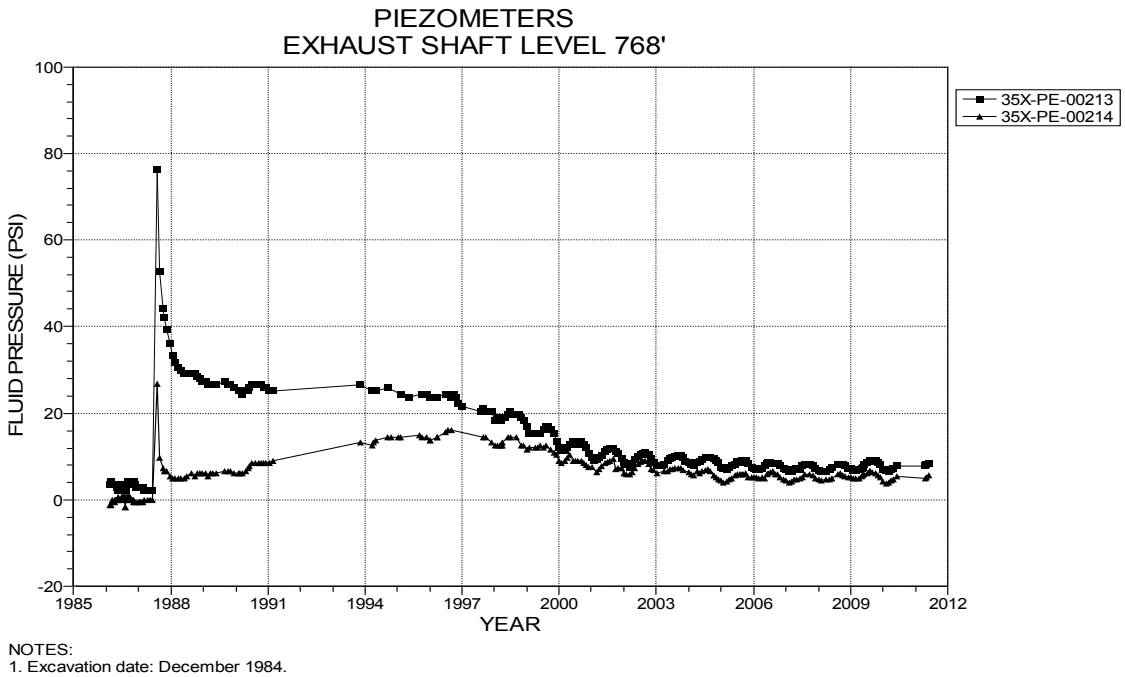


Figure 2-21 Piezometers 35X-PE-00213 and 35X-PE-00214
Exhaust Shaft – Level 768 at the Los Medaños Member

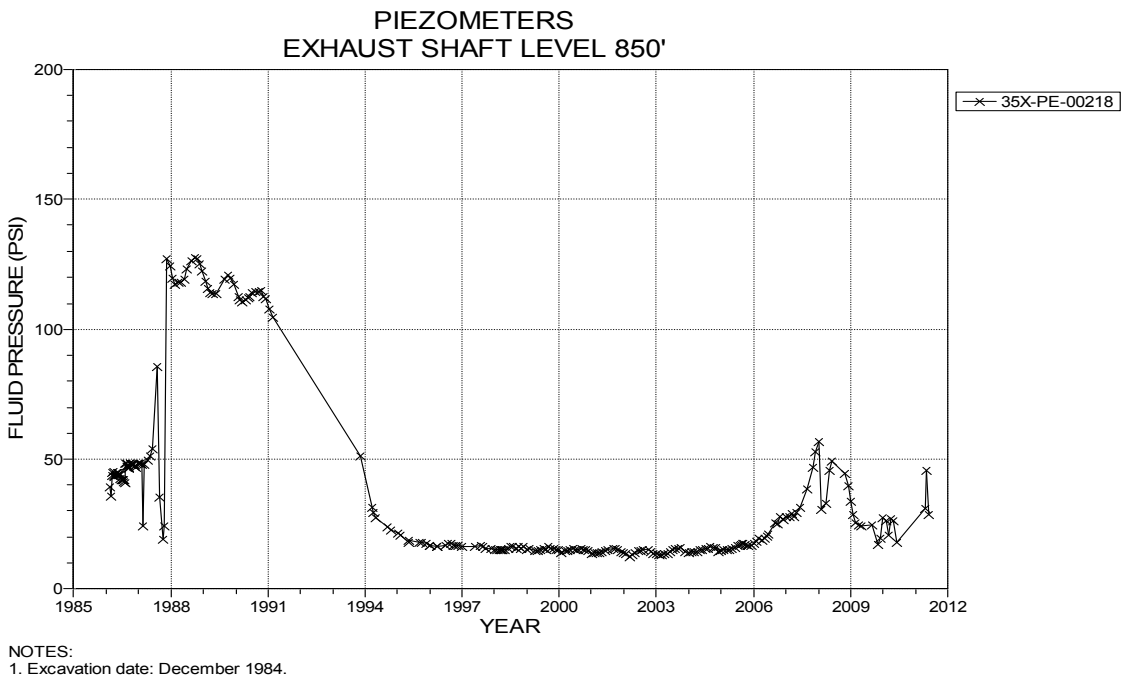
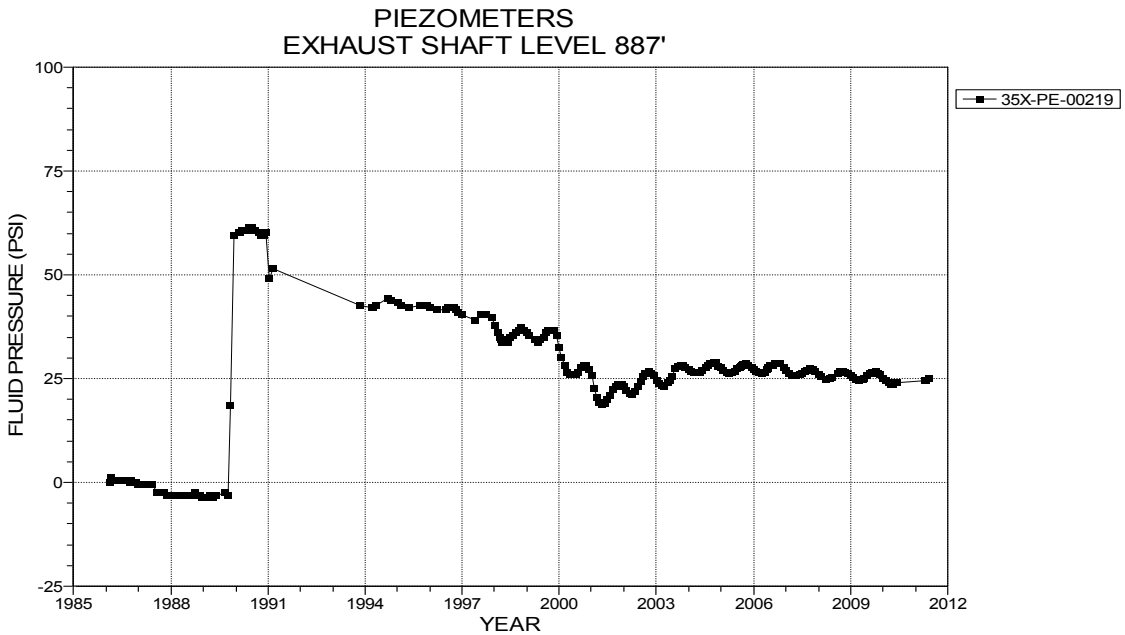


Figure 2-22 Piezometer 35X-PE-00218
Exhaust Shaft – Level 850 at the Rustler-Salado Contact



NOTES:
1. Excavation date: December 1984.

Figure 2-23 Piezometer 35X-PE-00219
Exhaust Shaft – Level 887 below the Lower Chemical Seal

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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 3-3 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 3-4 through 3-7.

Table 3-3 and Figures 3-8 through 3-13 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 2010-2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E0-S18-6 A-E	E0 Drift-S18	3-1	06/29/11	20.516	38.033	1.85	1.37	35%	
E0-S18-4 B-D	E0 Drift-S18	3-1a	06/29/11	22.389	39.407	2.01	1.52	32%	
E0-S18-4 H-F	E0 Drift-S18	3-1a	06/29/11	13.925	24.741	1.26	0.92	37%	
E0-S30-5 A-C	E0 Drift-S30	3-2	06/29/11	21.236	52.805	1.88	1.40	34%	
E0-S65-3 A-C	E0 Drift-S65	3-3	05/04/11	15.102	45.416	1.17	1.11	5%	

Table 3- Salt Handling Shaft Station Data Analysis

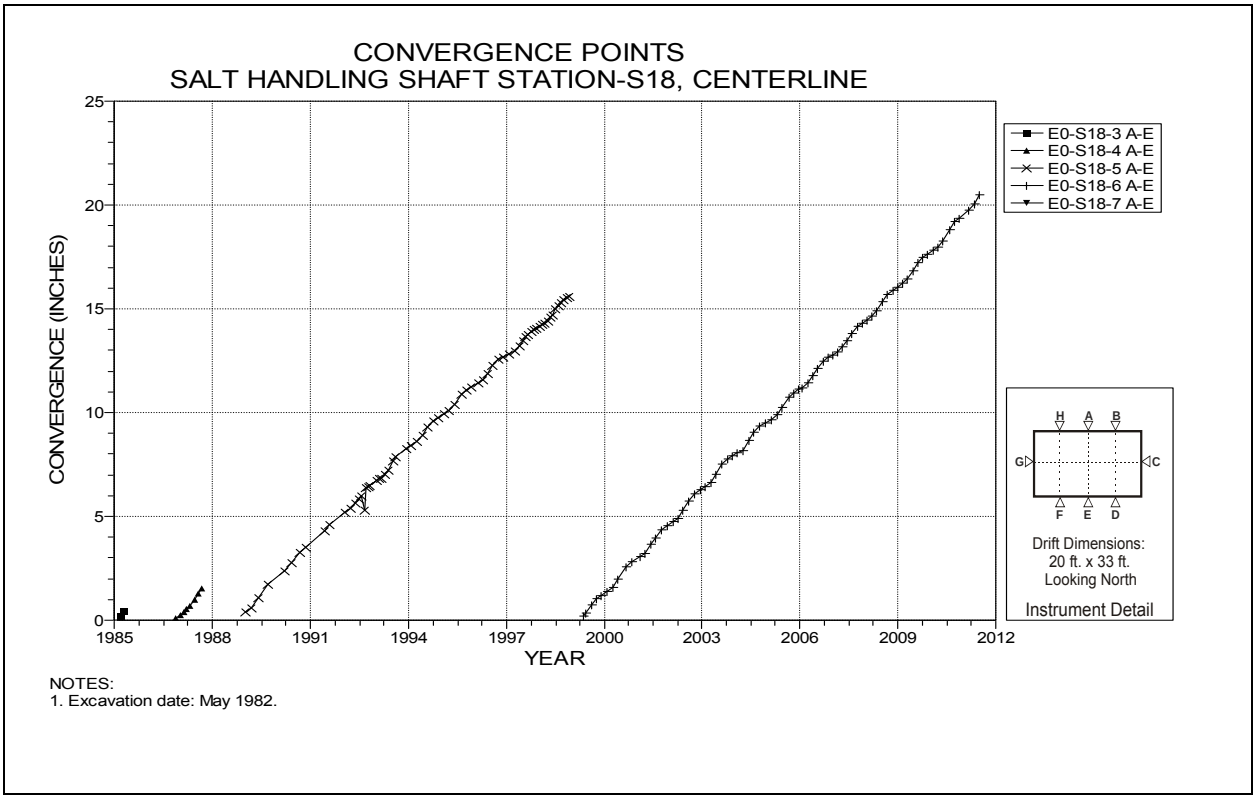

Figure 3-1 Convergence Point Array
Salt Handling Shaft Station at S18 – Centerline

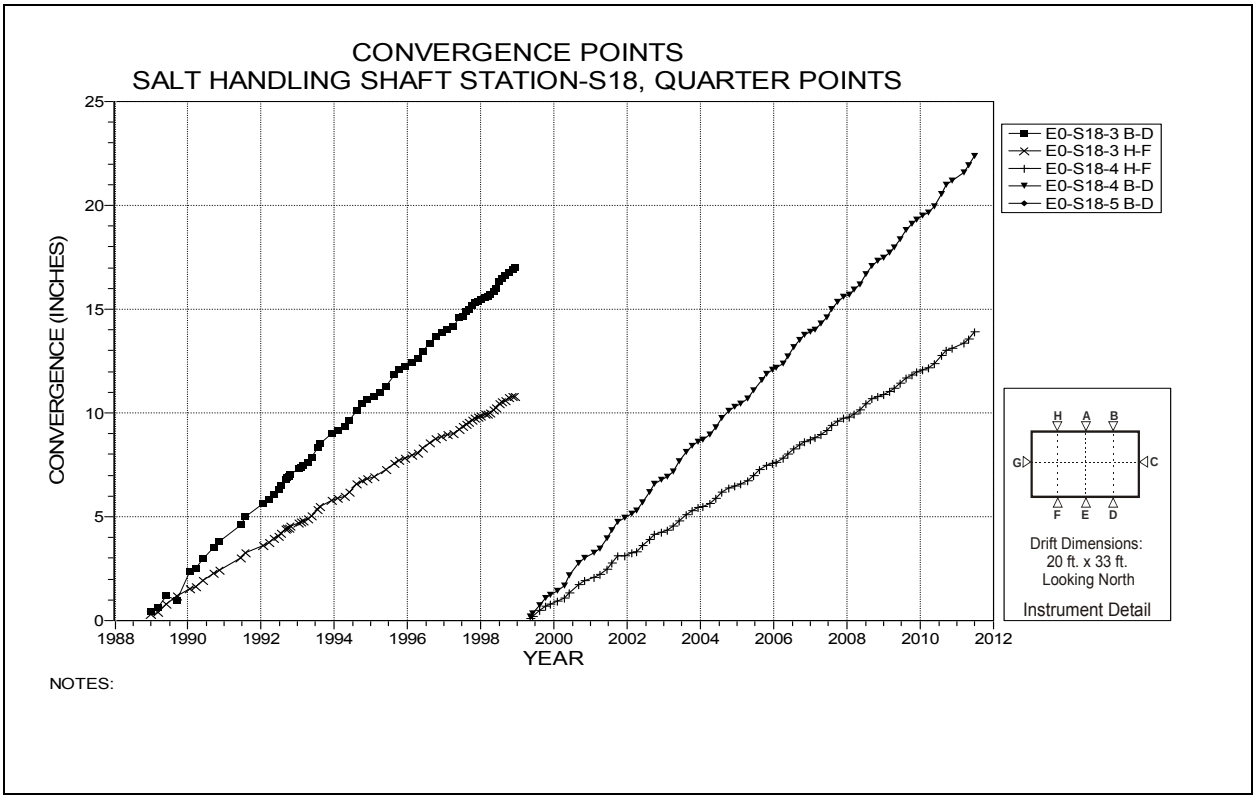

Figure 3-1a Convergence Point Array
Salt Handling Shaft Station at S18 – Quarter-Points

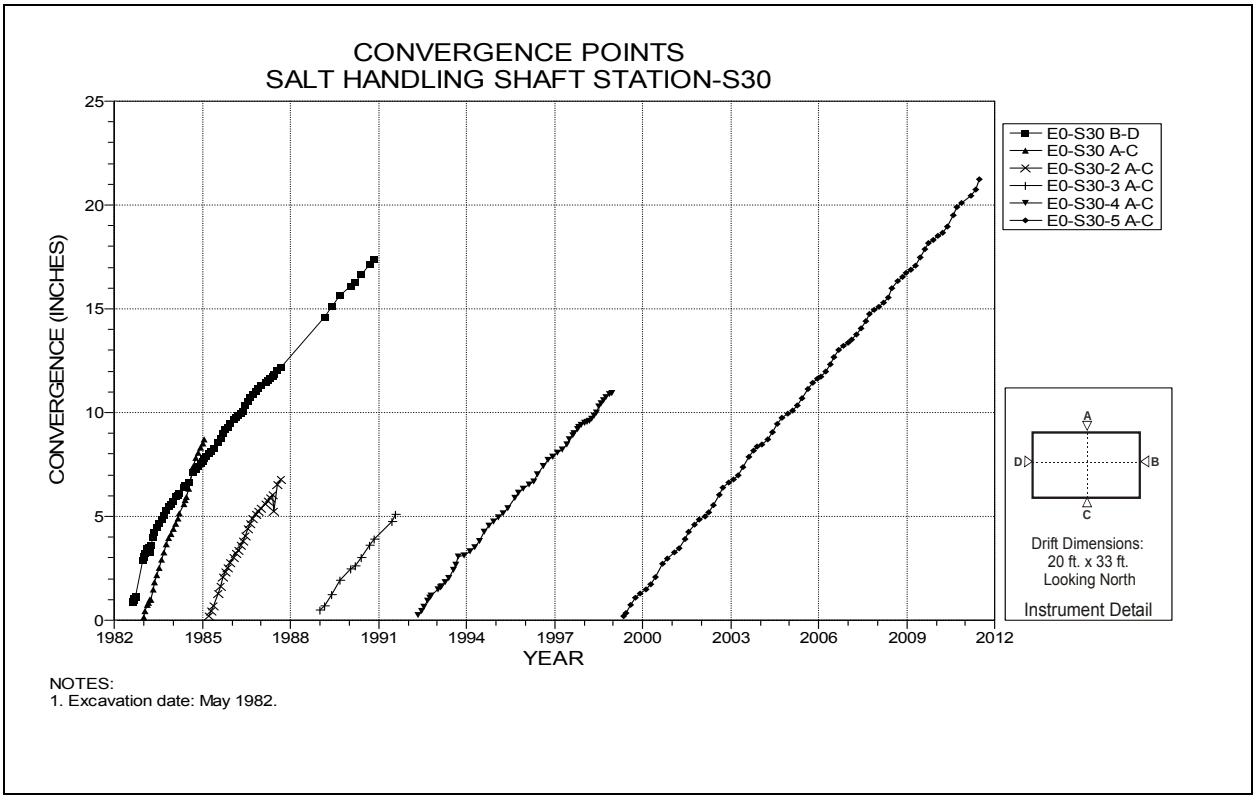

Figure 3-2 Convergence Point Array
Salt Handling Shaft Station at S30 – Roof to Floor

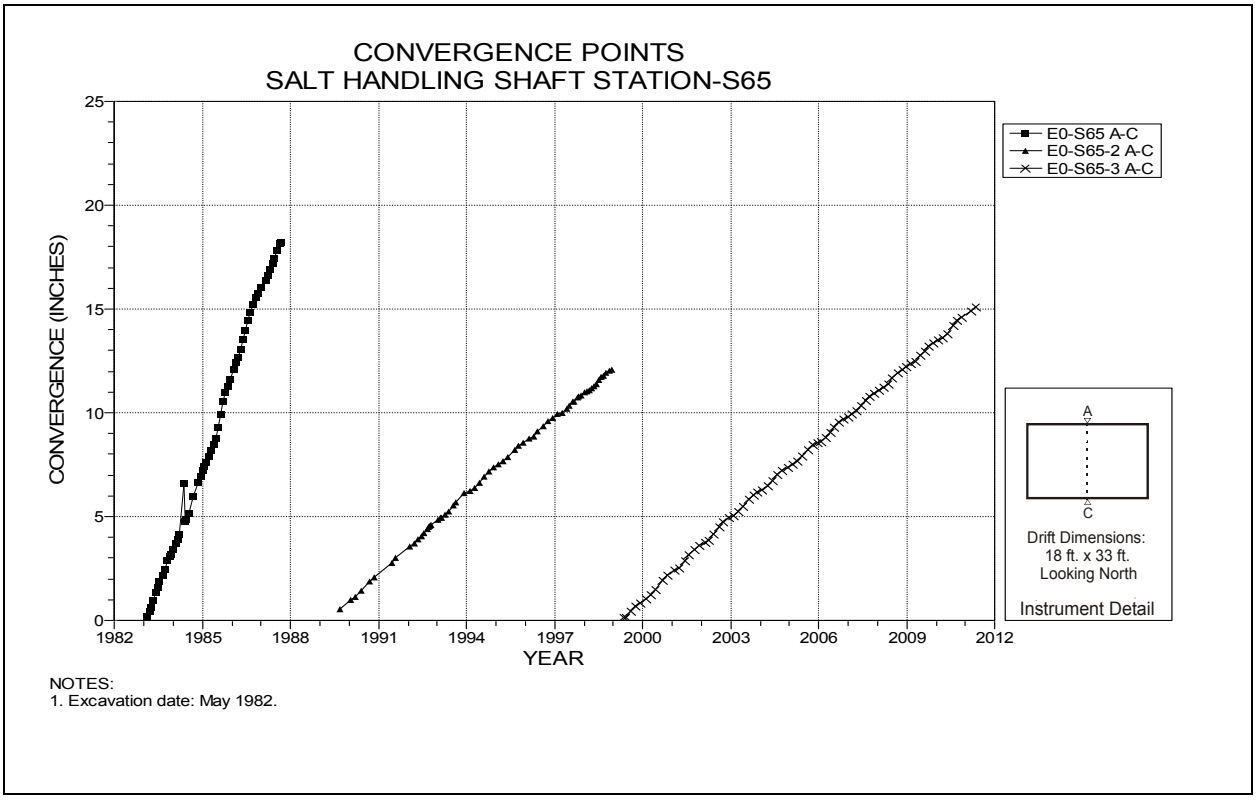

Figure 3-3 Convergence Point Array
Salt Handling Shaft Station at S65 – Roof to Floor

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 2010 to 2011 (in/year)	Displacement Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
51X-GE-00268	W30 Drift-S400	Roof	3-4	05/04/11	10.805	0.105	0.27	-61%	
51X-GE-00404-2	Waste Station	Roof	3-5	06/27/11	0.283	0.265	0.29	-9%	

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010-2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
S400-E32-2 B-D	S400-E32	3-6	06/16/11	2.918	2.918	1.26	1.17	8%	
S400-E85 B-D	S400-E85	3-7	06/16/11	2.963	2.918	1.32	1.16	14%	

Table 3- Waste Shaft Station Data Analysis

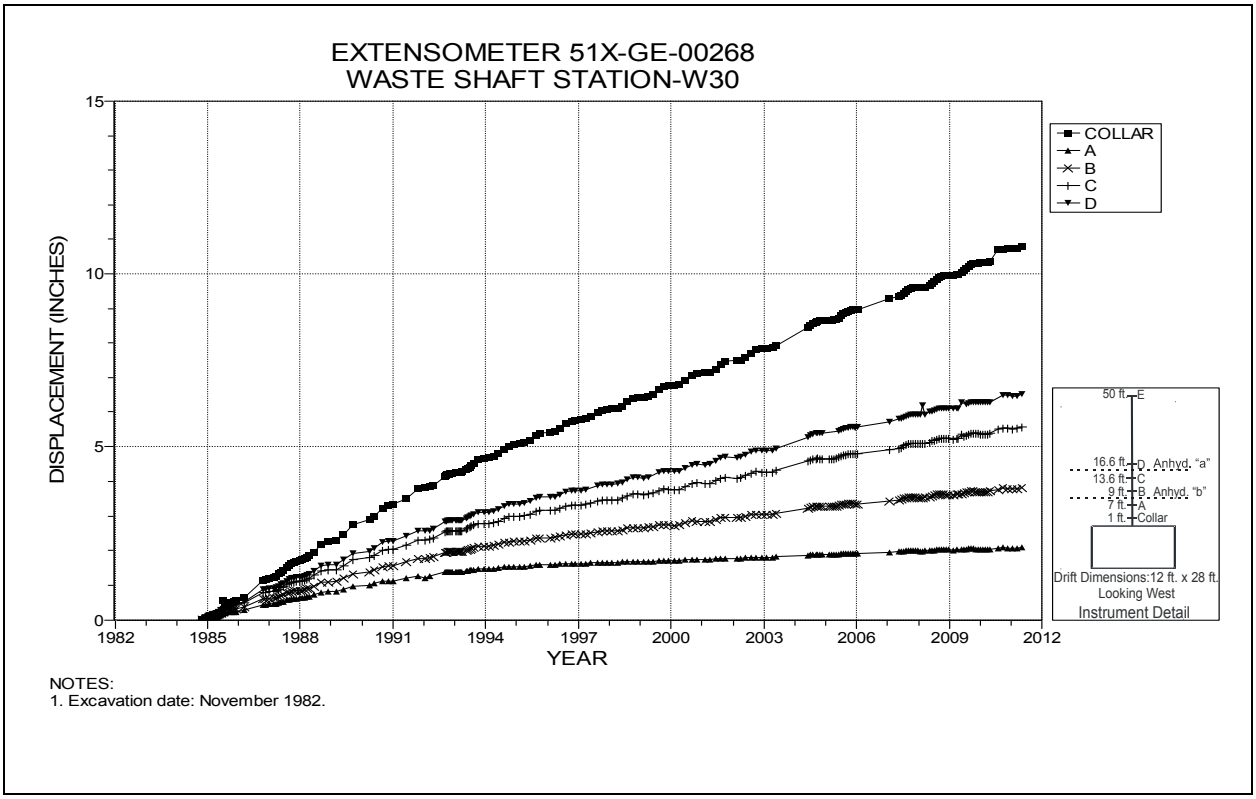

Figure 3-4 Extensometer 51X-GE-00268
Waste Shaft Station at W30 – Roof

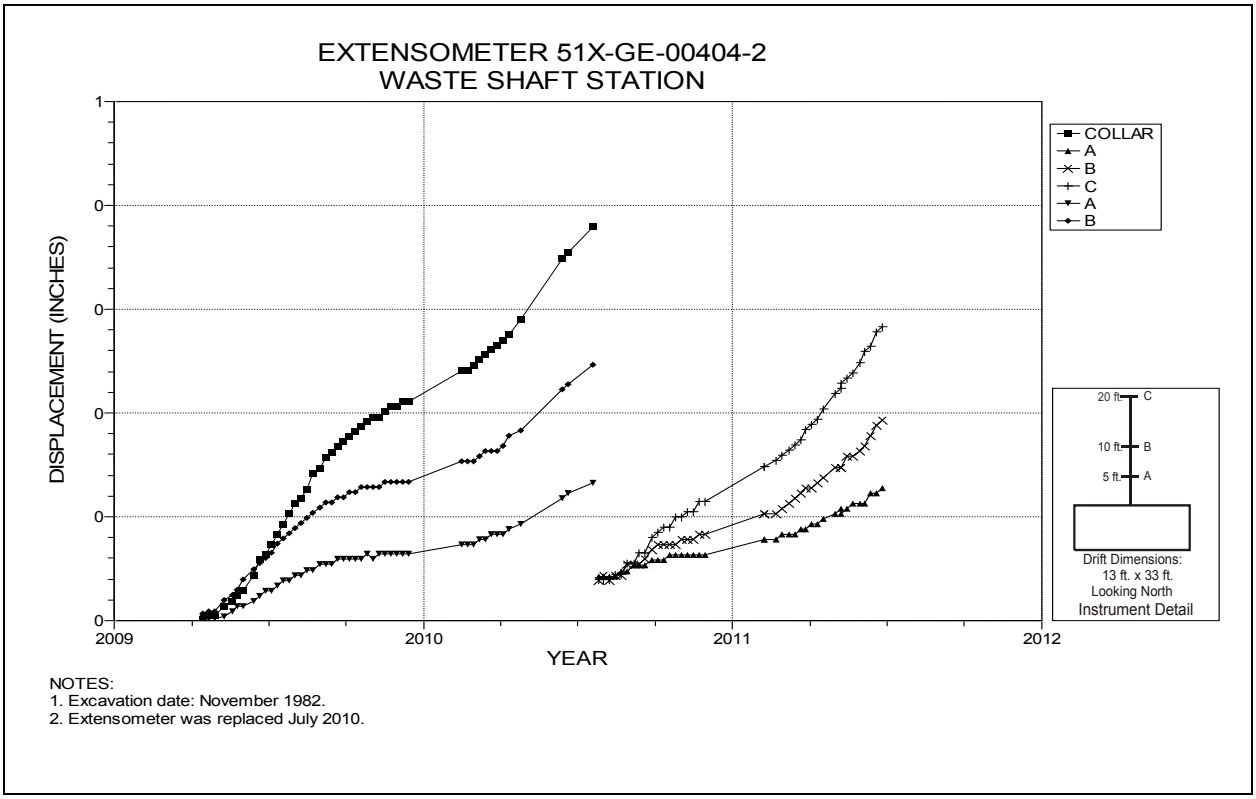

Figure 3-5 Extensometer 51X-GE-00404-2
Waste Shaft Station – Roof

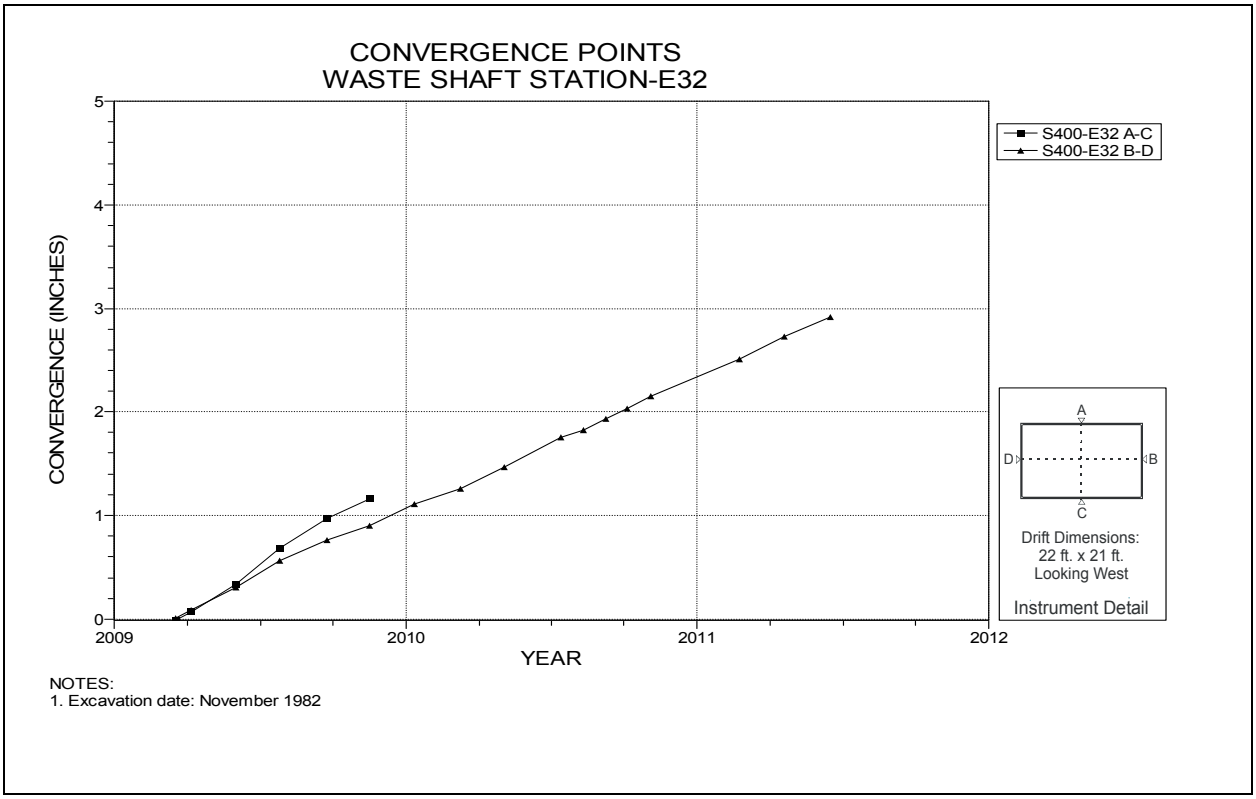

Figure 3-6 Convergence Point Array
Waste Shaft Station at E32 – All Chords

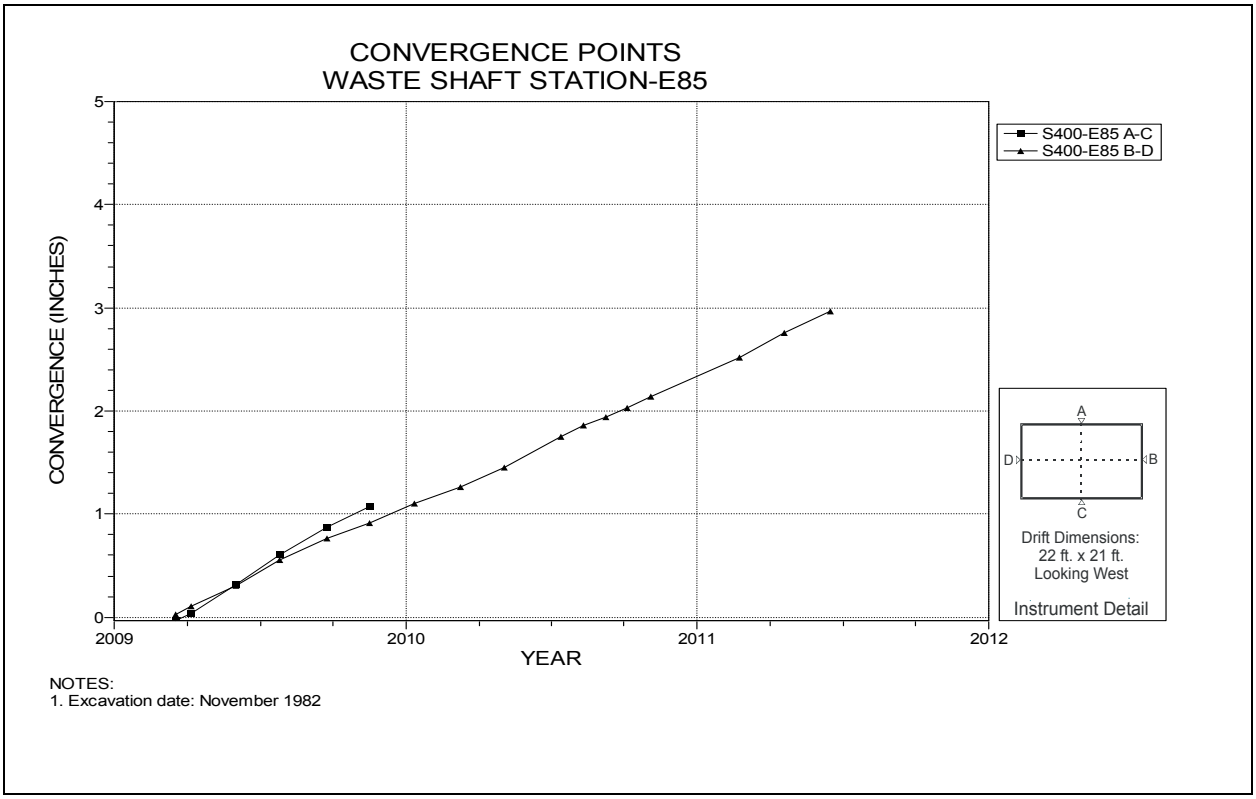

Figure 3-7 Convergence Point Array
Waste Shaft Station at E85 – All Chords

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 2010 to 2011 in/year	Displacement Rate 2009 to 2010 in/year	Rate Change Percent	Comments
41X-GE-00122	S65-W620 Roof	3-8	06/27/11	4.079	0.33	0.29	14%	
41X-GE-00123	N93-W620 Roof	3-9	06/27/11	5.084	0.01	0.35	-97%	Anchor @ max. range.

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	3-10	01/19/93	06/27/11	61.6	
51X-WG-00237	AIS Station Brow – South	3-10	01/19/93	06/27/11	1.8	
51X-WG-00238	AIS Station Brow – South	3-10	01/19/93	06/27/11	2.6	
51X-WG-00239	AIS Station Brow – South	3-10	01/19/93	06/27/11	28.0	
51X-WG-00240	AIS Station Brow – South	3-10	01/19/93	06/27/11	4.8	
51X-WG-00241	AIS Station Brow – South	3-11	01/19/93	06/27/11	66.3	
51X-WG-00242	AIS Station Brow – South	3-11	01/19/93	06/27/11	12.5	
51X-WG-00243	AIS Station Brow – South	3-11	01/19/93	06/27/11	9.3	
51X-WG-00244	AIS Station Brow – South	3-11	12/24/94	06/27/11	23.7	
51X-WG-00245	AIS Station Brow – South	3-11	01/19/93	06/27/11	0.8	
51X-WG-00246	AIS Station Brow – North	3-12	01/19/93	06/27/11	54.8	
51X-WG-00247	AIS Station Brow – North	3-12	01/19/93	06/27/11	58.4	
51X-WG-00248	AIS Station Brow – North	3-12	01/19/93	06/27/11	9.4	
51X-WG-00249	AIS Station Brow – North	3-12	01/19/93	06/27/11	36.8	
51X-WG-00250	AIS Station Brow – North	3-12	12/24/94	06/27/11	18.0	
51X-WG-00251	AIS Station Brow – North	3-13	01/19/93	06/27/11	36.9	
51X-WG-00252	AIS Station Brow – North	3-13	01/19/93	06/27/11	0.3	
51X-WG-00253	AIS Station Brow – North	3-13	01/19/93	06/27/11	55.8	
51X-WG-00254	AIS Station Brow – North	3-13	01/19/93	06/27/11	12.9	
51X-WG-00255	AIS Station Brow – North	3-13	01/19/93	06/27/11	34.0	

Table 3- Air Intake Shaft Station Data Analysis

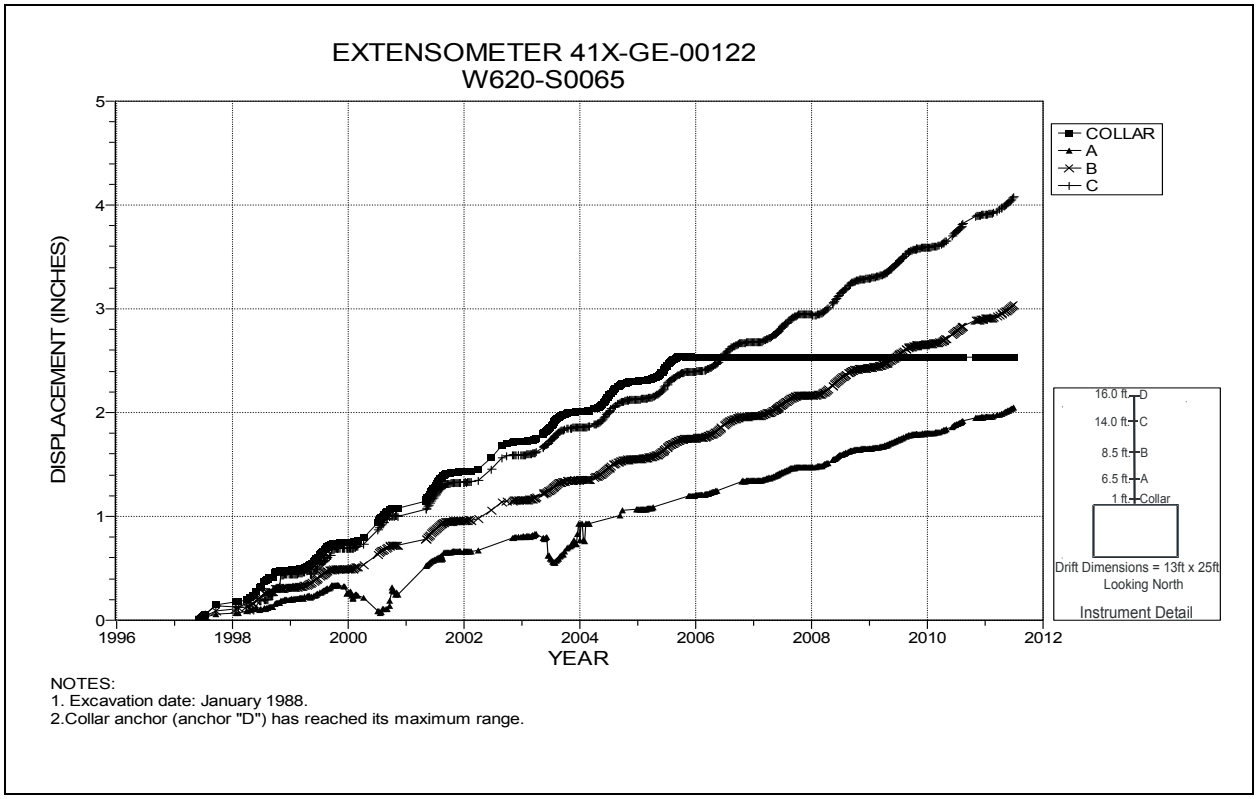

Figure 3-8 Extensometer 41X-GE-00122
Air Intake Shaft Station at S65 – Roof

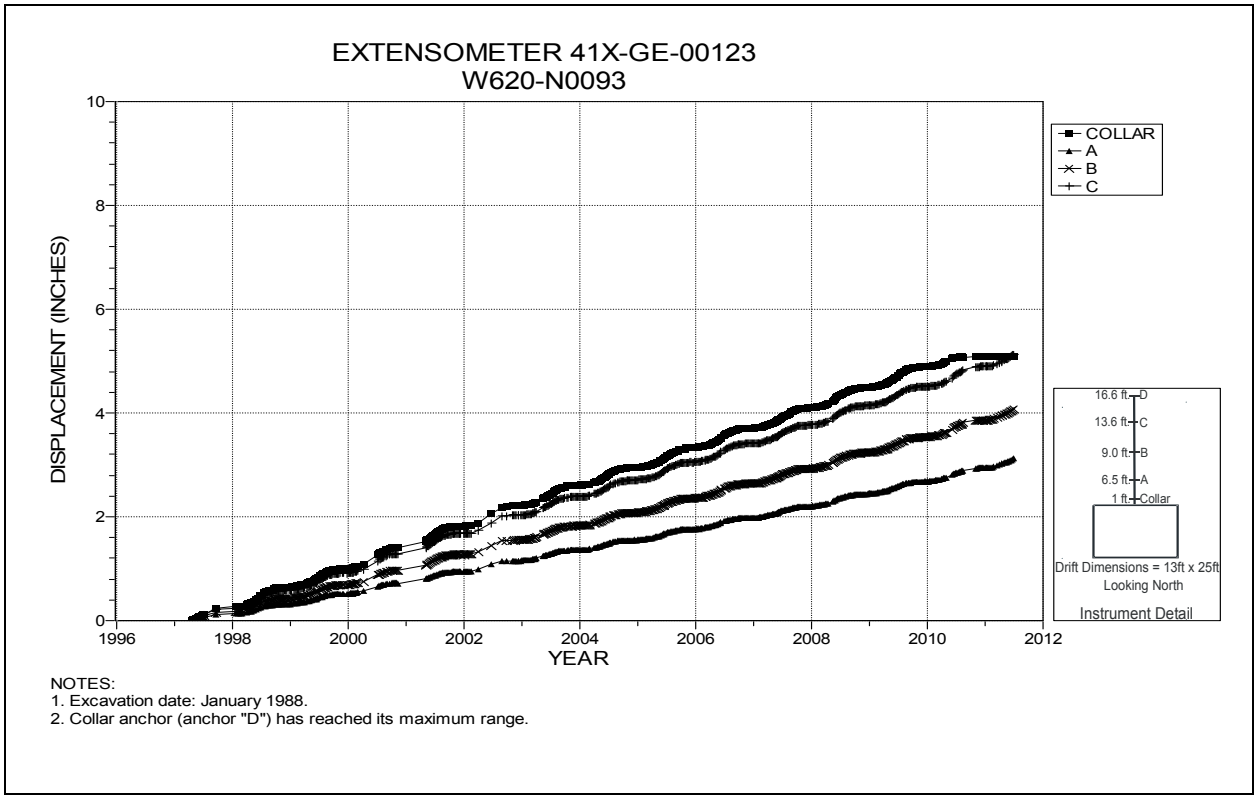

Figure 3-9 Extensometer 41X-GE-00123
Air Intake Shaft Station at N93 – Roof

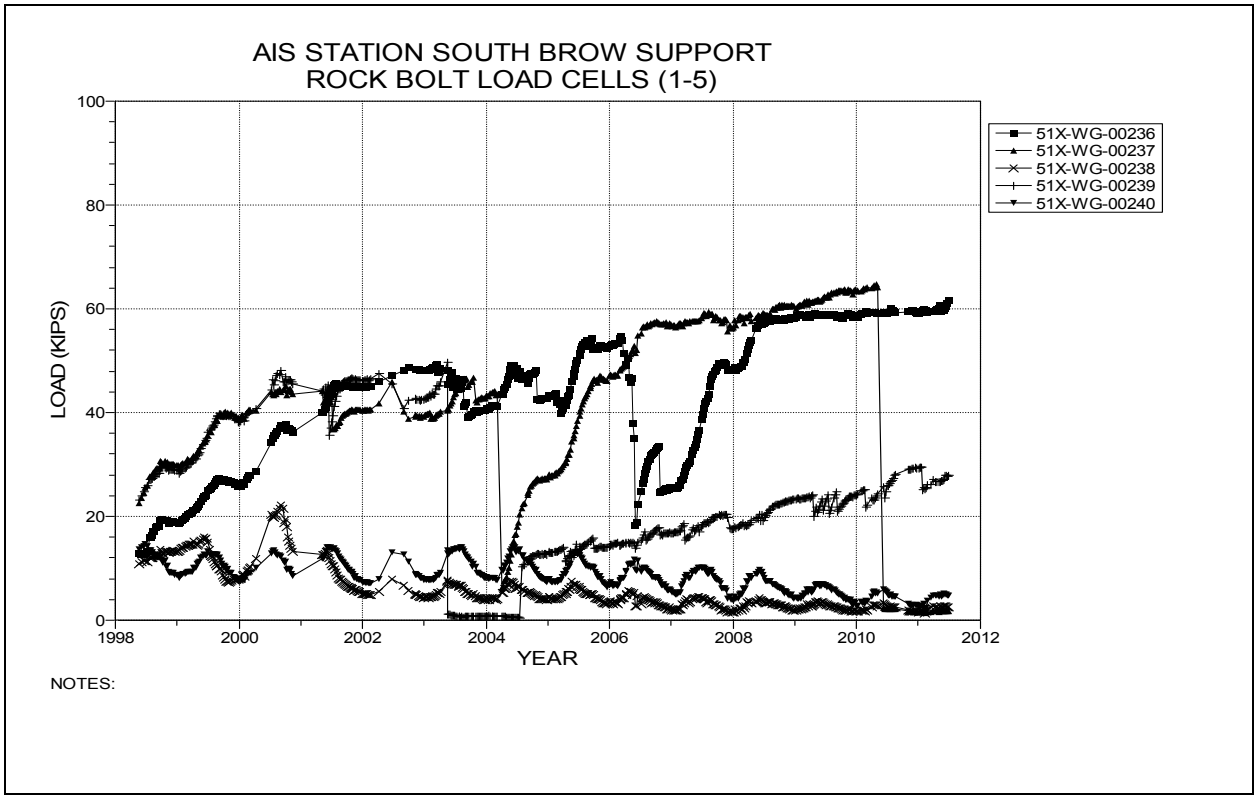

Figure 3-10 Rock Bolt Load Cells
Air Intake Shaft Station Brow – South Side Roof Bolts Set 1

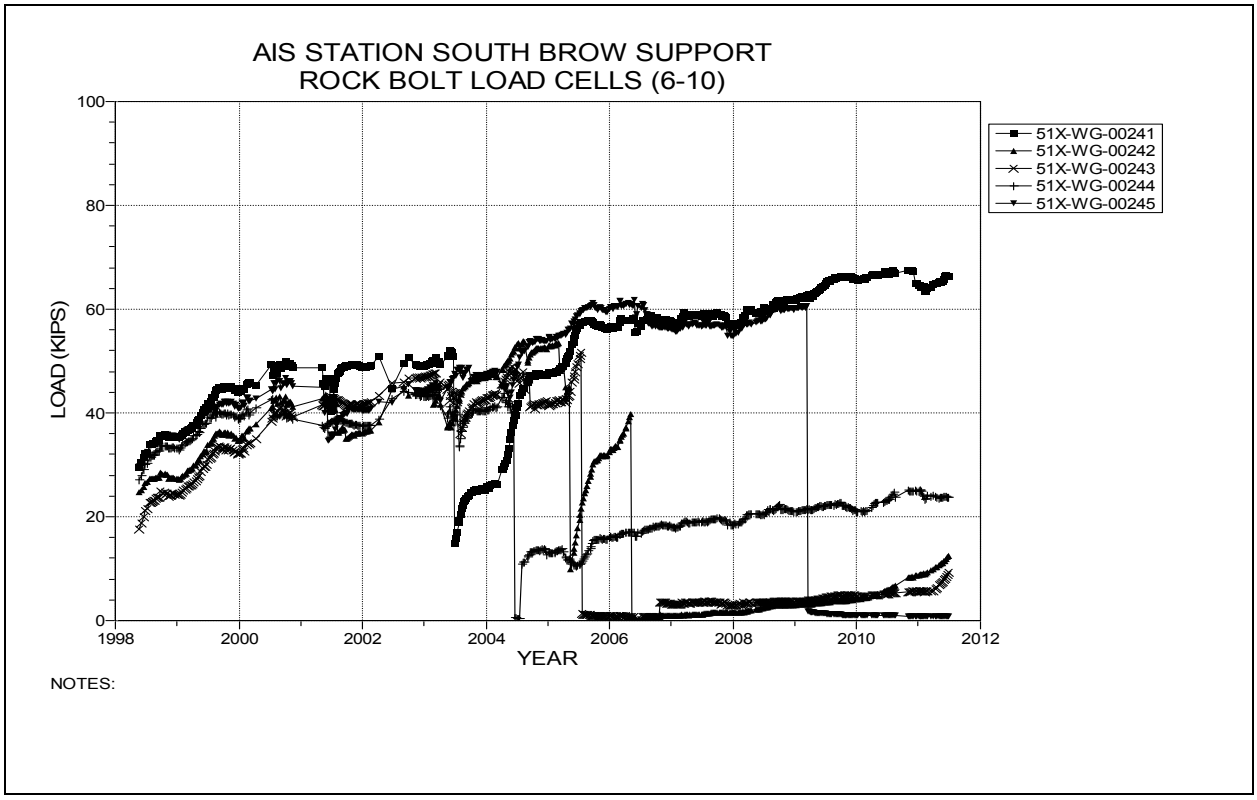

Figure 3-11 Rock Bolt Load Cells
Air Intake Shaft Station Brow – South Side Roof Bolts Set 2

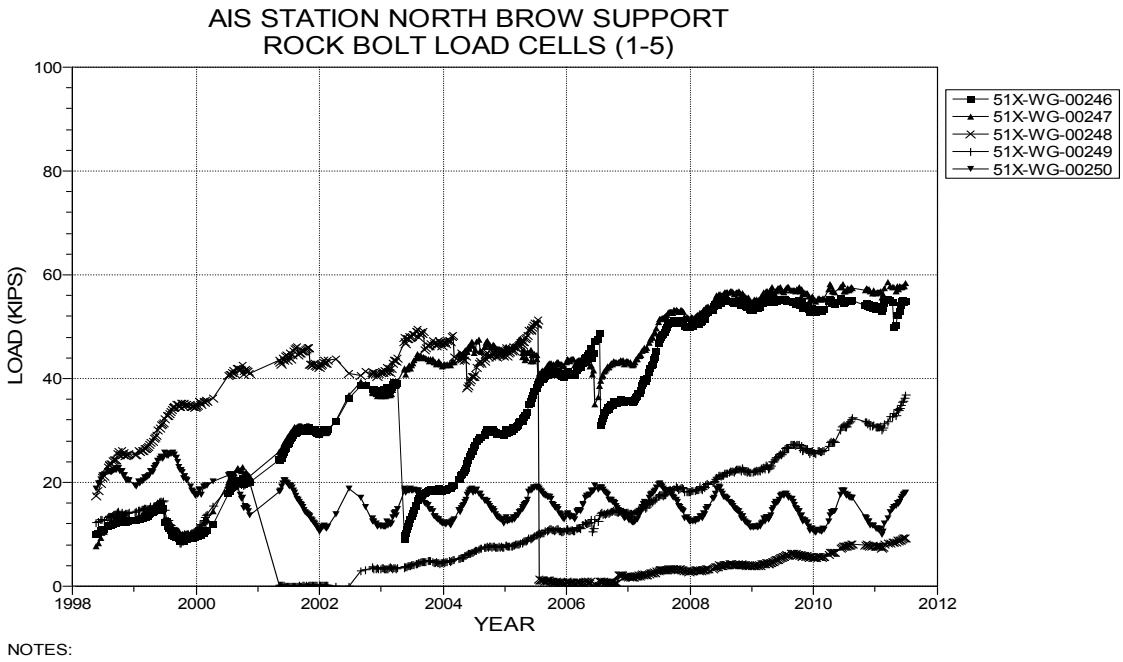

Figure 3-12 Rock Bolt Load Cells
Air Intake Shaft Station Brow – North Side Roof Bolts Set 1

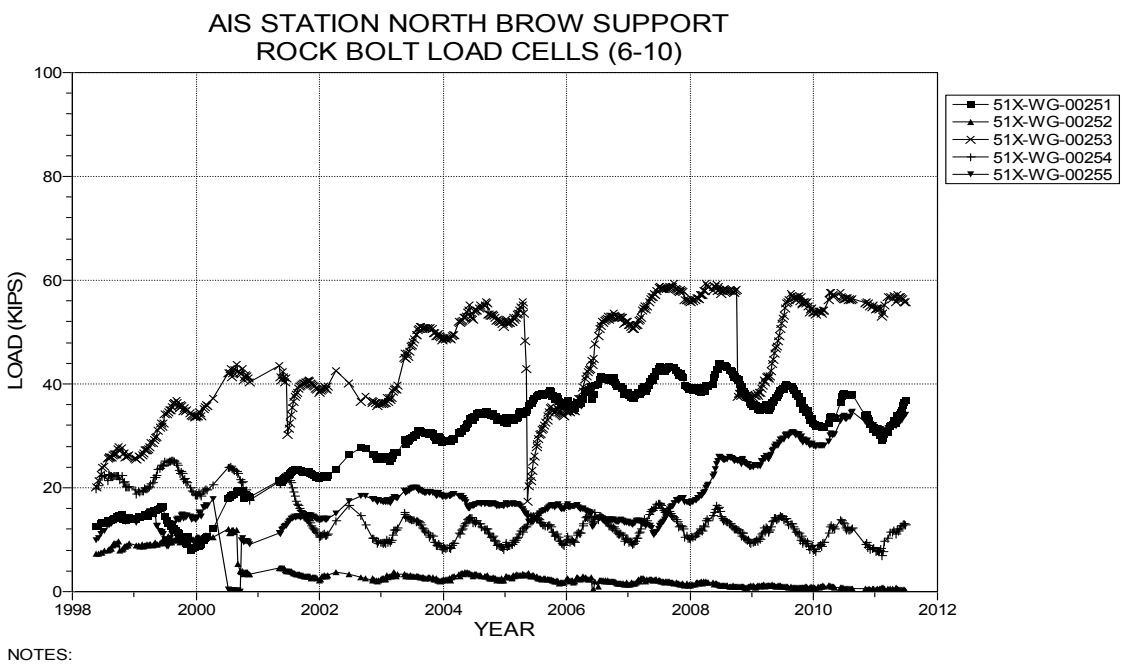

Figure 3-12 Rock Bolt Load Cells
Air Intake Shaft Station Brow – North Side Roof Bolts Set 2

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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 4-26 present data from borehole extensometers installed in the access drifts while Figures 4-27 through 4-251 present the convergence point data. Figure 4-252 through 4-261 presents data from joint meters installed at the S1950/E300 overcast and the access drifts. Figure 4-262 through 4-268 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 2010 to 2011 (in/year)	Displacement Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
51X-GE-00361	E0-N1266	Roof	4-1	06/27/11	9.246	0.96	1.01	-5%	
51X-GE-00352	E0-N940	Roof	4-2	06/27/11	5.443	1.44	1.04	38%	
51X-GE-00353	E0-N626	Roof	4-3	06/27/11	5.025	1.08	0.71	52%	
51X-GE-00355	E0-N300	Roof	4-4	06/27/11	4.658	0.58	0.49	18%	
51X-GE-00364	E140-N1266	Roof	4-5	11/29/10	4.579	0.69	0.66	5%	
51X-GE-00372	E140-S146	Roof	4-6	06/27/11	3.384	0.50	0.56	-11%	
51X-GE-00472	E140-S1000	Roof	4-7	06/15/11	5.285	0.40	0.04	900%	
51X-GE-00464	E140-S1025	Roof	4-8	06/15/11	4.535	0.40	0.15	167%	
51X-GE-00333	E140-S1075	Roof	4-9	06/27/11	6.516	0.34	0.64	-47%	
51X-GE-00465	E140-S1300	Roof	4-10	06/15/11	2.988	0.28	0.10	180%	
51X-GE-00335	E140-S1300	Roof	4-11	05/16/11	4.574	0.21	0.27	-22%	
51X-GE-00492	E140-S2750	Roof	4-12	06/15/11	3.233	0.33	0.24	38%	
51X-GE-00367-2	E140-S2916	Roof	4-13	06/27/11	8.159	2.08	1.04	100%	
51X-GE-00396	E140-S3493	Roof	4-14	06/27/11	4.757	1.66	1.38	20%	
51X-GE-00373	E300-N1341	Roof	4-15	06/27/11	3.905	1.00	0.70	43%	
51X-GE-00388	E300-N1266	Roof	4-16	06/27/11	2.783	0.60	0.54	11%	
51X-GE-00374	E300-N1186	Roof	4-17	06/27/11	4.660	0.57	0.46	24%	
51X-GE-00481	N300-W10 Brow	Roof	4-18	08/02/10	2.813	N/A	0.17	N/A	Instrument out of range.
51X-GE-00474	S1000-E120 Brow	Roof	4-19	05/26/11	1.302	0.08	0.01	700%	
51X-GE-00473	S1000-E160 Brow	Roof	4-20	05/26/11	1.093	0.06	0.01	500%	
51X-GE-00462	S1300-E120 Brow	Roof	4-21	05/26/11	0.743	0.05	0.02	150%	
51X-GE-00463	S1300-E160 Brow	Roof	4-22	05/26/11	4.576	0.56	0.22	155%	
51X-GE-00442	S1600-E120 Brow	Roof	4-23	05/26/11	1.058	0.07	-0.02	-450%	
51X-GE-00490	W30-S2750	Roof	4-24	06/30/11	3.133	0.67	0.46	46%	
51X-GE-00415	W170-S2998	Roof	4-25	06/27/11	4.104	3.51	3.23	9%	
41X-GE-00124	W519-N190	Roof	4-26	06/27/11	5.021	0.37	0.37	0%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E300-N250-3 A-C	E300-N250	4-27	06/22/11	7.654	36.608	1.68	1.50	12%	
E300-N170-2 A-E	E300-N170	4-28	06/22/11	7.847	30.341	1.79	1.55	15%	
E300-N170-2 H-F	E300-N170	4-28	06/22/11	7.197	27.257	1.68	1.42	18%	
E300-N170-2 C-G	E300-N170	4-28	06/22/11	8.809	23.653	1.45	1.23	18%	
E300-N45 A-E	E300-N45	4-29	06/22/11	30.366	30.366	1.47	1.26	17%	
E300-N45 H-F	E300-N45	4-29	06/22/11	27.200	27.200	1.36	1.12	21%	
E300-N45 C-G	E300-N45	4-29	06/22/11	22.372	22.372	1.29	1.09	18%	
E300-S45-2 A-E	E300-S45	4-30	06/22/11	24.630	24.630	1.36	1.15	18%	
E300-S45-2 B-D	E300-S45	4-30	06/22/11	22.019	22.019	1.66	1.40	19%	
E300-S45-2 H-F	E300-S45	4-30	06/22/11	21.233	21.233	1.12	0.96	17%	
E300-S45 C-G	E300-S45	4-30	06/22/11	18.699	18.699	0.98	0.73	34%	
E300-S90 A-C	E300-S90	4-31	06/23/11	18.099	18.099	0.85	0.62	37%	
E300-S250-2 A-C	E300-S250	4-32	06/23/11	8.551	12.936	0.69	0.55	25%	
E300-S250-2 B-D	E300-S250	4-32	06/23/11	9.192	13.238	0.73	0.55	33%	
E300-S700-2 A-C	E300-S700	4-33	06/23/11	0.579	20.309	1.81	0.56	223%	
E300-S850-2 A-E	E300-S850	4-34	06/23/11	0.225	11.526	0.56	0.38	47%	
E300-S850 B-D	E300-S850	4-34	11/19/10	11.301	11.301	0.35	0.38	-8%	
E300-S850-2 H-F	E300-S850	4-34	06/23/11	0.221	10.684	0.63	0.37	70%	
E300-S850-2 C-G	E300-S850	4-34	06/23/11	8.352	17.630	1.01	0.55	84%	
E300-S1000-2 A-C	E300-S1000	4-35	06/23/11	0.381	19.926	1.29	0.58	122%	
E300-S1150-4 A-E	E300-S1150	4-36	06/23/11	1.095	18.174	3.32	0.56	493%	
E300-S1150-4 B-D	E300-S1150	4-37	06/23/11	0.327	12.432	1.04	0.41	154%	
E300-S1150-4 H-F	E300-S1150	4-37	06/23/11	0.375	12.131	1.10	0.45	144%	
E300-S1150-2 C-G	E300-S1150	4-38	06/23/11	10.140	20.596	1.45	0.66	120%	
E300-S1300-2 A-C	E300-S1300	4-39	06/23/11	0.763	14.297	2.50	0.64	291%	
E300-S1450-2 A-C	E300-S1450	4-40	06/23/11	0.686	9.668	2.15	0.61	252%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E300-S1450 B-D	E300-S1450	4-40	06/23/11	11.520	11.520	1.65	0.71	132%	
E300-S1687-2 A-C	E300-S1687	4-41	06/23/11	0.432	10.289	1.46	0.78	87%	
E300-S1687 B-D	E300-S1687	4-41	06/23/11	11.415	11.415	1.42	0.78	82%	
E300-S1775-2 A-C	E300-S1775	4-42	06/23/11	0.541	9.336	1.81	0.68	166%	
E300-S1775 B-D	E300-S1775	4-42	06/23/11	11.637	11.637	1.49	0.76	96%	
E300-S1862-2 A-C	E300-S1862	4-43	06/23/11	0.682	10.135	2.38	0.74	222%	
E300-S1862 B-D	E300-S1862	4-43	06/23/11	12.615	12.615	1.78	0.84	112%	
E300-S2065-2 A-C	E300-S2065	4-44	06/23/11	0.591	11.702	1.94	0.90	116%	
E300-S2065 B-D	E300-S2065	4-44	06/23/11	16.215	16.215	2.27	1.14	99%	
E300-S2275-2 A-C	E300-S2275	4-45	06/23/11	1.115	14.541	3.79	1.06	258%	
E300-S2275 B-D	E300-S2275	4-45	06/23/11	19.030	19.030	2.60	1.46	78%	
E300-S2350-2 A-C	E300-S2350	4-46	06/23/11	1.545	17.109	5.06	1.22	315%	
E300-S2350 B-D	E300-S2350	4-46	06/23/11	19.679	19.679	2.58	1.44	79%	
E300-S2425-2 A-C	E300-S2425	4-47	06/23/11	1.325	17.547	4.35	1.37	218%	
E300-S2425 B-D	E300-S2425	4-47	06/23/11	19.761	19.761	2.45	1.36	80%	
E300-S2634-2 A-C	E300-S2634	4-48	06/23/11	0.714	14.099	2.44	1.60	53%	
E300-S2634 B-D	E300-S2634	4-48	06/23/11	14.742	14.742	2.38	1.49	60%	
E300-S2833-2 A-C	E300-S2833	4-49	06/23/11	0.576	16.868	1.95	2.11	-8%	
E300-S2833 B-D	E300-S2833	4-49	06/23/11	15.334	15.334	2.37	1.52	56%	
E300-S2916-4 A-C	E300-S2916	4-50	06/23/11	0.650	25.720	2.24	2.06	9%	
E300-S2916 B-D	E300-S2916	4-50	06/23/11	17.116	17.116	2.48	1.67	49%	
E300-S2998-4 A-C	E300-S2998	4-51	06/23/11	1.232	35.982	4.49	2.67	68%	
E300-S2998 B-D	E300-S2998	4-51	06/23/11	16.727	16.727	2.49	1.79	39%	
E300-S3195 A-C	E300-S3195	4-52	04/27/11	18.512	18.512	2.88	2.73	5%	
E300-S3195 B-D	E300-S3195	4-52	04/27/11	15.591	15.591	1.83	1.55	18%	
E300-S3480 A-C	E300-S3480	4-53	11/19/10	8.676	8.676	2.39	2.01	19%	
E300-S3480 B-D	E300-S3480	4-53	11/19/10	6.571	6.571	1.75	1.58	11%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E140-N1420-2 A-C	E140-N1420	4-54	05/12/11	11.357	27.827	1.67	1.43	17%	
E140-N1266-4 B-D	E140-N1266	4-55	05/12/11	8.591	30.596	1.34	1.11	21%	
E140-N1266-3 A-C	E140-N1266	4-55	05/12/11	17.195	54.950	2.44	2.26	8%	
E140-N1100-2 A-C	E140 -N1100	4-56	05/11/11	10.331	30.054	1.66	1.28	30%	
E140-N940-2 A-C	E140-N940	4-57	05/11/11	20.588	49.987	3.55	3.25	9%	
E140-N940-2 B-D	E140-N940	4-57	05/11/11	8.336	8.336	1.31	1.11	18%	
E140-N780-2 A-C	E140-N780	4-58	05/11/11	23.553	55.310	2.88	2.24	29%	
E140-N686-2 A-C	E140-N686	4-59	05/11/11	19.456	32.595	2.80	2.41	16%	
E140-N686-2 B-D	E140-N686	4-59	05/11/11	12.402	21.236	1.58	1.38	14%	
E140-N626-3 A-C	E140-N626	4-60	05/11/11	24.381	56.951	3.42	3.09	11%	
E140-N626-4 B-D	E140-N626	4-60	05/11/11	12.401	33.708	1.61	1.32	22%	
E140-N562-2 A-C	E140-N562	4-61	05/11/11	17.930	29.747	2.51	2.35	7%	
E140-N562-2 B-D	E140-N562	4-61	05/11/11	12.917	21.113	1.70	1.47	16%	
E140-N460-3 A-C	E140-N460	4-62	05/11/11	19.057	39.888	2.27	1.90	19%	
E140-N355-2 A-C	E140-N355	4-63	05/11/11	9.336	17.880	2.20	1.94	13%	
E140-N355 B-D	E140-N355	4-63	05/11/11	15.368	15.368	1.73	1.50	15%	
E140-N220-3 A-C	E140-N220	4-64	05/11/11	11.727	37.526	2.50	2.15	16%	
E140-N150-4 A-C	E140-N150	4-65	05/12/11	8.935	27.993	1.73	1.69	2%	
E140-N5-6 A-C	E140-N5	4-66	05/12/11	10.652	42.494	2.33	2.07	13%	
E140-N5-3 B-D	E140-N5	4-66	05/12/11	16.047	31.288	1.25	1.06	18%	
E140-S90-4 A-C	E140-S90	4-67	06/16/11	7.678	25.391	1.60	1.40	14%	
E140-S262-4 A-C	E140-S262	4-68	06/16/11	13.626	34.537	2.26	2.17	4%	
E140-S262-3 B-D	E140-S262	4-68	06/16/11	19.827	21.180	1.20	1.05	14%	
E140-S460-2 B-D	E140-S460	4-69	06/16/11	25.764	31.708	1.30	0.99	31%	
E140-S460-6 A-C	E140-S460	4-69	06/16/11	0.686	51.422	2.24	1.81	24%	
E140-S550-6 A-C	E140-S550	4-70	06/16/11	0.666	42.633	2.16	1.42	52%	
E140-S550-4 B-D	E140-S550	4-70	06/16/11	27.893	36.535	1.66	1.16	43%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E140-S700-8 A-D	E140-S700	4-71	06/15/11	0.849	30.889	2.82	1.69	67%	
E140-S700-6 B-C	E140-S0700	4-72	06/15/11	2.673	32.705	2.69	2.05	31%	
E140-S700-6 E-F	E140-S0700	4-73	06/15/11	1.608	21.605	1.61	0.98	64%	
E140-S850-9 A-C	E140-S0850	4-74	06/15/11	2.516	54.029	2.58	2.27	14%	
E140-S850-4 B-D	E140-S850	4-75	06/15/11	18.395	34.342	1.34	1.16	16%	
E140-S1000-3 A-C	E140-S1000	4-76	06/15/11	1.885	37.533	1.857	1.31	42%	
E140-S1025-4 A-C	E140-S1025	4-77	06/15/11	1.988	24.165	1.99	1.46	36%	
E140-S1075-4 A-E	E140-S1075	4-78	06/15/11	2.536	24.766	2.55	1.82	40%	
E140-S1075-4 B-D	E140-S1075	4-79	06/15/11	1.237	20.146	1.25	1.13	11%	
E140-S1075-4 F-H	E140-S1075	4-79	06/15/11	1.743	18.602	1.75	1.24	41%	
E140-S1075-2 C-G	E140-S1075	4-80	06/15/11	16.666	17.488	1.45	1.25	16%	
E140-S1150-4 A-G	E140-S1150	4-81	06/15/11	4.351	62.381	4.40	3.52	25%	
E140-S1150-5 L-H	E140-S1150	4-82	06/15/11	2.305	22.498	2.31	1.91	21%	
E140-S1150-2 D-J	E140-S1150	4-83	06/15/11	18.000	29.907	1.61	1.39	16%	
E140-S1150 C-K	E140-S1150	4-83	06/15/11	17.072	17.072	1.39	1.23	13%	
E140-S1150-2 E-I	E140-S1150	4-83	06/15/11	16.336	17.197	1.49	1.28	16%	
E140-S1225-4 A-E	E140-S1225	4-84	06/15/11	3.619	30.316	3.57	2.55	40%	
E140-S1225-2 C-G	E140-S1225	4-84	06/15/11	23.179	24.086	2.35	2.15	9%	
E140-S1225-3 B-D	E140-S1225	4-85	06/15/11	3.303	30.404	3.29	2.45	34%	
E140-S1225-3 H-F	E140-S1225	4-85	06/15/11	1.946	21.380	2.34	1.70	38%	
E140-S1300-4 A-C	E140-S1300	4-86	06/15/11	18.654	25.081	1.65	1.40	18%	
E140-S1378-3 A-E	E140-S1375	4-87	06/15/11	2.597	37.034	2.93	2.15	36%	
E140-S1378-3 B-D	E140-S1375	4-88	06/15/11	1.496	18.904	1.70	1.34	27%	
E140-S1378-3 H-F	E140-S1375	4-88	06/15/11	2.123	31.664	2.60	2.34	11%	
E140-S1378 C-G	E140-S1375	4-89	06/15/11	20.353	20.353	1.70	1.50	13%	
E140-S1450-5 A-G	E140-S1450/1456	4-90	06/15/11	3.667	75.037	4.09	3.78	8%	
E140-S1450-3 B-F	E140-S1450/1456	4-91	06/15/11	2.786	42.770	3.13	2.59	21%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E140-S1450-3 L-H	E140-S1450/1456	4-91	06/15/11	2.815	37.083	3.15	2.81	12%	
E140-S1456-2 D-J	E140-S1456	4-92	06/15/11	21.573	42.868	1.99	1.74	14%	
E140-S1456 K-C	E140-S1456	4-93	06/15/11	19.438	19.438	1.53	1.39	10%	
E140-S1450-3 I-E	E140-S1450/1456	4-93	06/15/11	1.051	19.143	1.53	1.31	17%	
E140-S1534-3 A-E	E140-S1534	4-94	06/15/11	2.644	48.807	3.06	2.97	3%	
E140-S1534-2 C-G	E140-S1534	4-94	06/15/11	19.201	20.672	1.68	1.47	14%	
E140-S1534-4 B-D	E140-S1534	4-95	06/15/11	1.989	30.864	2.31	2.26	2%	
E140-S1534-3 H-F	E140-S1534	4-95	06/15/11	2.219	33.778	2.58	2.17	19%	
E140-S1600-6 A-C	E140-S1600	4-96	06/15/11	1.756	38.493	2.03	1.82	12%	
E140-S1687-3 A-E	E140-S1687	4-97	06/15/11	3.293	43.549	3.81	3.56	7%	
E140-S1687-3 B-D	E140-S1687	4-97	06/15/11	2.136	32.997	2.51	2.65	-5%	
E140-S1687 C-G	E140-S1687	4-97	06/15/11	21.253	21.253	1.93	1.60	21%	
E140-S1687-3 H-F	E140-S1687	4-97	06/15/11	2.234	32.291	2.61	3.19	-18%	
E140-S1775-3 A-G	E140-S1775	4-98	06/15/11	3.599	61.657	4.35	4.10	6%	
E140-S1775-4 B-F	E140-S1775	4-98	06/15/11	3.275	51.363	3.96	3.62	9%	
E140-S1775-3 L-H	E140-S1775	4-98	06/15/11	2.031	29.014	2.31	2.19	5%	
E140-S1775 C-K	E140-S1775	4-99	06/15/11	20.505	20.505	1.71	1.44	19%	
E140-S1775-2 D-J	E140-S1775	4-99	06/15/11	21.442	22.693	2.15	1.75	23%	
E140-S1775-3 I-E	E140-S1775	4-99	06/15/11	7.327	21.548	2.13	1.60	33%	
E140-S1862-3 A-E	E140-S1862	4-100	06/15/11	3.294	46.977	3.96	3.82	4%	
E140-S1862-3 C-G	E140-S1862	4-100	06/15/11	14.913	21.218	2.09	1.66	26%	
E140-S1862-3 B-D	E140-S1862	4-101	06/15/11	3.255	42.344	3.96	3.48	14%	
E140-S1862-3 H-F	E140-S1862	4-101	06/15/11	1.676	23.135	2.06	1.88	10%	
E140-S1950-6 A-C	E140-S1950	4-102	06/15/11	2.703	50.887	3.22	2.47	30%	
E140-S2007-6 A-C	E140-S2007	4-103	06/15/11	3.482	37.434	4.15	3.21	29%	
E140-S2065-5 A-C	E140-S2065	4-104	06/15/11	4.404	44.767	5.26	4.15	27%	
E140-S2065-2 B-D	E140-S2065	4-104	06/15/11	14.948	21.596	2.17	1.74	25%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E140-S2122-4 A-C	E14-S2122	4-105	06/15/11	4.016	42.534	4.80	3.81	26%	
E140-S2275-4 A-C	E140-S2275	4-106	06/15/11	6.130	69.781	7.40	6.90	7%	
E140-S2275 B-D	E140-S2275	4-106	06/15/11	23.149	23.149	2.46	1.95	26%	
E140-S2350-5 A-C	E140-S2350	4-107	06/15/11	6.180	73.254	7.39	6.94	6%	
E140-S2350-2 B-D	E140-S2350	4-107	06/15/11	24.389	31.280	2.61	2.11	24%	
E140-S2425-4 A-C	E140-S2425	4-108	06/15/11	5.136	49.024	6.16	5.71	8%	
E140-S2425 B-D	E140-S2425	4-108	06/15/11	24.016	24.016	2.63	2.10	25%	
E140-S2520-3 A-C	E140-S2520	4-109	06/15/11	3.108	35.129	3.69	2.89	28%	
E140-S2634 A-C	E140-S2634	4-110	06/15/11	47.779	47.779	6.47	5.42	19%	
E140-S2634 B-D	E140-S2634	4-110	06/15/11	18.059	18.059	2.56	2.02	27%	
E140-S2750-3 A-C	E140-S2750	4-111	06/15/11	2.036	21.207	2.82	2.37	19%	
E140-S2833-3 A-C	E140-S2833	4-112	06/15/11	10.728	31.527	4.99	4.04	24%	
E140-S2833 B-D	E140-S2833	4-112	06/15/11	15.963	15.963	2.26	1.79	26%	
E140-S2915-3 A-C	E140-S2915	4-113	06/15/11	8.935	35.151	3.65	3.50	4%	
E140-S2915 B-D	E140-S2915	4-113	06/15/11	17.348	17.348	2.37	1.94	22%	
E140-S2998-3 A-C	E140-S2998	4-114	06/15/11	8.780	35.935	3.88	3.43	13%	
E140-S2998 B-D	E140-S2998	4-114	06/15/11	16.026	16.026	2.07	1.74	19%	
E140-S3080-2 A-C	E140-S3080	4-115	06/15/11	7.214	23.353	3.27	2.58	27%	
E140-S3195-2 A-C	E140-S3195	4-116	06/14/11	8.792	35.047	3.76	3.47	8%	
E140-S3195 B-D	E140-S3195	4-116	06/14/11	15.961	15.961	1.99	1.66	20%	
E140-S3295-2 A-C	E140-S3295	4-117	06/14/11	5.685	13.390	2.47	2.15	15%	
E140-S3325 A-C	E140-S3325	4-118	06/14/11	13.077	13.077	2.36	2.01	17%	
E140-S3395-2 A-C	E140-S3395	4-119	06/14/11	8.733	23.891	3.70	3.47	7%	
E140-S3395 B-D	E140-S3395	4-119	06/14/11	10.920	10.920	1.76	1.55	14%	
E140-S3480-2 A-C	E140-S3480	4-120	06/14/11	9.081	23.381	3.99	3.59	11%	
E140-S3480 B-D	E140-S3480	4-120	06/14/11	11.219	11.219	1.77	1.60	11%	
E140-S3565-2 A-C	E140-S3565	4-121	06/14/11	6.666	17.994	2.93	2.61	12%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
E140-S3565 B-D	E140-S3565	4-121	06/14/11	10.602	10.602	1.80	1.55	16%	
E140-S3650-2 A-C	E140-S3650	4-122	06/08/11	4.757	11.377	2.08	1.74	20%	
E0-N1266-4 A-C	E0-N1266	4-123	06/29/11	19.151	56.058	2.17	1.94	12%	
E0-N1110-5 A-C	E0-N1110	4-124	06/29/11	11.519	45.943	1.81	1.30	39%	
E0-N940-5 A-C	E0-N940	4-125	06/29/11	16.774	64.826	3.18	2.26	41%	
E0-N780-2 A-C	E0-N780	4-126	06/29/11	16.738	37.160	2.27	1.67	36%	
E0-N686 B-D	E0-N686	4-127	03/08/11	11.873	11.873	1.26	1.24	2%	
E0-N686 A-C	E0-N686	4-127	03/08/11	19.062	19.062	2.05	2.11	-3%	
E0-N626-4 A-C	E0-N626	4-128	05/04/11	18.086	59.045	2.02	1.91	6%	
E0-N562 A-C	E0-N562	4-129	05/04/11	14.802	14.802	1.99	1.78	12%	
E0-N562 B-D	E0-N562	4-129	05/04/11	12.902	12.902	1.65	1.42	16%	
E0-N460-3 A-C	E0-N460	4-130	06/29/11	20.679	40.768	2.39	1.52	57%	
E0-N300-6 A-C	E0-N290	4-131	06/29/11	1.160	52.205	2.78	1.52	83%	
E0-N225-2 A-C	E0-N225	4-132	06/29/11	17.617	17.664	2.02	1.60	26%	
E0-N225-2 B-D	E0-N225	4-132	06/29/11	1.527	13.832	1.63	1.60	2%	
E0-N75 A-C	E0-N80	4-133	06/29/11	17.798	17.798	1.96	1.68	17%	
E0-N75 B-D	E0-N80	4-133	06/29/11	12.476	12.476	1.40	1.13	24%	
W30-S120-2 A-C	W30-S120	4-134	06/29/11	4.865	24.859	1.03	0.88	17%	
W30-S250-5 A-C	W30-S250	4-135	06/29/11	5.832	32.065	1.37	1.08	27%	
W30-S250-5 B-D	W30-S250	4-135	06/29/11	16.652	27.606	1.14	0.84	36%	
W30-S400-2 A-C	W30-S400	4-136	06/29/11	4.990	22.818	1.17	0.77	52%	
W30-S500 B-D	W30-S500	4-137	06/29/11	26.118	26.118	1.05	0.92	14%	
W30-S500-2 A-C	W30-S500	4-137	06/29/11	4.995	27.505	1.11	1.01	10%	
W30-S700-5 A-C	W30-S700	4-138	06/29/11	2.269	36.546	2.23	1.35	65%	
W30-S850-4 A-E	W30-S0850	4-139	06/28/11	3.096	24.588	2.97	1.07	178%	
W30-S850-4 B-D	W30-S0850	4-140	06/28/11	1.518	17.348	1.49	1.02	46%	
W30-S850-3 H-F	W30-S0850	4-140	06/28/11	2.240	17.808	2.14	0.70	206%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
W30-S850-3 C-G	W30-S0850	4-141	06/28/11	1.594	24.832	1.59	1.05	51%	
W30-S1000-5 A-C	W30-S1000	4-142	06/28/11	1.053	39.232	1.98	N/A	N/A	Insufficient data
W30-S1150-2 A-C	W30-S1150	4-143	06/28/11	3.590	5.091	3.47	N/A	N/A	
W30-S1300-2 A-C	W30-S1300	4-144	06/28/11	2.328	23.566	2.25	N/A	N/A	
W30-S1453-2 A-C	W30-S1453	4-145	06/28/11	2.792	16.859	2.74	N/A	N/A	
W30-S1453-3 B-D	W30-S1453	4-145	06/28/11	1.629	15.591	1.63	N/A	N/A	
W30-S1600-3 A-C	W30-S1600	4-146	06/28/11	2.644	21.774	2.58	N/A	N/A	
W30-S1775-2 A-C	W30-S1775	4-147	06/28/11	4.525	15.022	4.50	N/A	N/A	
W30-S1775-3 B-D	W30-S1775	4-147	06/28/11	2.019	14.695	1.97	N/A	N/A	
W30-S1950-2 A-C	W30-S1950	4-148	06/28/11	3.458	23.906	3.41	1.35	153%	
W30-S2067-2 A-C	W30-S2067	4-149	06/28/11	3.518	20.367	3.65	1.61	127%	
W30-S2067-3 B-D	W30-S2067	4-149	06/28/11	2.267	17.582	2.35	N/A	N/A	
W30-S2275-3 A-C	W30-S2275	4-150	06/28/11	6.893	17.927	7.24	N/A	N/A	
W30-S2275-2 B-D	W30-S2275	4-150	06/28/11	2.430	13.610	2.57	N/A	N/A	
W30-S2350-3 A-C	W30-S2350	4-151	06/28/11	5.536	17.129	5.72	N/A	N/A	
W30-S2350-2 B-D	W30-S2350	4-151	06/28/11	2.674	15.169	2.74	N/A	N/A	
W30-S2425-3 A-C	W30-S2425	4-152	06/28/11	3.970	16.841	4.22	N/A	N/A	
W30-S2425-2 B-D	W30-S2425	4-152	06/28/11	2.608	16.092	2.76	N/A	N/A	
W30-S2520-3 A-C	W30-S2520	4-153	06/28/11	2.865	22.023	3.07	2.03	51%	
W30-S2685-3 A-C	W30-S2685	4-154	06/27/11	2.475	21.365	2.66	2.84	-6%	
W30-S2685-3 B-D	W30-S2685	4-154	06/27/11	2.216	16.486	2.38	1.59	50%	
W30-S2750-2 A-C	W30-S2750	4-155	06/27/11	2.378	14.728	2.56	1.75	46%	
W30-S2833-3 A-C	W30-S2833	4-156	06/27/11	2.164	17.837	3.83	3.11	23%	
W30-S2833-2 B-D	W30-S2833	4-156	06/27/11	2.392	14.398	2.59	2.07	25%	
W30-S2916 A-C	W30-S2916	4-157	06/27/11	32.535	32.535	7.25	5.16	41%	
W30-S2916-2 B-D	W30-S2916	4-157	06/27/11	2.021	12.405	2.19	1.64	34%	
W30-S2998 A-C	W30-S2998	4-158	06/27/11	17.267	17.267	3.86	2.74	41%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
W30-S2998-2 B-D	W30-S2998	4-158	06/27/11	1.719	12.436	1.89	1.61	17%	
W30-S3080 A-C	W30-S3080	4-159	06/27/11	22.040	22.040	2.17	2.24	-3%	
W30-S3195 A-C	W30-S3195	4-160	06/27/11	16.578	16.578	2.41	2.03	19%	
W30-S3195 B-D	W30-S3195	4-160	06/27/11	12.707	12.707	1.61	1.42	13%	
W30-S3310 A-C	W30-S3310	4-161	06/27/11	15.432	15.432	1.82	1.64	11%	
W30-S3395 A-C	W30-S3395	4-162	06/27/11	10.828	10.828	1.86	1.71	9%	
W30-S3395 B-D	W30-S3395	4-162	06/27/11	9.039	9.039	1.52	1.35	13%	
W30-S3480 A-C	W30-S3480	4-163	06/30/11	12.797	12.797	2.72	2.25	21%	
W30-S3480 B-D	W30-S3480	4-163	06/30/11	8.806	8.806	1.45	1.30	12%	
W30-S3565-2 A-C	W30-S3565	4-164	06/30/11	3.405	9.230	1.64	1.37	20%	
W30-S3565 B-D	W30-S3565	4-164	06/30/11	8.868	8.868	1.44	1.31	10%	
W30-S3650-2 A-C	W30-S3650	4-165	06/07/11	4.351	10.003	1.96	1.59	23%	
W170-N150-3 A-C	W170-N150	4-166	06/02/11	2.056	10.408	0.68	0.49	39%	
W170-S5 A-C	W170-S5	4-167	06/02/11	14.708	14.708	0.42	0.58	-28%	
W170-S5-2 B-D	W170-S5	4-167	06/02/11	9.133	16.899	0.58	0.70	-17%	
W170-S90-3 A-C	W170-S90	4-168	06/02/11	8.381	15.583	0.86	0.81	6%	
W170-S232-2 A-C	W170-S232	4-169	06/01/11	6.311	11.900	0.60	0.53	13%	
W170-S232-2 B-D	W170-S232	4-169	06/01/11	9.590	12.232	0.64	0.53	21%	
W170-S400 A-C	W170-S400	4-170	06/01/11	14.511	14.511	0.76	0.62	23%	
W170-S560-4 A-C	W170-S560	4-171	06/01/11	2.107	12.926	0.62	0.63	-2%	
W170-S560-3 B-D	W170-S560	4-171	06/01/11	1.206	14.034	0.747	0.66	13%	
W170-S700-2 A-C	W170-S700	4-172	06/01/11	2.576	22.369	0.65	0.75	-13%	
W170-S850-7 A-E	W170-S850	4-173	06/01/11	2.171	19.160	0.60	0.70	-14%	
W170-S850-6 B-D	W170-S850	4-174	06/01/11	1.872	14.612	0.53	0.60	-12%	
W170-S850-7 H-F	W170-S850	4-175	06/01/11	1.557	13.178	0.36	0.51	-29%	
W170-S850-3 C-G	W170-S850	4-176	06/01/11	11.229	22.042	0.66	0.82	-20%	
W170-S1000-3 A-C	W170-S1000	4-177	06/01/11	3.137	26.050	0.96	0.92	4%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
W170-S1150-4 A-E	W170-S1150	4-178	06/01/11	2.558	22.987	0.73	0.82	-11%	
W170-S1150-4 B-D	W170-S1150	4-178	06/01/11	2.049	16.246	0.59	0.66	-11%	
W170-S1150-2 H-F	W170-S1150	4-178	06/01/11	2.041	15.447	0.57	0.65	-12%	
W170-S1150-2 C-G	W170-S1150	4-179	06/01/11	12.633	24.210	0.89	0.96	-7%	
W170-S1300-4 A-C	W170-S1300	4-180	06/01/11	5.794	26.752	1.69	1.71	-1%	
W170-S1445-4 A-C	W170-S1445	4-181	06/01/11	4.572	15.864	1.56	1.34	16%	
W170-S1445-2 B-D	W170-S1445	4-181	06/01/11	11.851	14.509	1.15	0.98	17%	
W170-S1600-4 A-C	W170-S1600	4-182	06/01/11	3.366	18.131	1.55	1.45	7%	
W170-S1779-3 A-C	W170-S1779	4-183	06/01/11	4.417	19.388	1.55	1.25	24%	
W170-S1779-2 B-D	W170-S1779	4-183	06/01/11	14.216	17.351	1.47	1.17	26%	
W170-S1950-3 A-C	W170-S1950	4-184	06/01/11	3.281	16.462	1.37	1.01	36%	
W170-S2060-2 A-C	W170-S2060	4-185	06/01/11	12.168	17.701	1.55	1.06	46%	
W170-S2060-2 B-D	W170-S2060	4-185	06/01/11	15.324	18.648	2.01	1.29	56%	
W170-S2180-2 A-C	W170-S2180	4-186	06/28/11	16.630	22.620	2.66	1.31	103%	
W170-S2275 A-C	W170-S2275	4-187	06/27/11	13.609	13.609	2.02	1.22	66%	
W170-S2275 B-D	W170-S2275	4-187	06/27/11	15.245	15.245	2.53	1.44	76%	
W170-S2350 A-C	W170-S2350	4-188	06/27/11	18.018	18.018	2.65	1.70	56%	
W170-S2350 B-D	W170-S2350	4-188	06/27/11	15.352	15.352	2.40	1.31	83%	
W170-S2425 A-C	W170-S2425	4-189	06/27/11	15.959	15.959	2.22	1.53	45%	
W170-S2425 B-D	W170-S2425	4-189	06/27/11	17.100	17.100	2.70	1.80	50%	
W170-S2520 A-C	W170-S2520	4-190	06/27/11	20.036	20.036	3.16	1.72	84%	
W170-S2685-2 A-C	W170-S2685	4-191	06/30/11	20.326	22.172	2.09	2.08	0%	
W170-S2685-2 B-D	W170-S2685	4-191	06/30/11	15.934	17.797	2.45	1.82	35%	
W170-S2833 A-C	W170-S2833	4-192	06/27/11	25.063	25.063	6.09	5.08	20%	
W170-S2833 B-D	W170-S2833	4-192	06/27/11	14.960	14.960	3.03	2.40	26%	
W170-S2916 A-C	W170-S2916	4-193	06/27/11	24.282	24.282	3.86	3.03	27%	
W170-S2916 B-D	W170-S2916	4-193	06/27/11	14.355	14.355	2.56	2.10	22%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
W170-S2998 A-C	W170-S2998	4-194	06/27/11	31.589	31.589	6.62	6.31	5%	
W170-S2998-2 B-D	W170-S2998	4-194	06/27/11	2.632	15.325	3.07	2.60	18%	
W170-S3080 A-C	W170-S3080	4-195	06/27/11	20.406	20.406	3.57	3.24	10%	
W170-S3195 A-C	W170-S3195	4-196	06/27/11	19.540	19.540	3.57	2.87	24%	
W170-S3195 B-D	W170-S3195	4-196	06/27/11	13.785	13.785	2.02	1.82	11%	
W170-S3310 A-C	W170-S3310	4-197	06/27/11	17.863	17.863	2.30	2.10	10%	
W170-S3395 A-C	W170-S3395	4-198	06/27/11	16.616	16.616	3.67	4.19	-12%	
W170-S3395 B-D	W170-S3395	4-198	06/27/11	10.257	10.257	1.94	1.83	6%	
W170-S3480 A-C	W170-S3480	4-199	06/27/11	18.036	18.036	3.60	4.25	-15%	
W170-S3480 B-D	W170-S3480	4-199	06/27/11	13.358	13.358	2.33	2.27	3%	
W170-S3565 A-C	W170-S3565	4-200	06/30/11	11.243	11.243	2.07	1.86	11%	
W170-S3565 B-D	W170-S3565	4-200	06/30/11	9.489	9.489	1.53	1.47	4%	
W170-S3650-2 A-C	W170-S3650	4-201	06/07/11	4.288	11.933	1.90	1.61	18%	
N780-E70 A-C	N780-E70	4-202	06/29/11	11.516	11.516	1.43	1.24	15%	
N780-E70 B-D	N780-E70	4-202	06/29/11	11.455	11.455	1.43	1.23	16%	
N460-E70-3 A-C	N460-E70	4-203	06/29/11	13.540	29.986	1.51	1.38	9%	
N460-E70-2 B-D	N460-E70	4-203	06/29/11	14.669	26.367	1.56	1.42	10%	
N300-W170-2 A-C	N300-W170	4-204	05/10/11	12.575	34.835	1.55	1.41	10%	
N300-W170-2 B-D	N300-W170	4-204	05/10/11	15.533	23.728	1.28	1.09	17%	
N250-E220-2 A-E	N250-E220	4-205	06/22/11	12.174	35.801	2.58	2.27	14%	
N250-E220-2 B-D	N250-E220	4-205	06/22/11	8.440	33.382	1.79	1.60	12%	
N250-E220-2 H-F	N250-E220	4-205	06/22/11	7.341	25.766	1.55	1.33	17%	
N250-E220 C-G	N250-E220	4-205	06/22/11	24.623	24.623	1.56	1.29	21%	
N215-W500-2 A-C	N215-W500	4-206	05/10/11	10.503	28.832	1.33	1.19	12%	
N215-W500-2 B-D	N215-W500	4-206	05/10/11	11.883	18.701	0.95	0.74	28%	
N215-W620-2 A-C	N215-W620	4-207	05/10/11	7.767	23.985	1.04	0.85	22%	
N140-E90-2 A-C	N140-E90	4-208	05/12/11	2.447	16.584	0.70	0.77	-9%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
N140-E90 B-D	N140-E90	4-208	05/12/11	17.870	17.870	0.86	0.79	9%	
S90-W120 A-C	S90-W120	4-209	06/02/11	7.399	7.399	0.63	0.63	0%	
S90-W120 B-D	S90-W120	4-209	06/01/11	7.894	7.894	0.71	0.68	4%	
S90-W400-2 A-C	S90-W400	4-210	06/02/11	4.055	17.404	0.47	0.63	-25%	
S90-W400-2 B-D	S90-W400	4-210	06/02/11	8.964	16.858	0.47	0.61	-23%	
S90-W590-2 A-C	S90-W590	4-211	06/02/11	3.912	13.241	0.65	0.56	16%	
S90-W590-2 B-D	S90-W590	4-211	06/02/11	8.553	12.360	0.61	0.51	20%	
S90-W620 A-C	S90-W620	4-212	06/02/11	24.941	24.941	1.22	1.15	6%	
S90-W770 A-C	S90-W770	4-213	06/02/11	17.304	17.304	0.94	0.87	8%	
S90-W770-3 B-D	S90-W770	4-213	06/02/11	2.512	15.833	0.94	0.82	15%	
S90-W905 A-C	S90-W905	4-214	06/02/11	13.760	13.760	1.19	1.24	-4%	
S105-W920 A-C	S105-W920	4-215	06/02/11	2.876	2.876	1.127	1.17	-4%	
CORE-W10 A-C	Core Storage W10	4-216	06/02/11	21.942	21.942	0.92	0.83	11%	
CORE-W20 A-C	Core Storage W20	4-216	06/02/11	20.755	20.755	0.93	0.84	11%	
CORE-W30 A-C	Core Storage W30	4-216	06/02/11	21.851	21.851	1.11	0.94	18%	
CORE-W51 A-C	Core Storage W51	4-216	06/02/11	25.218	25.218	1.38	1.26	10%	
CORE-W62 A-C	Core Storage W62	4-216	06/02/11	26.437	26.437	1.46	1.37	7%	
CORE-W73 A-C	Core Storage W73	4-216	06/02/11	26.691	26.691	1.46	1.36	7%	
CORE-W117 A-C	Core Storage W117	4-216	06/02/11	23.200	23.200	1.14	1.10	4%	
CORE-W133 A-C	Core Storage W133	4-216	06/02/11	19.452	19.452	0.89	0.85	5%	
S700-E205-3 A-C	S700-E205	4-217	05/26/11	9.490	26.919	2.04	1.70	20%	
S700-E180 A-C	S700-E180	4-218	05/26/11	9.609	9.609	2.05	1.73	18%	
S700-E180 B-D	S700-E180	4-218	05/26/11	5.651	5.651	1.25	0.93	34%	
S700-E55-2 A-C	S700-E55	4-219	05/26/11	1.982	6.116	2.14	0.85	152%	
S700-E55-2 B-D	S700-E55	4-219	05/26/11	1.325	5.467	1.42	0.83	71%	
S700-W98-2 A-C	S700-W98	4-220	05/26/11	9.175	23.657	1.80	1.45	24%	
S1000-E58-4 A-C	S1000-E58	4-221	05/26/11	7.858	23.324	1.43	1.14	25%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S1000-E58-2 B-D	S1000-E58	4-221	05/26/11	17.317	18.861	1.24	0.91	36%	
S1000-W98-2 A-C	S1000-W98	4-222	05/26/11	13.428	32.176	1.99	1.79	11%	
S1000-E120-3 A-C	S1000-E120	4-223	05/26/11	7.009	15.449	1.17	0.91	29%	
S1000-E160 -3 A-C	S1000-E160	4-224	05/26/11	2.984	11.194	0.96	0.72	33%	
S1300-E24 A-C	S1300-E24	4-225	05/26/11	21.392	21.392	1.35	1.15	17%	
S1300-E120 A-C	S1300-E120	4-226	05/26/11	13.940	13.940	1.06	0.82	29%	
S1300-E160 A-C	S1300-E160	4-227	05/26/11	21.407	21.407	2.00	1.45	38%	
S1300-W100-3 A-C	S1300-W100	4-228	05/26/11	10.677	34.680	2.35	1.93	22%	
S1600-E110 A-C	S1600-E110	4-229	05/26/11	14.834	14.834	1.12	0.86	30%	
S1600-E170 A-C	S1600-E170	4-230	05/26/11	16.208	16.208	1.21	0.94	29%	
S1950-E113-4 A-C	S1950-E113	4-231	05/26/11	8.106	11.982	1.31	0.71	85%	
S1950-E281-3 A-C	S1950-E281	4-232	05/25/11	14.066	20.608	1.34	0.99	35%	
S1950-E284-3 A-C	S1950-E284	4-233	05/25/11	14.310	20.922	1.39	1.03	35%	
S2180-E55-3 A-C	S2180-E55	4-234	06/07/11	4.388	15.235	2.13	1.81	18%	
S2180-E55 B-D	S2180-E55	4-234	06/07/11	13.767	13.767	2.00	1.66	20%	
S2180-E220 A-C	S2180-E220	4-235	06/07/11	14.213	14.213	1.64	1.32	24%	
S2180-E220 B-D	S2180-E220	4-235	06/07/11	15.510	15.510	1.96	1.47	33%	
S2180-W100-3 A-C	S2180-W100	4-236	06/07/11	1.941	20.124	3.12	2.31	35%	
S2180-W100-2 B-D	S2180-W100	4-236	06/07/11	12.597	12.738	2.33	1.35	73%	
S2520-E220 A-C	S2520-E220	4-237	06/07/11	18.650	18.650	1.78	1.49	19%	
S2520-E220 B-D	S2520-E220	4-237	06/07/11	19.179	19.179	2.073	1.53	36%	
S2520-W100 A-C	S2520-W100	4-238	06/07/11	18.89	18.89	2.489	1.78	40%	
S2520-W100-2 B-D	S2520-W100	4-238	06/06/11	1.550	17.173	2.63	1.94	36%	
S2750-E55-2 A-C	S2750-E55	4-239	06/07/11	2.734	19.415	3.06	3.55	-14%	
S2750-E55 B-D	S2750-E55	4-239	06/07/11	14.750	14.750	2.72	1.91	42%	
S2750-E220 A-C	S2750-E220	4-240	06/07/11	21.397	21.397	3.12	2.03	54%	
S2750-E220 B-D	S2750-E220	4-240	06/07/11	13.767	13.767	2.04	1.53	33%	

Table 4-1 (Continued) Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S2750-E410 A-C	S2750-E410	4-241	06/07/11	21.118	21.118	4.46	2.97	50%	
S2750-E410 B-D	S2750-E410	4-241	06/07/11	15.321	15.321	2.37	1.90	25%	
S2750-W93-2 A-C	S2750-W93	4-242	06/07/11	6.241	24.709	7.08	3.91	81%	
S2750-W93 B-D	S2750-W93	4-242	06/07/11	12.078	12.078	2.52	1.52	66%	
S3080-E55-2 A-C	S3080-E55	4-243	06/07/11	0.688	17.872	2.92	2.14	36%	
S3080-E55-2 B-D	S3080-E55	4-243	06/07/11	10.426	12.085	1.66	1.34	24%	
S3080-E220-2 A-C	S3080-E220	4-244	06/06/11	14.470	17.175	2.75	2.20	25%	
S3080-E220 B-D	S3080-E220	4-244	06/06/11	13.760	13.760	1.83	1.46	25%	
S3080-W100 A-C	S3080-W100	4-245	06/07/11	21.226	21.226	4.54	3.41	33%	
S3080-W100 B-D	S3080-W100	4-245	06/07/11	13.680	13.680	2.24	1.91	17%	
S3310-E55 A-C	S3310-E55	4-246	06/07/11	18.257	18.257	2.32	2.26	3%	
S3310-E55 B-D	S3310-E55	4-246	06/07/11	13.395	13.395	1.80	1.44	25%	
S3310-E220 A-C	S3310-E220	4-247	06/08/11	22.396	22.396	5.79	3.18	82%	
S3310-E220 B-D	S3310-E220	4-247	06/08/11	15.623	15.623	1.90	1.62	17%	
S3310-W100-3 A-C	S3310-W100	4-248	06/07/11	14.579	16.347	3.19	3.60	-11%	
S3310-W100 B-D	S3310-W100	4-248	06/07/11	14.002	14.002	1.94	1.68	15%	
S3650-E55-2 A-C	S3650-E55	4-249	06/07/11	4.138	7.471	1.82	1.58	15%	
S3650-E220-2 A-C	S3650-E220	4-250	06/07/11	4.345	7.702	1.95	2.08	-6%	
S3650-W100-2 A-C	S3650-W100	4-251	06/07/11	5.154	11.171	2.59	1.78	46%	
S3650-W100 B-D	S3650-W100	4-251	06/07/11	8.989	8.989	1.66	1.42	17%	

[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: temporary removal of instrument due to floor, rib or back trimming; locations blocked by equipment or waste disposal, etc.

Table 4-1 (Continued) Access Drifts Data Analysis

JOINT METERS

Field Tag	Location	Figure Number	Date Of Last Reading	Cumulative Displacement (inches)	Dilation Rate 2010 to 2011 (in/year)	Dilation Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
51X-CG-02706	S1950-E300	4-252	06/16/11	1.750	0.16	0.10	60%	
51X-CG-02707	S1950-E300	4-252	06/16/11	1.764	0.17	0.08	113%	
51X-CG-02713	E140-S2964	4-253	06/16/11	0.326	-0.26	-0.25	4%	
51X-CG-02715-2	W30-S2920	4-254	6/7/2011	0.298	1.06	0.76	39%	
51X-CG-02714-2	W30-S2932	4-255	6/7/2011	1.006	3.54	0.89	298%	
51X-CG-02716	W170-S2678	4-256	06/06/11	0.195	0.15	0.07	114%	
51X-CG-02717	W170-S2687	4-257	06/06/11	0.858	0.28	0.82	-66%	
51X-CG-02876-2	E140-S1505	4-258	06/16/11	0.056	0.02	0.03	-33%	
51X-CG-02883-2	E140-S1529	4-259	06/16/11	0.348	0.16	0.33	-52%	
51X-CG-02885-2	E140-S1545	4-260	06/16/11	0.587	0.29	0.32	-9%	
51X-CG-02875-2	E140-S1795	4-261	06/16/11	0.220	0.13	0.13	0%	

Table 4-1 (Continued) Access Drifts Data Analysis

ROCKBOLT LOAD CELLS

Field Tag	Location	Figure Number	Date of Initial Reading	Date of Last Reading	Load (klps)	Comments
51X-WG-00214	E140-S910 East Rib	4-262	06/26/97	06/27/11	49.5	
51X-WG-00215-2	E140-S910	4-262	10/21/09	06/27/11	43.6	
51X-WG-00216	E140-S910 East Rib	4-262	06/26/97	06/27/11	45.4	
51X-WG-00217	E140-S910 West Rib	4-262	06/26/97	06/27/11	1.4	
51X-WG-00218	E140-S775	4-263	06/26/97	06/27/11	0.8	
51X-WG-00219	E140-S975	4-263	06/26/97	06/27/11	39.4	
51X-WG-00220	E140-S1023	4-263	10/23/96	06/27/11	59.5	
51X-WG-00221	S1300-E120	4-264	10/23/96	06/27/11	4.2	
51X-WG-00222	S1300-E160	4-264	10/23/96	06/27/11	44.9	
51X-WG-00223	S1600-E150	4-265	02/18/96	06/06/11	5.5	
51X-WG-00293	E140-S1550	4-266	03/17/04	06/16/11	53.0	
51X-WG-00294	E140-S1775	4-267	03/17/04	06/16/11	52.8	
51X-WG-00295-2	E140-S2916	4-268	03/18/10	06/30/11	29.3	
51X-WG-00296-2	E140-S2916	4-268	03/18/10	06/30/11	45.6	

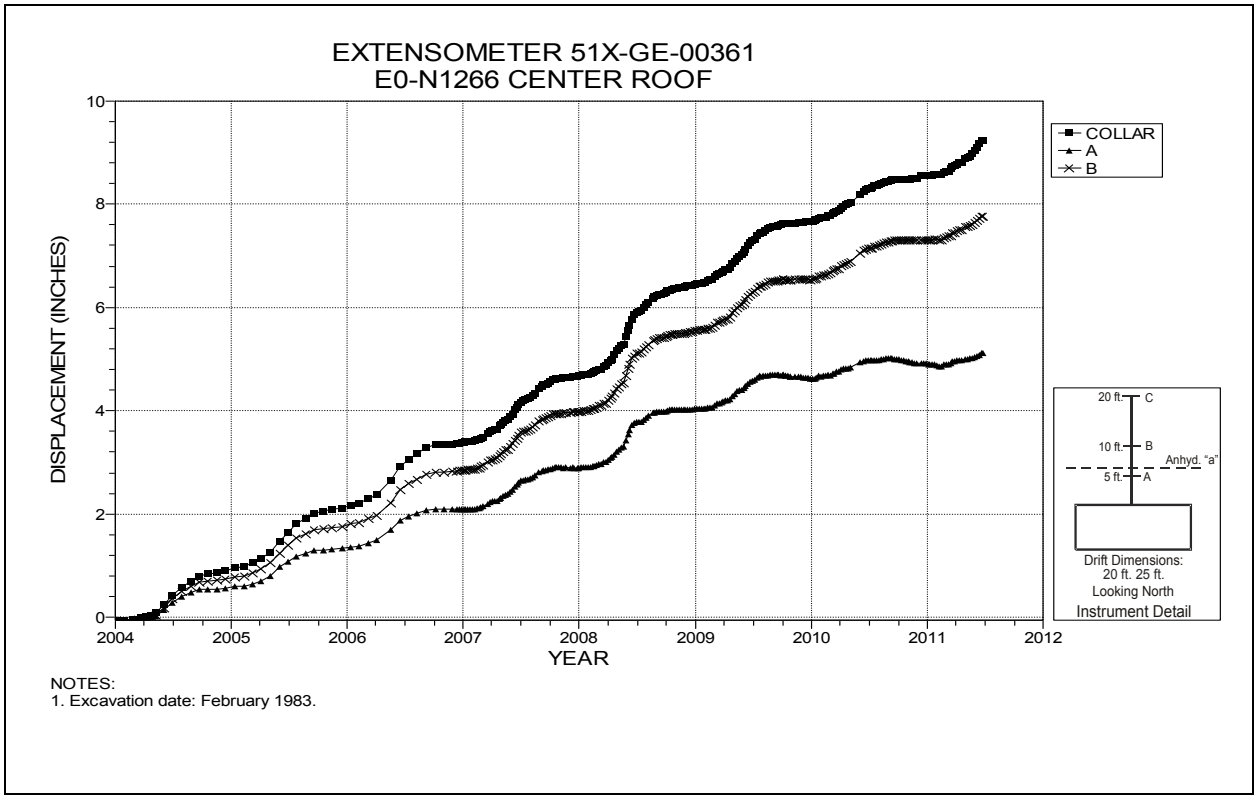


Figure 4-1 Extensometer 51X-GE-00361
E0 N1266 – Roof

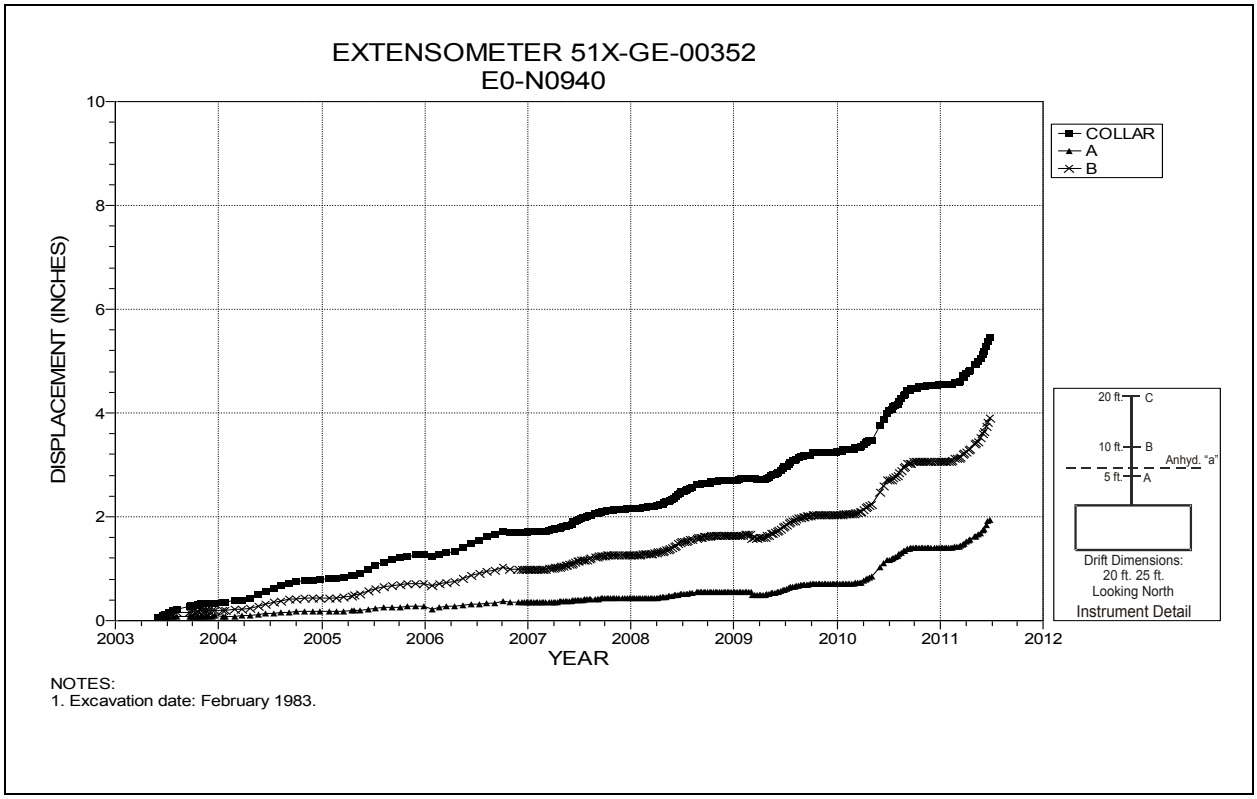


Figure 4-2 Extensometer 51X-GE-00352
E0 N940 – Roof

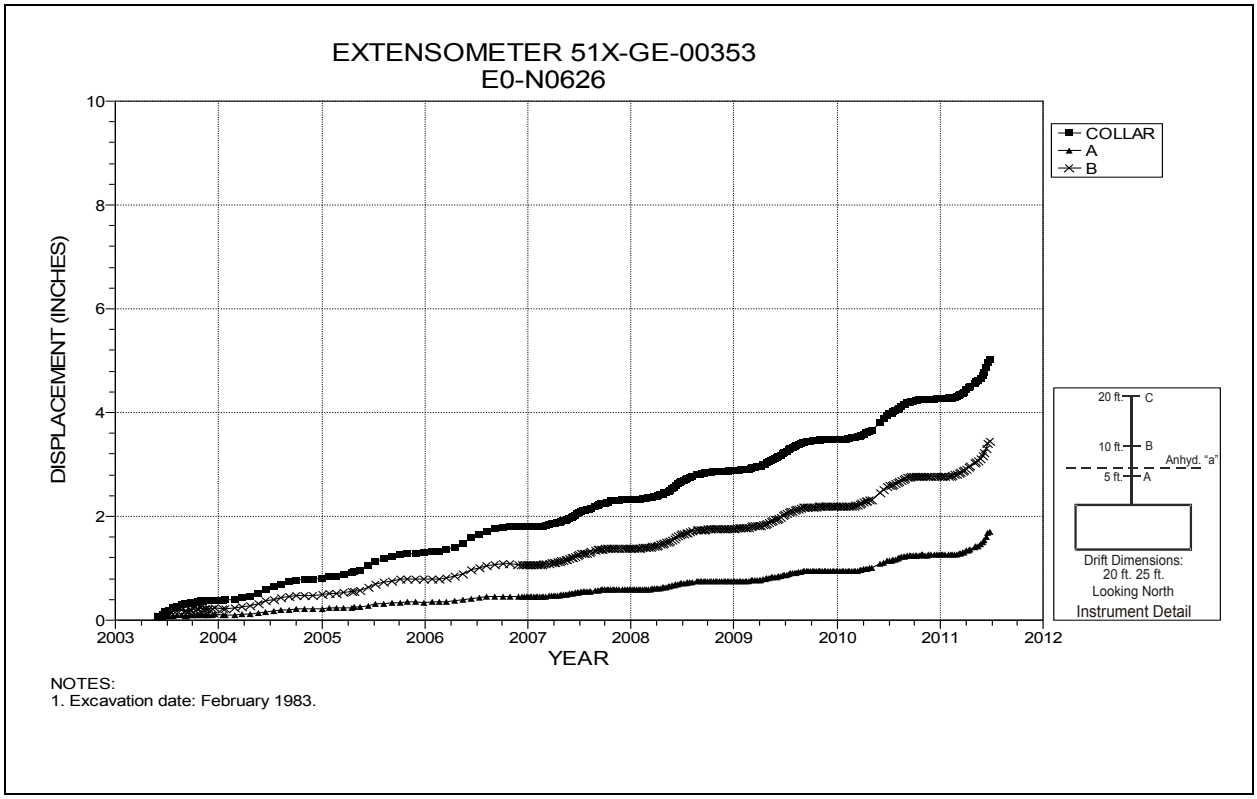


Figure 4-3 Extensometer 51X-GE-00353
E0 N626 – Roof

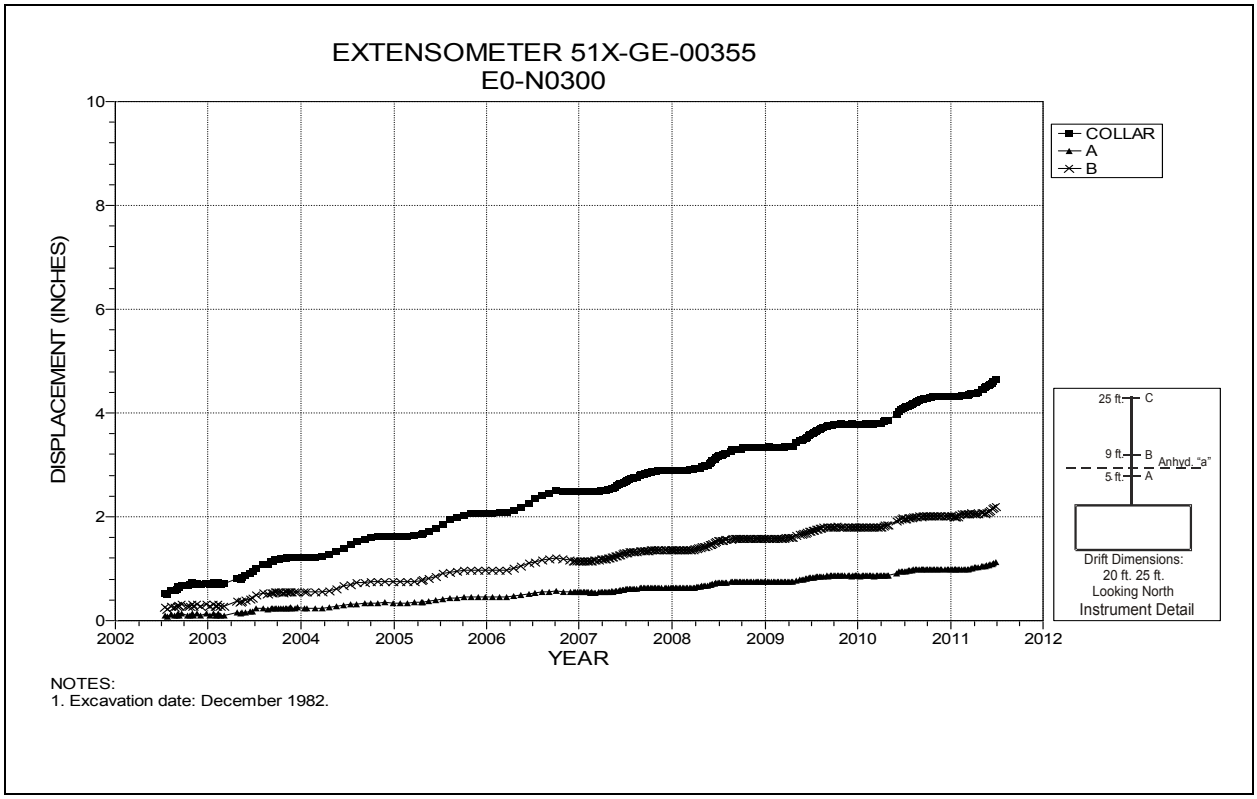


Figure 4-4 Extensometer 51X-GE-00355
E0 N300 – Roof

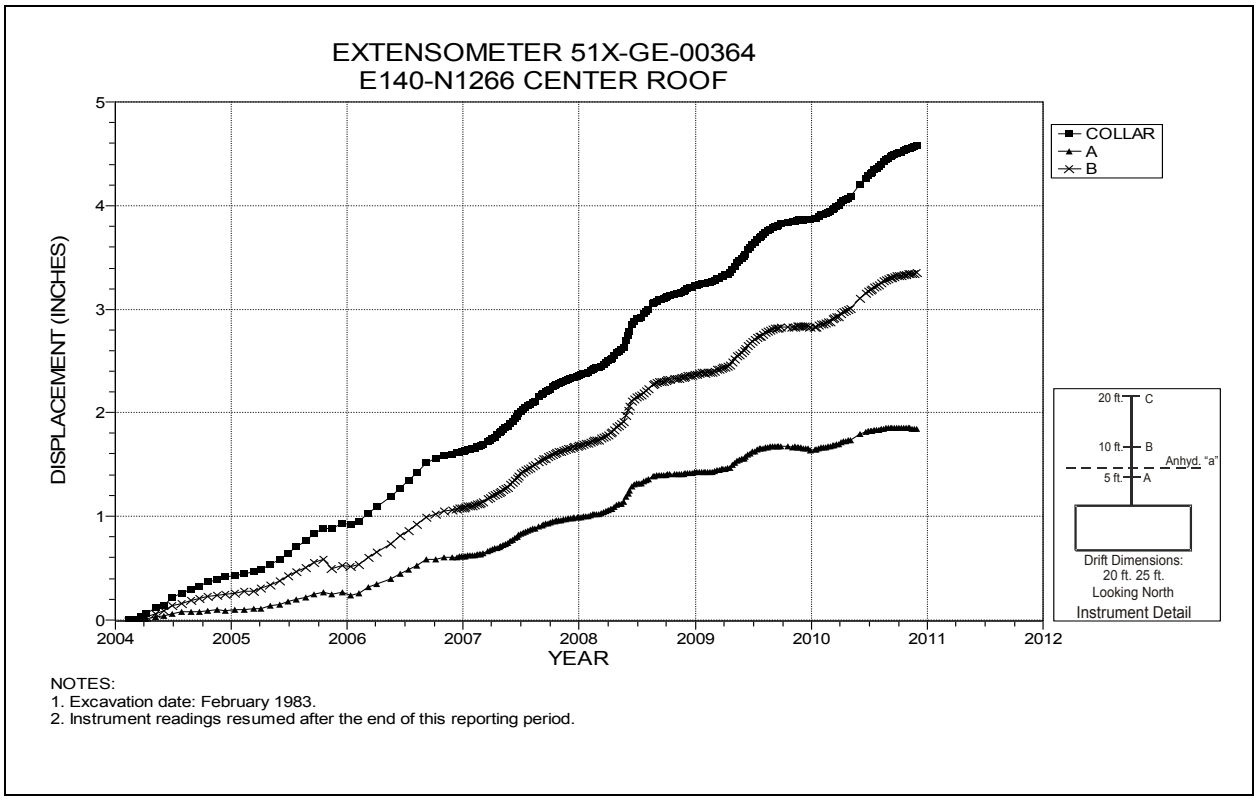


Figure 4-5 Extensometer 51X-GE-00364
E140 N1266 – Roof

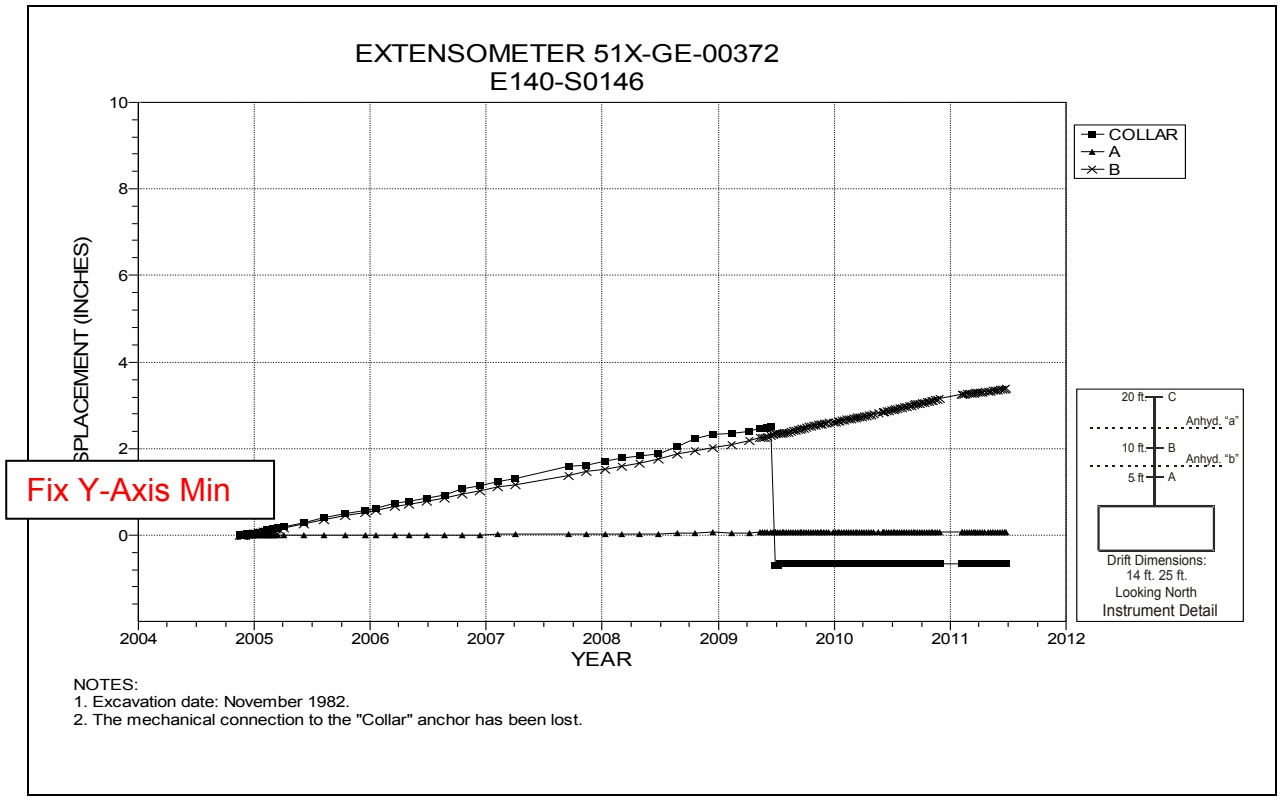


Figure 4-6 Extensometer 51X-GE-00372
E140 S146 – Roof

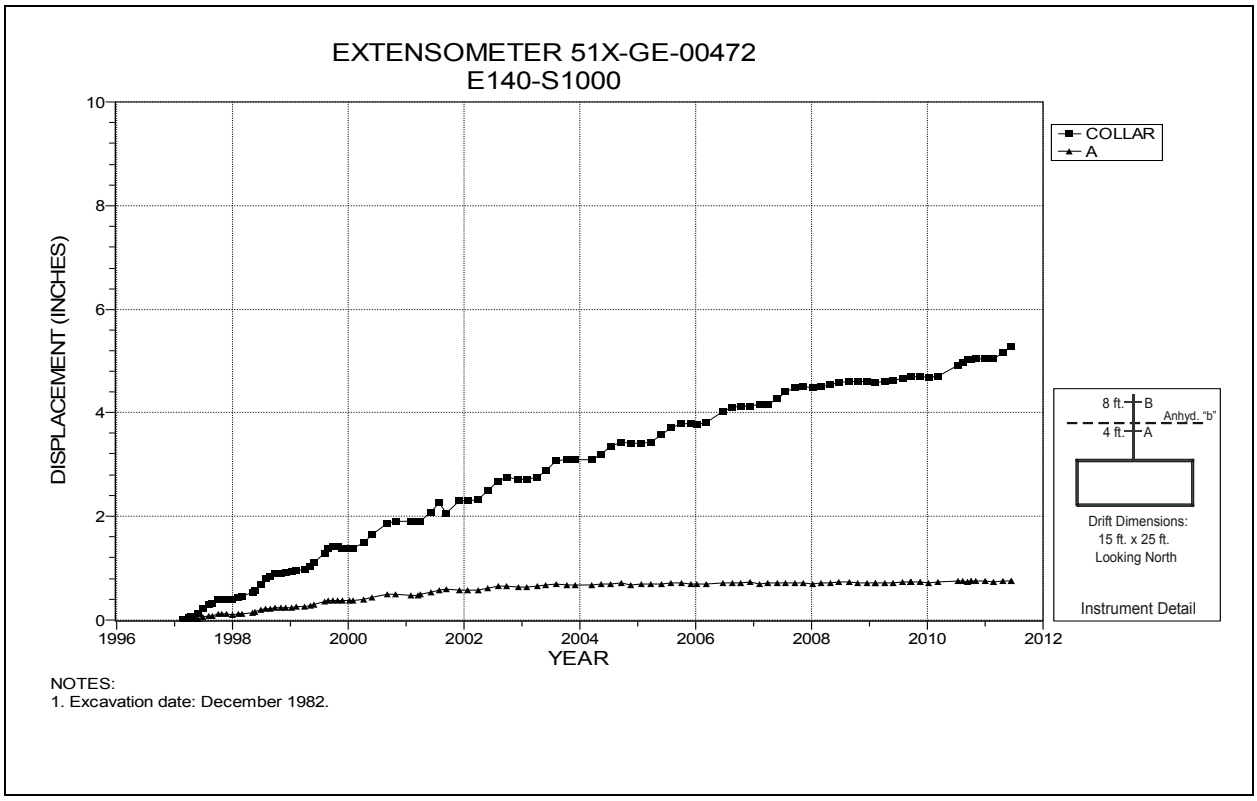


Figure 4-7 Extensometer 51X-GE-00472
E140 S1000 – Roof

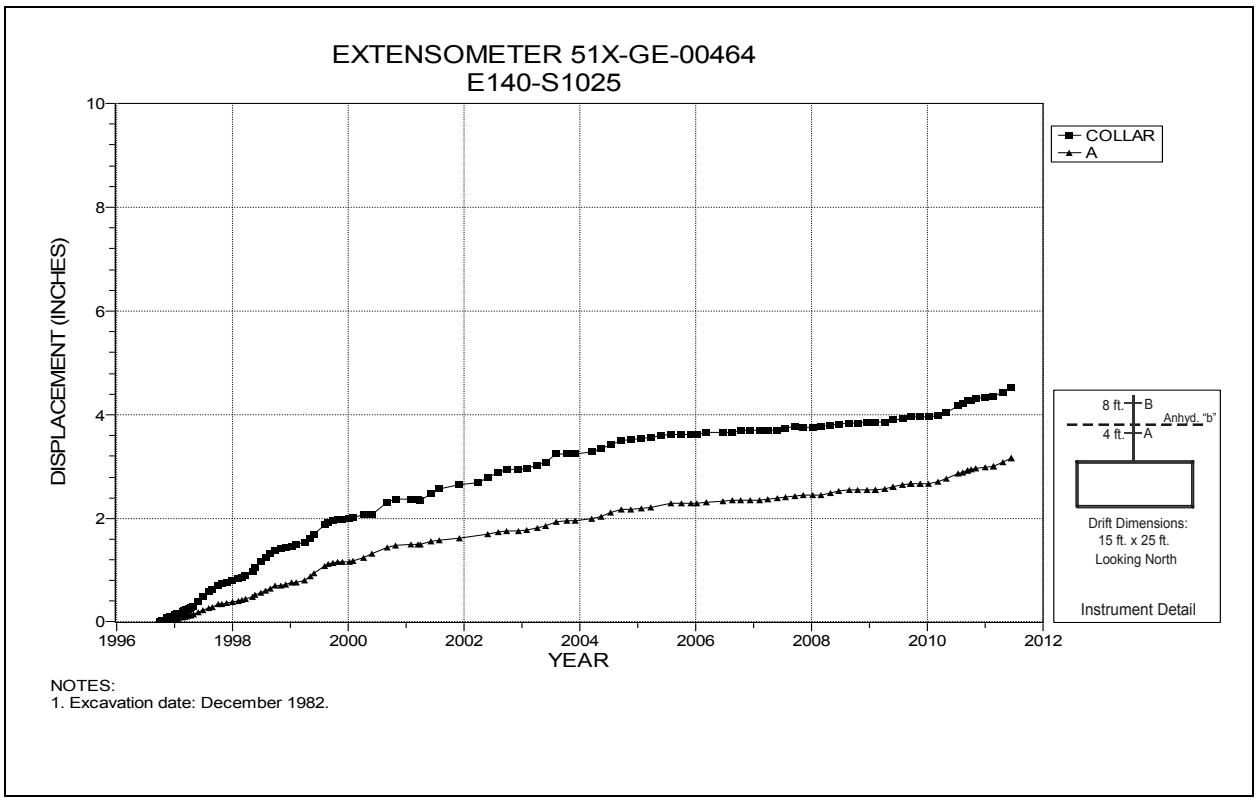


Figure 4-8 Extensometer 51X-GE-00464
E140 S1025 – Roof

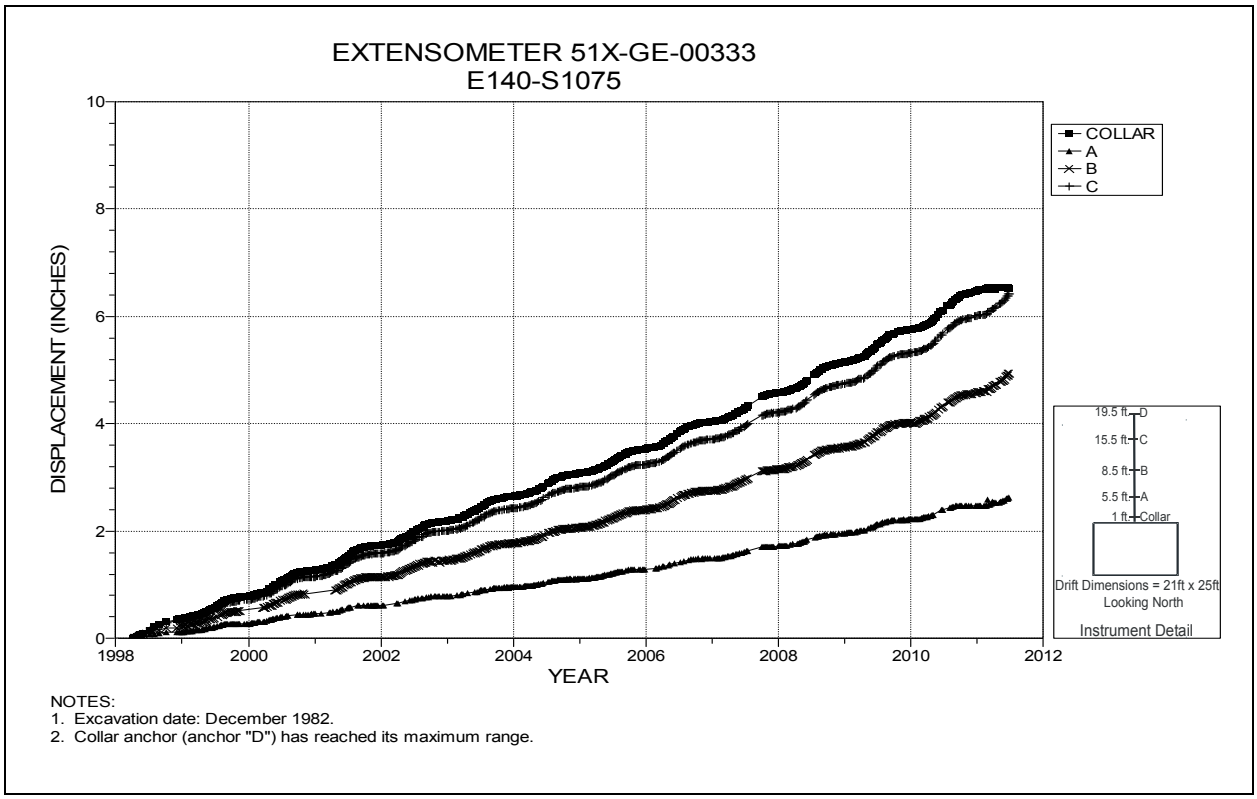


Figure 4-9 Extensometer 51X-GE-00333
E140 S1075 – Roof

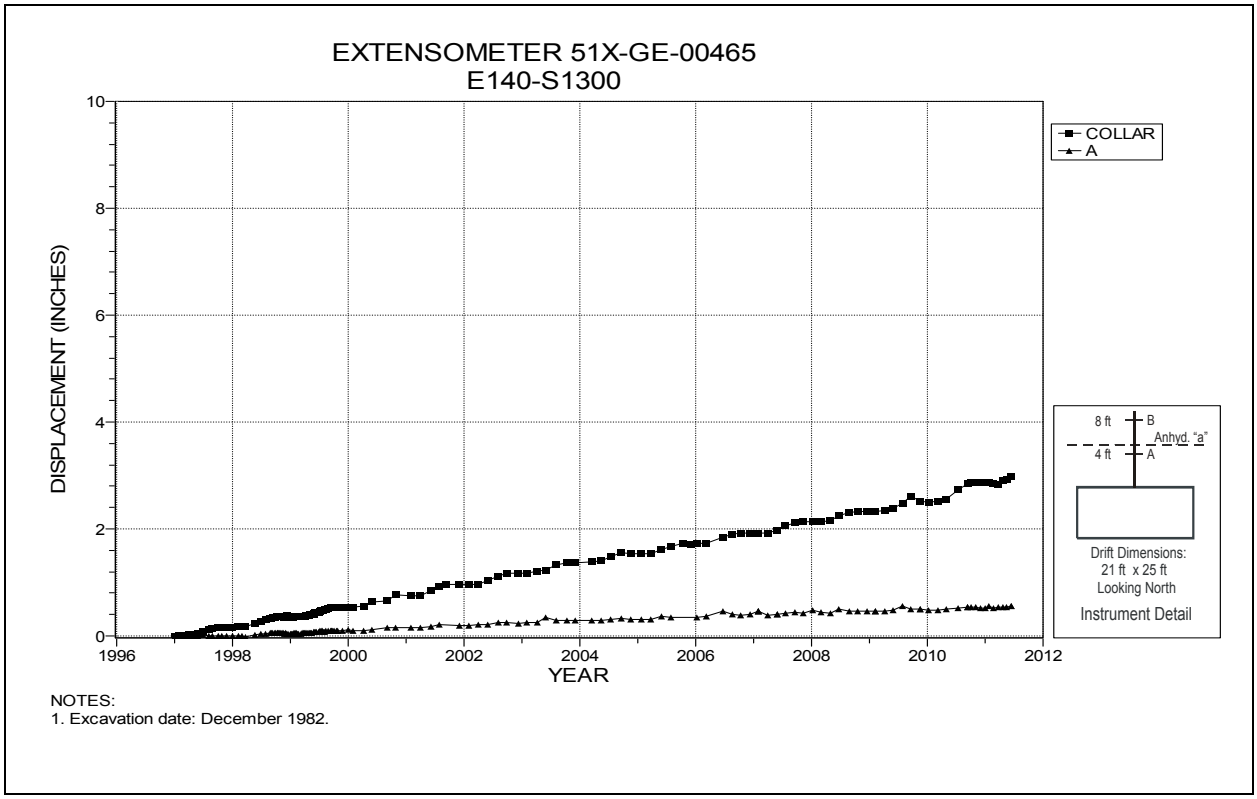


Figure 4-10 Extensometer 51X-GE-00465
E140 S1300 – Roof

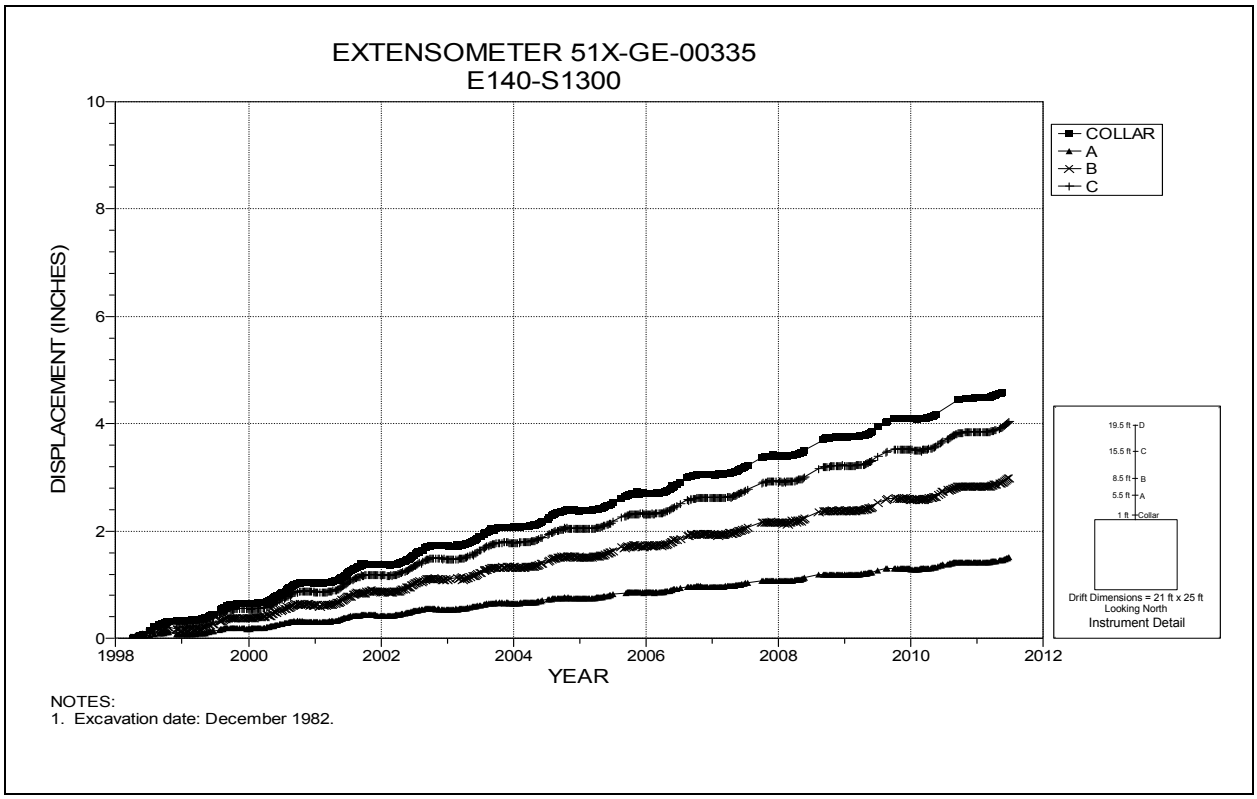


Figure 4-11 Extensometer 51X-GE-00335
E140 S1300 – Roof

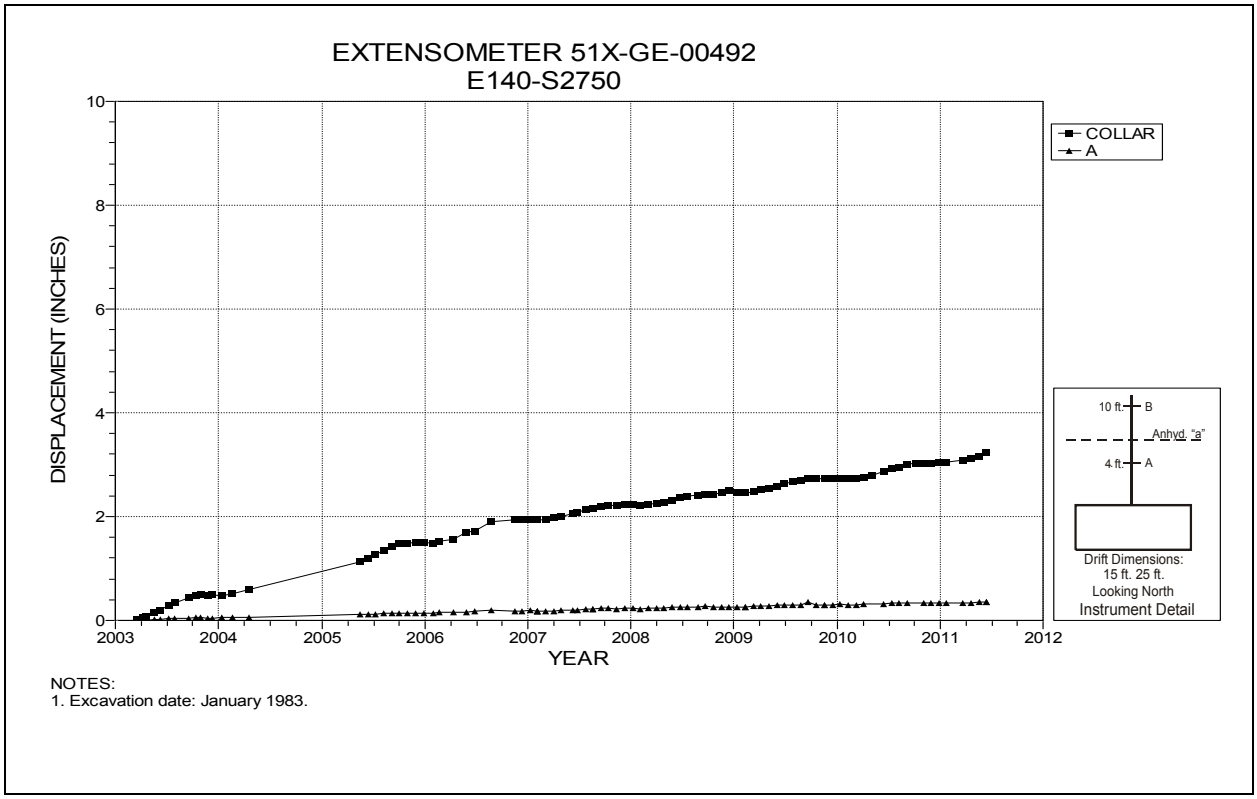


Figure 4-12 Extensometer 51X-GE-00492
E140 S2750 – Roof

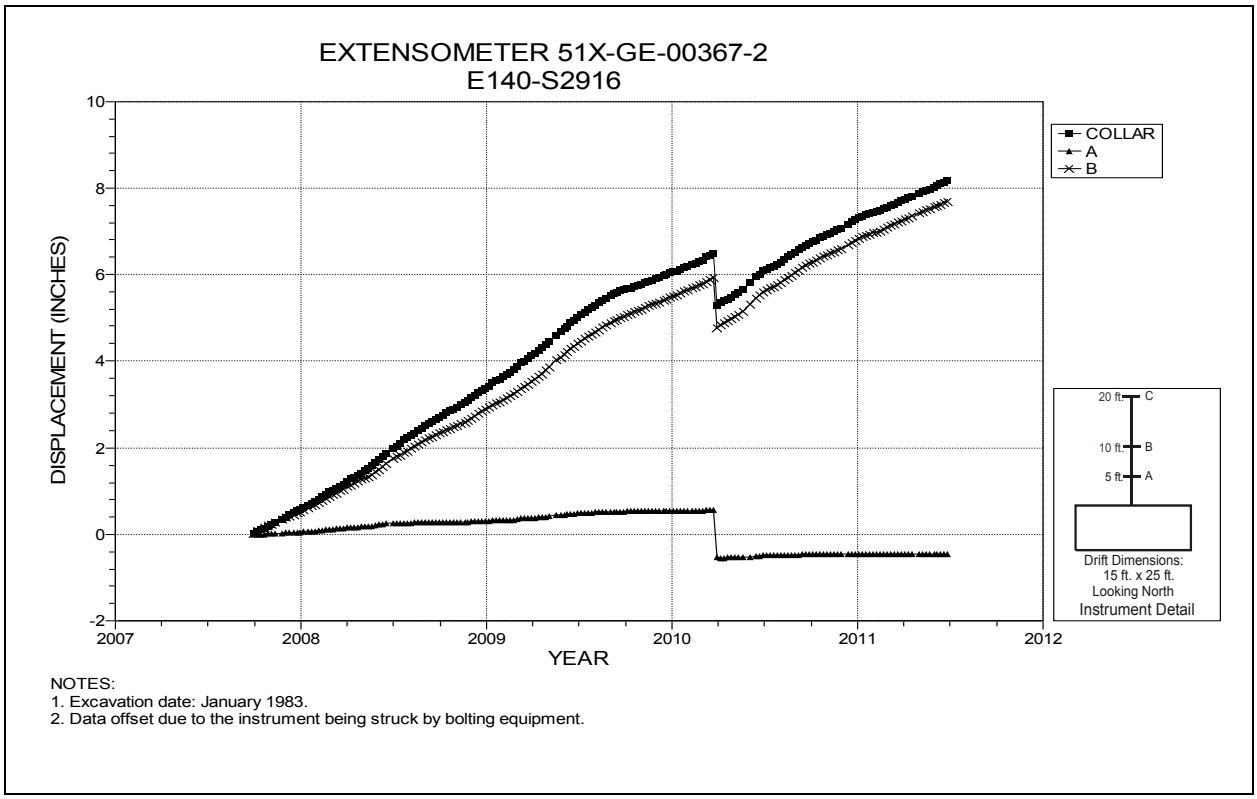


Figure 4-13 Extensometer 51X-GE-00367-2
E140 S2916 – Roof

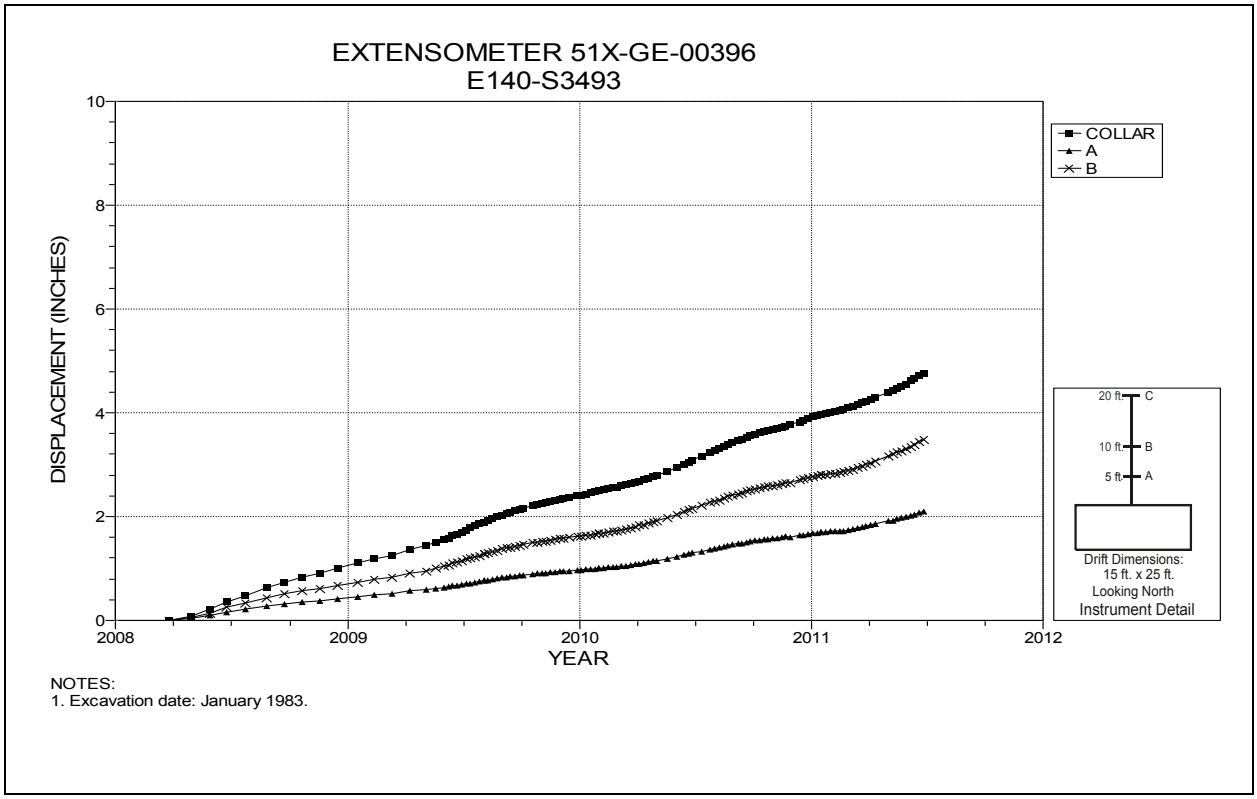


Figure 4-14 Extensometer 51X-GE-00396
E140 S3493 – Roof

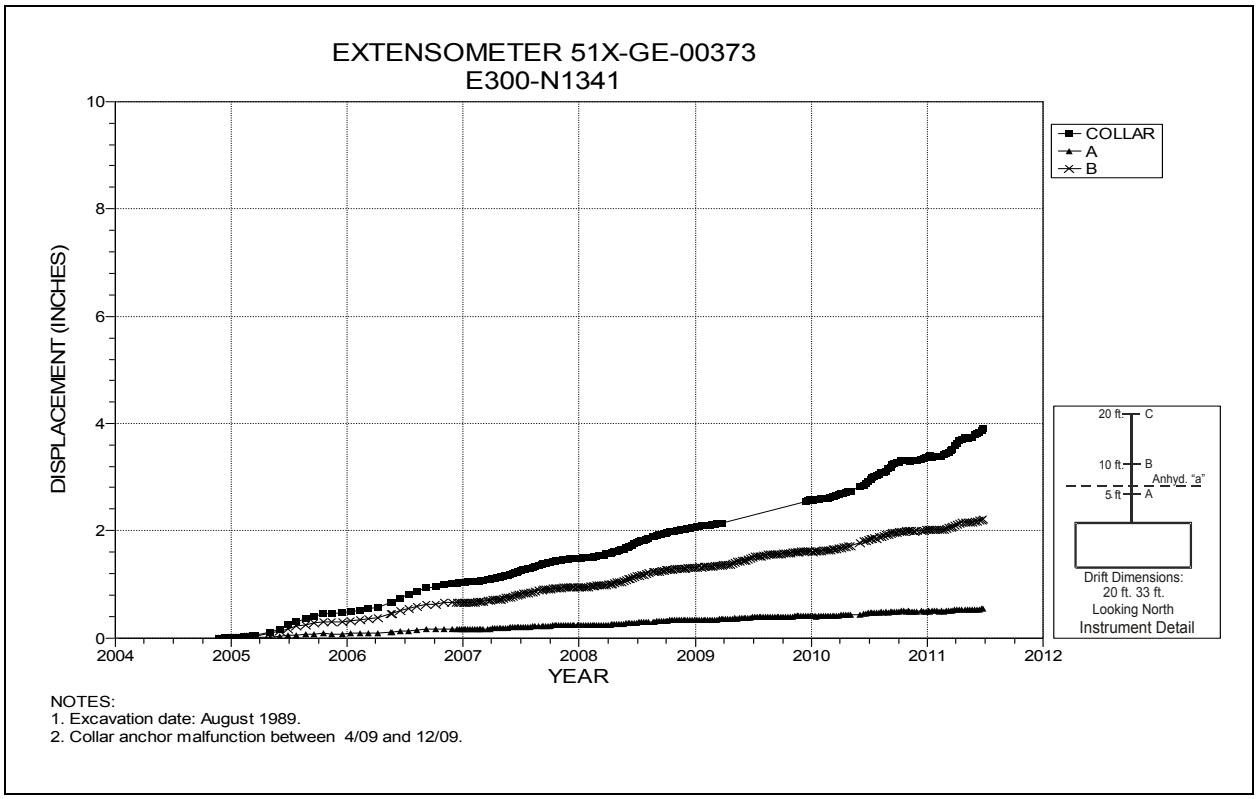


Figure 4-15 Extensometer 51X-GE-00373
E300 N1341 – Roof

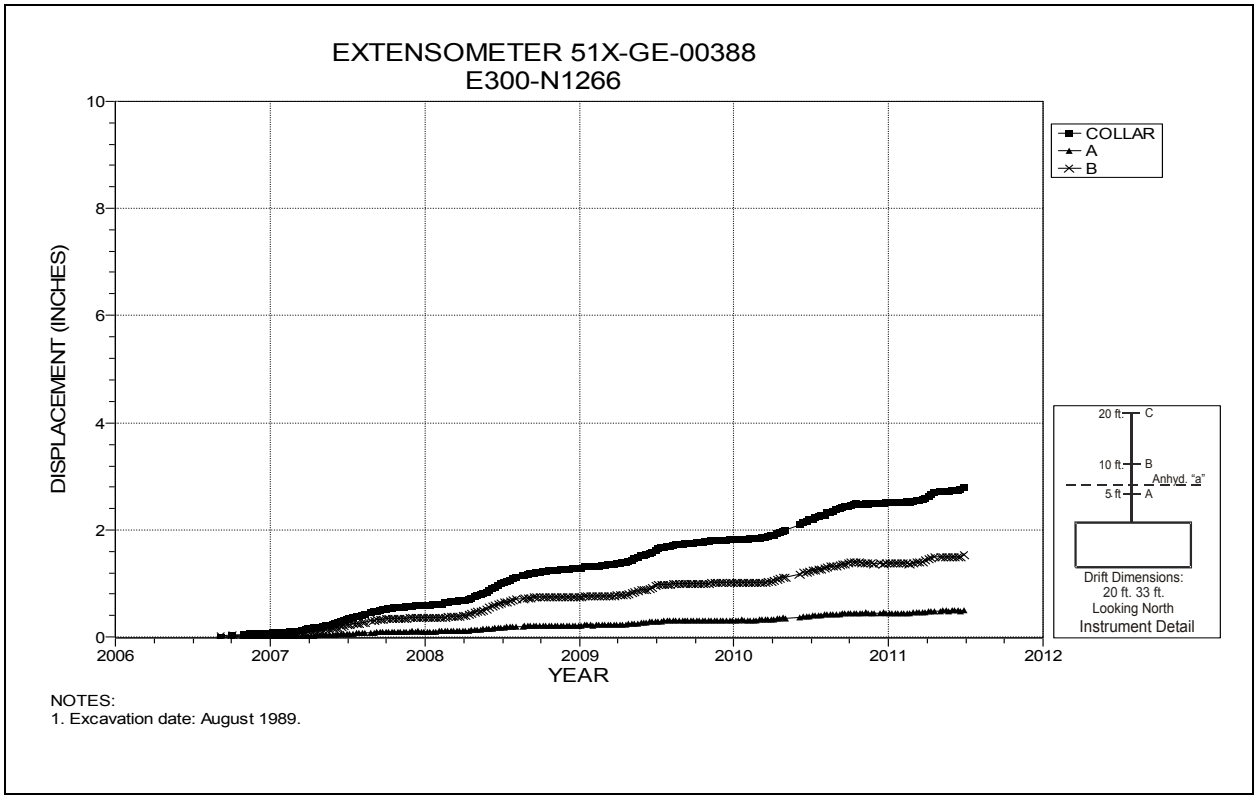


Figure 4-16 Extensometer 51X-GE-00388
E300 N1266 – Roof

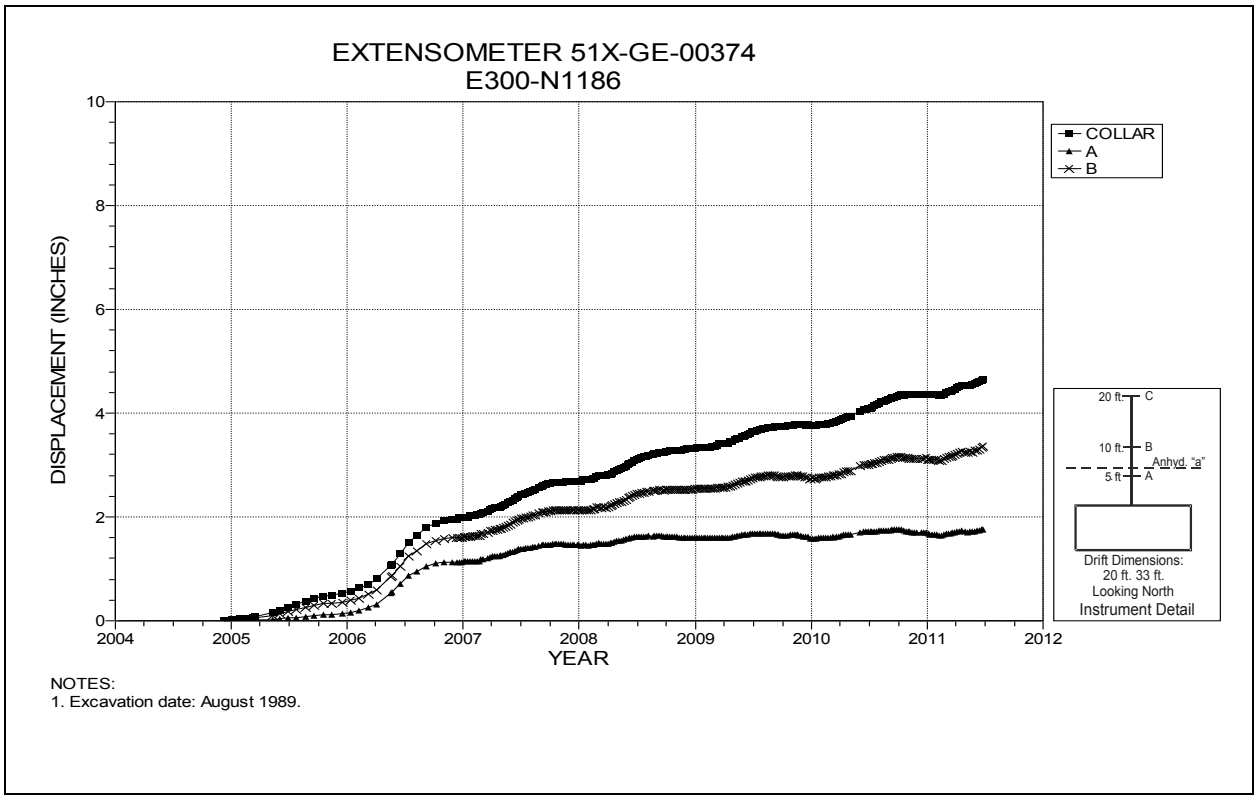


Figure 4-17 Extensometer 51X-GE-00374
E300 N1186 – Roof

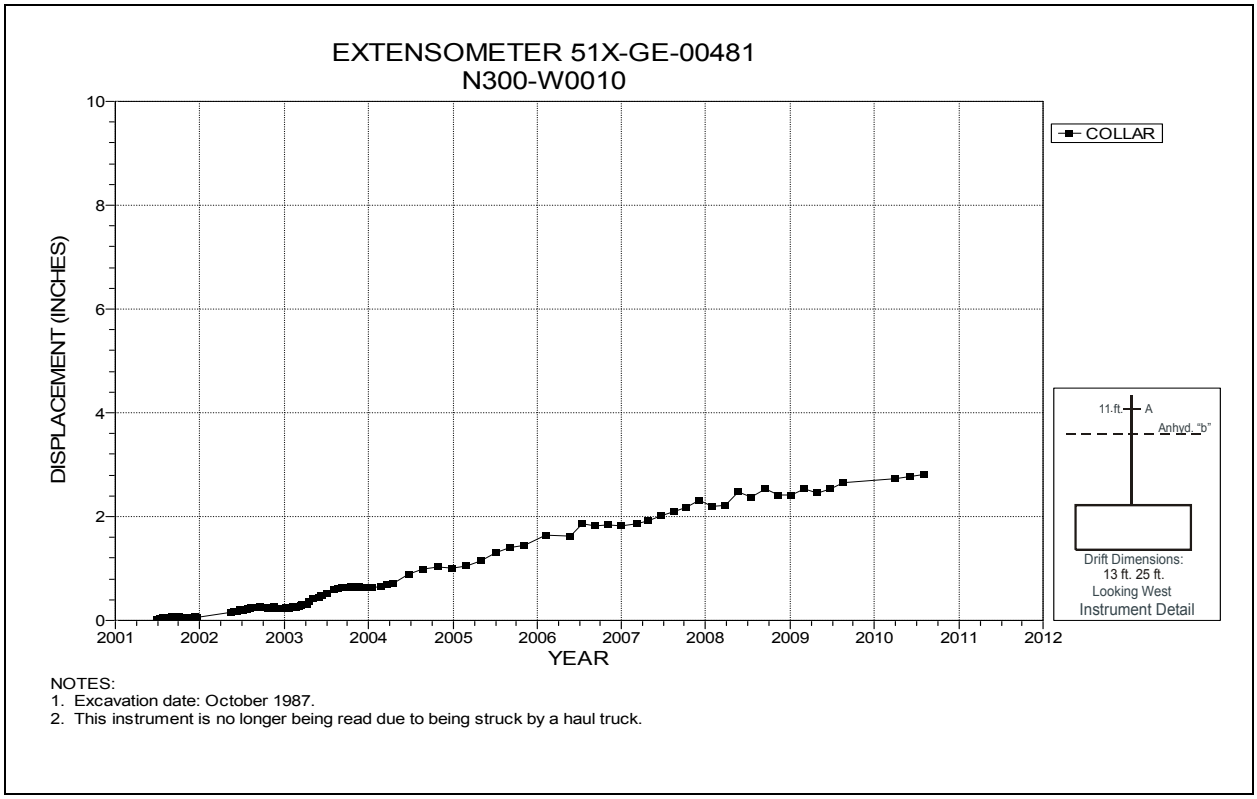


Figure 4-18Extensometer 51X-GE-00481
N300 W10 – Roof

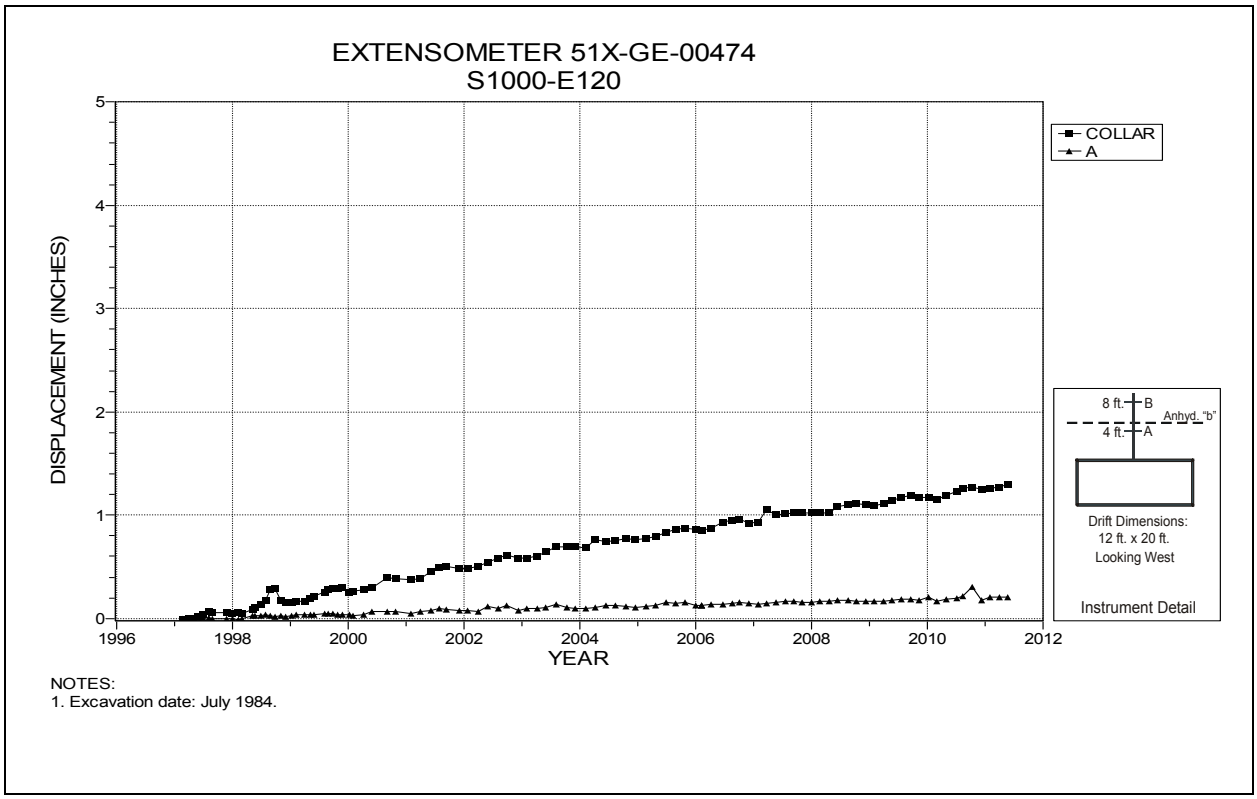


Figure 4-19 Extensometer 51X-GE-00474
S1000 E120 – Roof

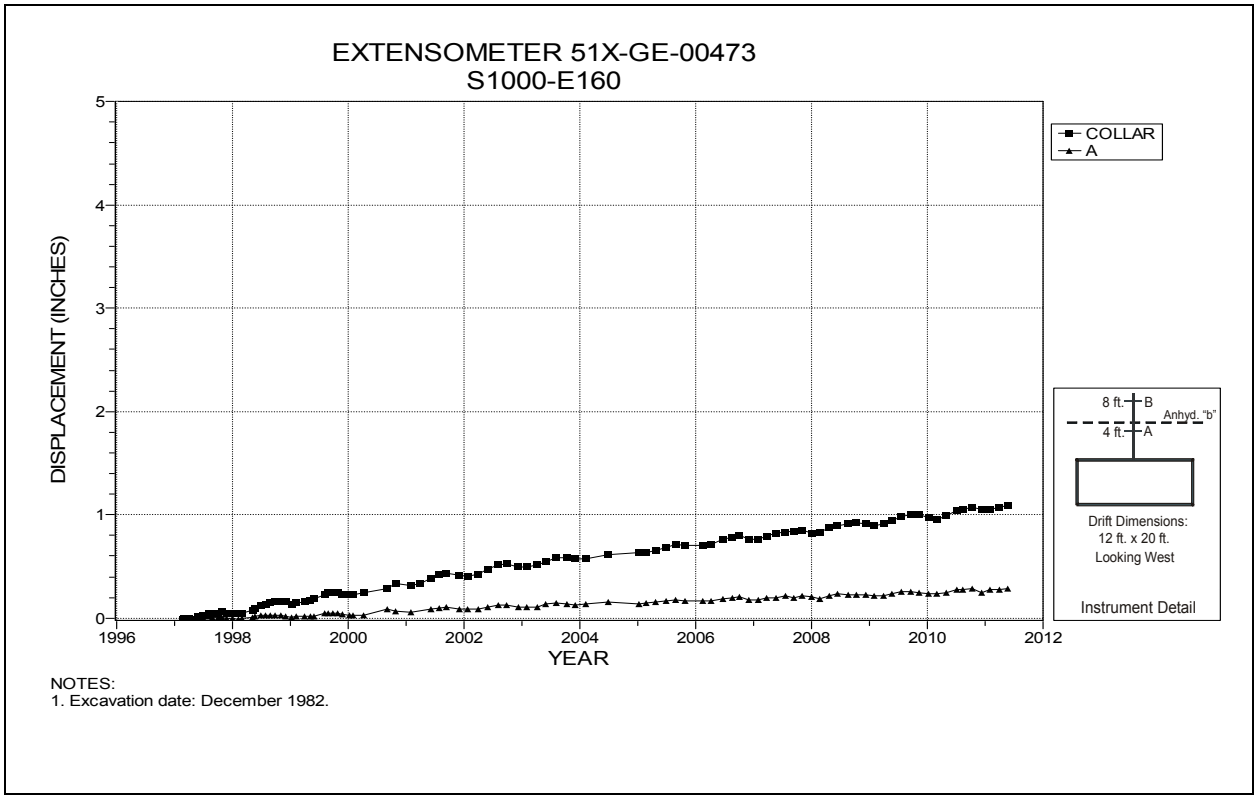


Figure 4-20 Extensometer 51X-GE-00473
S1000 E160 – Roof

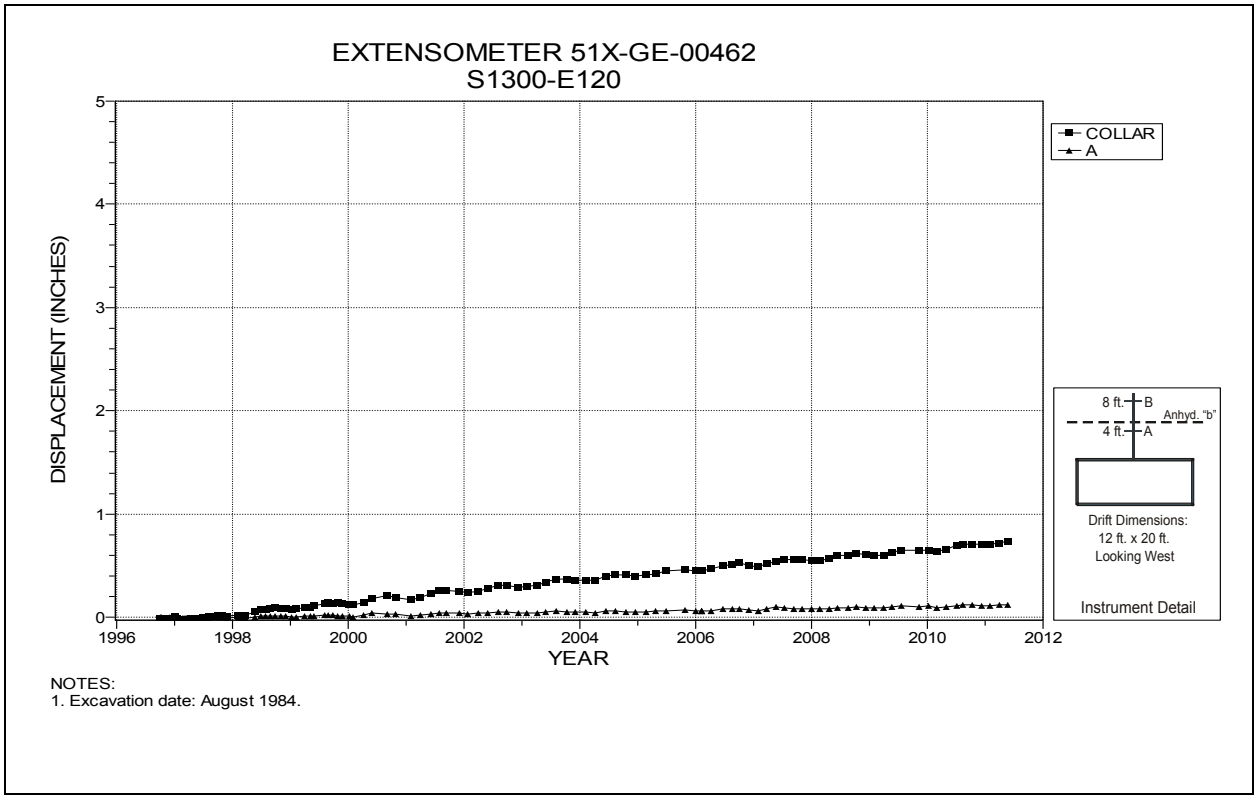


Figure 4-21 Extensometer 51X-GE-00462
S1300 E120 – Roof

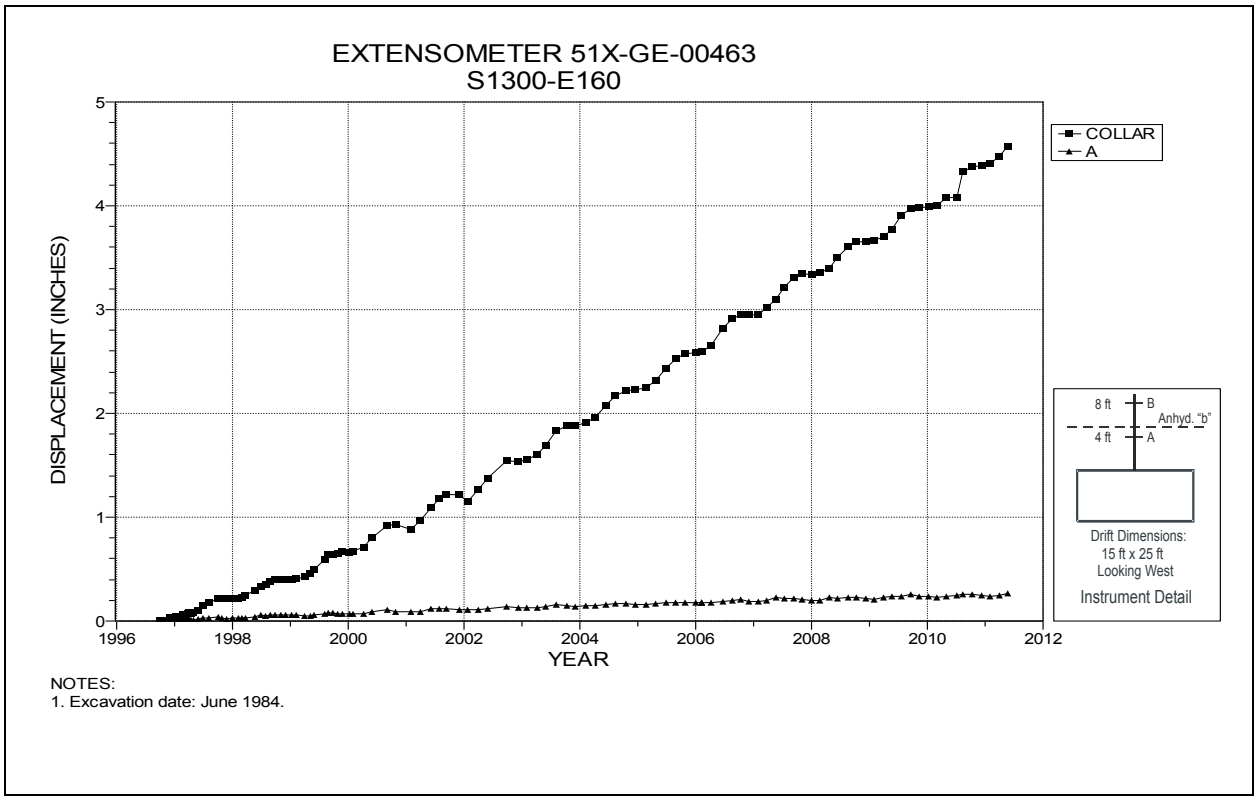


Figure 4-22 Extensometer 51X-GE-00463
S1300 E160 – Roof

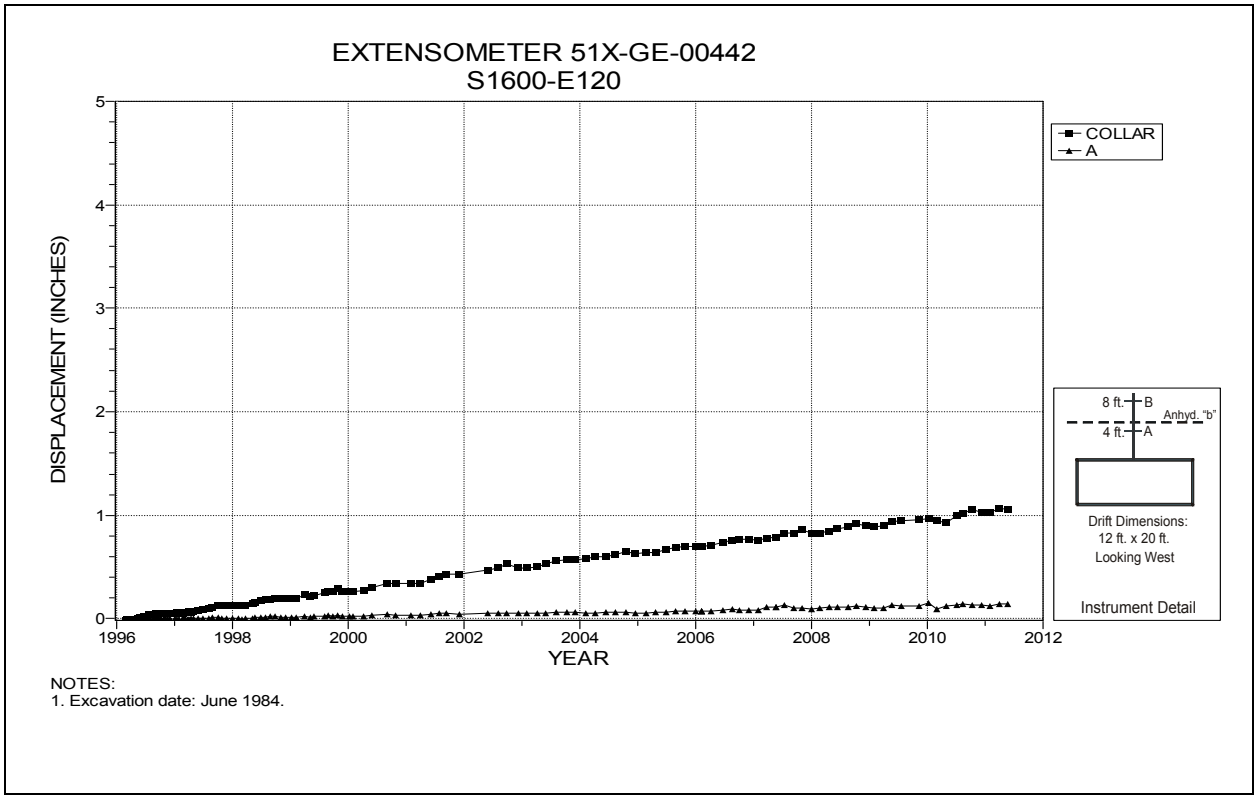


Figure 4-23 Extensometer 51X-GE-00442
S1600 E120 – Roof

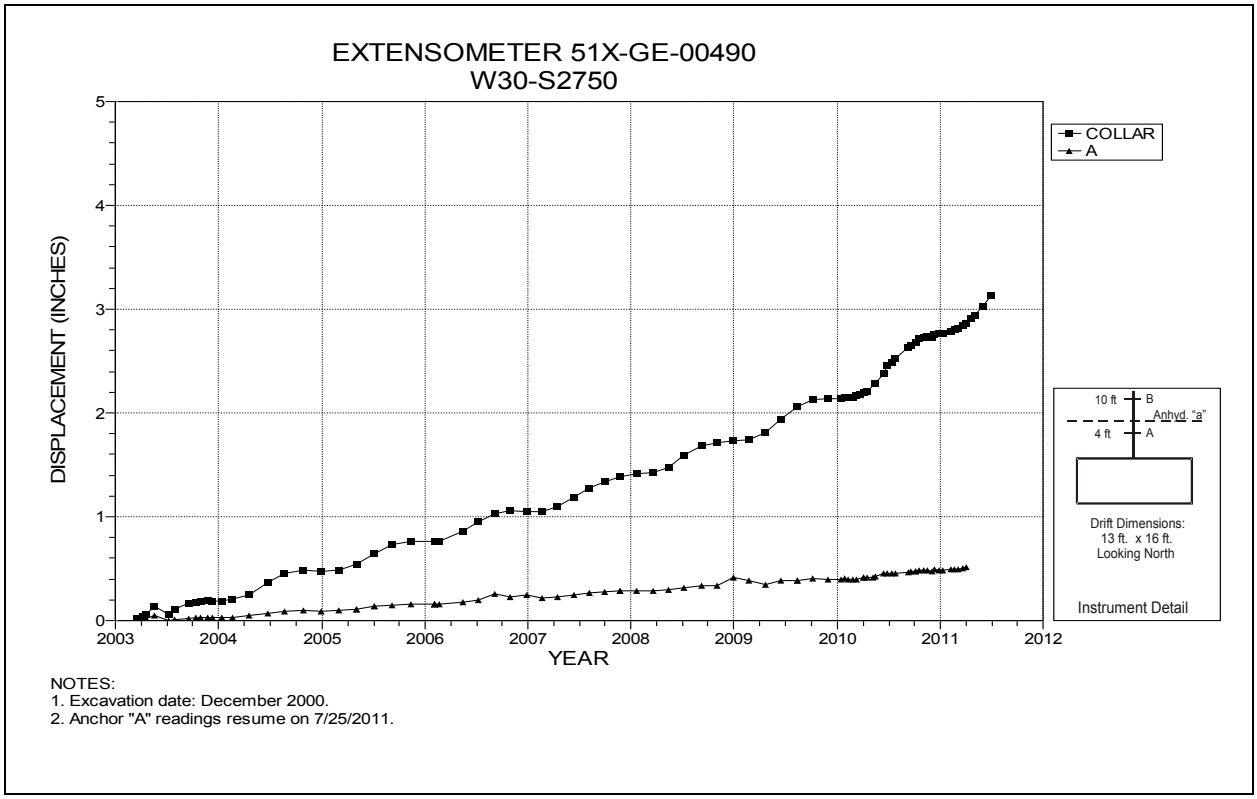


Figure 4-24 Extensometer 51X-GE-00490
W30 S2750 – Roof

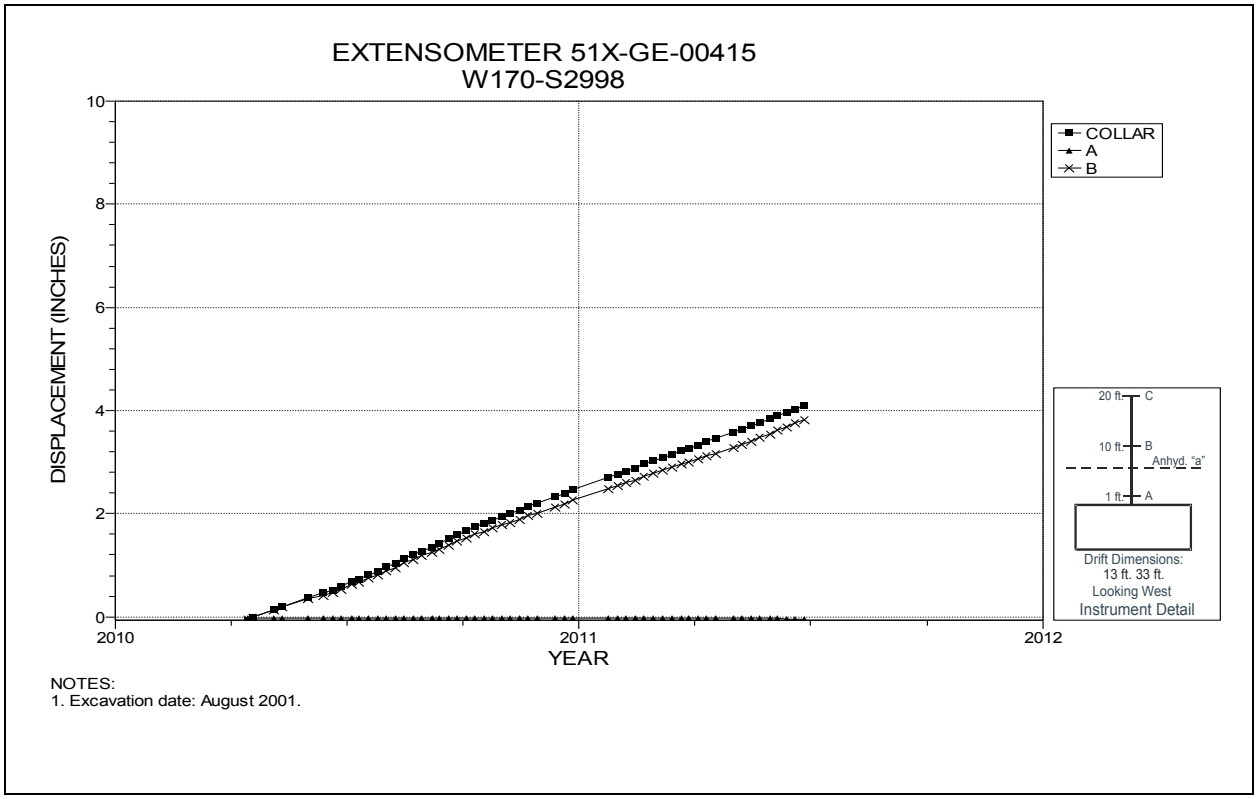


Figure 4-25 Extensometer 51X-GE-00415
W170 S2998 – Roof

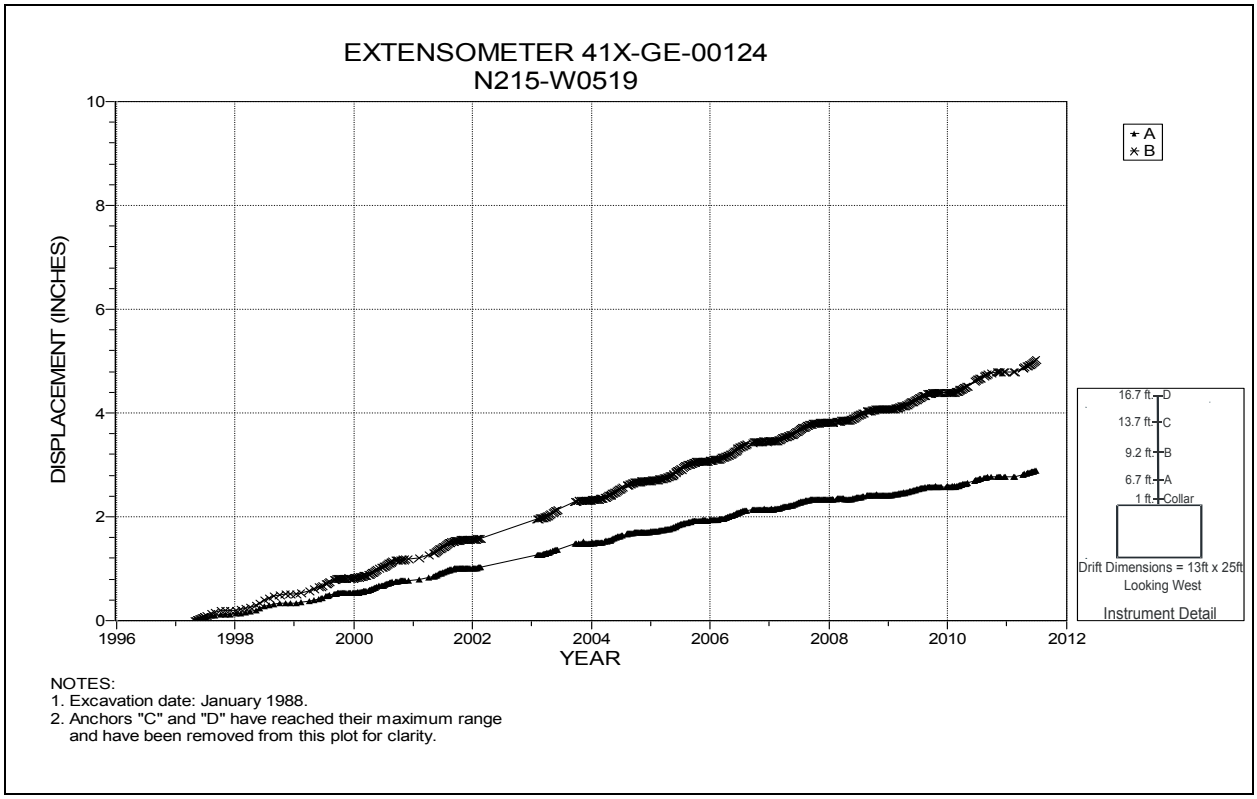


Figure 4-26 Extensometer 41X-GE-00124
W519 N190 – Roof

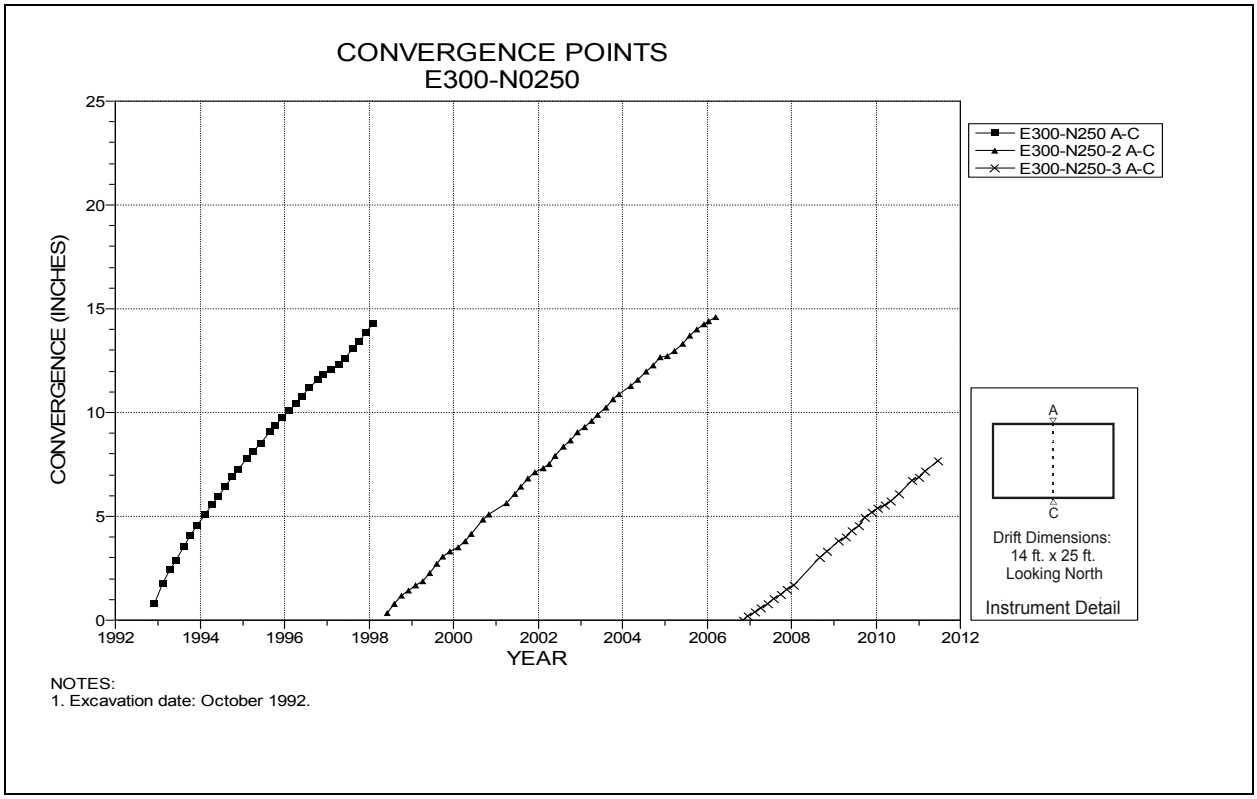


Figure 4-27 Convergence Point Array
E300 Shop N250 – Roof to Floor

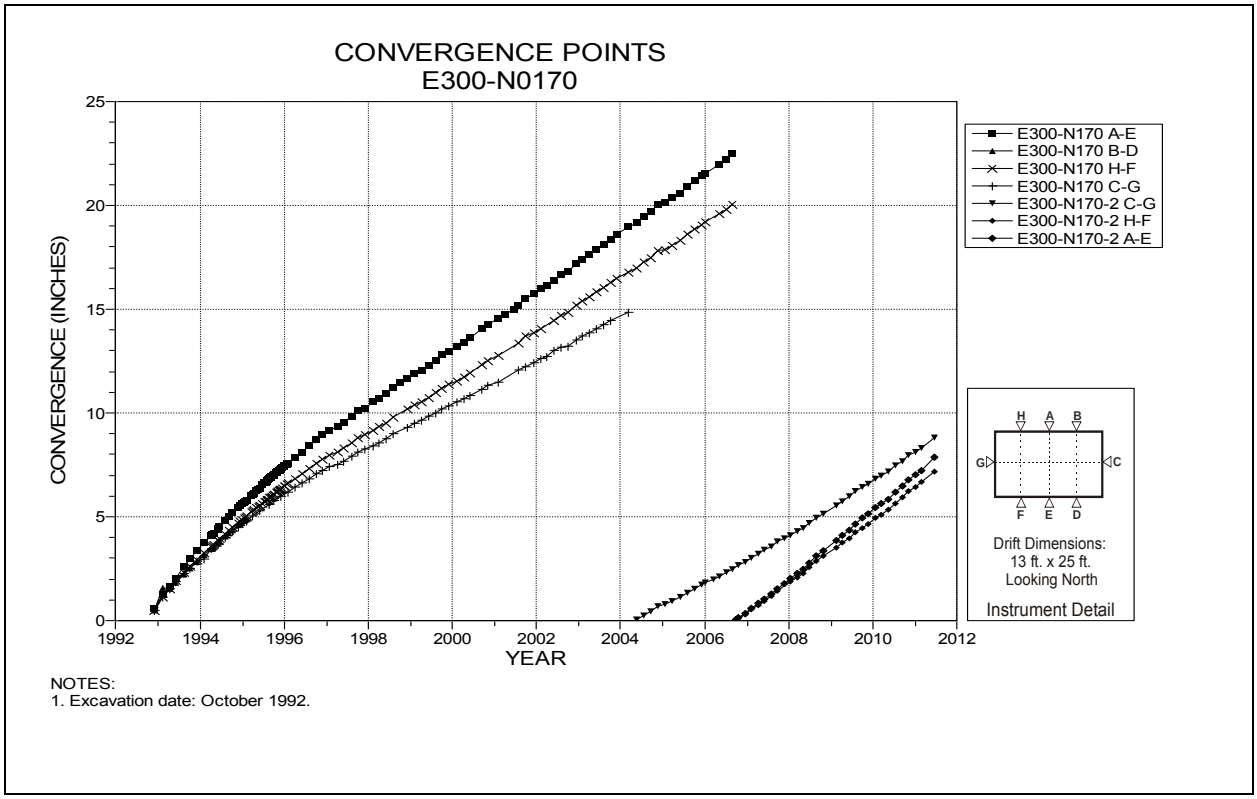


Figure 4-28 Convergence Point Array E300 Shop
N170 – All Chords

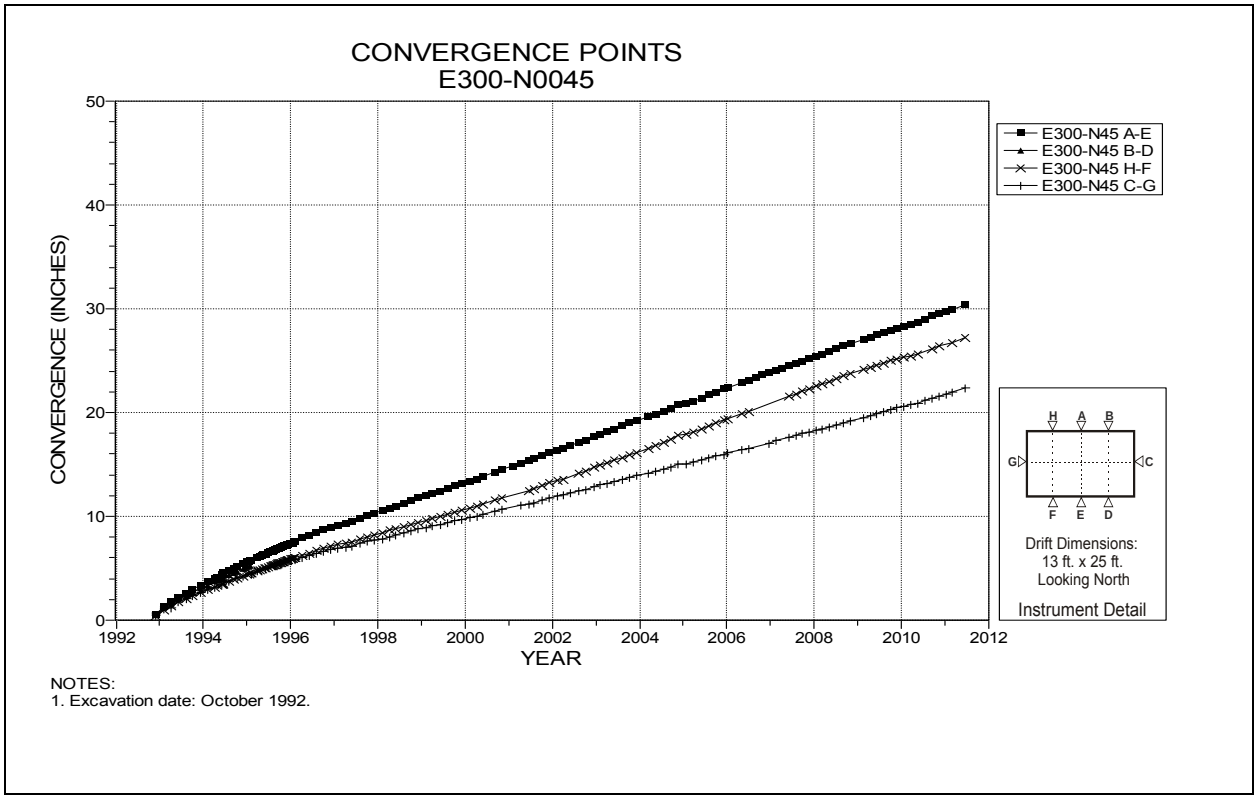


Figure 4-29 Convergence Point Array
E300 Shop N45 – All Chords

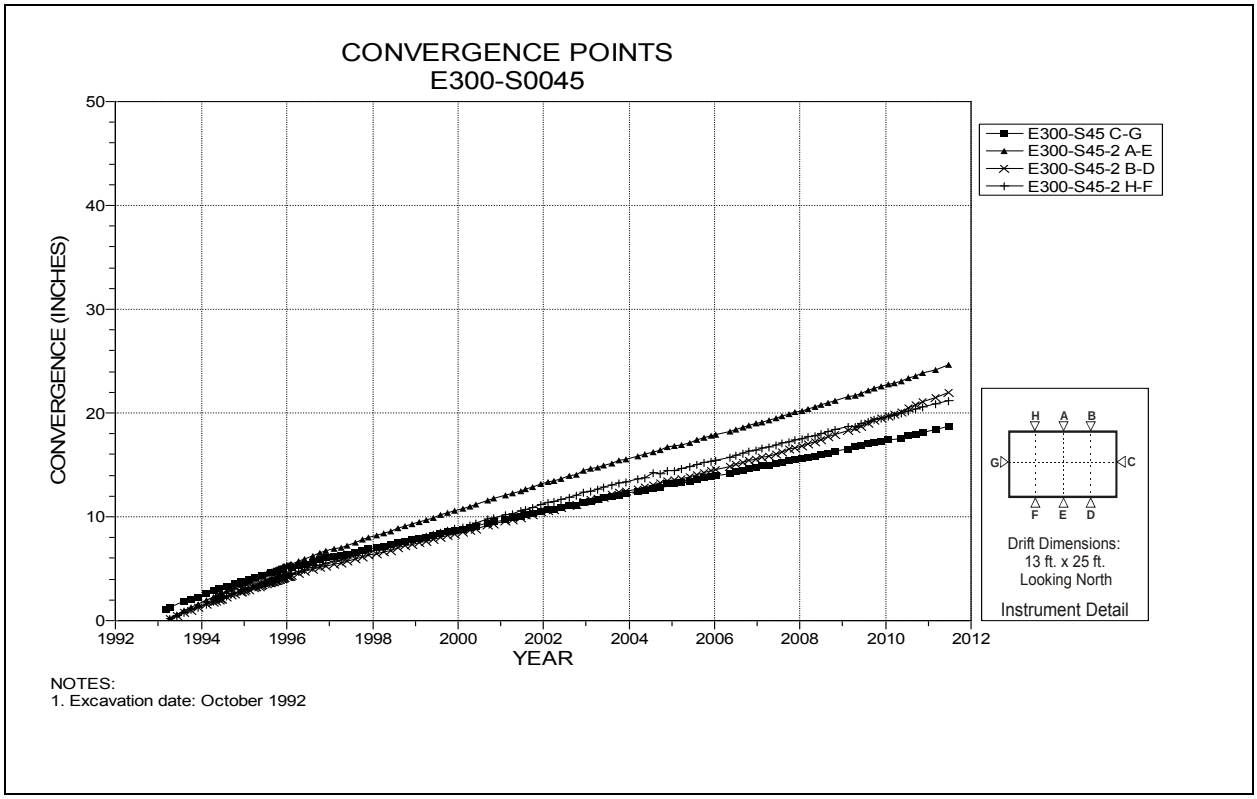


Figure 4-30 Convergence Point Array
E300 Shop S45 – All Chords

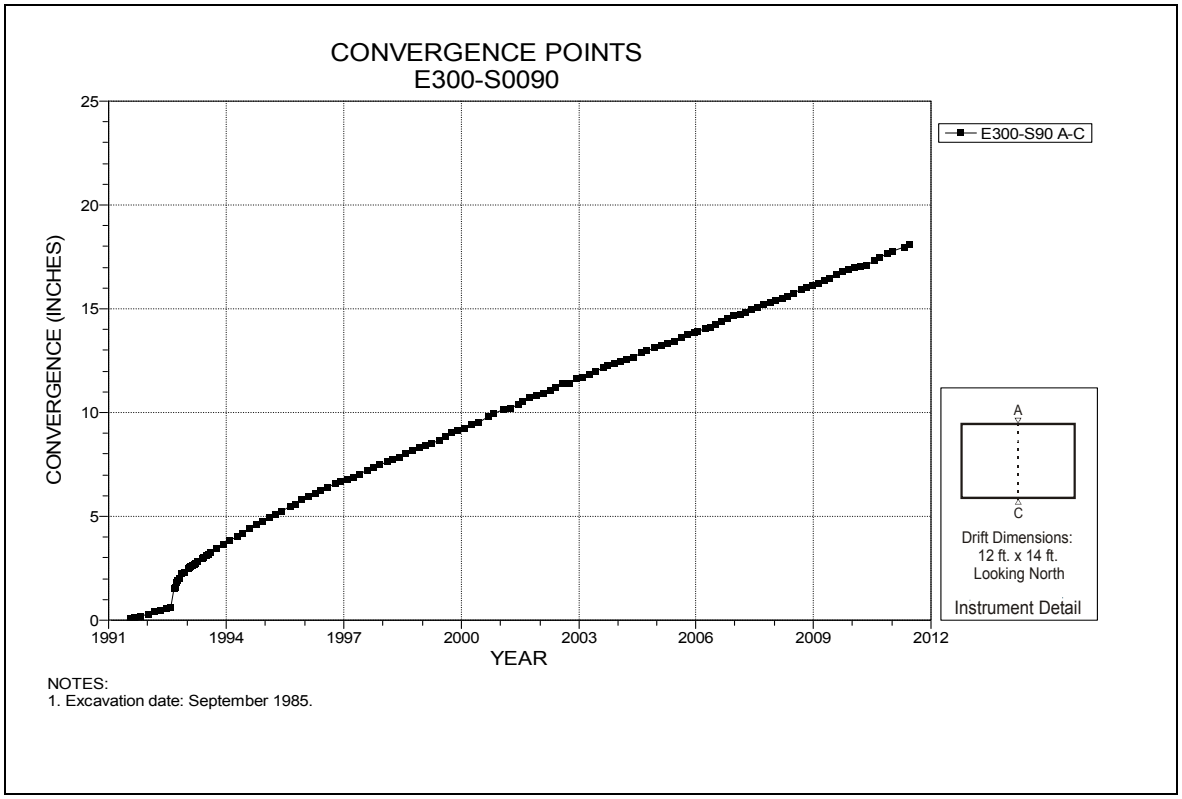


Figure 4-31 Convergence Point Array
E300 S90 – Roof to Floor

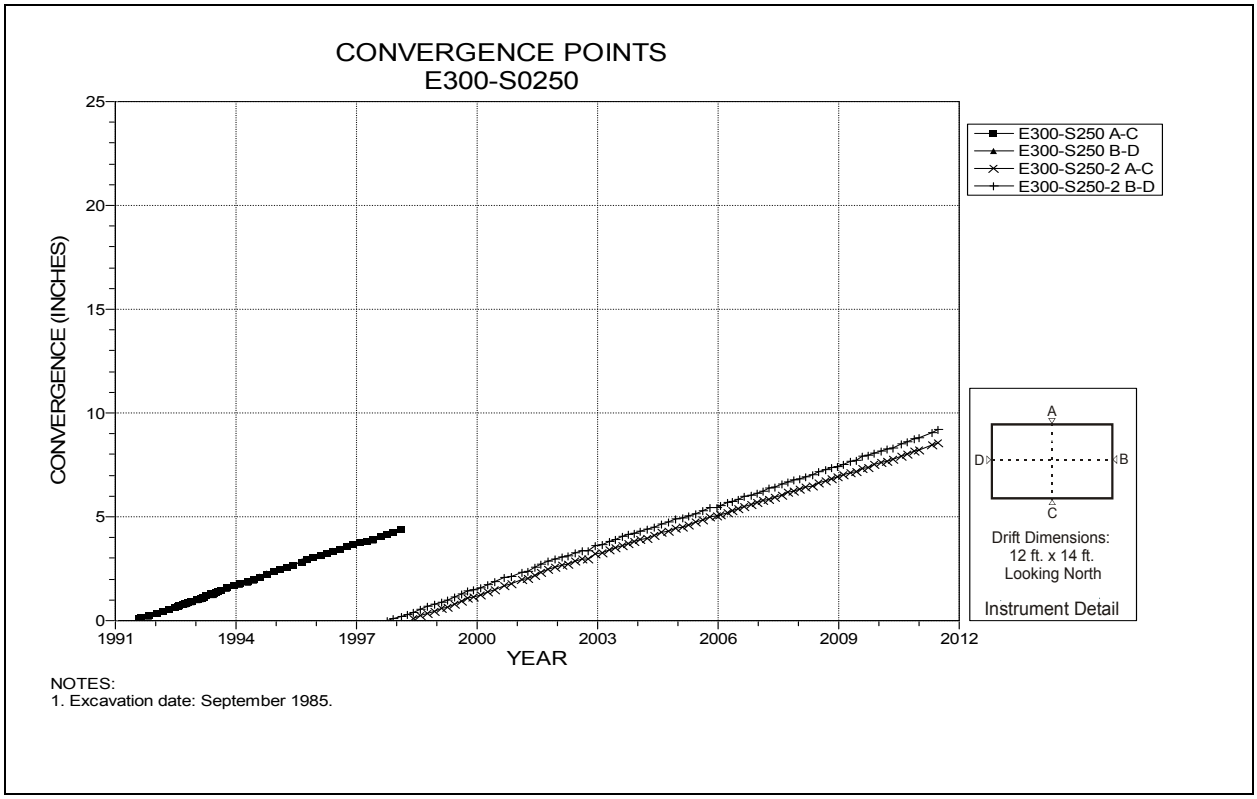


Figure 4-32 Convergence Point Array
E300 S250 – All Chords

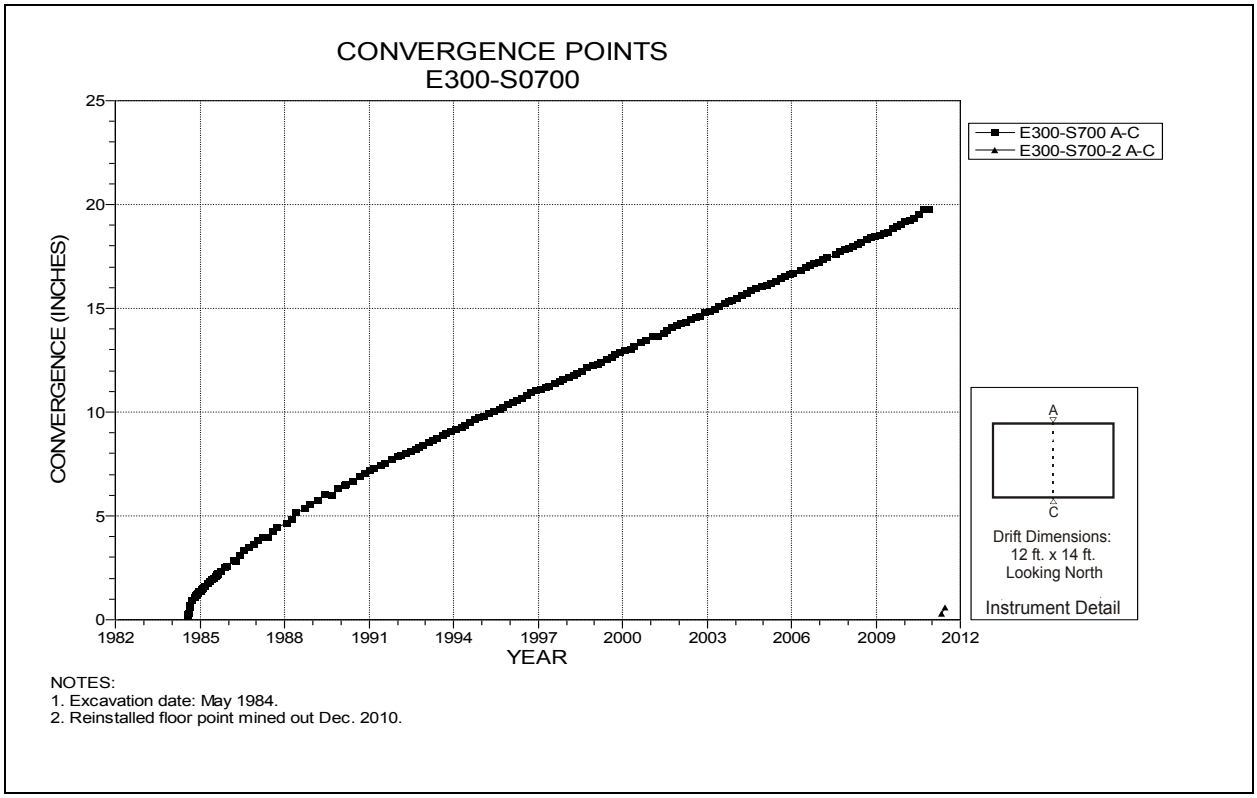


Figure 4-33 Convergence Point Array
E300 S700 – Roof to Floor

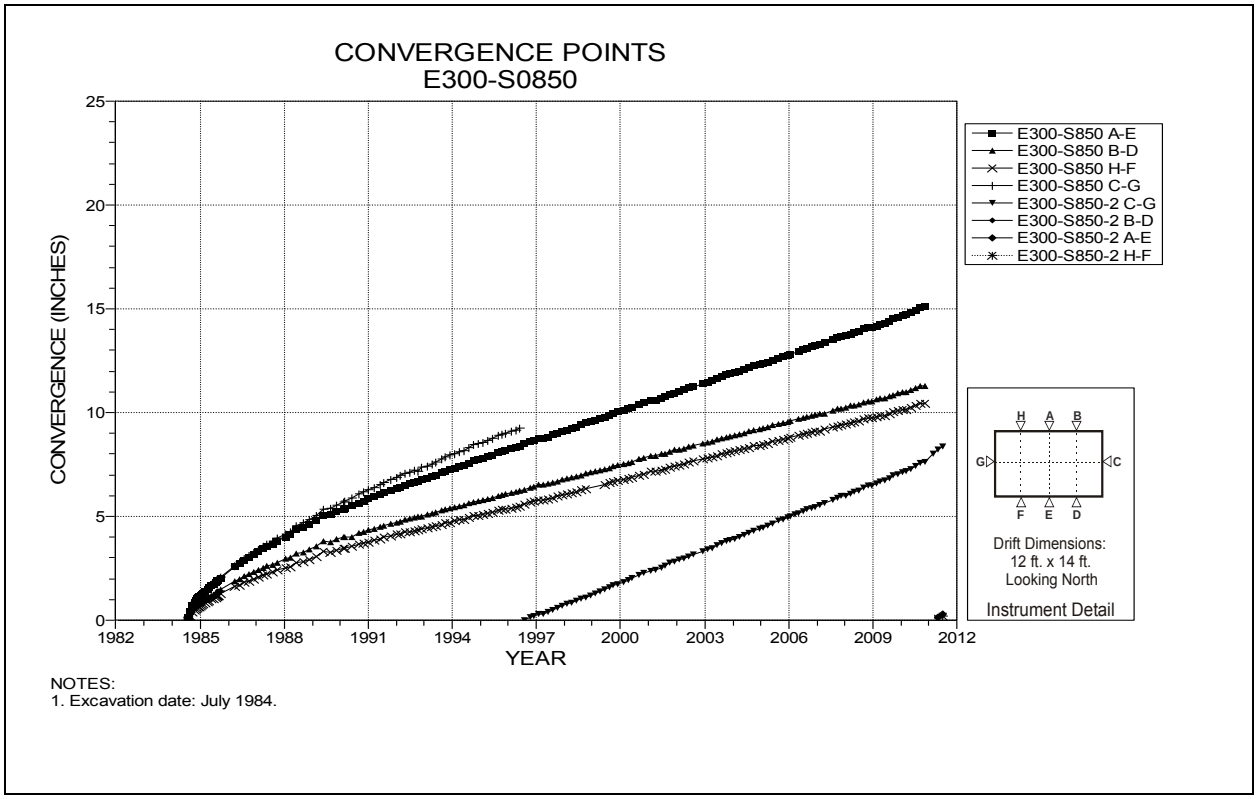


Figure 4-34 Convergence Point Array
E300 S850 – All Chords

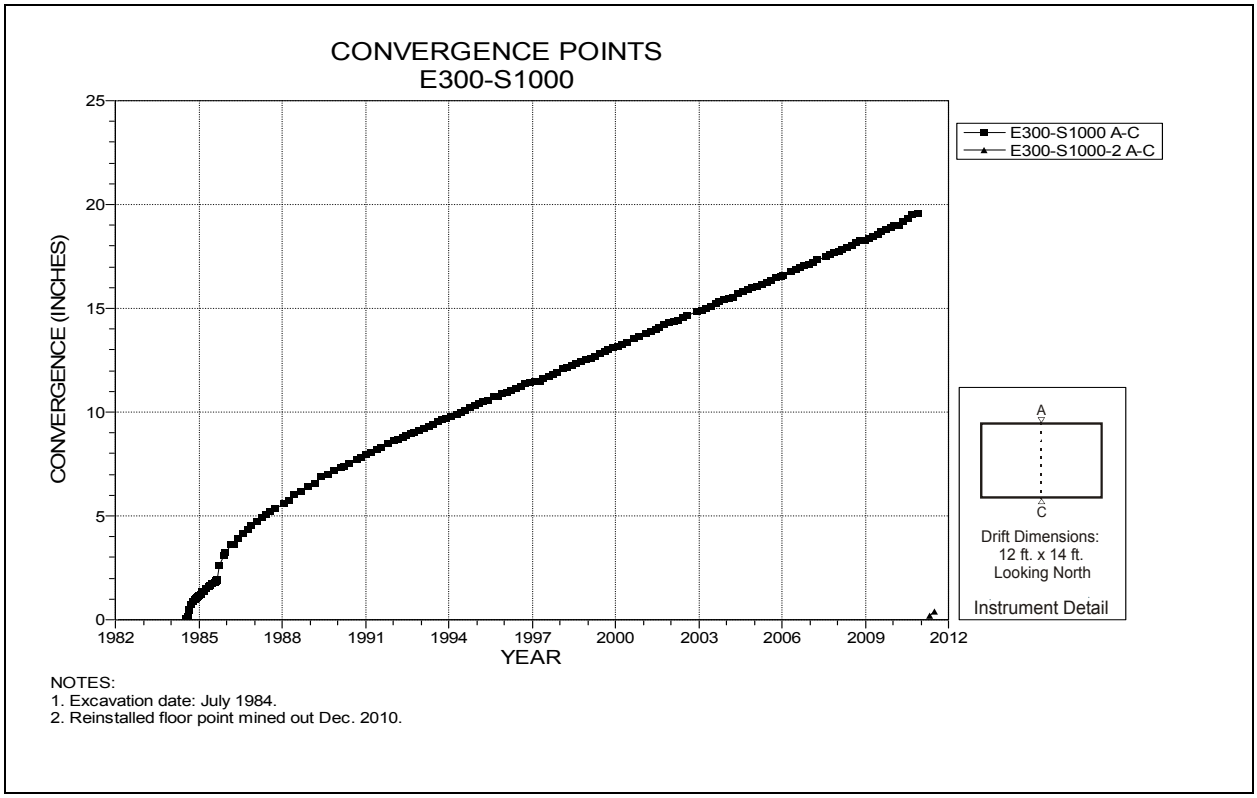


Figure 4-35 Convergence Point Array
E300 S1000 – Roof to Floor

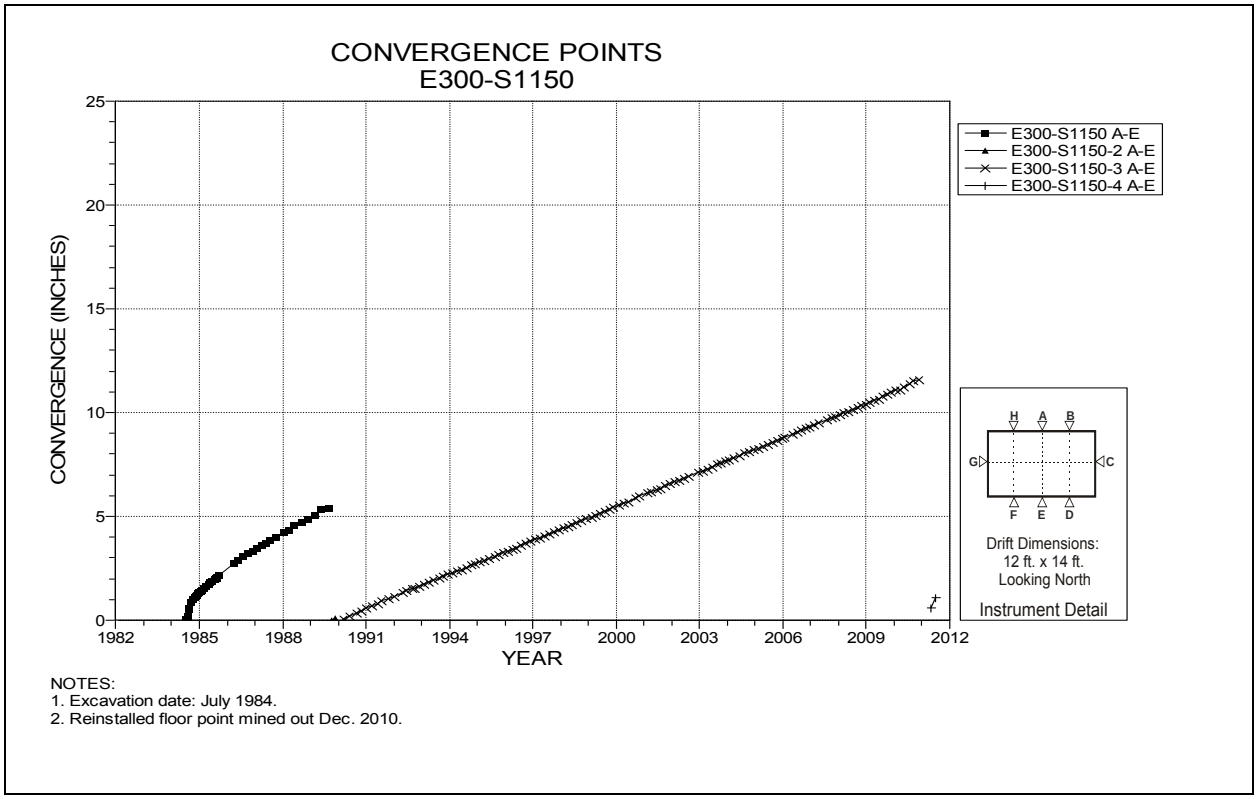


Figure 4-36 Convergence Point Array
E300 S1150 – Roof to Floor

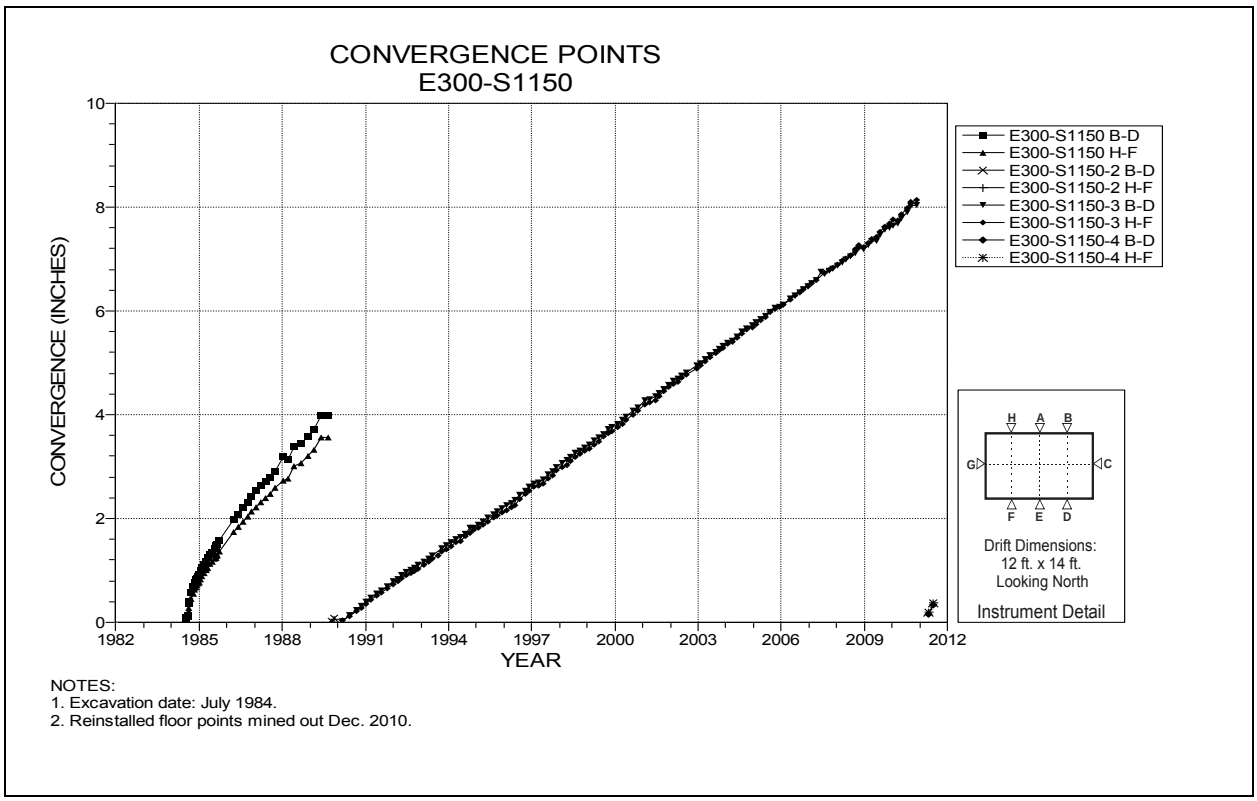


Figure 4-37 Convergence Point Array
E300 S1150 – Quarter-Points

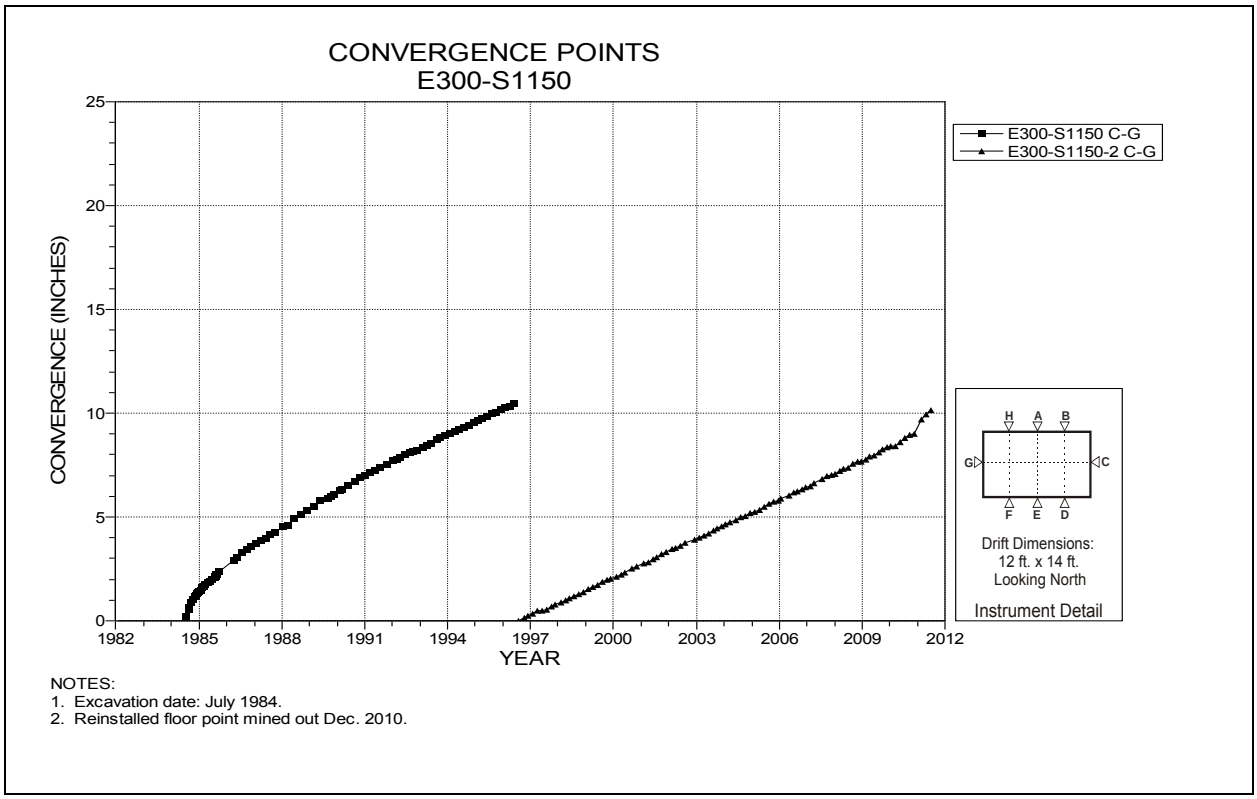


Figure 4-38 Convergence Point Array
E300 S1150 – Rib to Rib

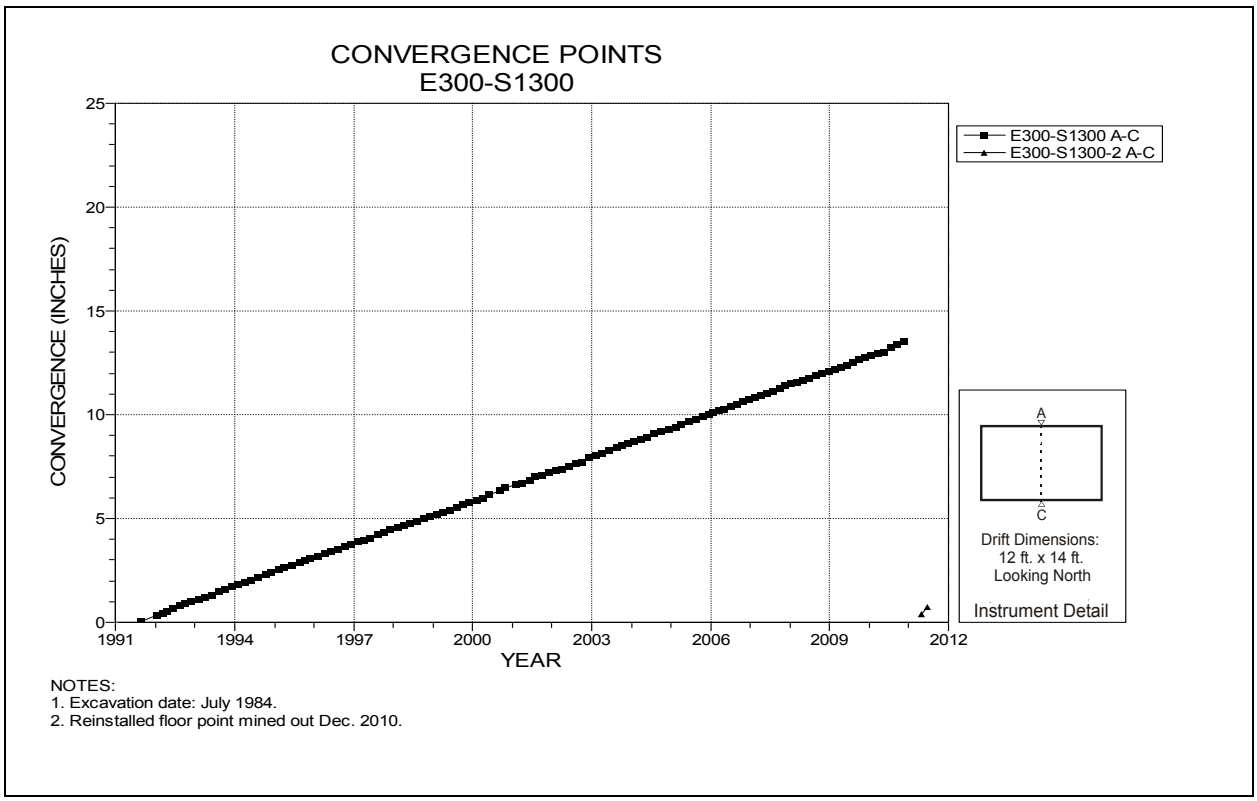


Figure 4-39 Convergence Point Array
E300 S1300 – Roof to Floor

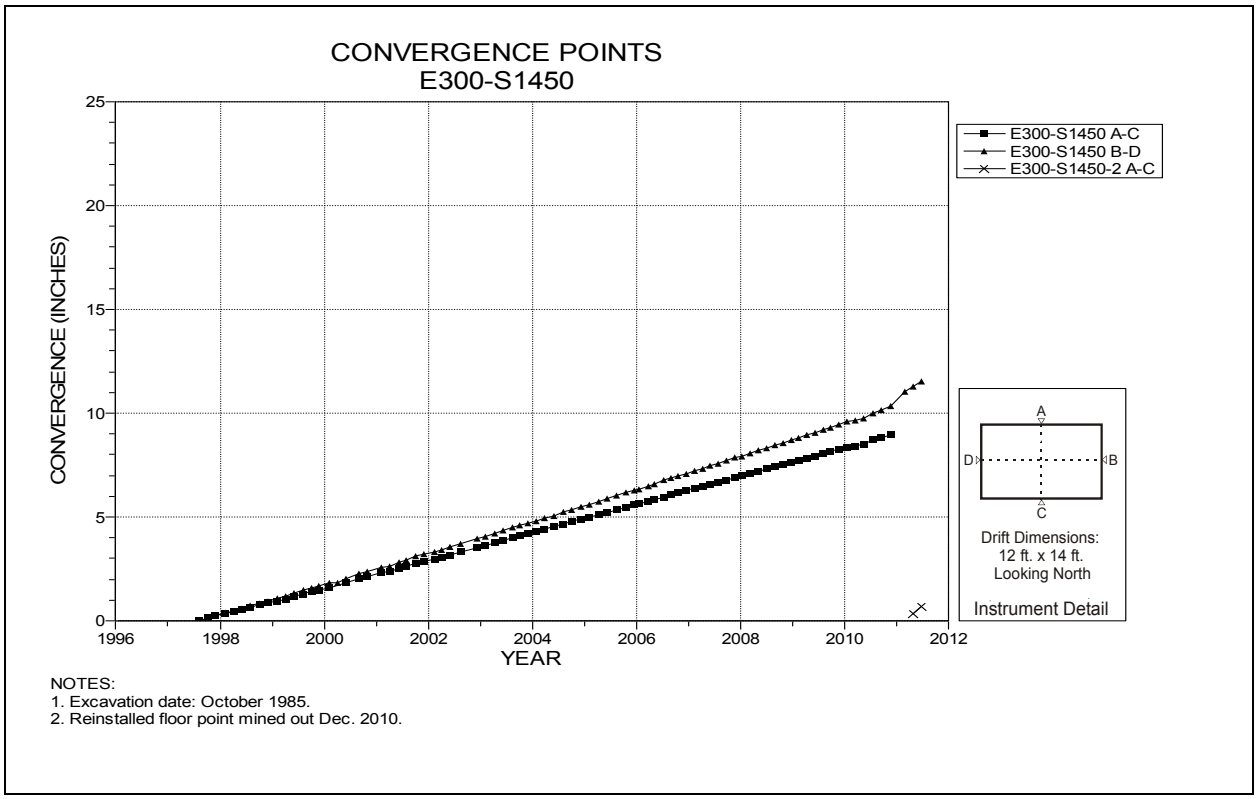


Figure 4-40 Convergence Point Array
E300 S1450 – All Chords

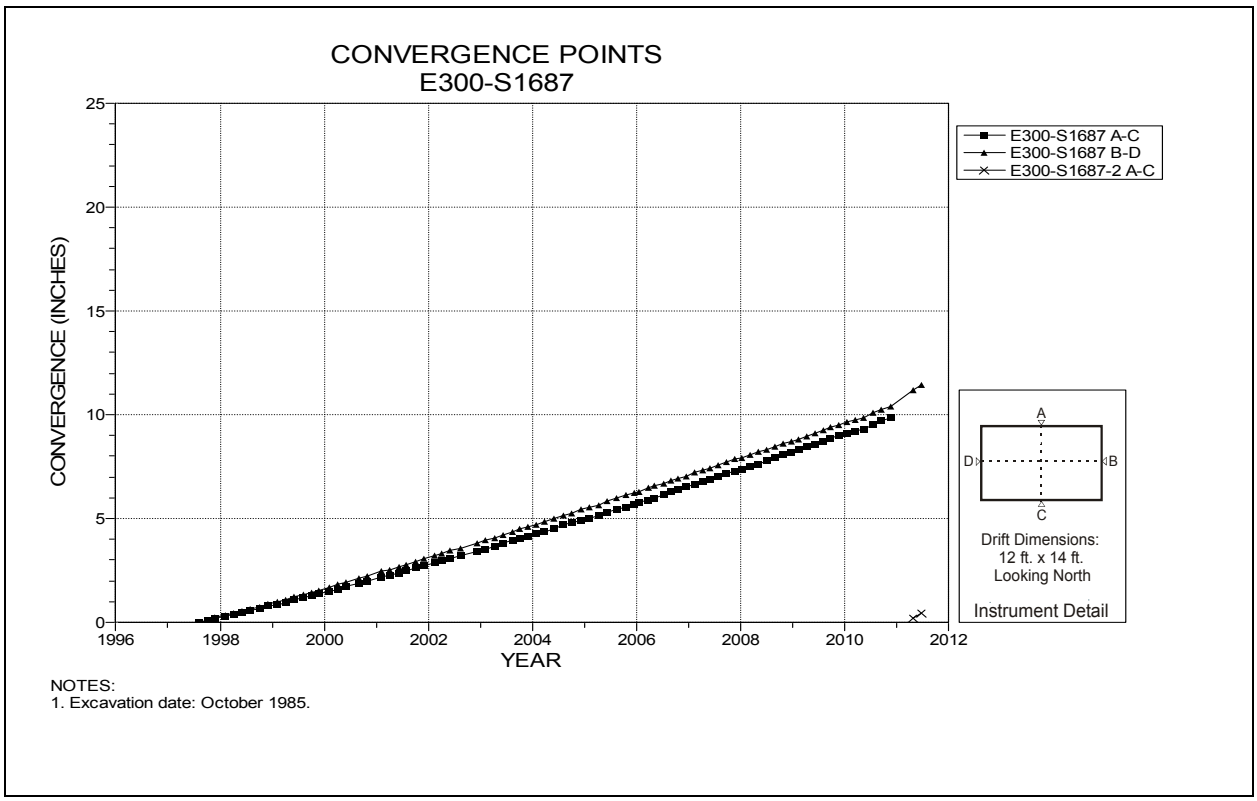


Figure 4-41 Convergence Point Array
E300 S1687 – All Chords

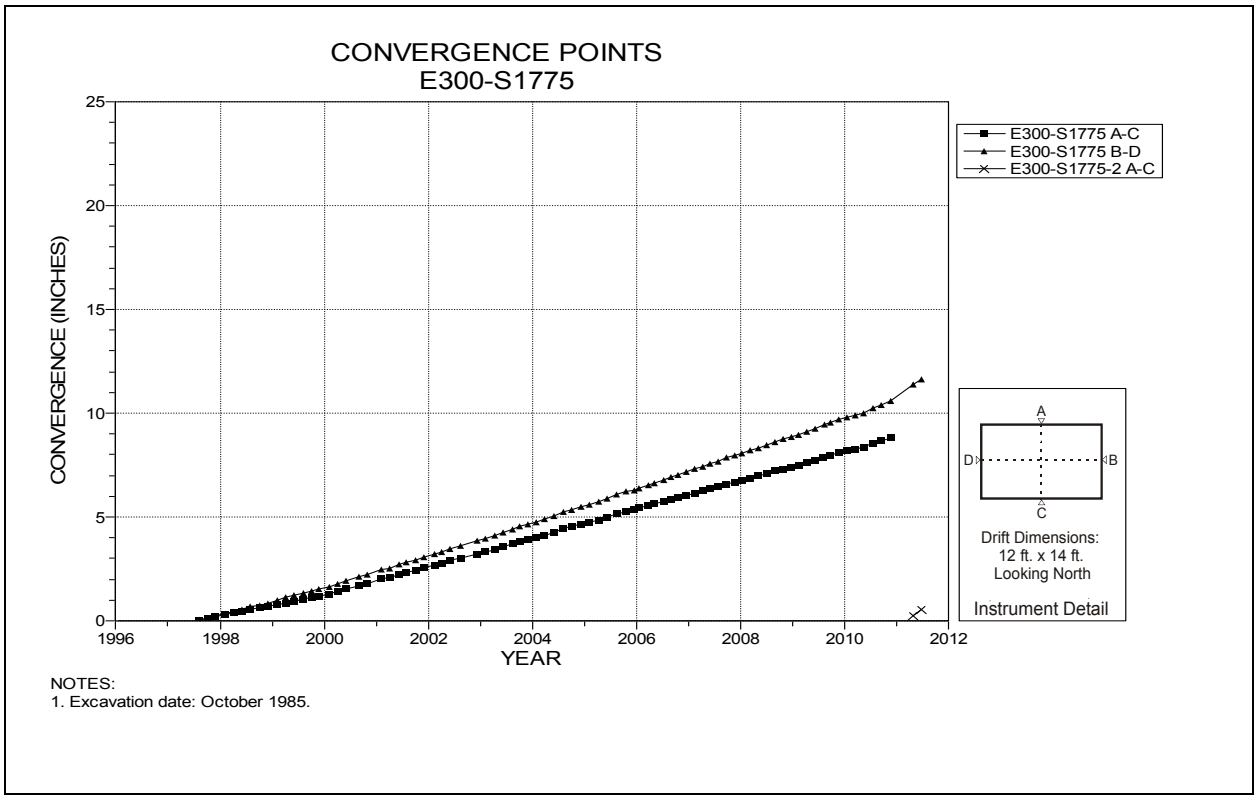


Figure 4-42 Convergence Point Array
E300 S1775 – All Chords

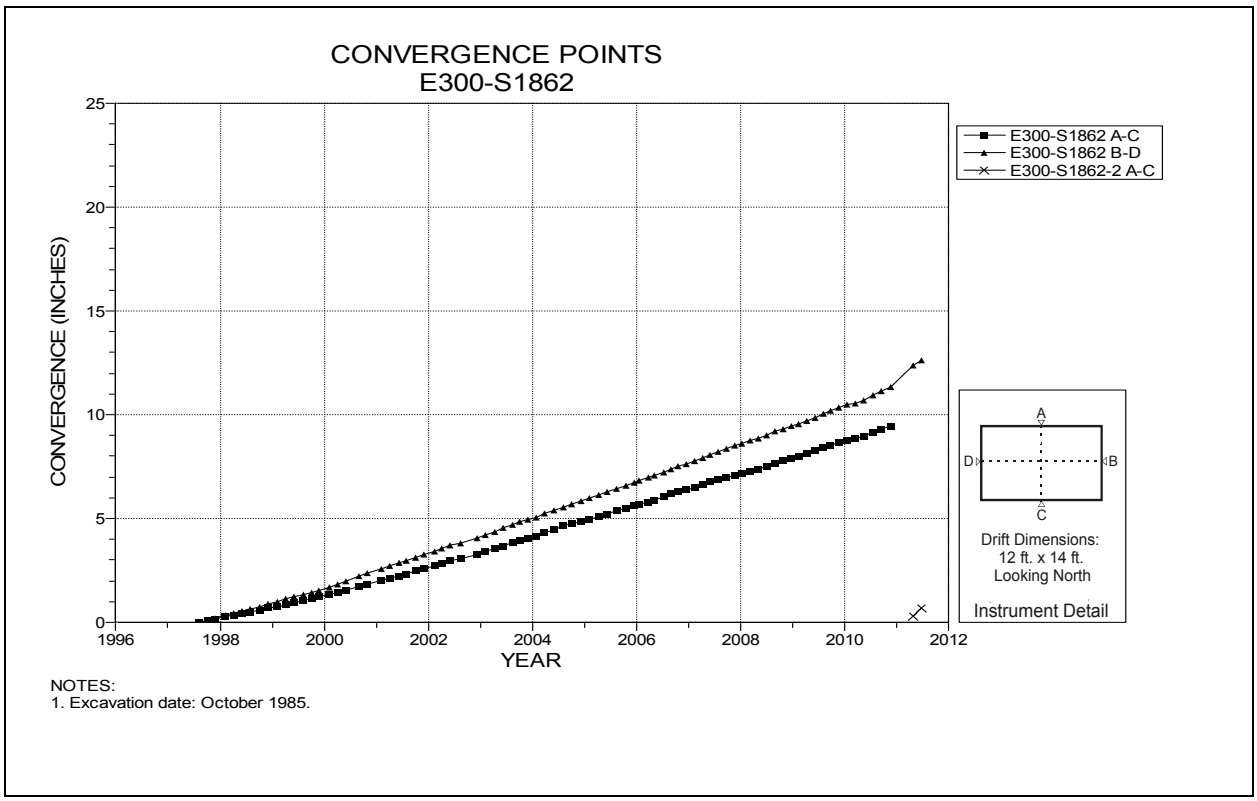


Figure 4-43 Convergence Point Array
E300 S1862 – All Chords

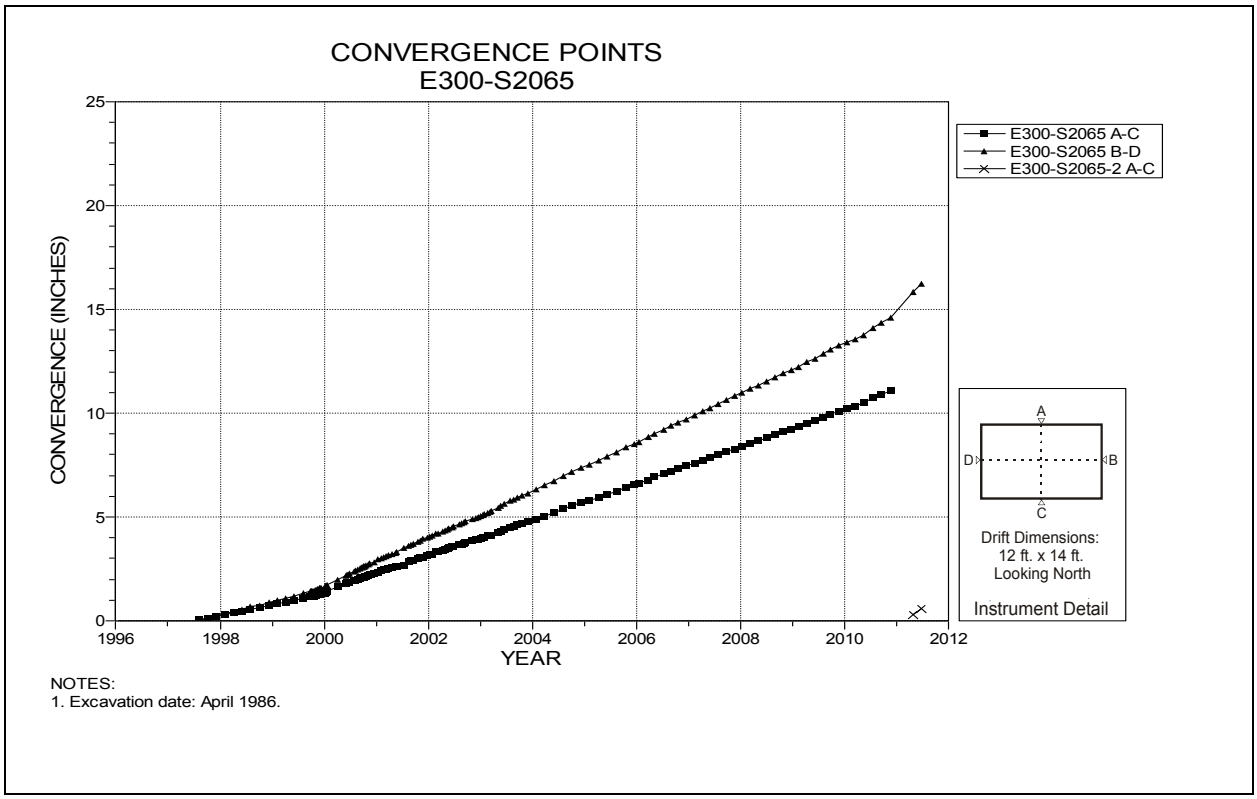


Figure 4-44 Convergence Point Array
E300 S2065 – All Chords

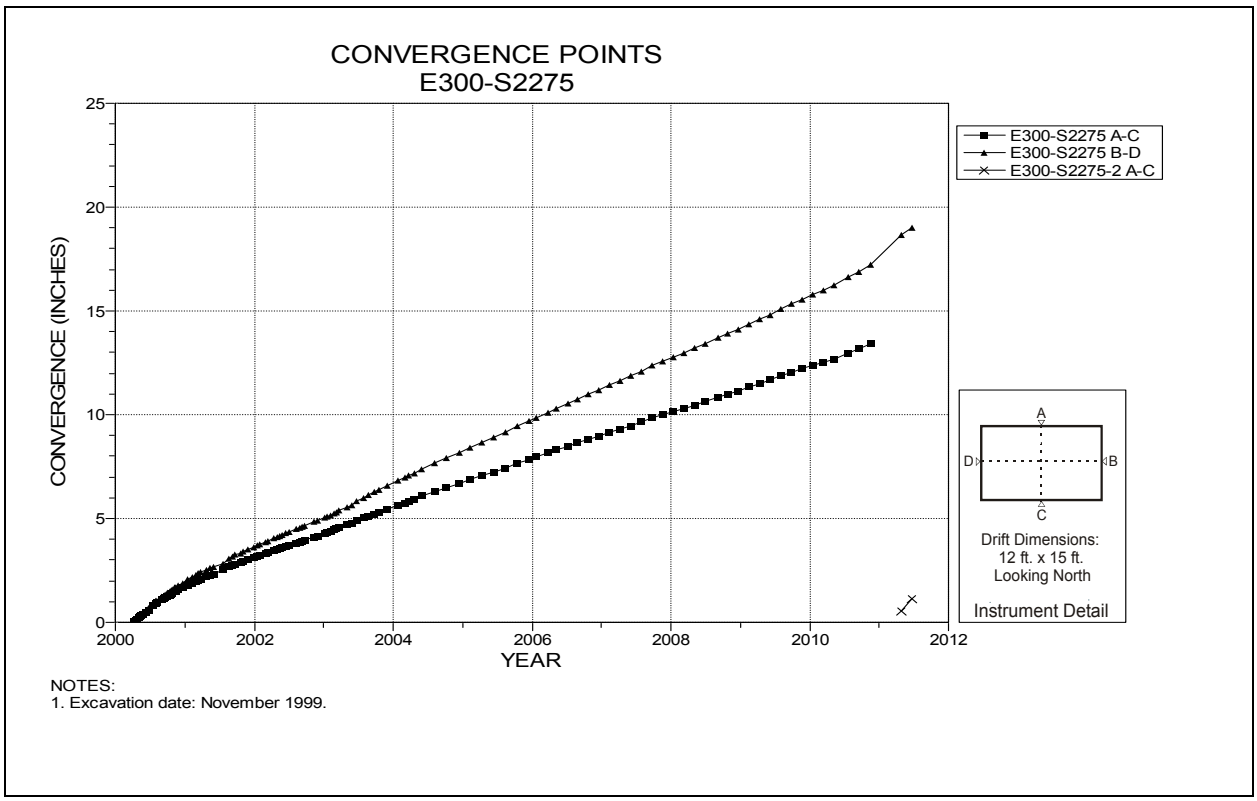


Figure 4-45 Convergence Point Array
E300 S2275 – All Chords

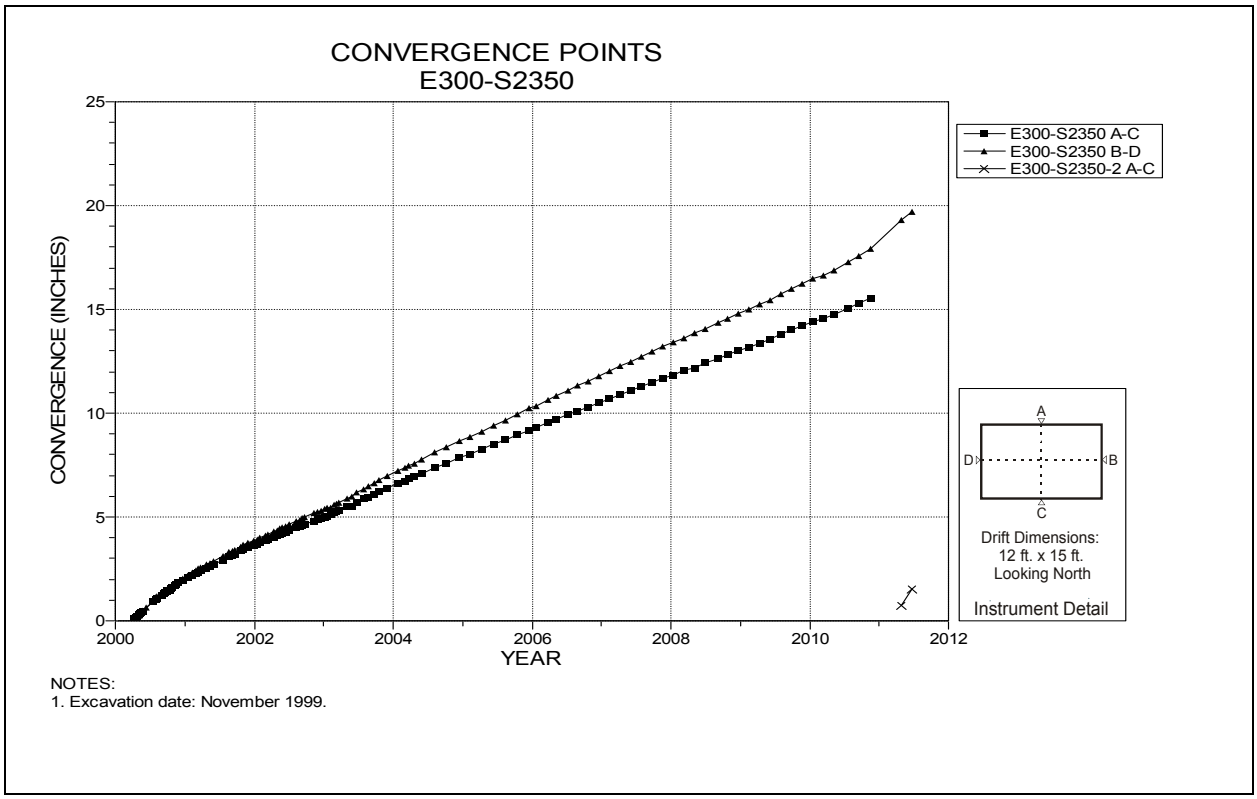
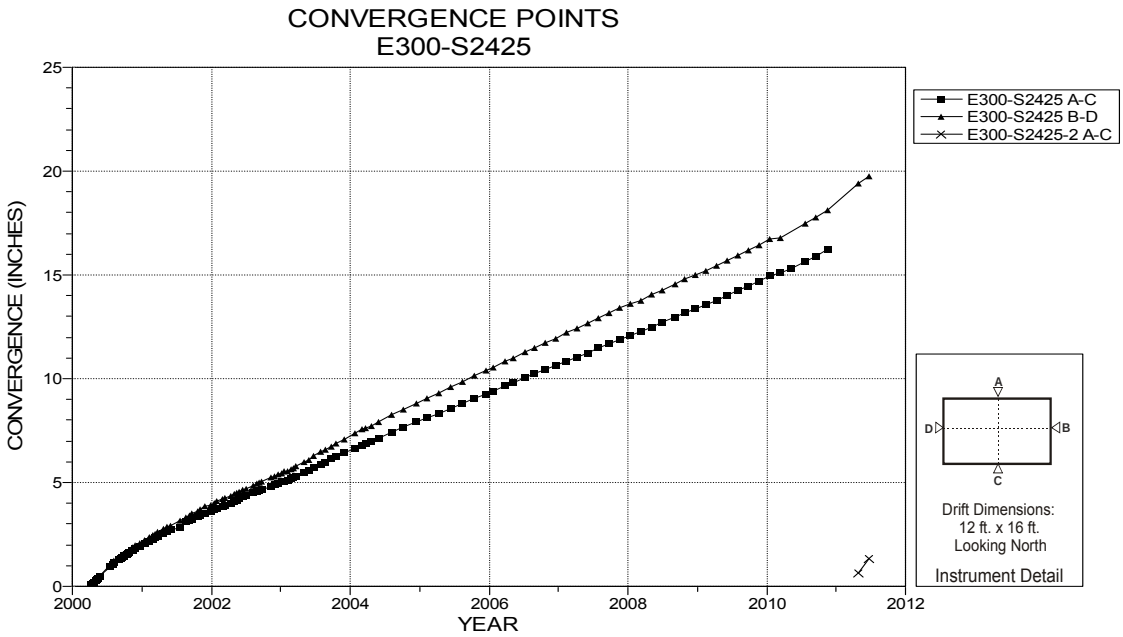
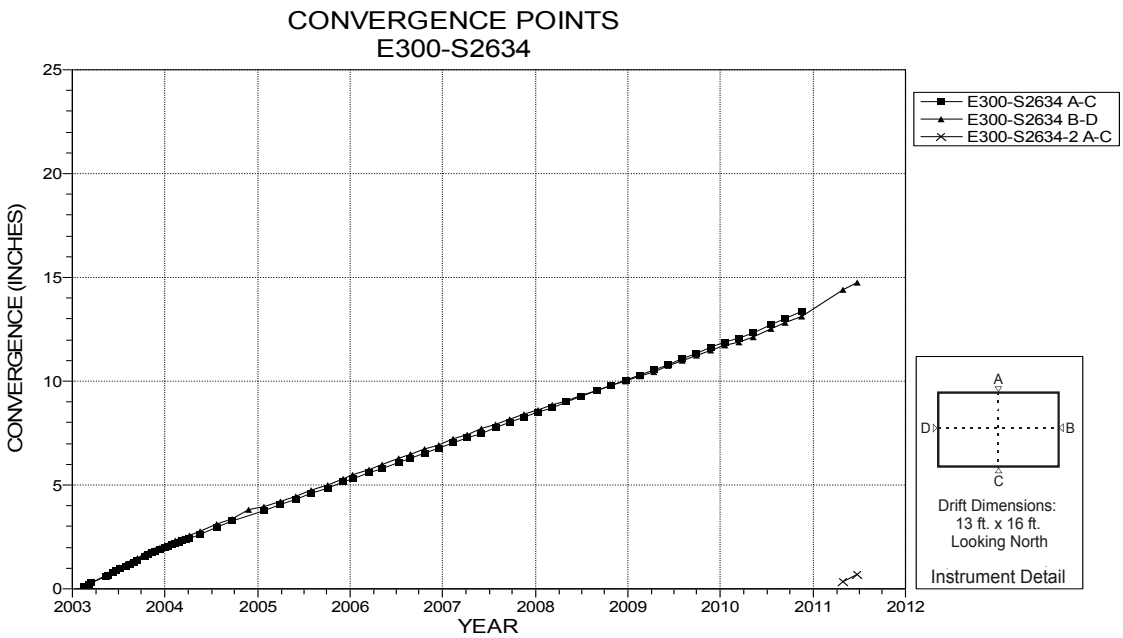


Figure 4-46 Convergence Point Array
E300 S2350 – All Chords



NOTES:
1. Excavation date: December 1999.

Figure 4-47 Convergence Point Array
E300 S2425 – All Chords



NOTES:
1. Excavation date: December 2001.

Figure 4-48 Convergence Point Array
E300 S2634 – All Chords

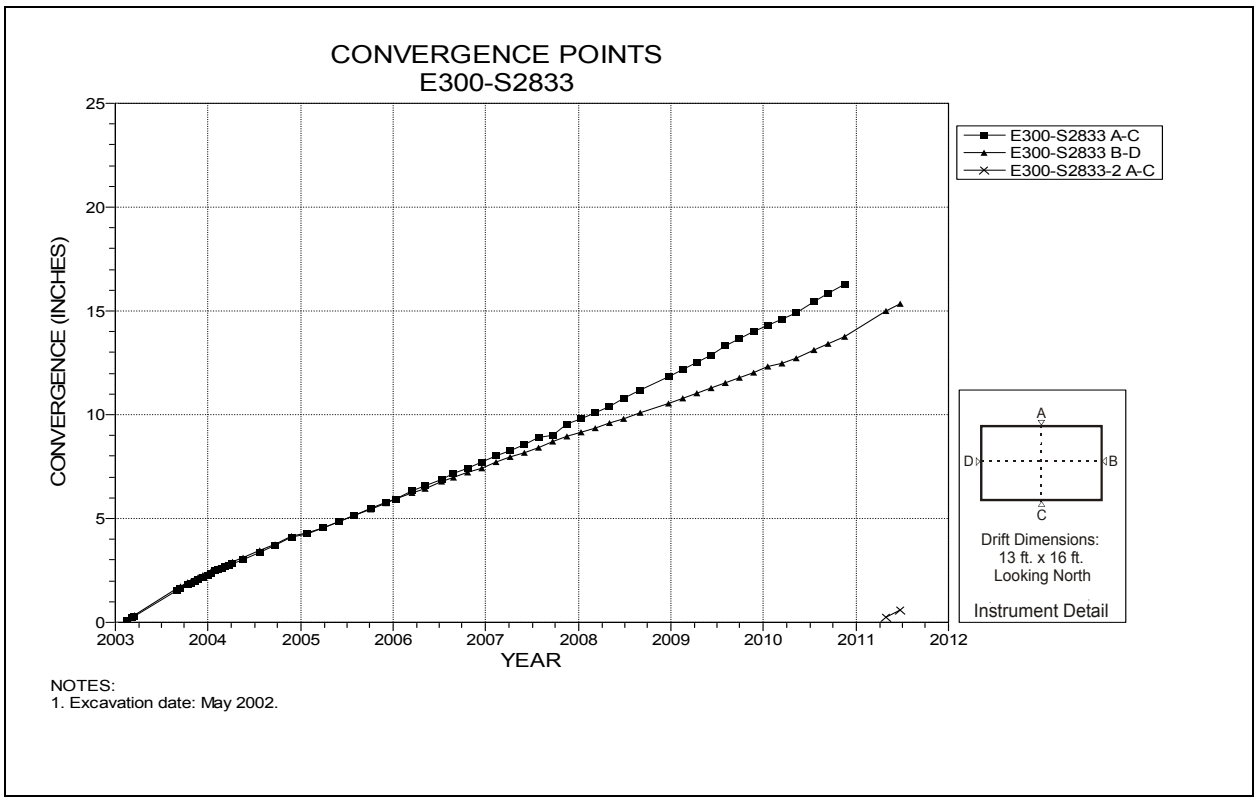


Figure 4-49 Convergence Point Array
E300 S2833 – All Chords

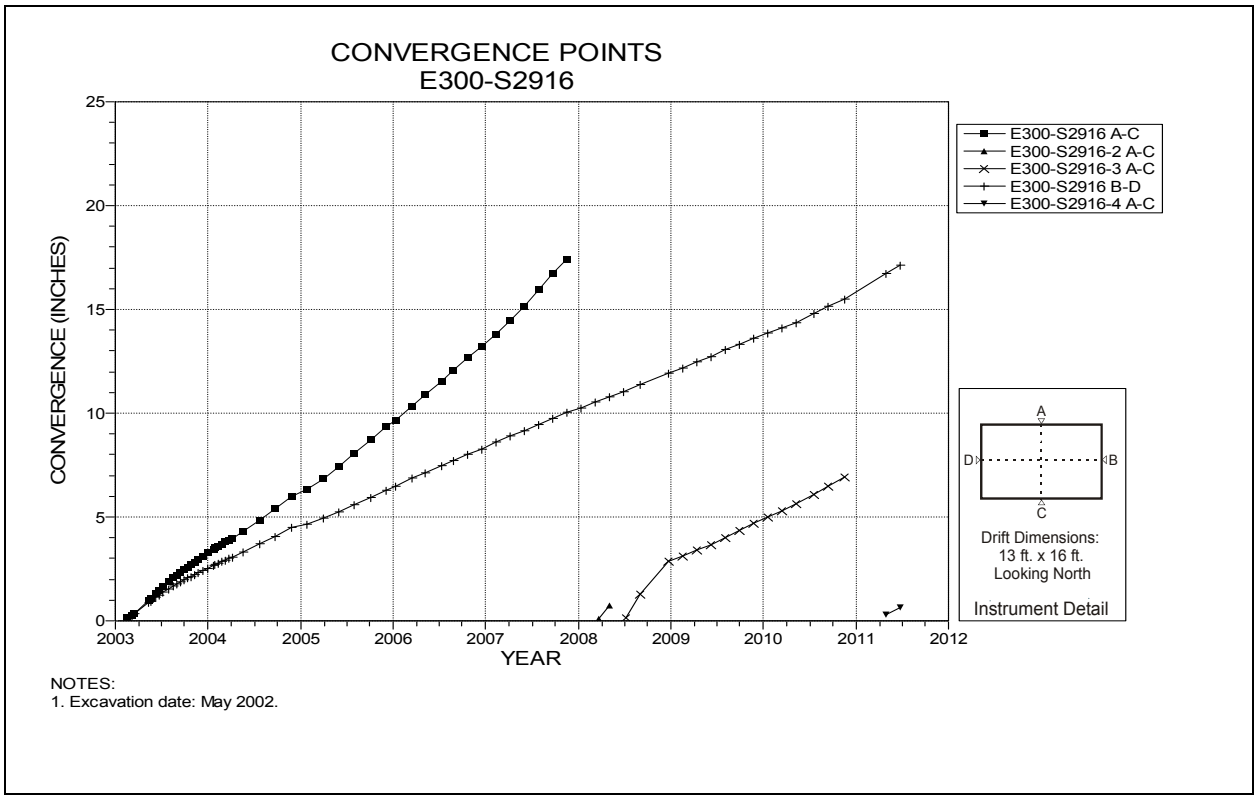


Figure 4-50 Convergence Point Array
E300 S2916 – All Chords

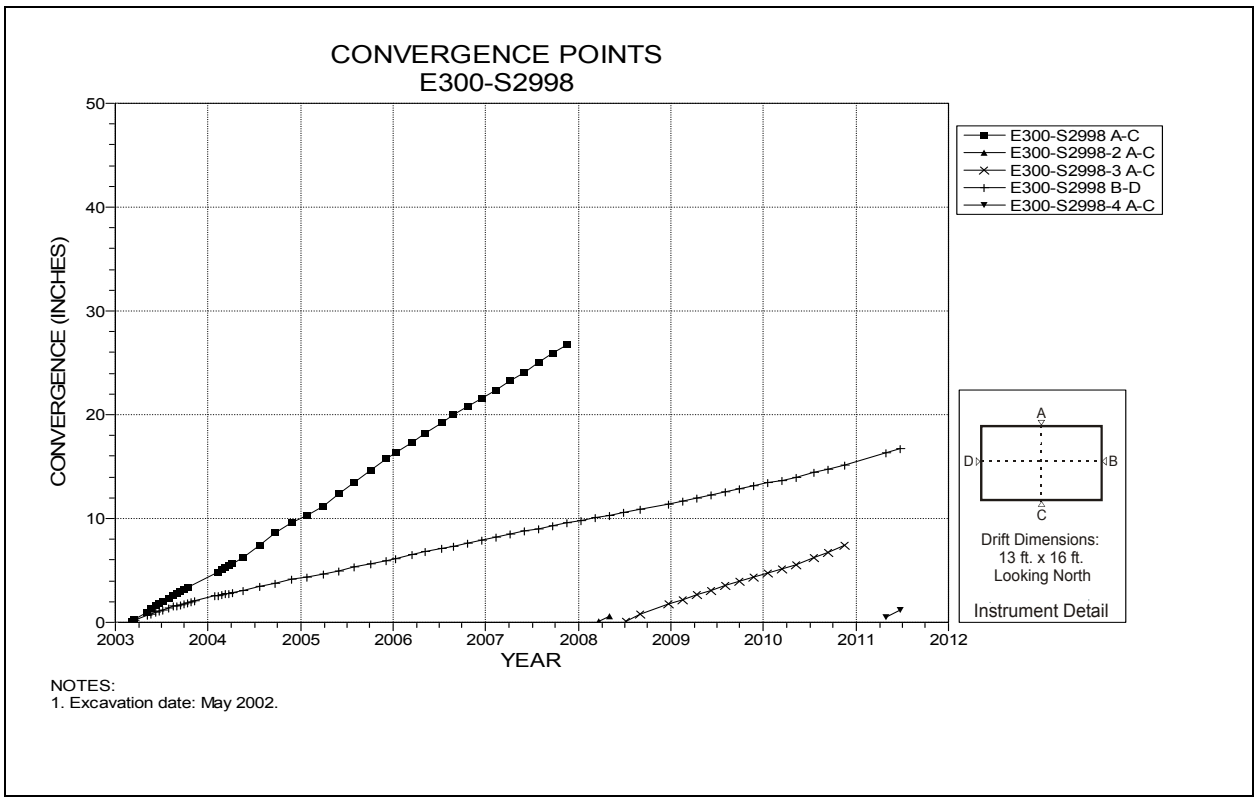


Figure 4-51 Convergence Point Array
E300 S2998 – All Chords

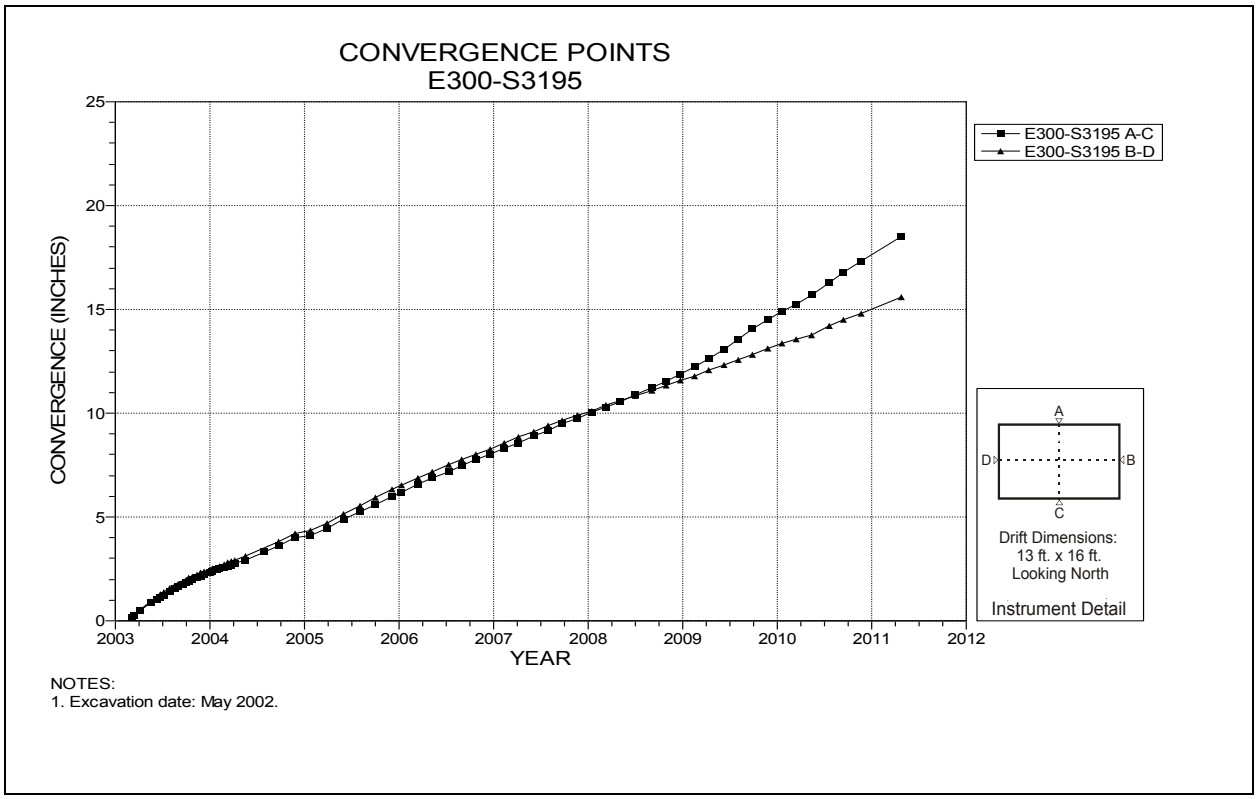
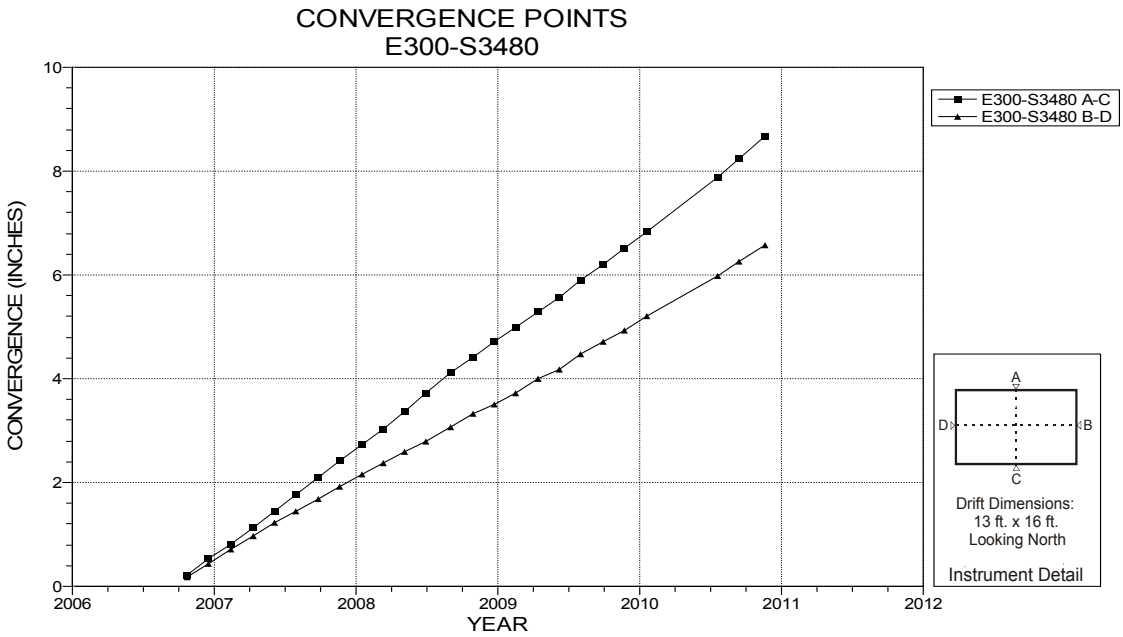
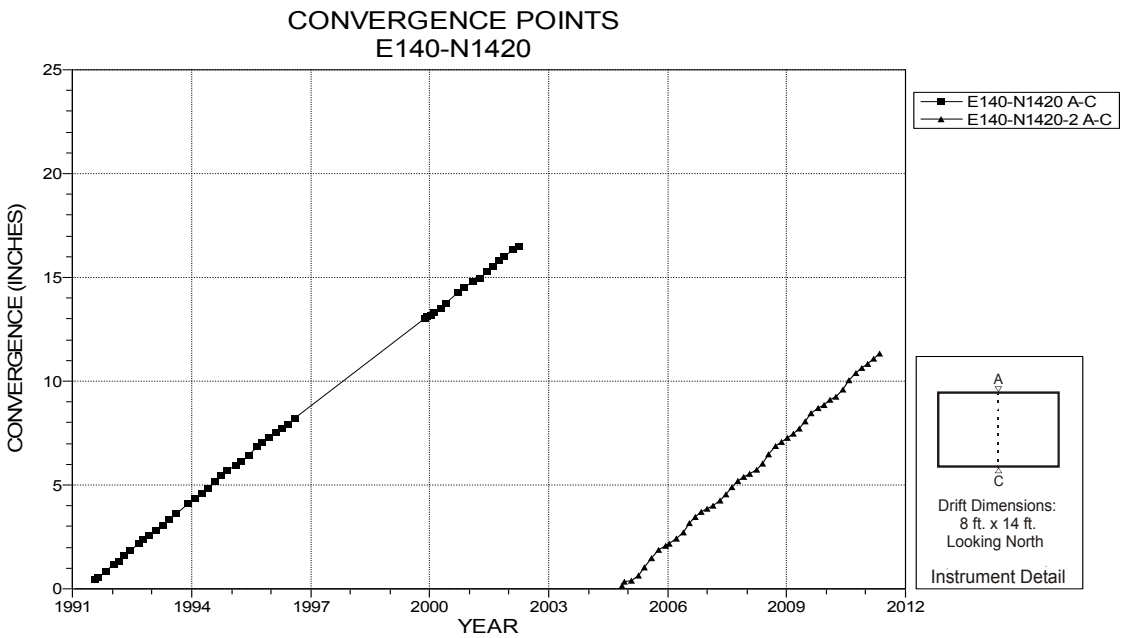


Figure 4-52 Convergence Point Array
E300 S3195 – All Chords



NOTES:
1. Excavation date: October 2002.
2. This area was inaccessible for instrument reading from early 2011 until July 2011.

Figure 4-53 Convergence Point Array
E300 S3480 – All Chords



NOTES:
1. Excavation date: February 1983.
2. Inaccessible from August 1996 to November 1999.

Figure 4-54 Convergence Point Array
E140 N1420 – Roof to Floor

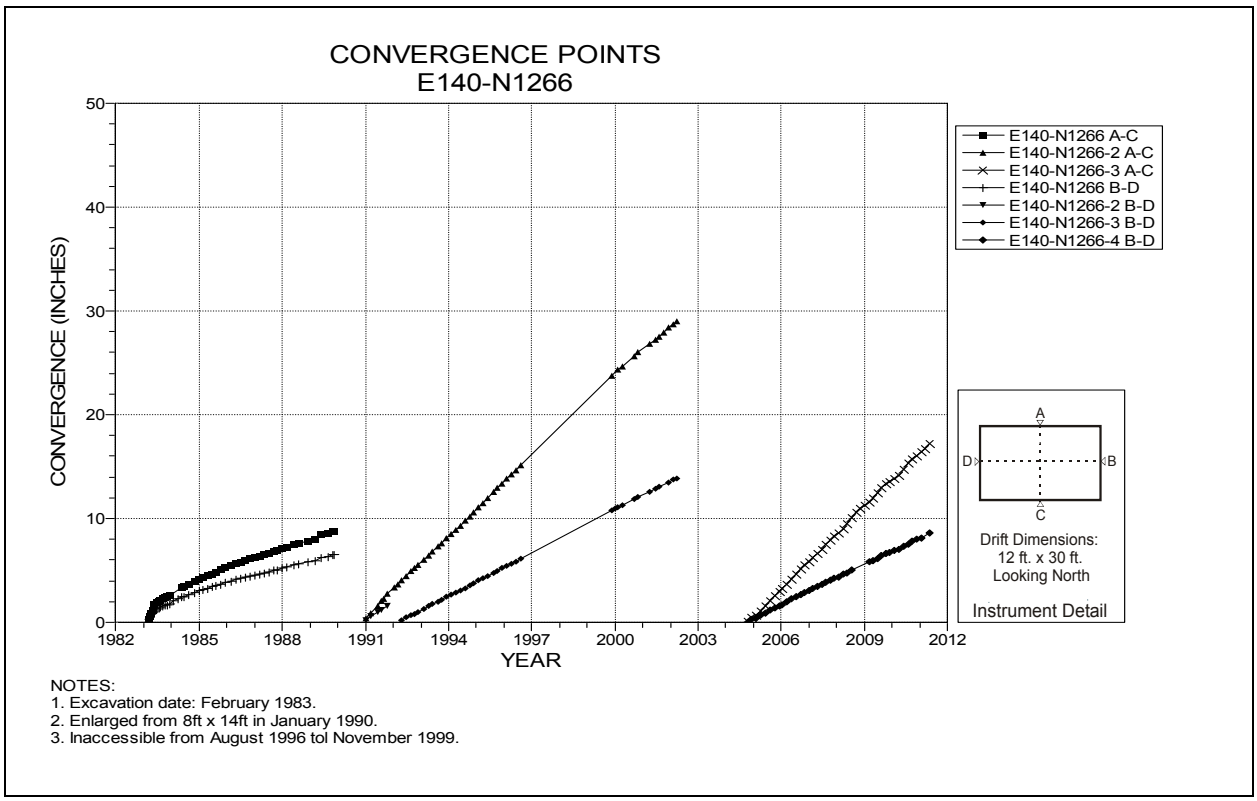


Figure 4-55 Convergence Point Array
E140 N1266 – All Chords

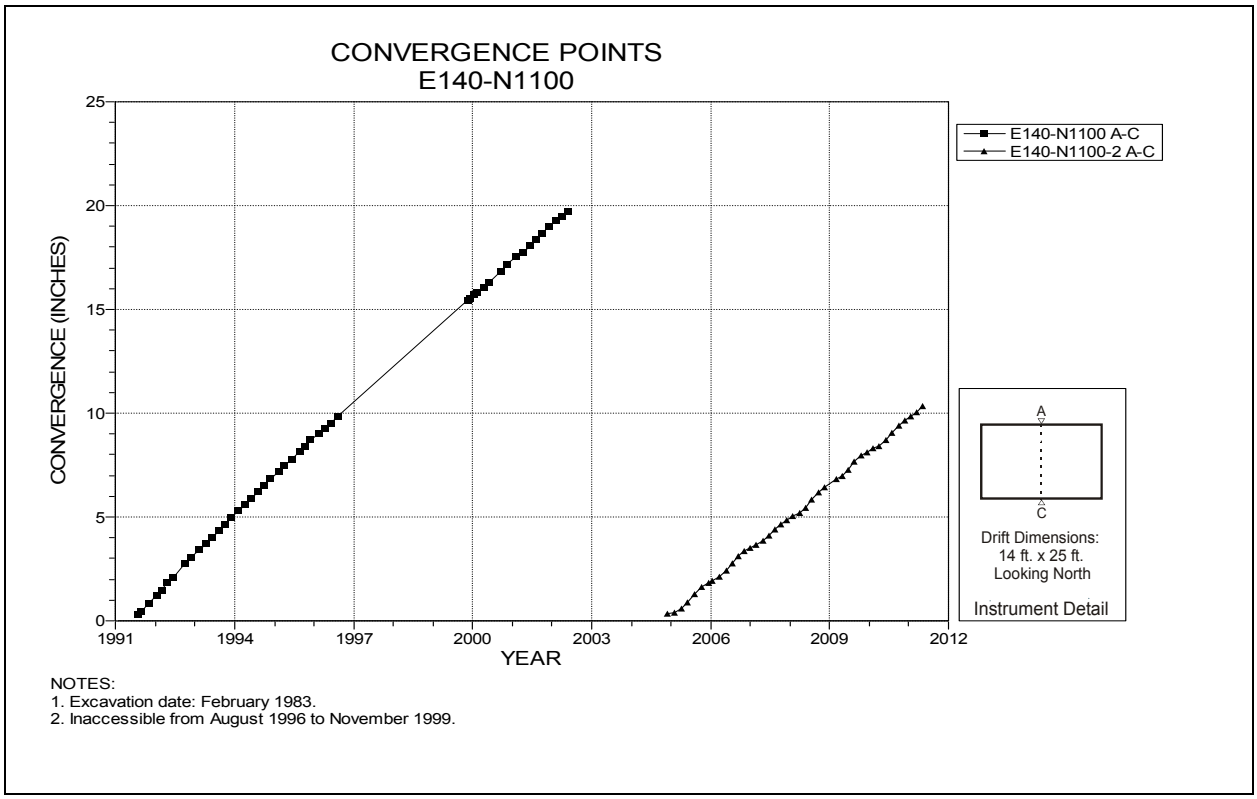
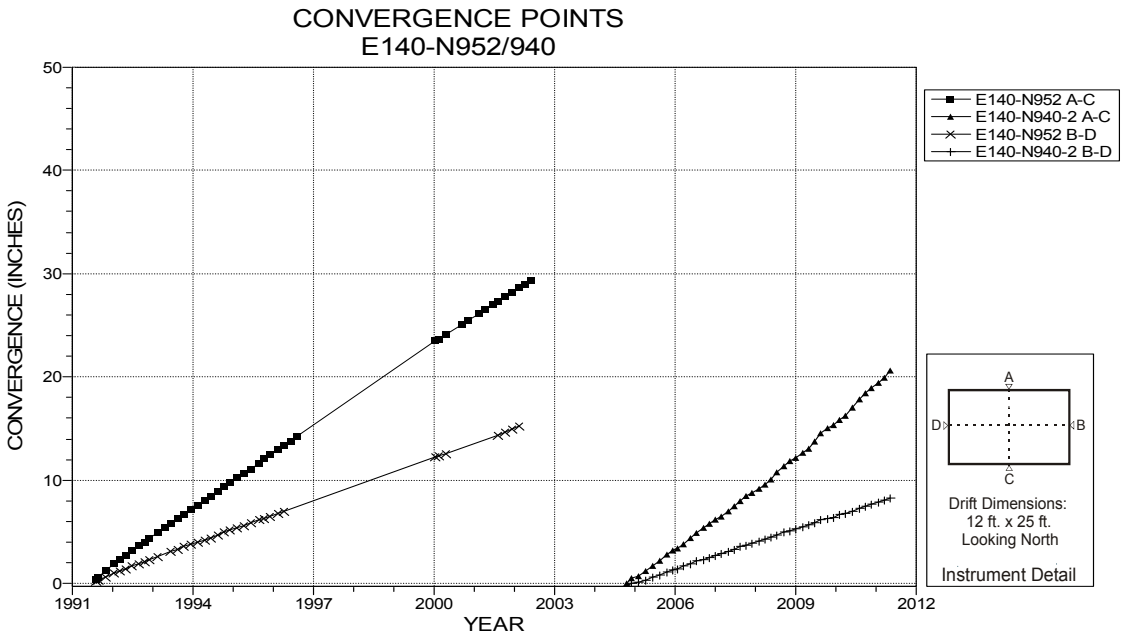
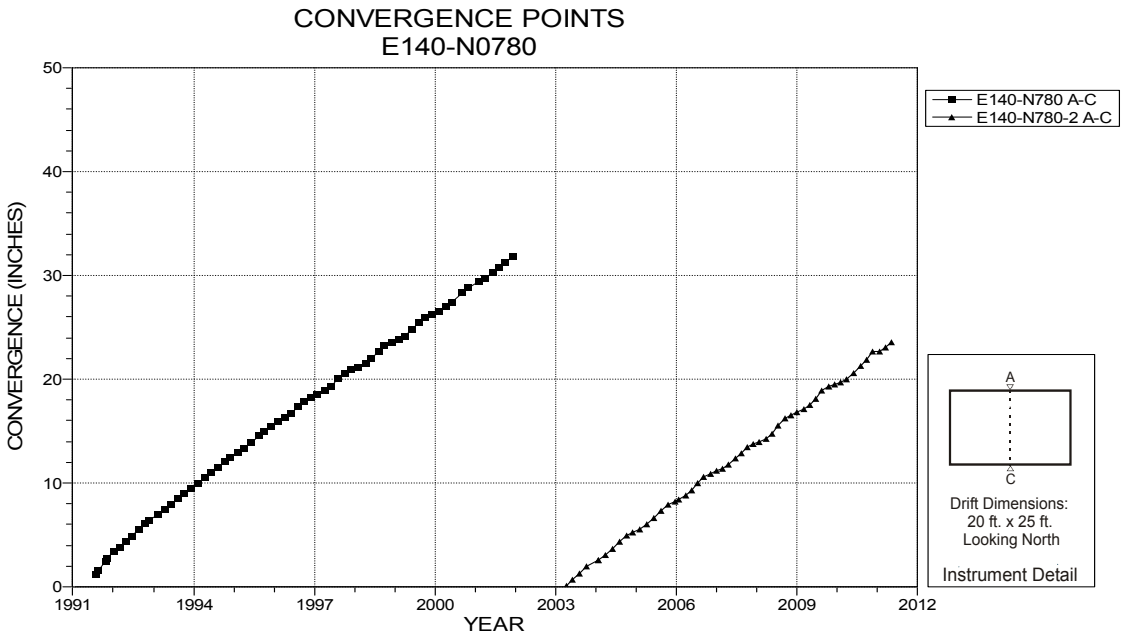


Figure 4-56 Convergence Point Array
E140 N1100 – Roof to Floor



NOTES:
1. Excavation date: February 1983.
2. Not accessible from August 1996 to January 2000.

Figure 4-57 Convergence Point Array
E140 N952/940 – All Chords



NOTES:
1. Excavation date: February 1983.
2. Roof excavated to Anhydrite "b" in early 2002.

Figure 4-58 Convergence Point Array
E140 N780 – Roof to Floor

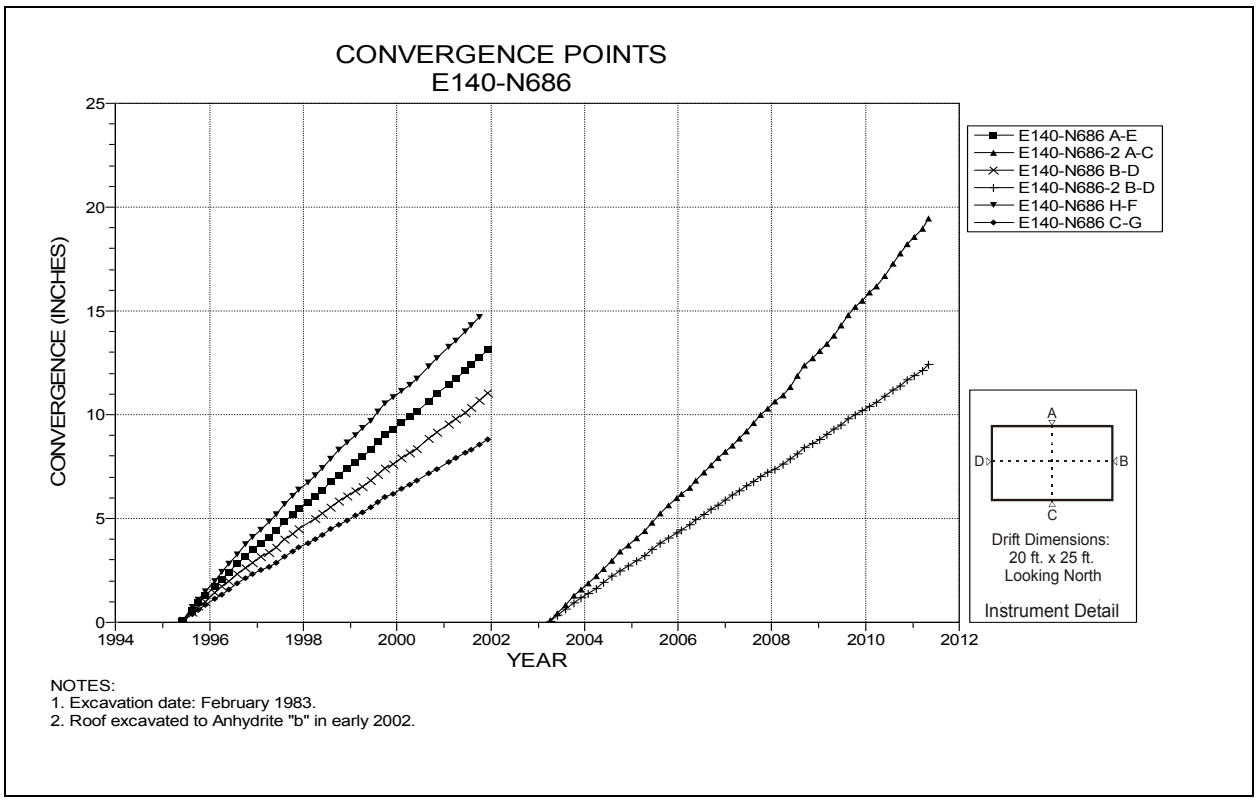


Figure 4-59 Convergence Point Array
E140 N686 – All Chords

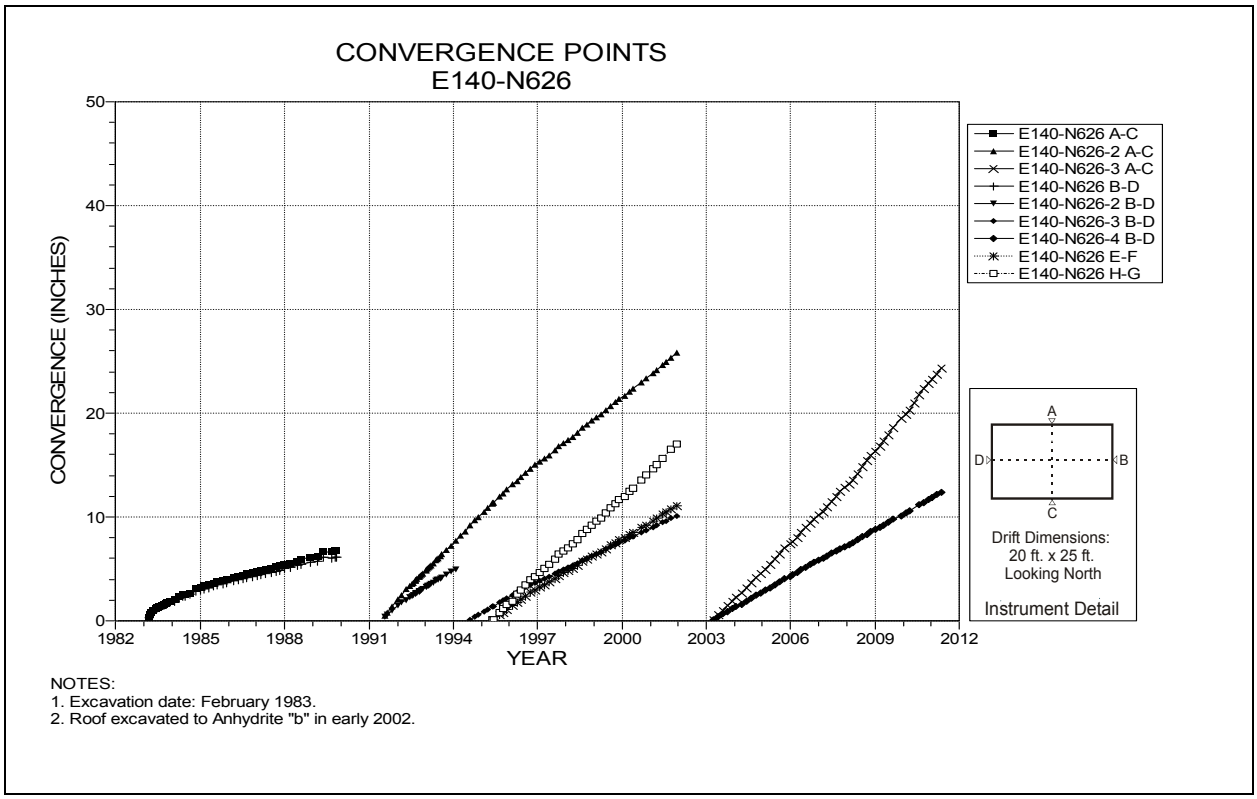


Figure 4-60 Convergence Point Array
E140 N626 – All Chords

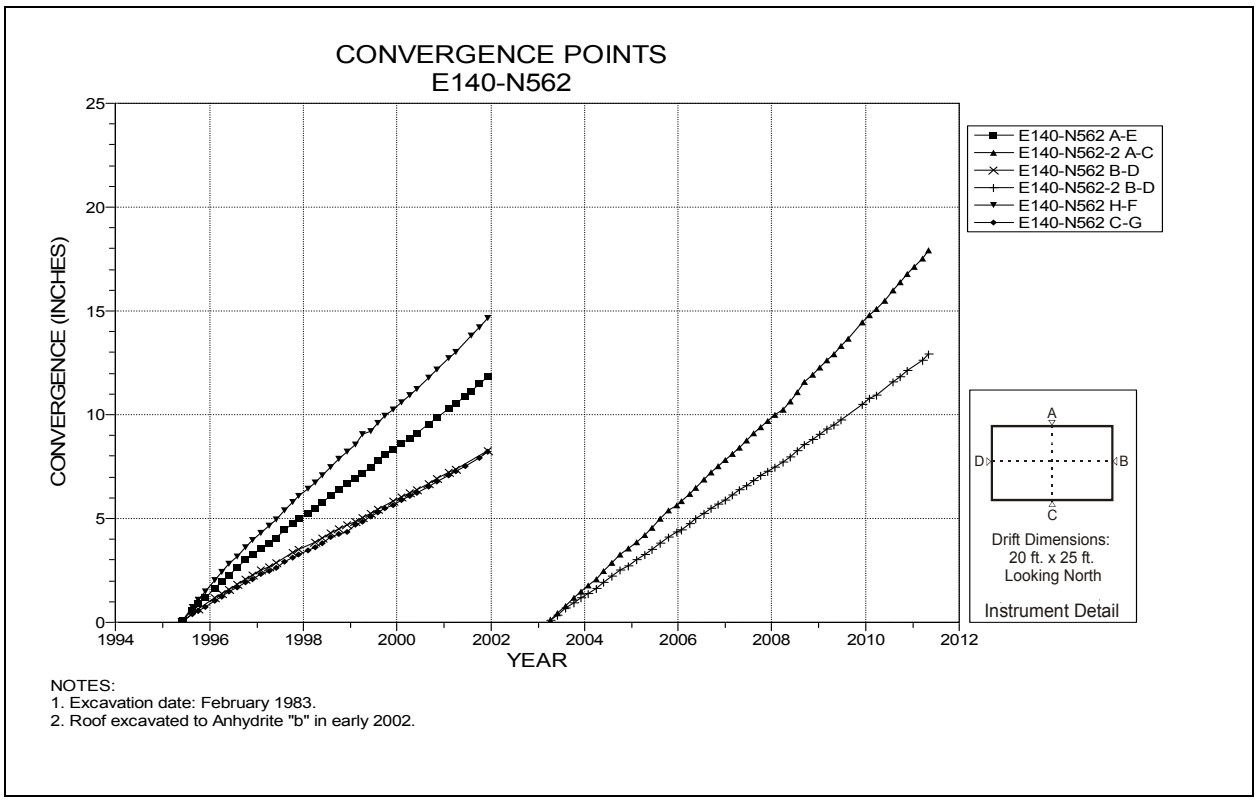


Figure 4-61 Convergence Point Array
E140 N562 – All Chords

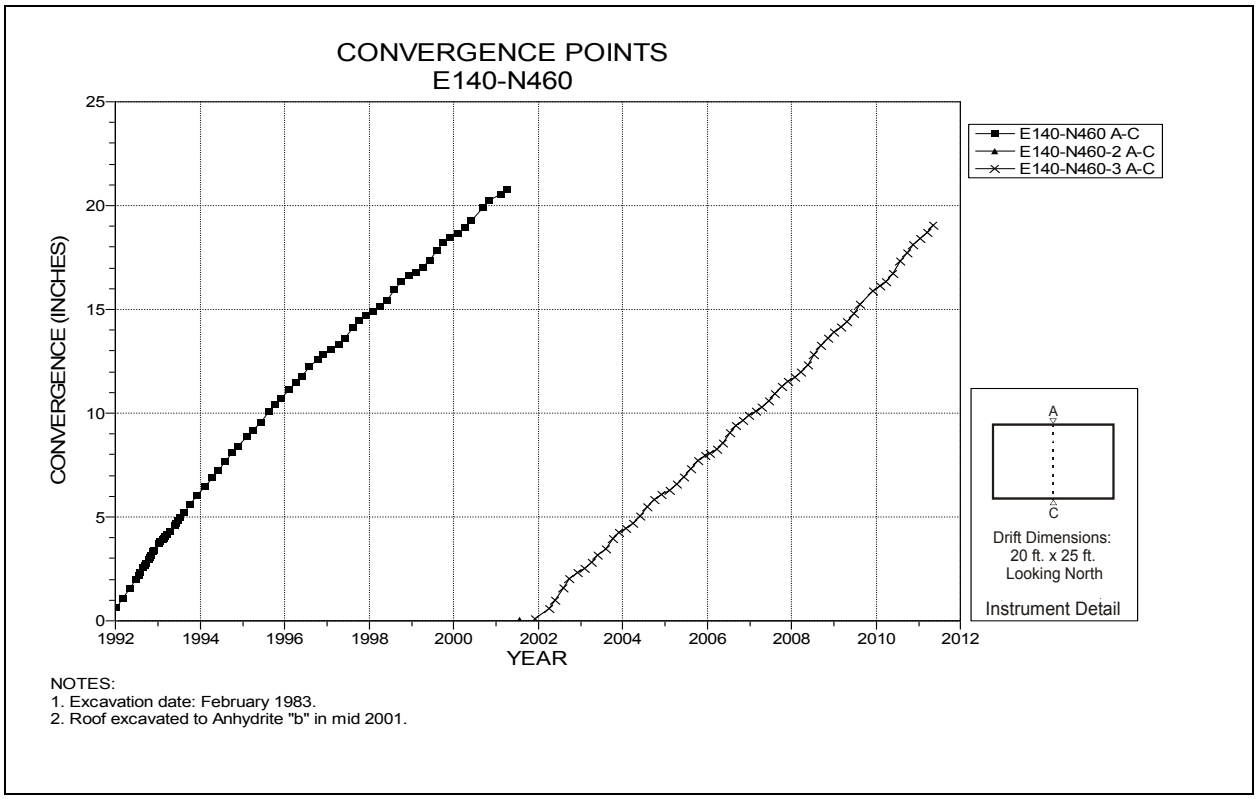


Figure 4-62 Convergence Point Array
E140 N460 – Roof to Floor

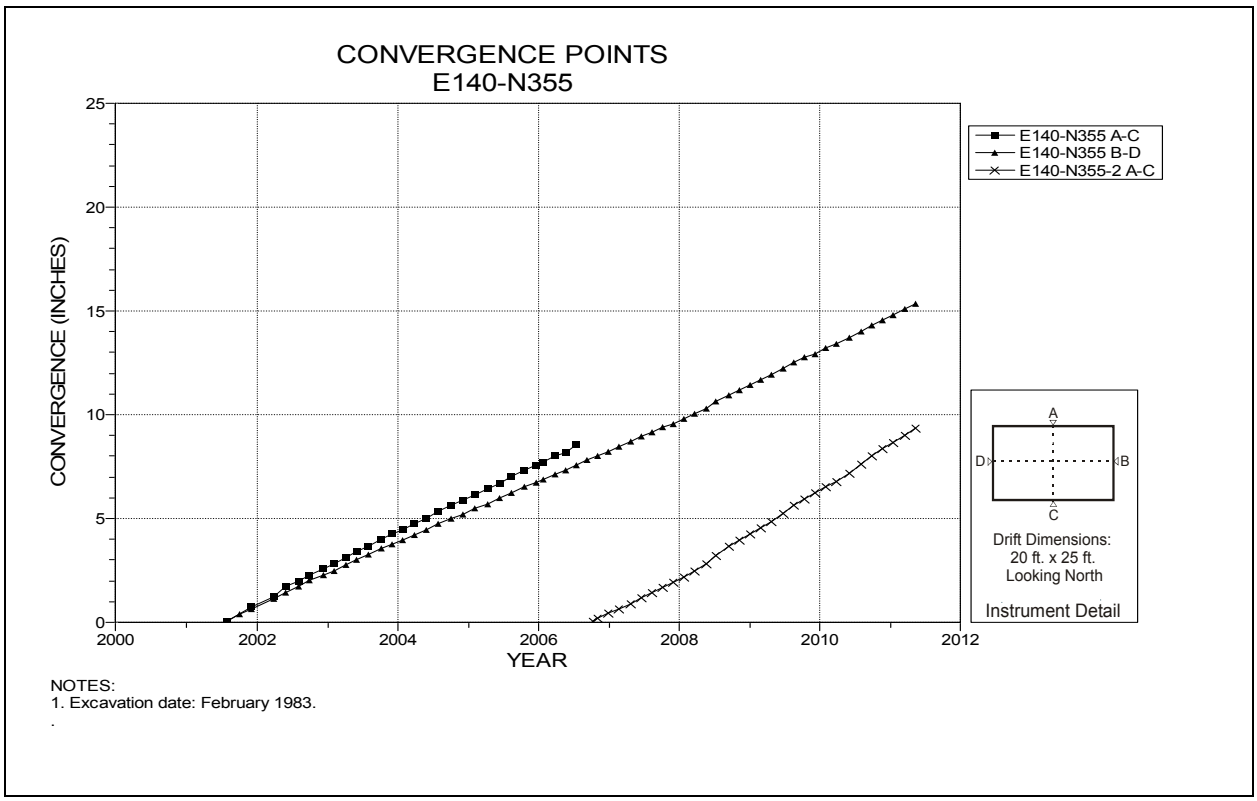


Figure 4-63 Convergence Point Array
E140 N355 – All Chords

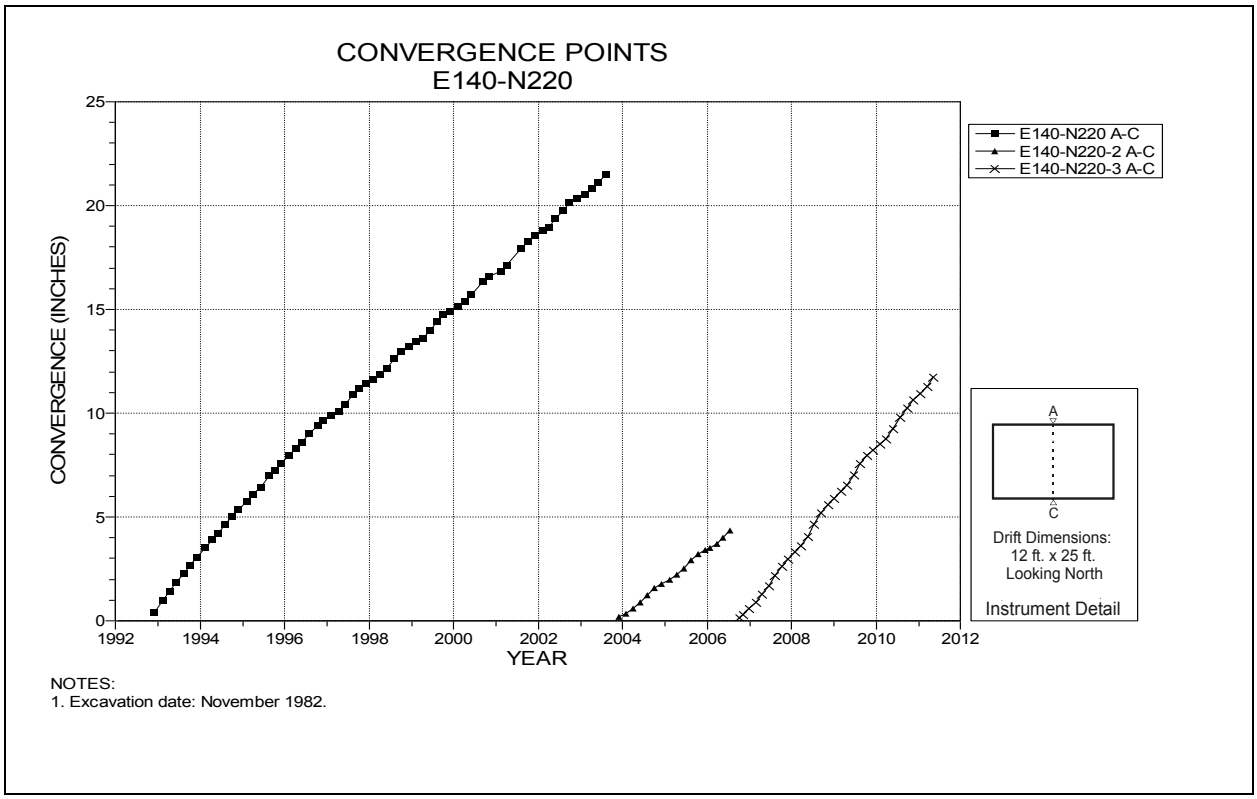


Figure 4-64 Convergence Point Array
E140 N220 – Roof to Floor

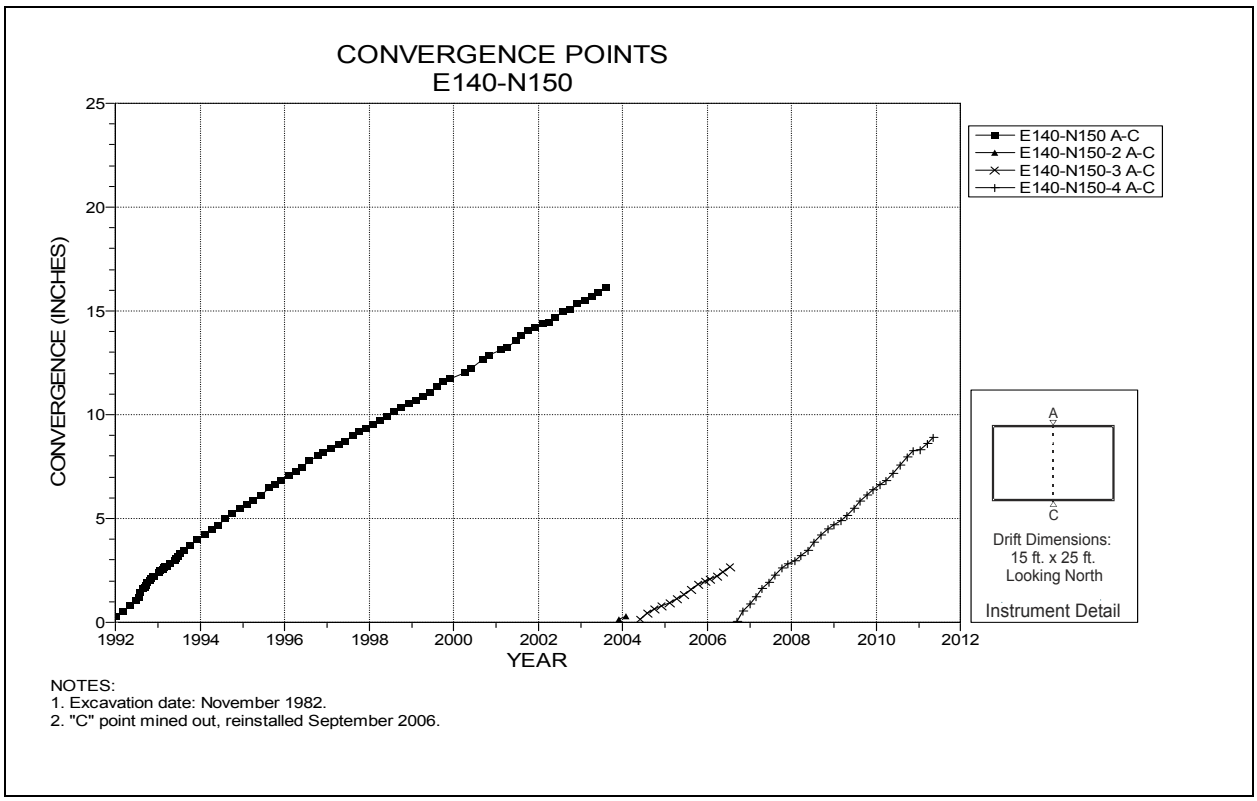


Figure 4-65 Convergence Point Array
E140 N150 – Roof to Floor

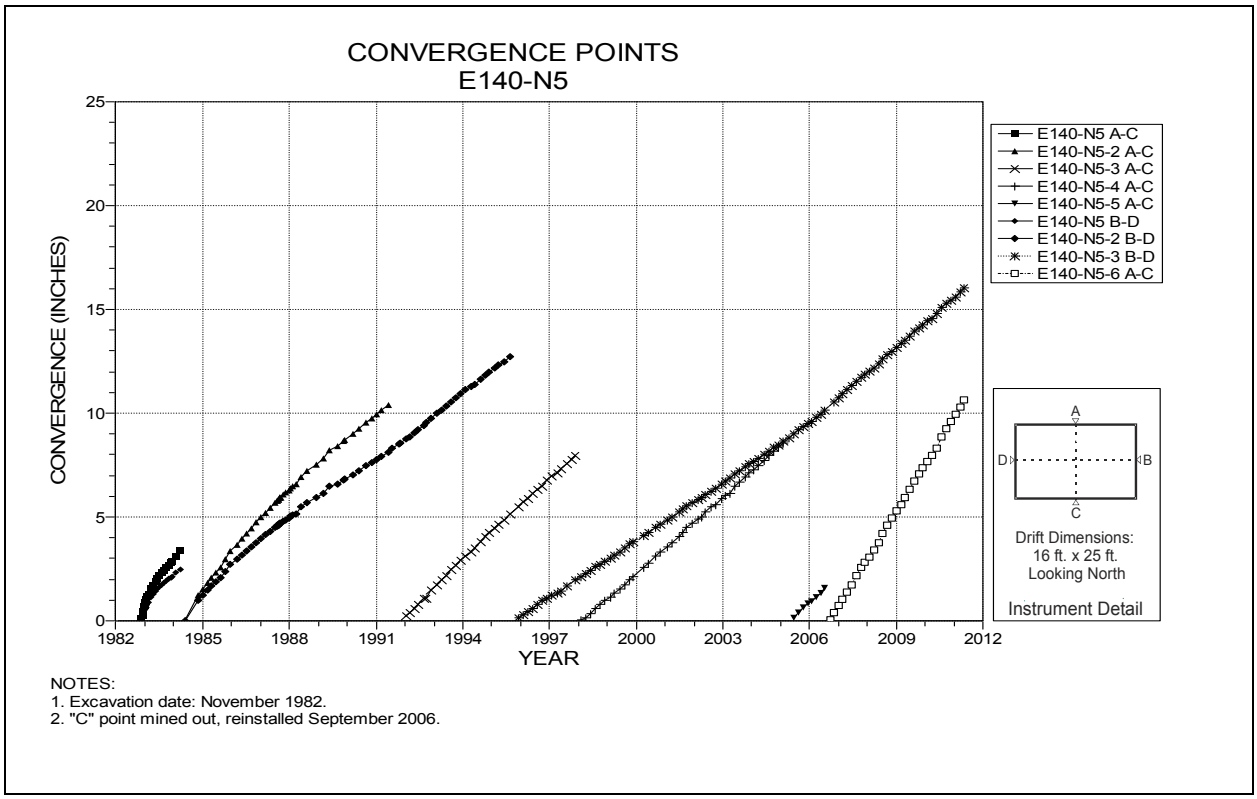


Figure 4-66 Convergence Point Array
E140 N5 – All Chords

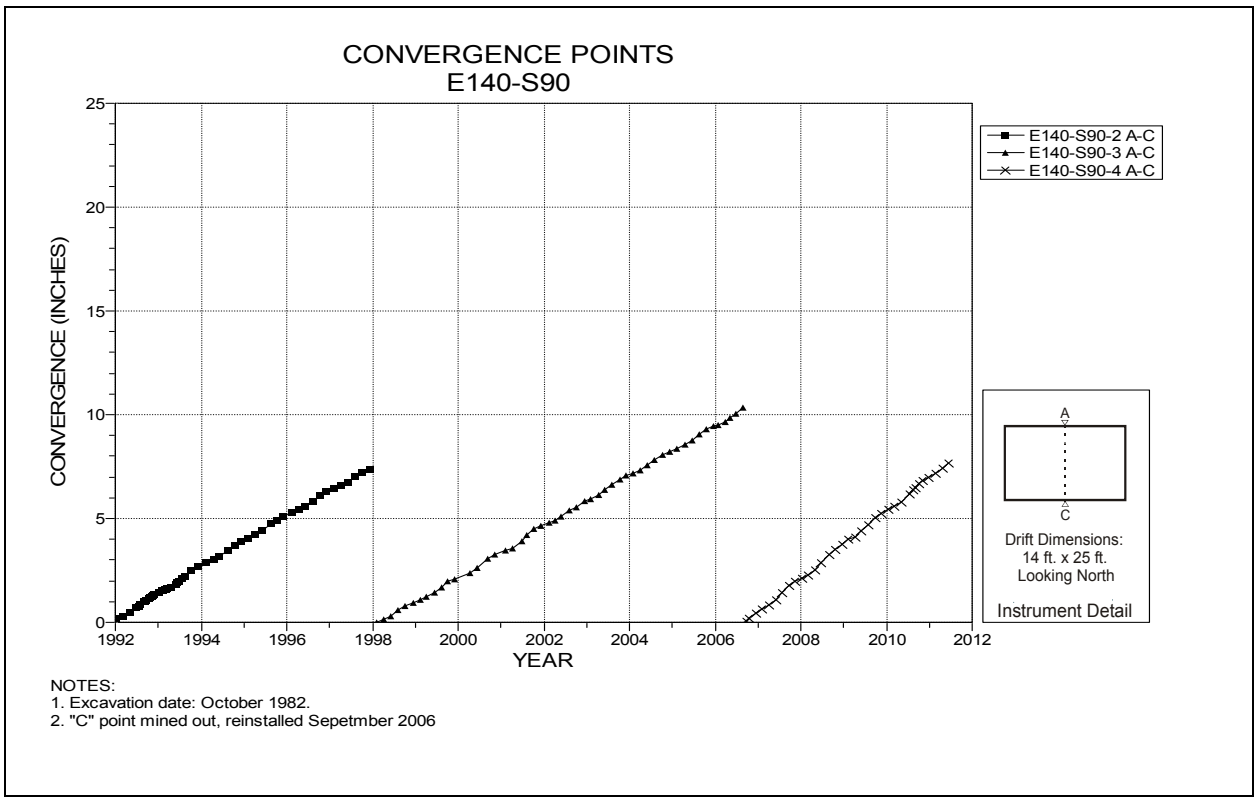


Figure 4-67 Convergence Point Array
E140 S90 – Roof to Floor

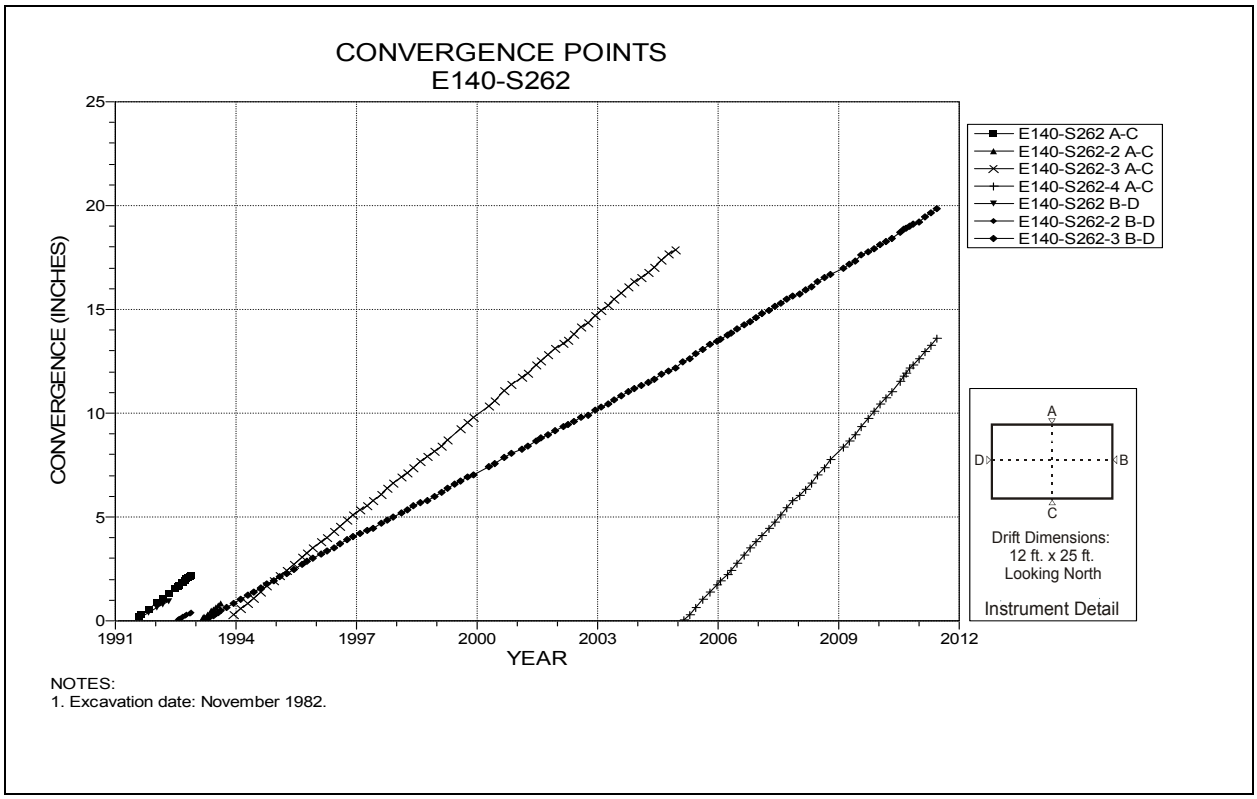


Figure 4-68 Convergence Point Array
E140 S262 – All Chords

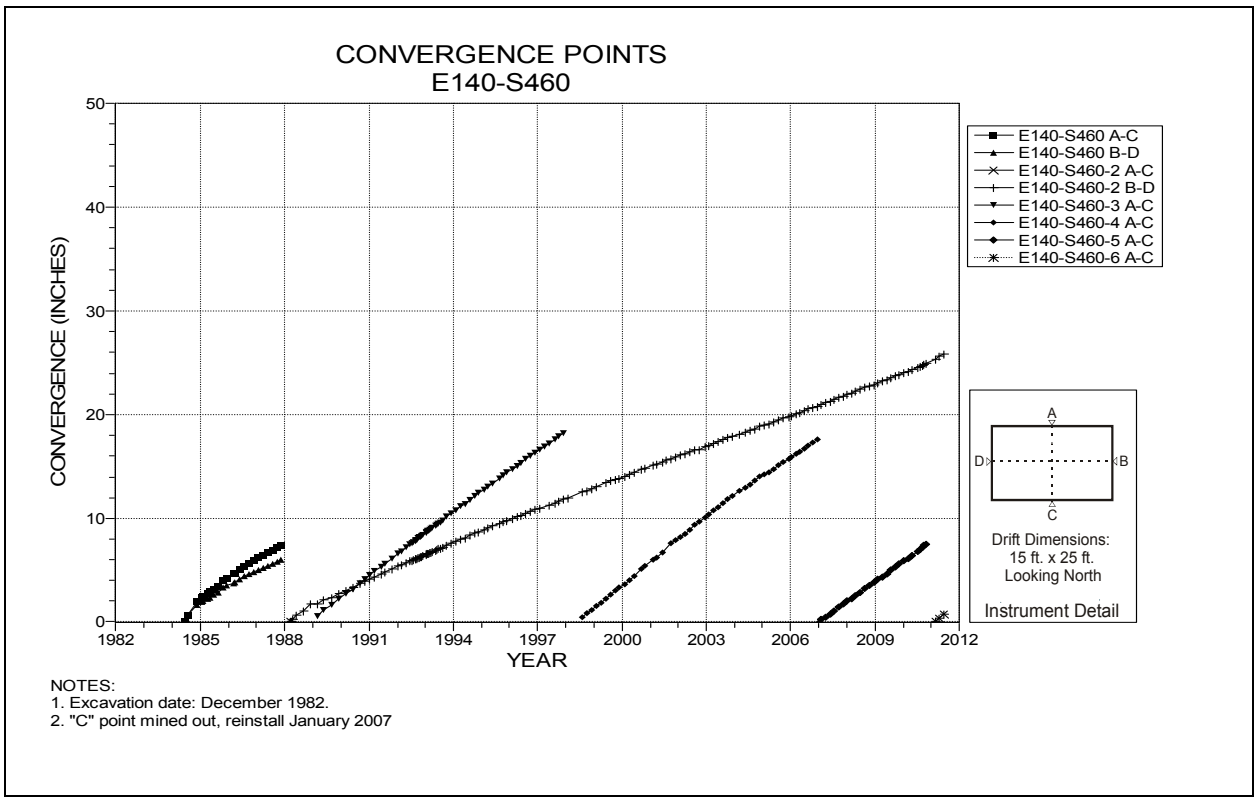


Figure 4-69 Convergence Point Array
E140 S460 – All Chords

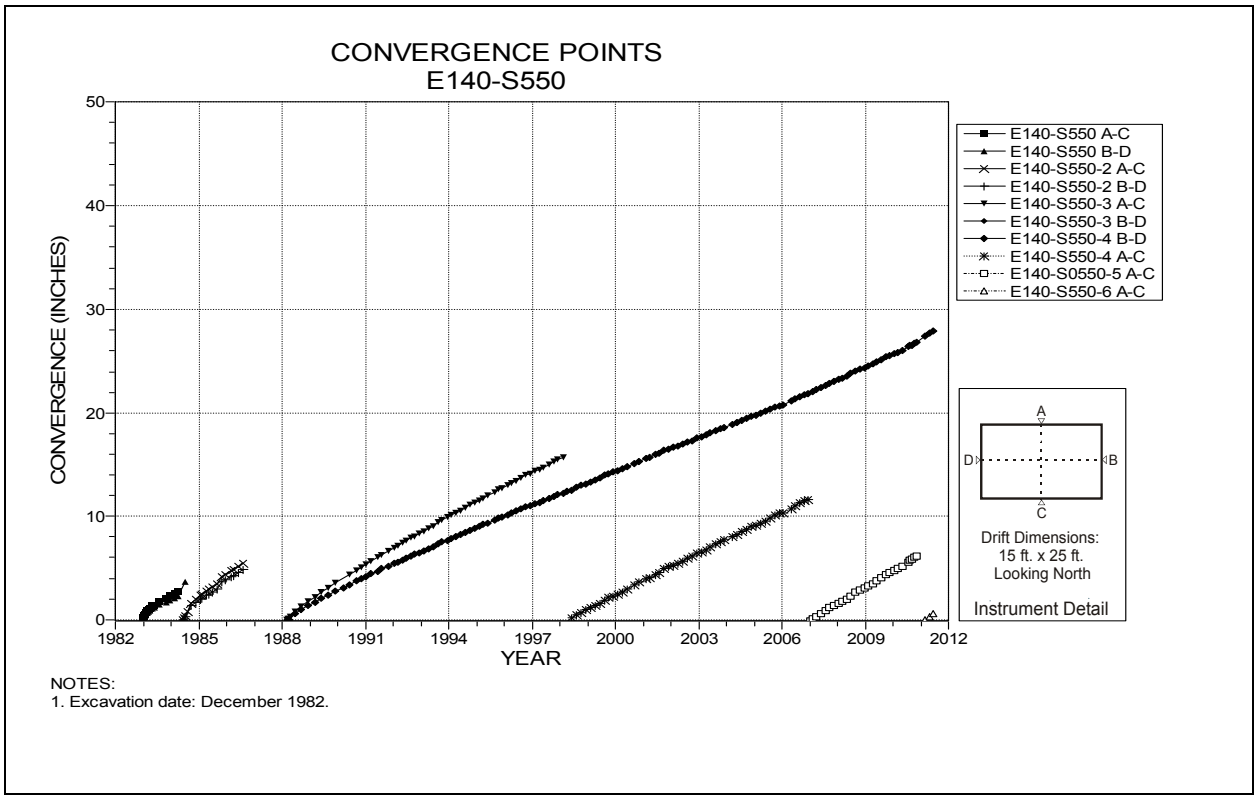
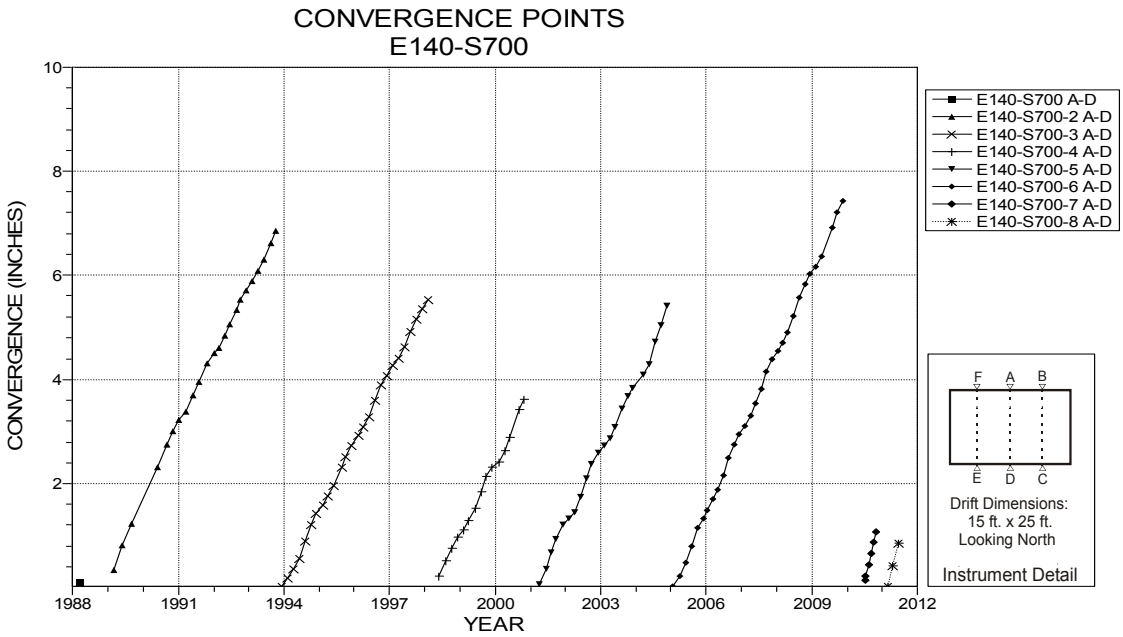
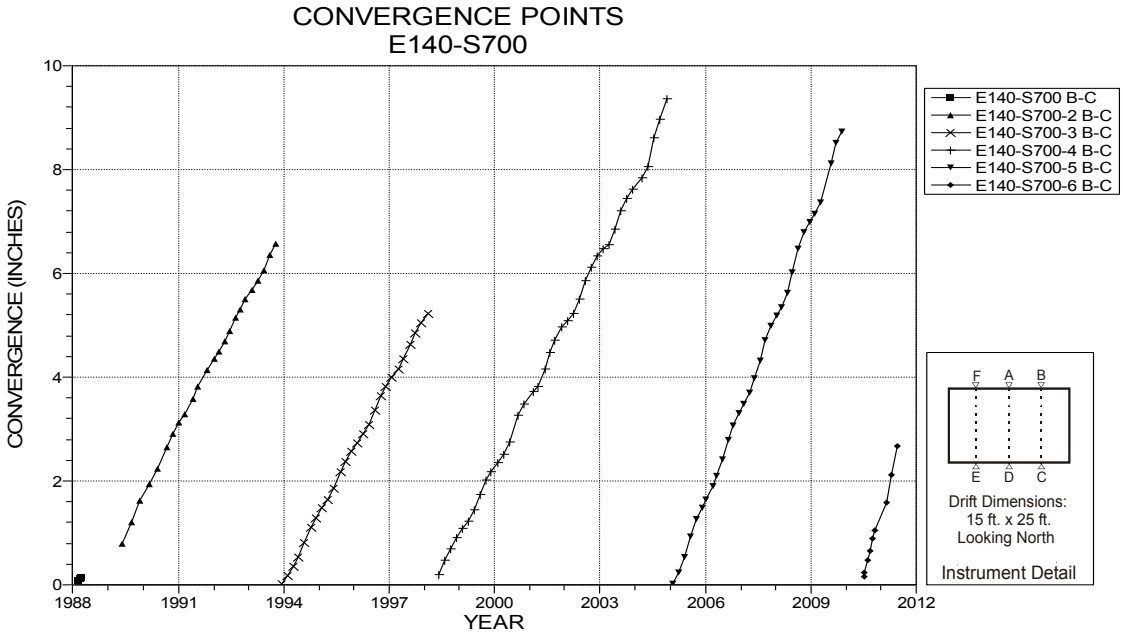


Figure 4-70 Convergence Point Array
E140 S550 – All Chords



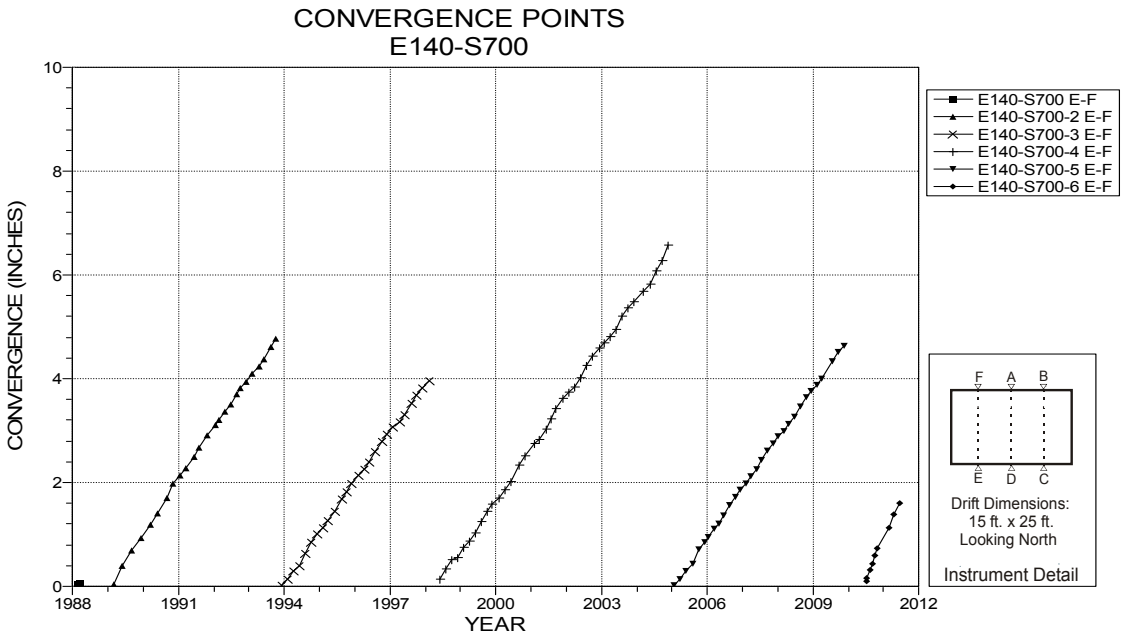
NOTES:
1. Excavation date: December 1982.

Figure 4-71 Convergence Point Array
E140 S700 – Roof to Floor – Centerline



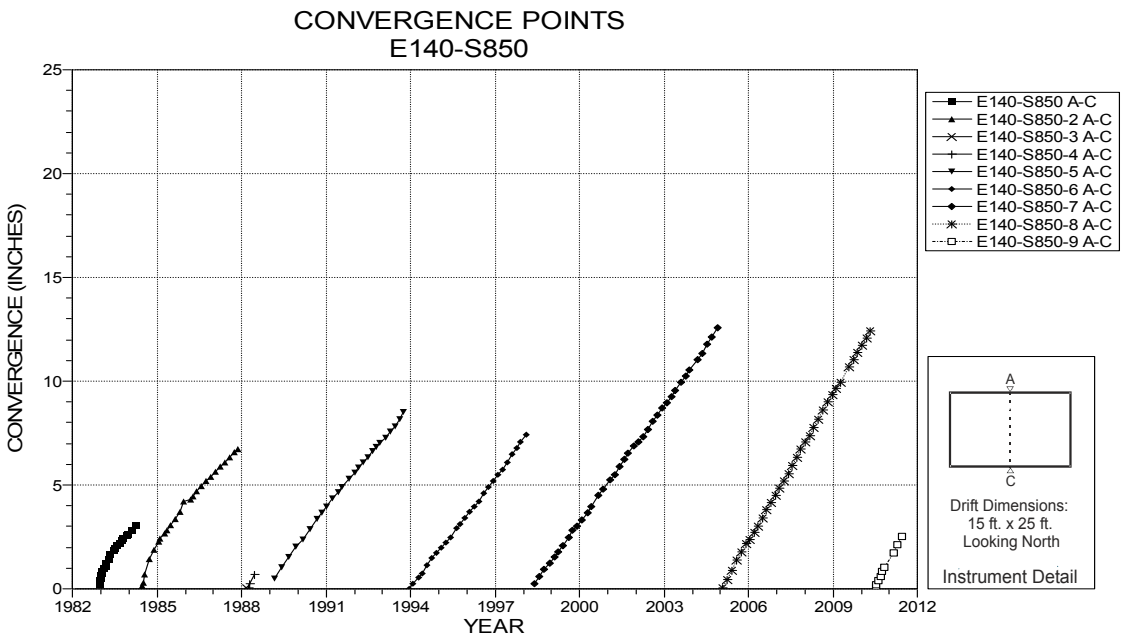
NOTES:
1. Excavation date: December 1982.

Figure 4-72 Convergence Point Array
E140 S700 – Roof to Floor – Quarter Point



NOTES:
1. Excavation date: December 1982.

Figure 4-73 Convergence Point Array
E140 S700 – Roof to Floor – Quarter Point



NOTES:

Figure 4-74 Convergence Point Array
E140 S850 – Roof to Floor

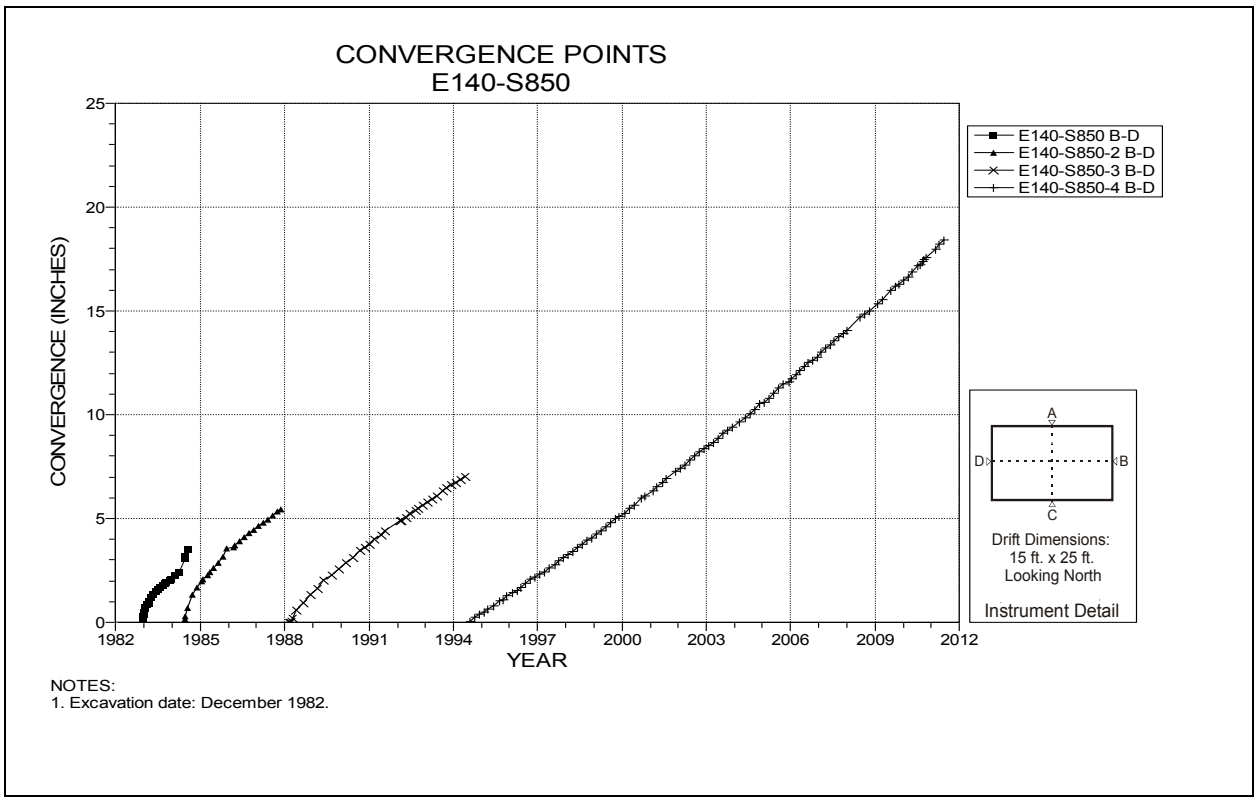


Figure 4-75 Convergence Point Array
E140 S850 – Rib to Rib

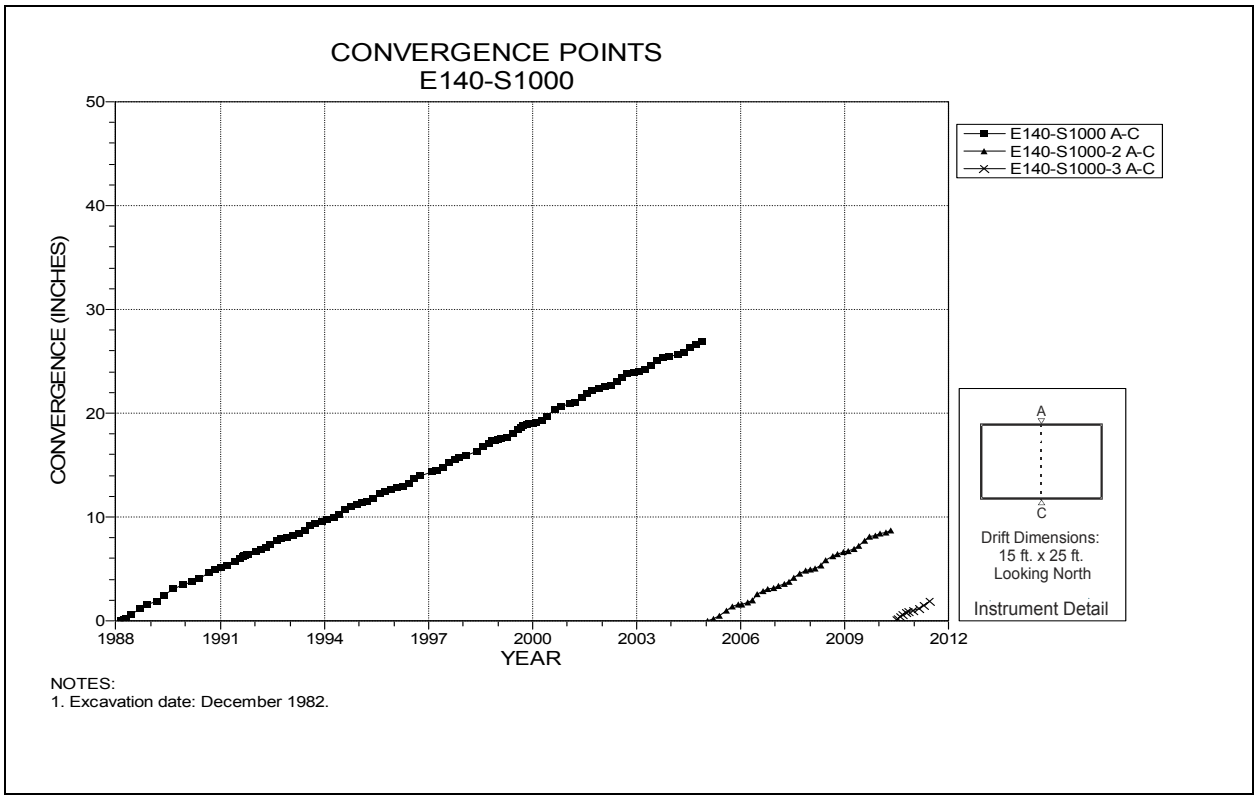


Figure 4-76 Convergence Point Array
E140 S1000 – Roof to Floor

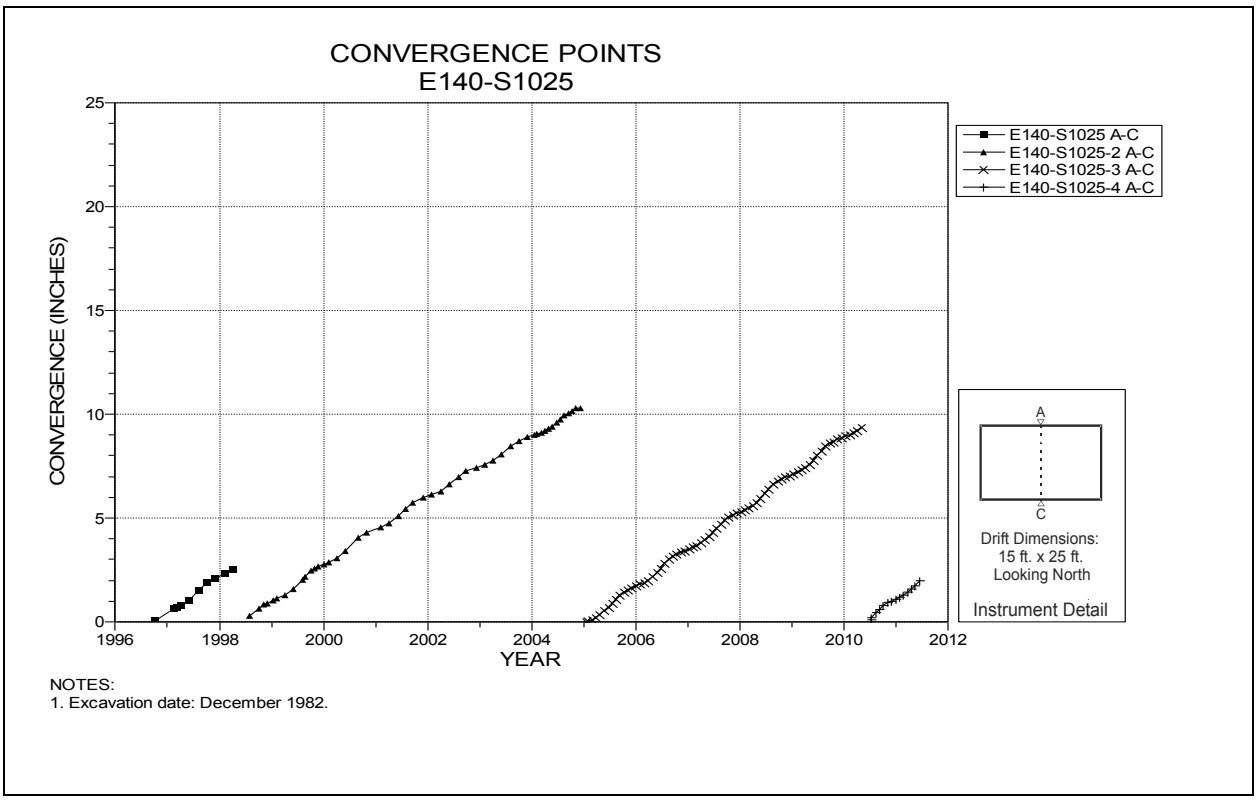


Figure 4-77 Convergence Point Array
E140 S1025 – Roof to Floor

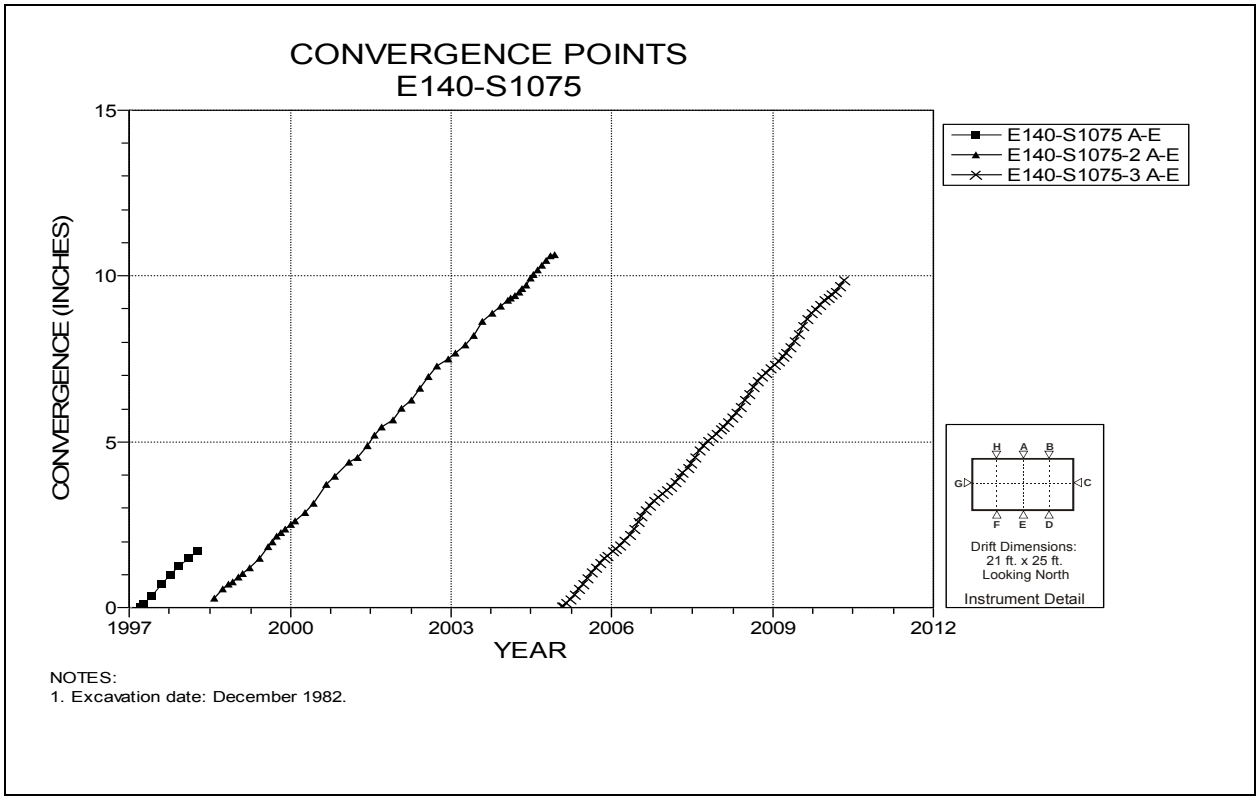


Figure 4-78 Convergence Point Array
E140 S1075 – Roof to Floor

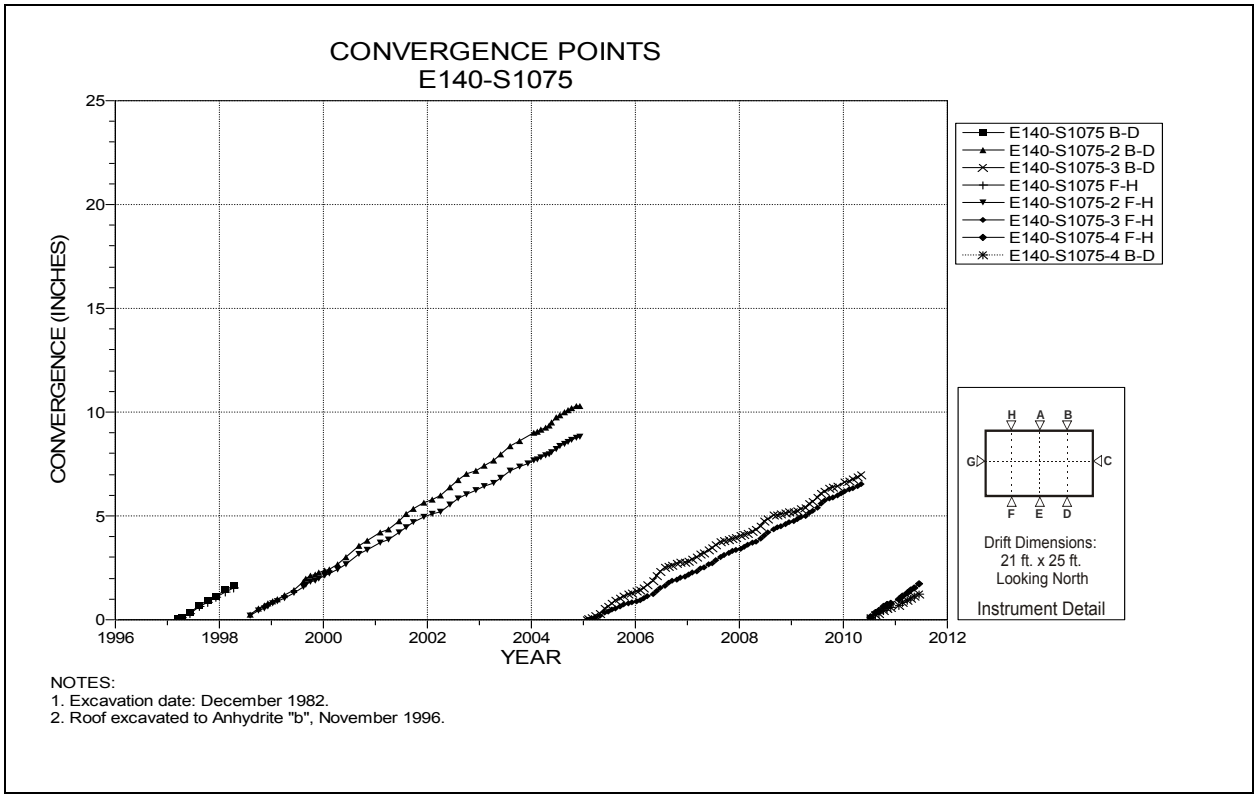


Figure 4-79 Convergence Point Array
E140 S1075 – Roof to Floor – Quarter Points

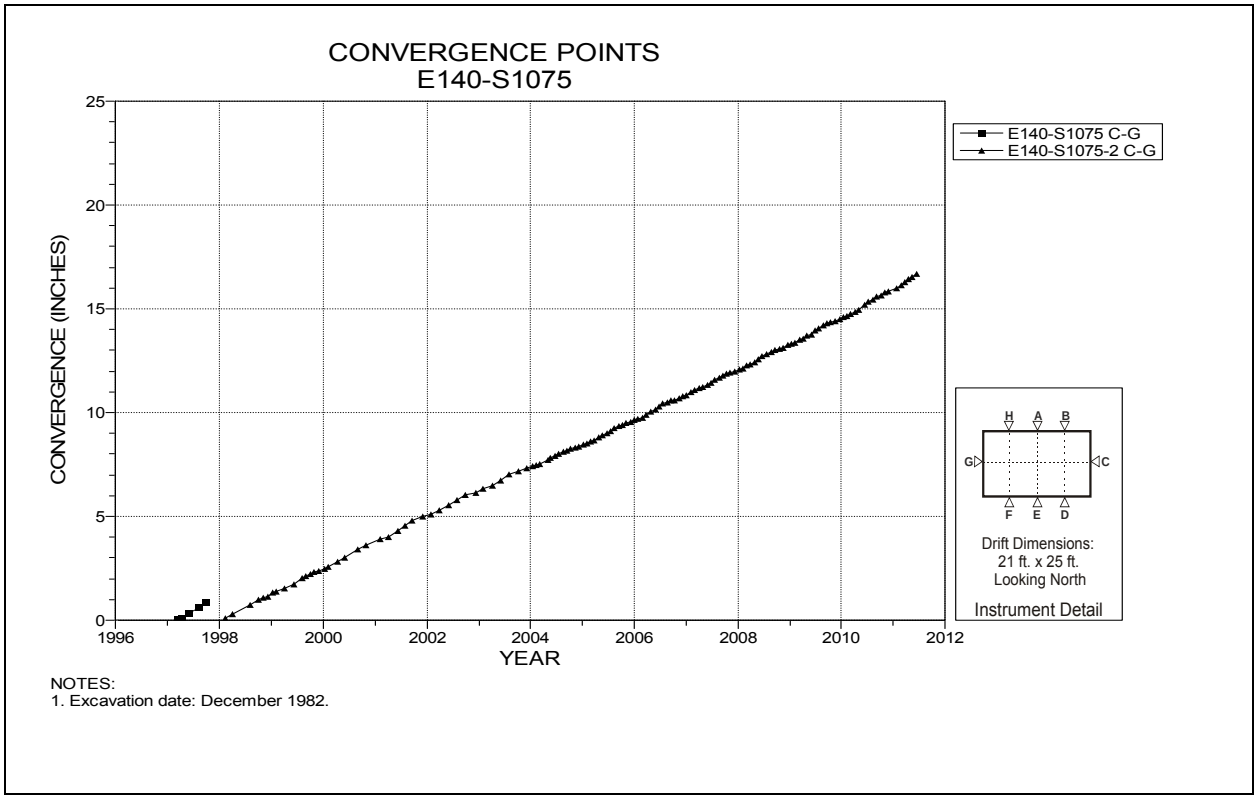


Figure 4-80 Convergence Point Array
E140 S1075 – Rib to Rib

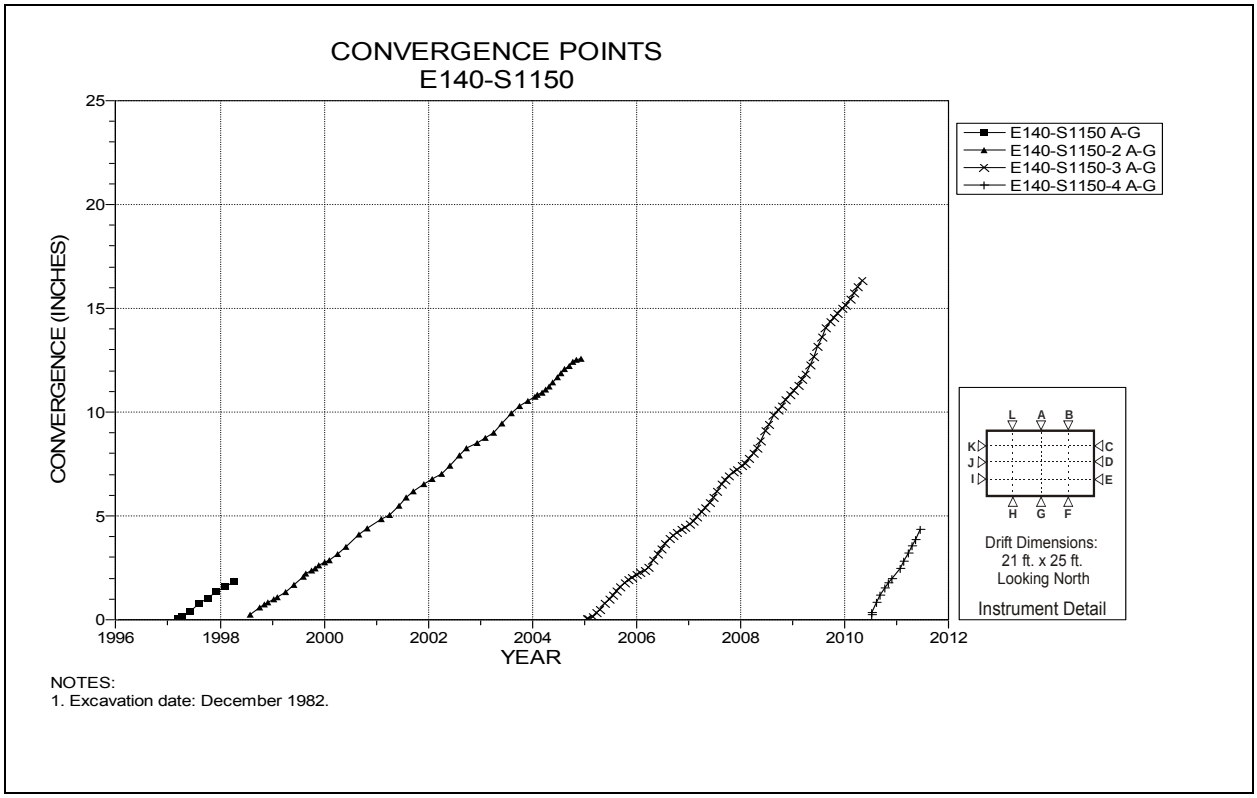


Figure 4-81 Convergence Point Array
E140 S1150 – Roof to Floor

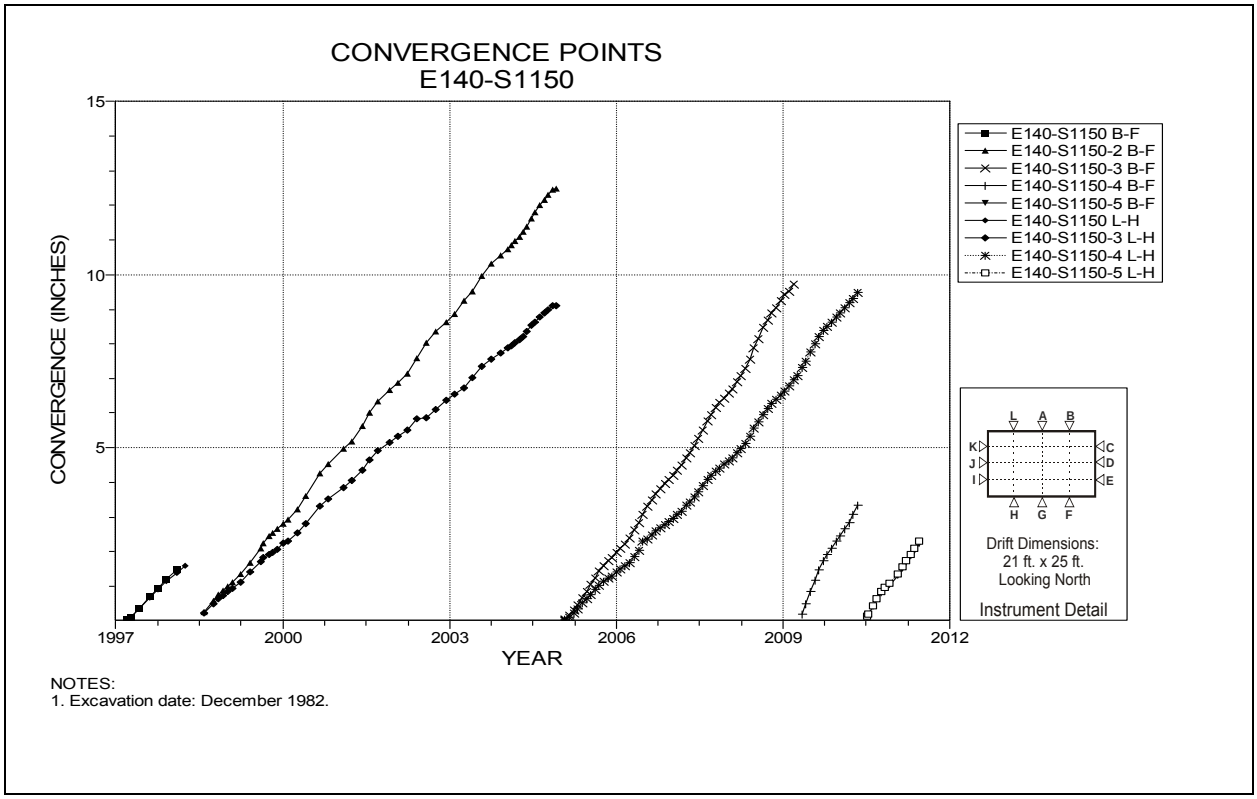


Figure 4-82 Convergence Point Array
E140 S1150 – Roof to Floor – Quarter Points

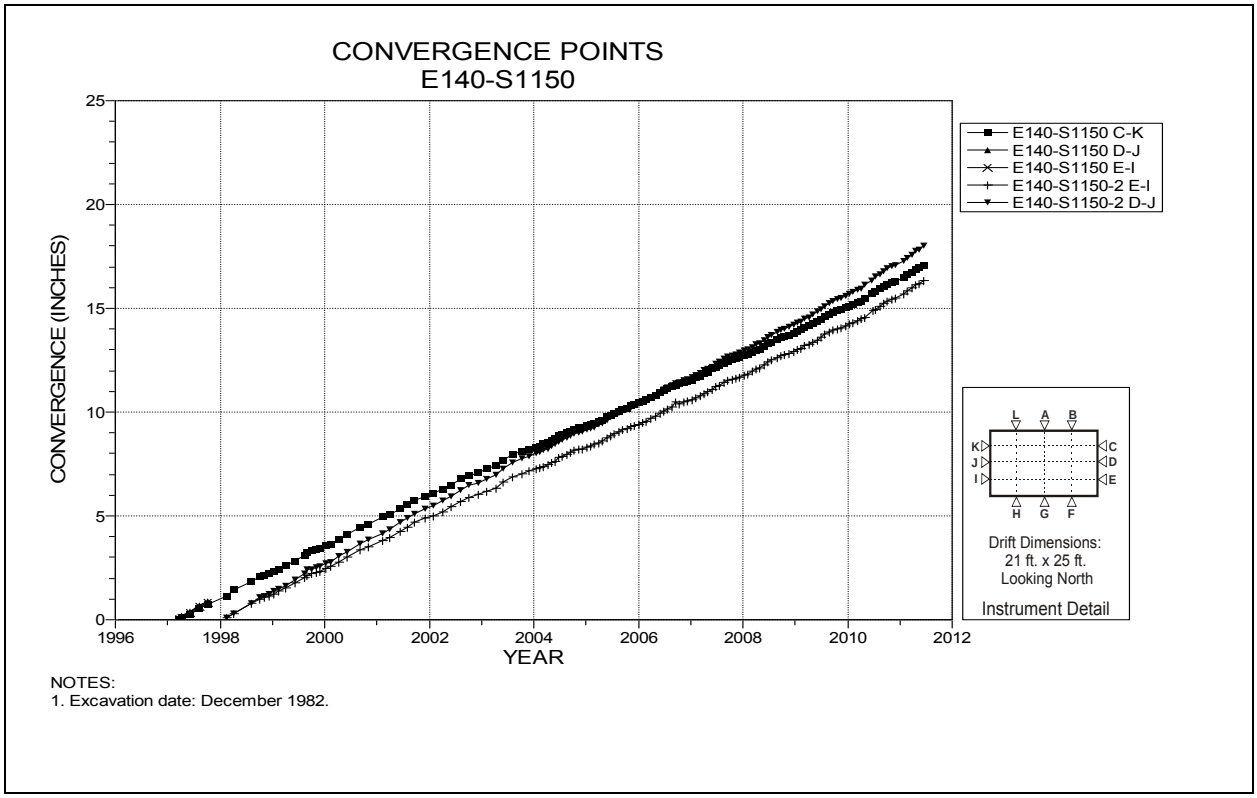


Figure 4-83 Convergence Point Array
E140 S1150 – Rib to Rib – Quarter Points

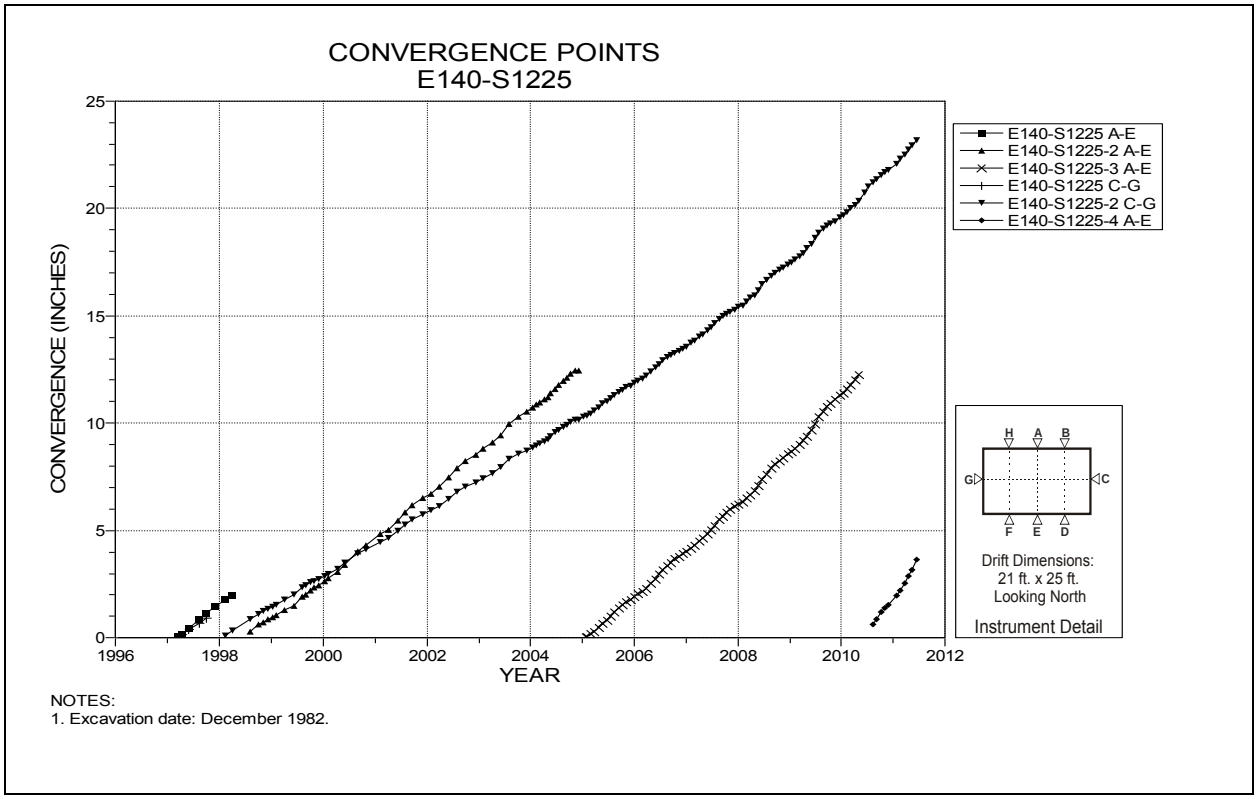


Figure 4-84 Convergence Point Array
E140 S1225 – Roof to Floor

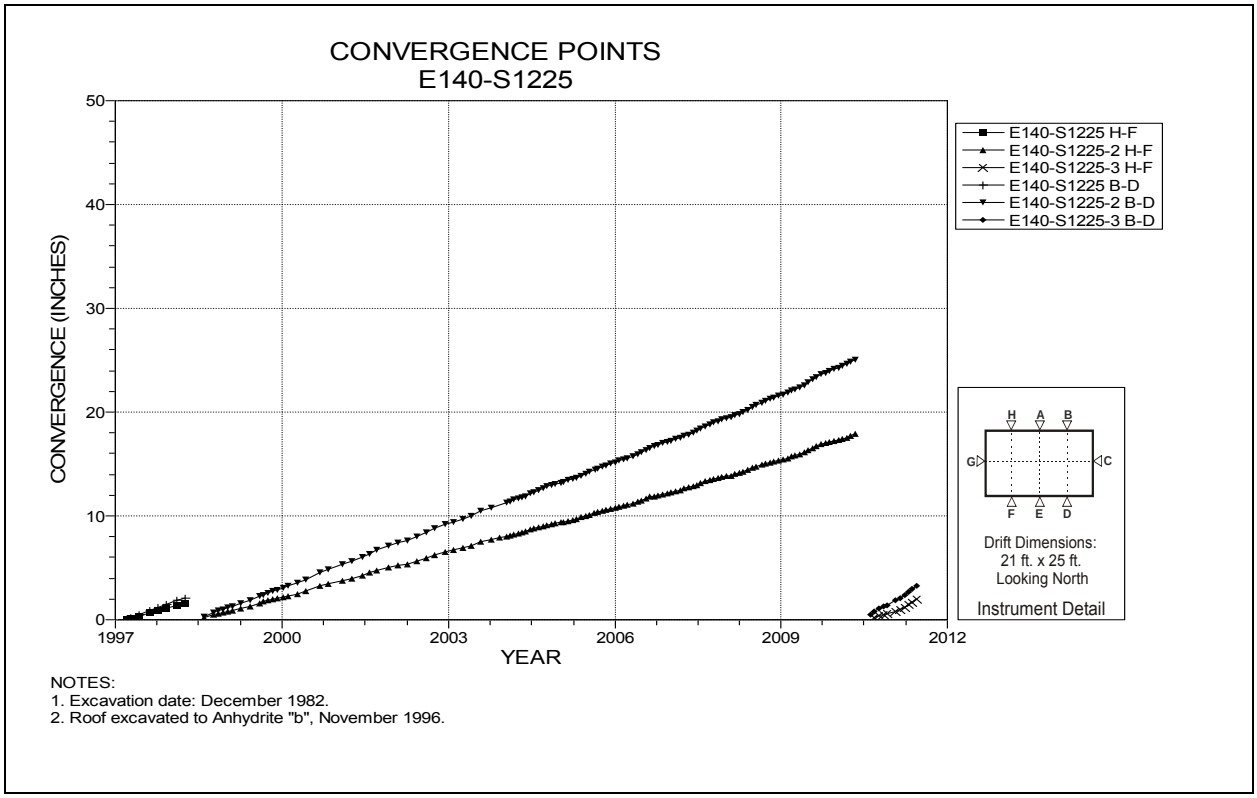


Figure 4-85 Convergence Point Array
E140 S1225 – Roof to Floor – Quarter Points

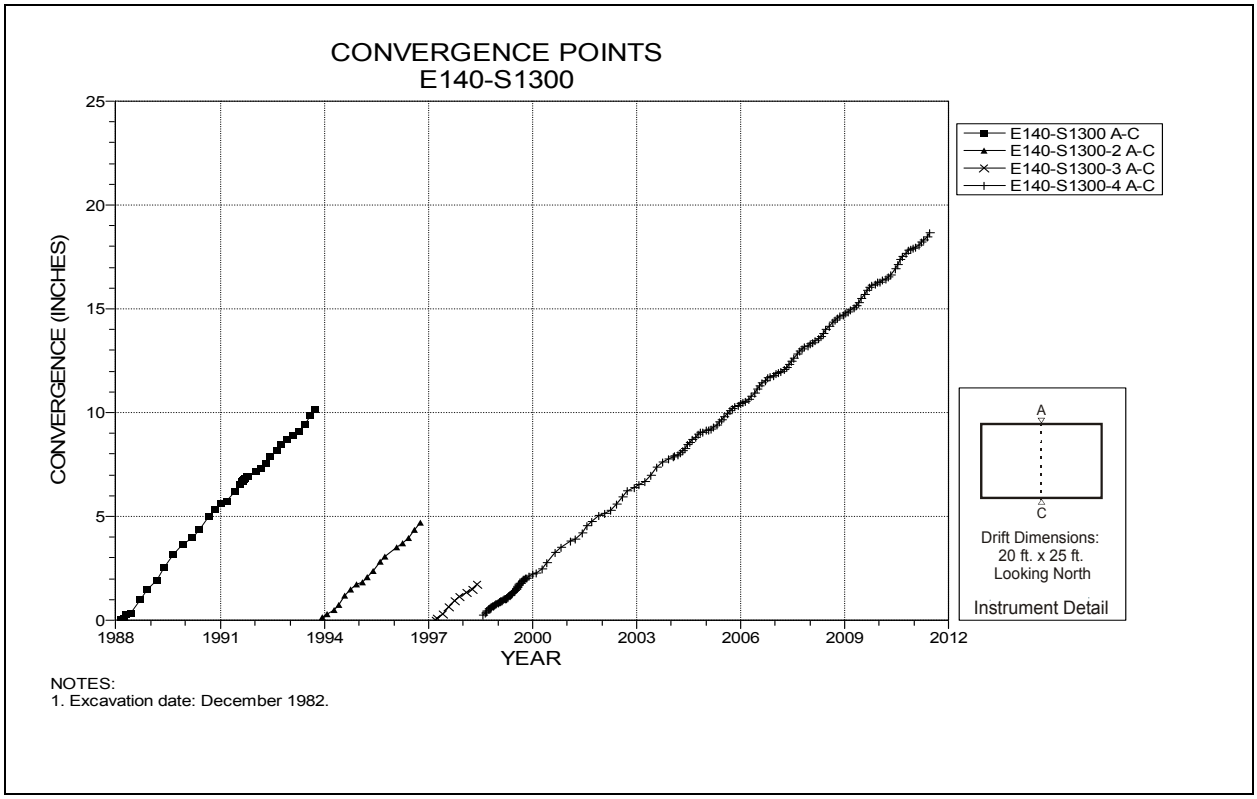


Figure 4-86 Convergence Point Array
E140 S1300 – Roof to Floor

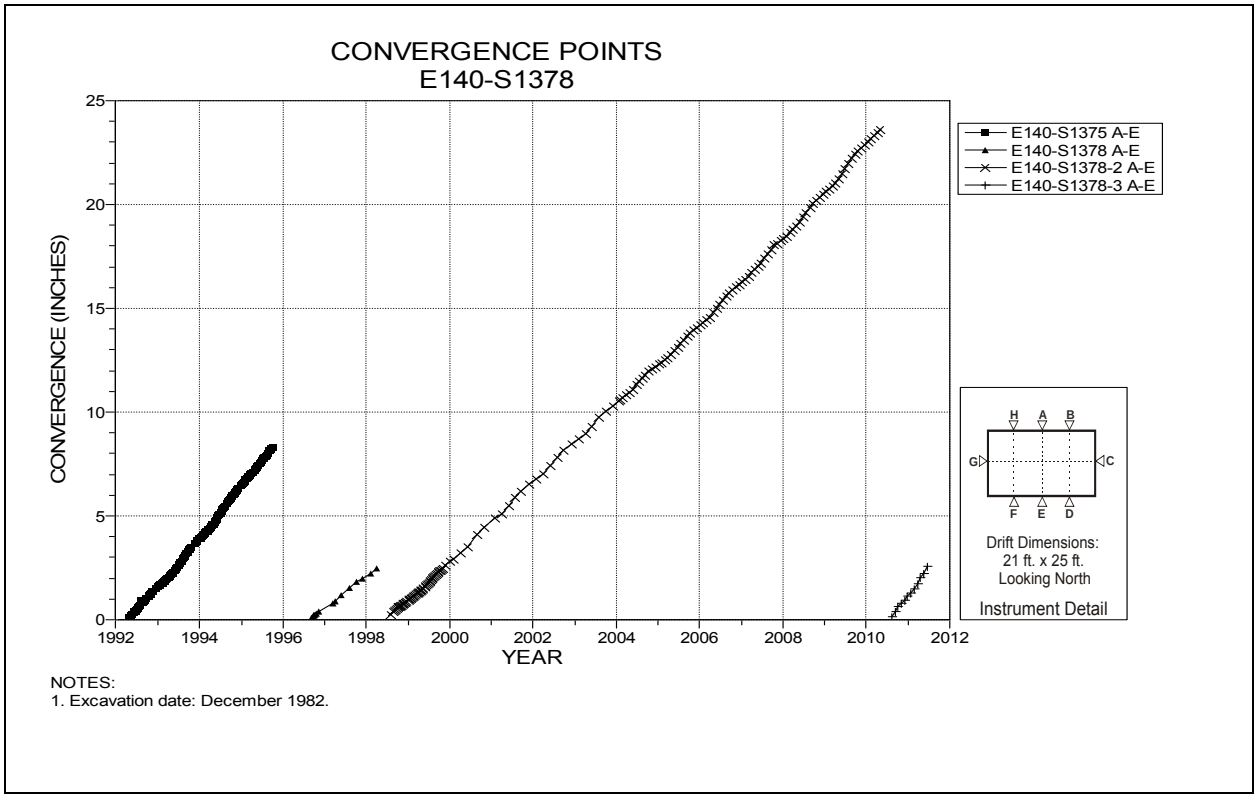


Figure 4-87 Convergence Point Array
E140 S1378 – Roof to Floor

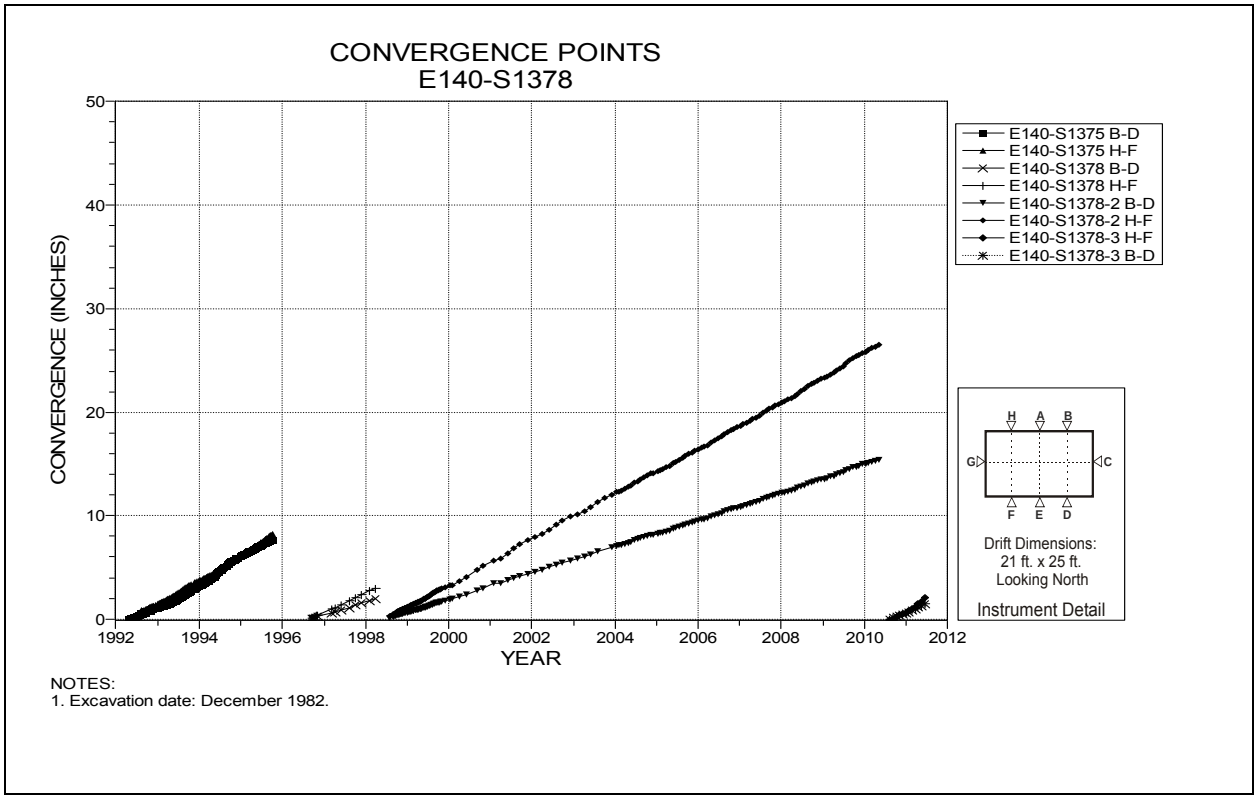


Figure 4-88 Convergence Point Array
E140 S1378 – Roof to Floor – Quarter Points

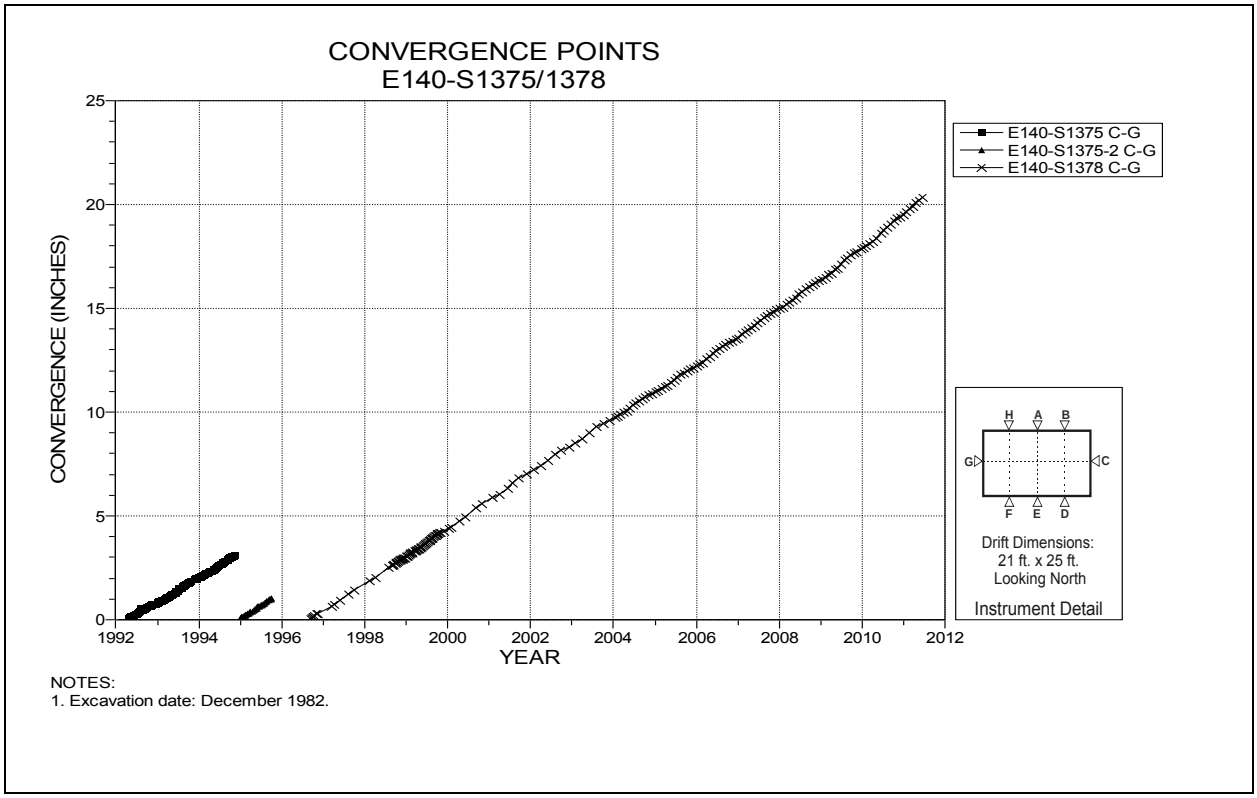


Figure 4-89 Convergence Point Array
E140 S1375/1378 – Rib to Rib

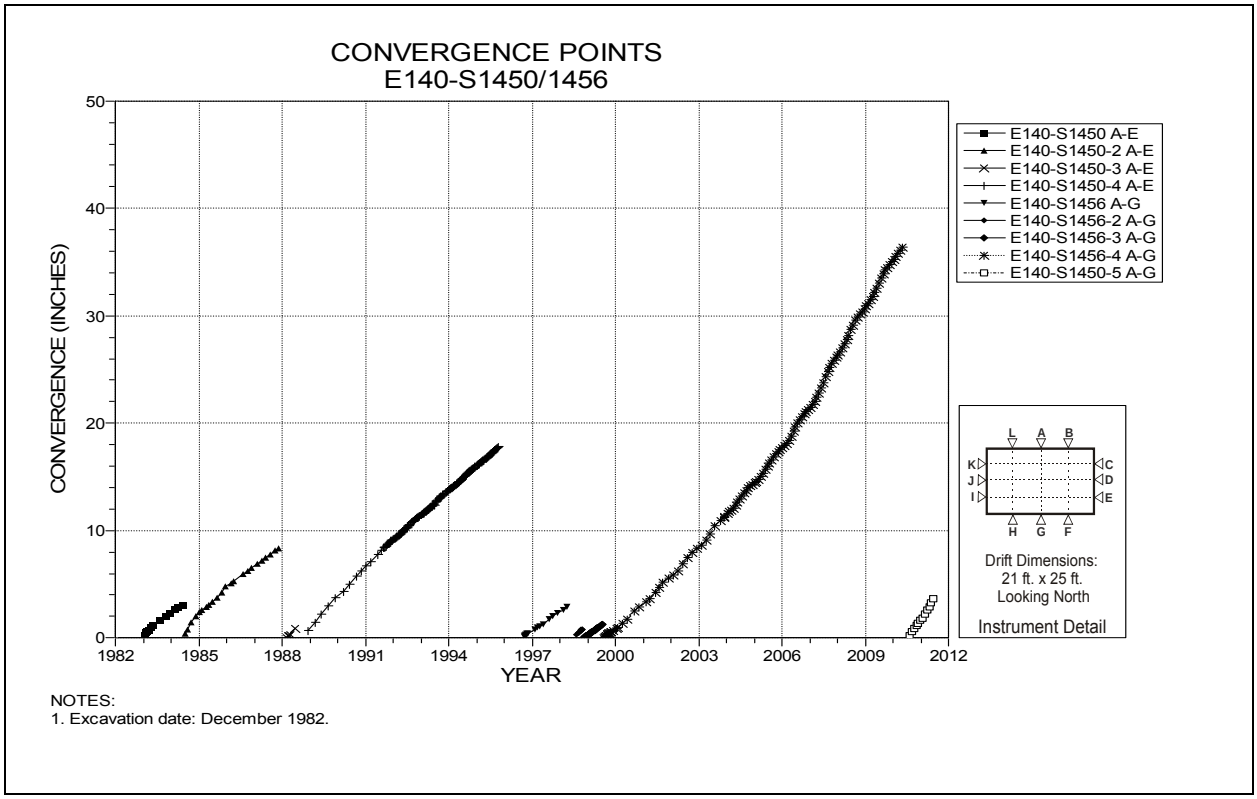


Figure 4-90 Convergence Point Array
E140 S1450/1456 – Roof to Floor

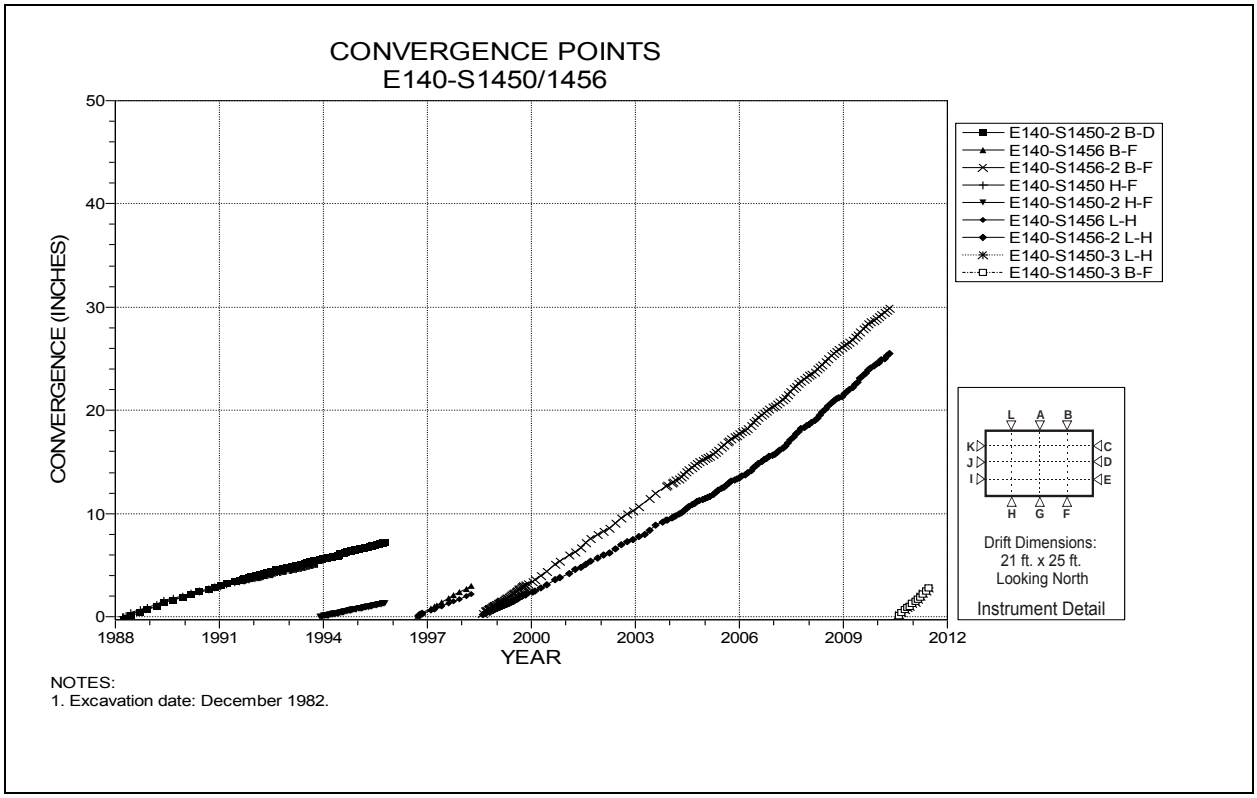


Figure 4-91 Convergence Point Array
E140 S1450/S1456 – Roof to Floor – Quarter Points

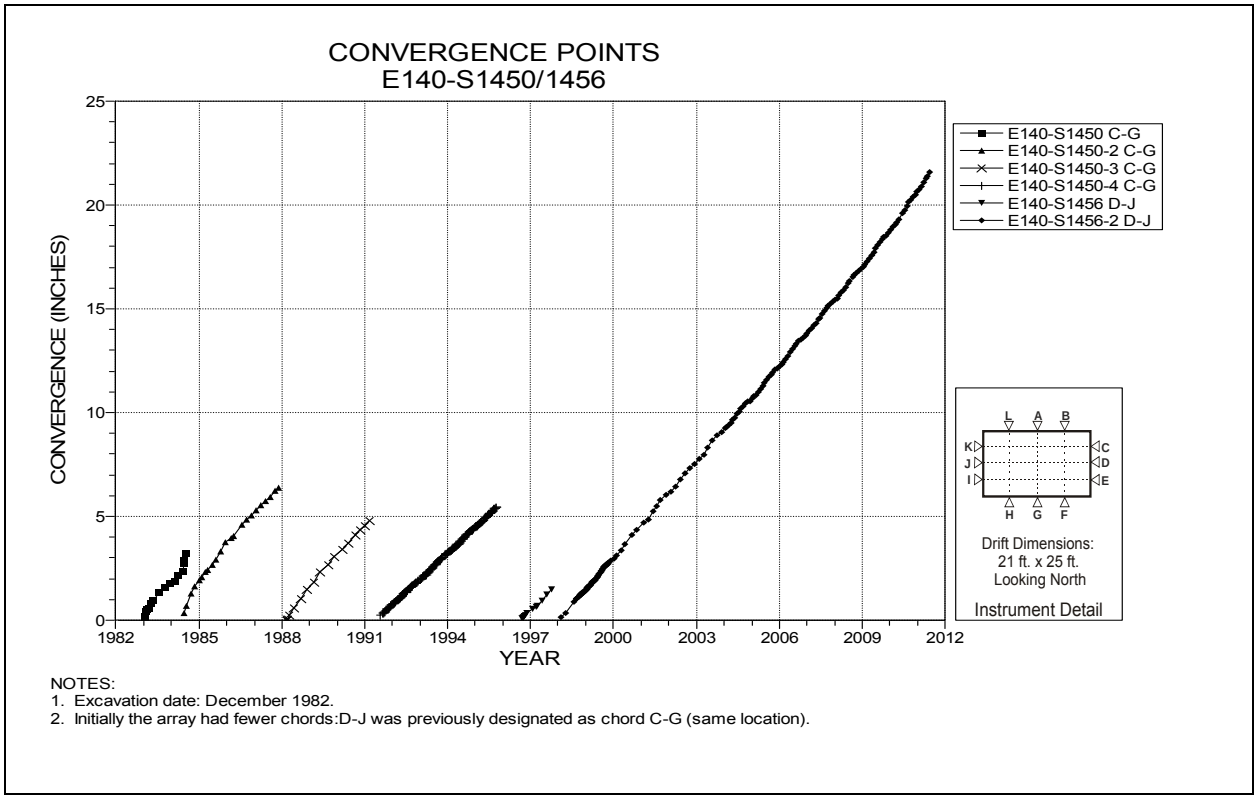


Figure 4-92 Convergence Point Array
E140 S1450/S1456 – Rib to Rib – Midheight

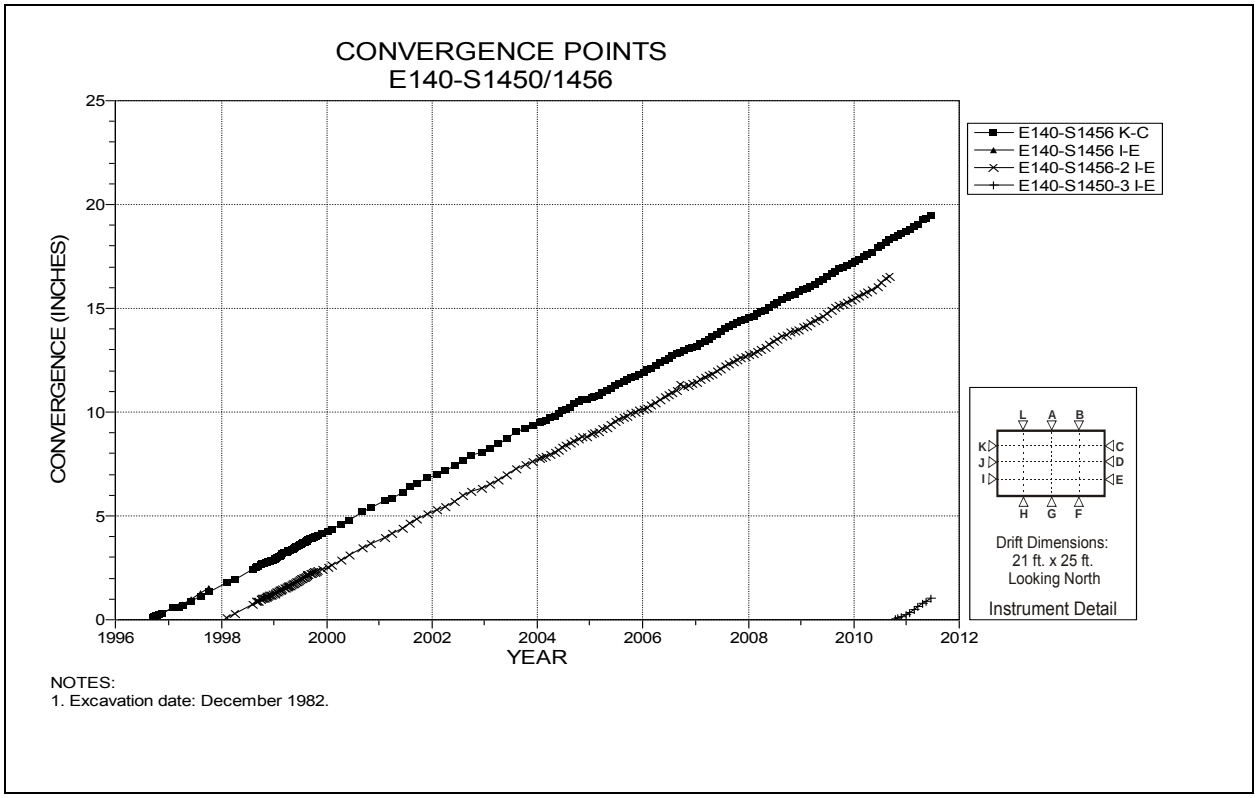


Figure 4-93 Convergence Point Array
E140 S1450/S1456 – Rib to Rib

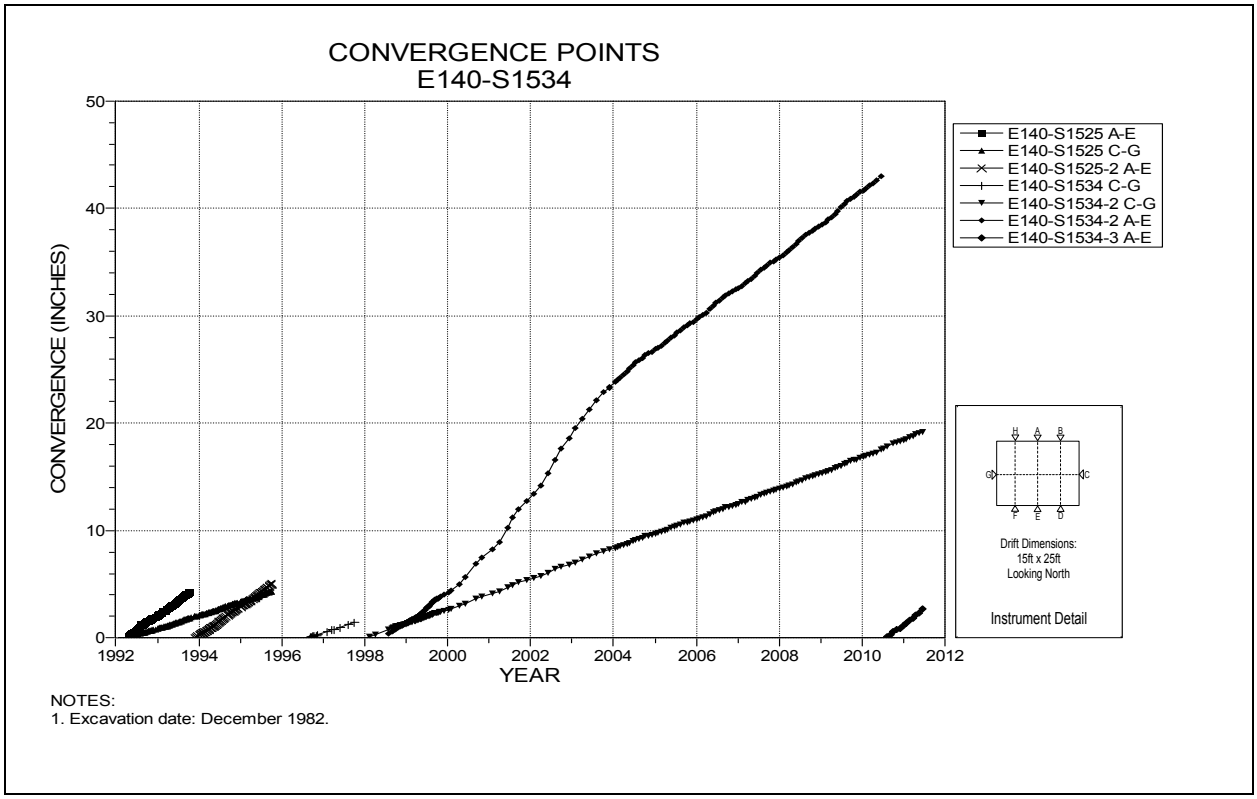


Figure 94 Convergence Point Array
E140 S1534 – Roof to Floor – Rib to Rib

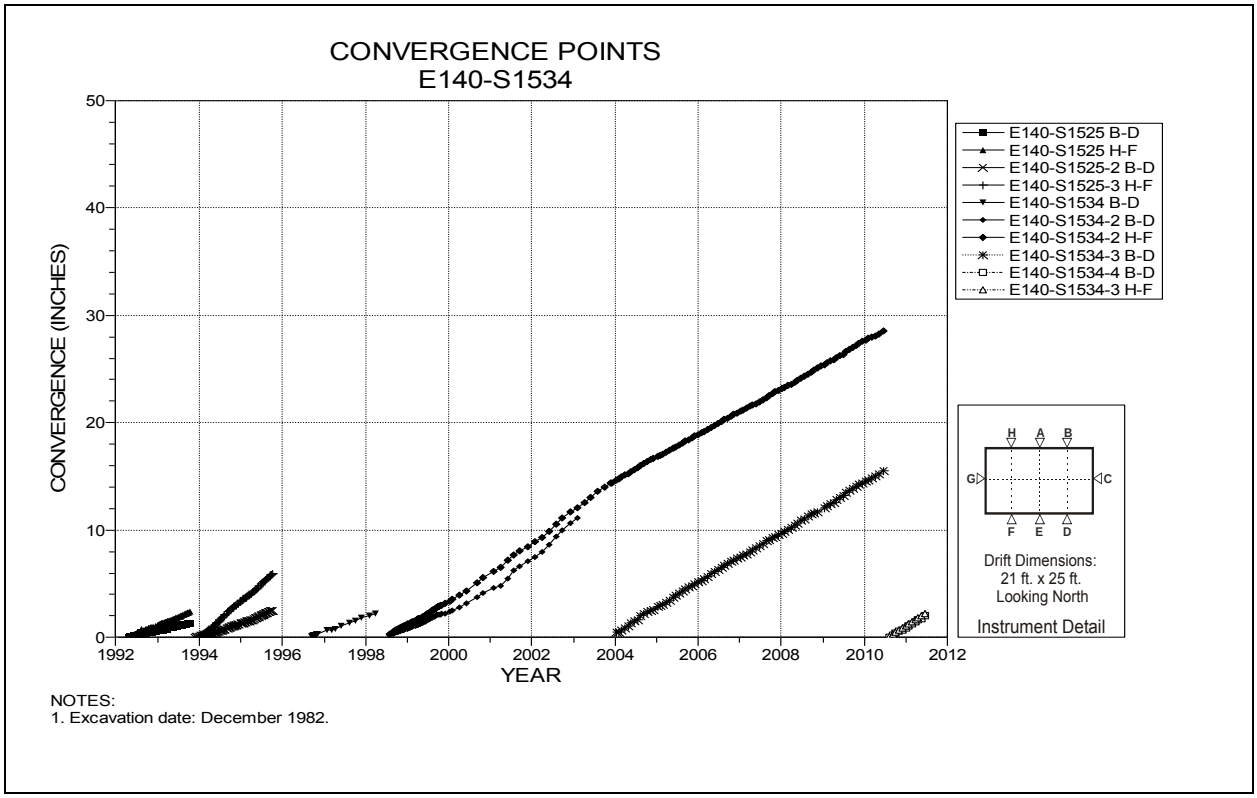


Figure 4-95 Convergence Point Array
E140 S1534 – Roof to Floor – Quarter Points

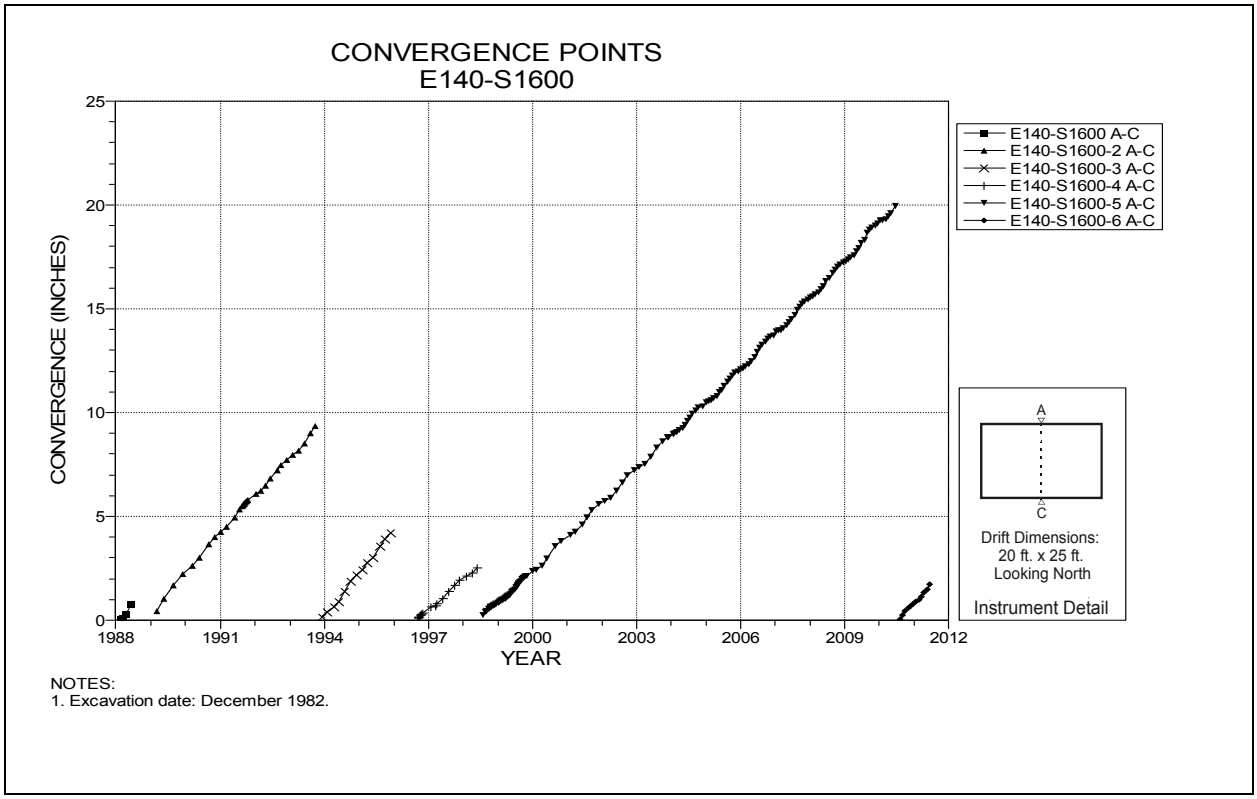


Figure 4-96 Convergence Point Array
E140 S1600 – Roof to Floor

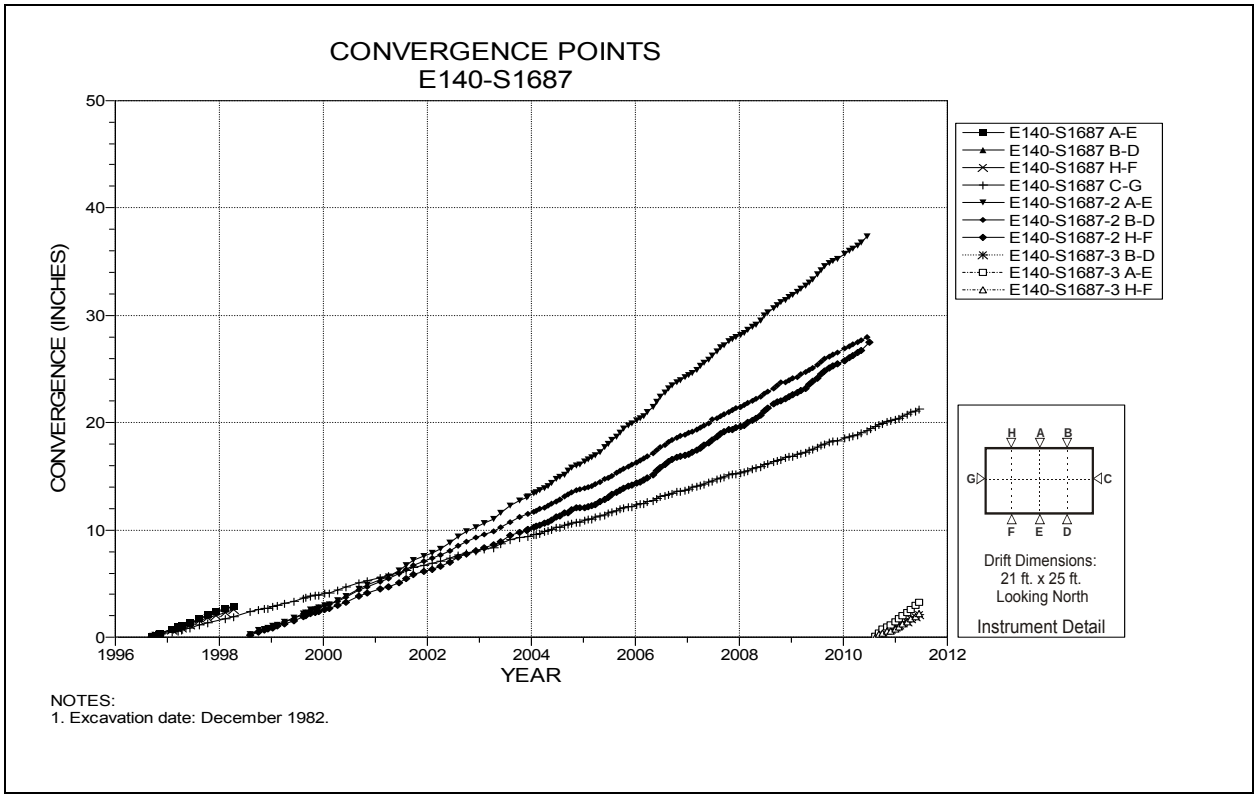


Figure 4-97 Convergence Point Array
E140 S1687 – All Chords

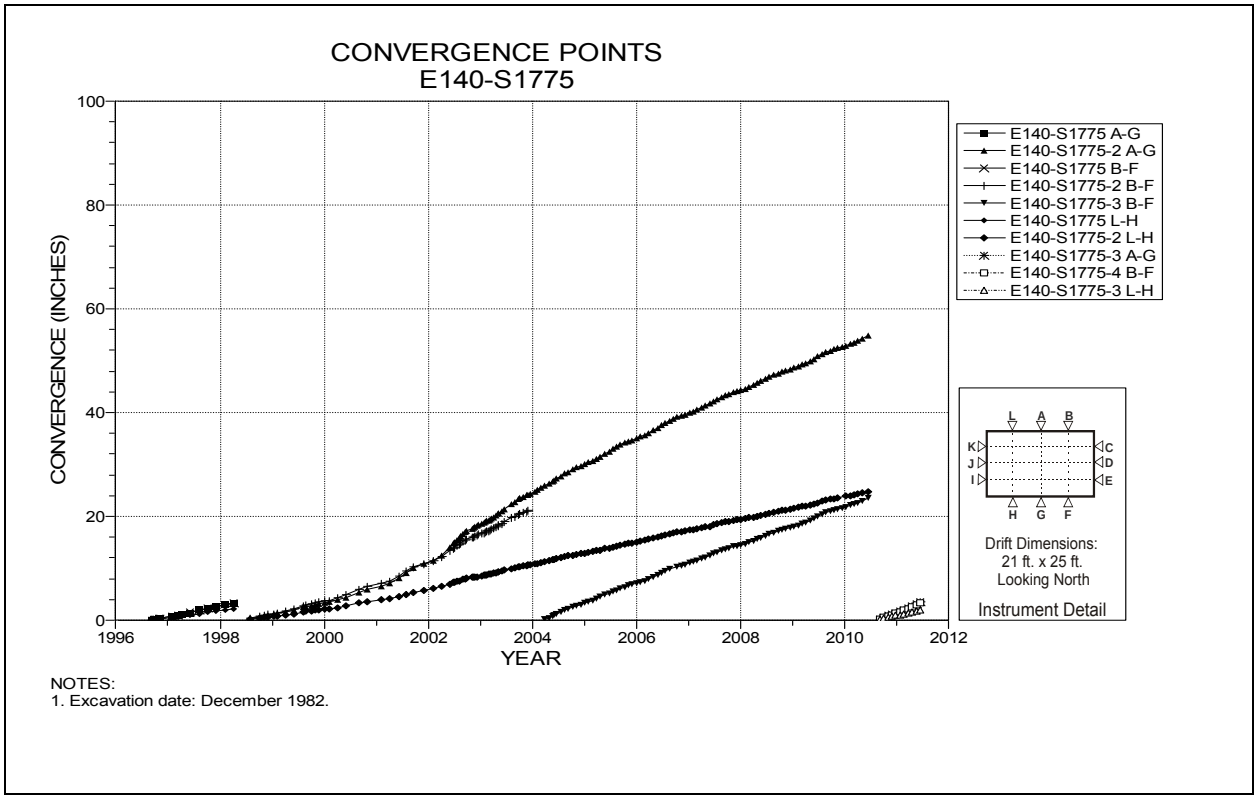


Figure 4-98 Convergence Point Array
E140 S1775 – Roof to Floor – Quarter Points

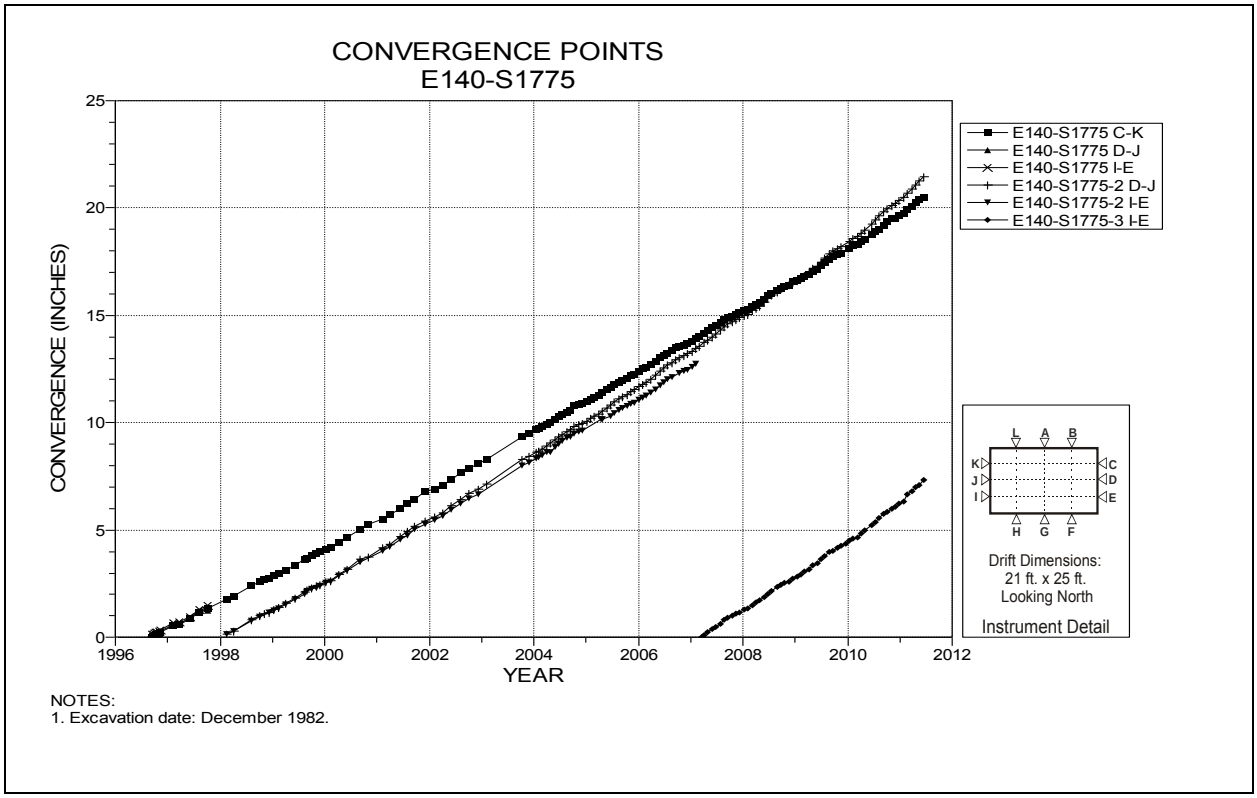


Figure 4-99 Convergence Point Array
E140 S1775 – Rib to Rib

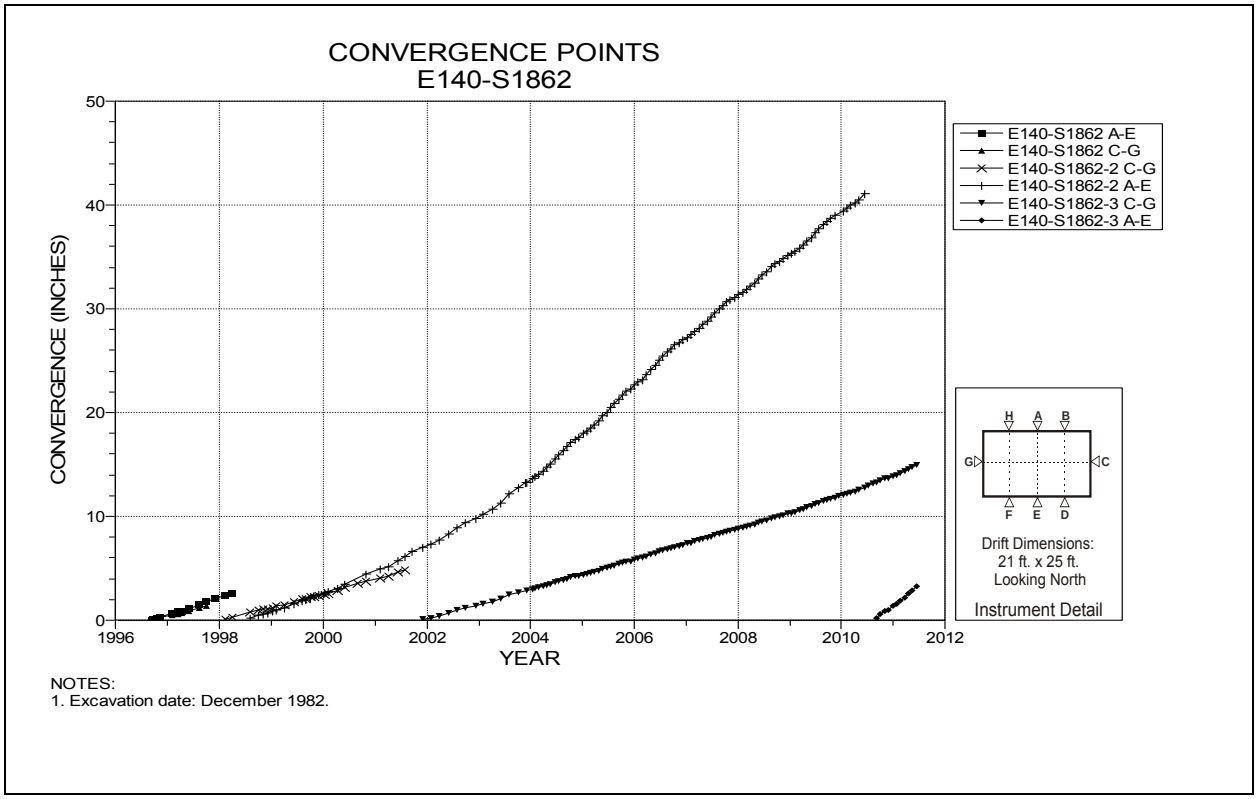


Figure 4-100 Convergence Point Array
E140 S1862 – Centerline Roof to Floor – Rib to Rib

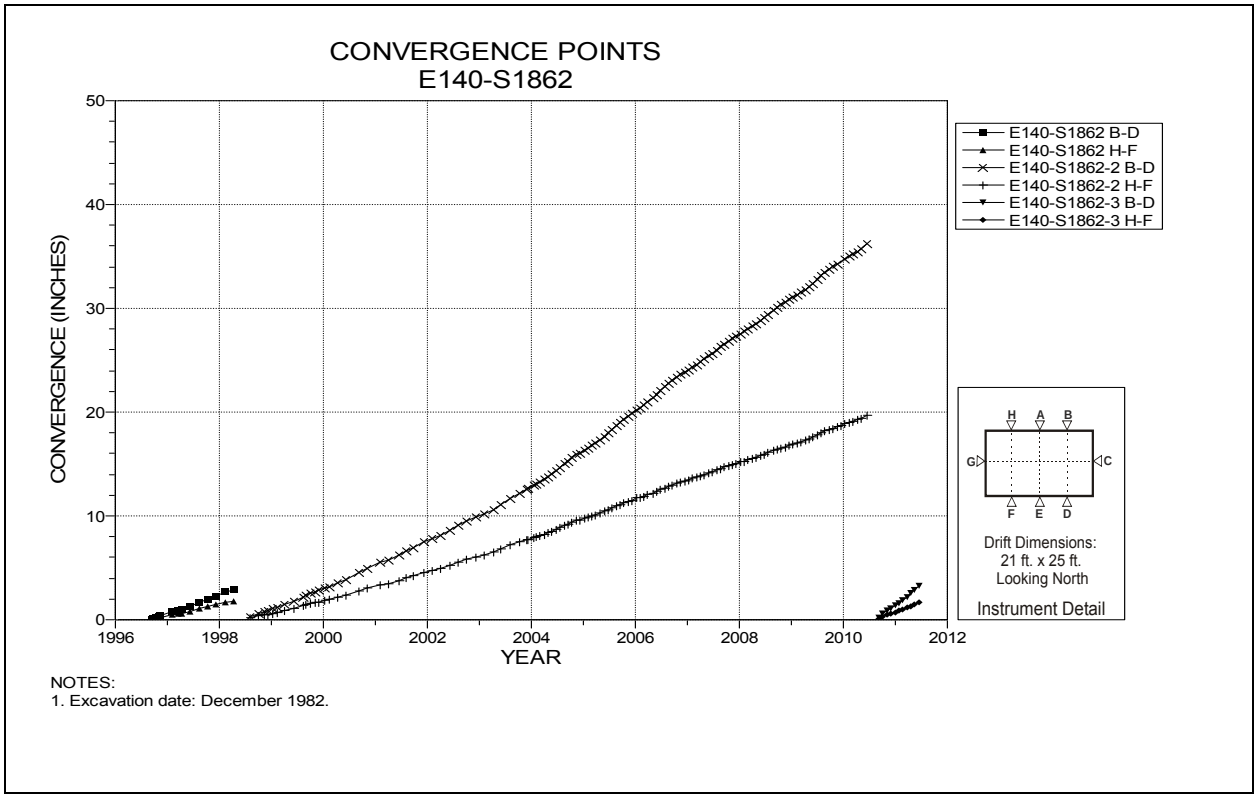


Figure 4-101 Convergence Point Array
E140 S1862 – Roof to Floor – Quarter Points

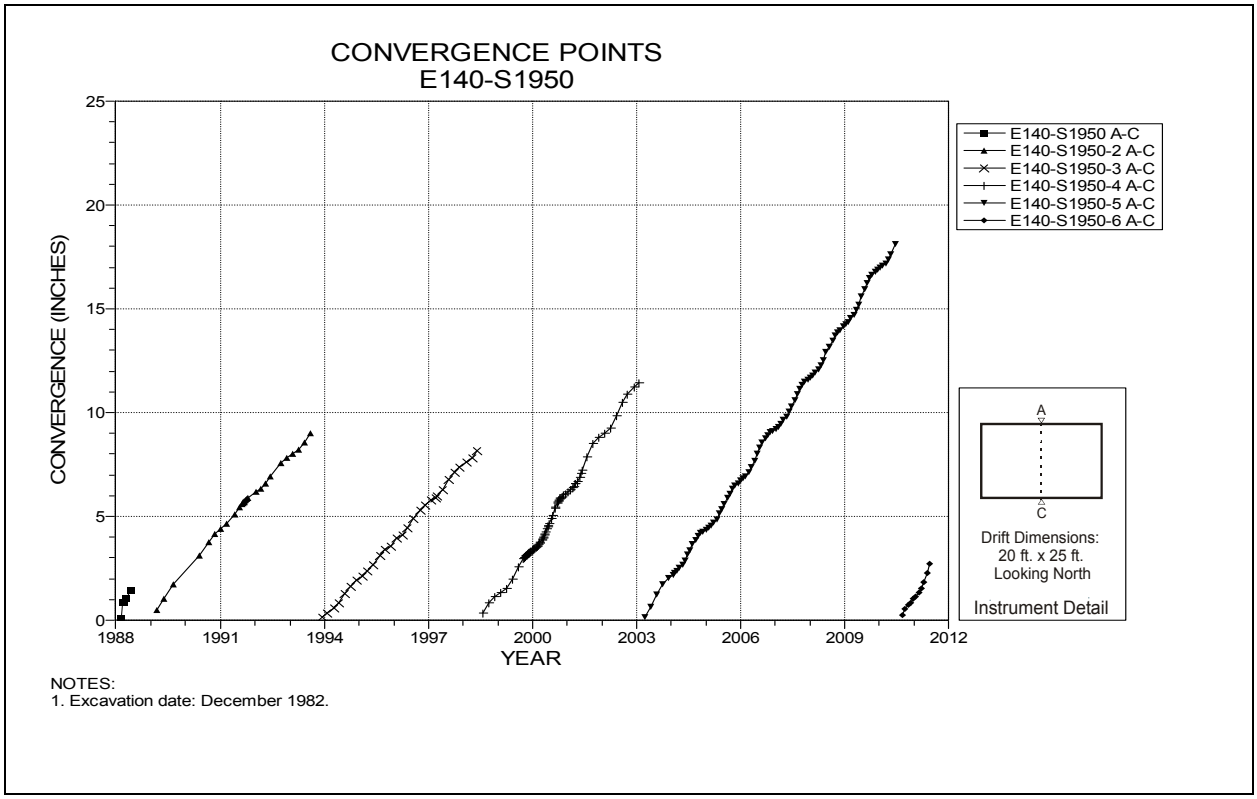


Figure 4-102 Convergence Point Array
E140 S1950 – Roof to Floor

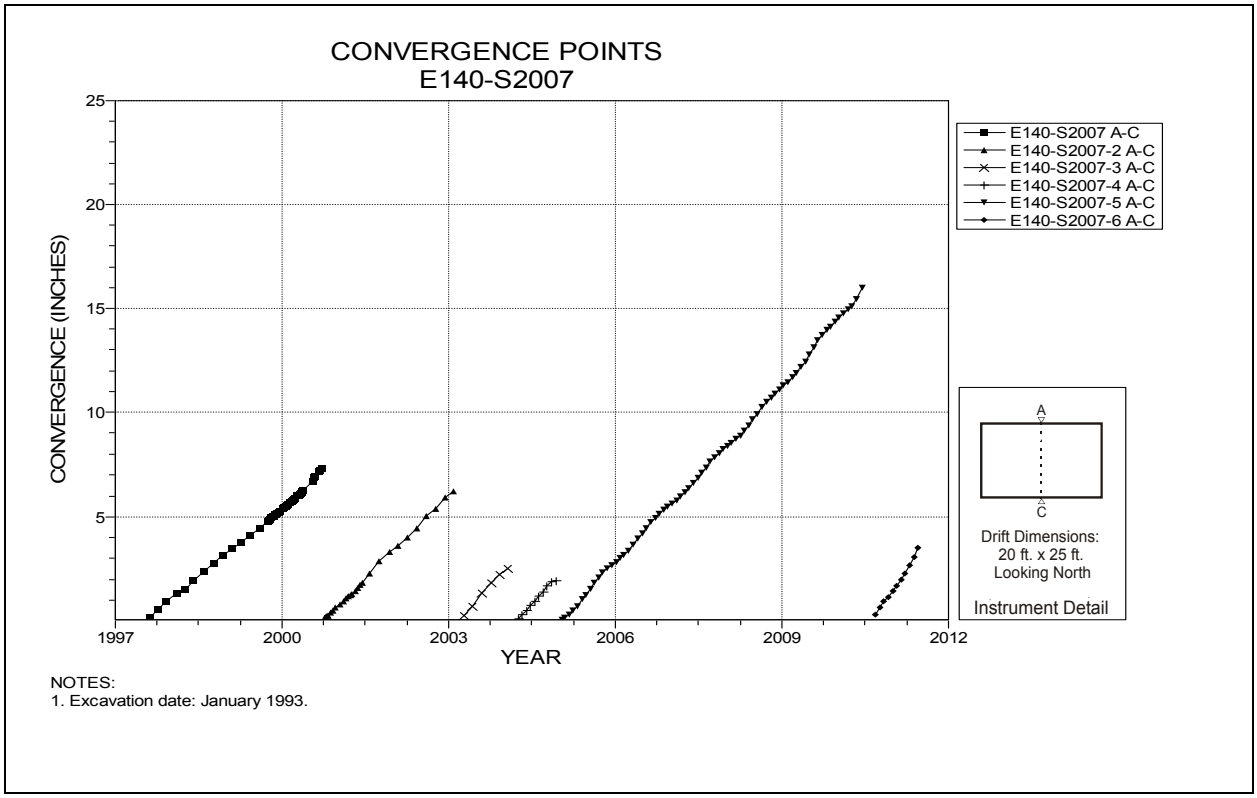


Figure 4-103 Convergence Point Array
E140 S2007 – Roof to Floor

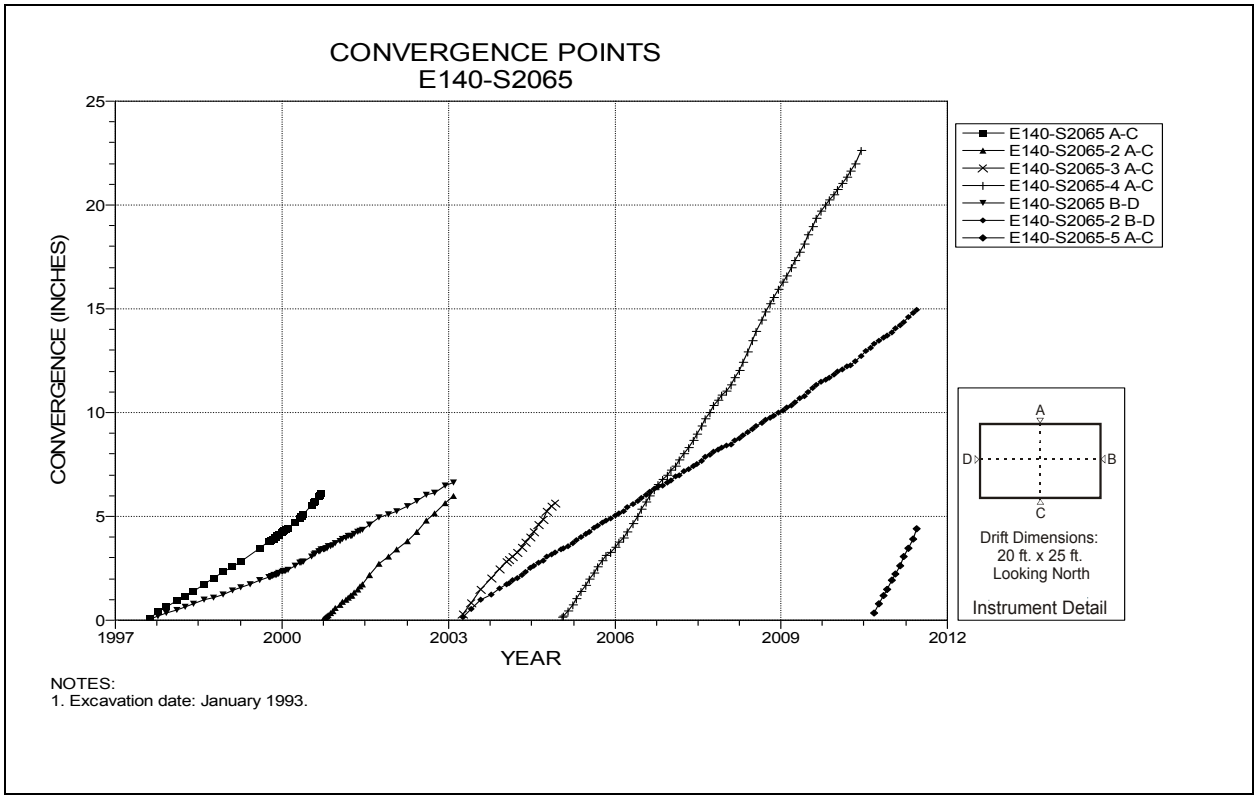


Figure 4-104 Convergence Point Array
E140 S2065 – All Chords

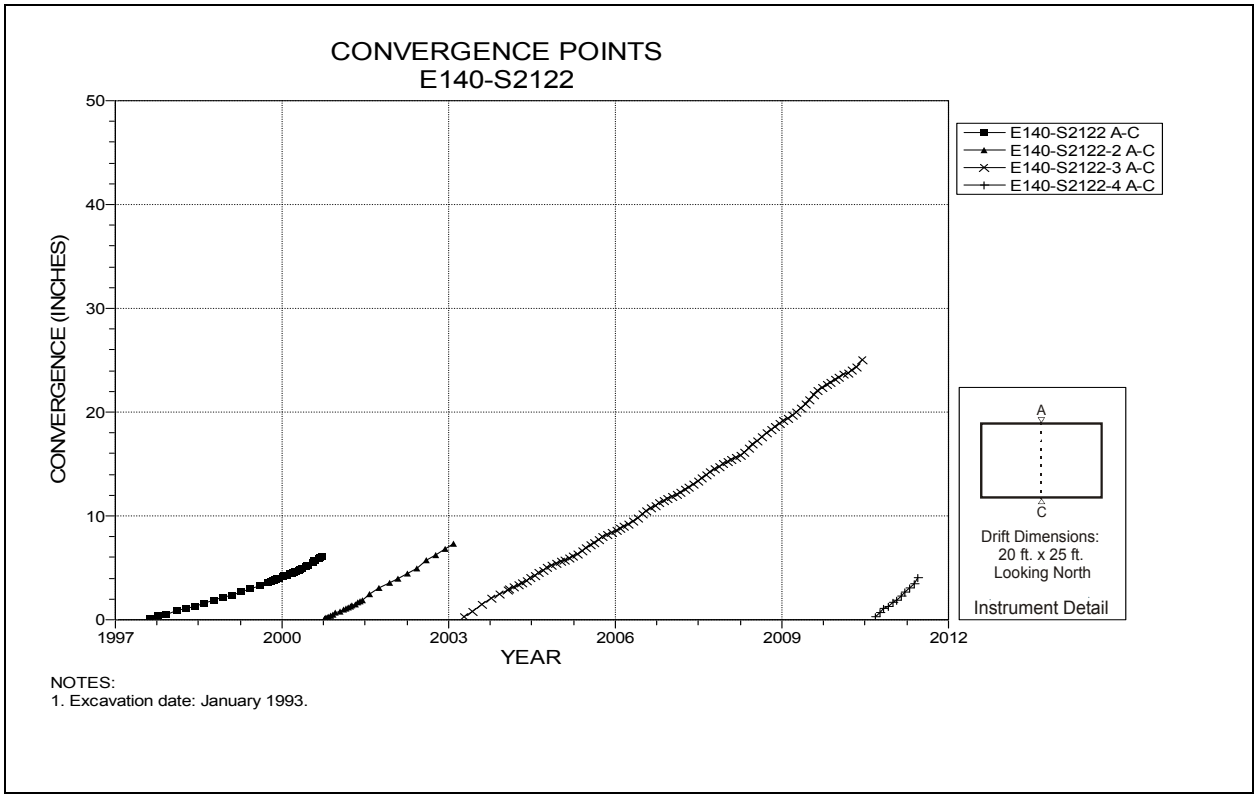


Figure 4-105 Convergence Point Array
E140 S2122 – Roof to Floor

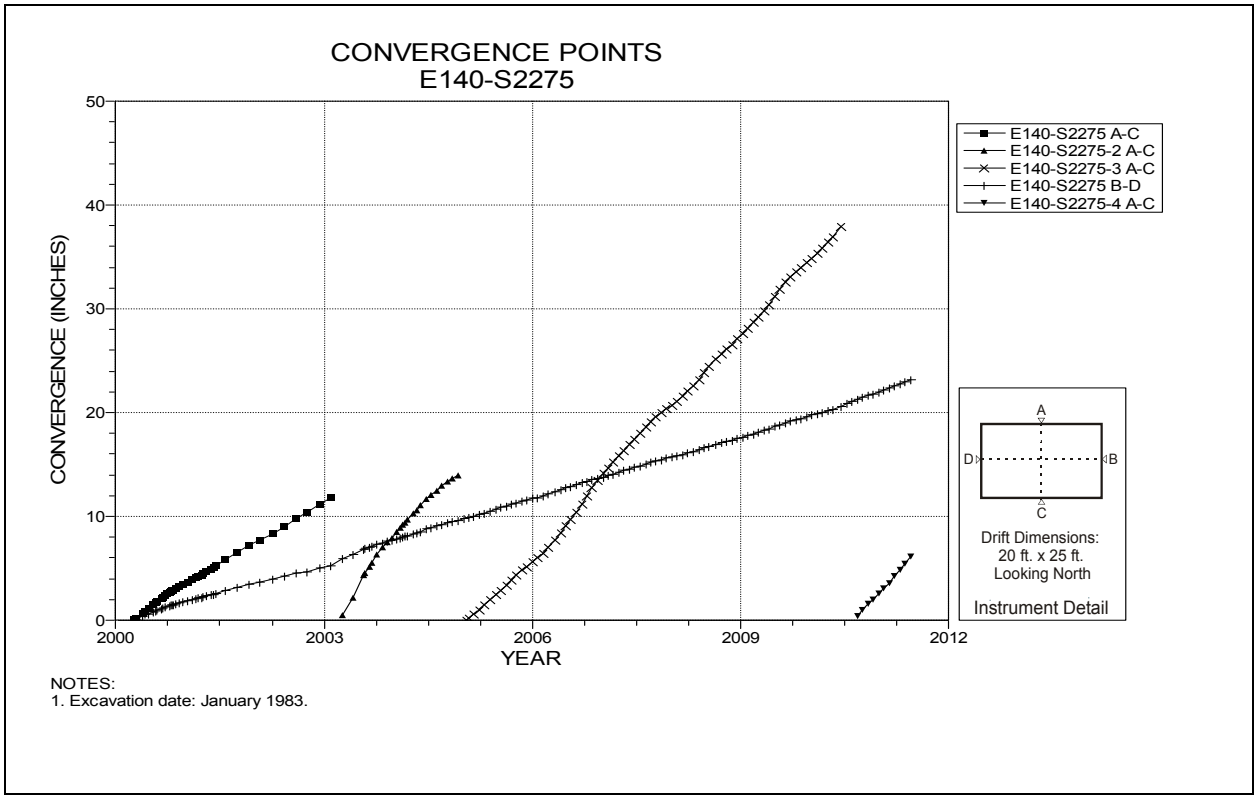


Figure 4-106 Convergence Point Array
E140 S2275 – All Chords

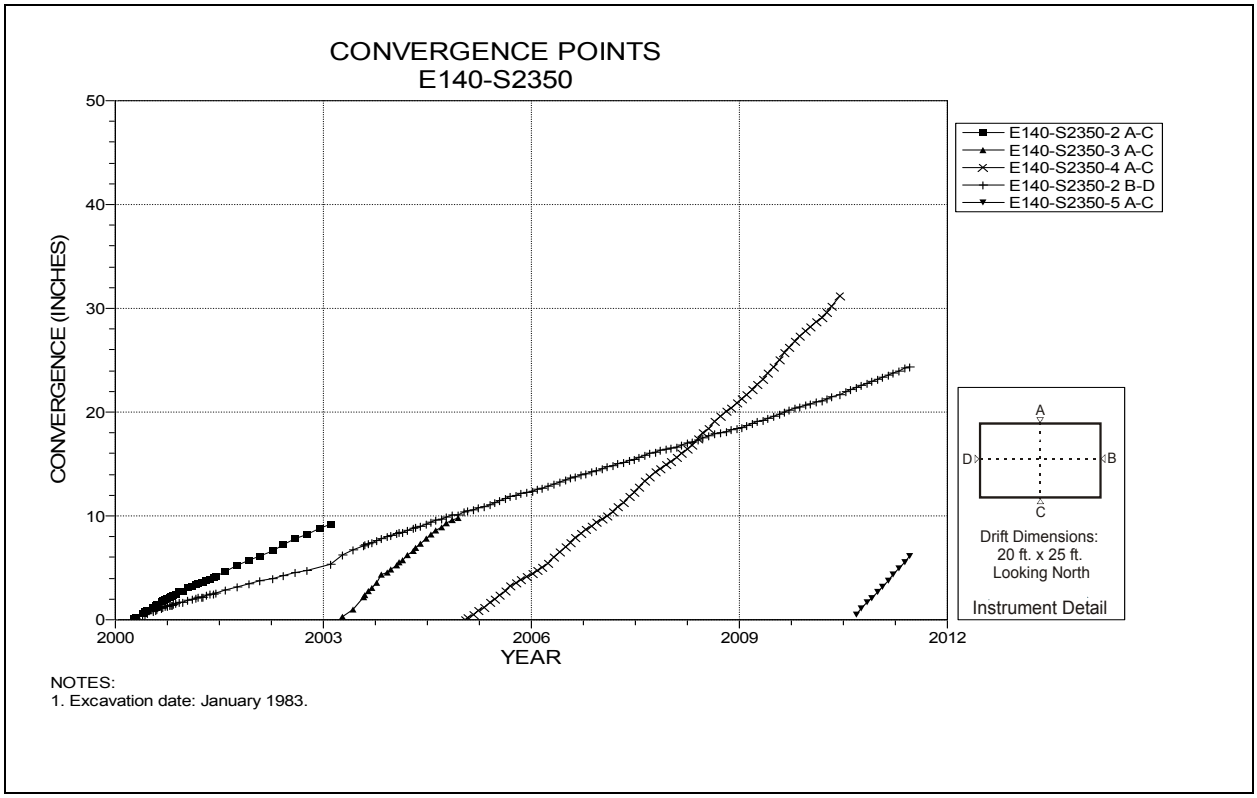


Figure 4-107 Convergence Point Array
E140 S2350 – All Chords

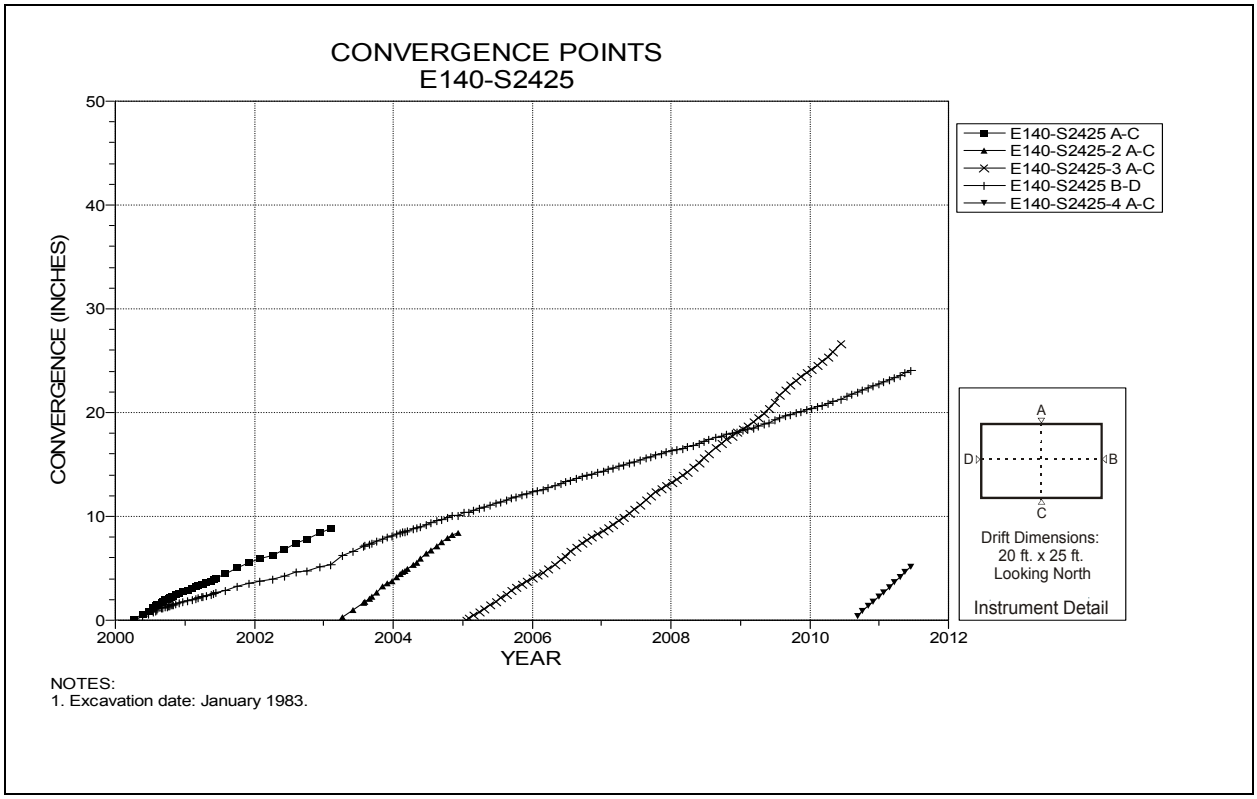


Figure 4-108 Convergence Point Array
E140 S2425 – All Chords

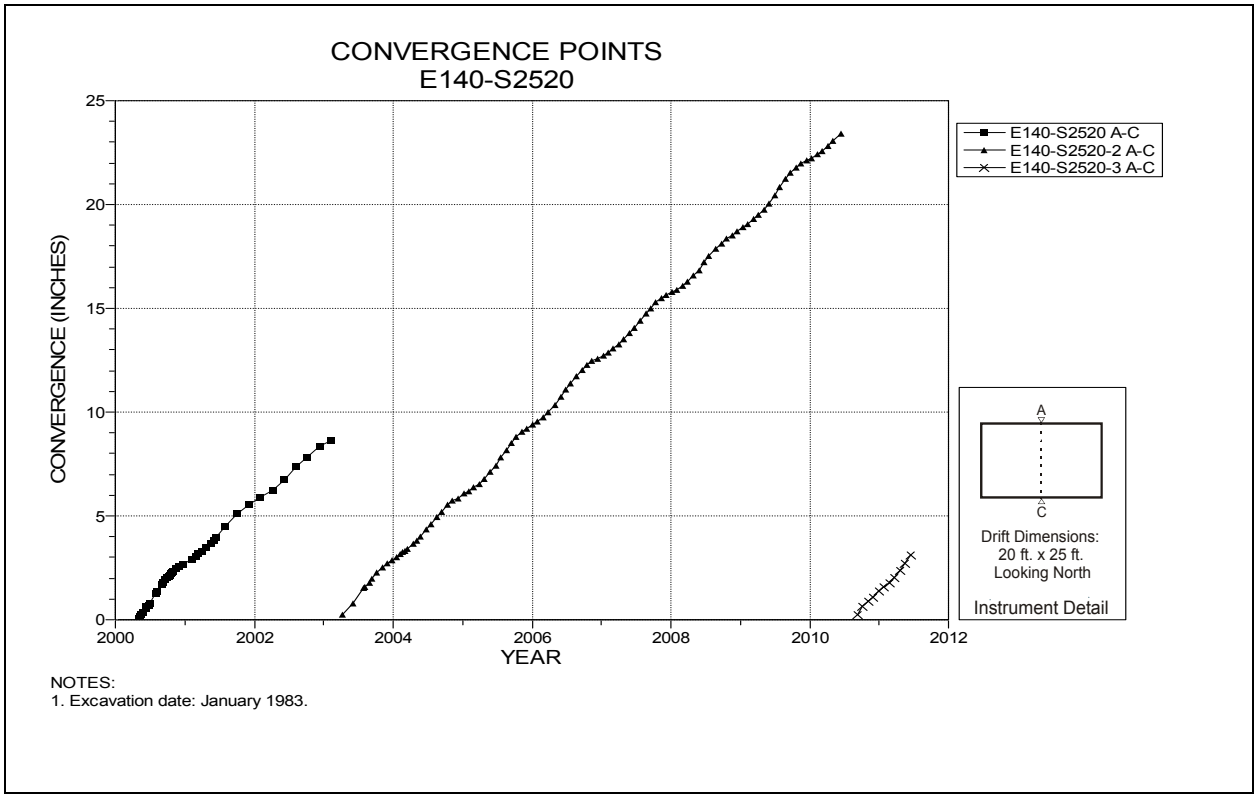


Figure 4-109 Convergence Point Array
E140 S2520 – Roof to Floor

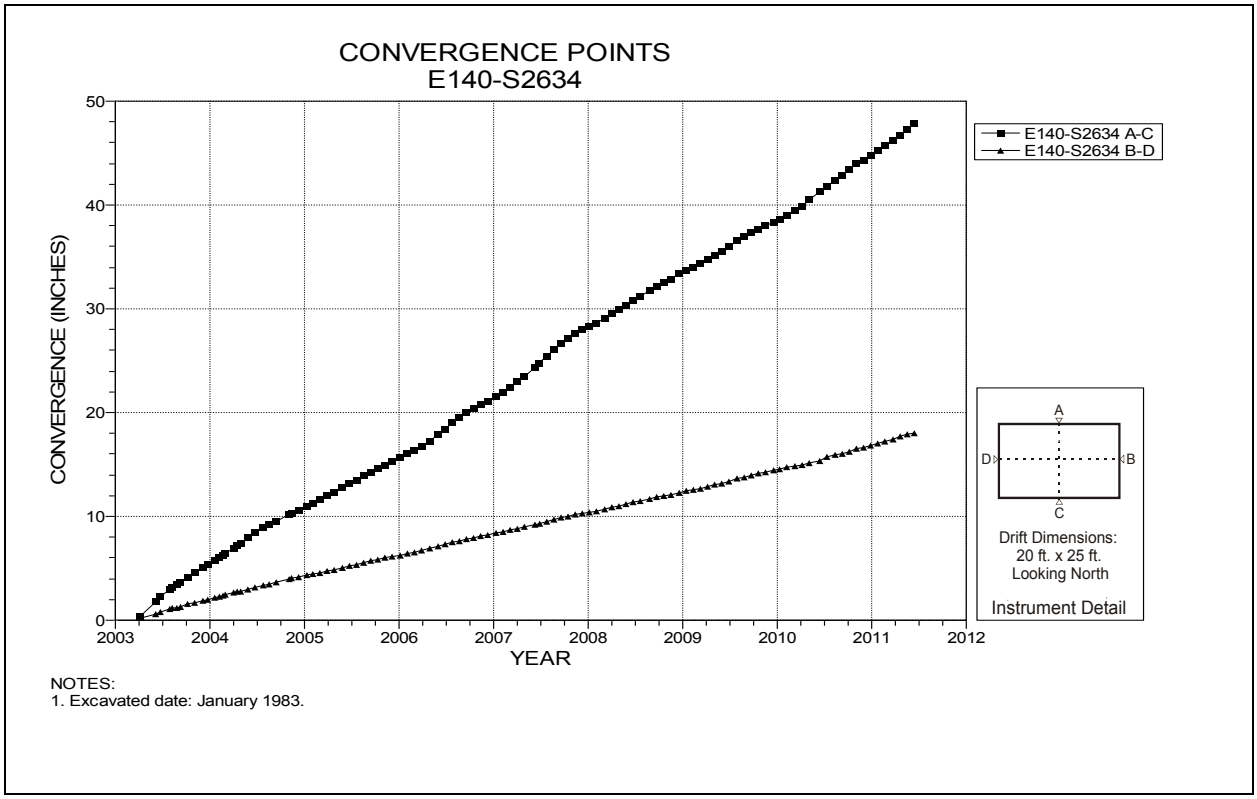


Figure 4-110 Convergence Point Array
E140 S2634 – All Chords

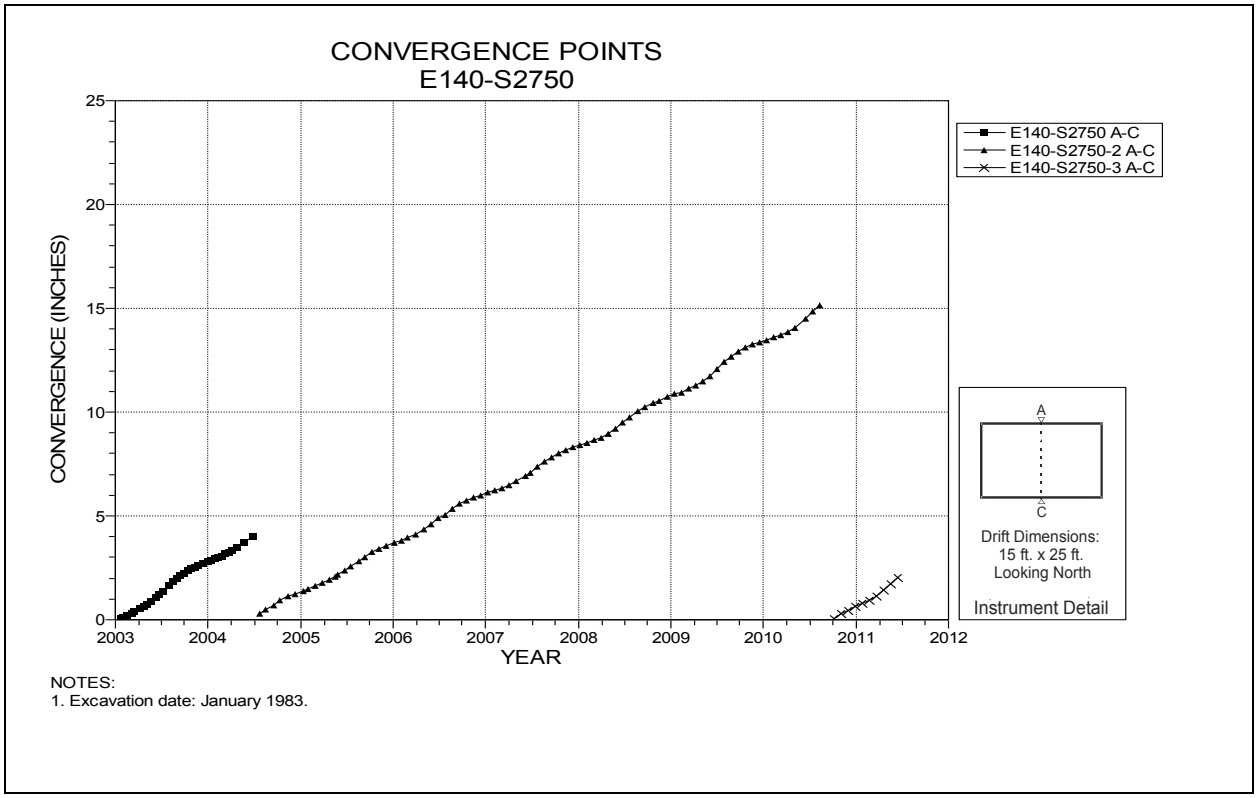


Figure 4-111 Convergence Point Array
E140 S2750 – Roof to Floor

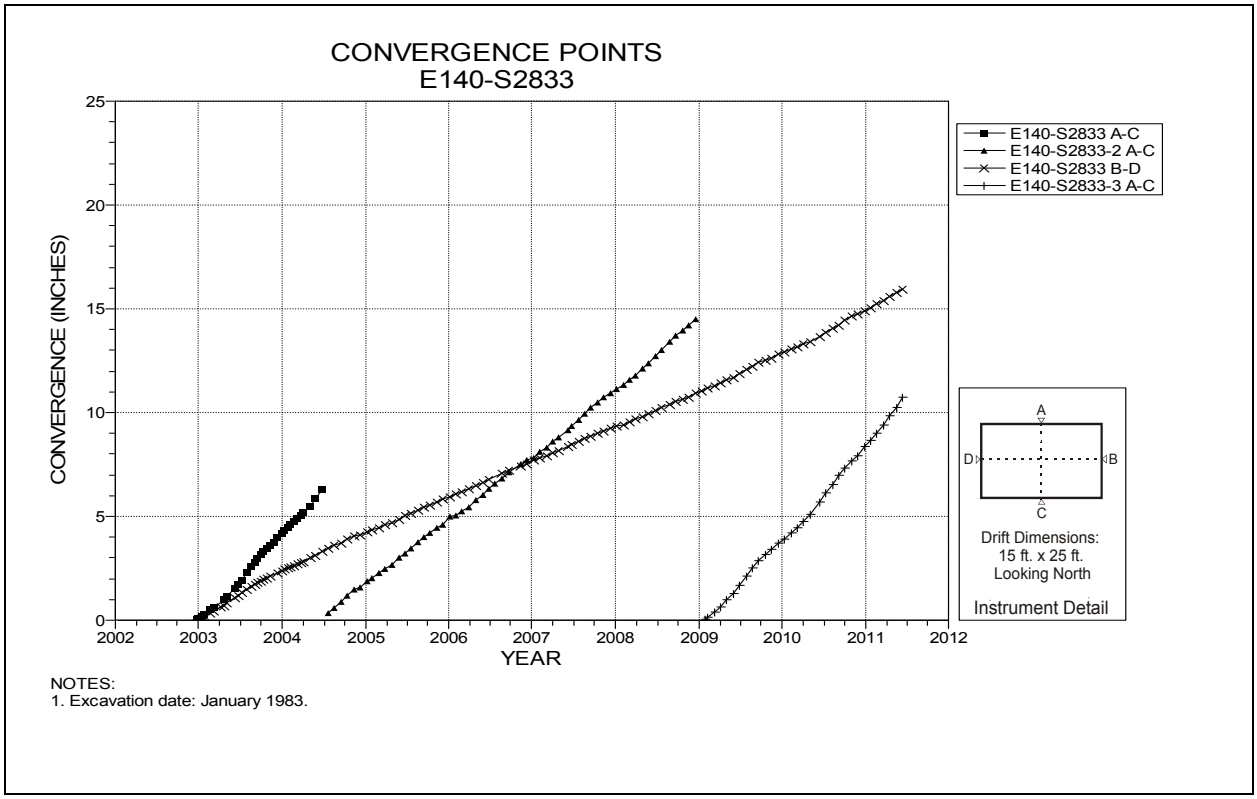


Figure 4-112 Convergence Point Array
E140 S2833 – All Chords

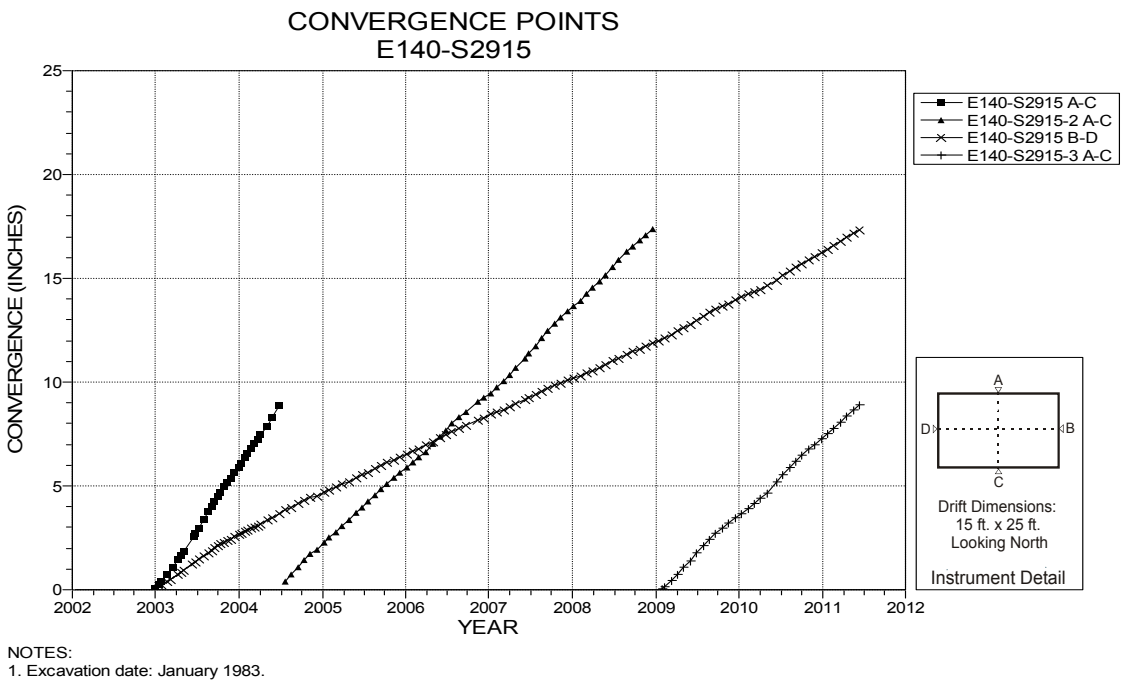


Figure 4-113 Convergence Point Array
E140 S2915 – All Chords

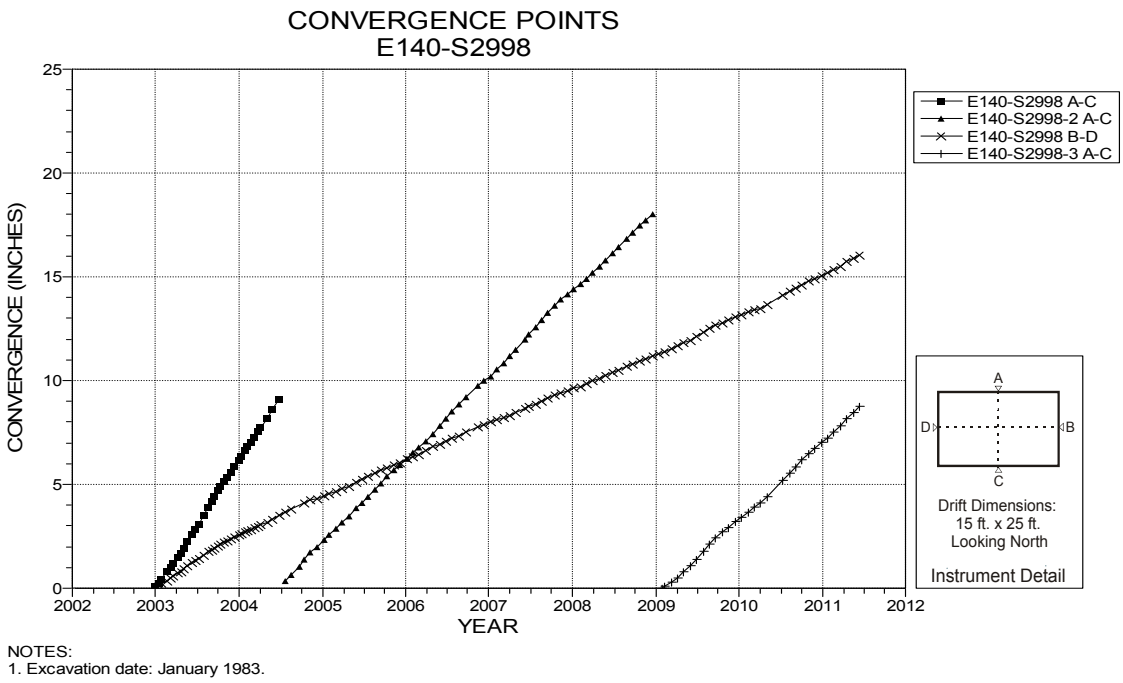


Figure 4-114 Convergence Point Array
E140 S2998 – All Chords

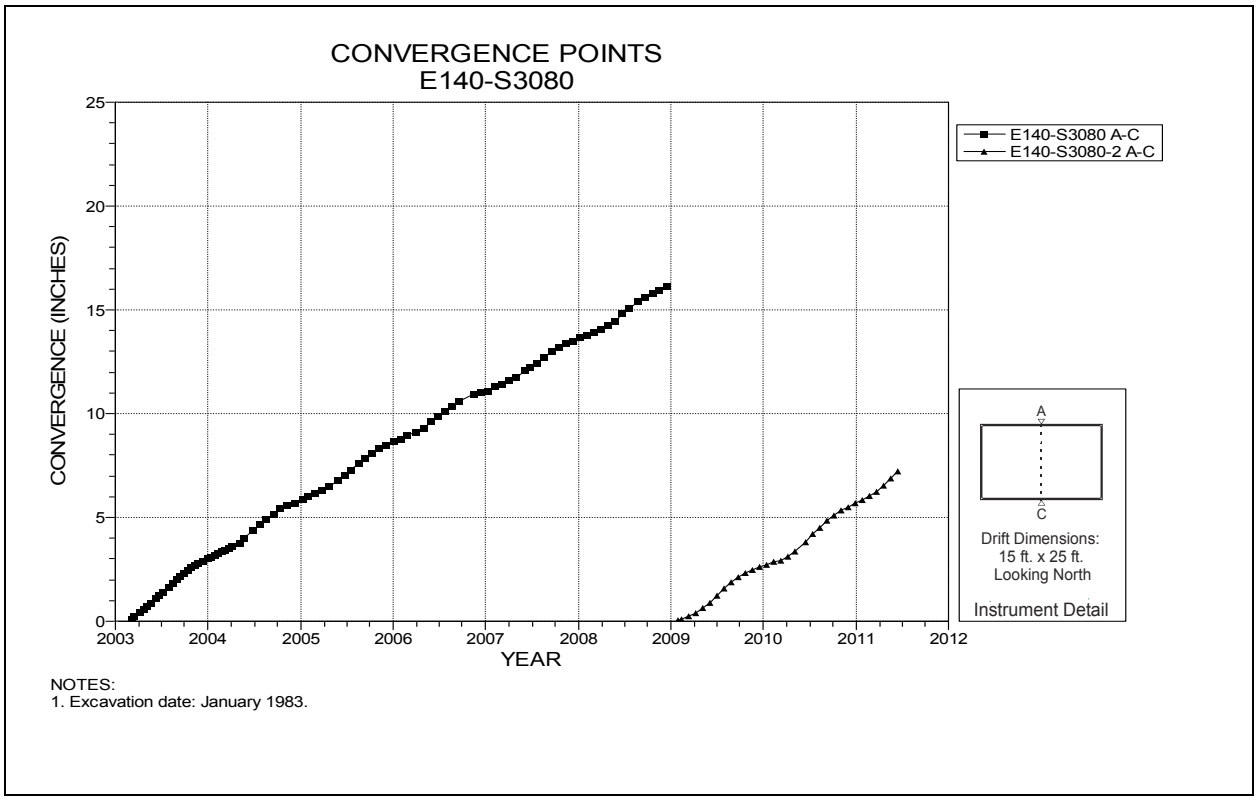


Figure 4-115 Convergence Point Array
E140 S3080 – Roof to Floor

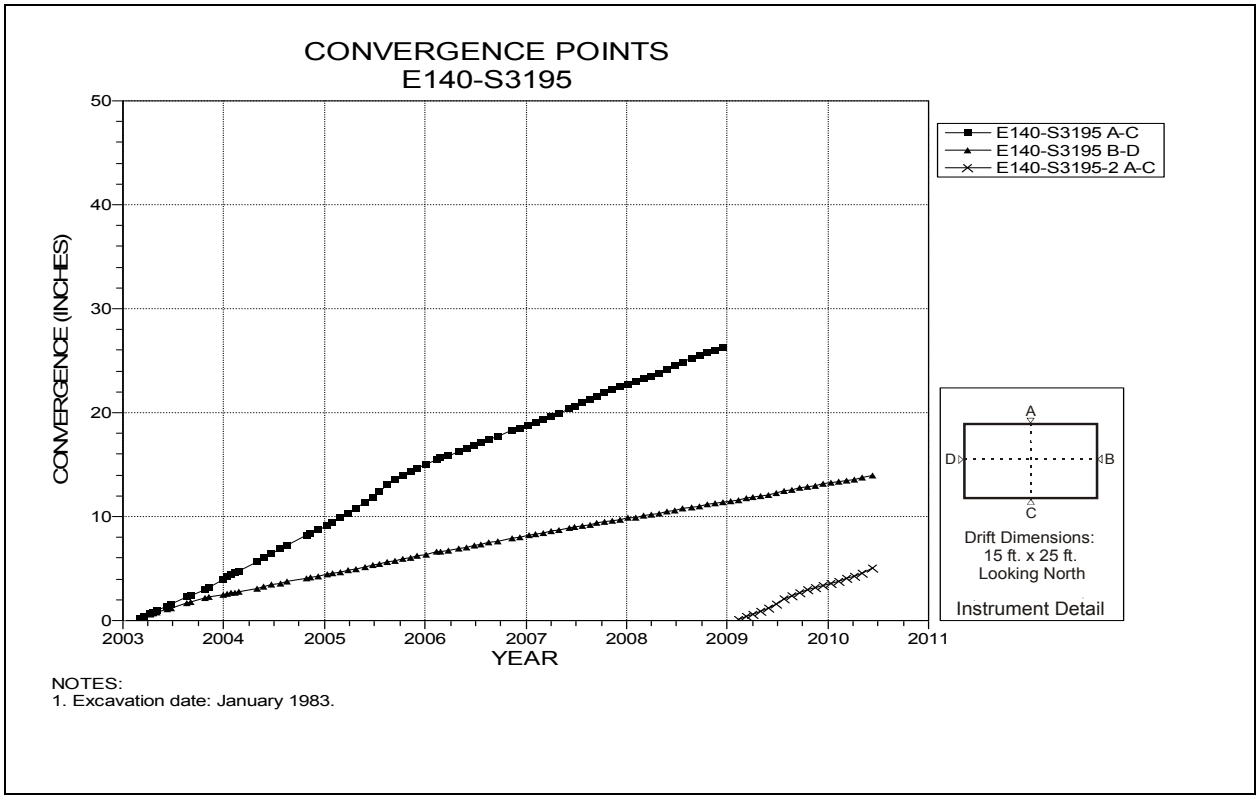


Figure 4-116 Convergence Point Array
E140 S3195 – All Chords

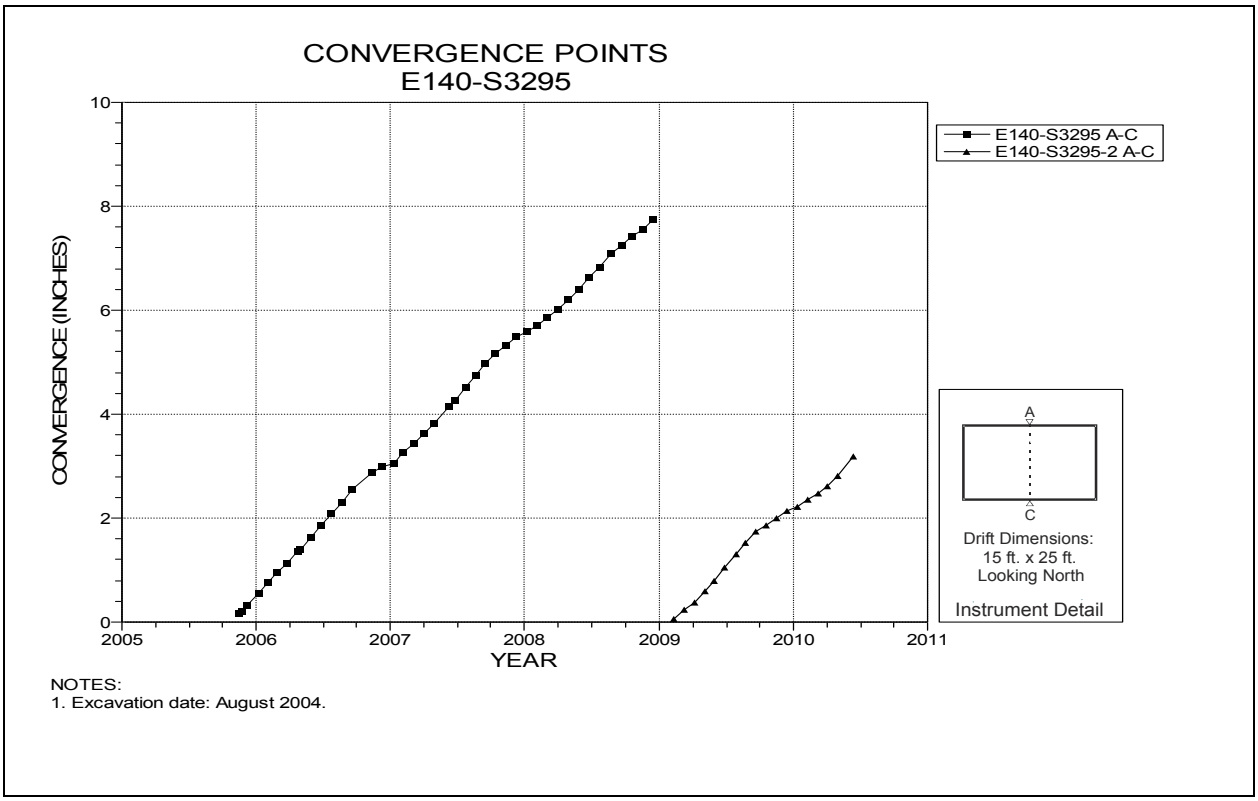


Figure 4-117 Convergence Point Array
E140 S3295 – Roof to Floor

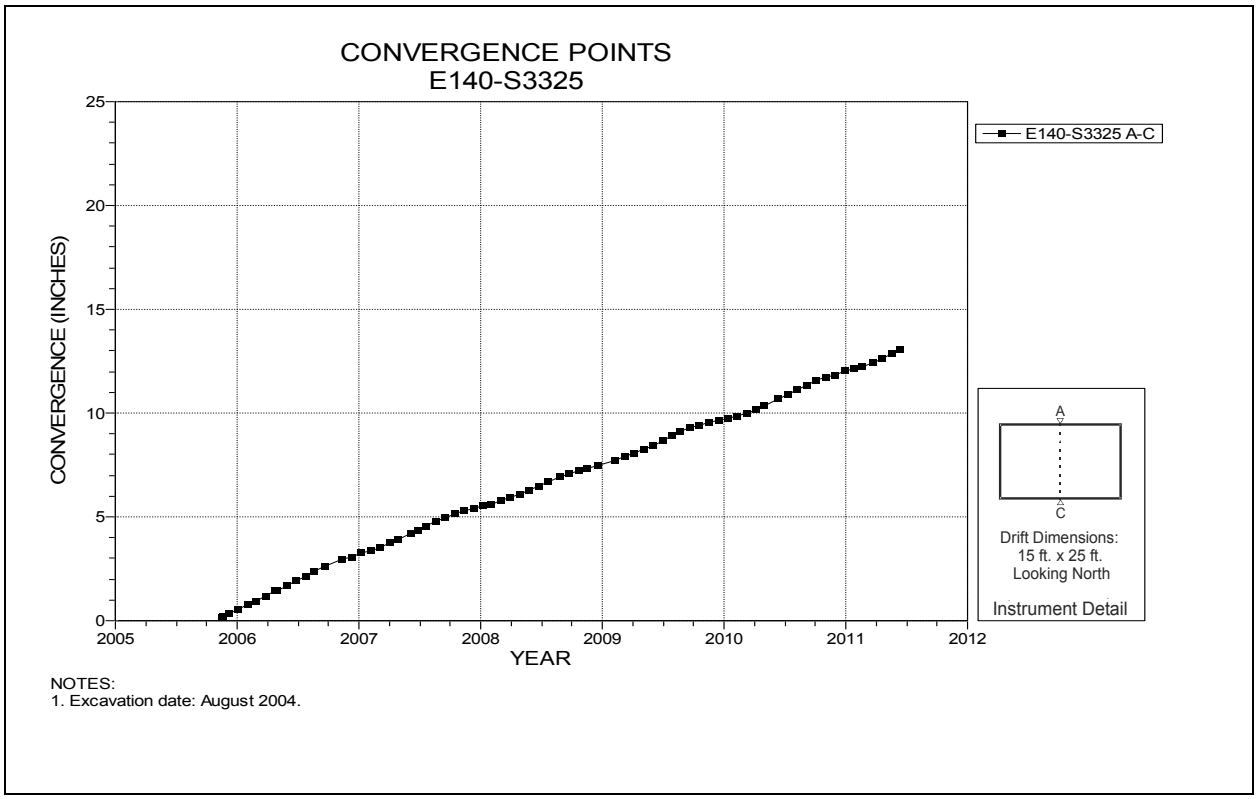


Figure 4-118 Convergence Point Array
E140 S3325 – Roof to Floor

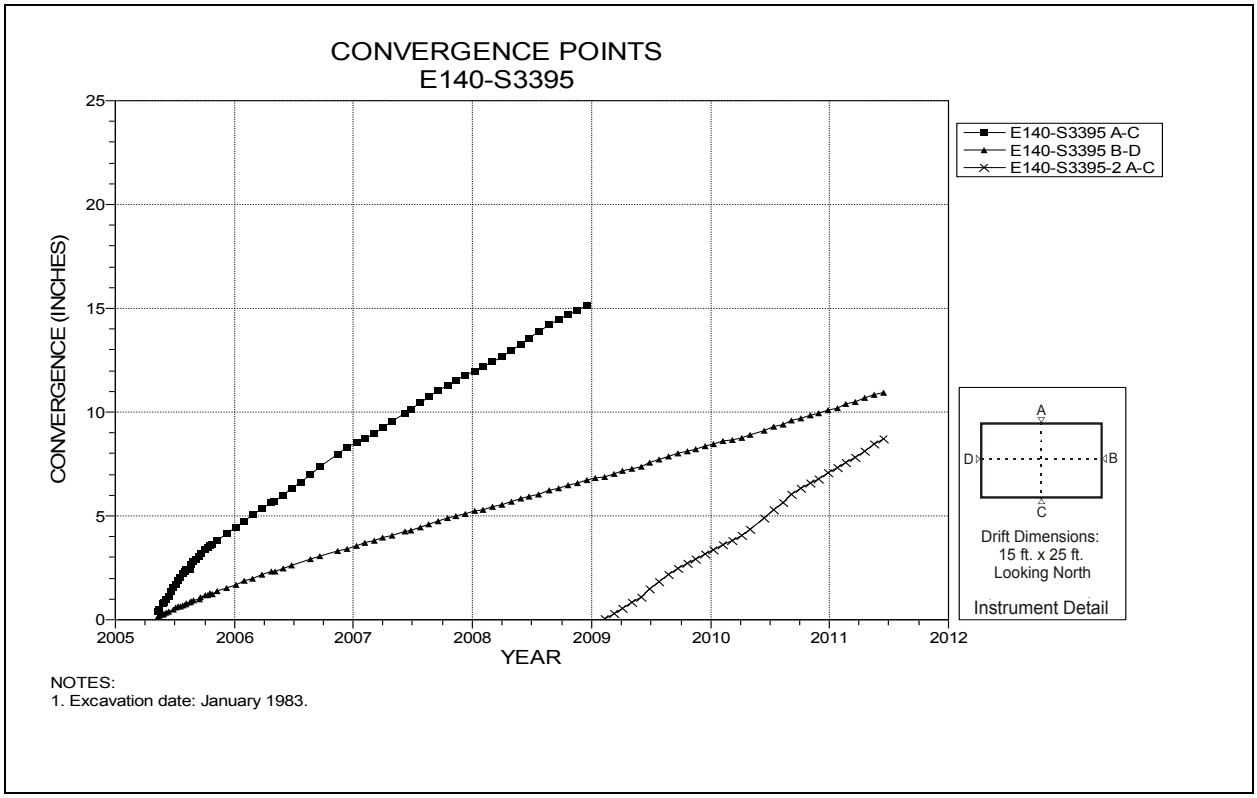


Figure 4-119 Convergence Point Array
E140 S3395 – All Chords

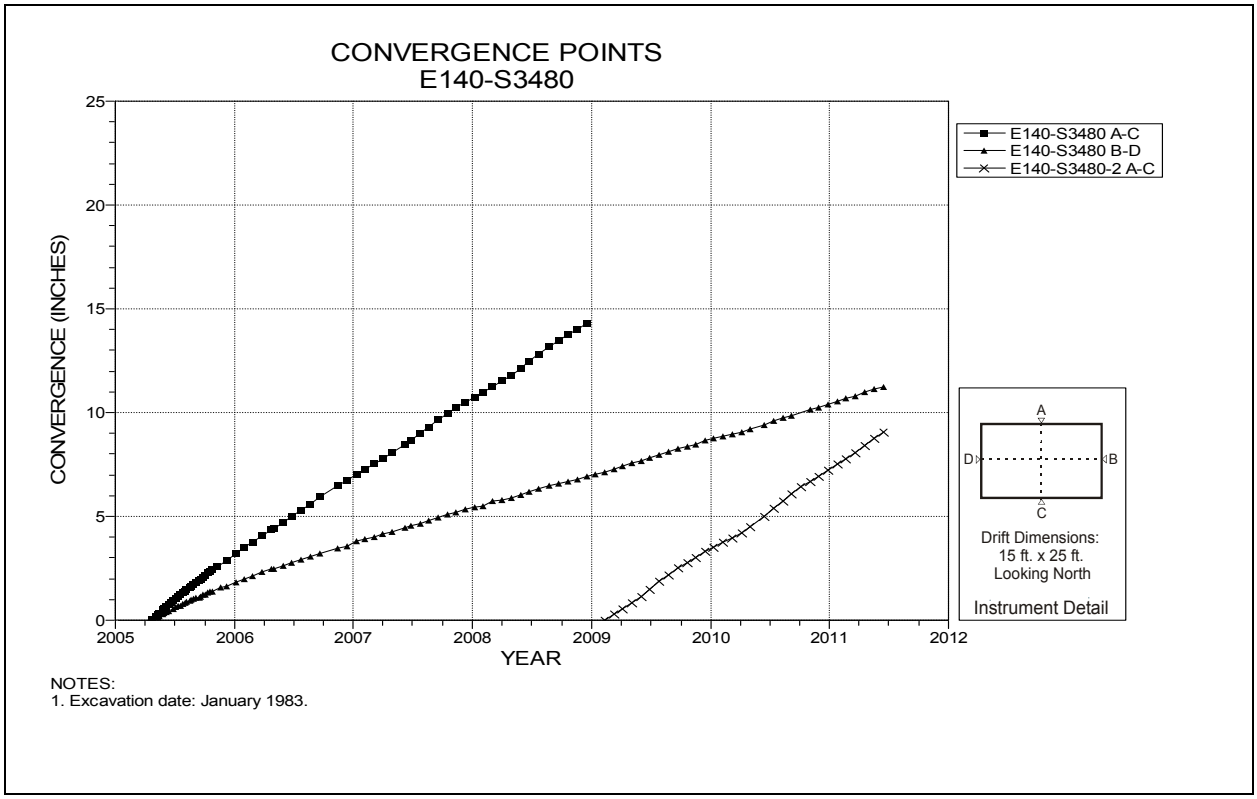


Figure 4-120 Convergence Point Array
E140 S3480 – All Chords

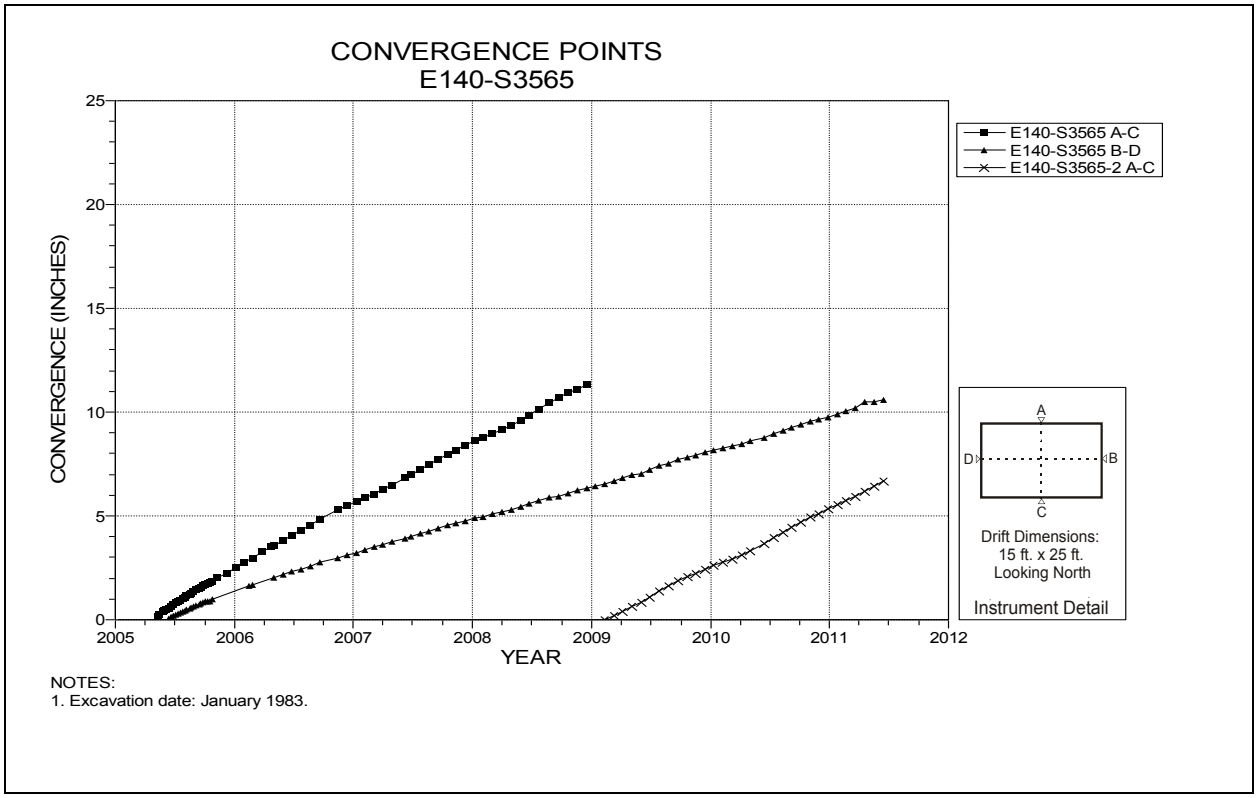


Figure 4-121 Convergence Point Array
E140 S3565 – All Chords

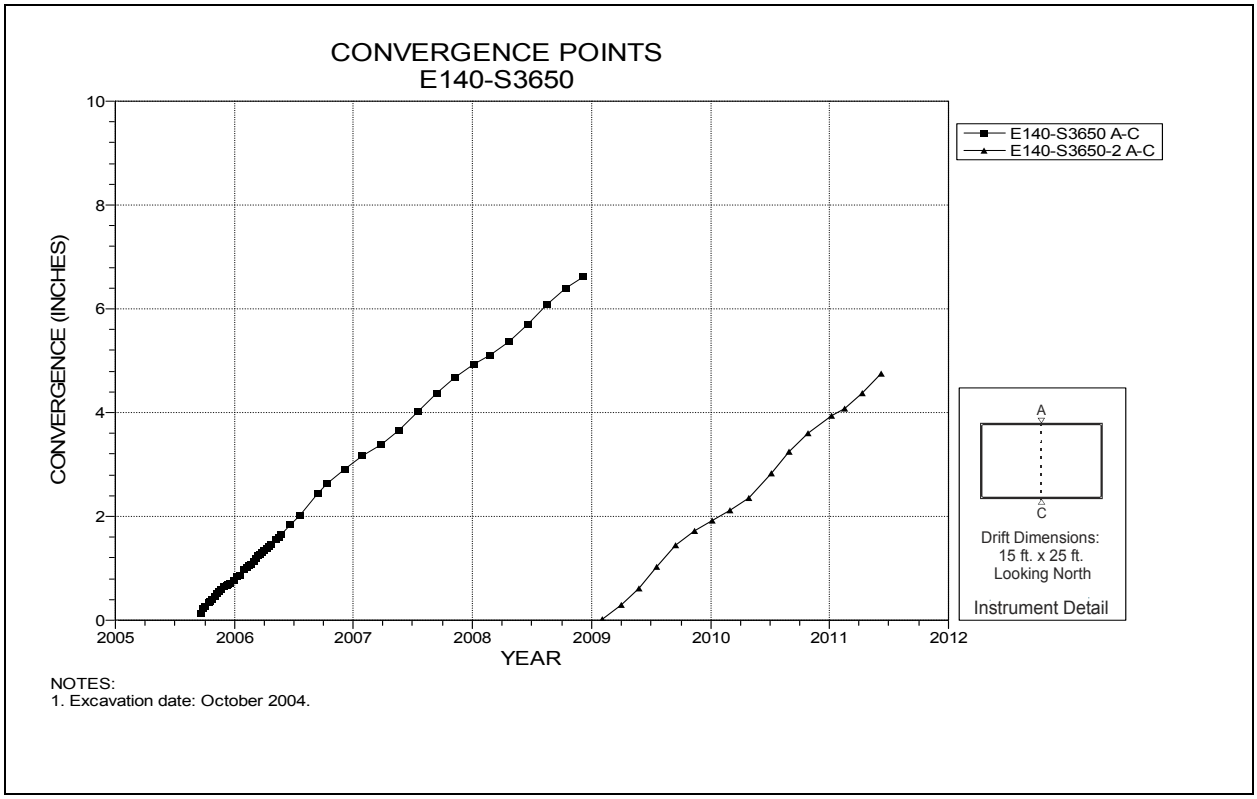


Figure 4-122 Convergence Point Array
E140 S3650– Roof to Floor

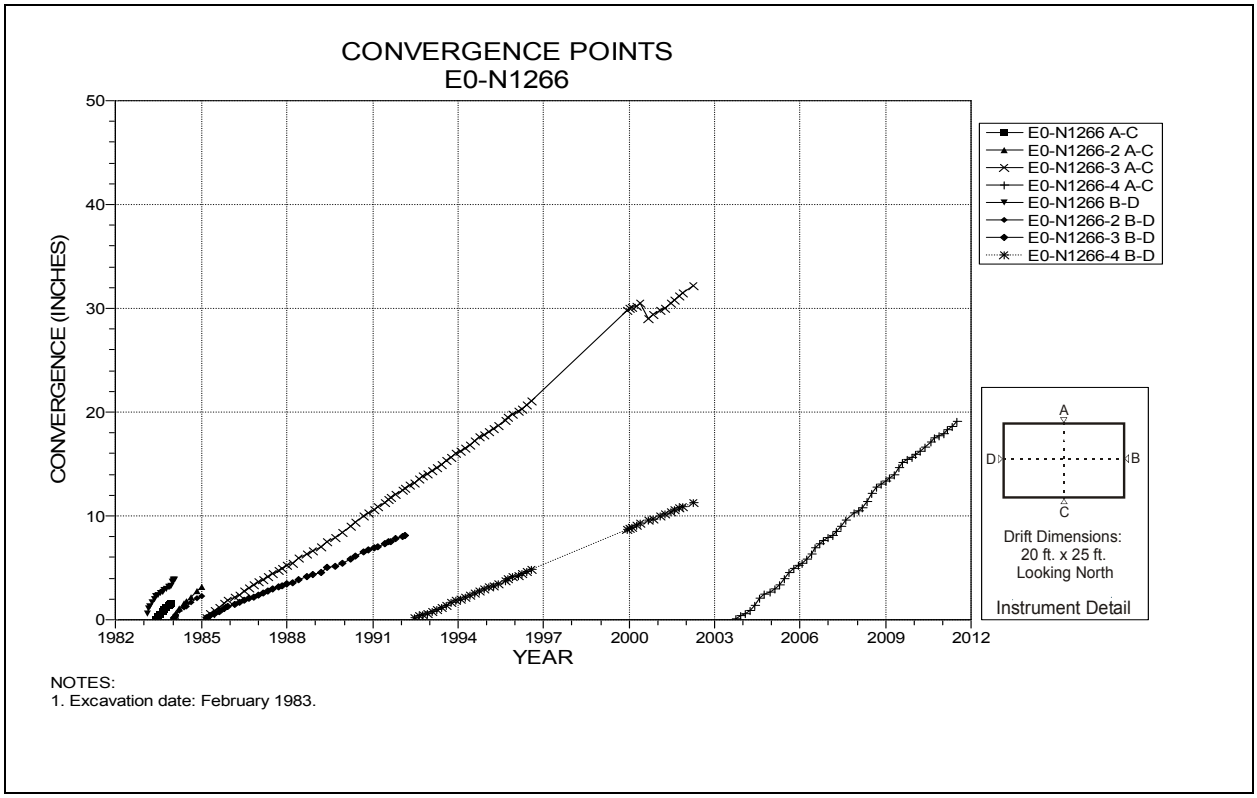


Figure 4-123 Convergence Point Array
E0 N1266 – All Chords

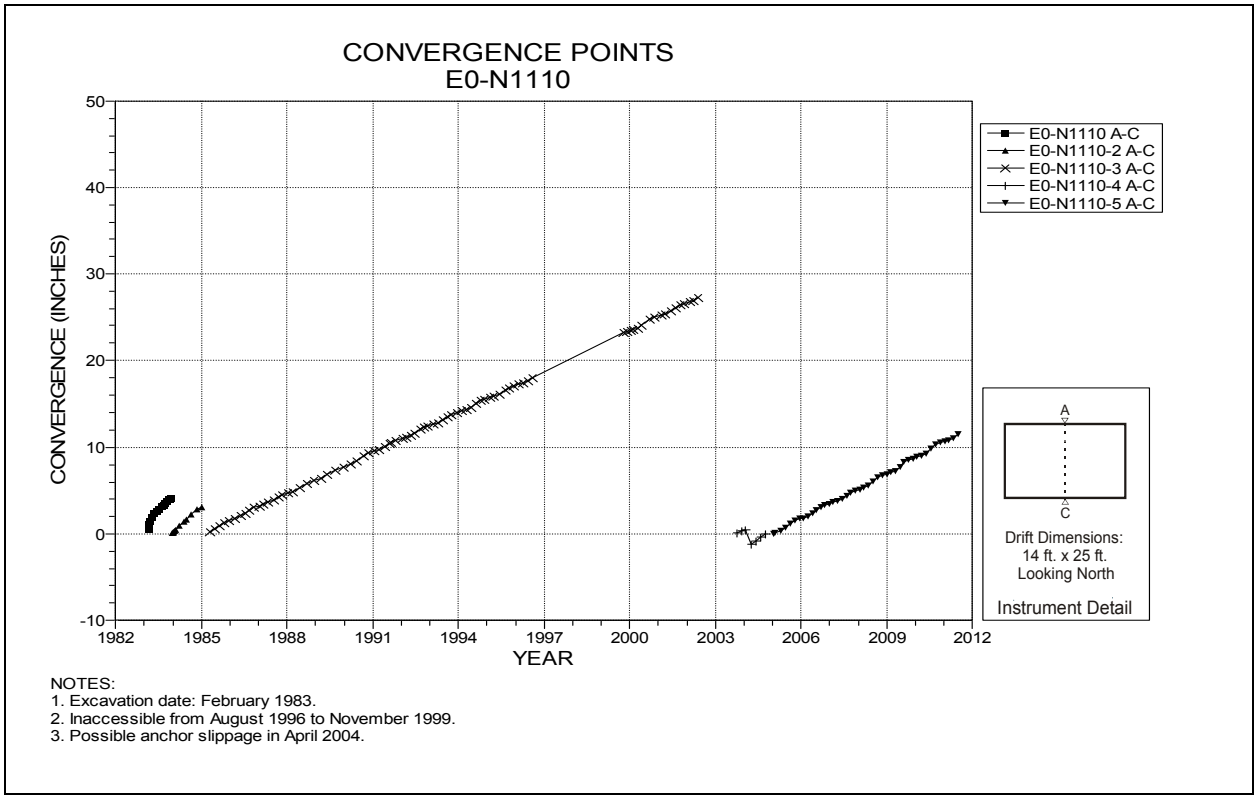


Figure 4-124 Convergence Point Array
E0 N1100 – Roof to Floor

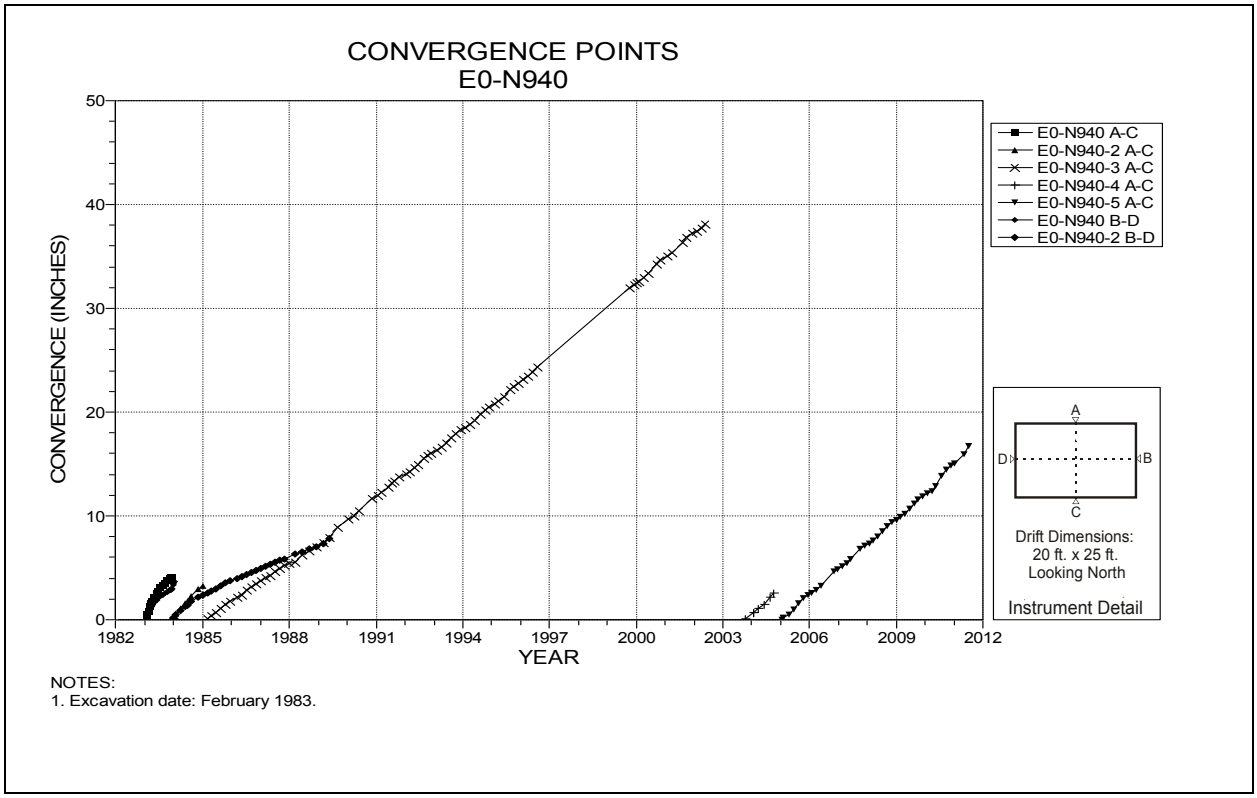


Figure 4-125 Convergence Point Array
E0 N940 – All Chords

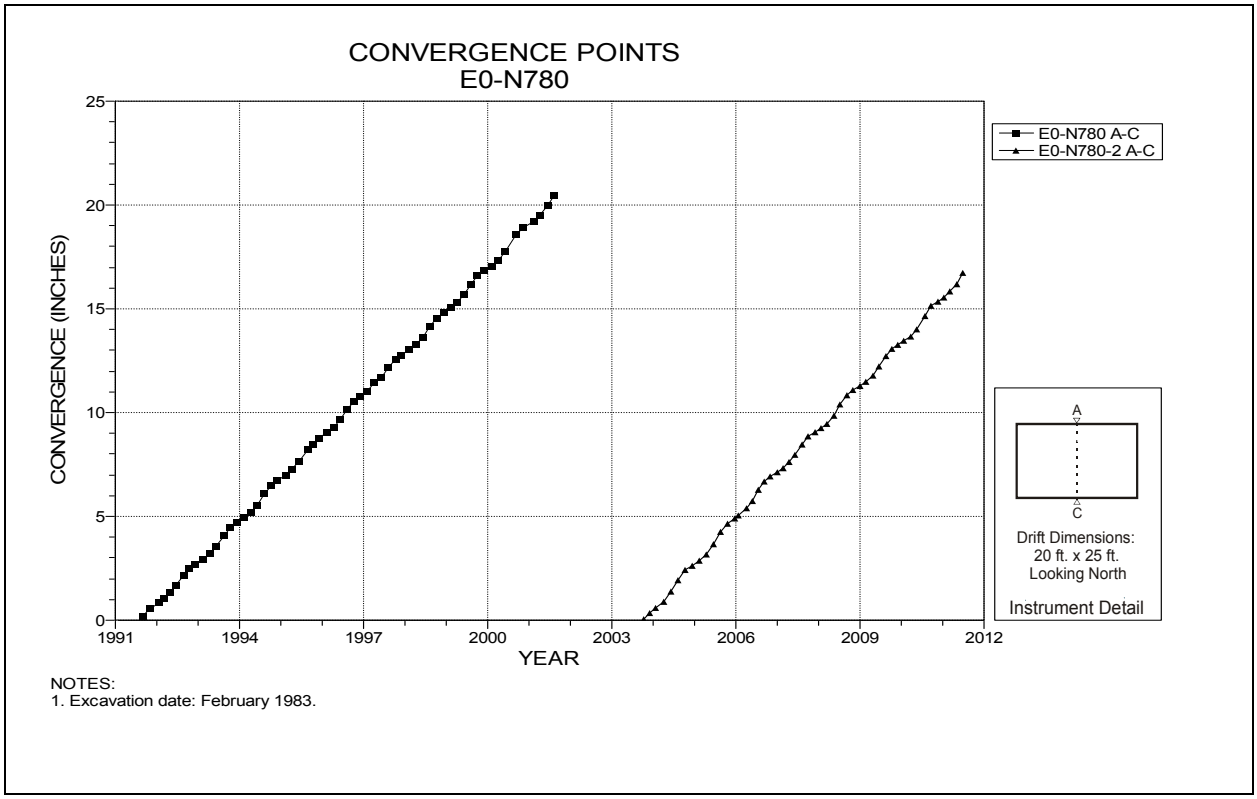


Figure 4-126 Convergence Point Array
E0 N780 – Roof to Floor

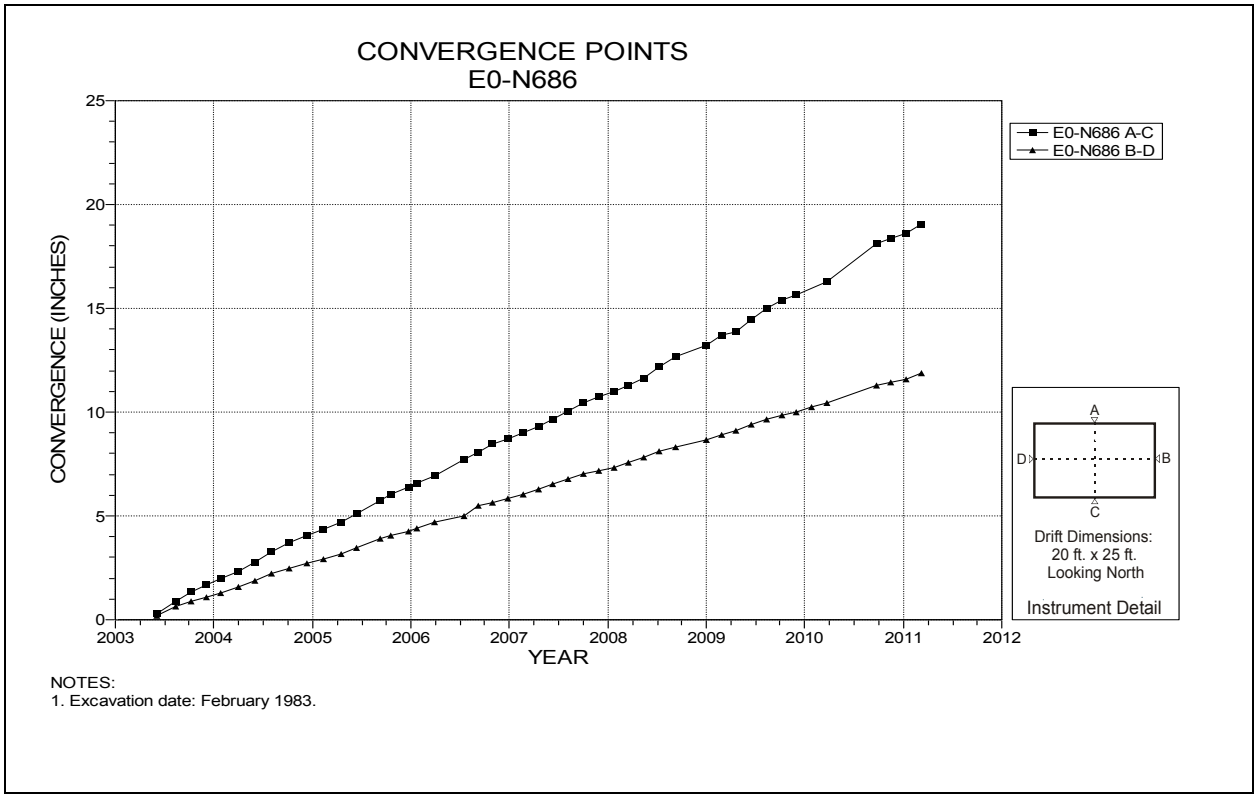


Figure 4-127 Convergence Point Array
E0 N686 – All Chords

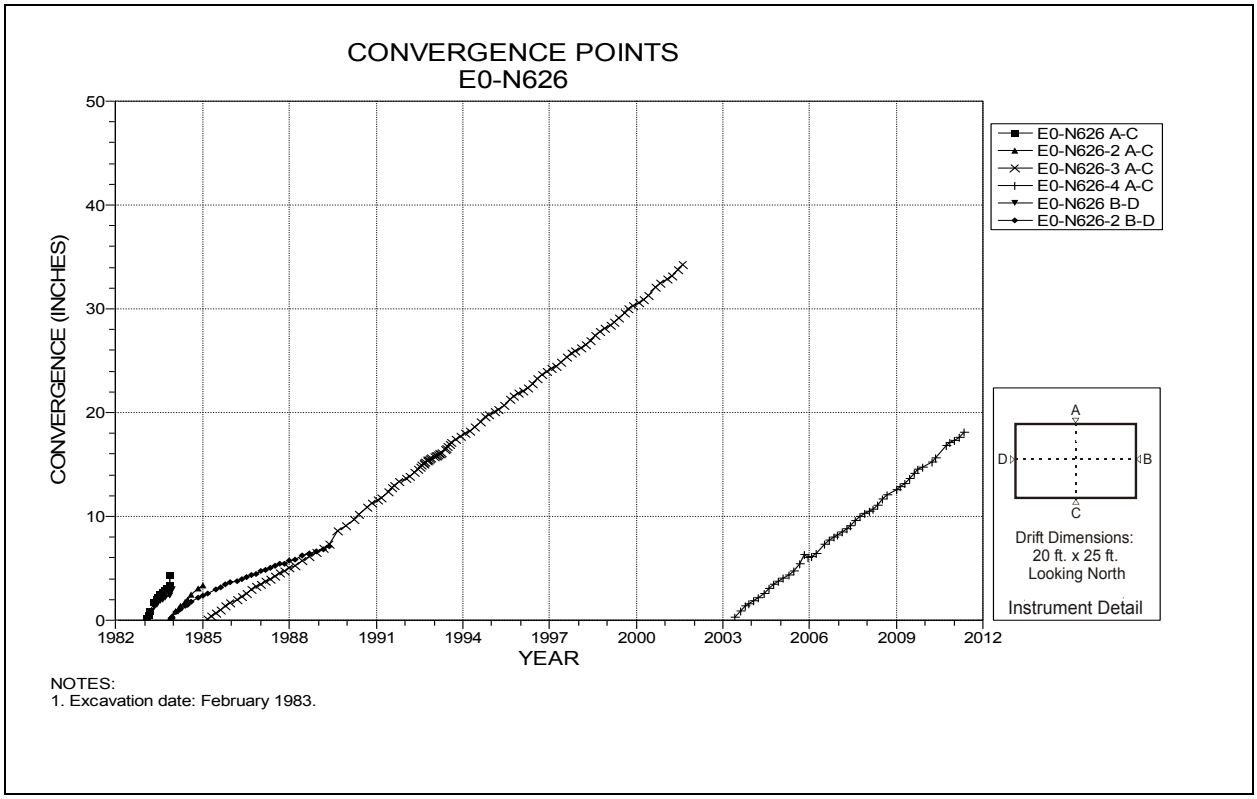


Figure 4-128 Convergence Point Array
E0 N626 – All Chords

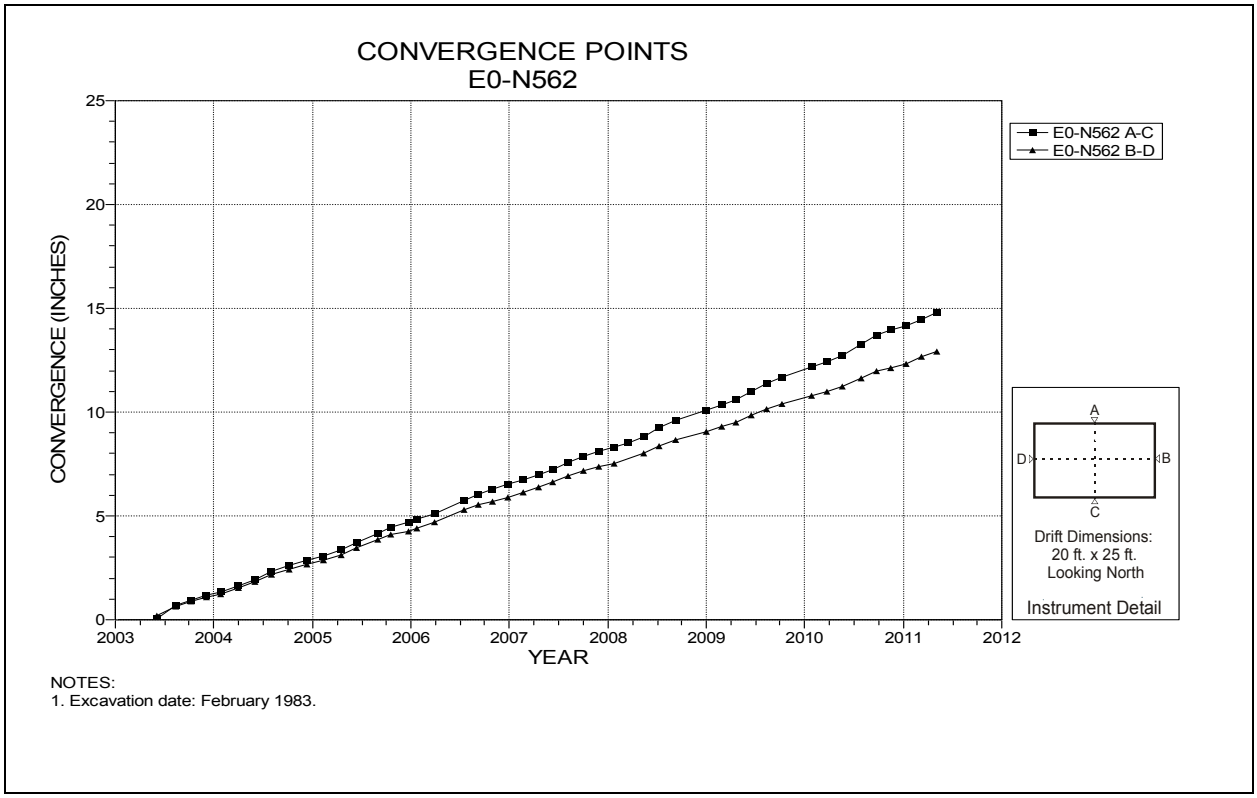


Figure 4-129 Convergence Point Array
E0 N562 – All Chords

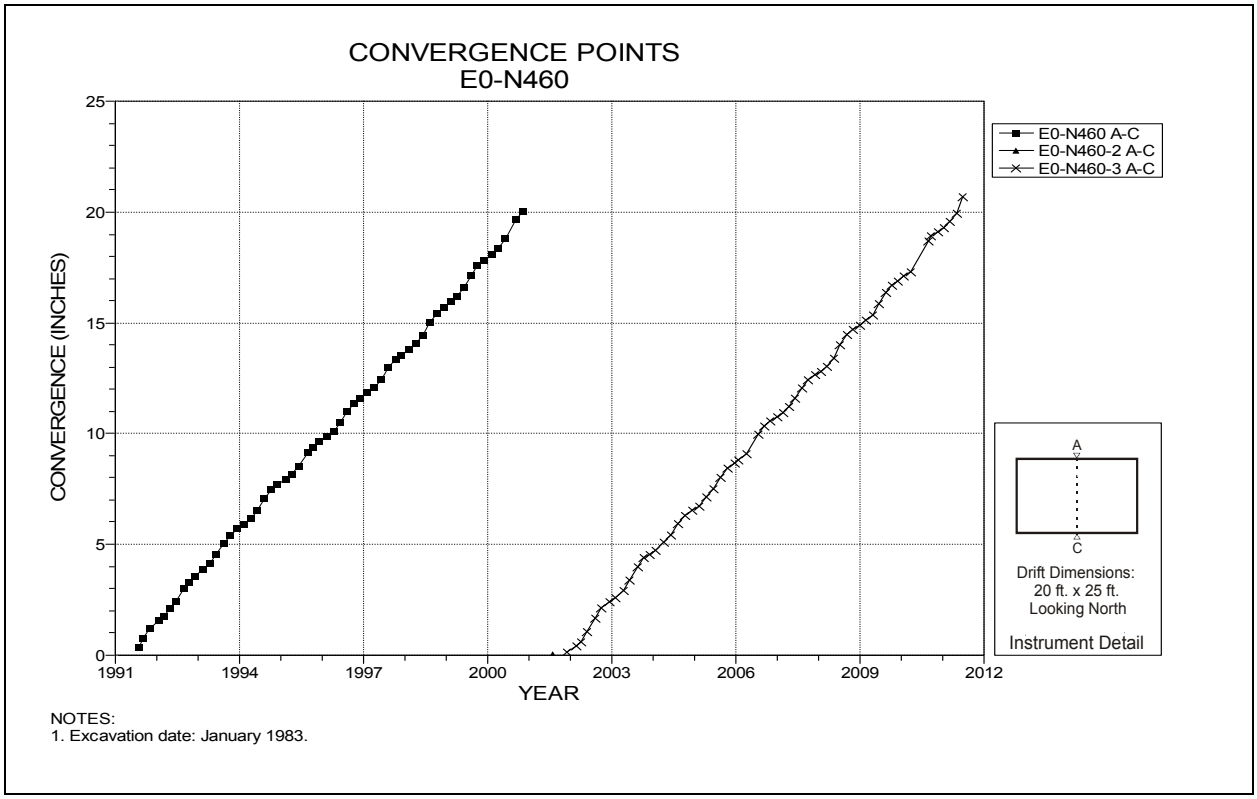


Figure 4-130 Convergence Point Array
E0 N460 – Roof to Floor

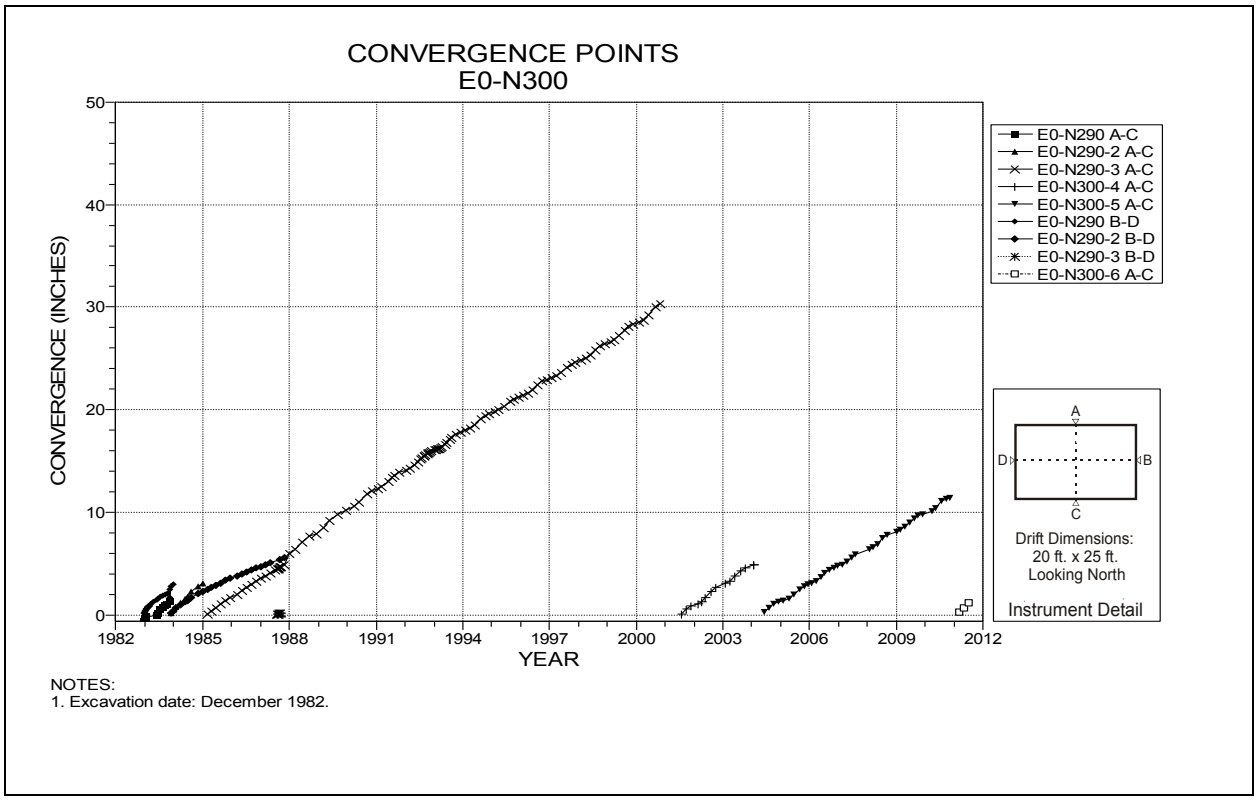


Figure 4-131 Convergence Point Array
E0 N300 – All Chords

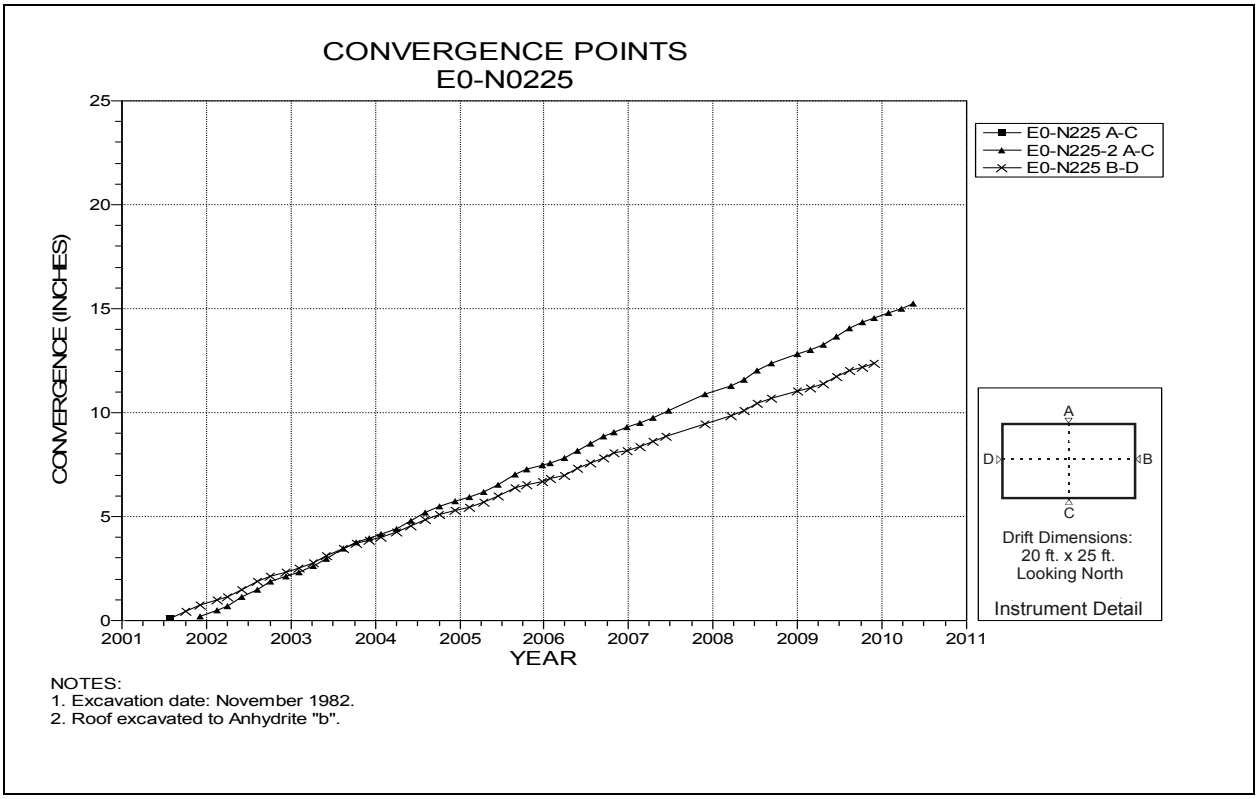


Figure 4-132 Convergence Point Array
E0 N225 – All Chords

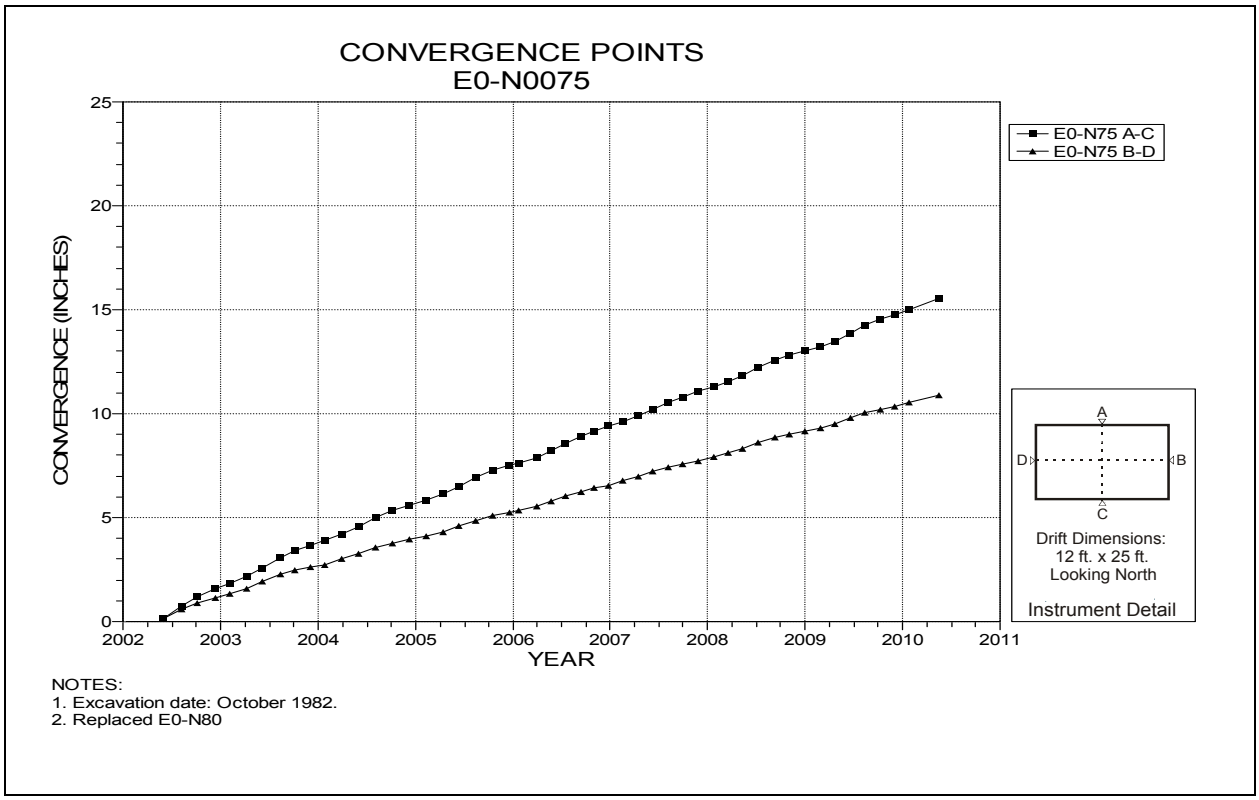


Figure 4-133 Convergence Point Array
E0 N75 – All Chords

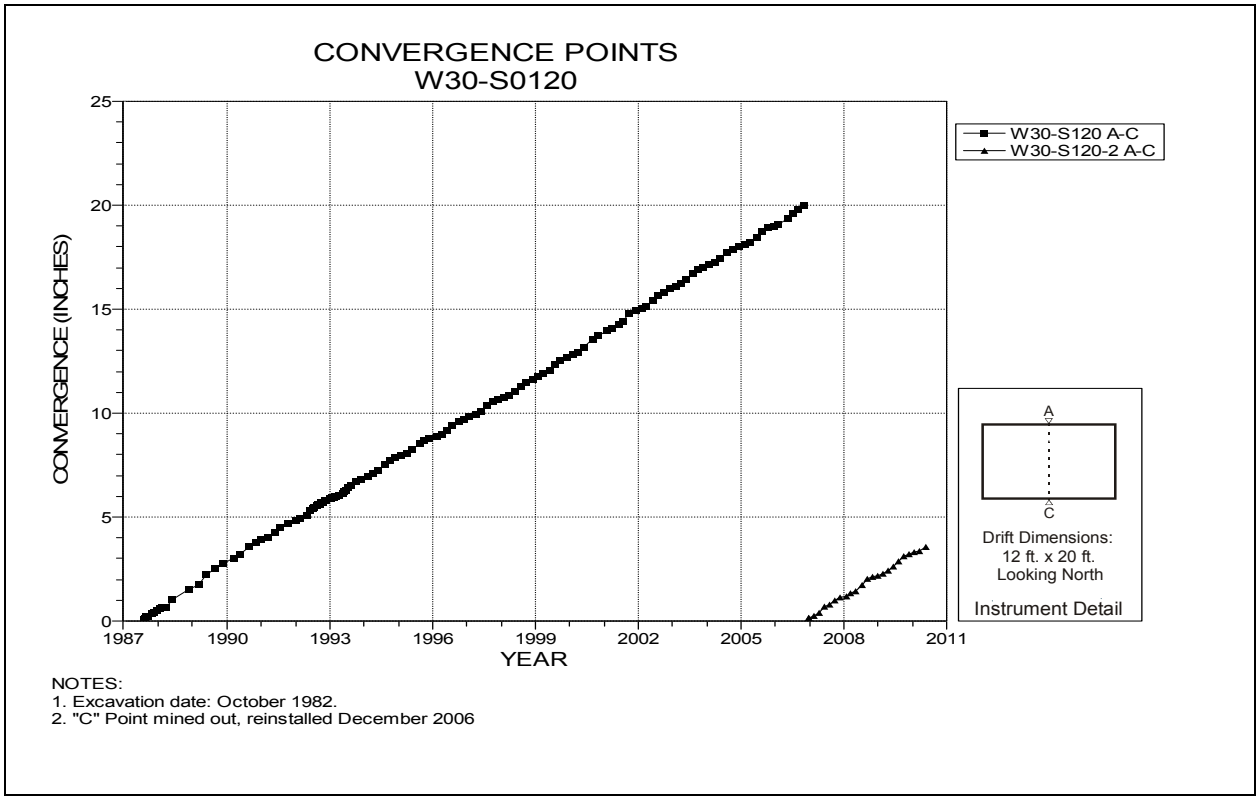


Figure 4-134 Convergence Point Array
W30 S120 – Roof to Floor

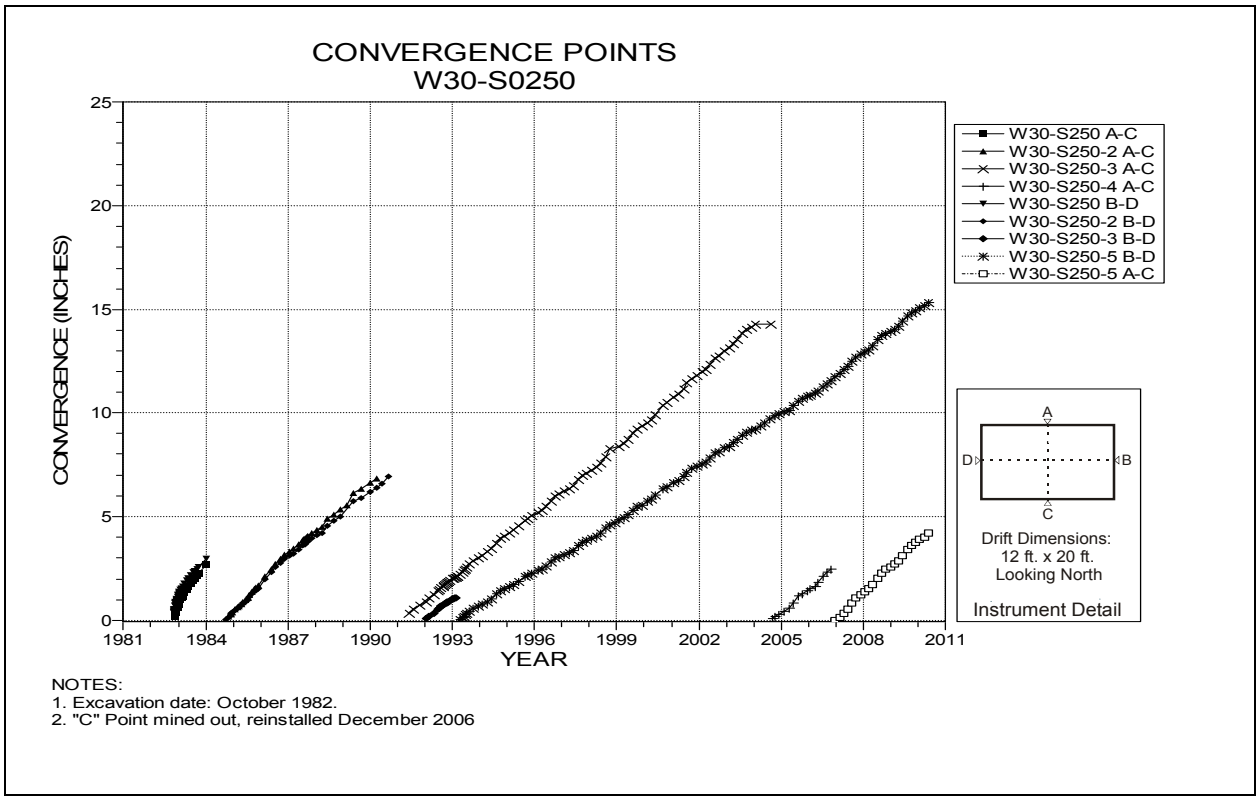


Figure 4-135 Convergence Point Array
W30 S250 – All Chords

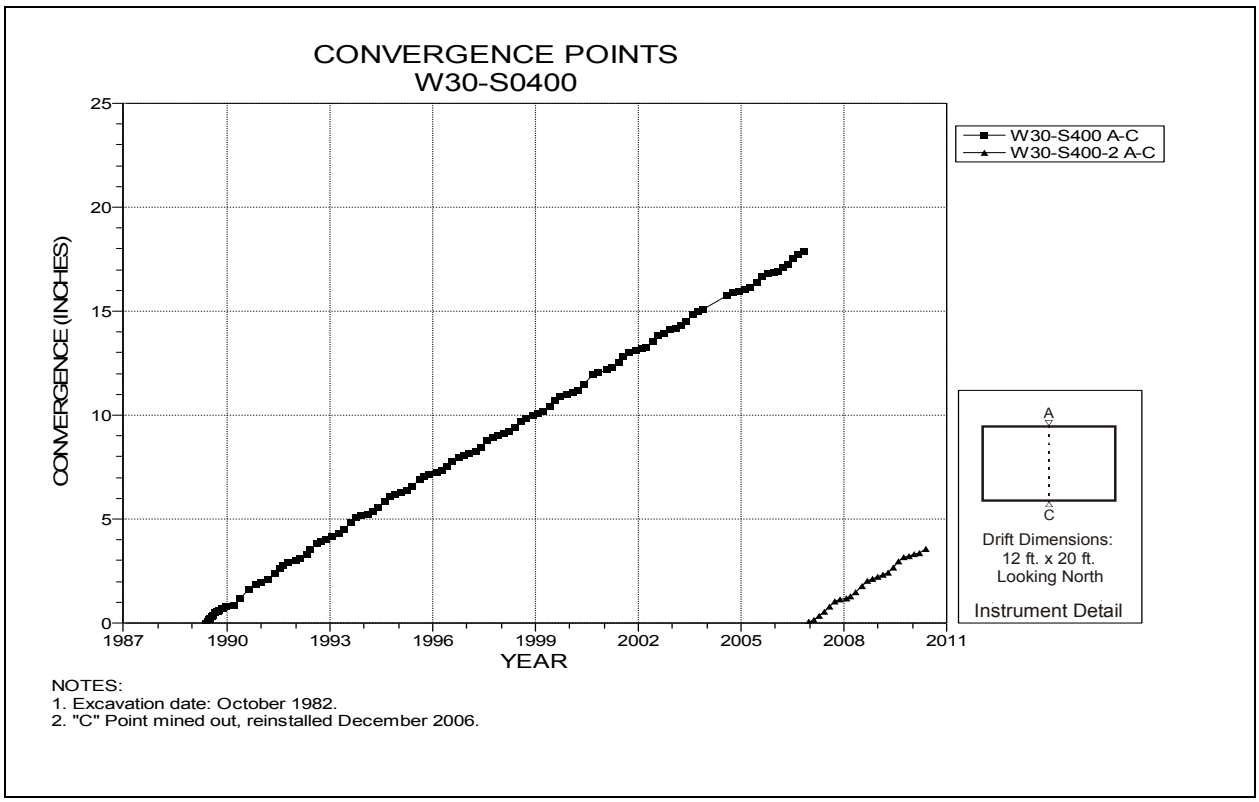


Figure 4-136 Convergence Point Array
W30 S400 – Roof to Floor

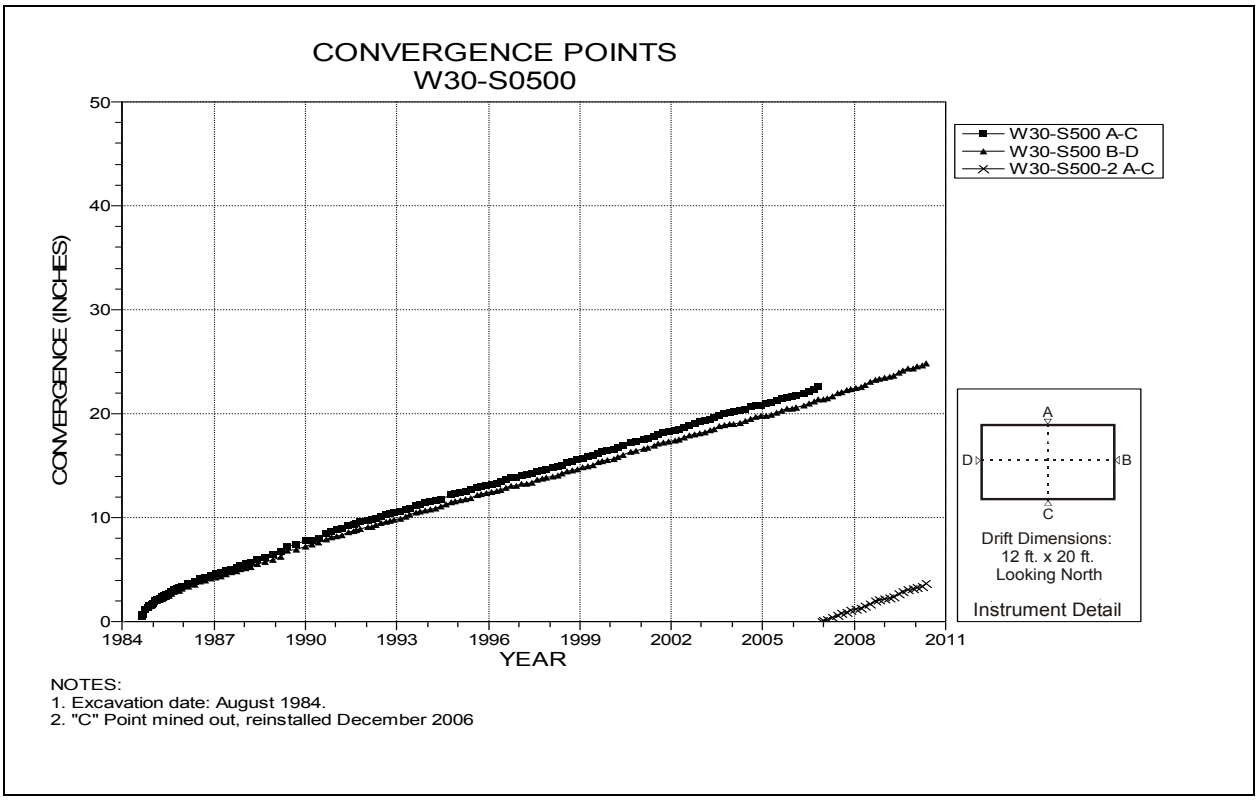


Figure 4-137 Convergence Point Array
W30 S500 – All Chords

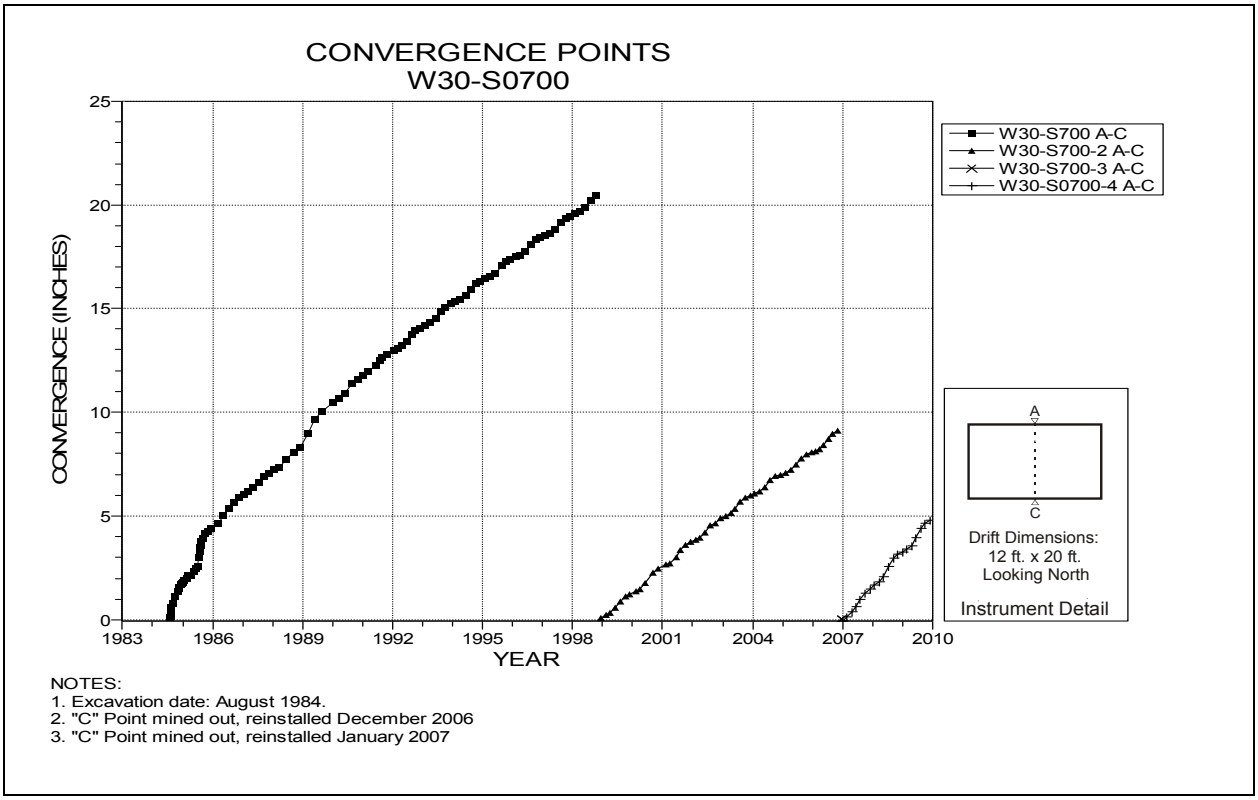
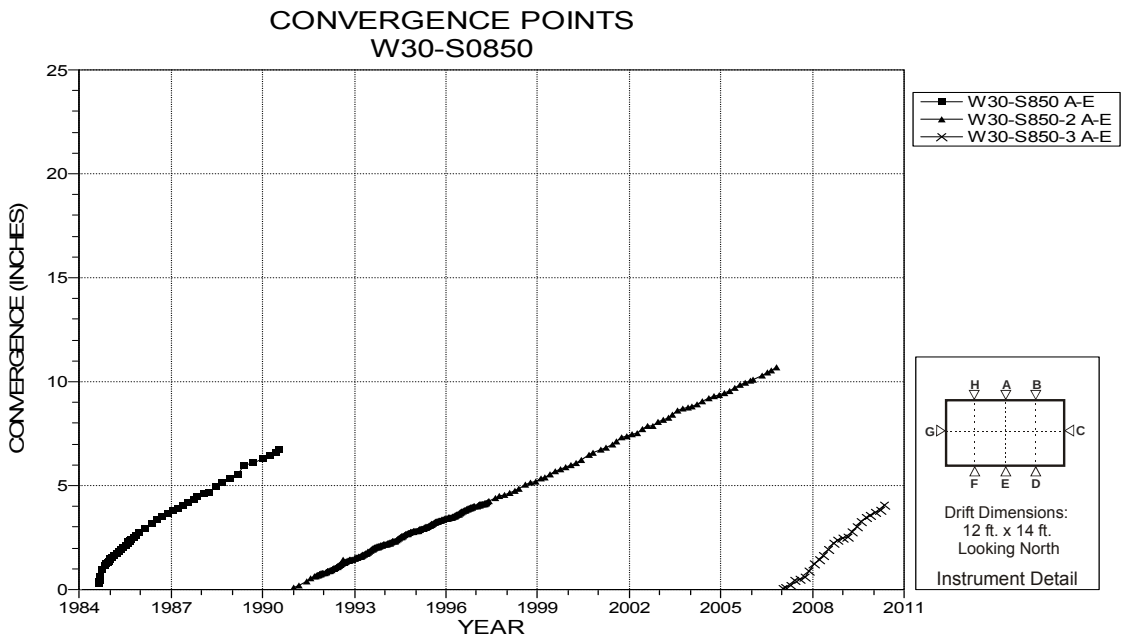
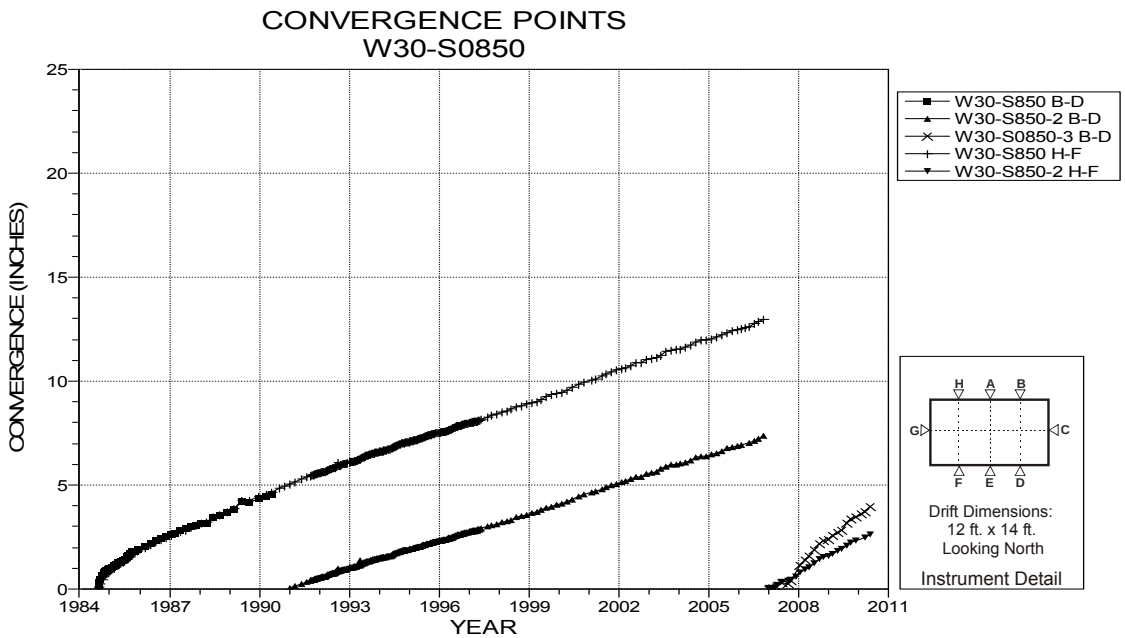


Figure 4-78 Convergence Point Array
W30 S700 – Roof to Floor



NOTES:
1. Excavation date: August 1984.

Figure 4-139 Convergence Point Array
W30 S850 – Roof to Floor – Centerline



NOTES:
1. Excavation date: August 1984.

Figure 4-140 Convergence Point Array
W30 S850 – Roof to Floor – Quarter Points

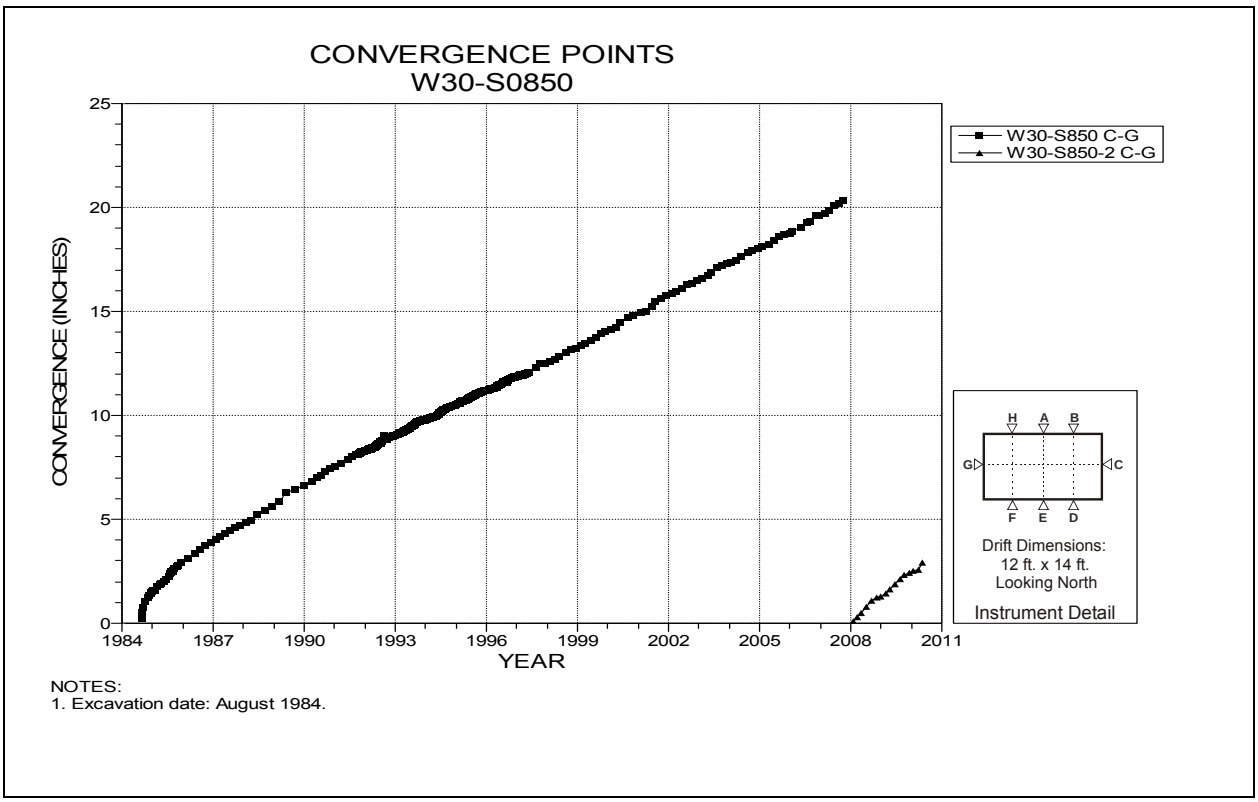


Figure 4-141 Convergence Point Array
W30 S850 – Rib to Rib

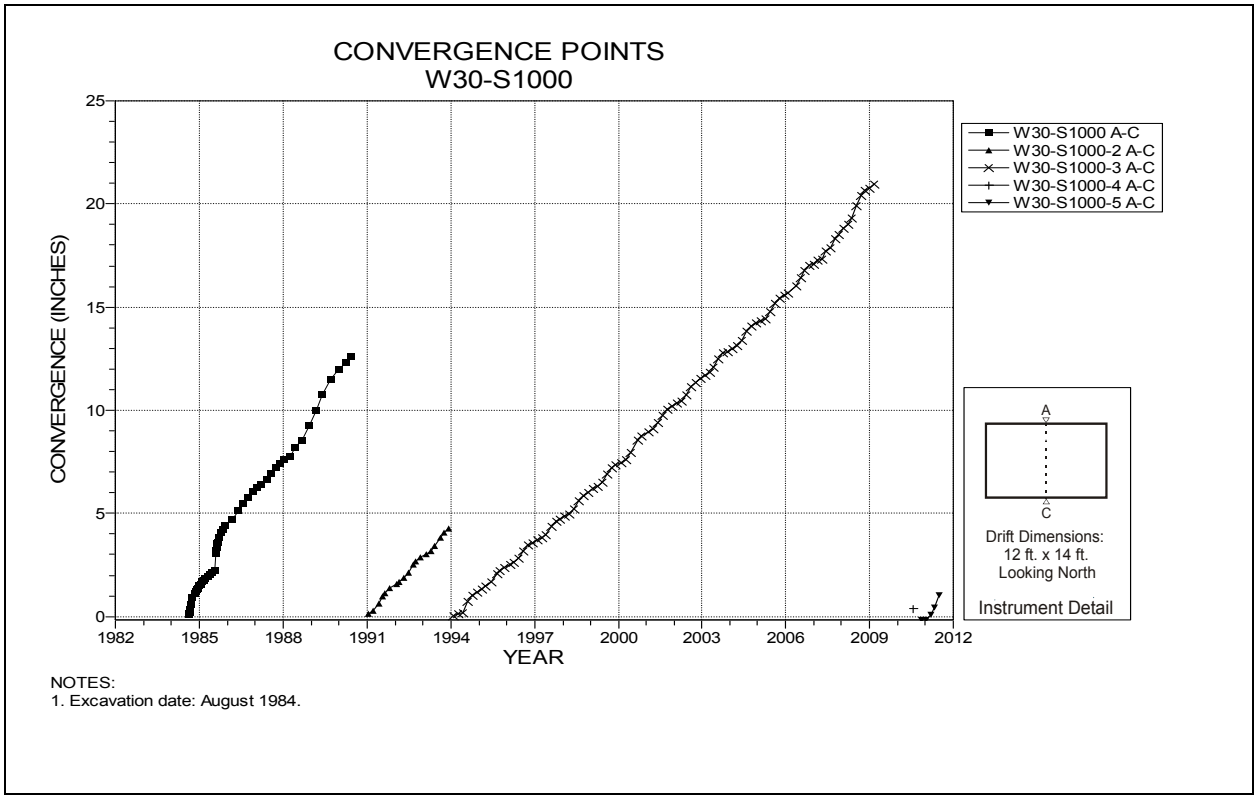


Figure 4-142 Convergence Point Array
W30 S1000 – Roof to Floor]

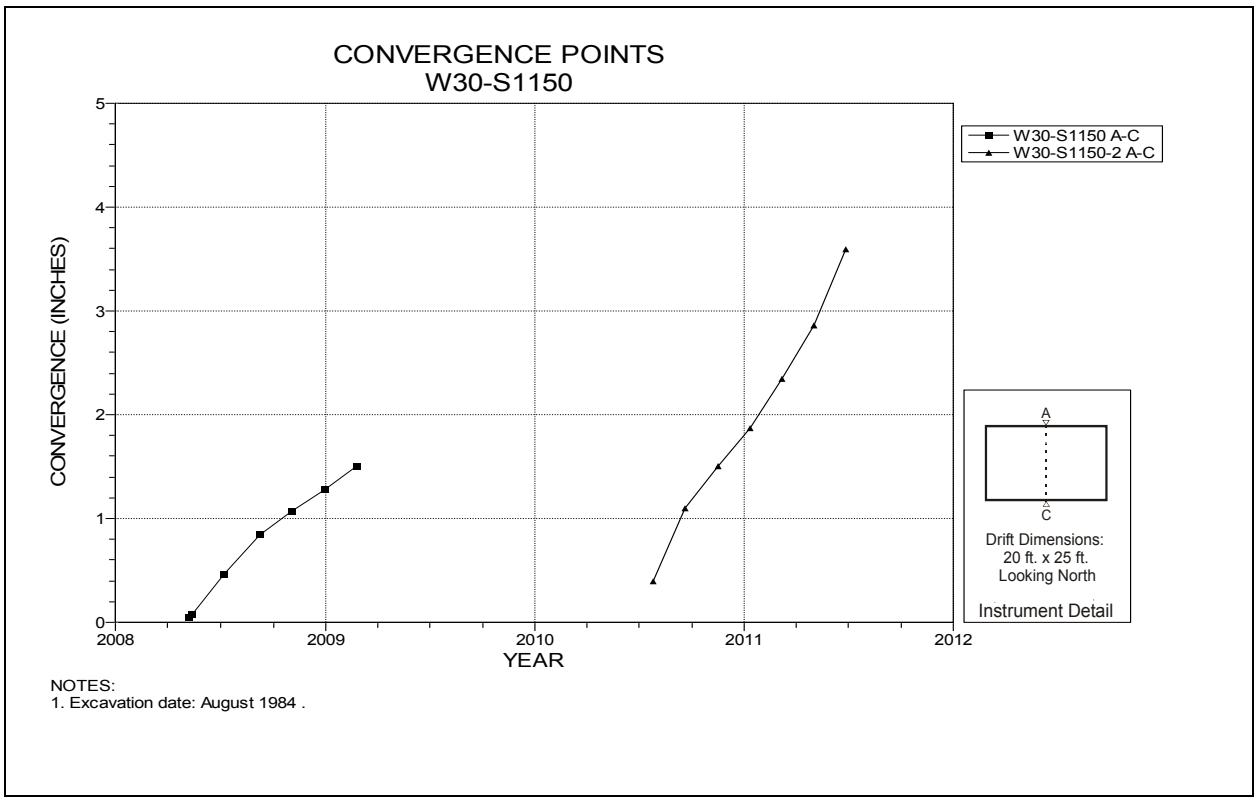


Figure 4-143 Convergence Point Array
W30 S1150 – Roof to Floor

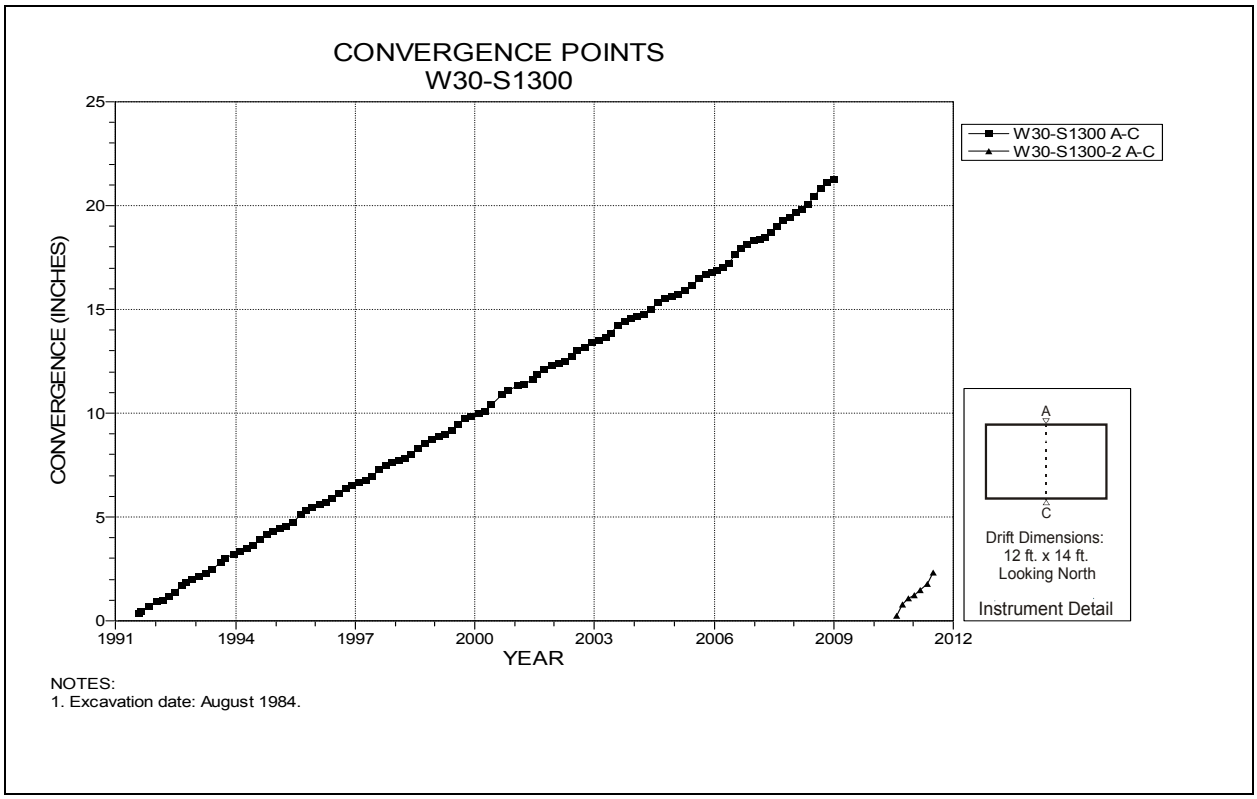


Figure 4-144 Convergence Point Array
W30 S1300 – Roof to Floor

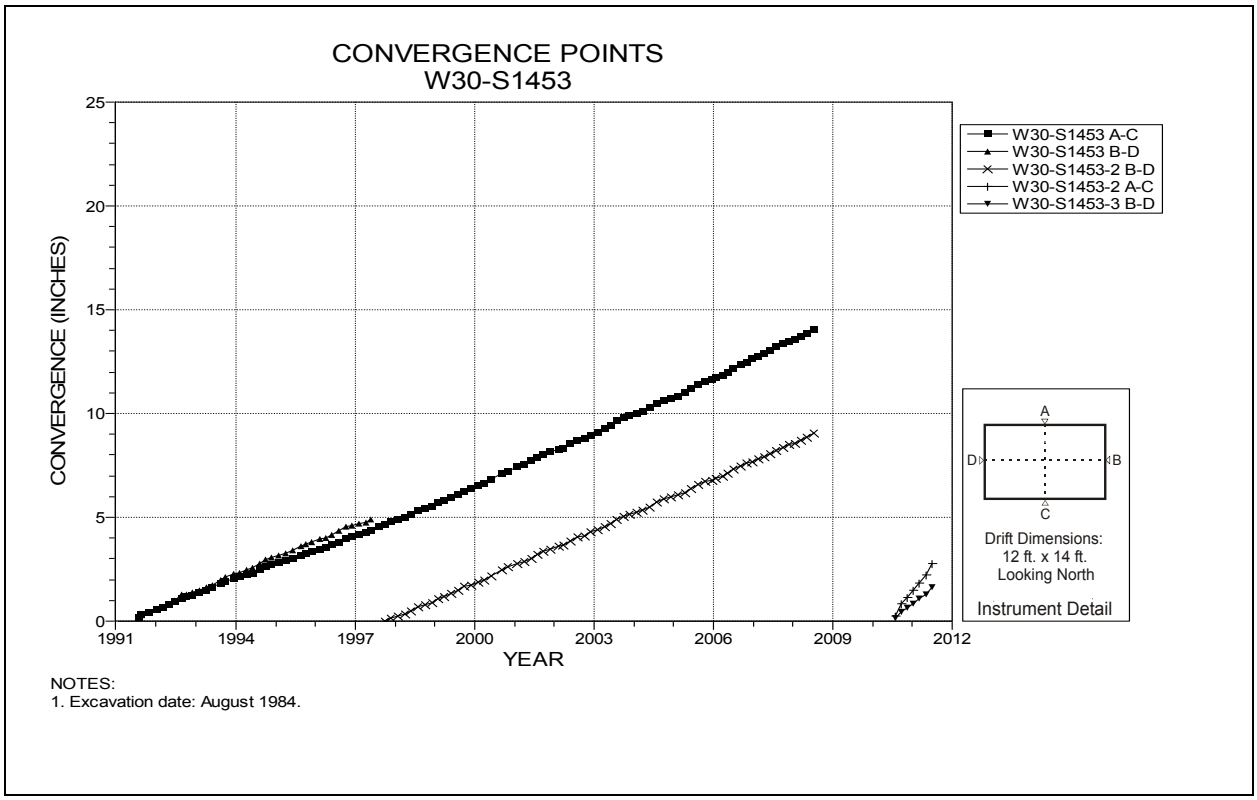


Figure 4-145 Convergence Point Array
W30 S1453 – All Chords

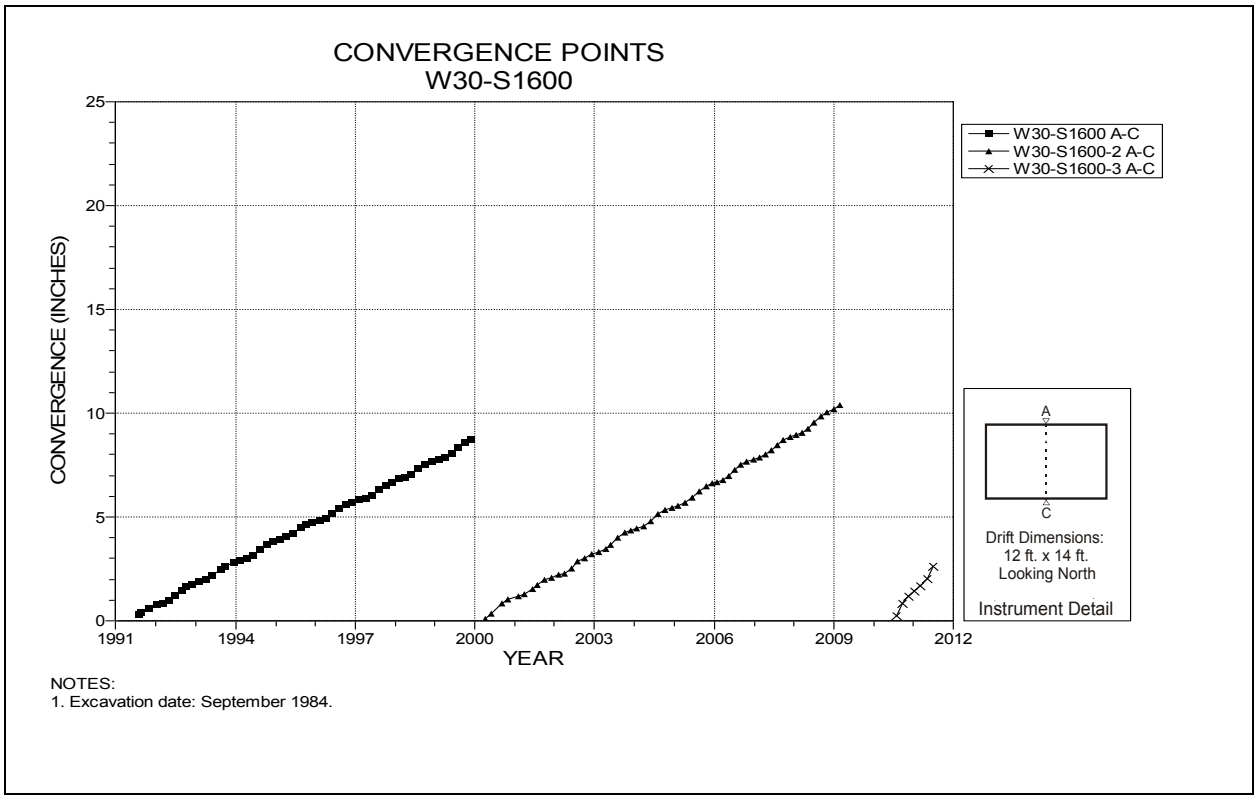


Figure 4-146 Convergence Point Array
W30 S1600 – Roof to Floor

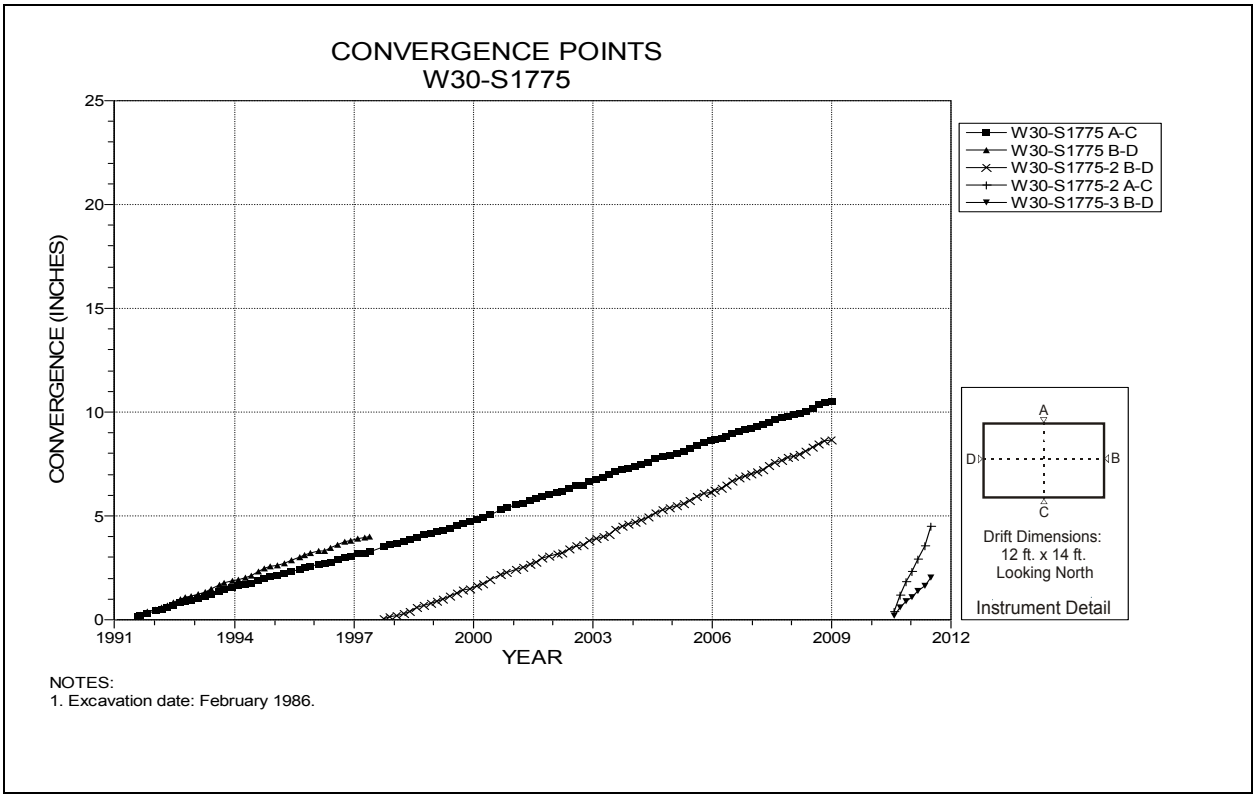


Figure 4-147 Convergence Point Array
W30 S1775 – All Chords

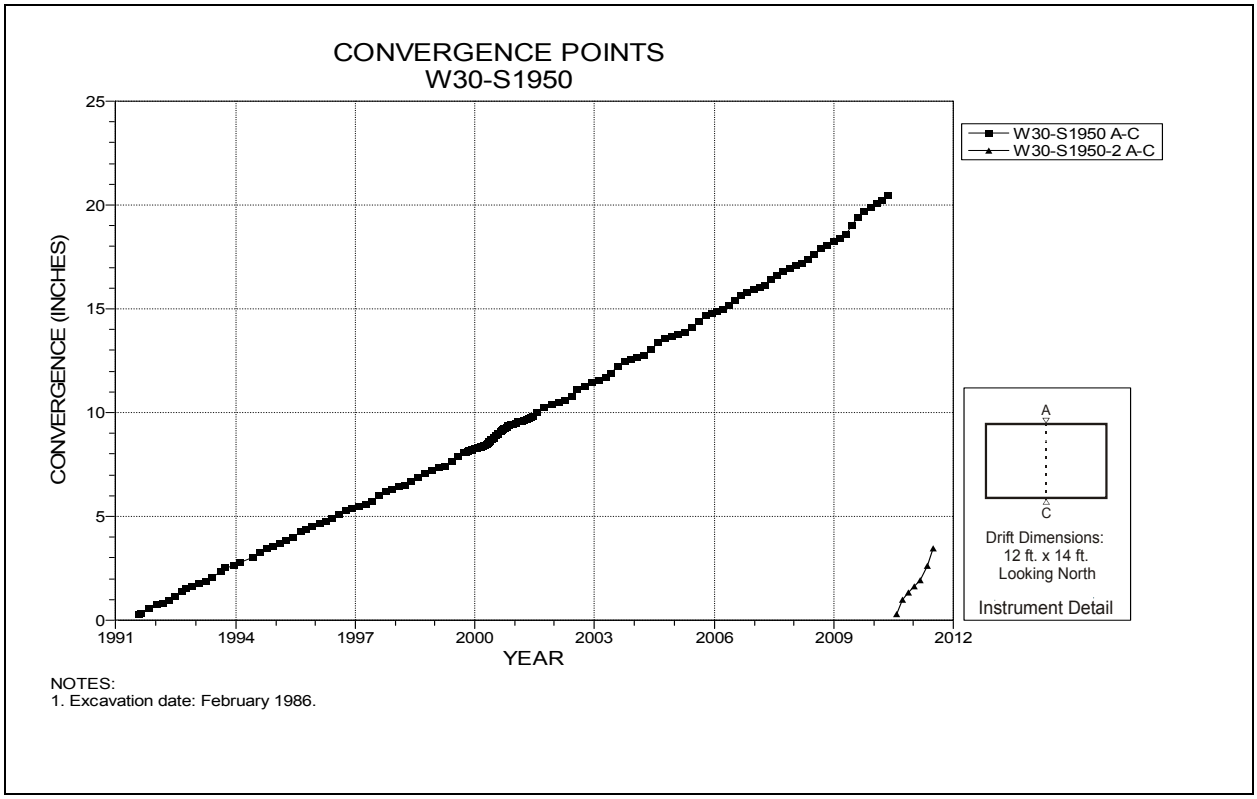


Figure 4-148 Convergence Point Array
W30 S1950 – Roof to Floor

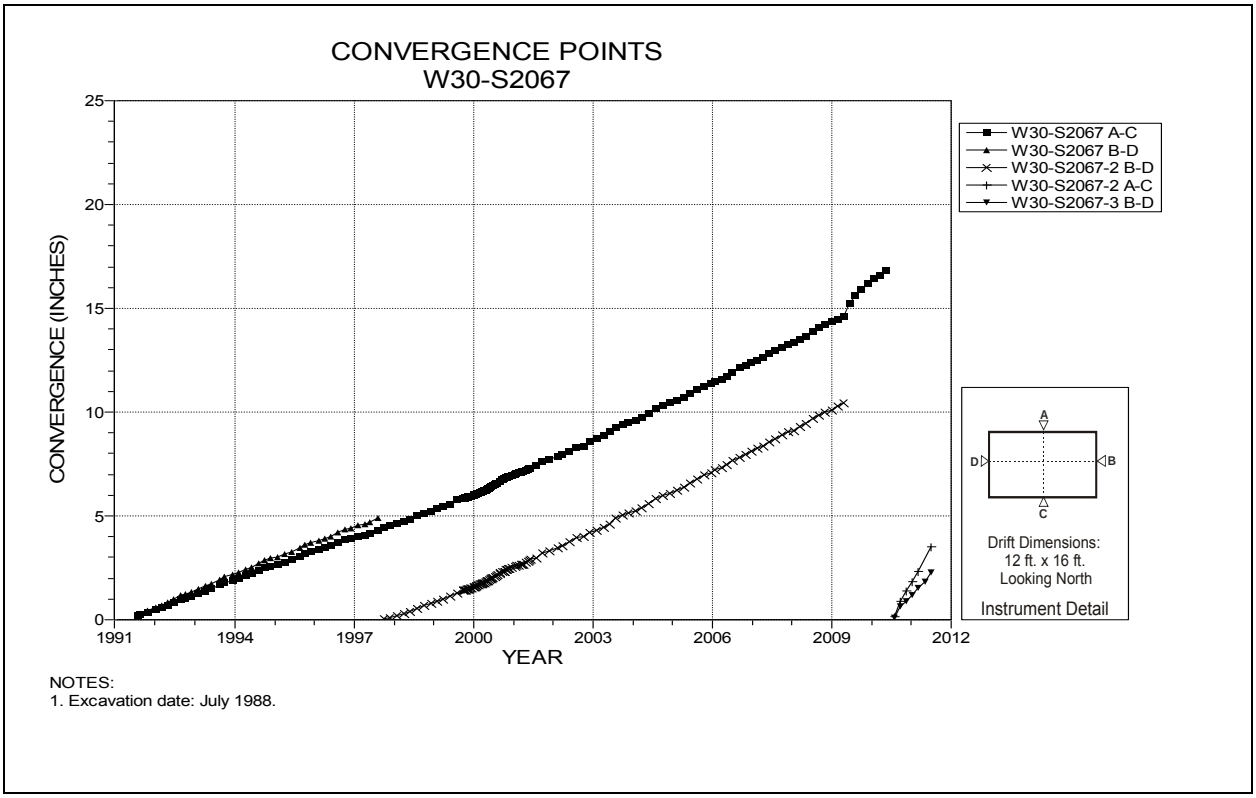


Figure 4-149 Convergence Point Array
W30 S2067 – All Chords

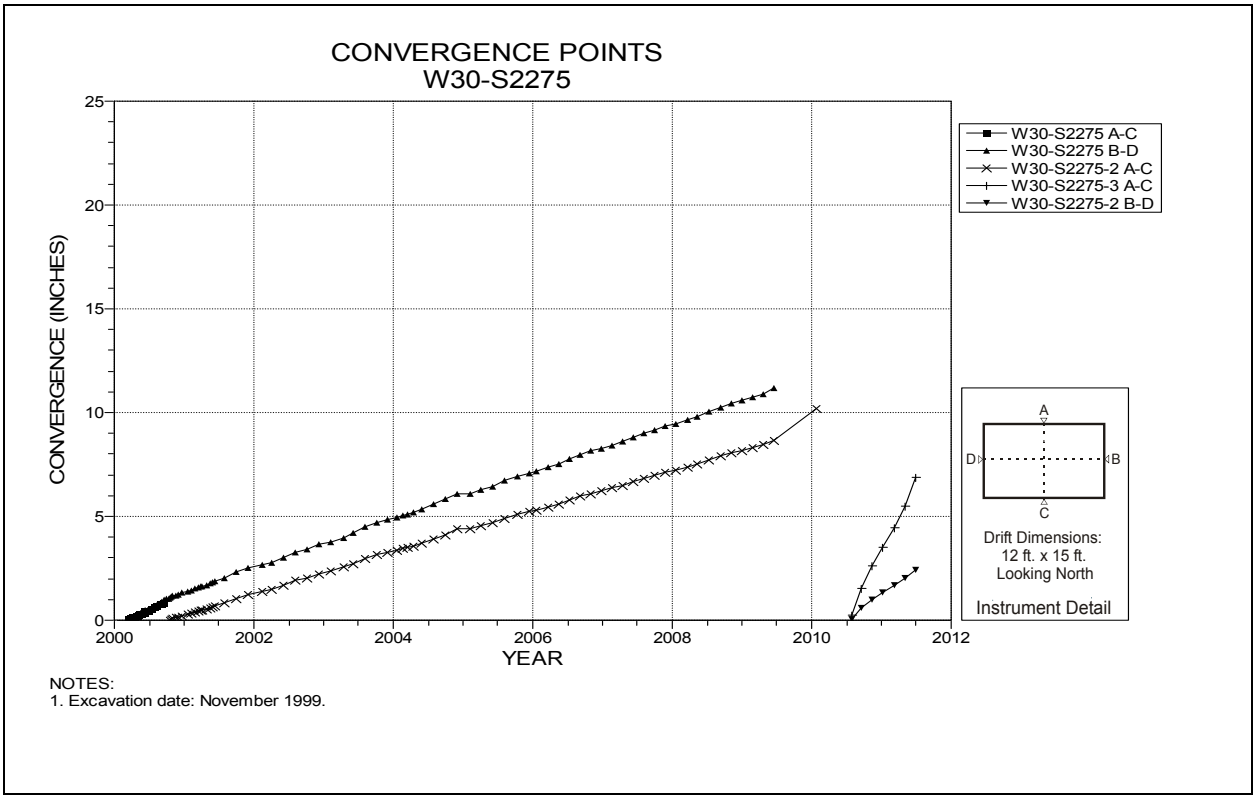


Figure 4-150 Convergence Point Array
W30 S2275 – All Chords

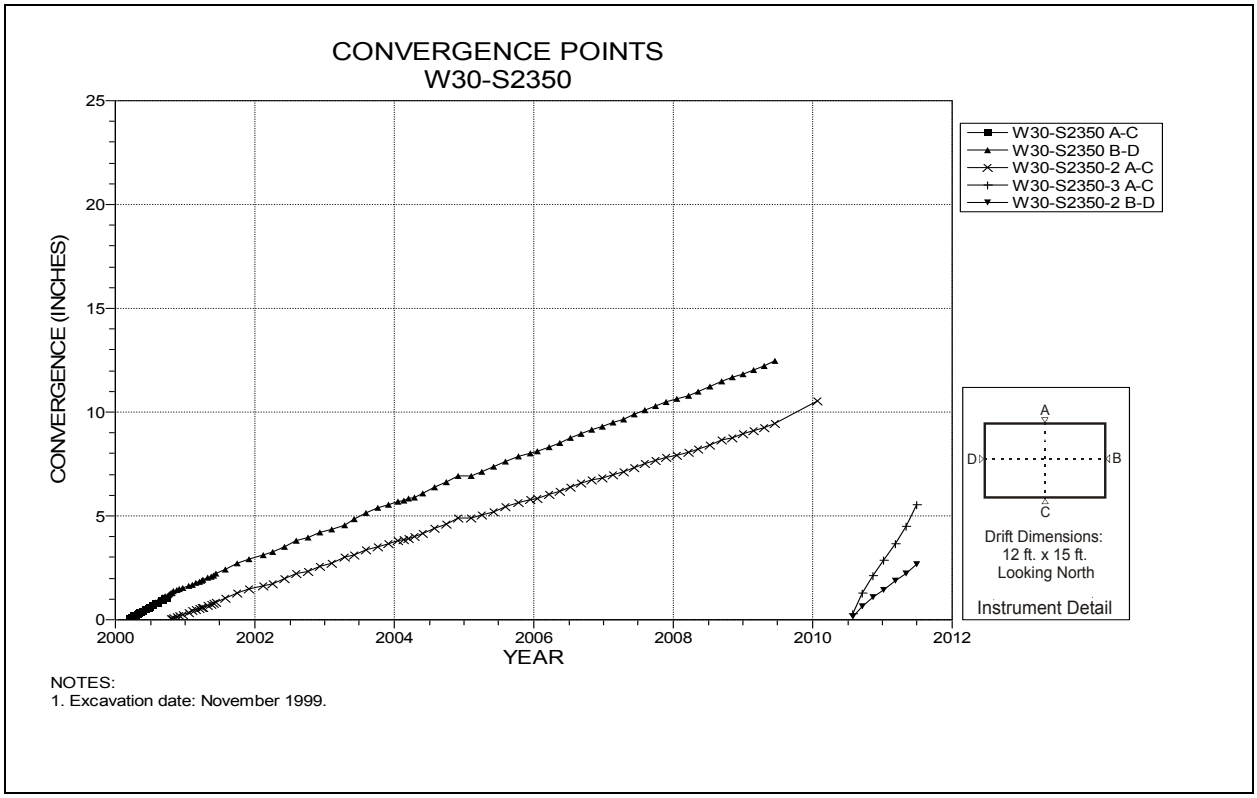


Figure 4-151 Convergence Point Array
W30 S2350 – All Chords

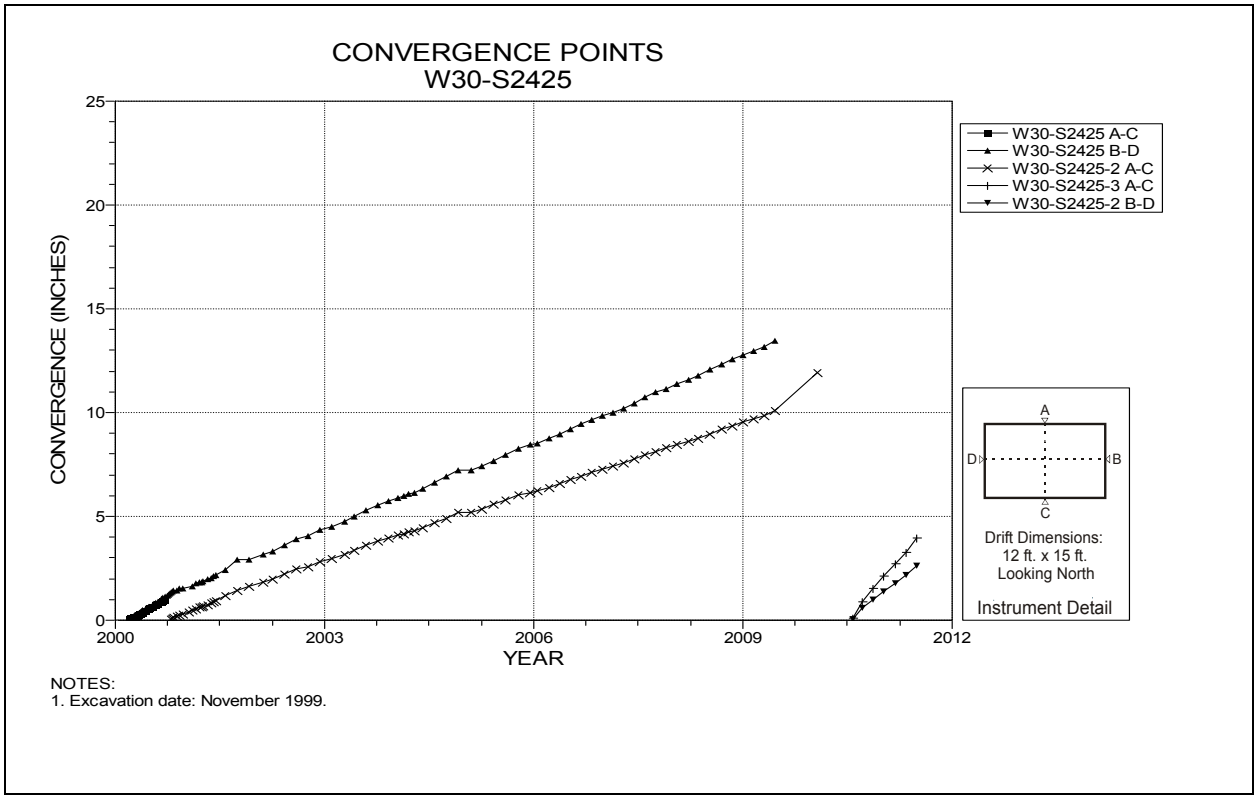


Figure 4-152 Convergence Point Array
W30 S2425 – All Chords

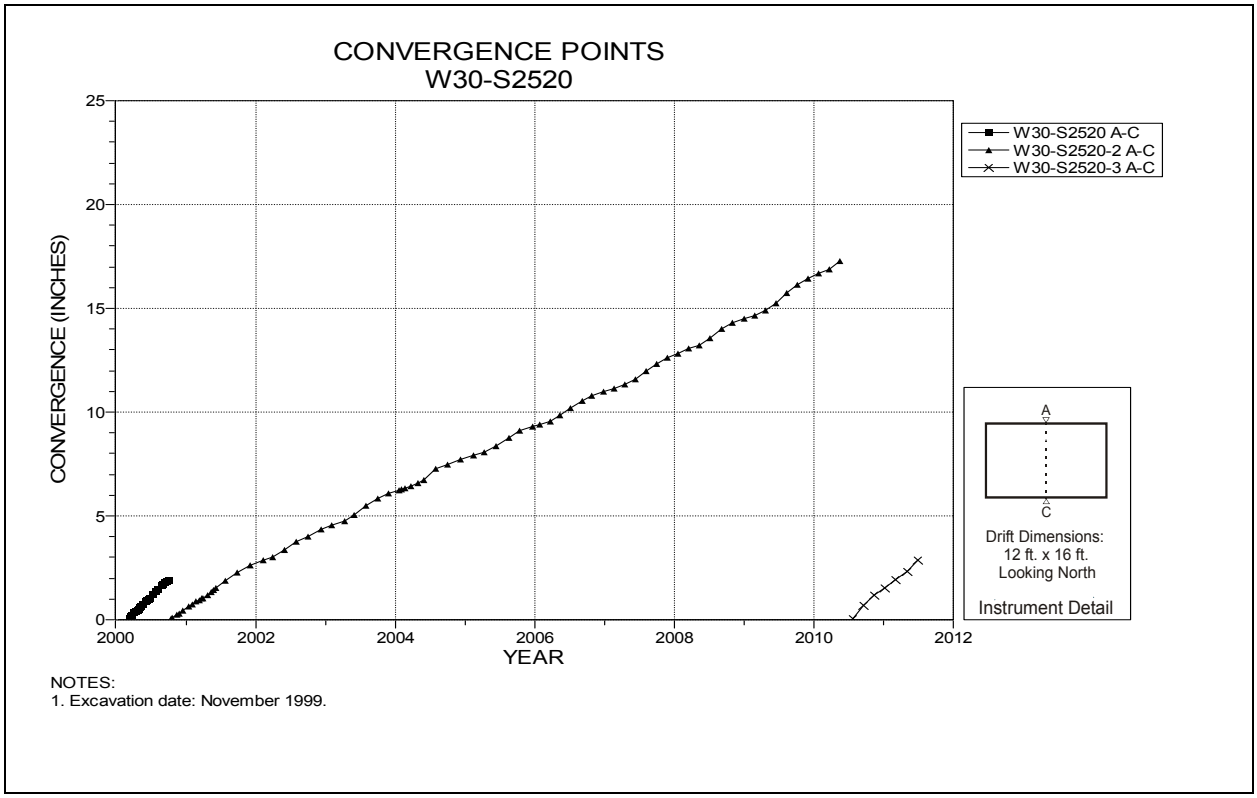


Figure 4-153 Convergence Point Array
W30 S2520 – Roof to Floor

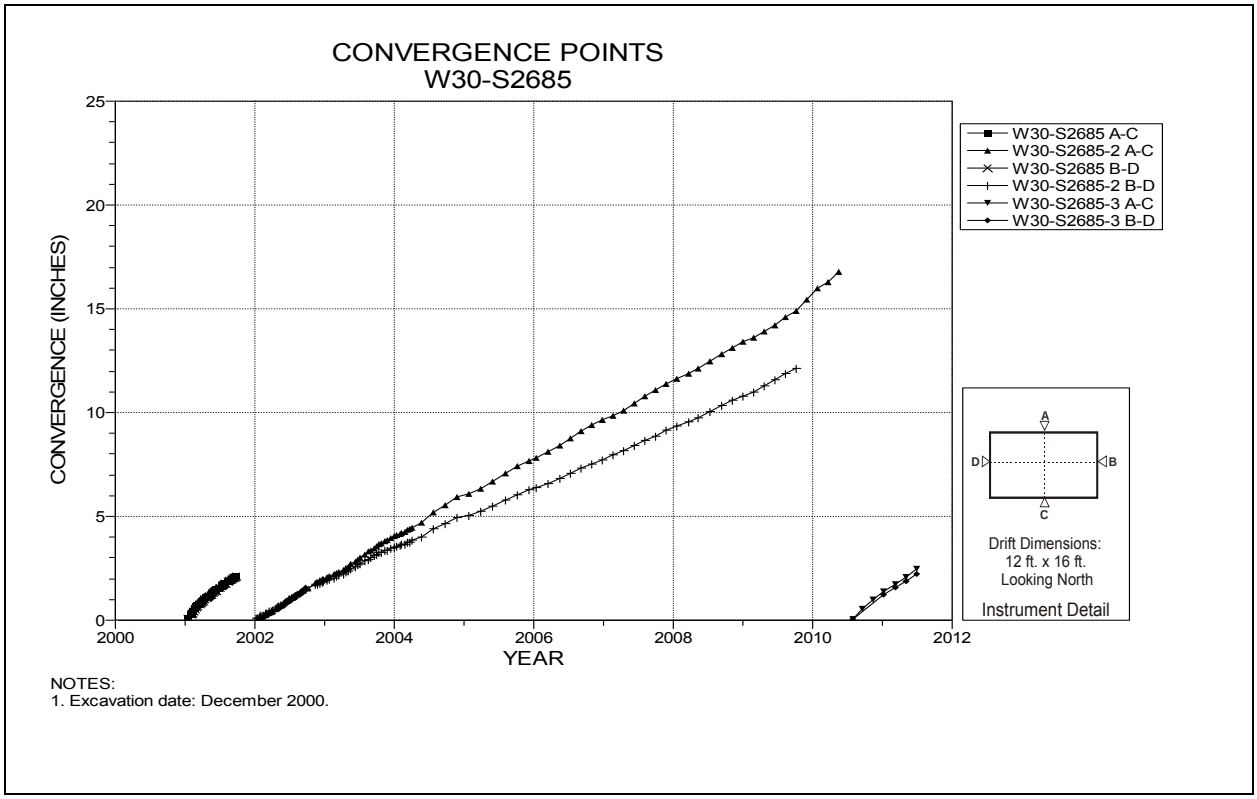


Figure 4-154 Convergence Point Array
W30 S2685 – All Chords

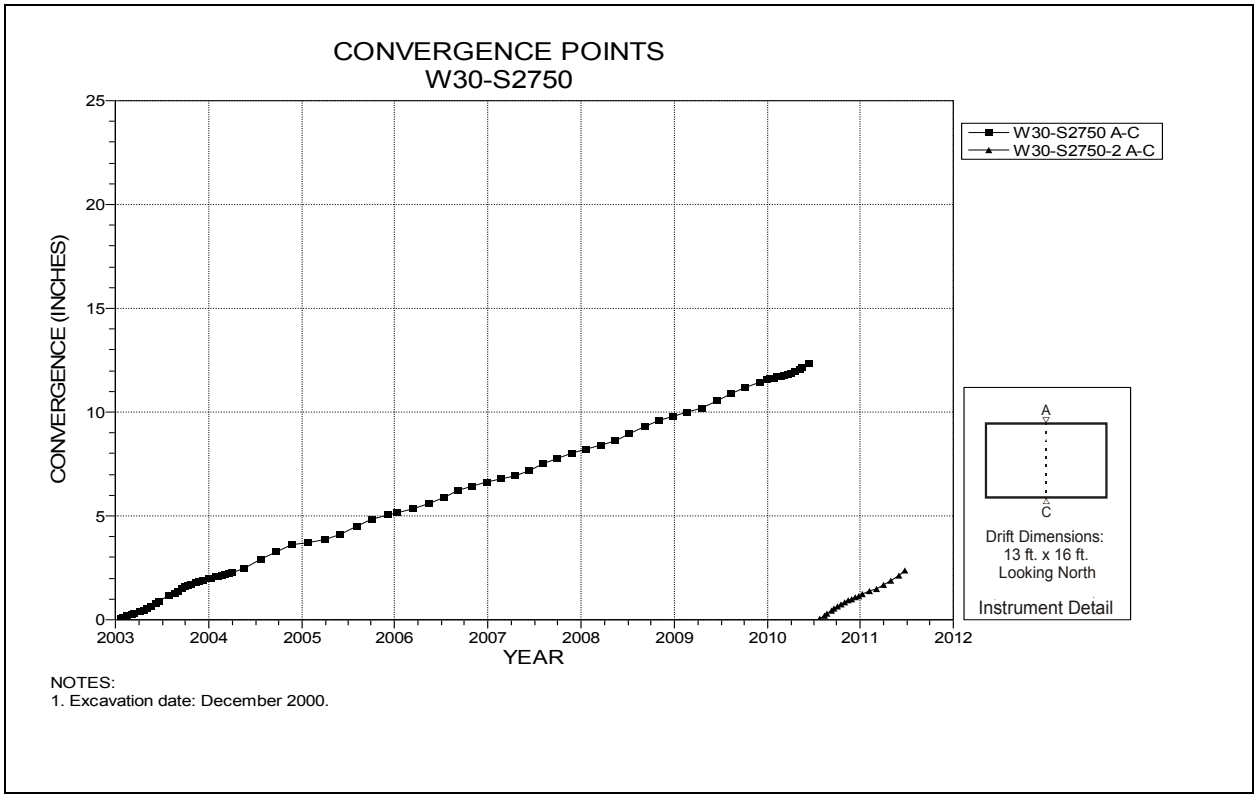


Figure 4-155 Convergence Point Array
W30 S2750 – Roof to Floor

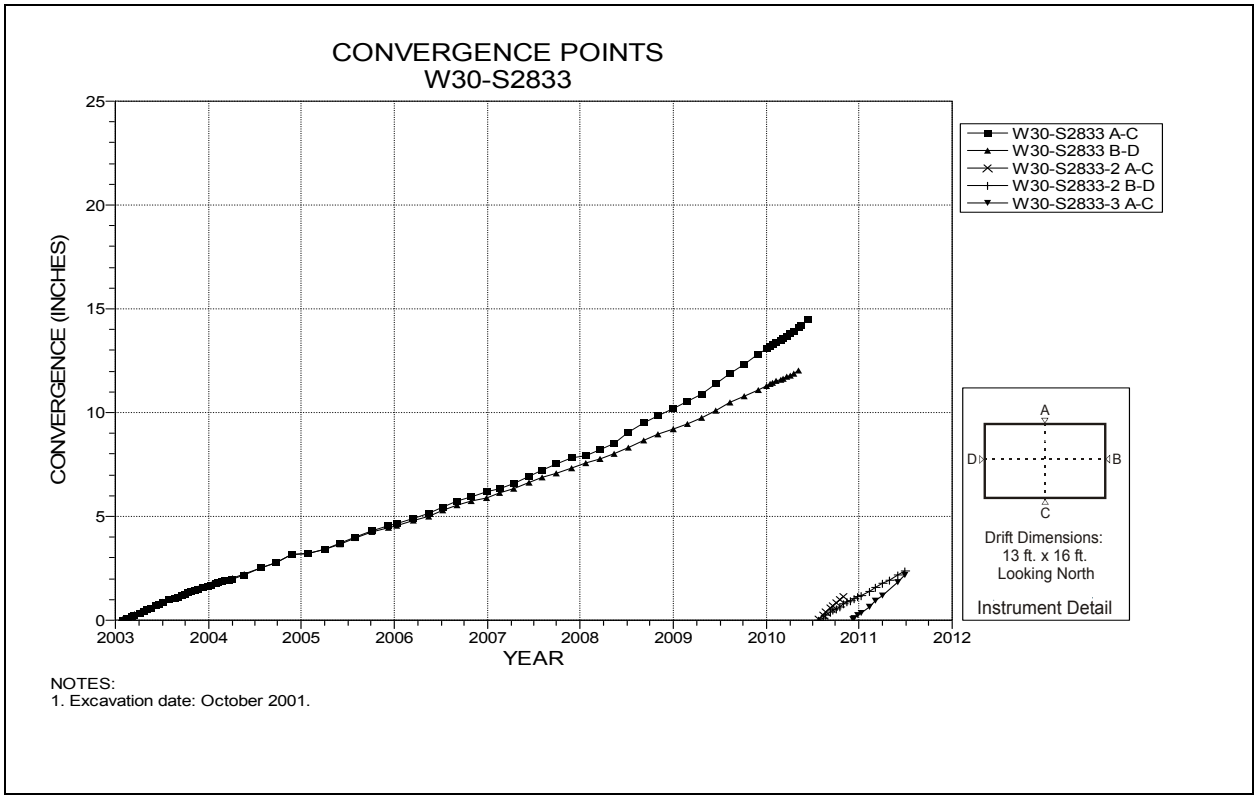


Figure 4-156 Convergence Point Array
W30 S2833 – All Chords

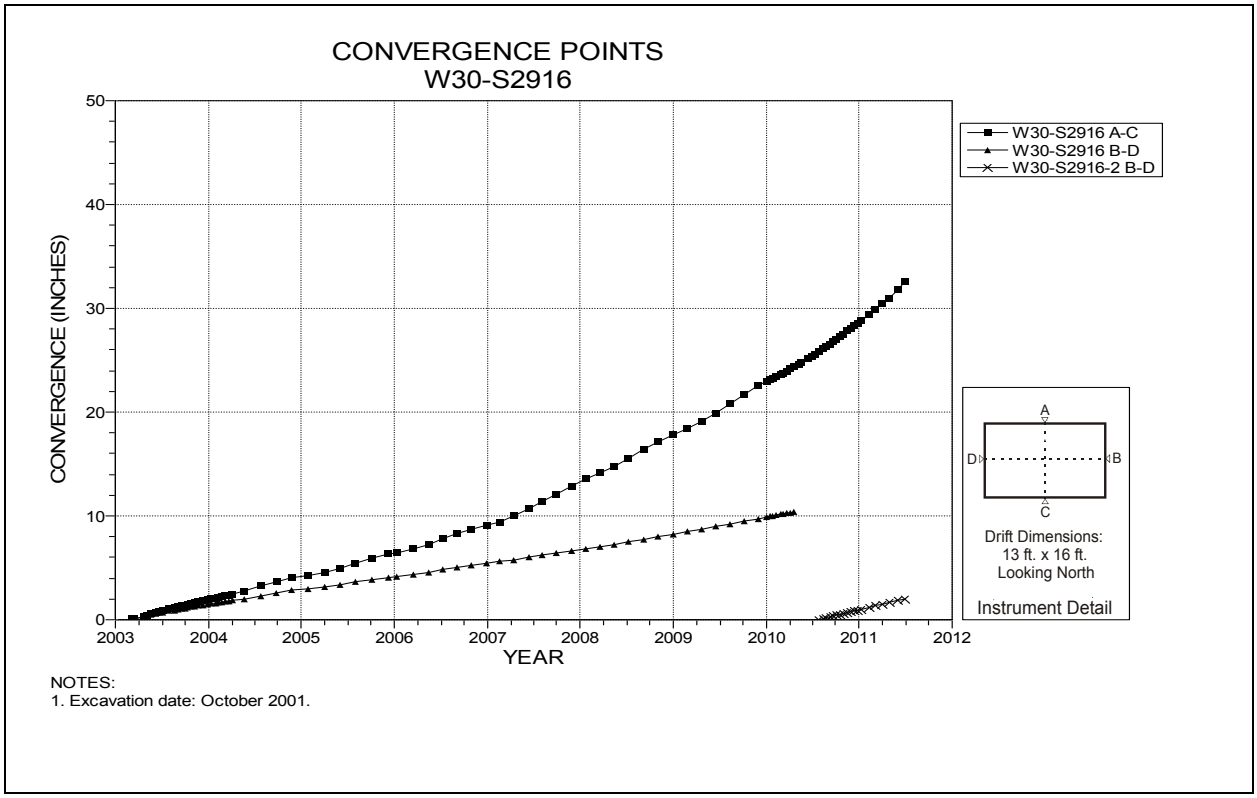


Figure 4-157 Convergence Point Array
W30 S2916 – All Chords

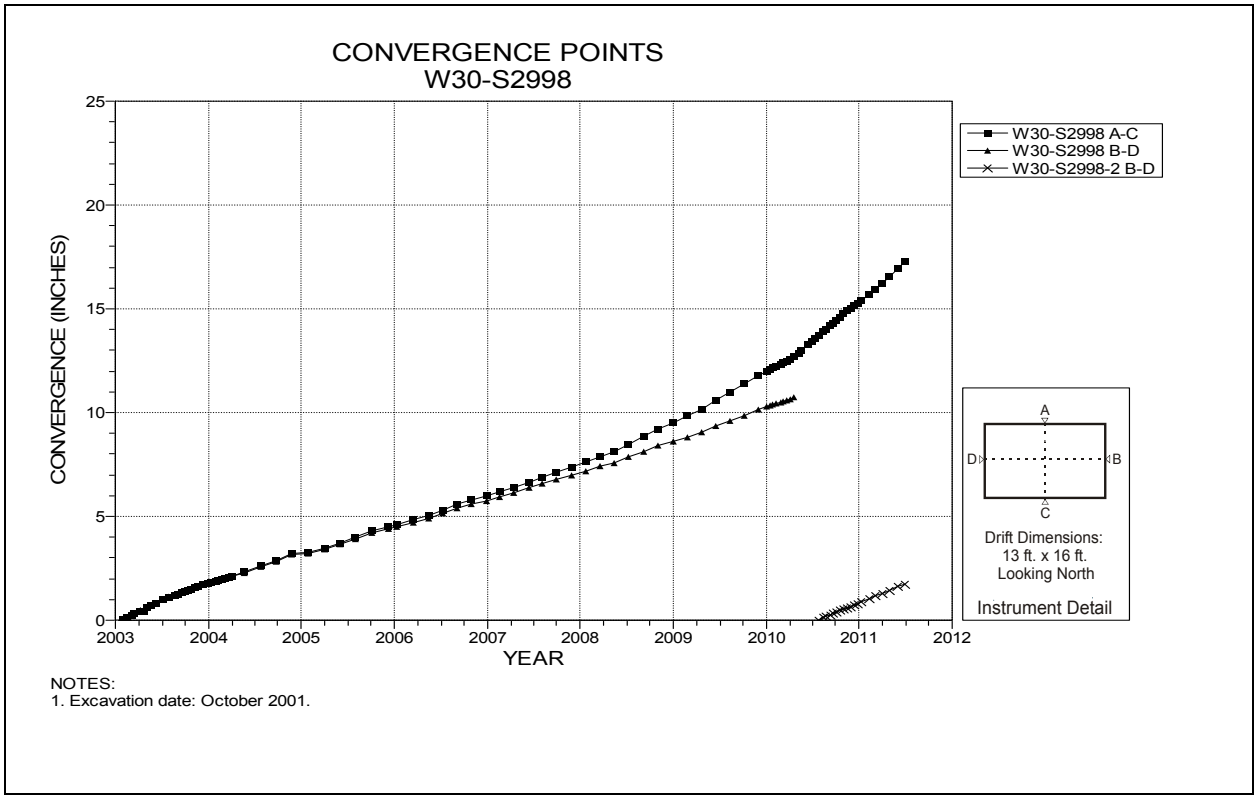


Figure 4-158 Convergence Point Array
W30 S2998 – All Chords

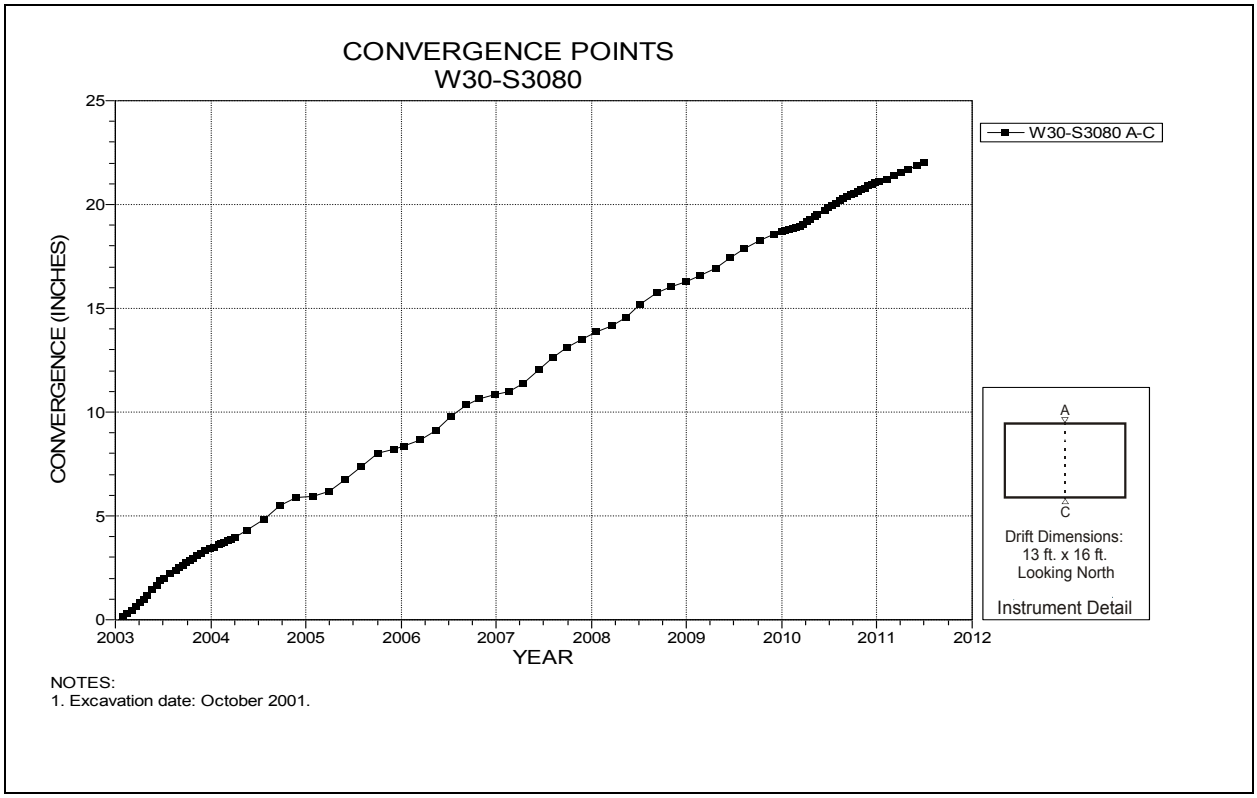


Figure 4-159 Convergence Point Array
W30 S3080 Drift – Roof to Floor

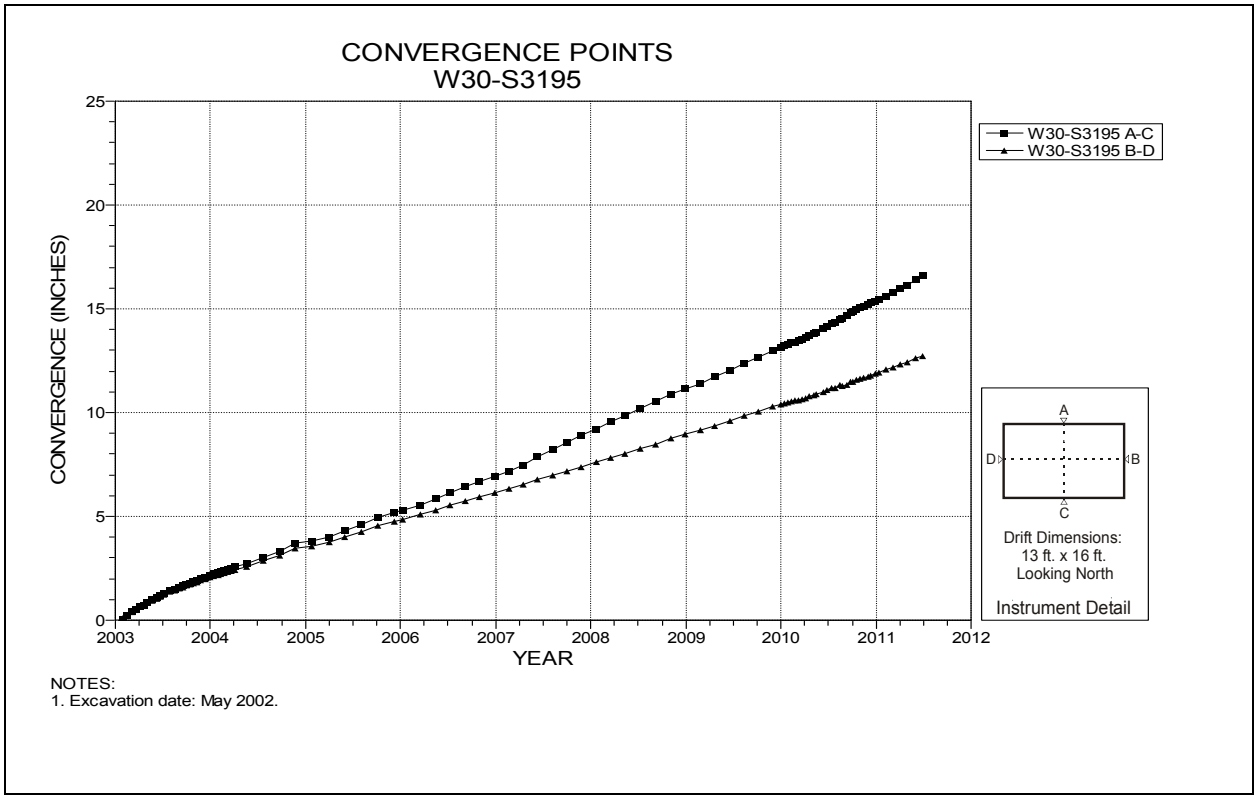


Figure 4-160 Convergence Point Array
W30 S3195 – All Chords

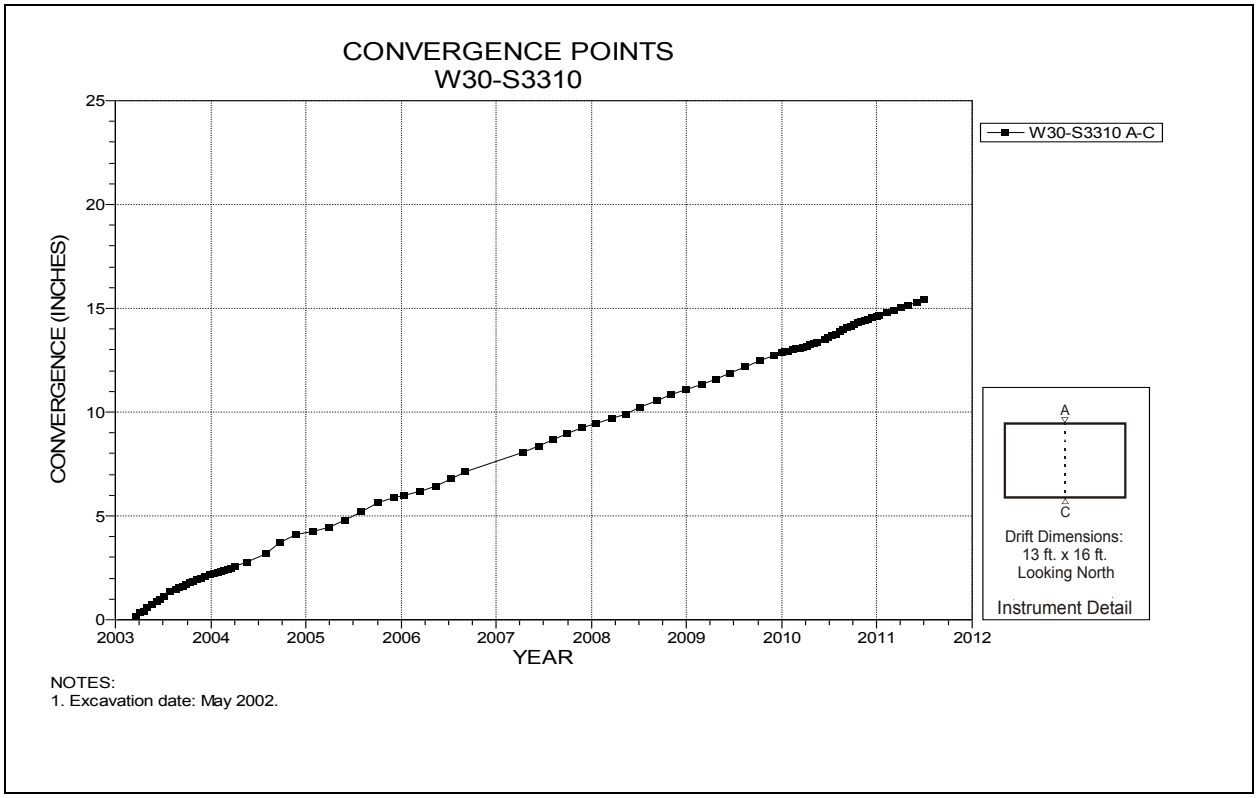


Figure 4-161 Convergence Point Array
W30 S3310 – Roof to Floor

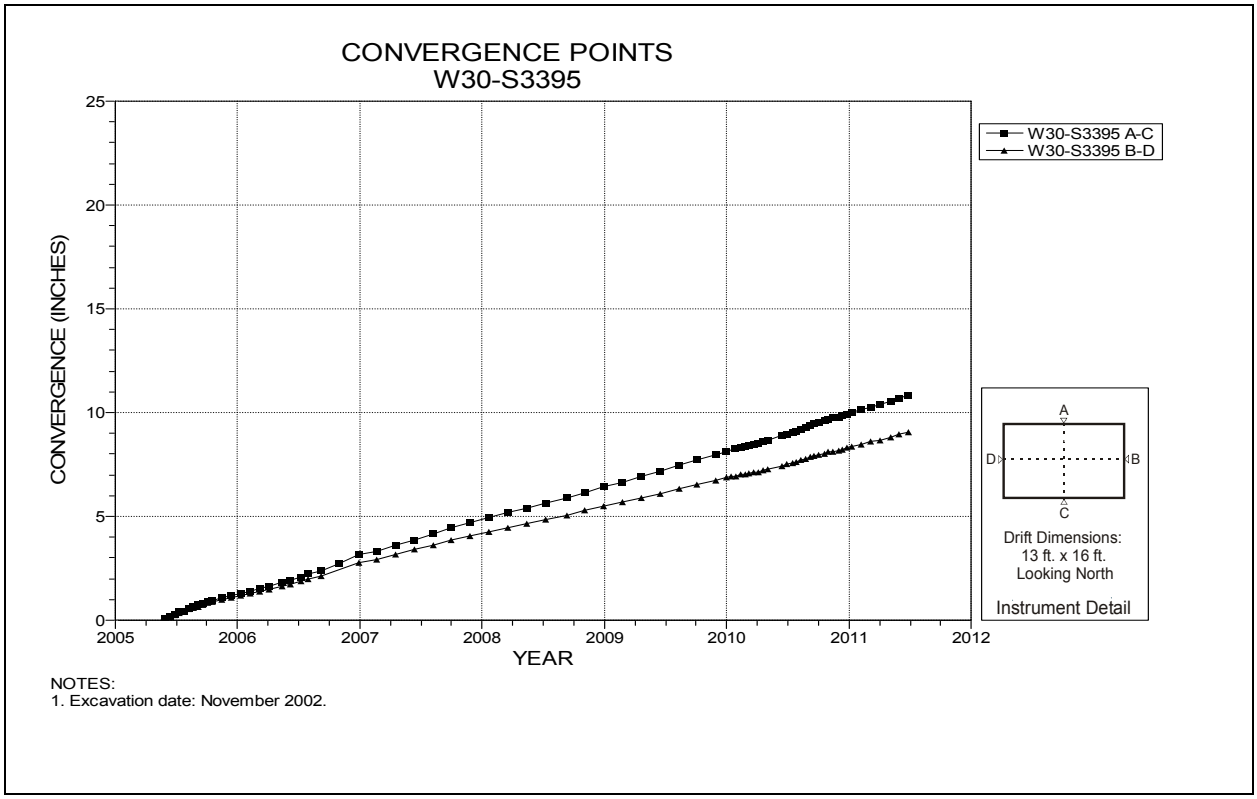


Figure 4-162 Convergence Point Array
W30 S3395 – All Chords

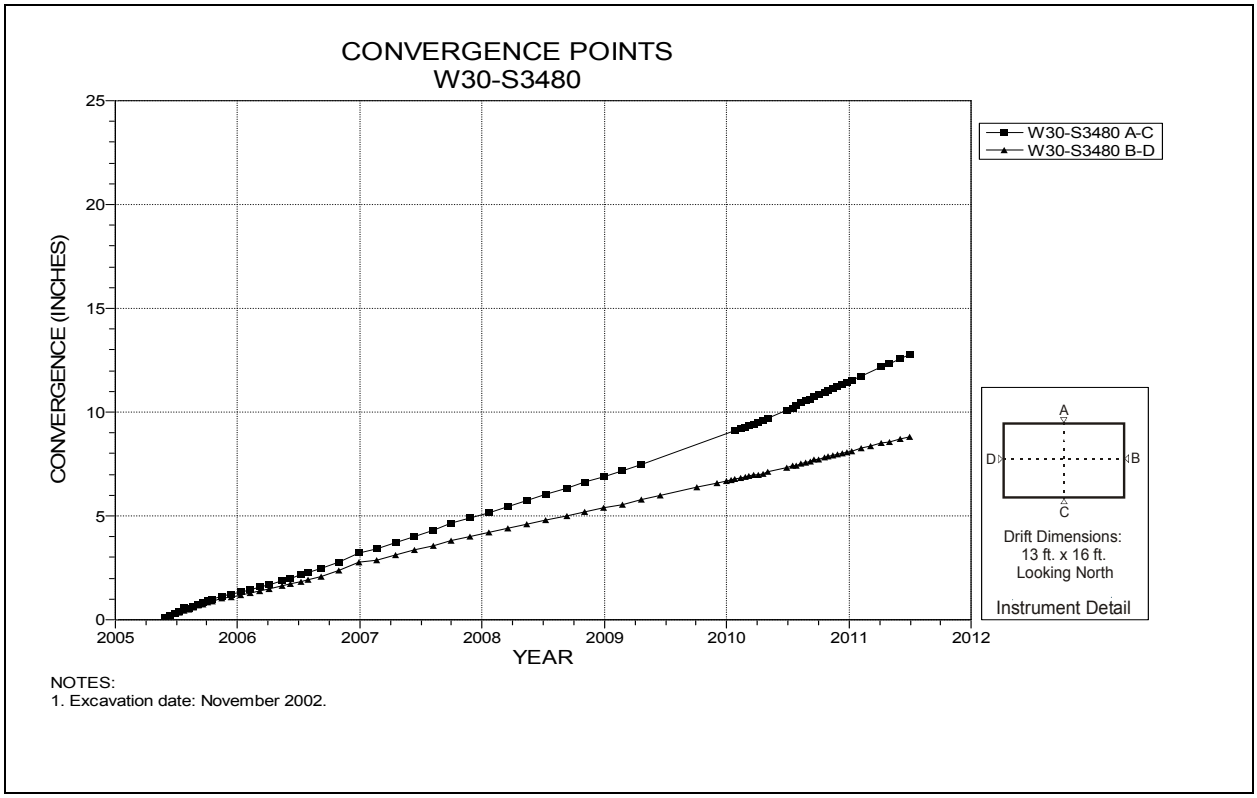


Figure 4-163 Convergence Point Array
W30 S3480 – All Chords

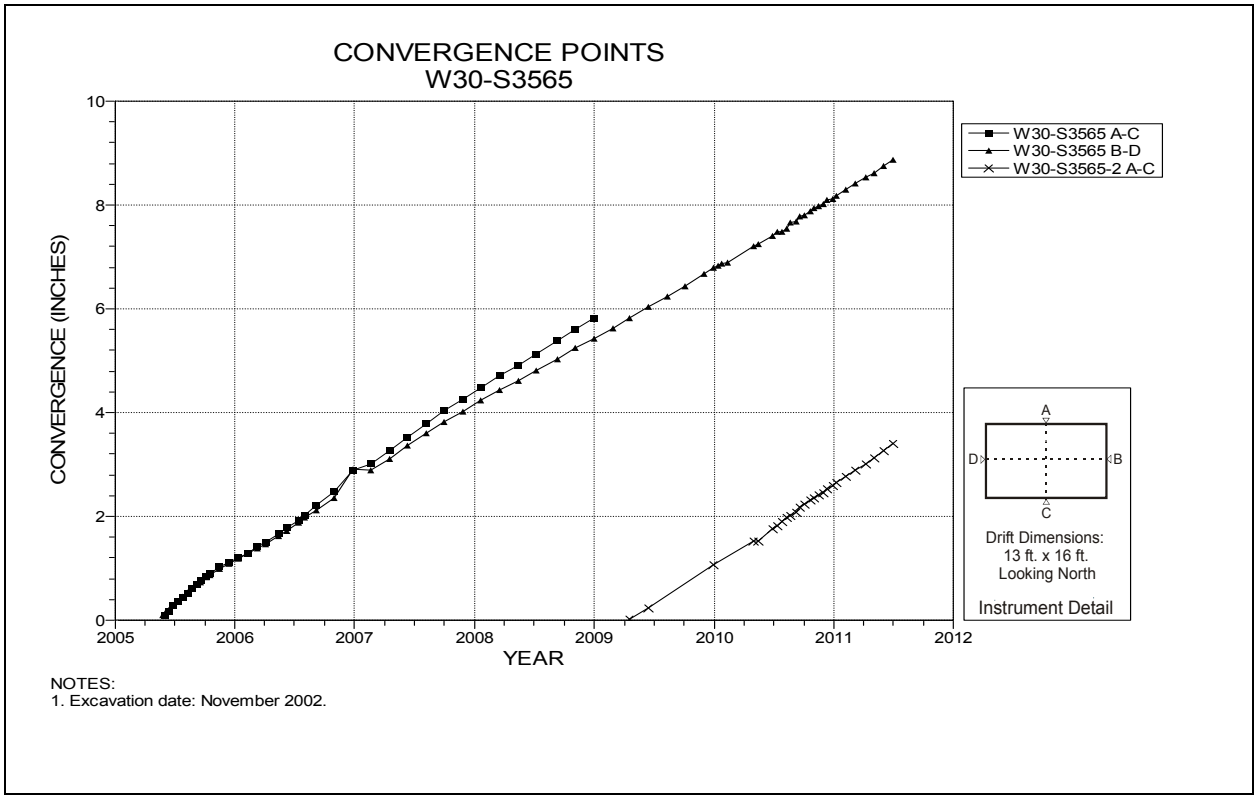


Figure 4-164 Convergence Point Array
W30 S3565 – All Chords

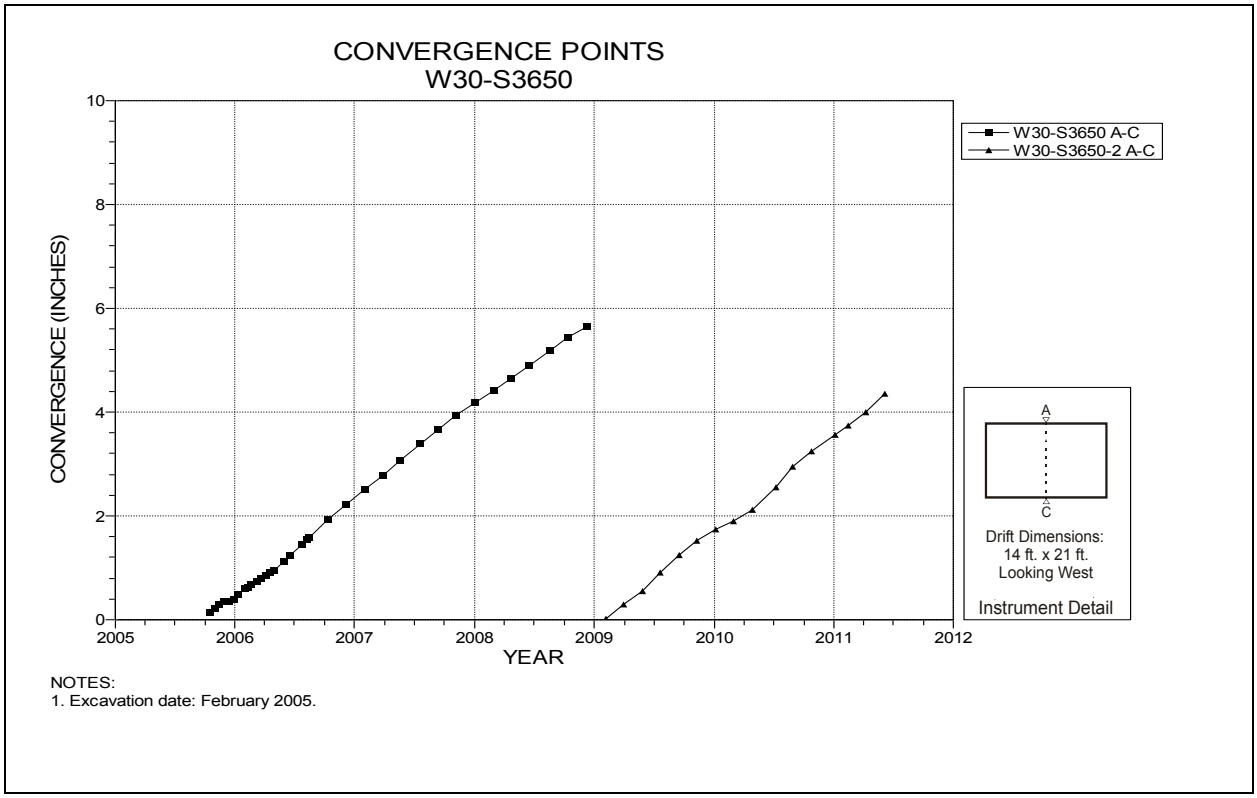


Figure 4-165 Convergence Point Array
W30 S3560 – Roof to Floor

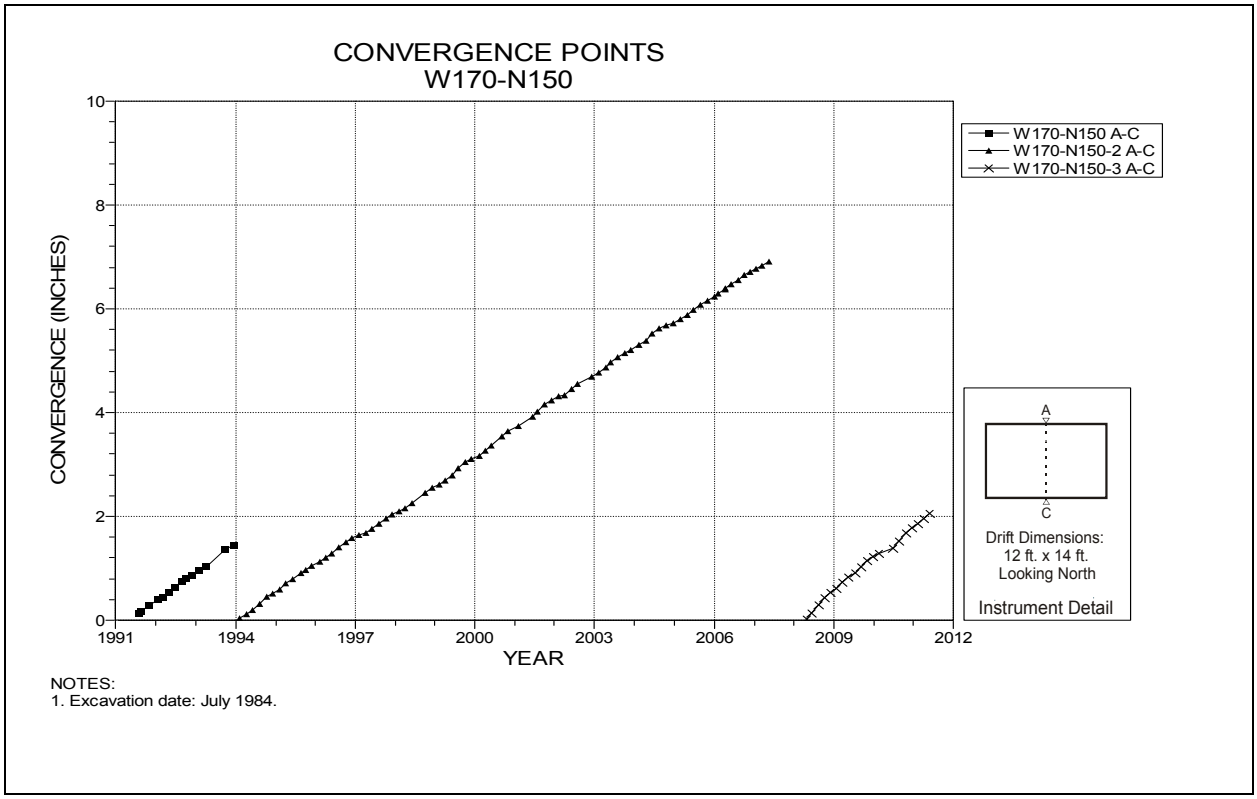


Figure 4-166 Convergence Point Array
W170 N150 – Roof to Floor

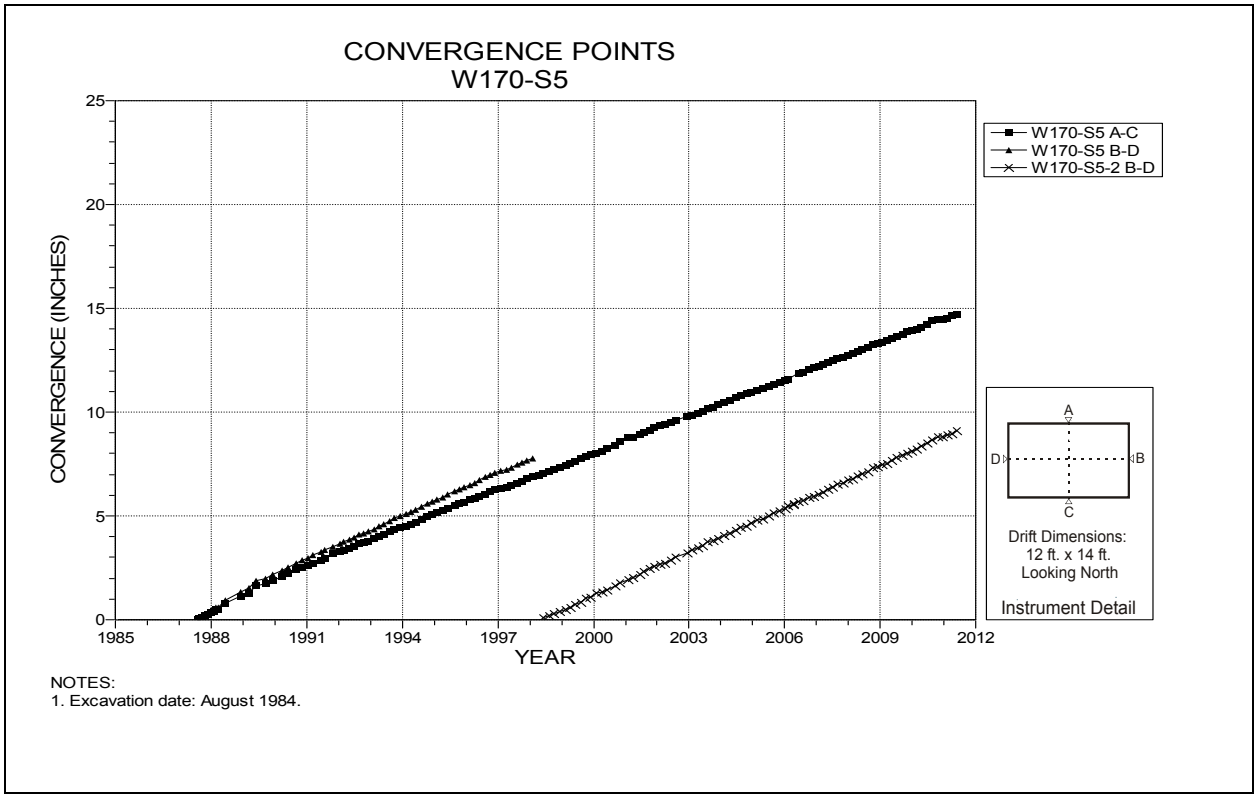


Figure 4-167 Convergence Point Array
W170 S5 – All Chords

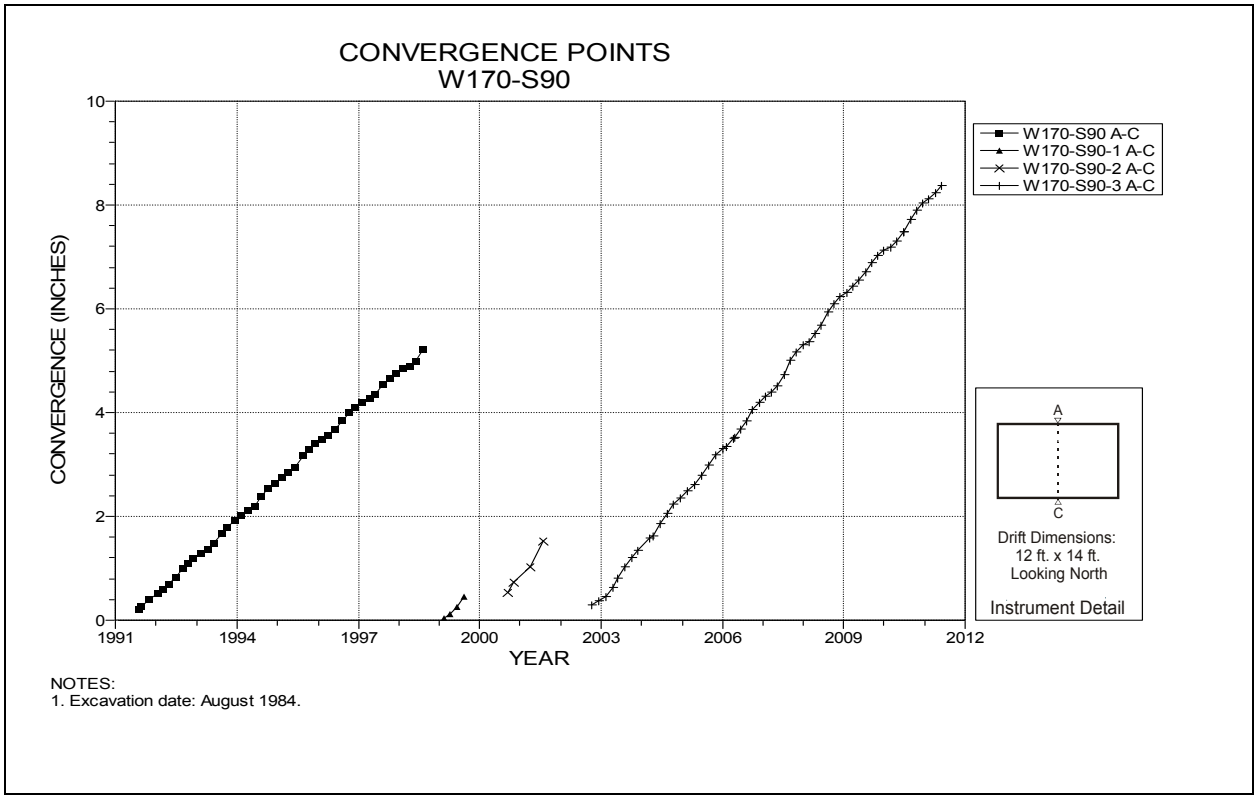


Figure 4-168 Convergence Point Array
W170 S90 – Roof to Floor

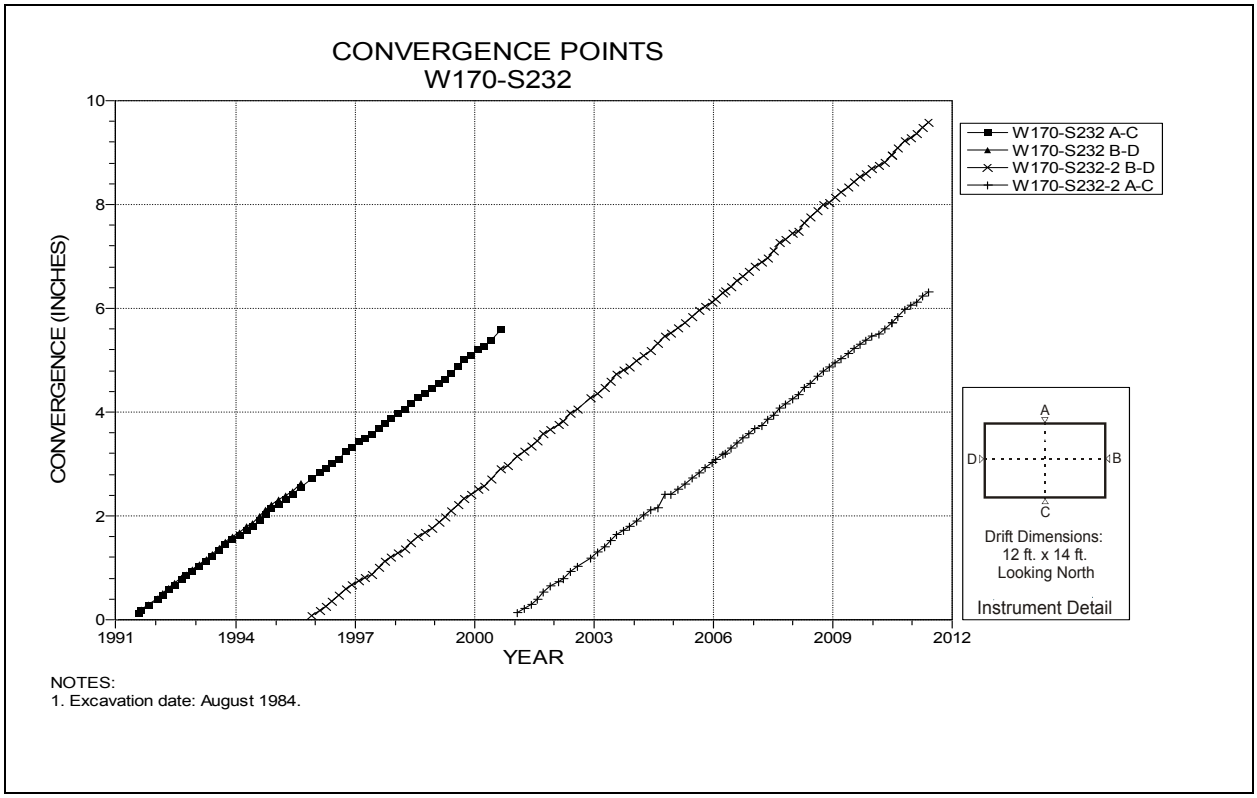


Figure 4-169 Convergence Point Array
W170 S232 – All Chords

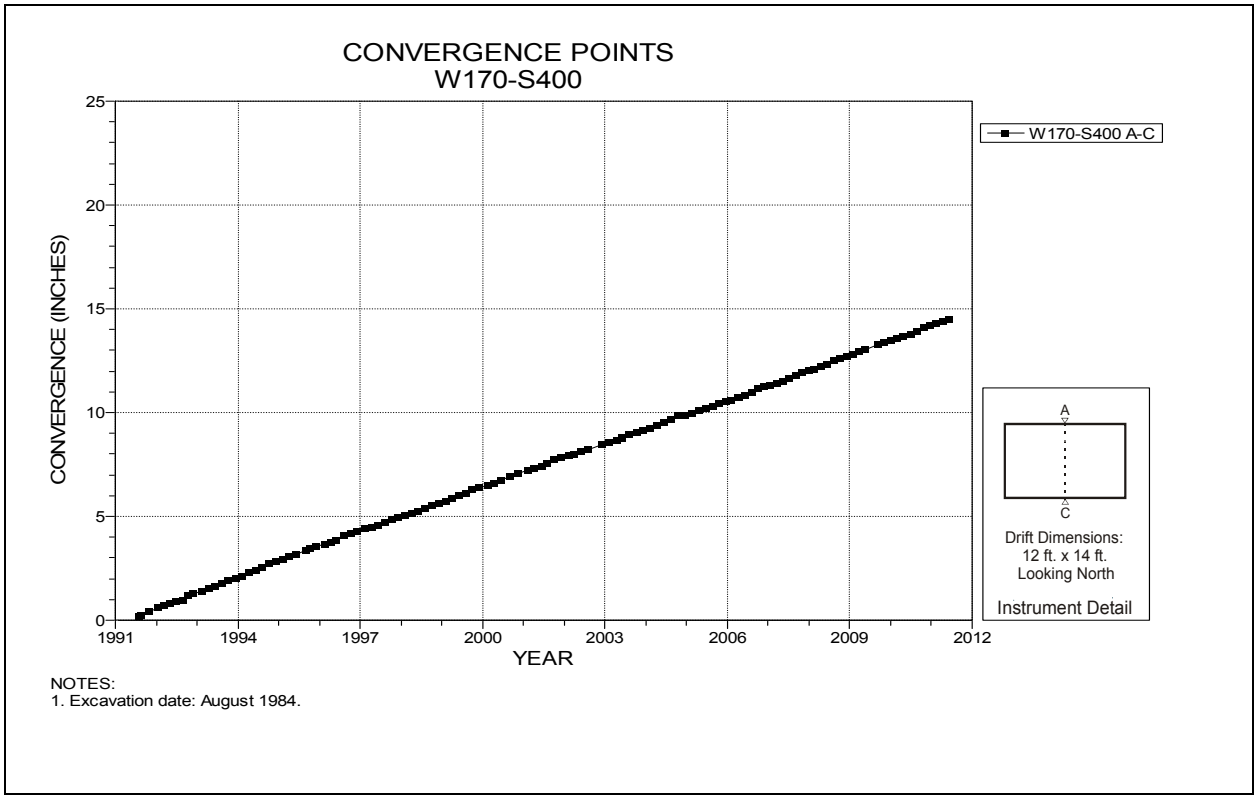


Figure 4-170 Convergence Point Array
W170 S400 – Roof to Floor

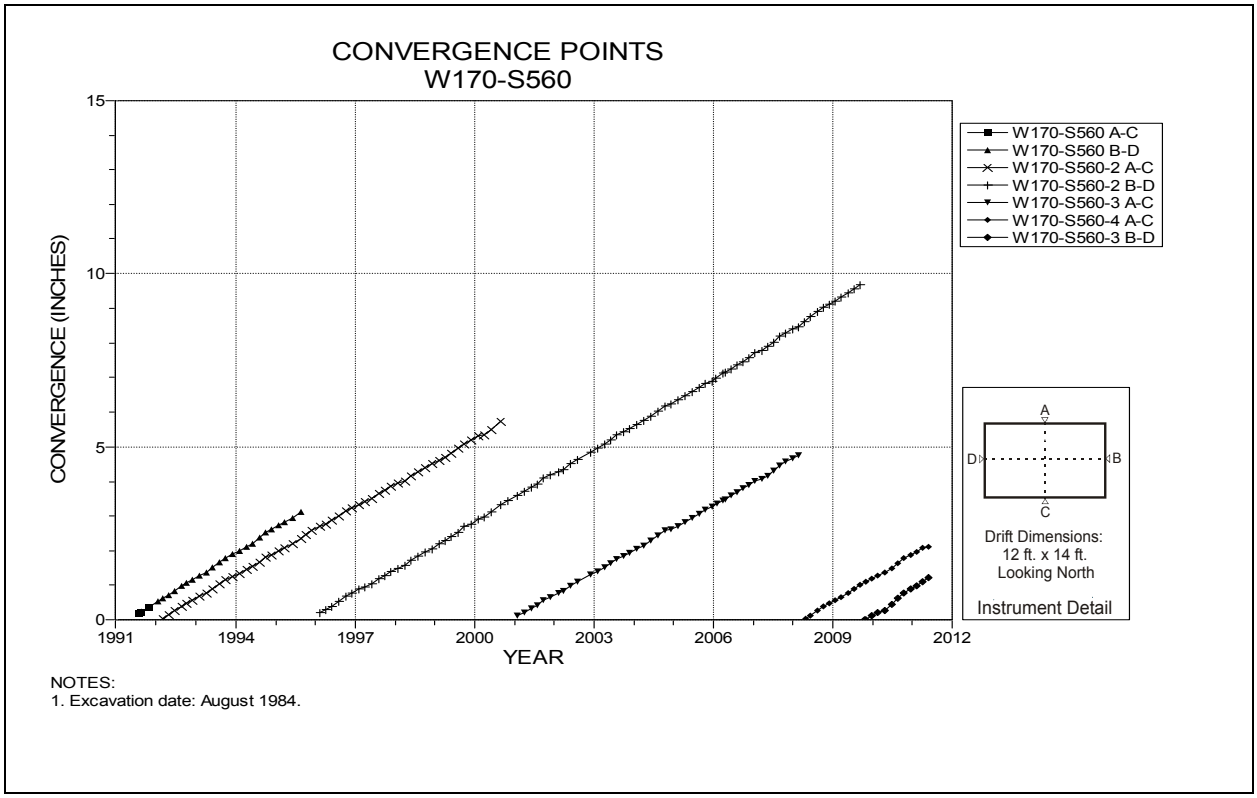


Figure 4-171 Convergence Point Array
W170 S560 – All Chords

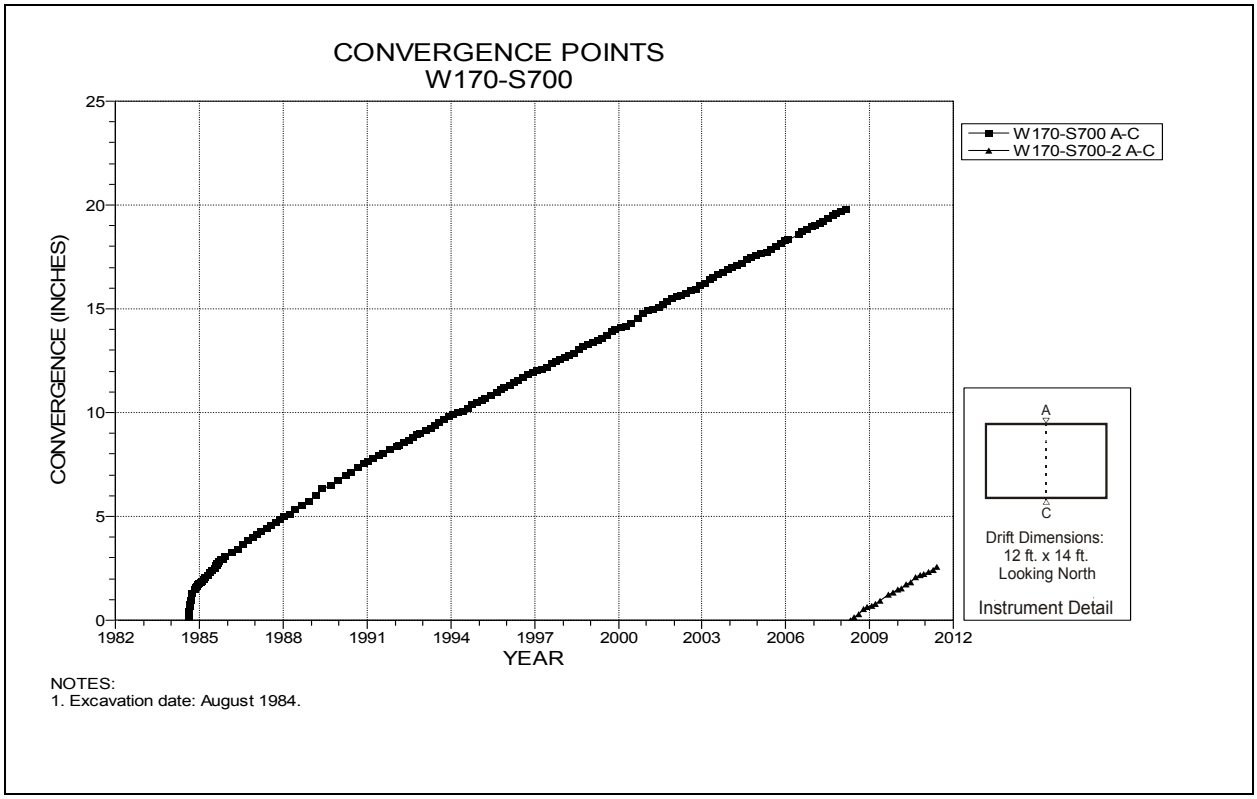


Figure 4-172 Convergence Point Array
W170 S700 – Roof to Floor

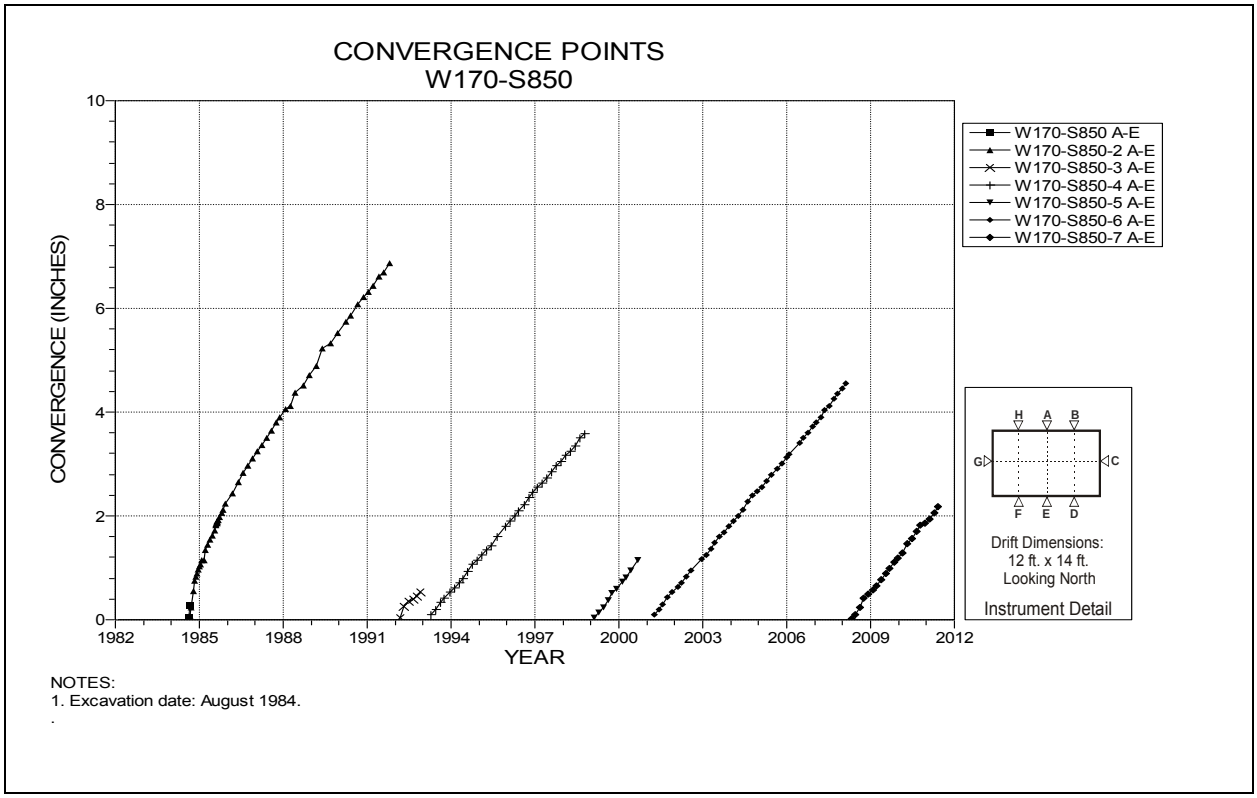


Figure4 -173 Convergence Point Array
W170 S850 – Roof to Floor – Centerline

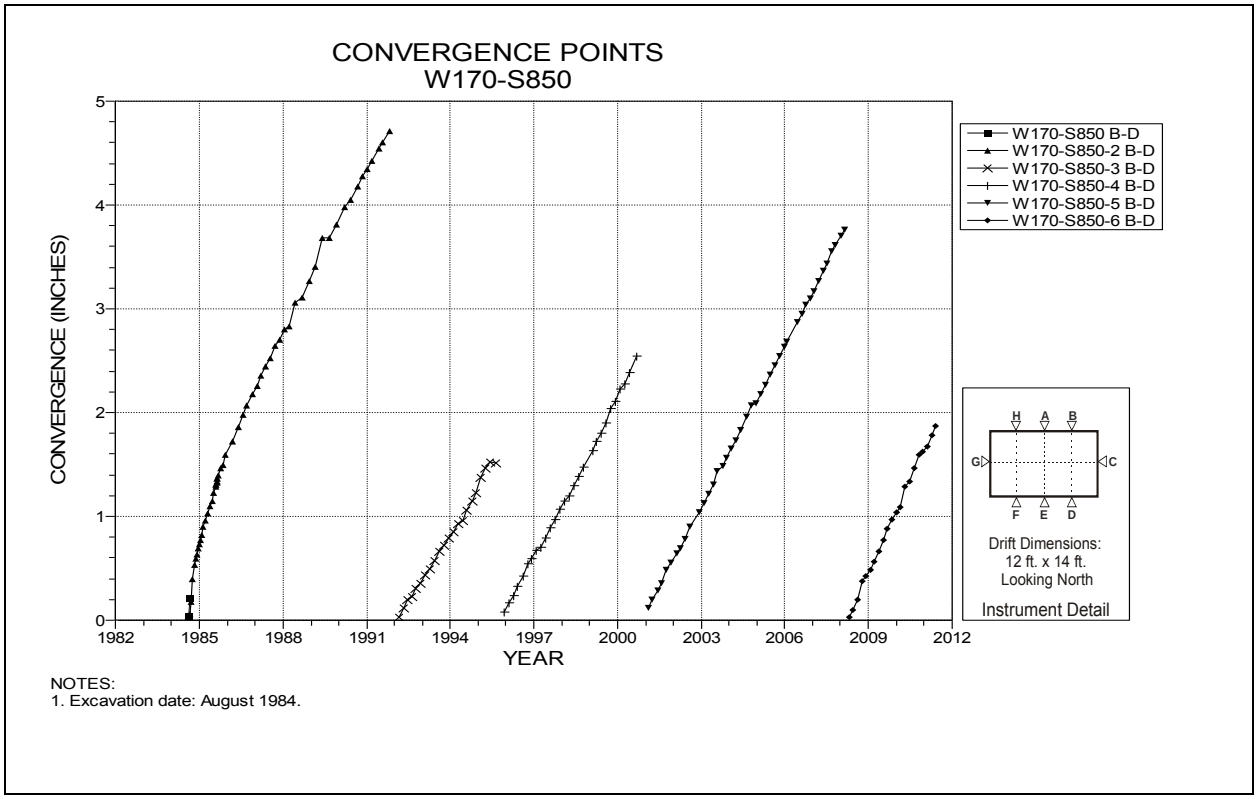


Figure 4-174 Convergence Point Array
W170 S850 – Roof to Floor – East Quarter Point

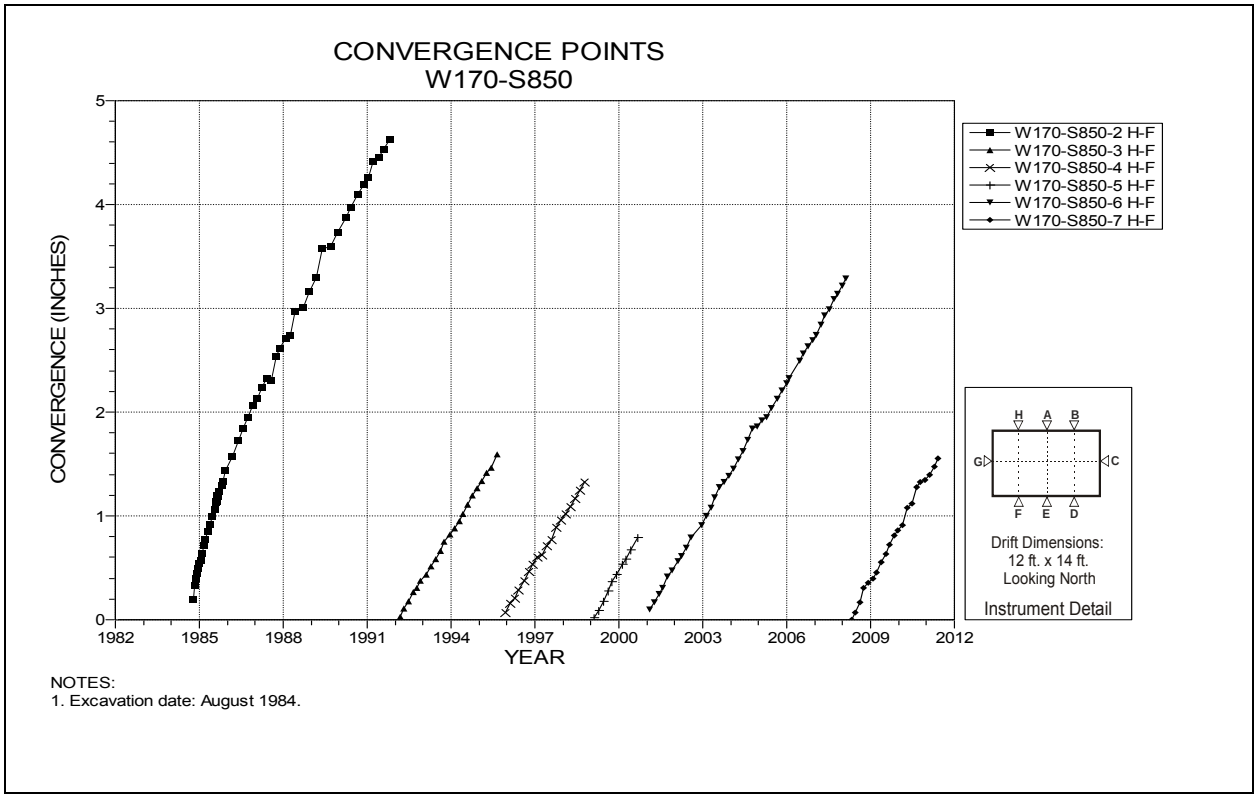


Figure 4-175 Convergence Point Array
W170 S850 – Roof to Floor – West Quarter Point

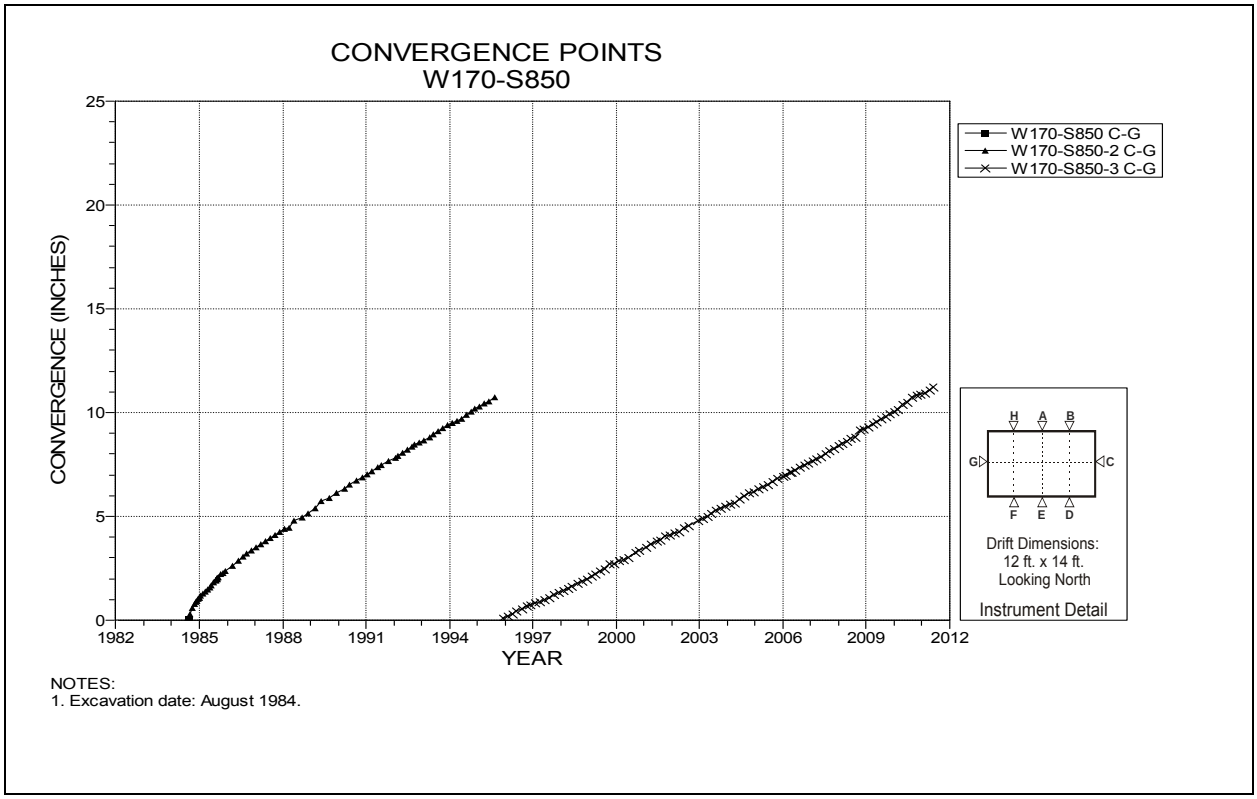


Figure 4-176 Convergence Point Array
W170 S850 – Rib to Rib

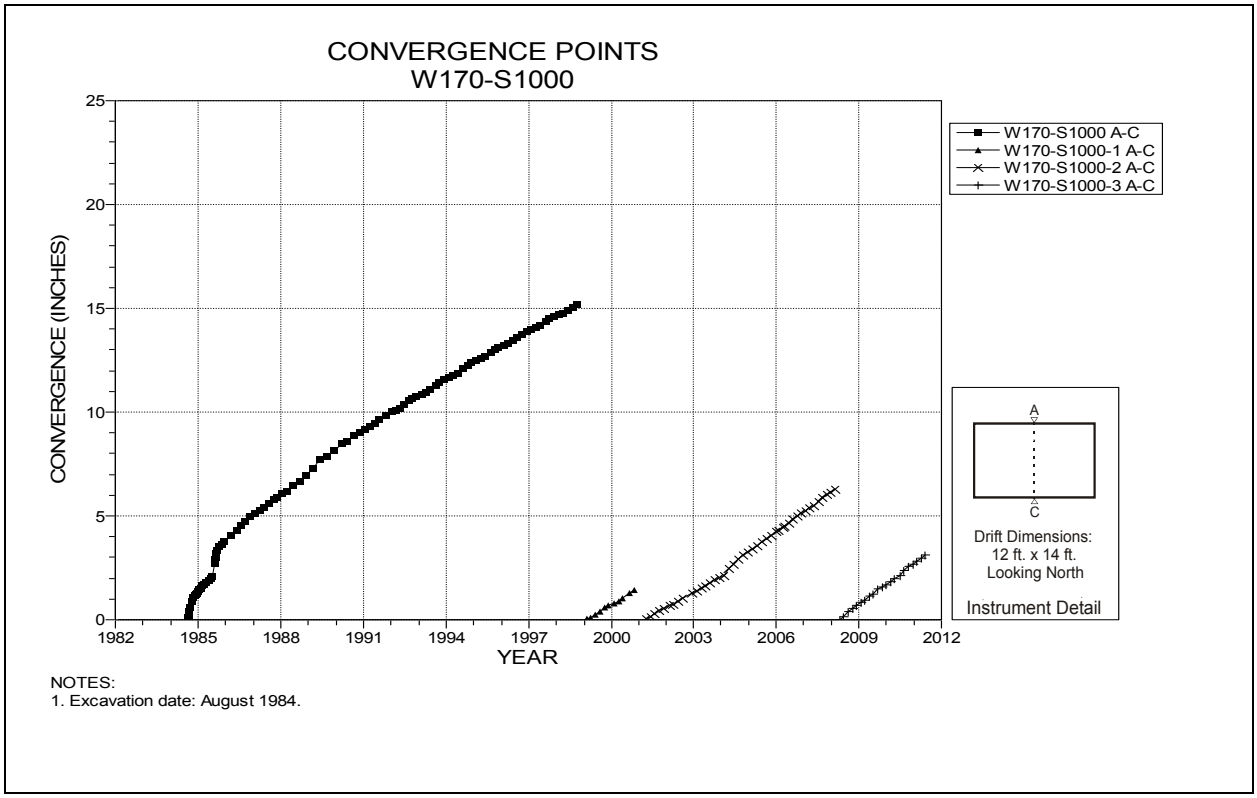


Figure 4-177 Convergence Point Array
W170 S1000 – Roof to Floor

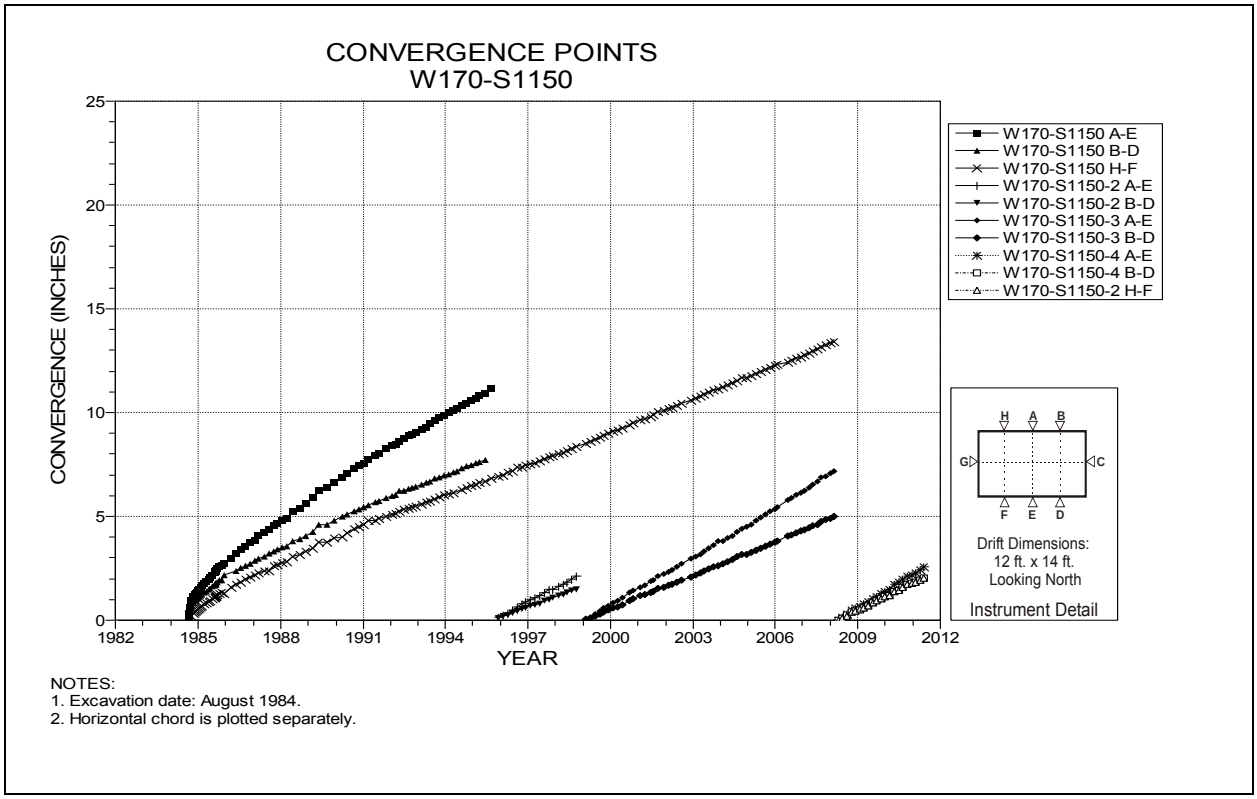


Figure 4-178 Convergence Point Array
W170 S1150 – Roof to Floor – Quarter Points

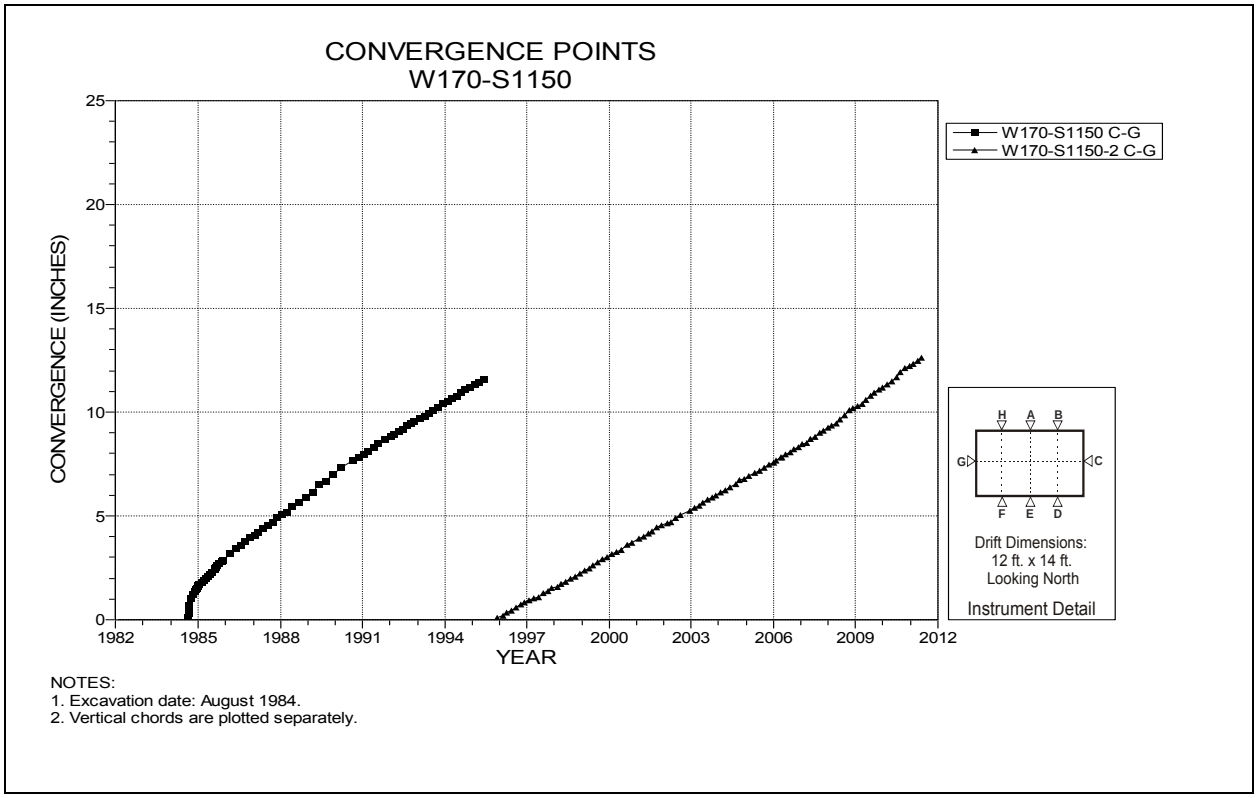


Figure 4-179 Convergence Point Array
W170 S1150 – Rib to Rib

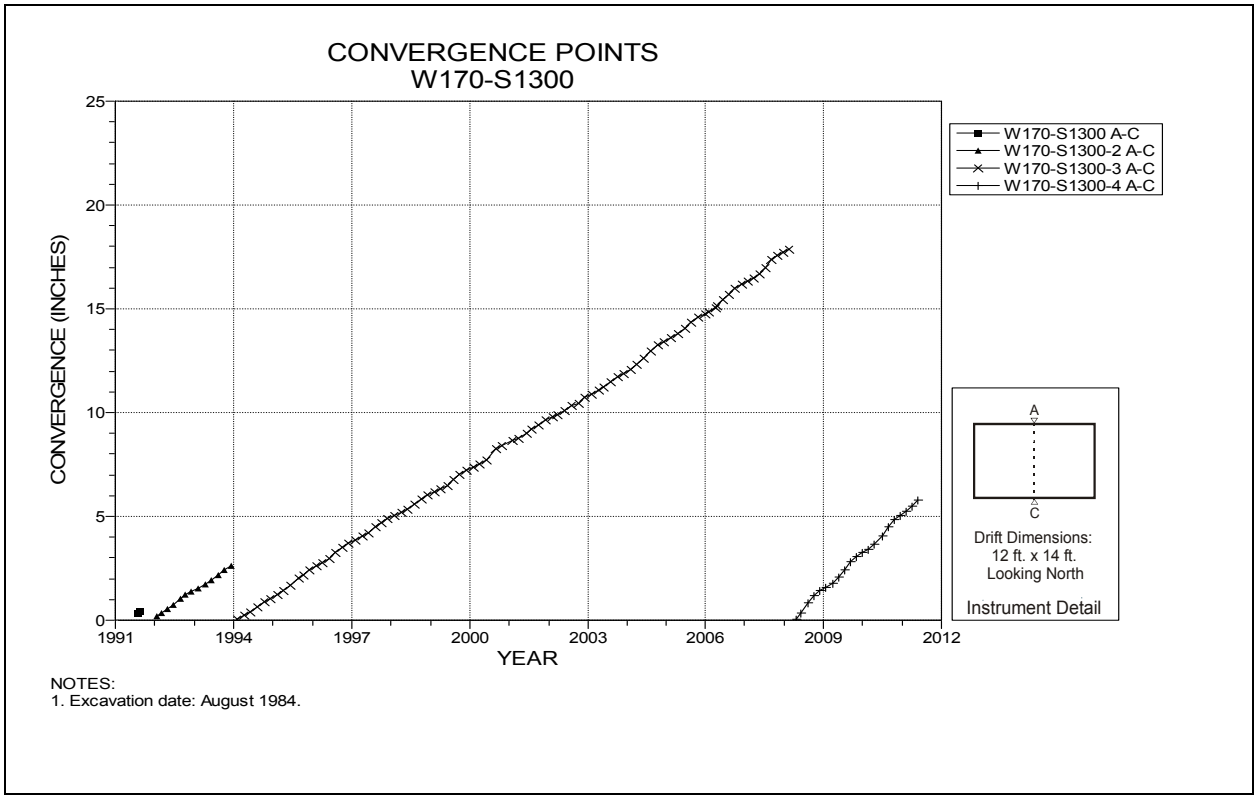


Figure 4-180 Convergence Point Array
W170 S1300 – Roof to Floor

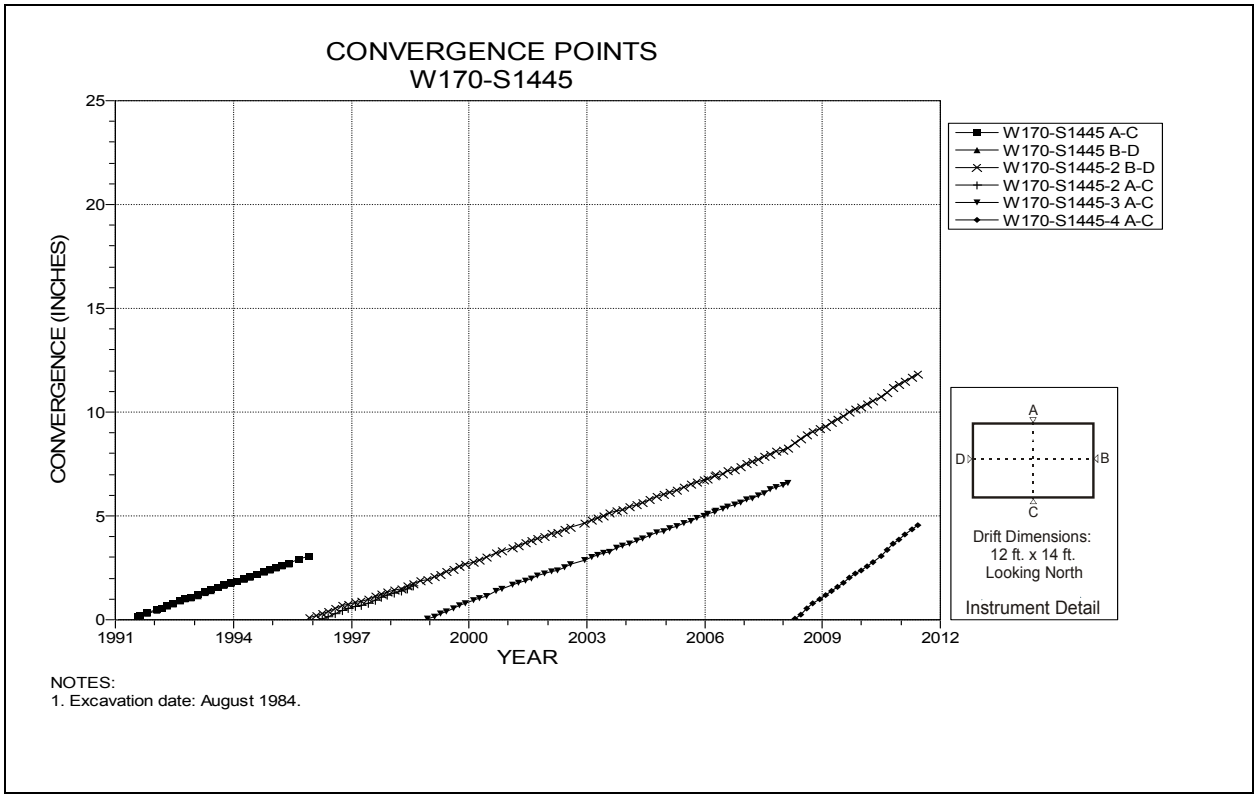


Figure 4-181 Convergence Point Array
W170 S1445 – All Chords

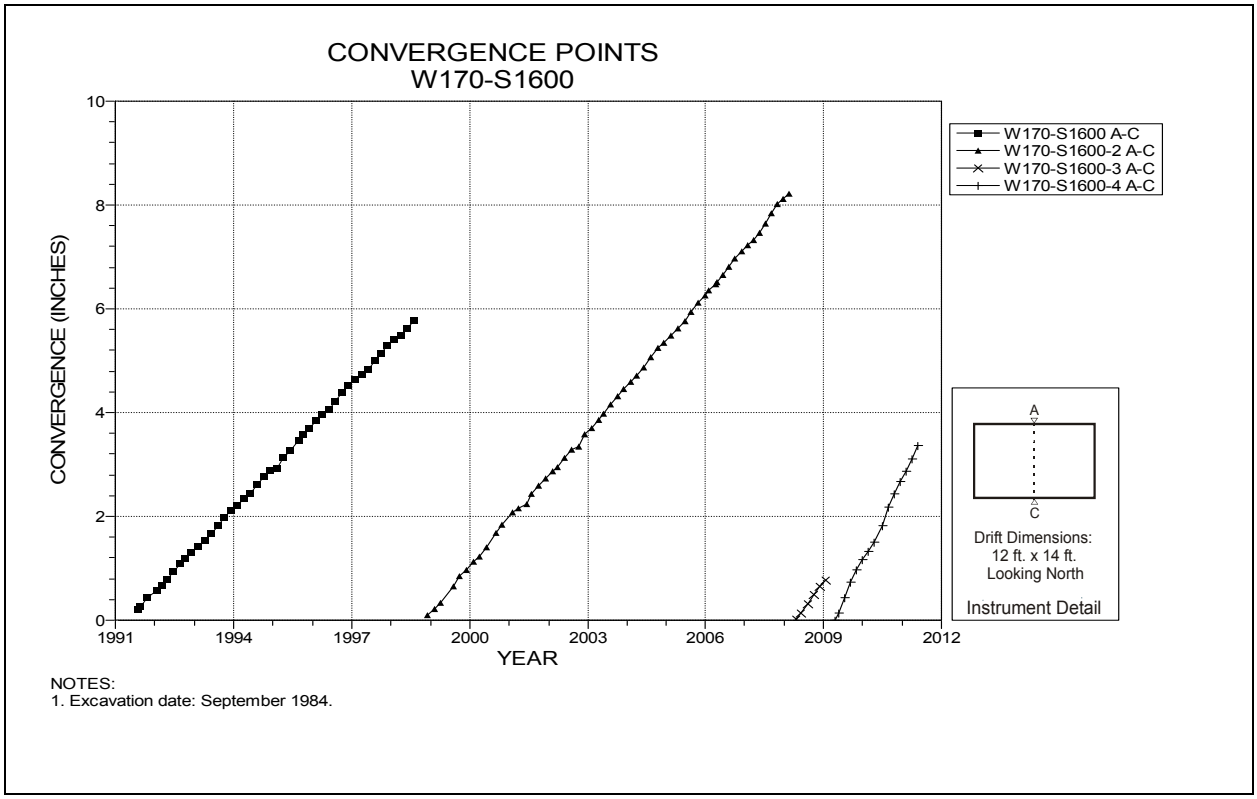


Figure 4-182 Convergence Point Array
W170 S1600 – Roof to Floor

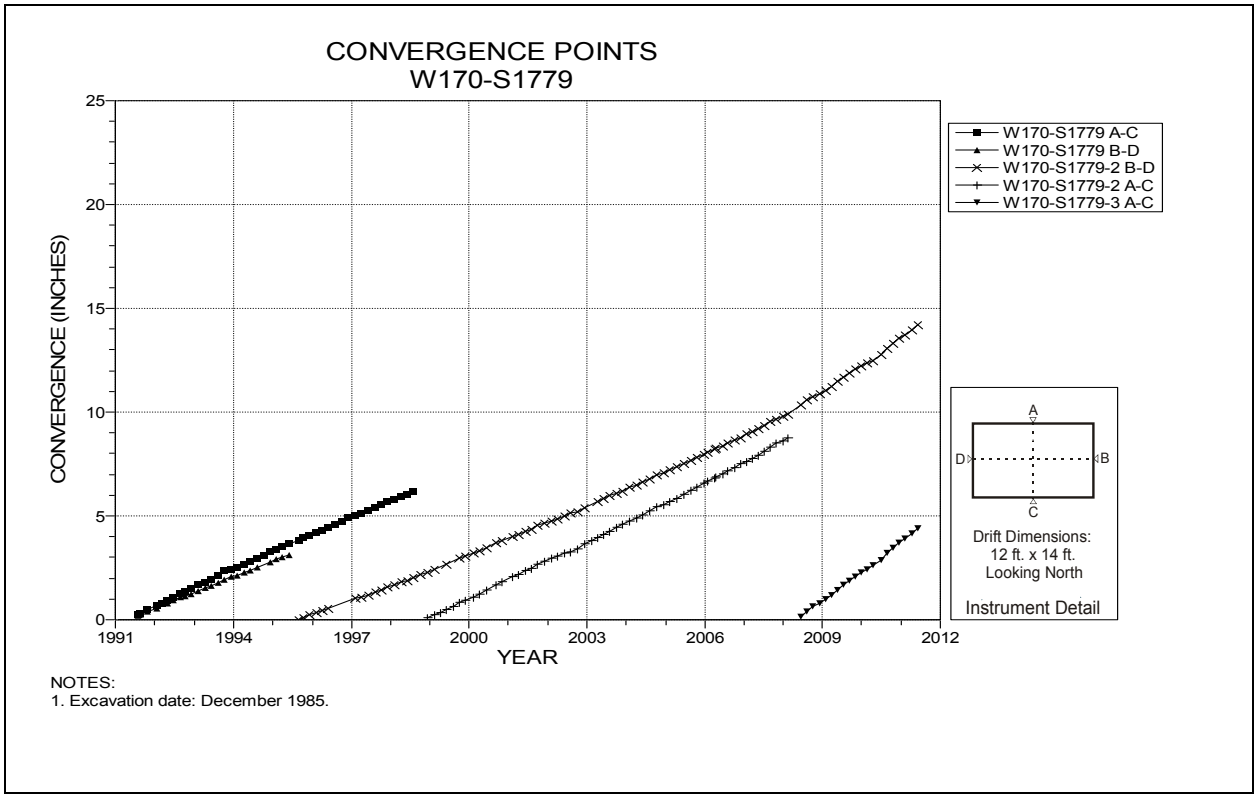


Figure 4-183 Convergence Point Array
W170 S1779 – All Chords

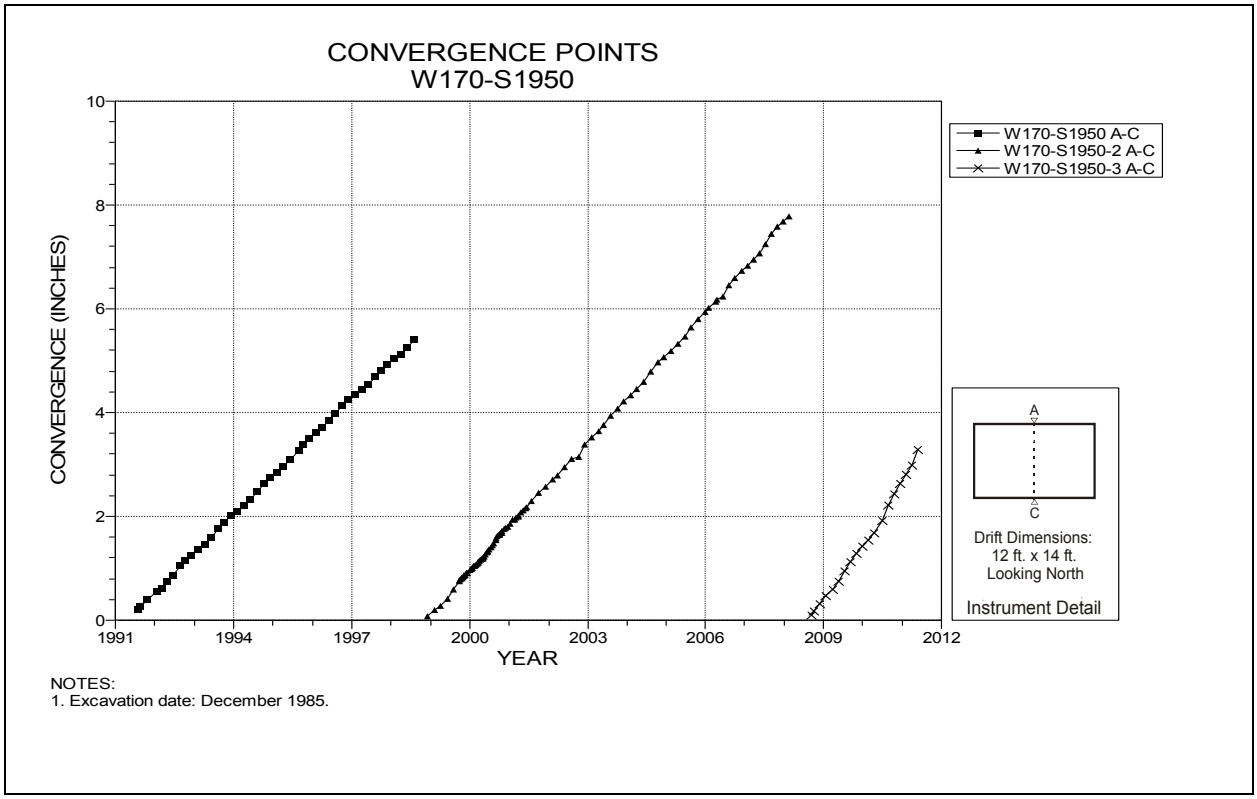


Figure 4-184 Convergence Point Array
W170 S1950 – Roof to Floor

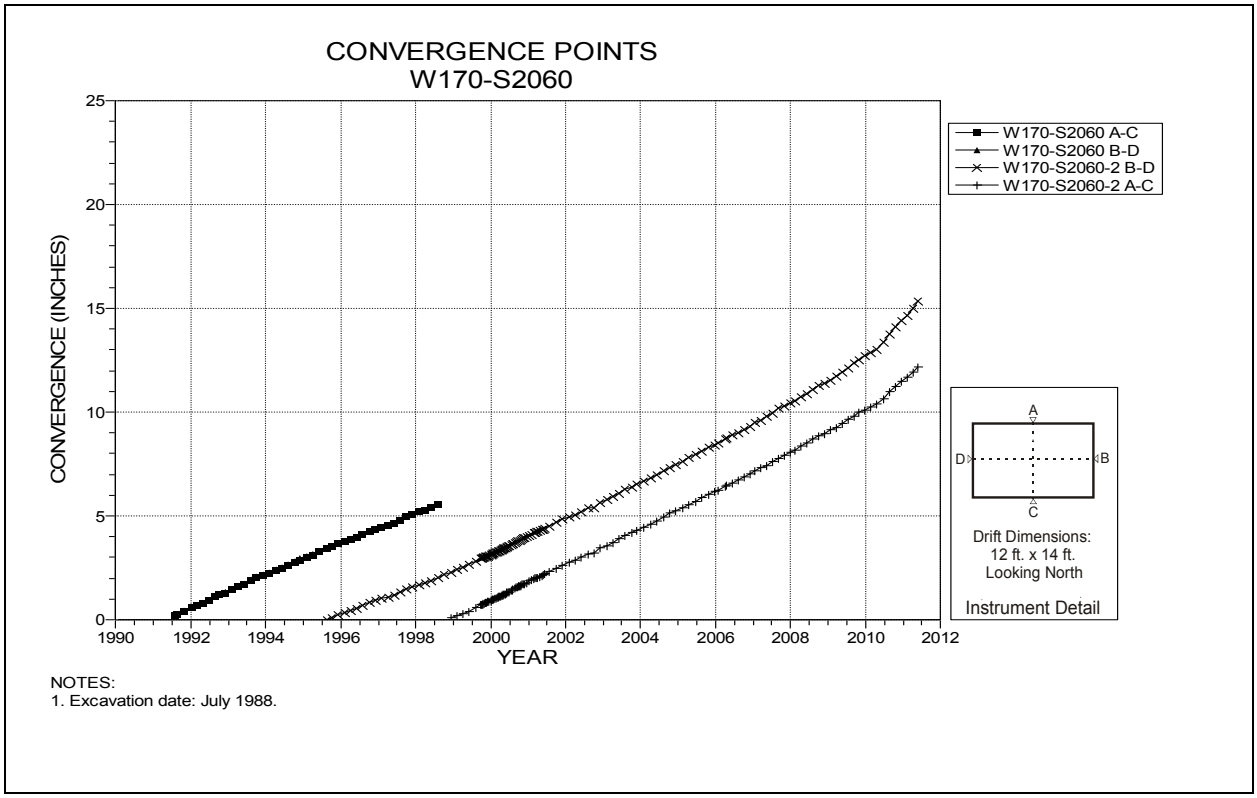


Figure 4-185 Convergence Point Array
W170 S2060 – All Chords

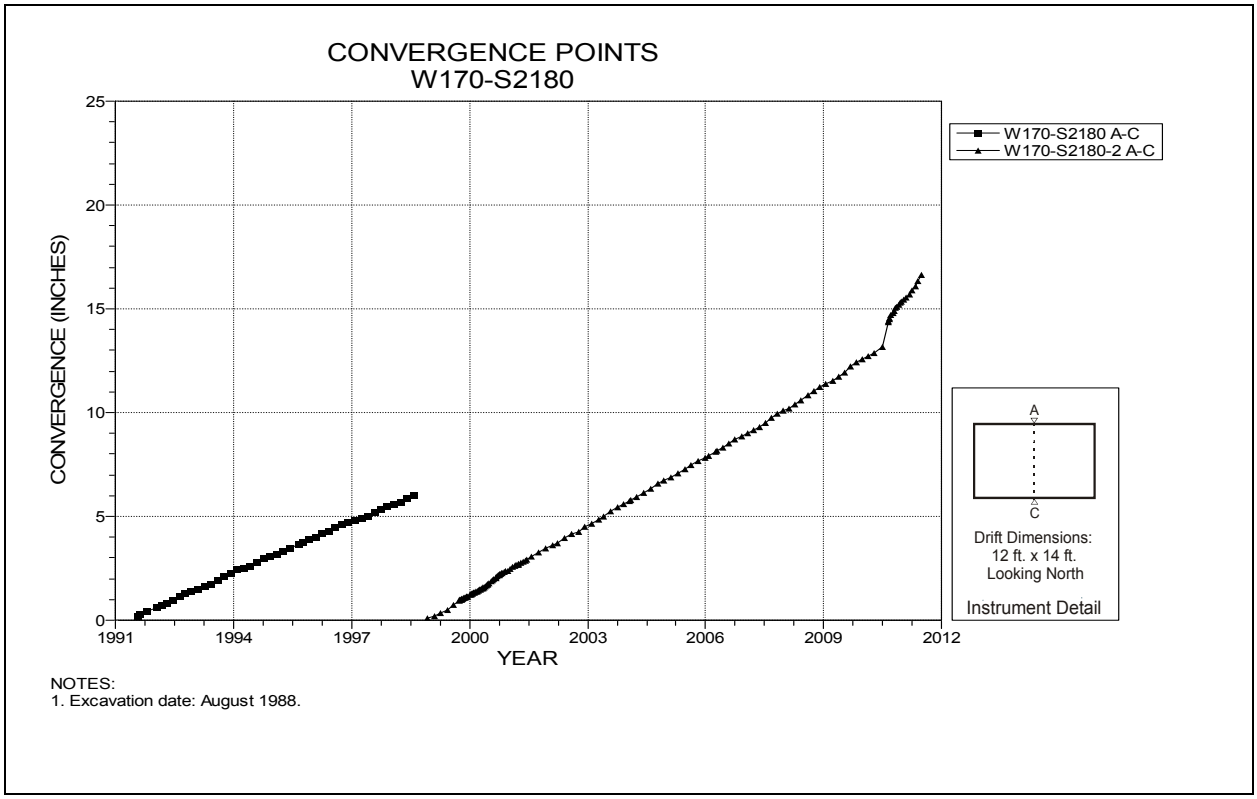


Figure 4-186 Convergence Point Array
W170 S2180 – Roof to Floor

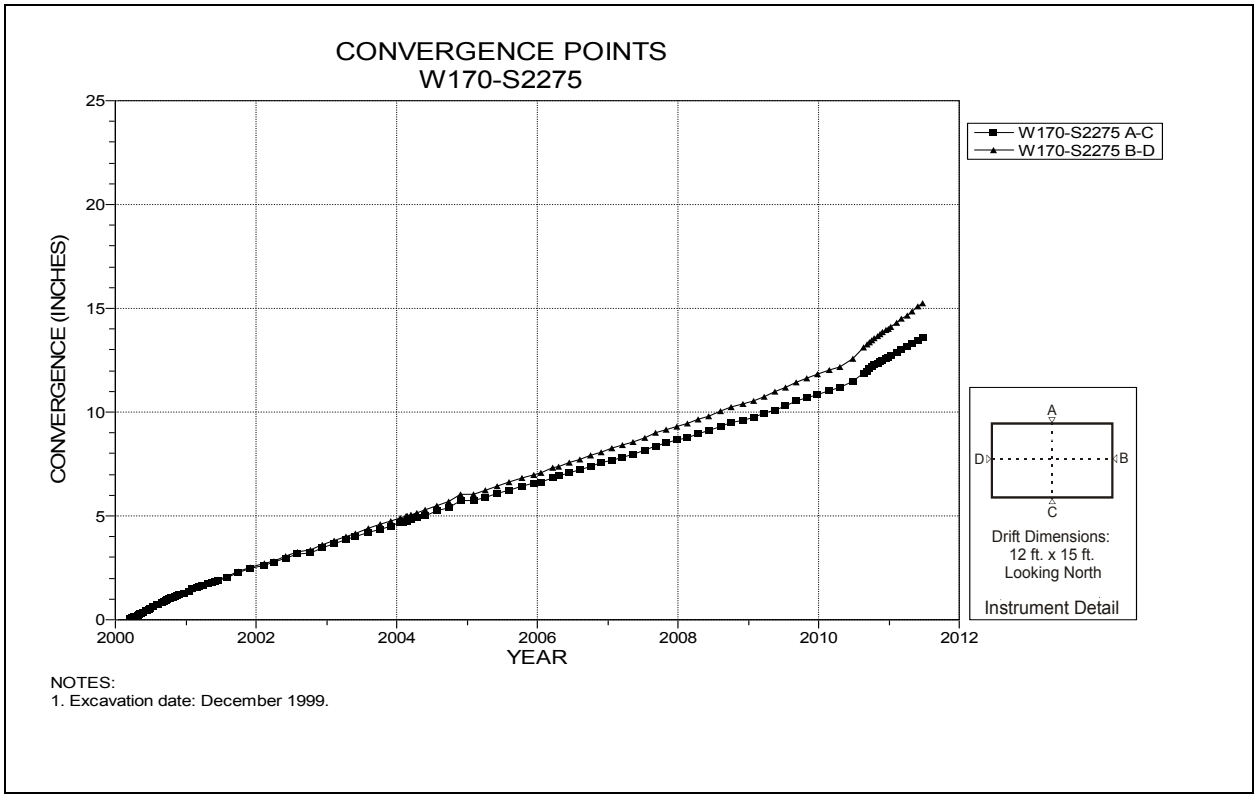


Figure 4-187 Convergence Point Array
W170 S2275 – All Chords

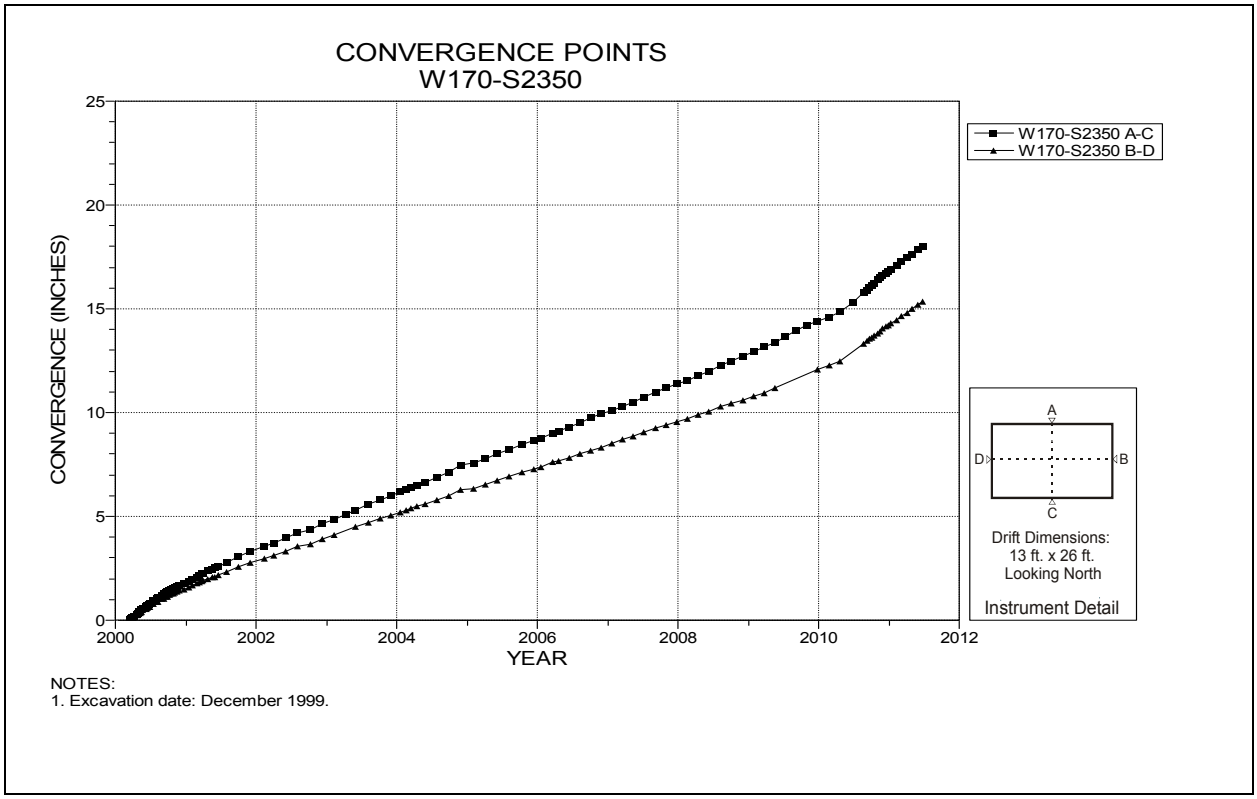


Figure 4-188 Convergence Point Array
W170 S2350 – All Chords

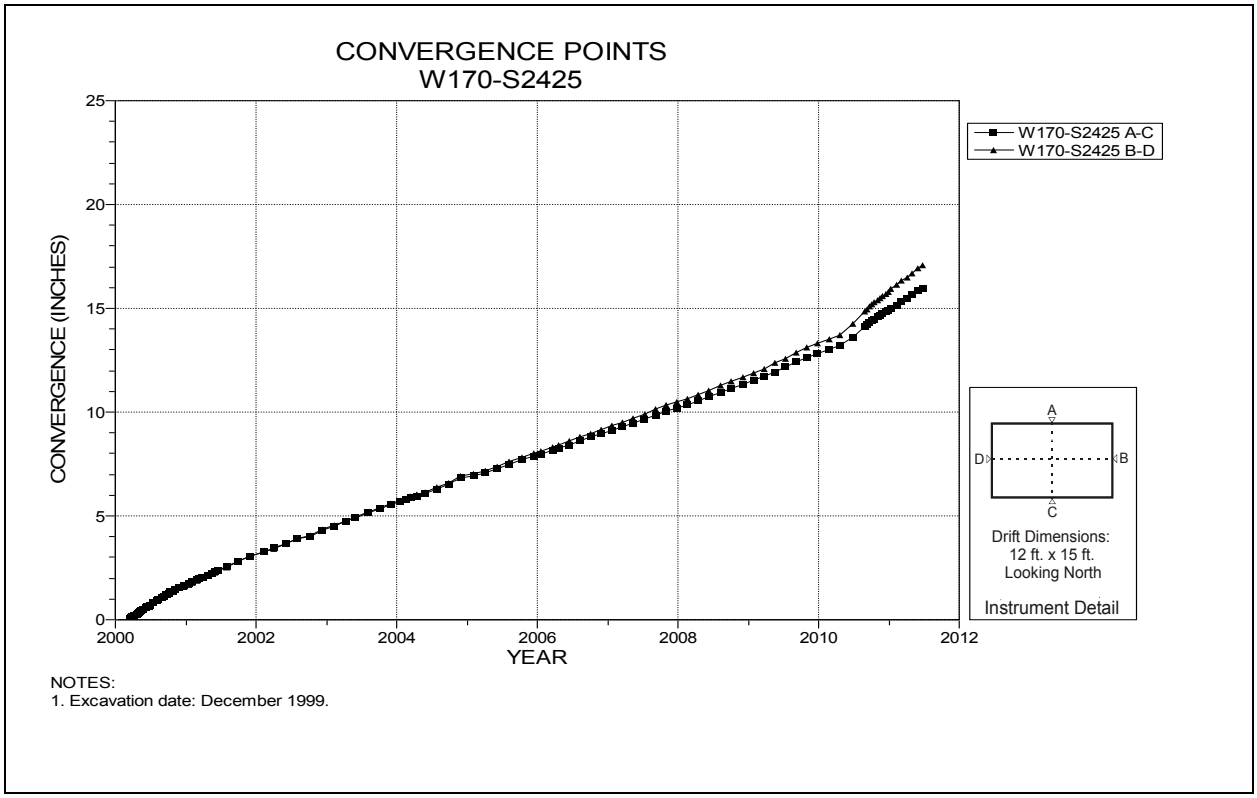


Figure 4-189 Convergence Point Array
W170 S2425 – All Chords

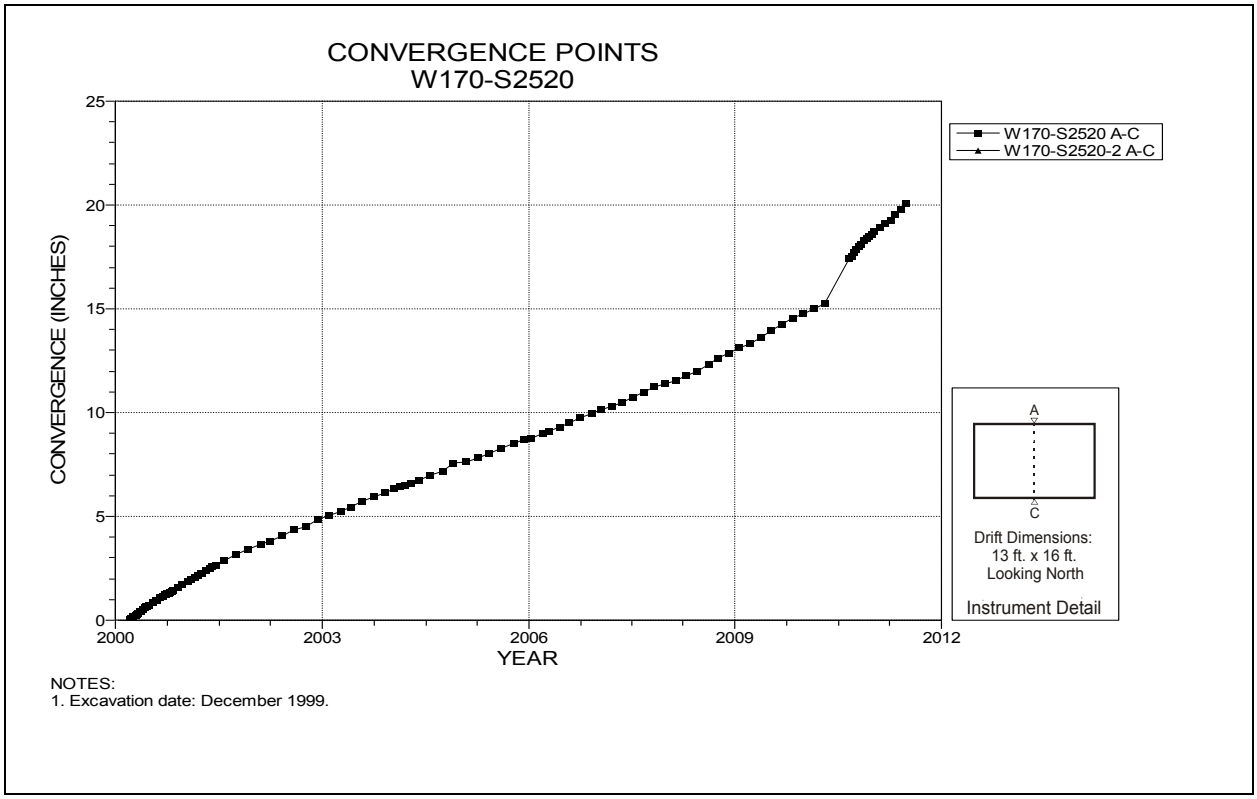


Figure 4-190 Convergence Point Array
W170 S2520 – Roof to Floor

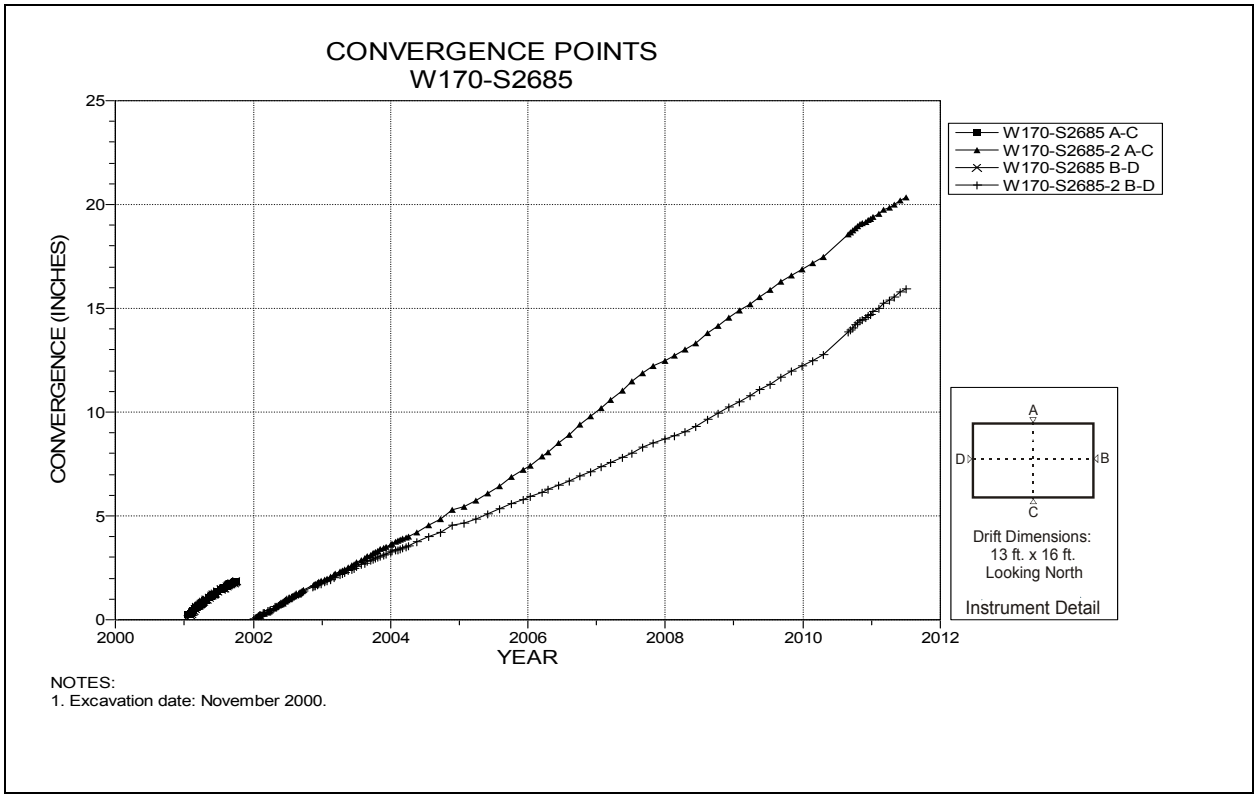


Figure 4-191 Convergence Point Array
W170 S2685 – All Chords

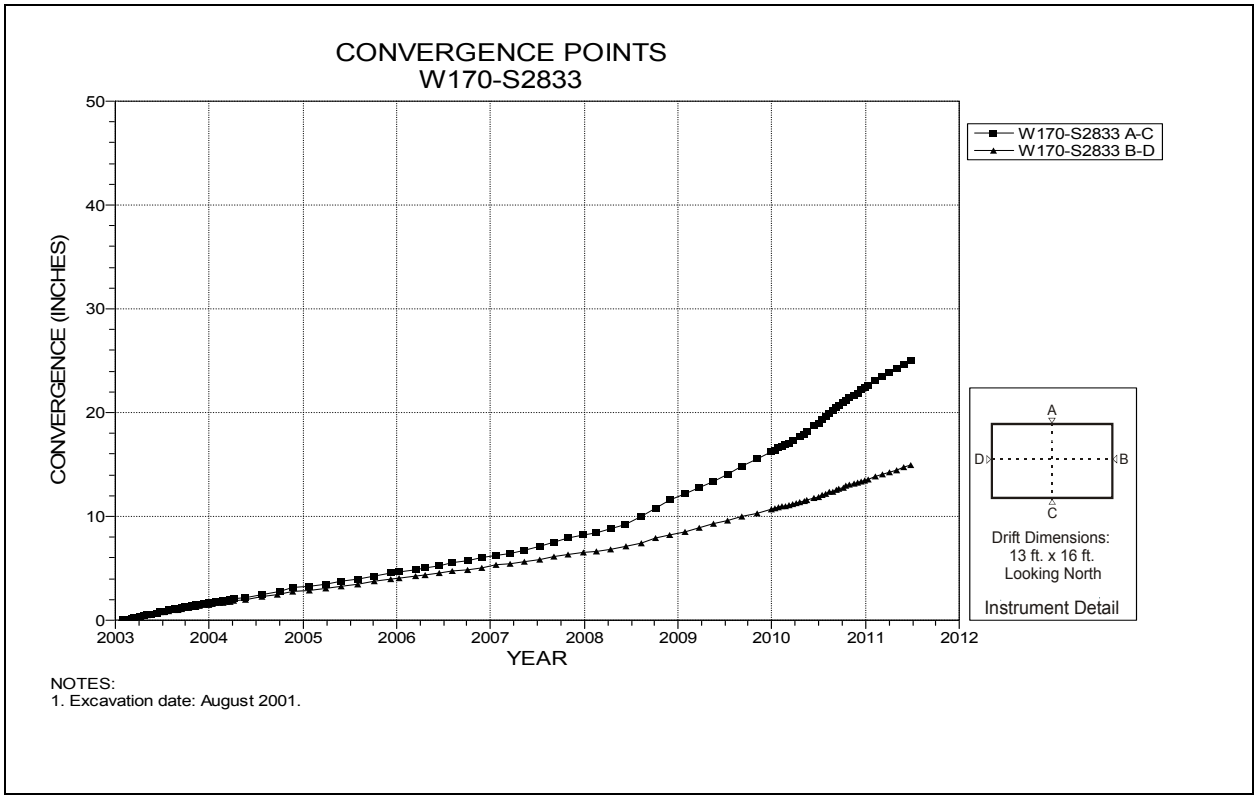


Figure 4-192 Convergence Point Array
W170 S2833 – All Chords

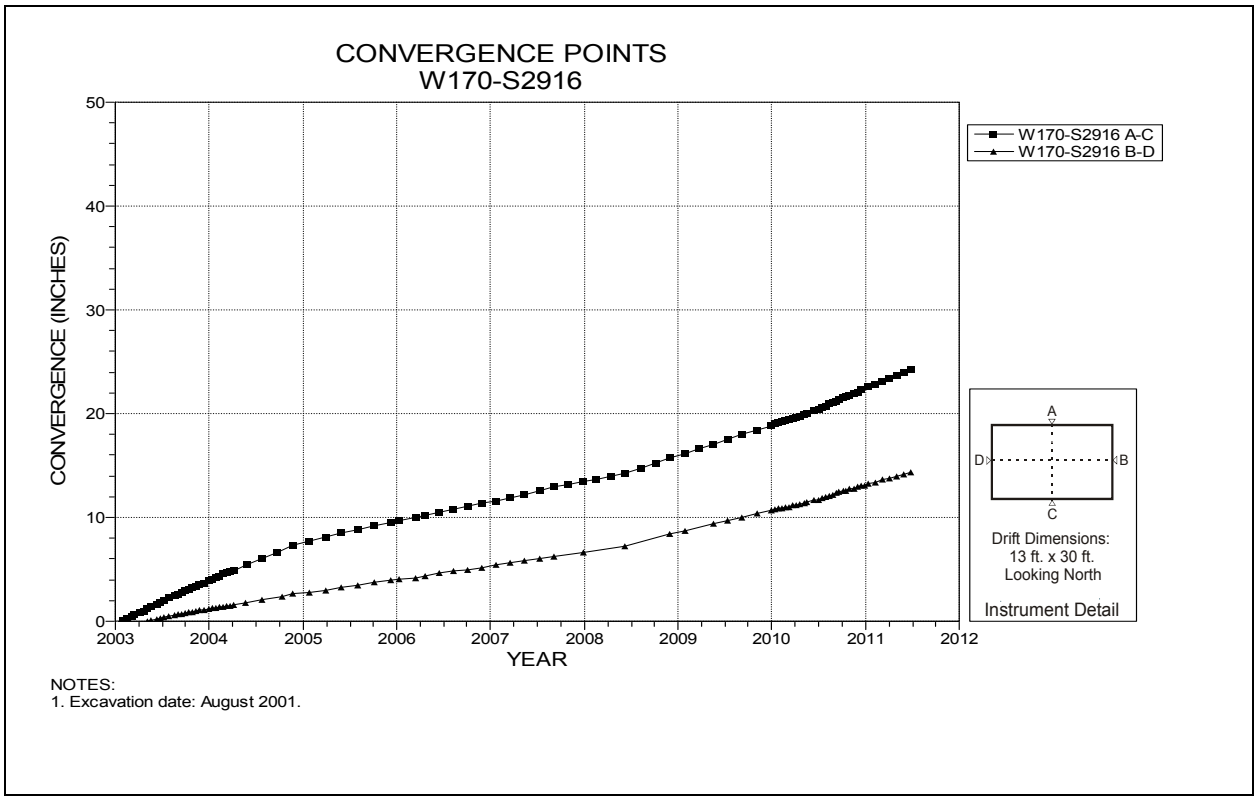


Figure 4-193 Convergence Point Array
W170 S2916 – All Chords

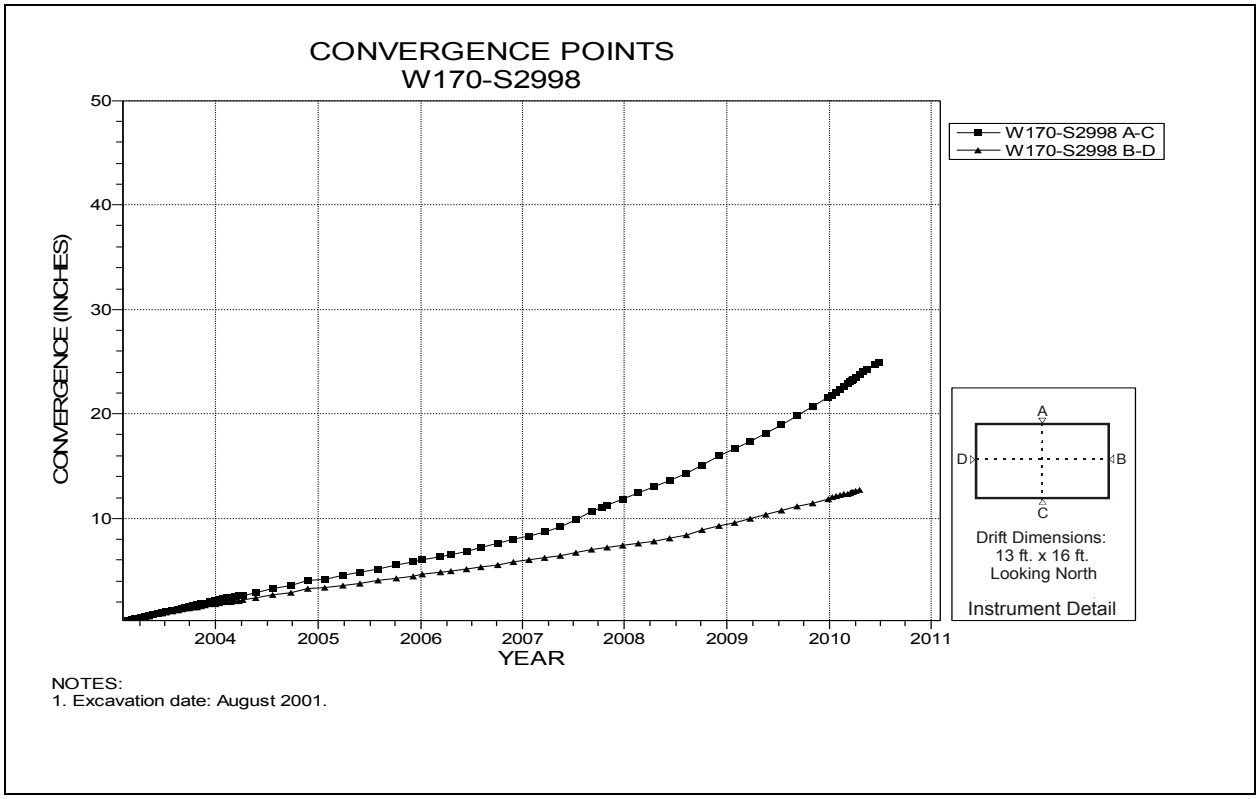


Figure 4-194 Convergence Point Array
W170 S2998 – All Chords

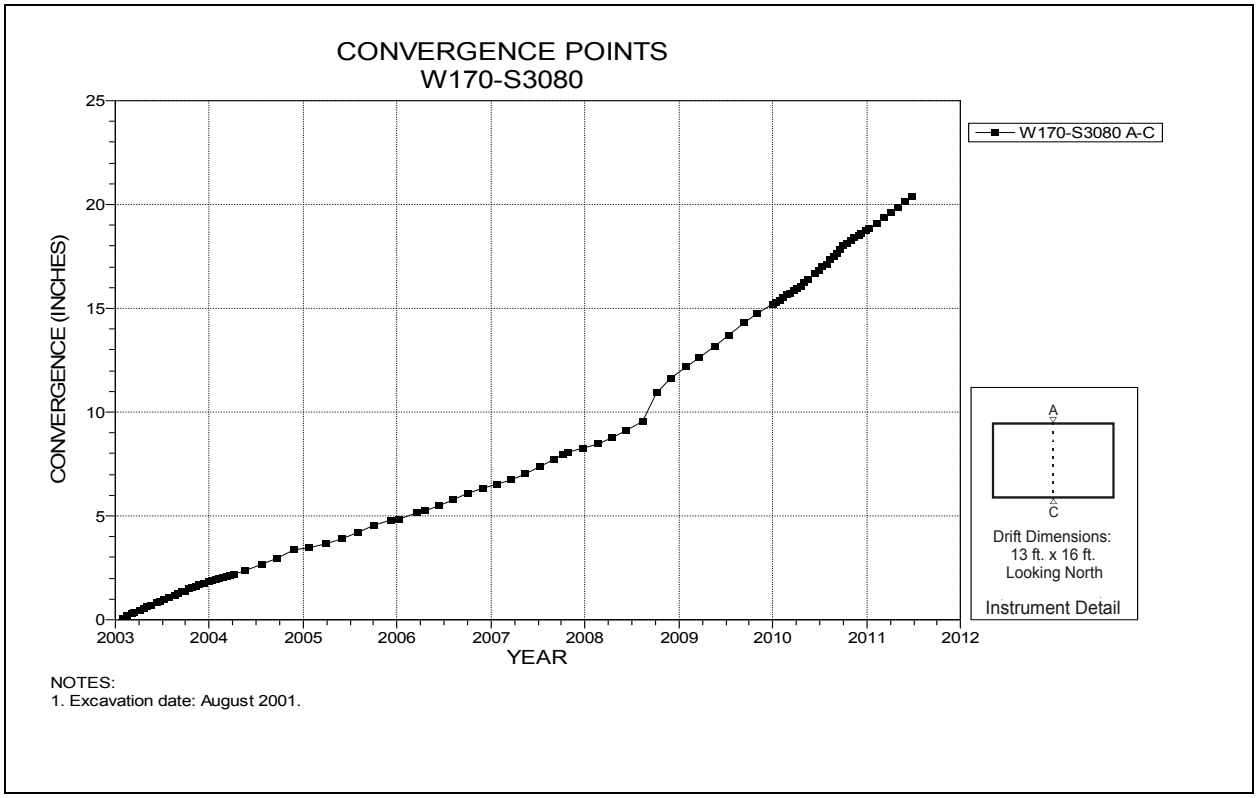


Figure 4-195 Convergence Point Array
W170 S3080 – Roof to Floor

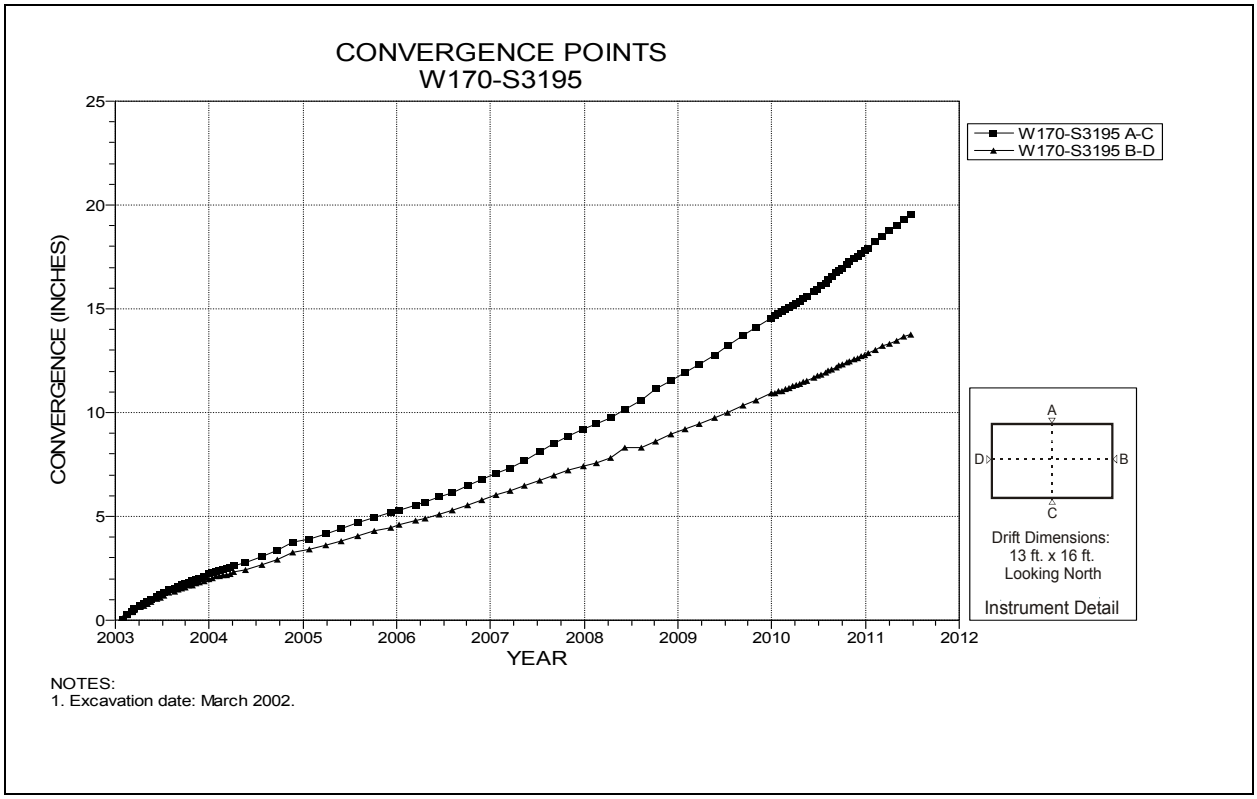


Figure 4-196 Convergence Point Array
W170 S3195 – All Chords

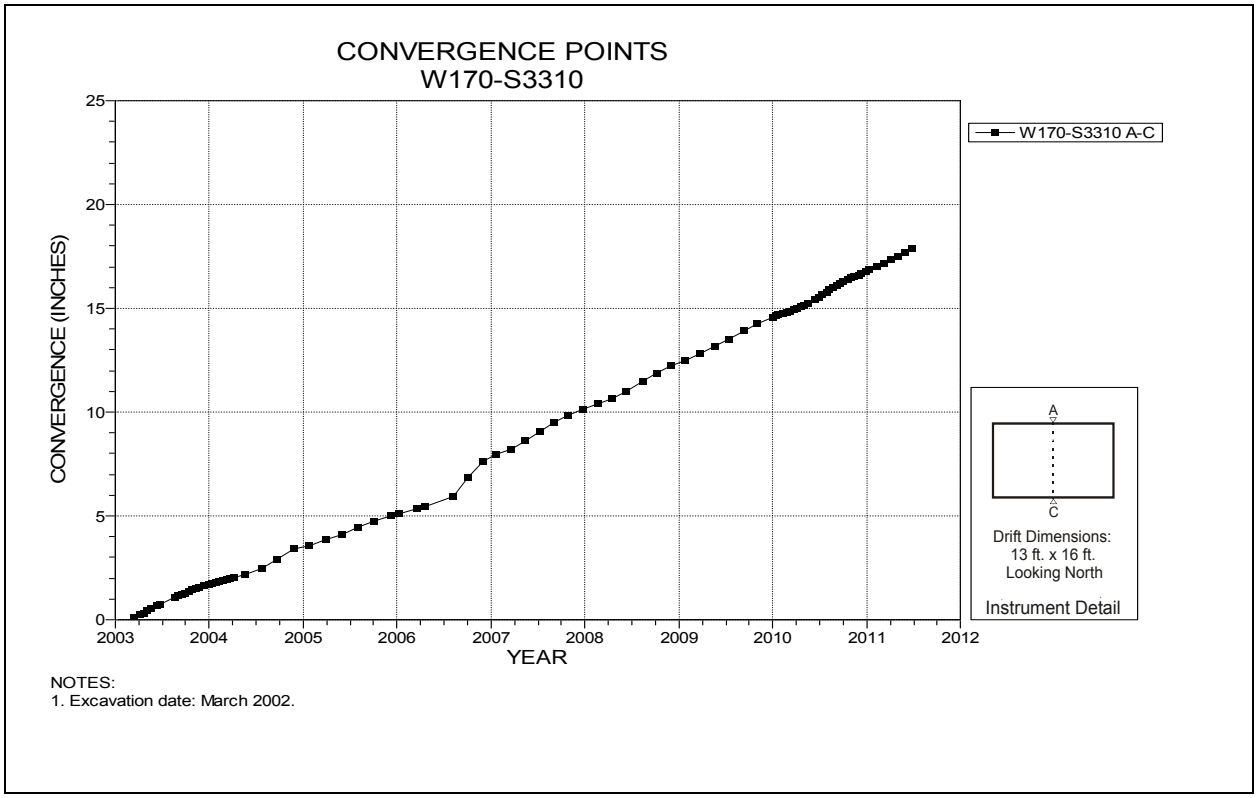


Figure 4-197 Convergence Point Array
W170 S3310 – Roof to Floor

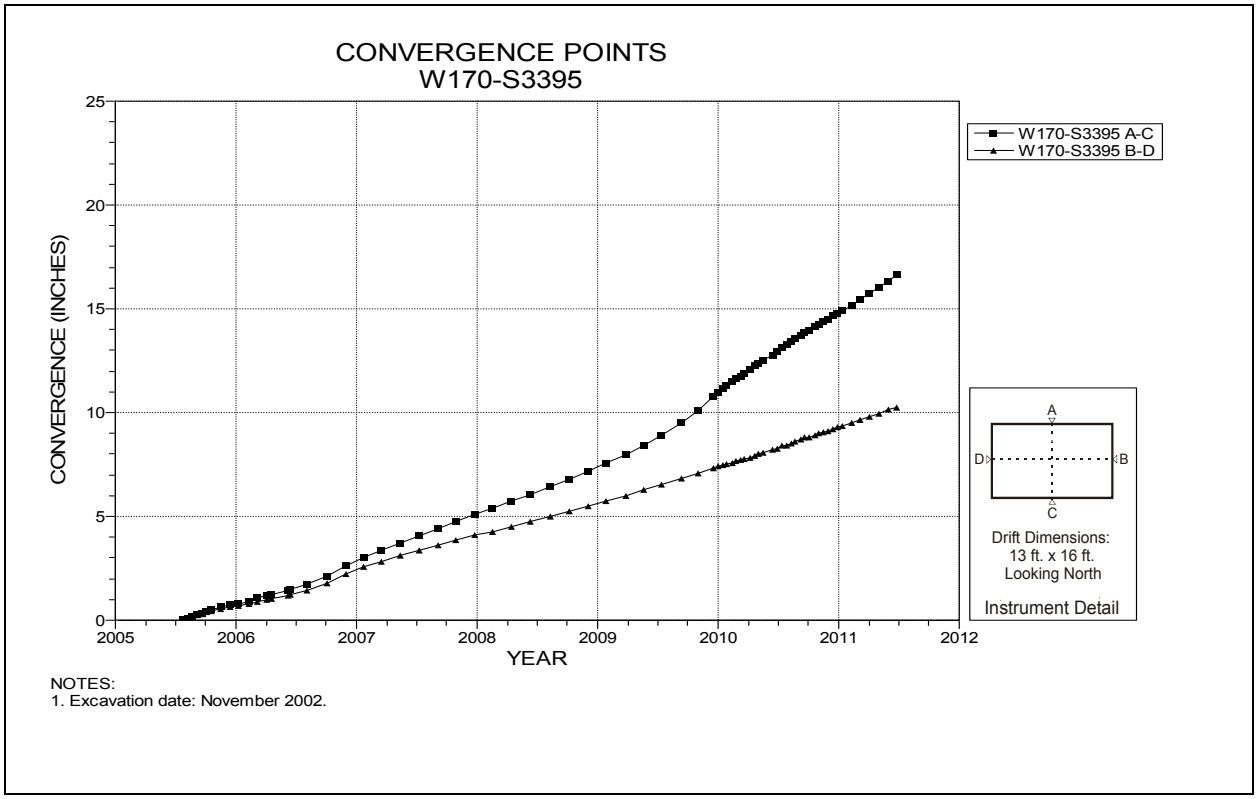


Figure 4-198 Convergence Point Array
W170 S3395 – All Chords

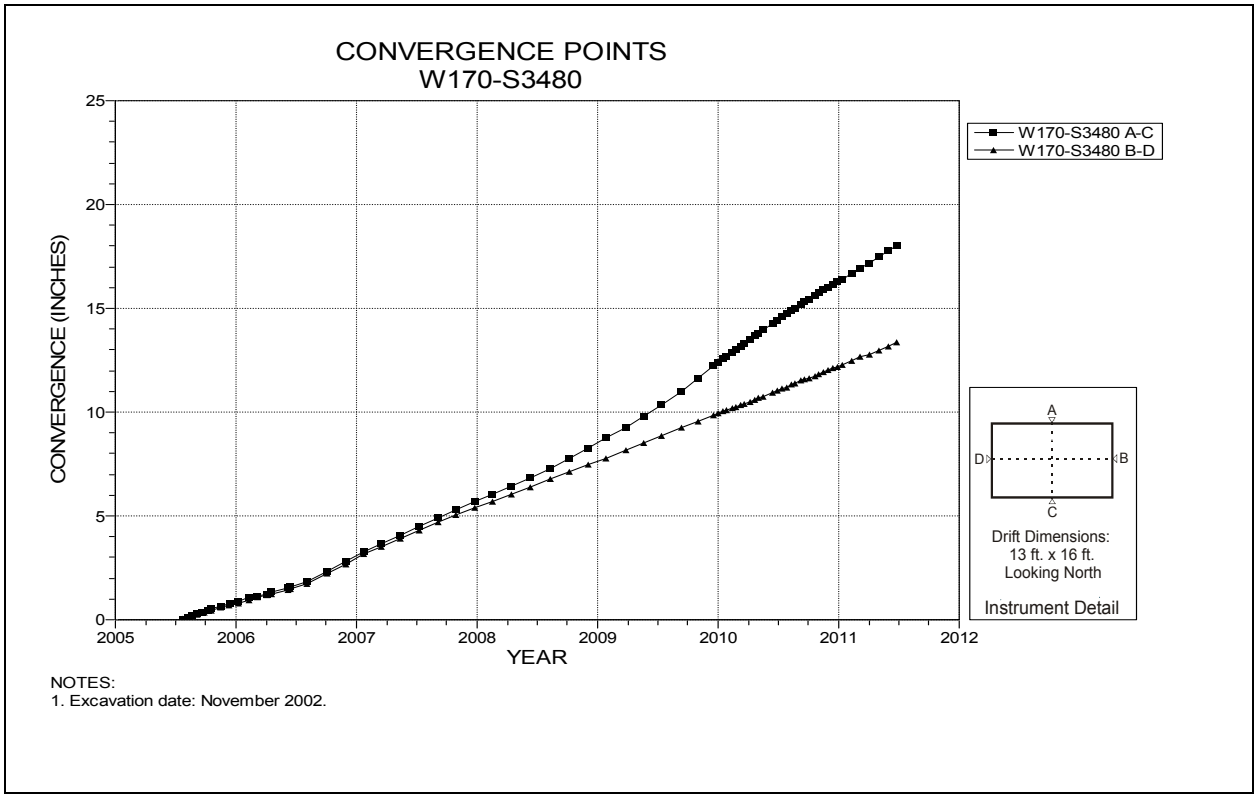


Figure 4-199 Convergence Point Array
W170 S3480 – All Chords

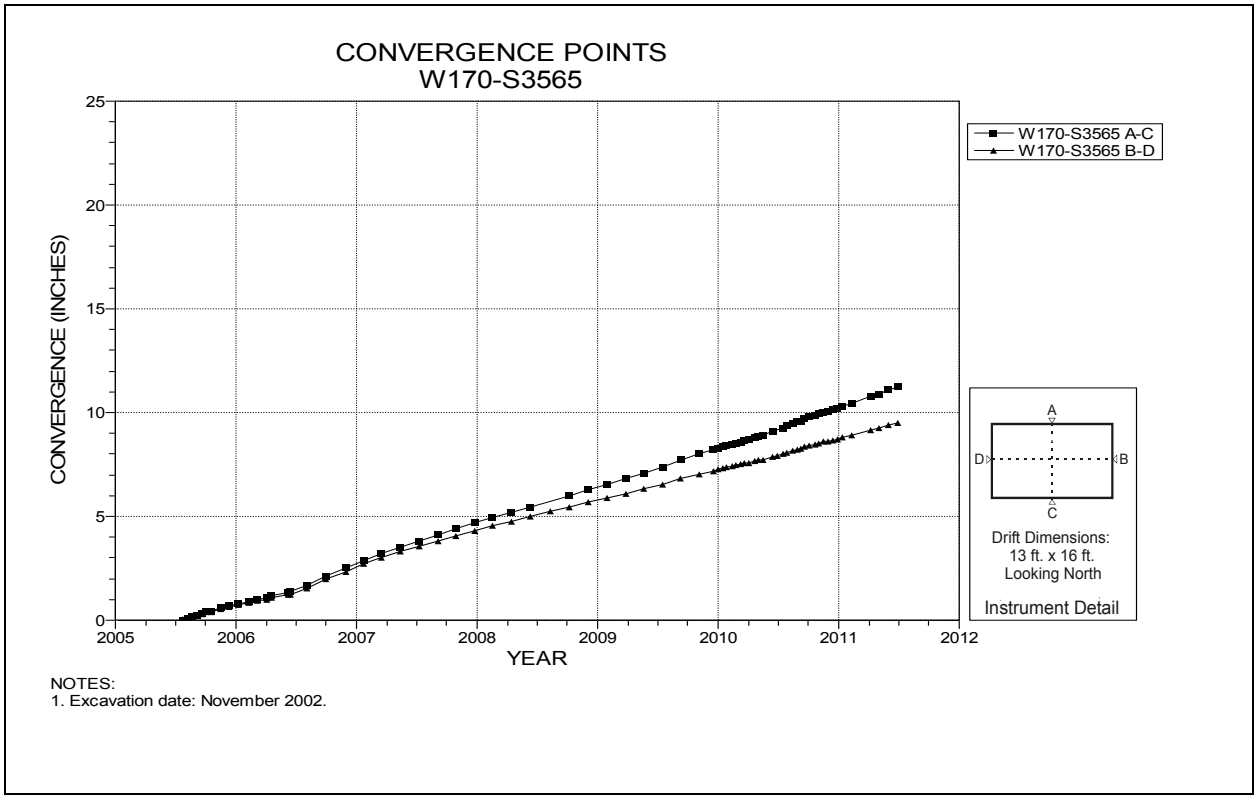


Figure 4-200 Convergence Point Array
W170 S3565 – All Chords

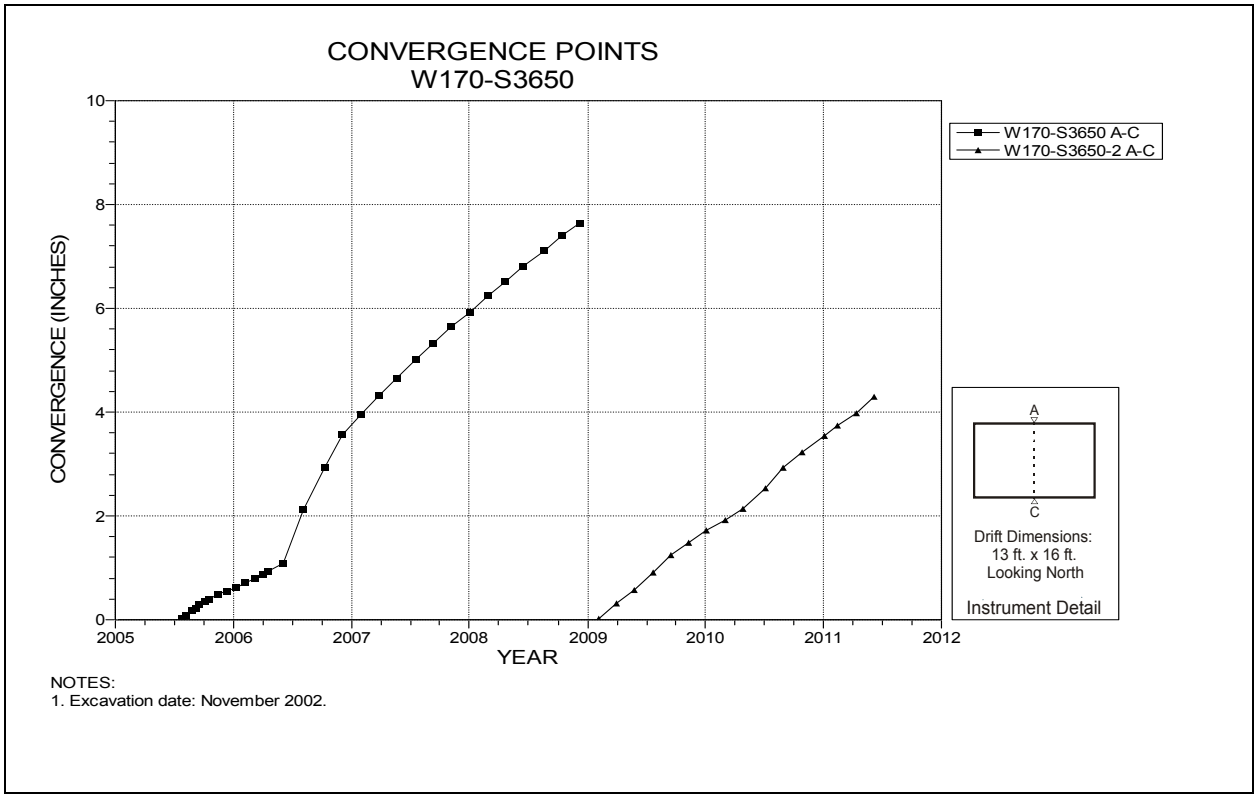


Figure 4-201 Convergence Point Array
W170 S3650 – Roof to Floor

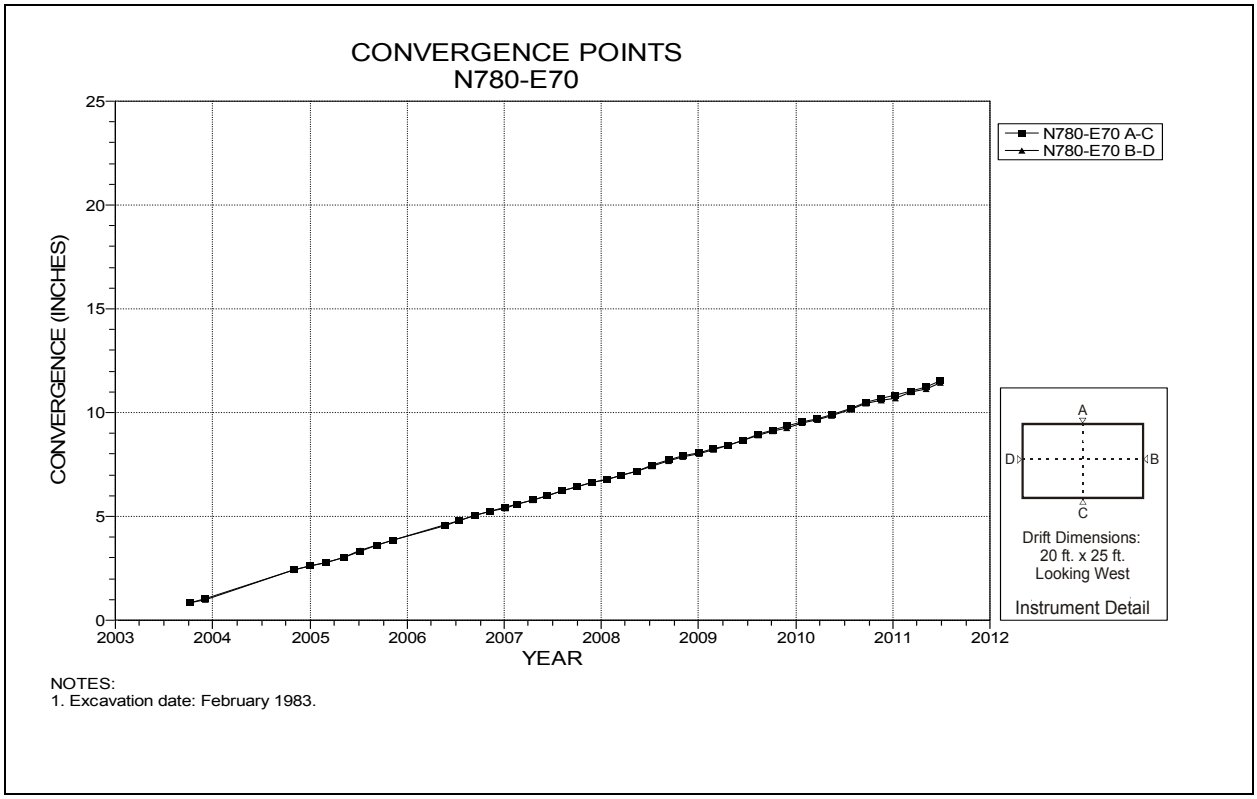


Figure 4-202 Convergence Point Array
N780 E70 – All Chords

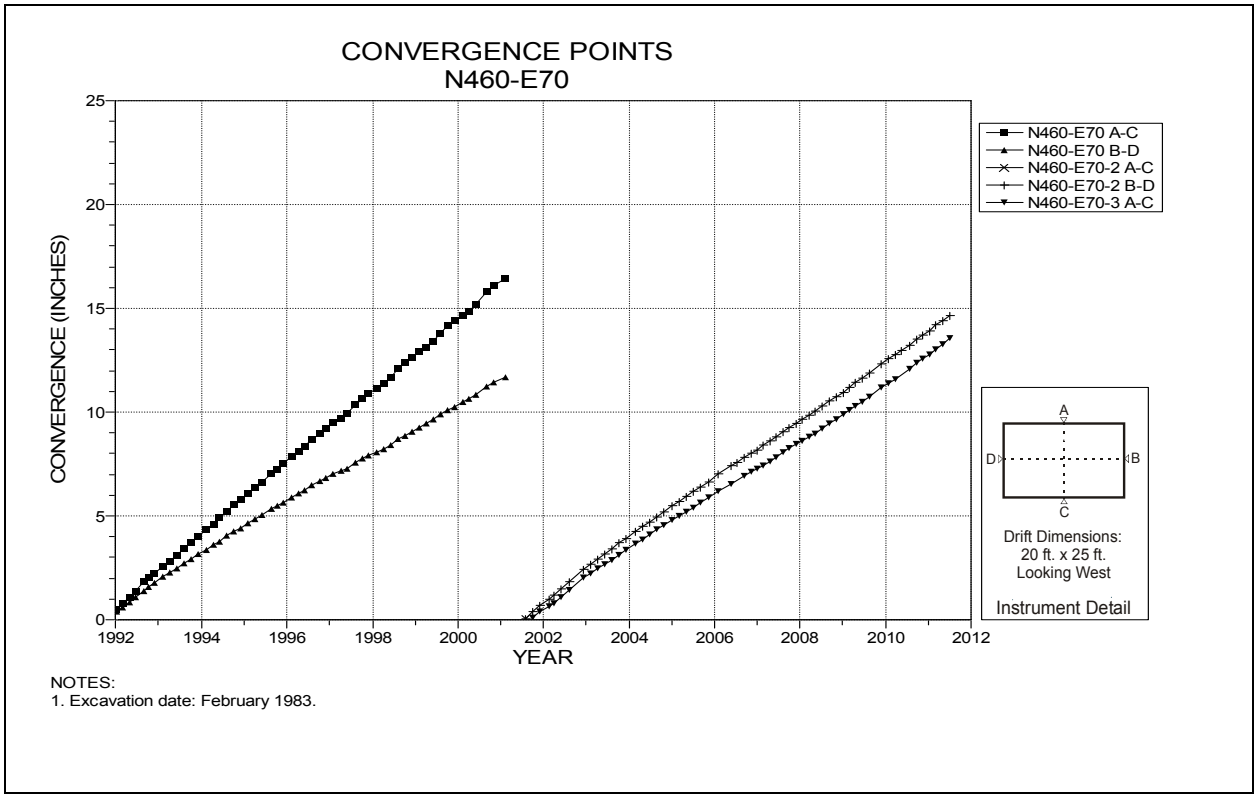


Figure 4-203 Convergence Point Array
N460 E70 – All Chords

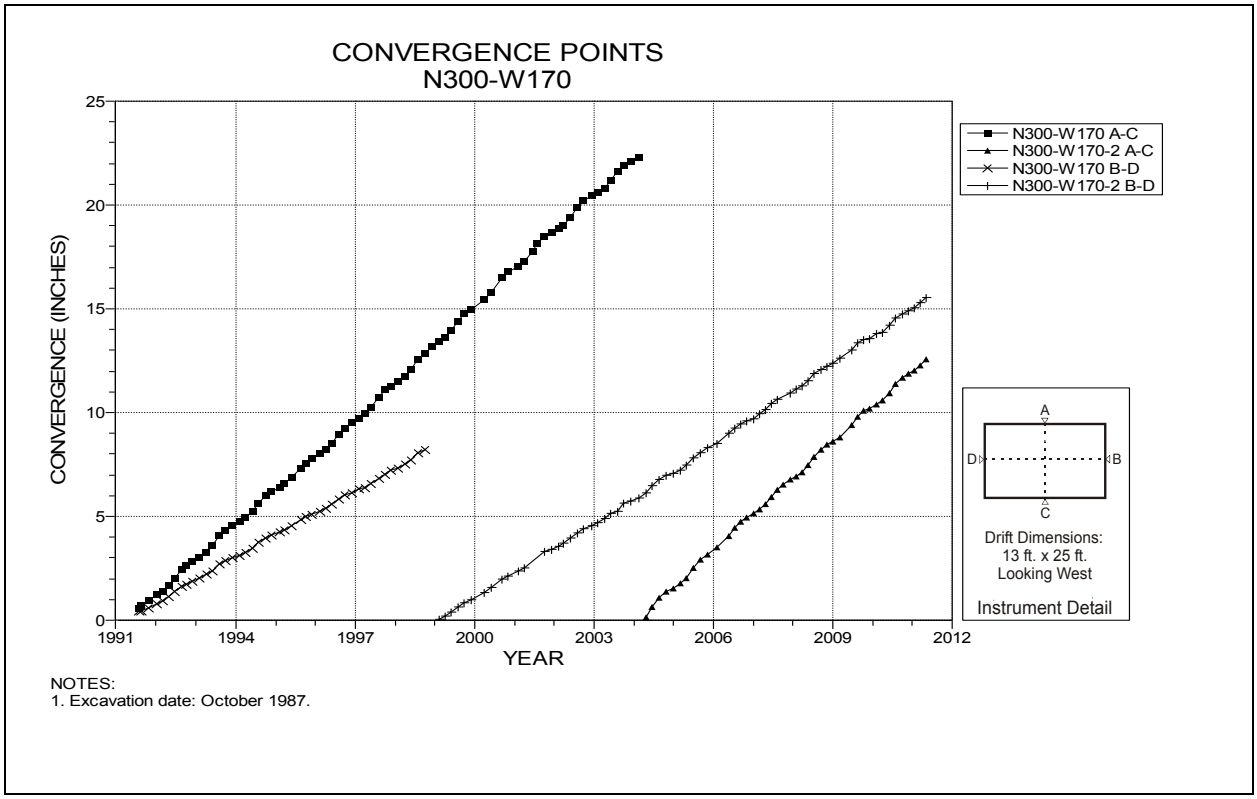


Figure 4-204 Convergence Point Array
N300 W170 – All Chords

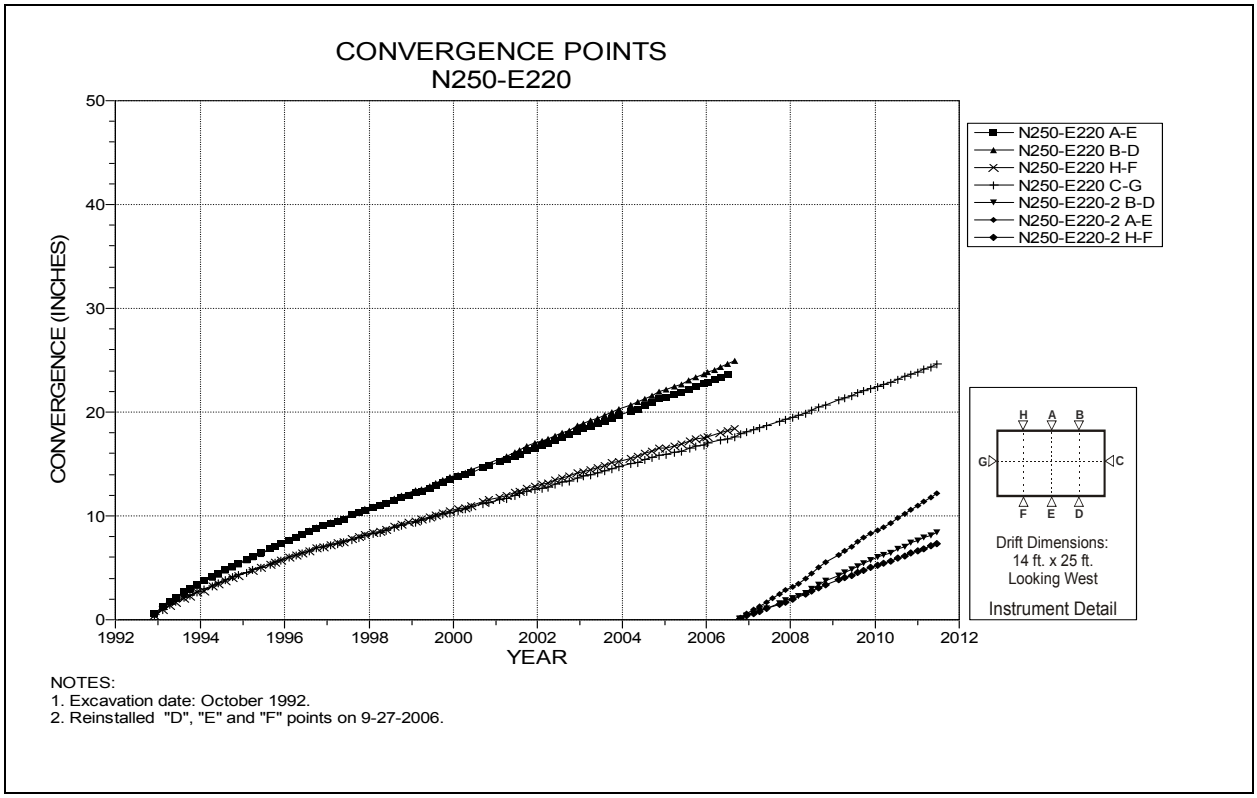


Figure 4-205 Convergence Point Array
N250 E220 – All Chords

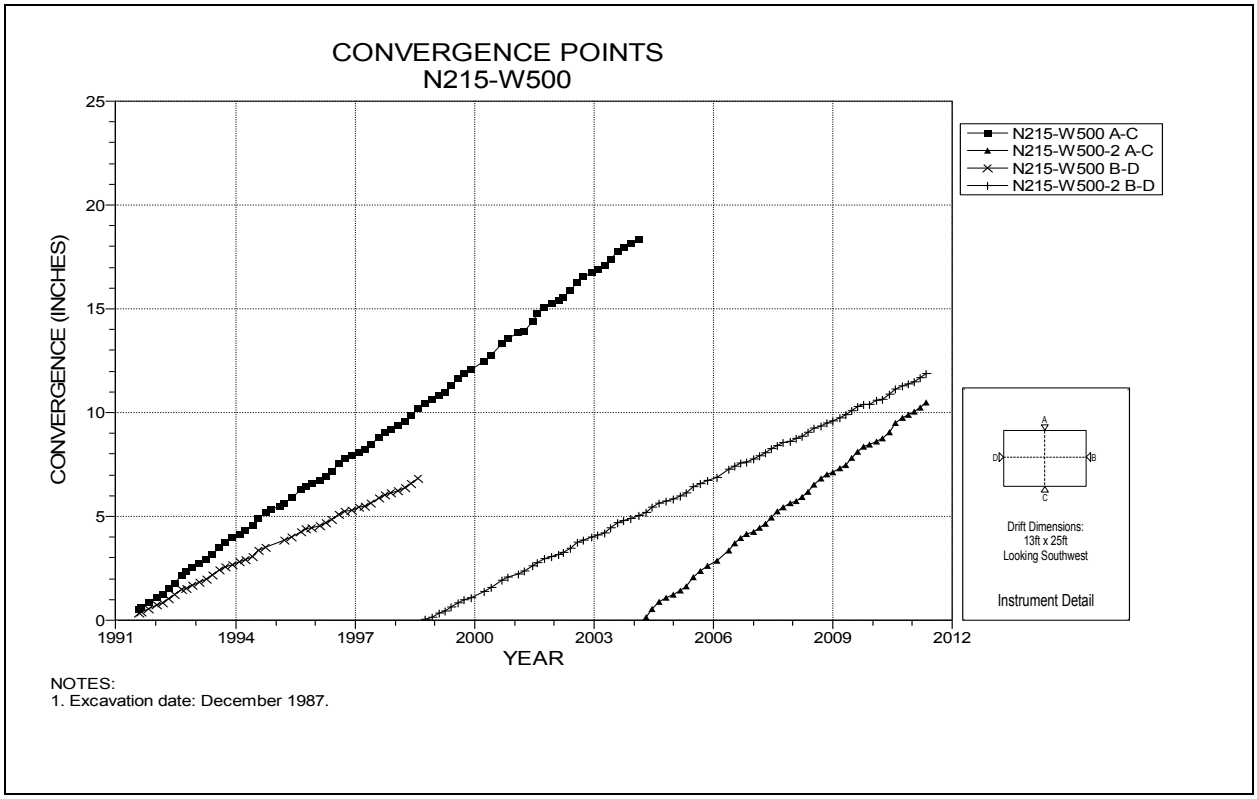


Figure 4-206 Convergence Point Array
N215 W500 – All Chords

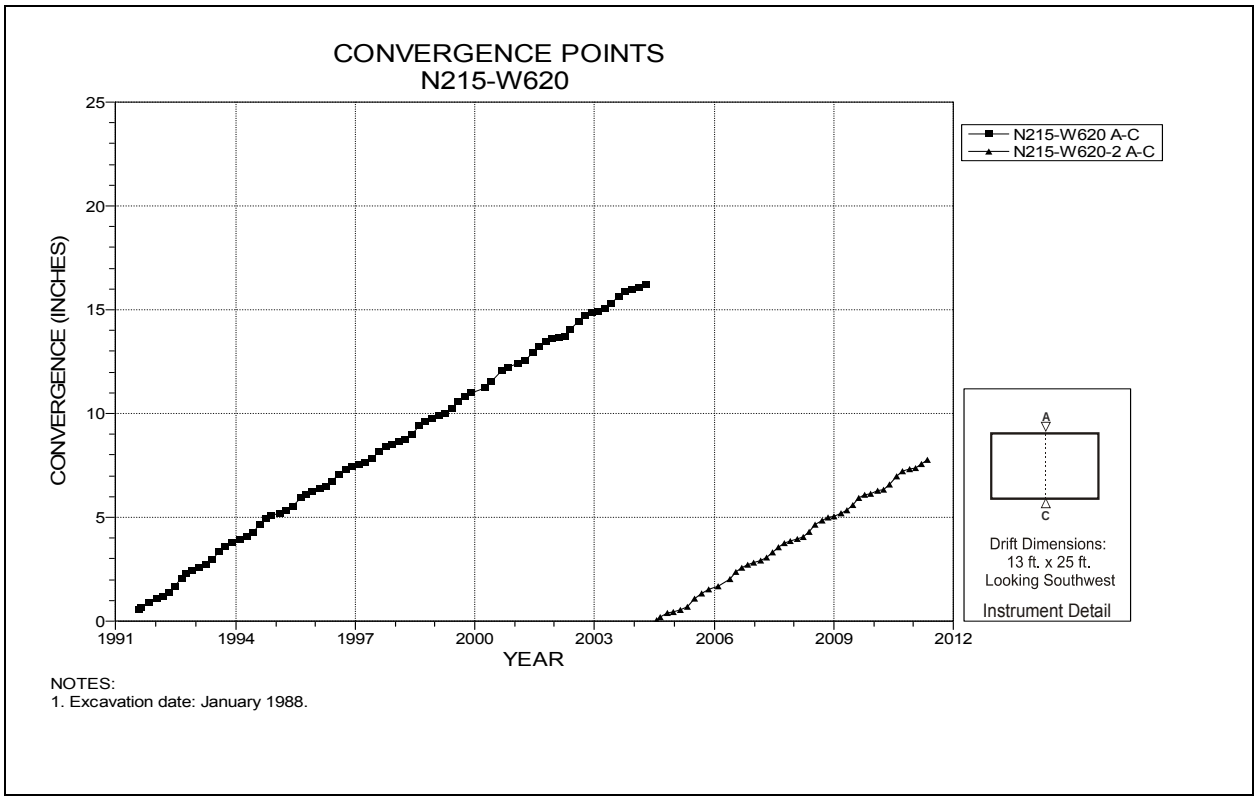


Figure 4-207 Convergence Point Array N215 W620 – Roof to Floor

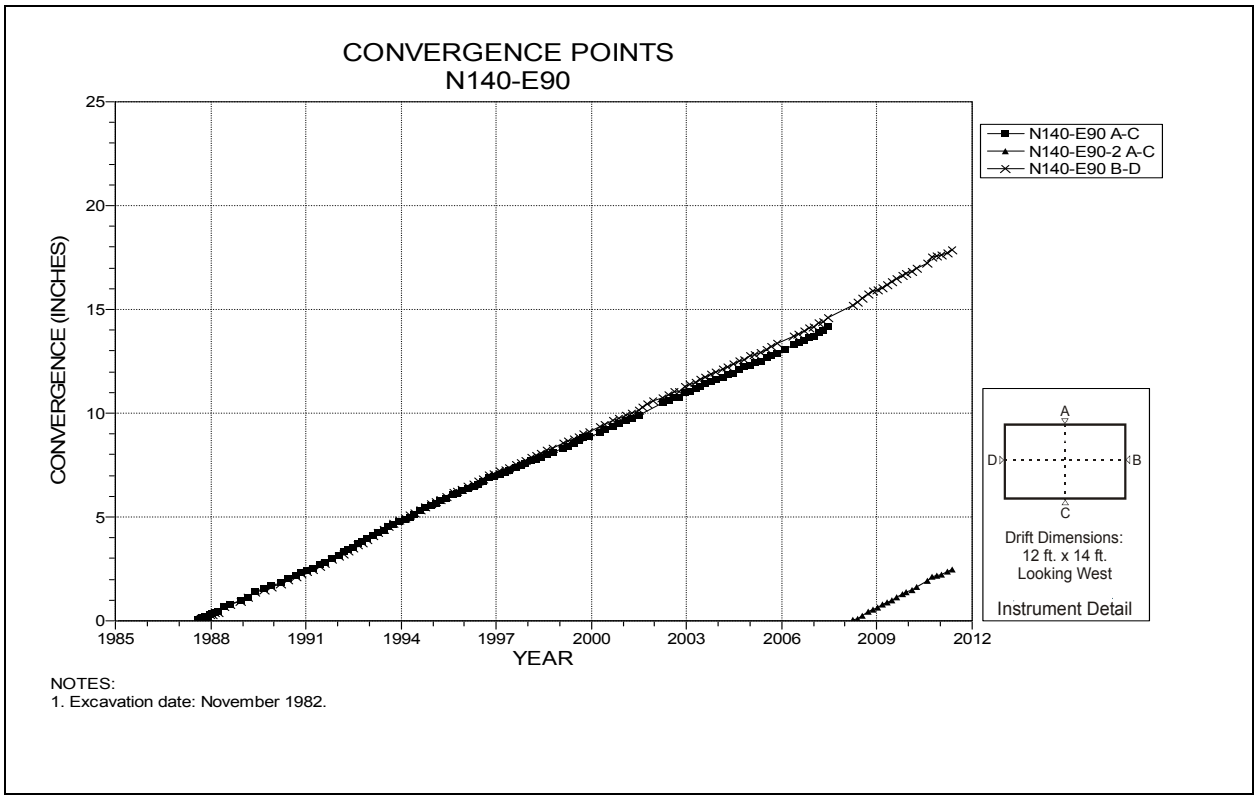
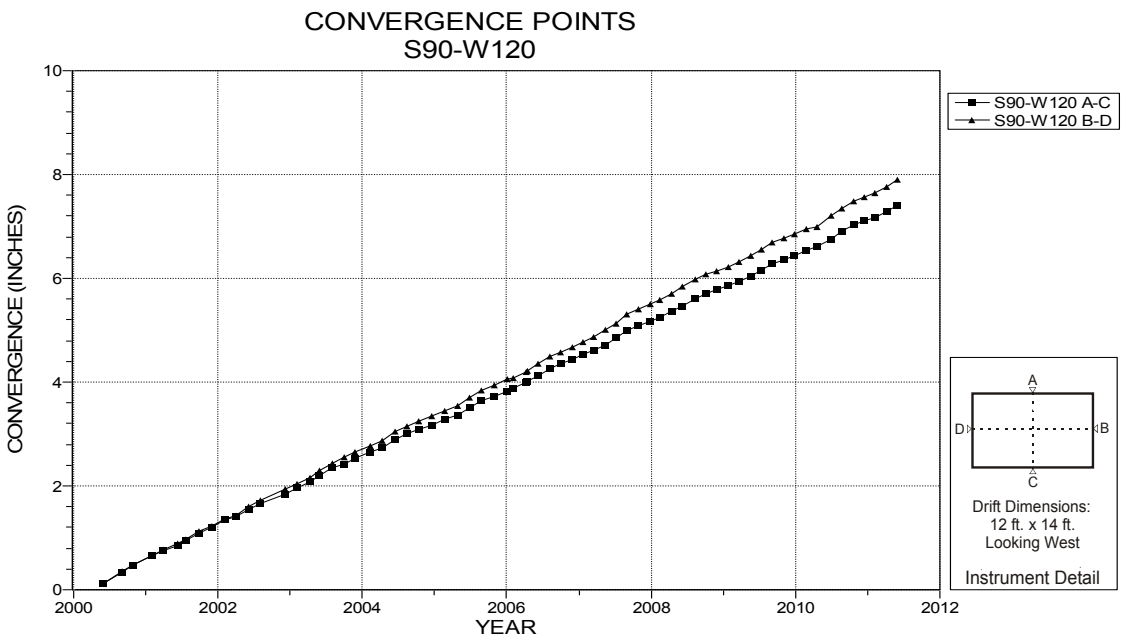
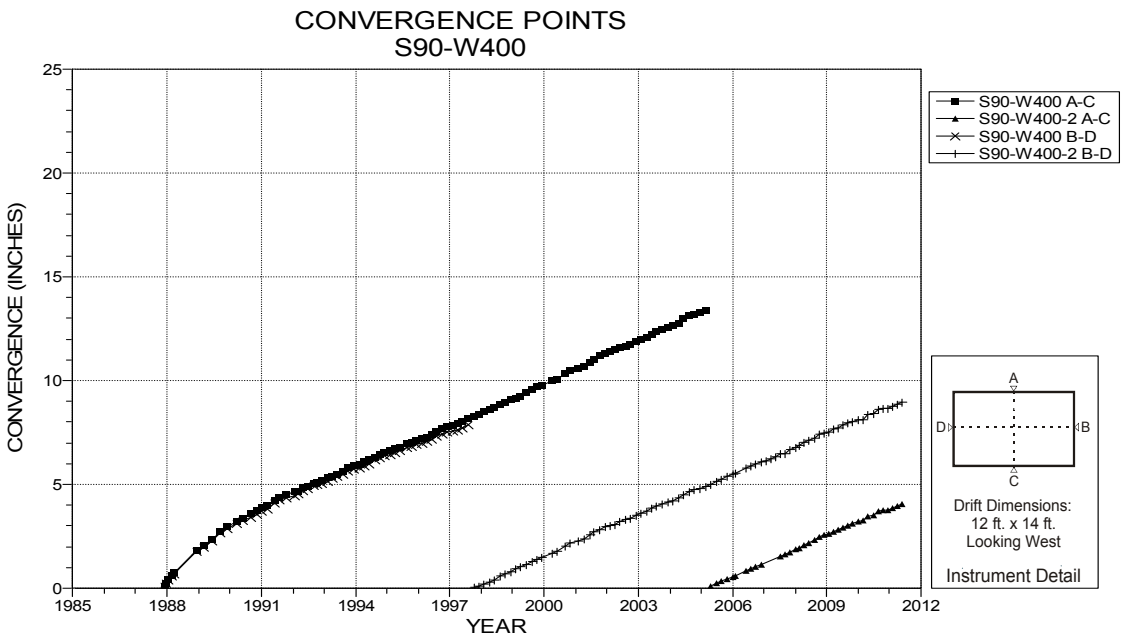


Figure 4-208 Convergence Point Array
N140 E90 – All Chords



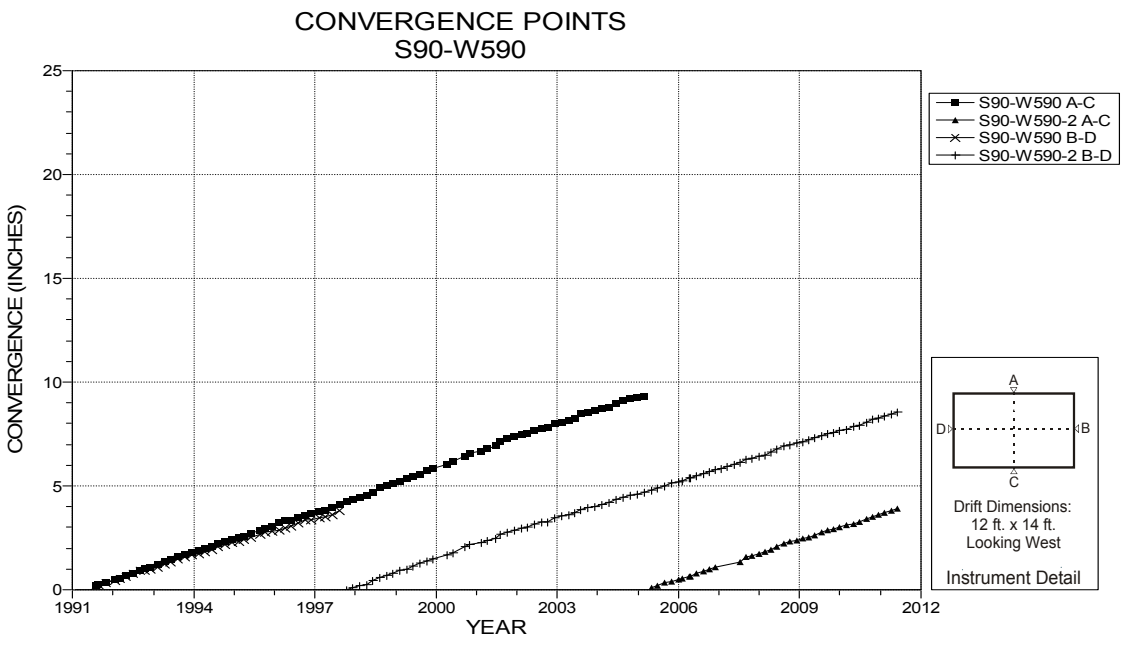
NOTES:
1. Excavation date: July 1985.

Figure 4-209 Convergence Point Array
S90 W120 – All Chords



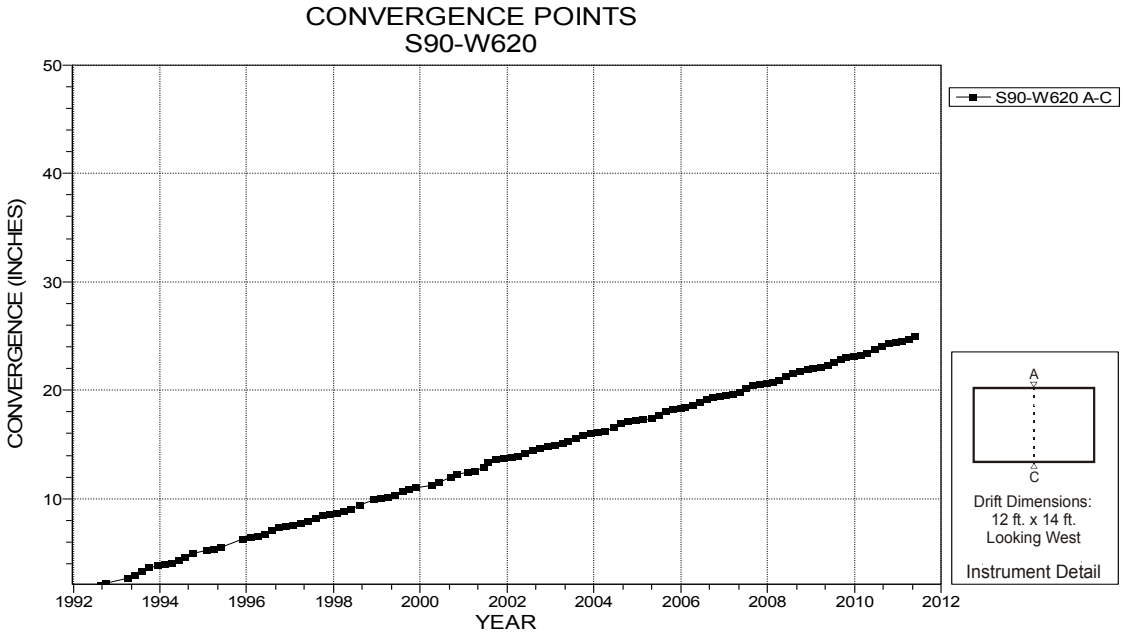
NOTES:
1. Excavation date: October 1987.

Figure 4-210 Convergence Point Array
S90 W400 – All Chords



NOTES:
1. Excavation date: November 1987.

Figure 4-211 Convergence Point Array
S90 W590 – All Chords



NOTES:
1. Excavation date: January 1988.

Figure 4-212 Convergence Point Array
S90 W620 – Roof to Floor

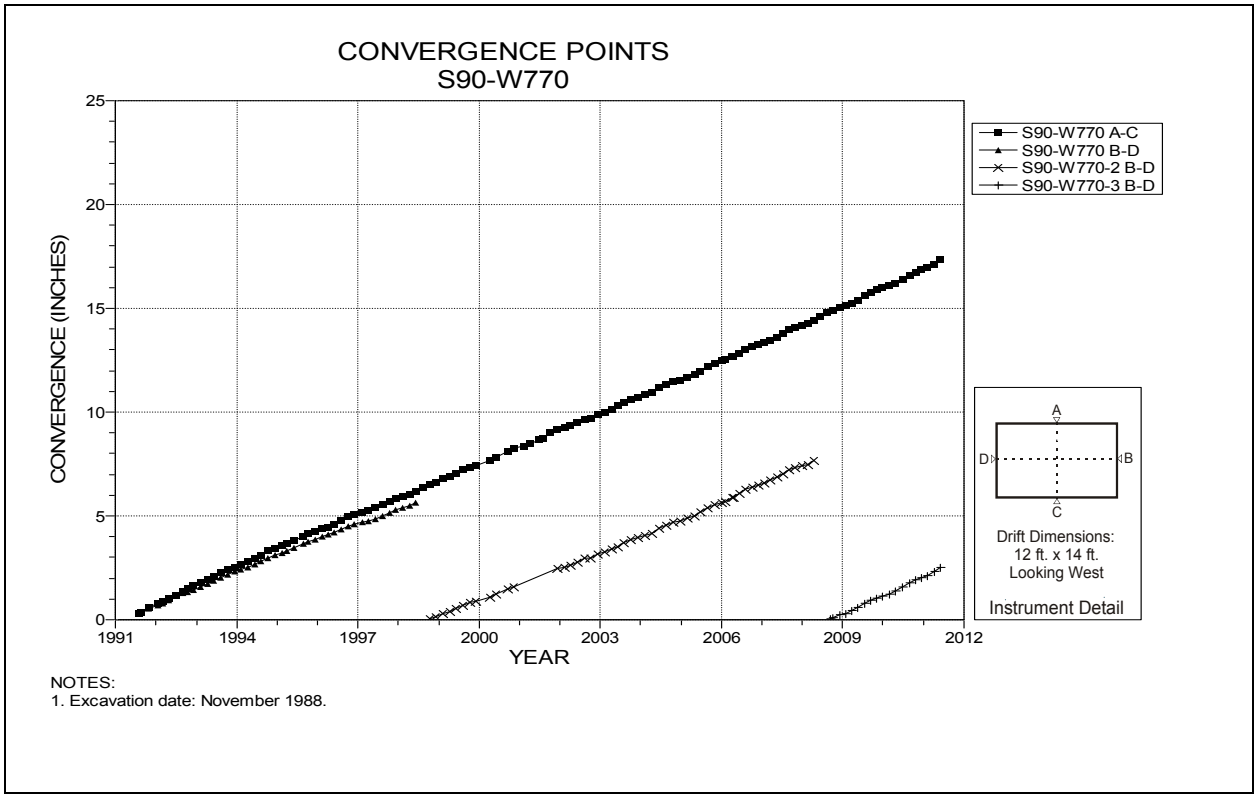


Figure 4-213 Convergence Point Array
S90 W770 – All Chords

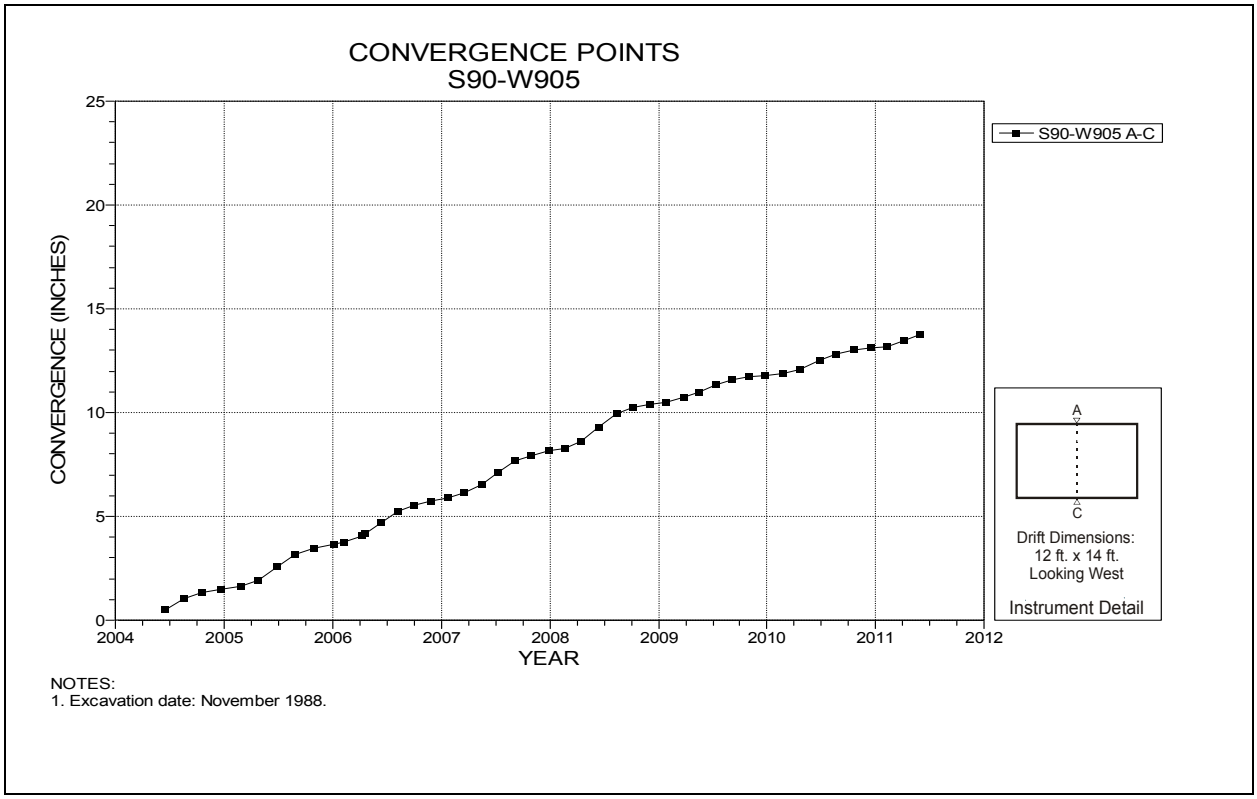


Figure 4-214 Convergence Point Array
S90 W905 – Roof to Floor

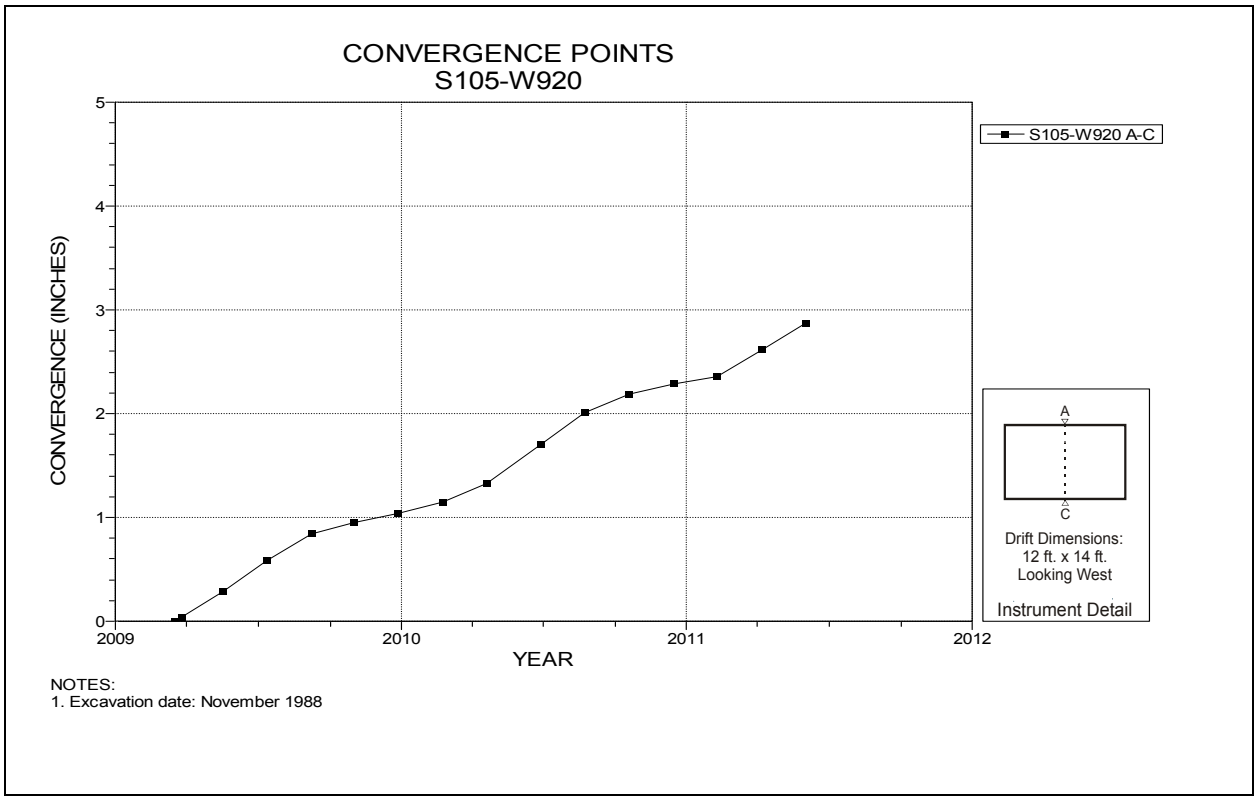


Figure 4-215 Convergence Point Array
S105 W920 – Roof to Floor

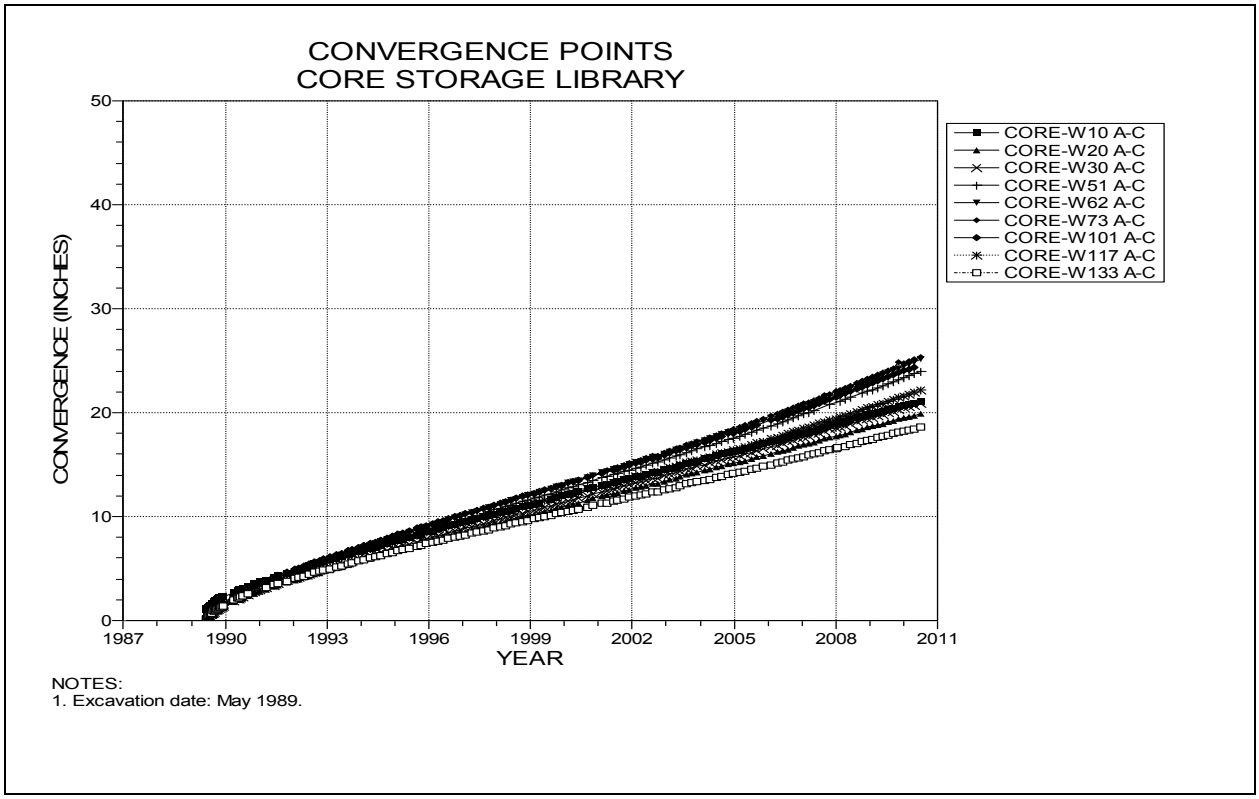


Figure 4-216 Convergence Point Array
S400 Core Storage Library – All Chords

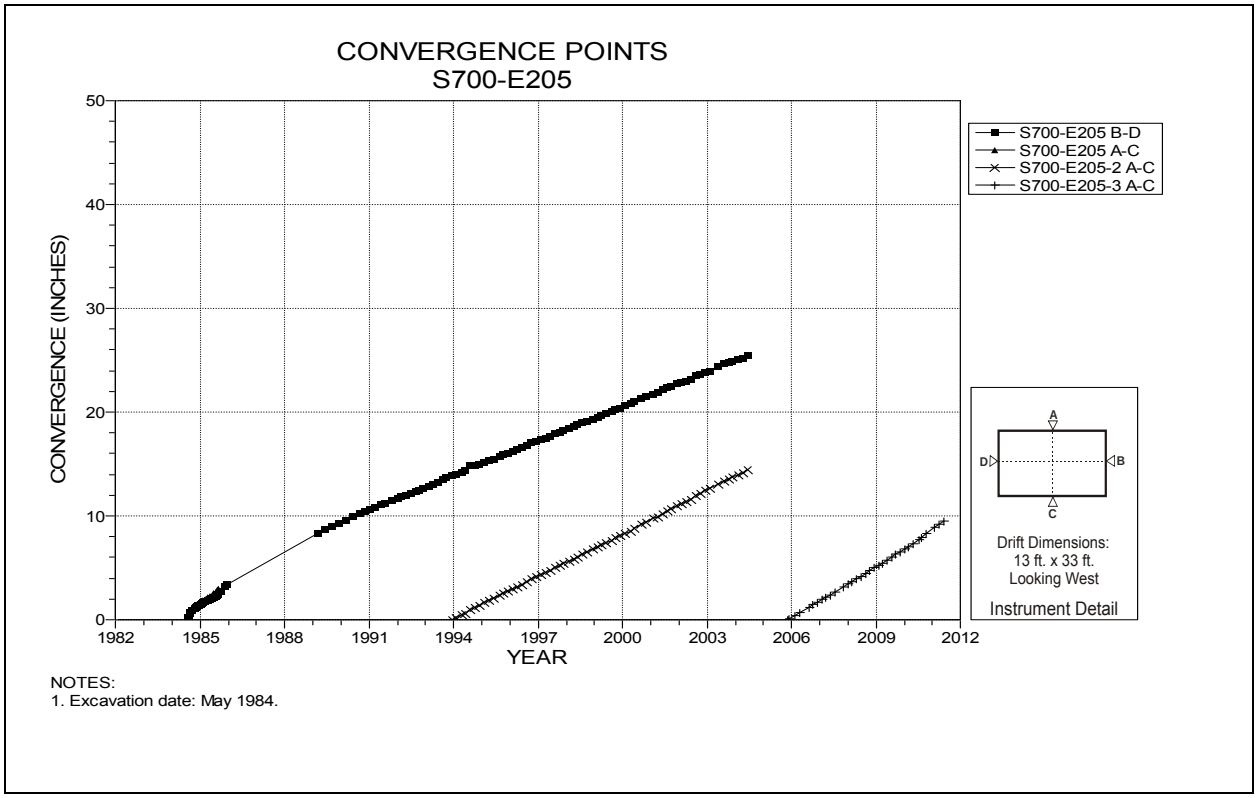


Figure 4-217 Convergence Point Array
S700 E205 – All Chords

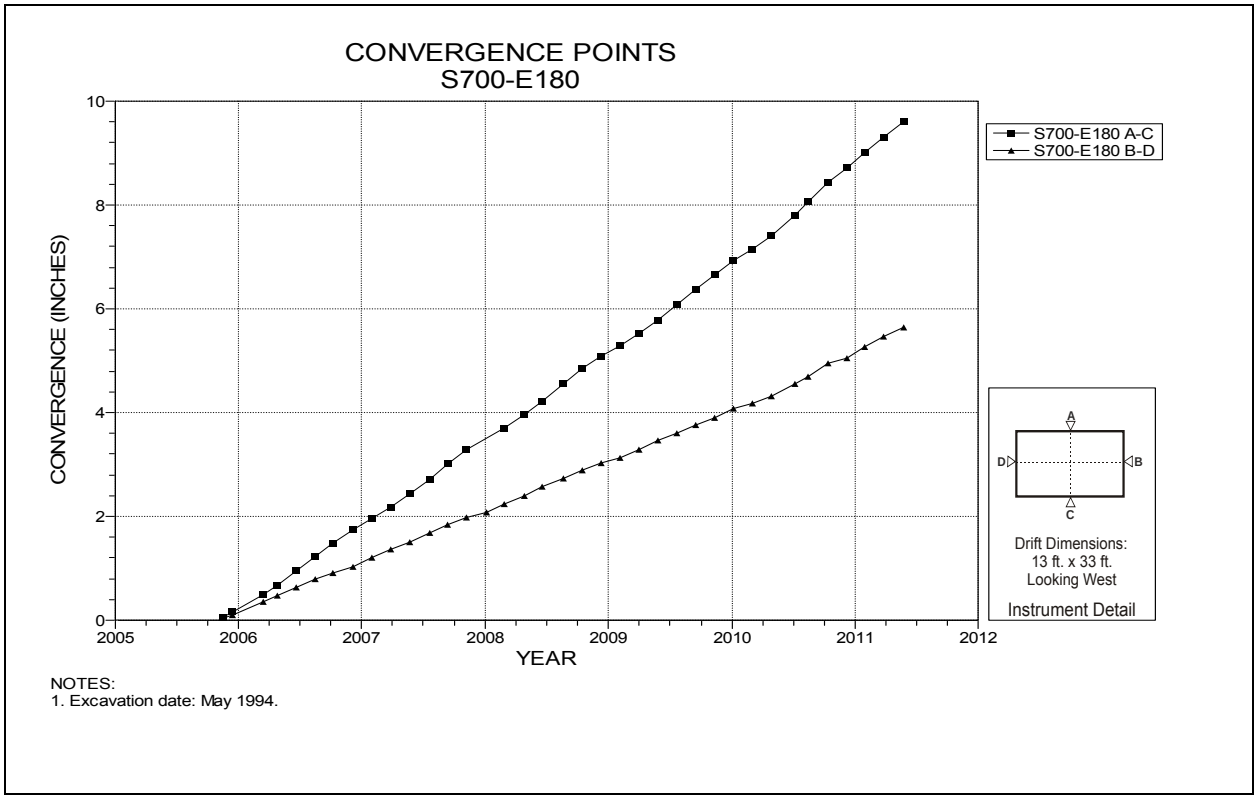


Figure 4-218 Convergence Point Array
S700 E180 – All Chords

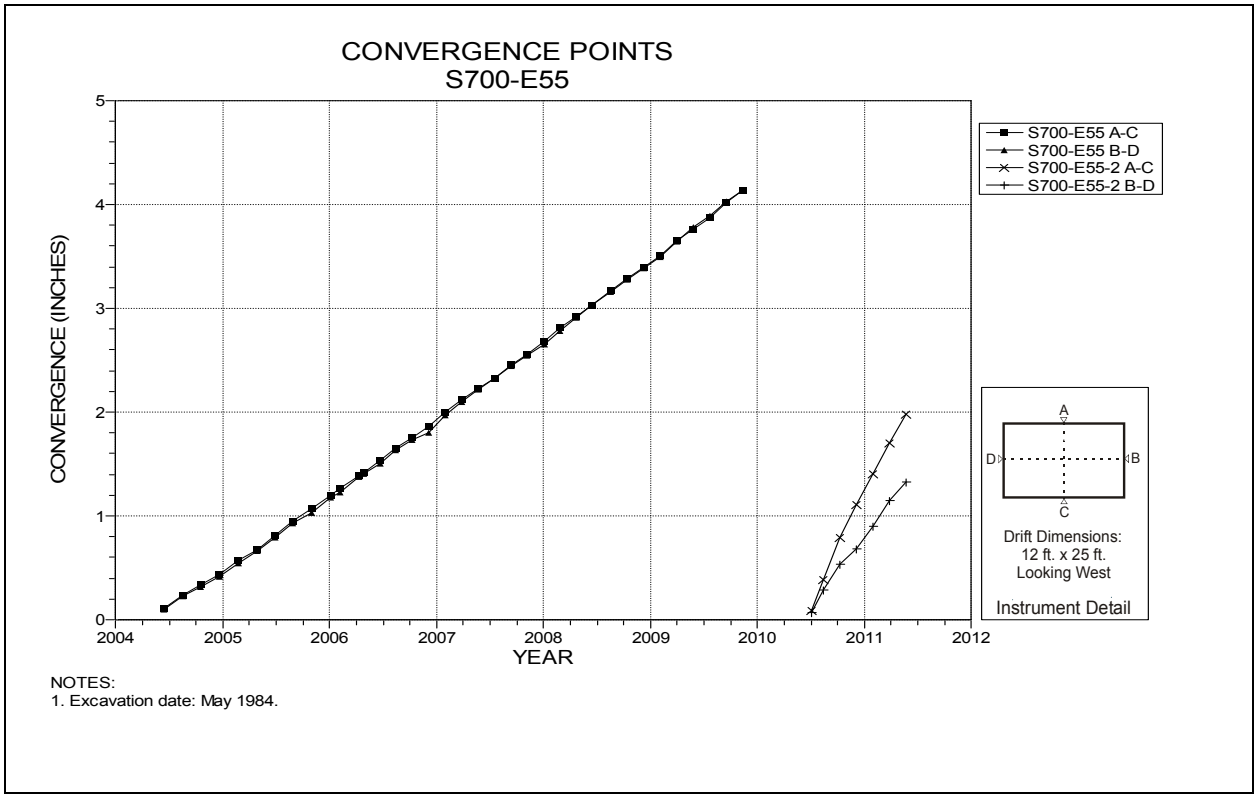


Figure 4-219 Convergence Point Array
S700 E55 – All Chords

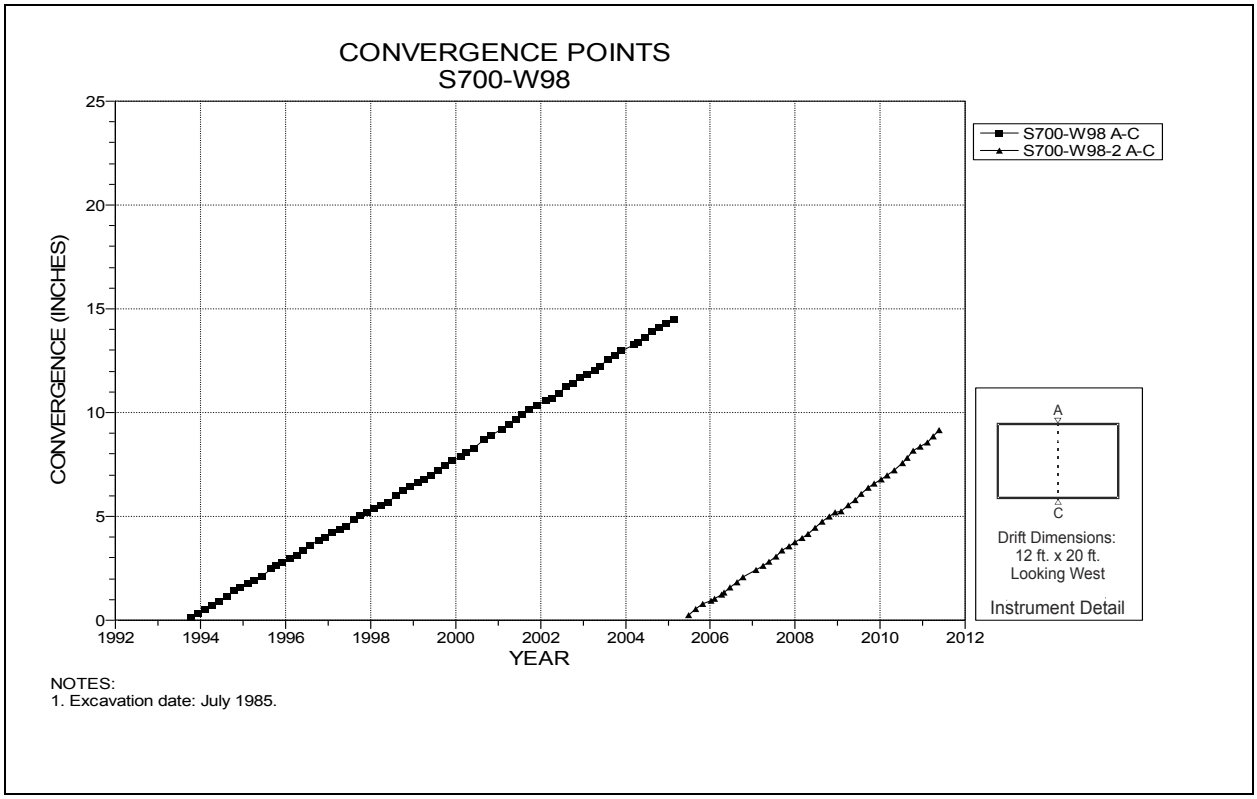


Figure 4-220 Convergence Point Array
S700 W98 – Roof to Floor

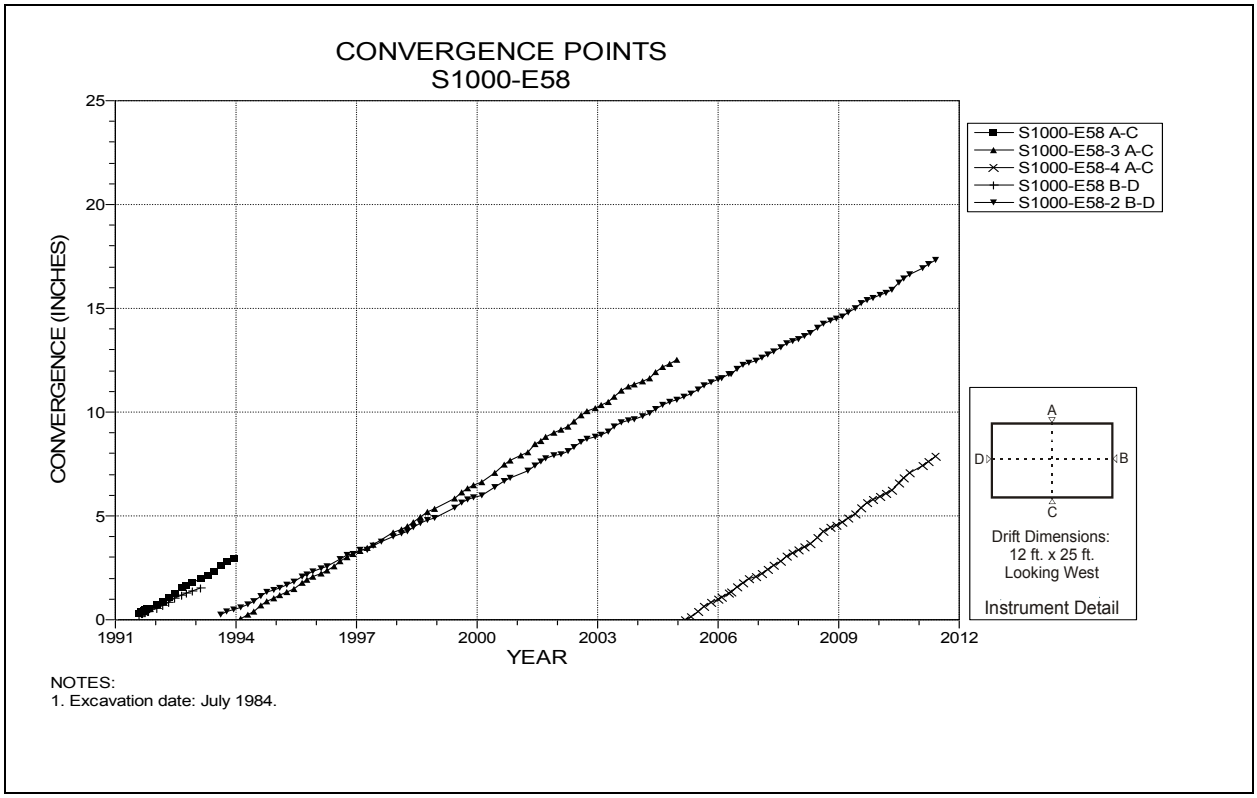


Figure 4-221 Convergence Point Array
S1000 E58 – All Chords

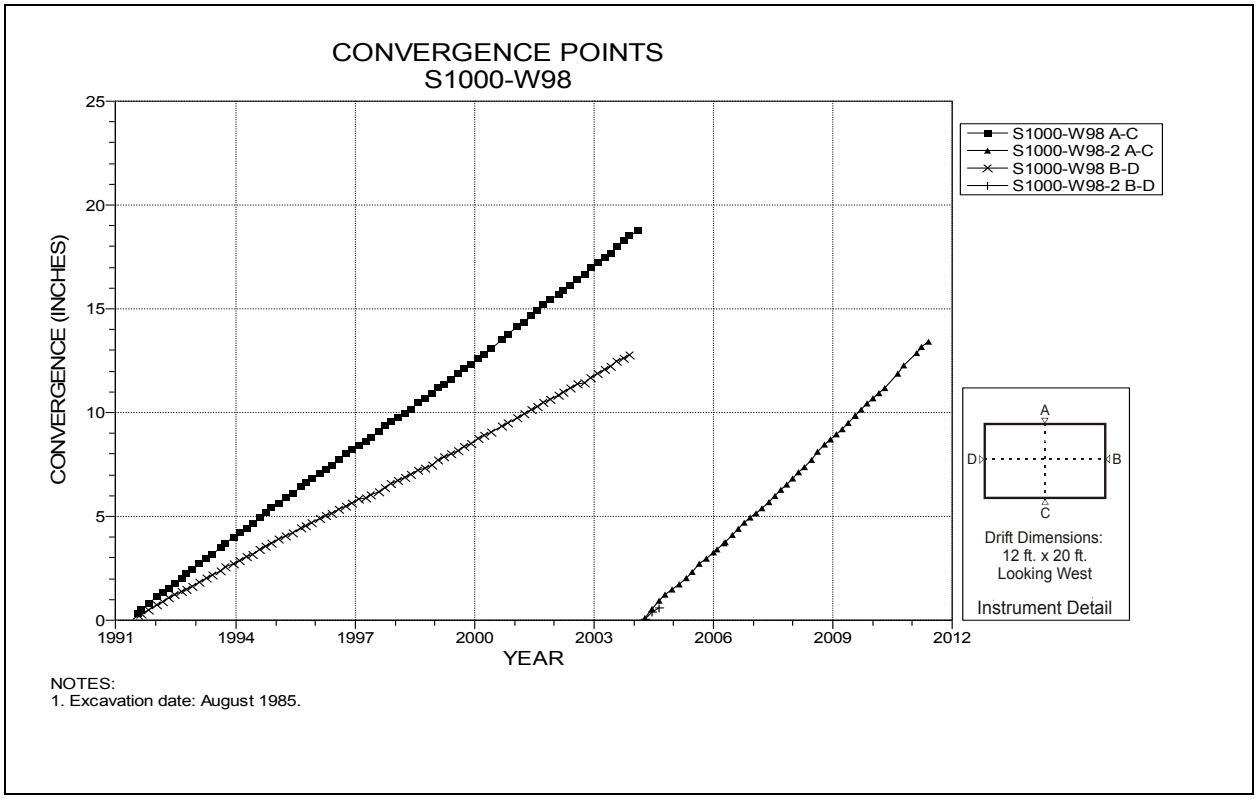


Figure 4-222 Convergence Point Array
S1000 W98 – All Chords

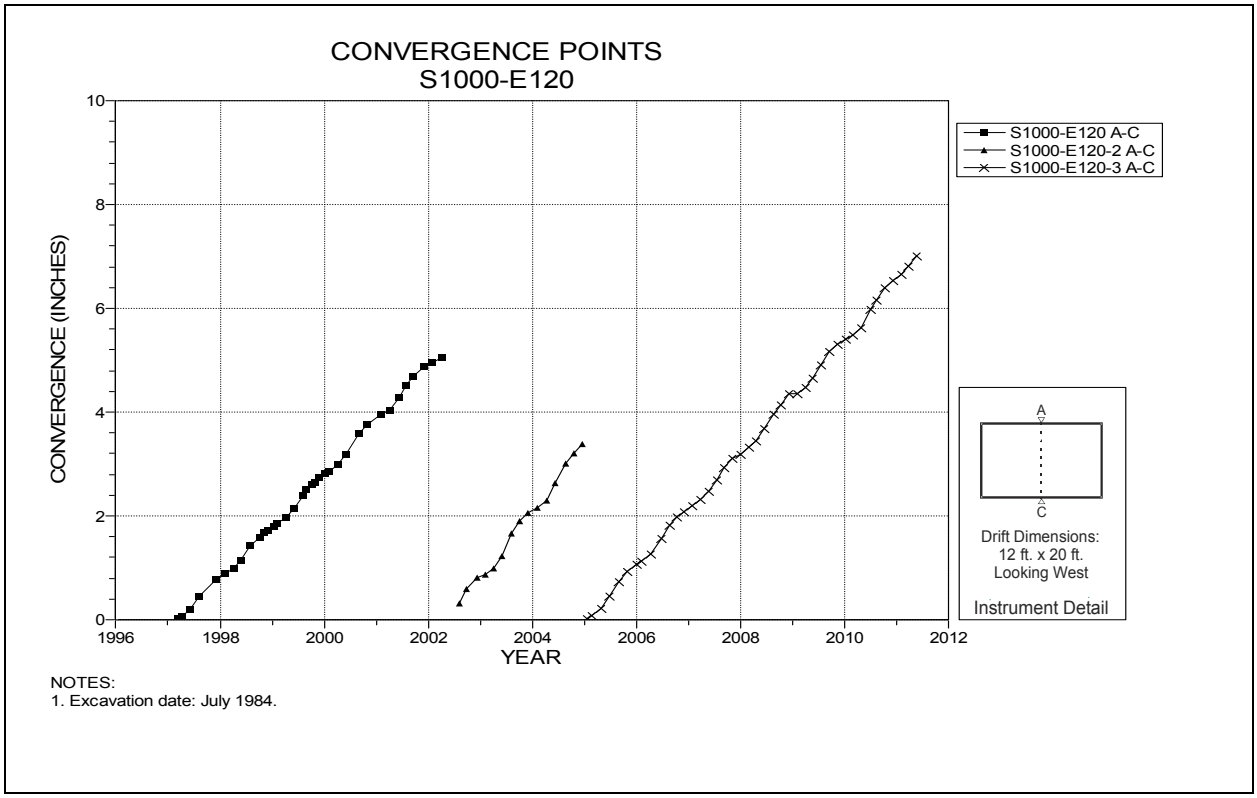


Figure 4-223 Convergence Point Array
S1000 E120 – Roof to Floor

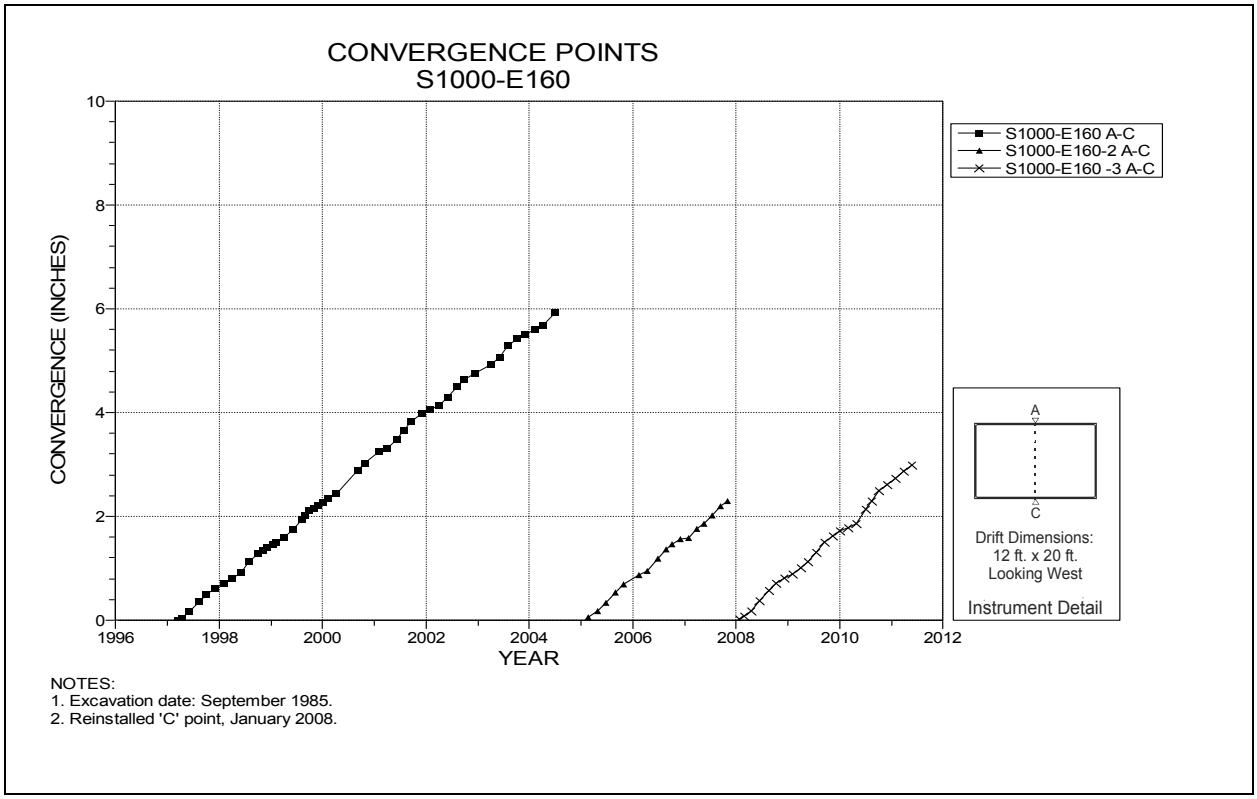


Figure 4-224 Convergence Point Array
S1000 E160 – Roof to Floor

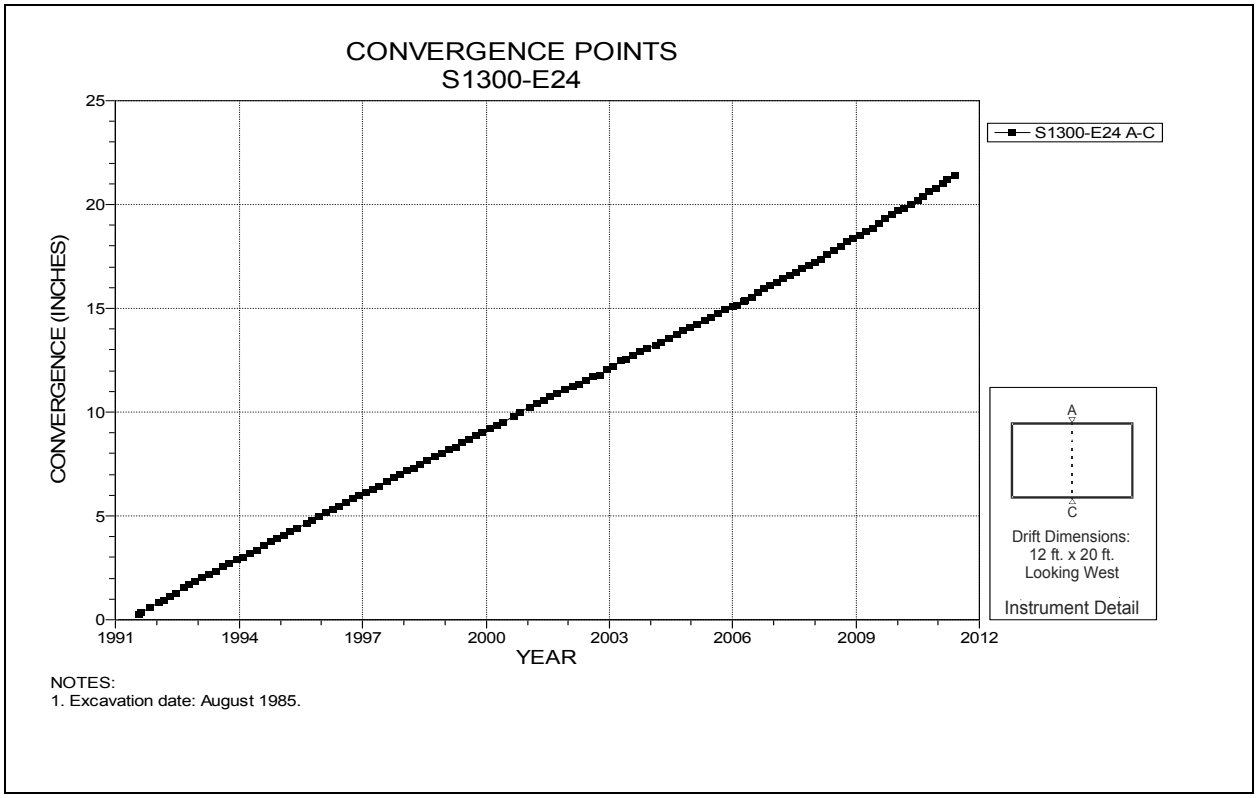


Figure 4-225 Convergence Point Array
S1300 E24 – Roof to Floor

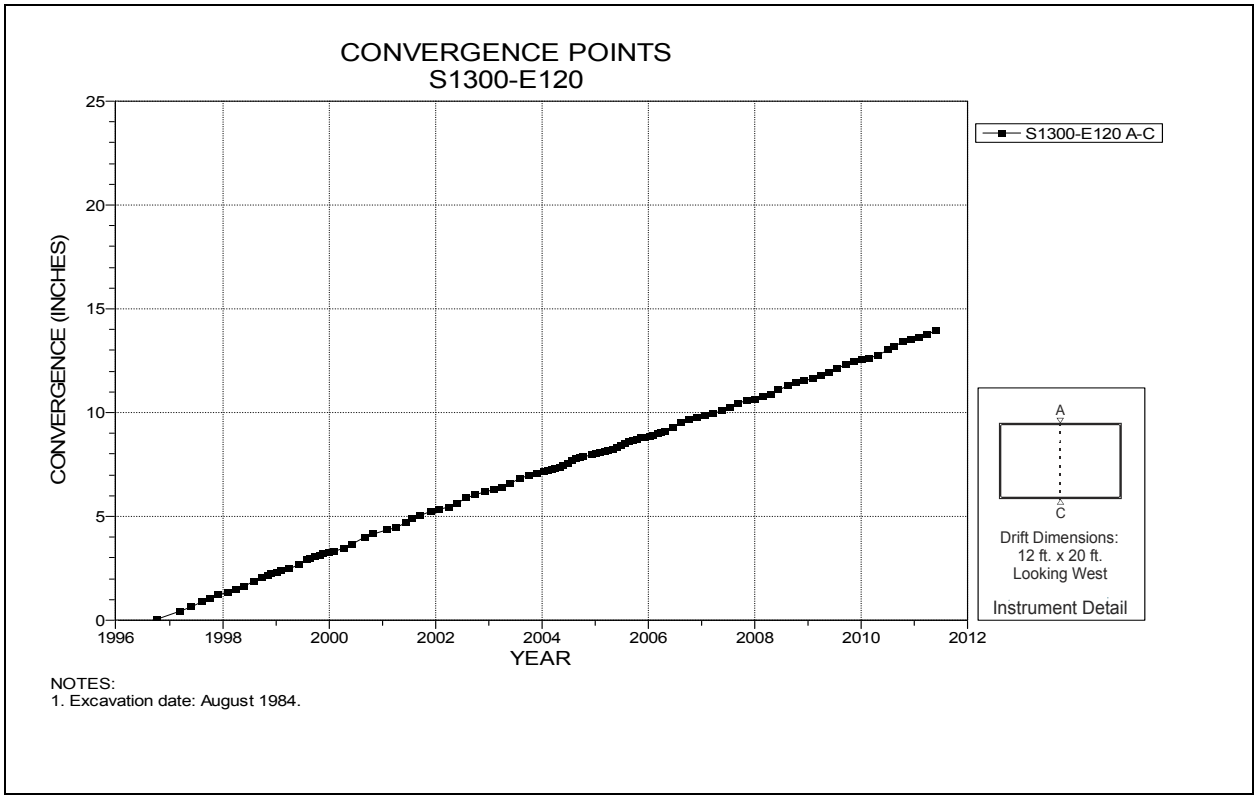


Figure 4-226 Convergence Point Array
S1300 E120 – Roof to Floor

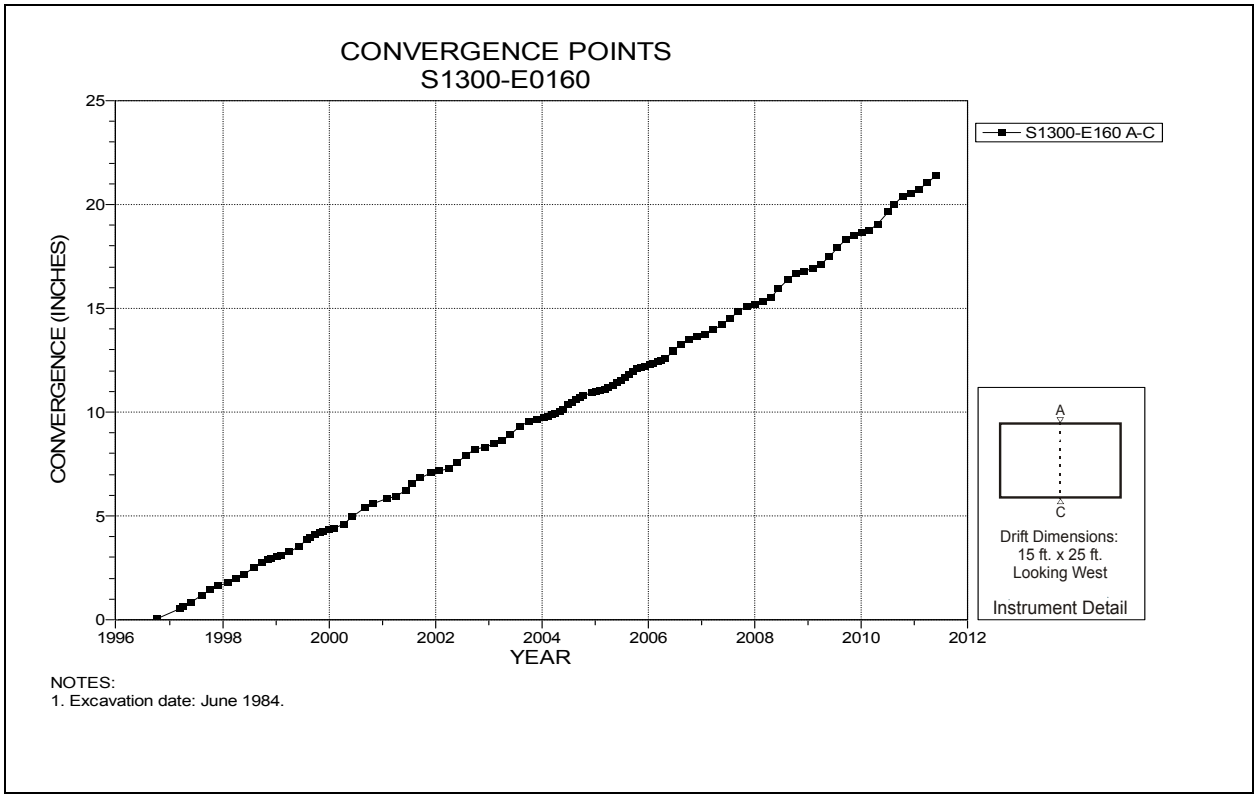


Figure 4-227 Convergence Point Array
S1300 E160 – Roof to Floor

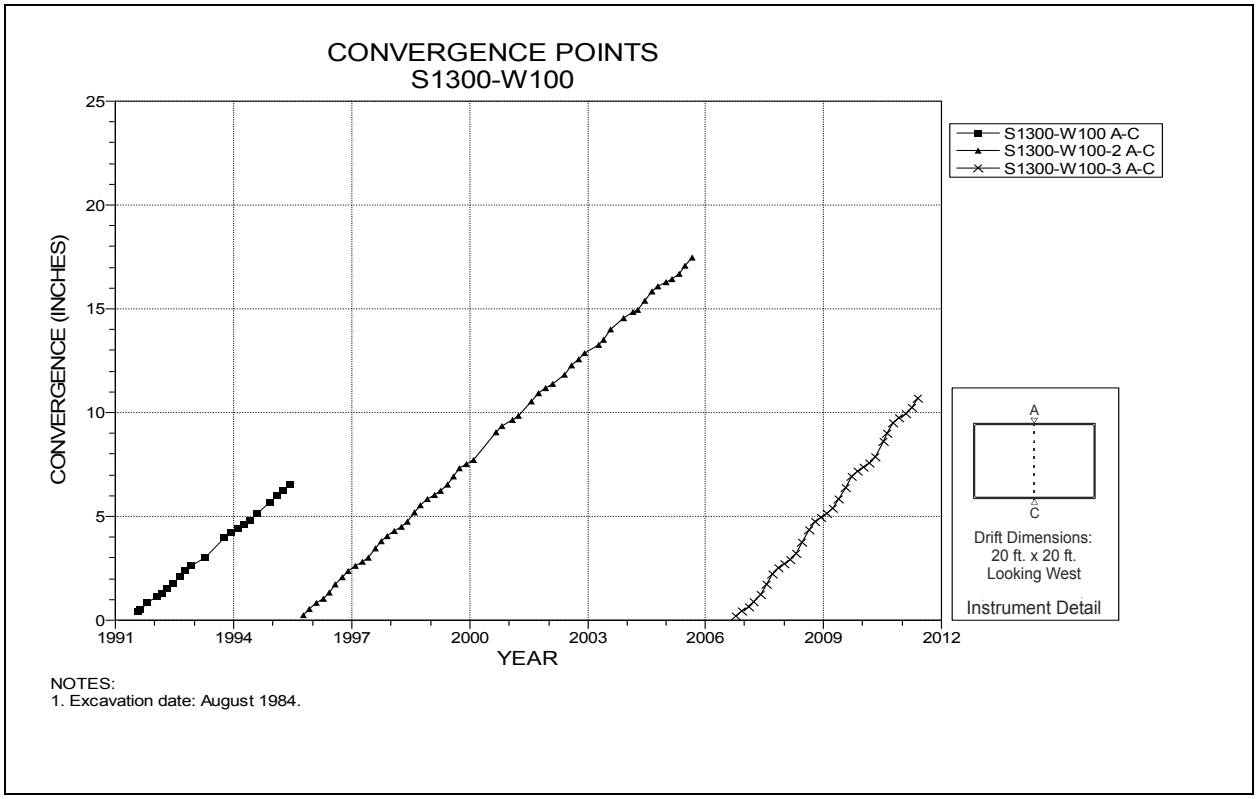
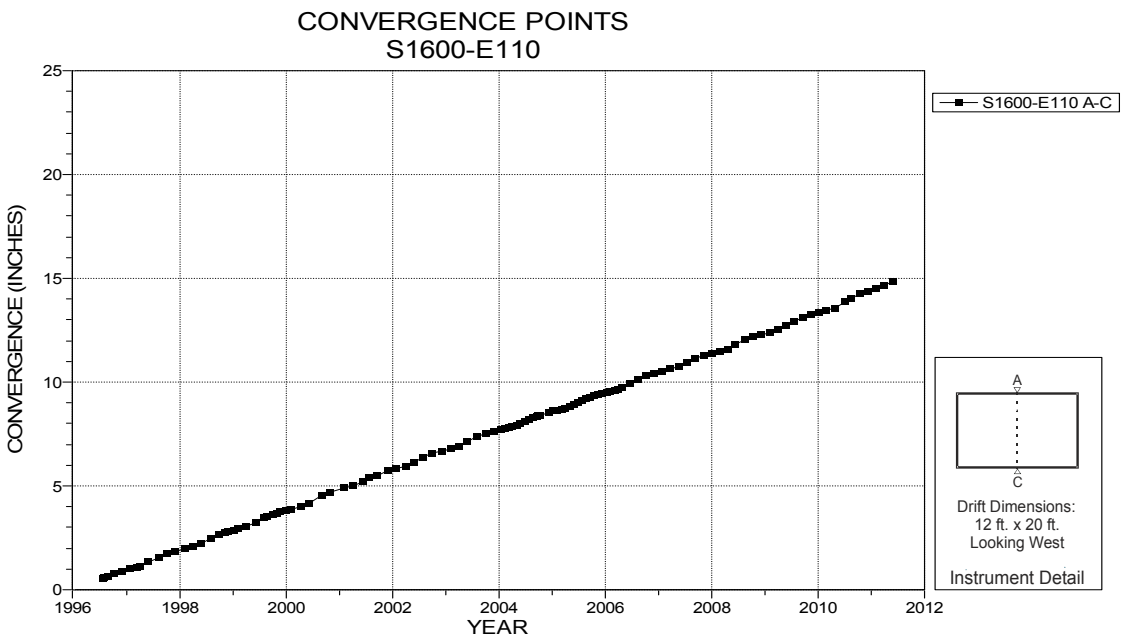
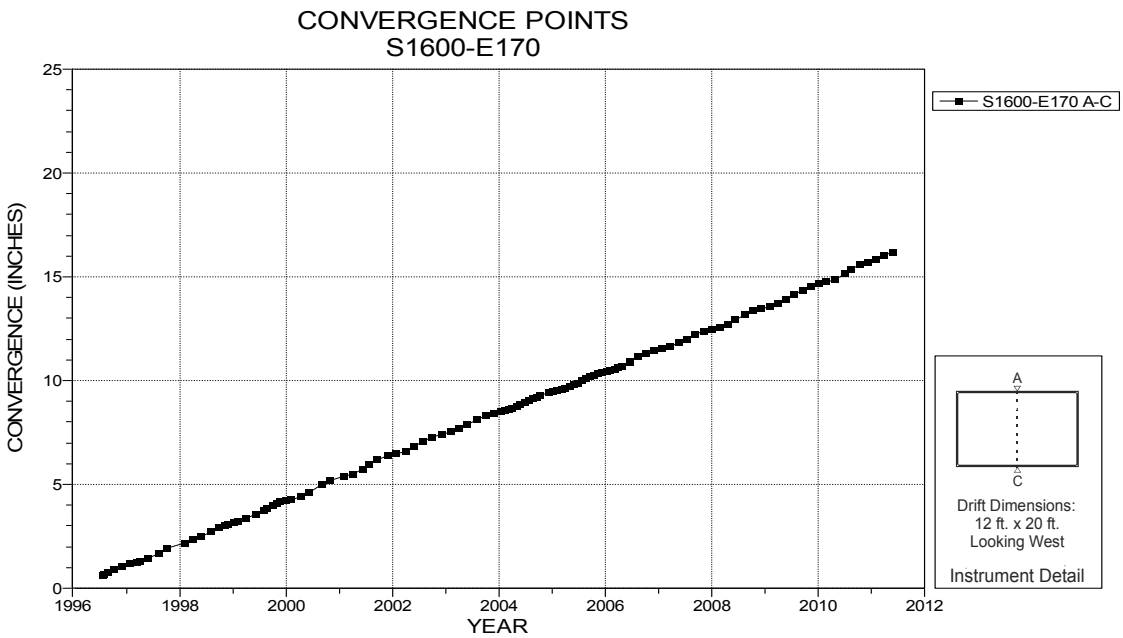


Figure 4-228 Convergence Point Array
S1300 W100 – Roof to Floor



NOTES:
1. Excavation date: June 1984.

Figure 4-229 Convergence Point Array
S1600 E110 – Roof to Floor



NOTES:
1. Excavation date: September 1985.

Figure 4-230 Convergence Point Array
S1600 E170 – Roof to Floor

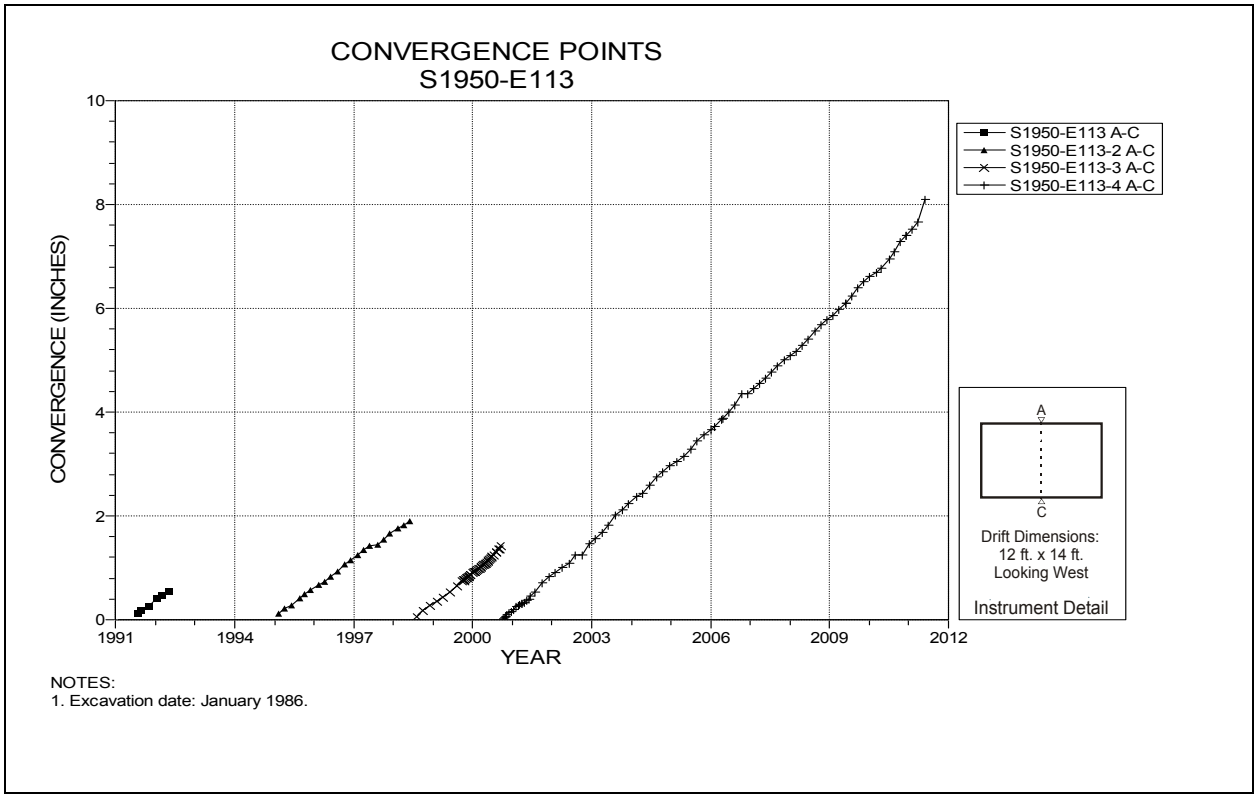


Figure 4-231 Convergence Point Array
S1950 E113 – Roof to Floor

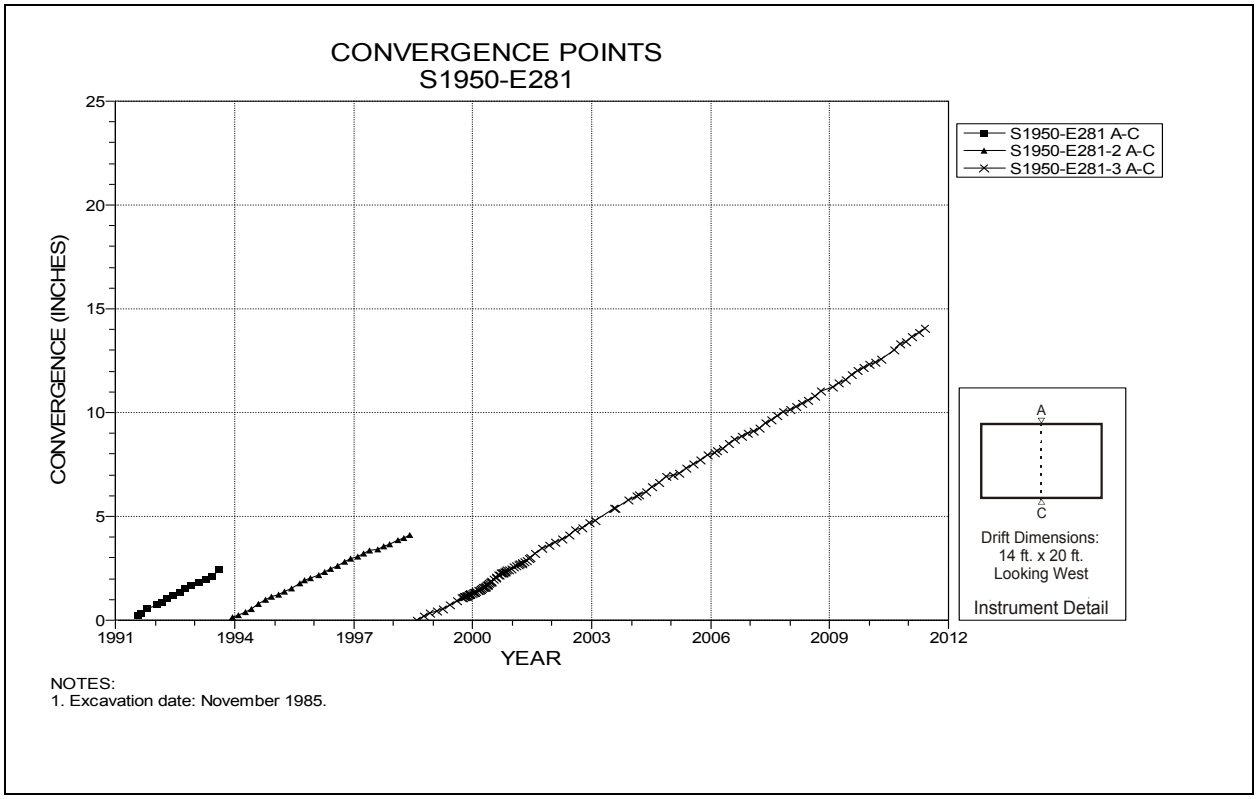


Figure 4-232 Convergence Point Array
S1950 E281 – Roof to Floor

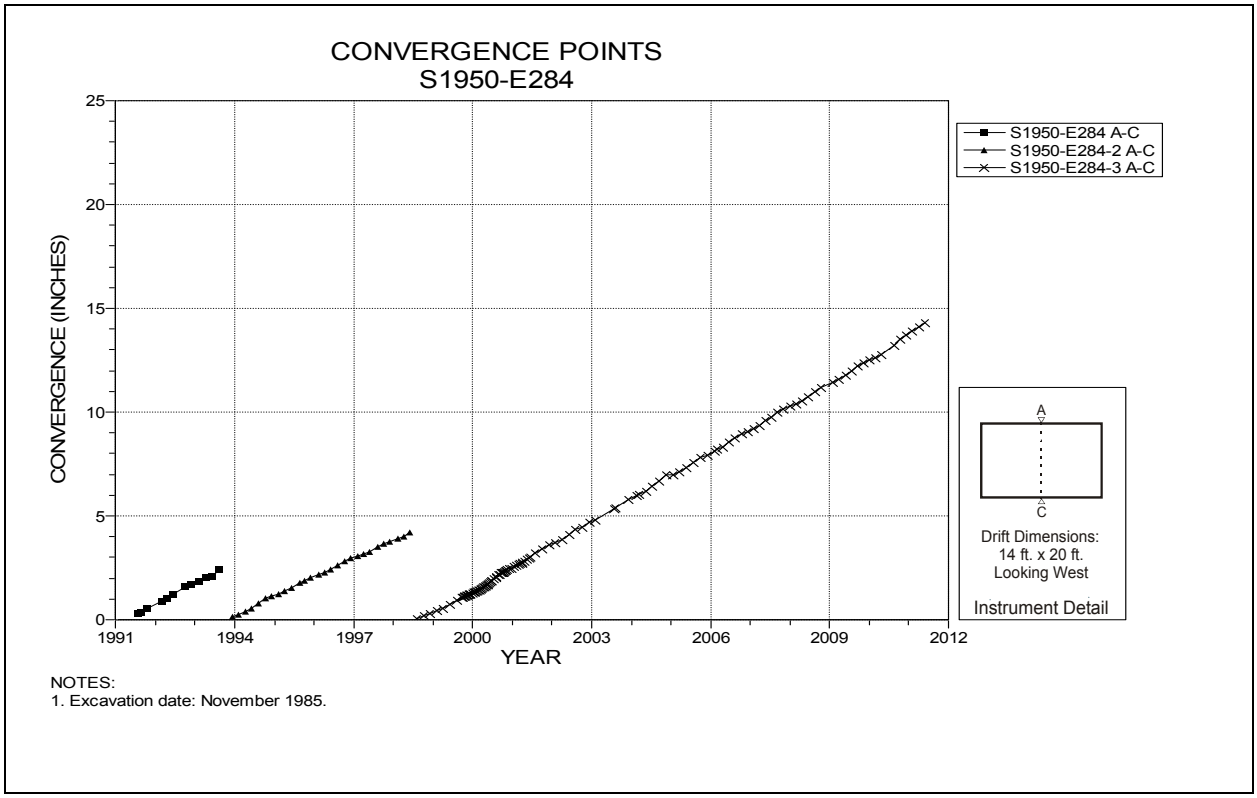


Figure 4-233 Convergence Point Array
S1950 E284 – Roof to Floor

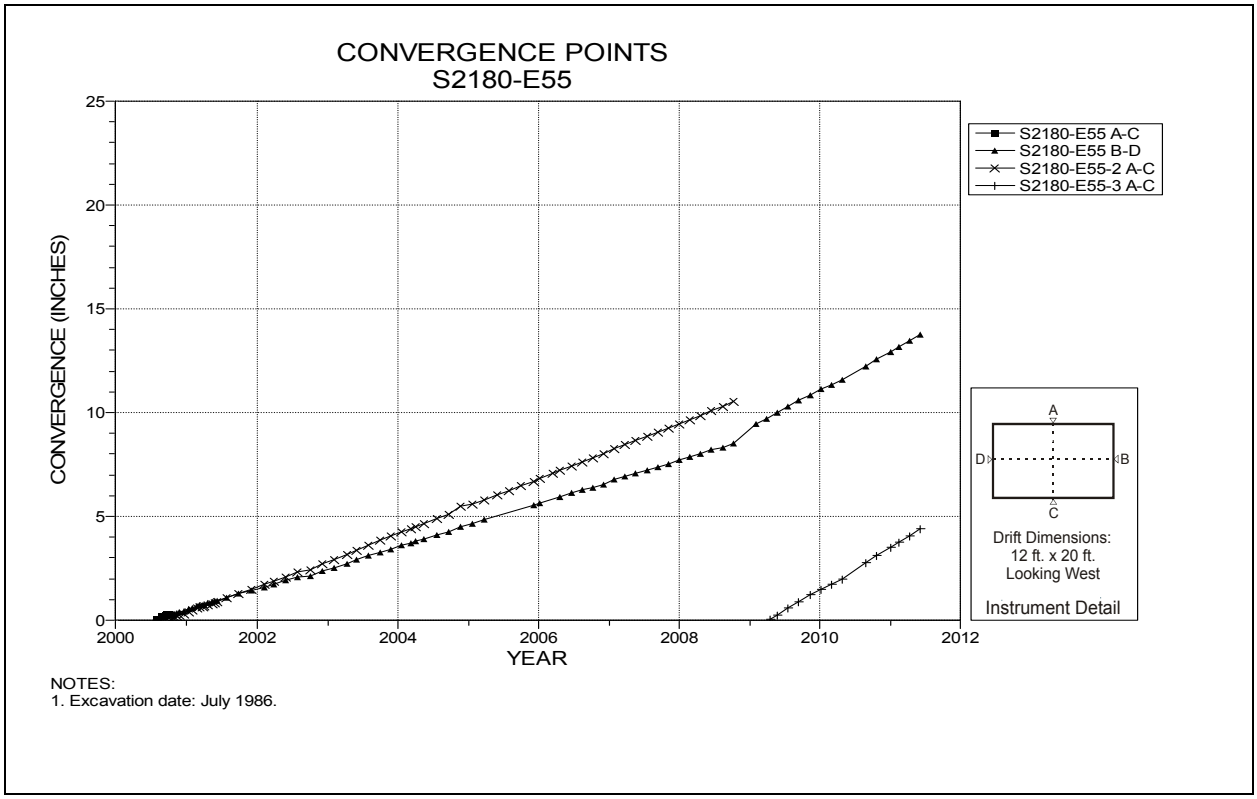


Figure 4-234 Convergence Point Array
S2180 E55 – All Chords

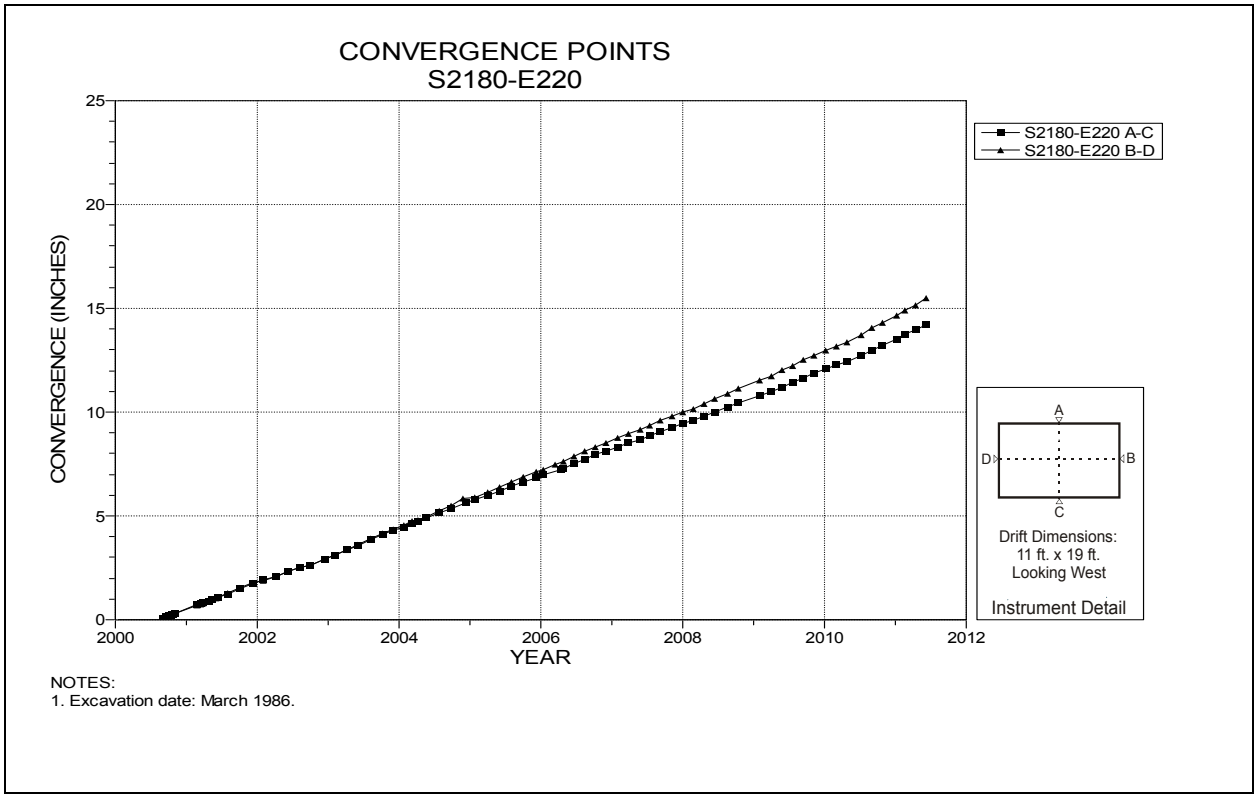


Figure 4-235 Convergence Point Array
S2180 E220 – All Chords

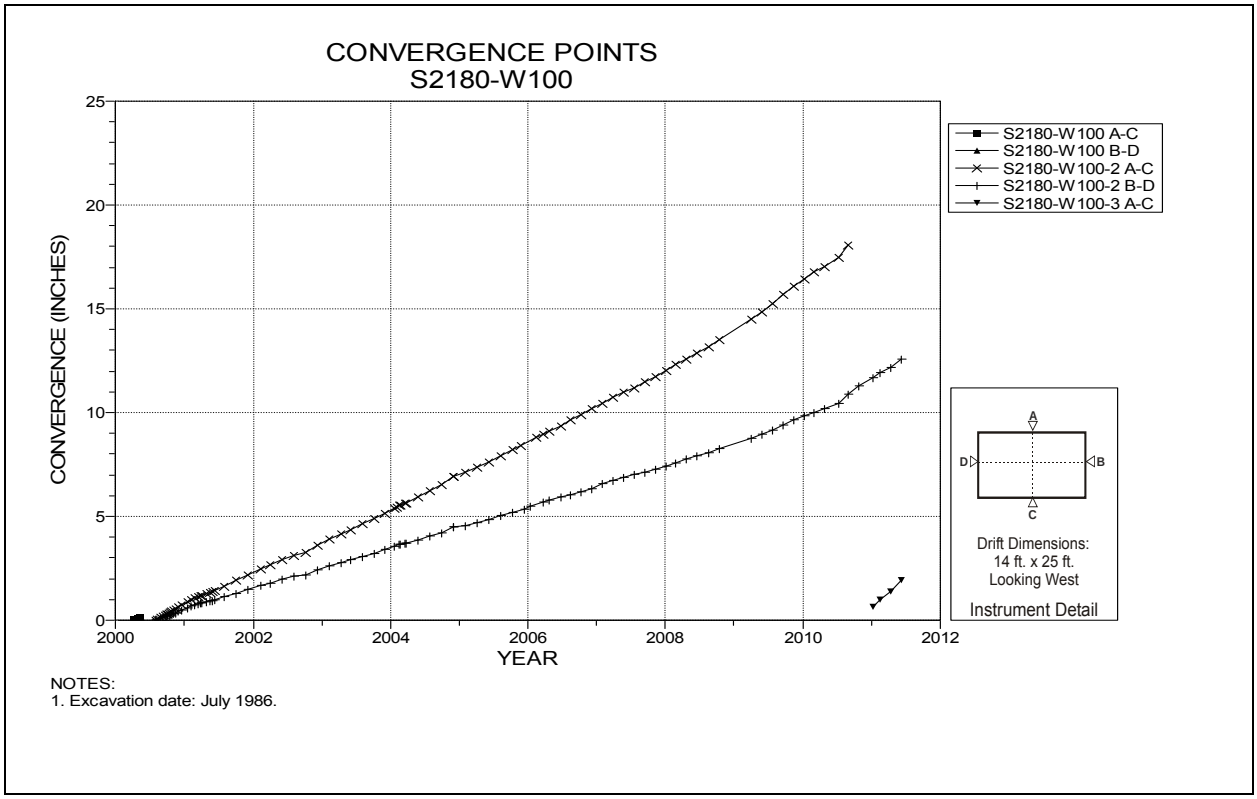


Figure 4-236 Convergence Point Array
S2180 W100 – All Chords

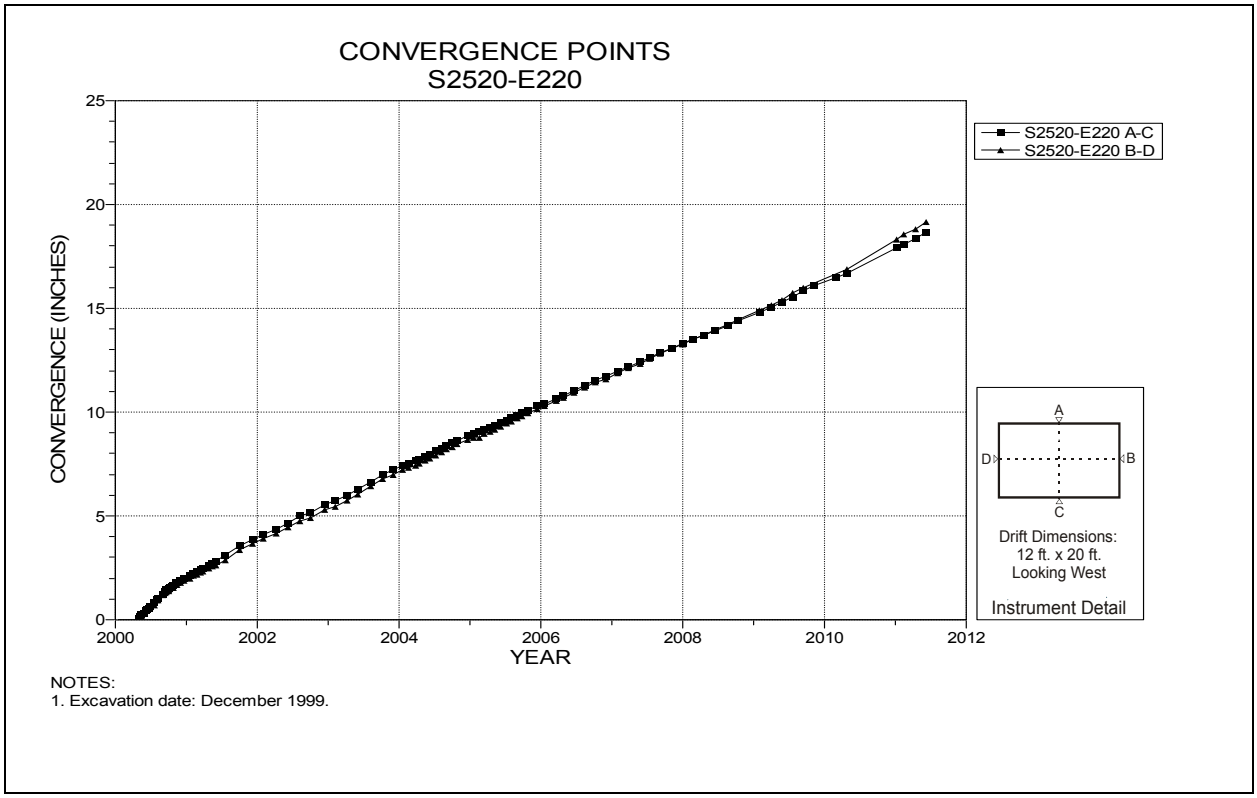


Figure 4-237 Convergence Point Array
S2520 E220 – All Chords

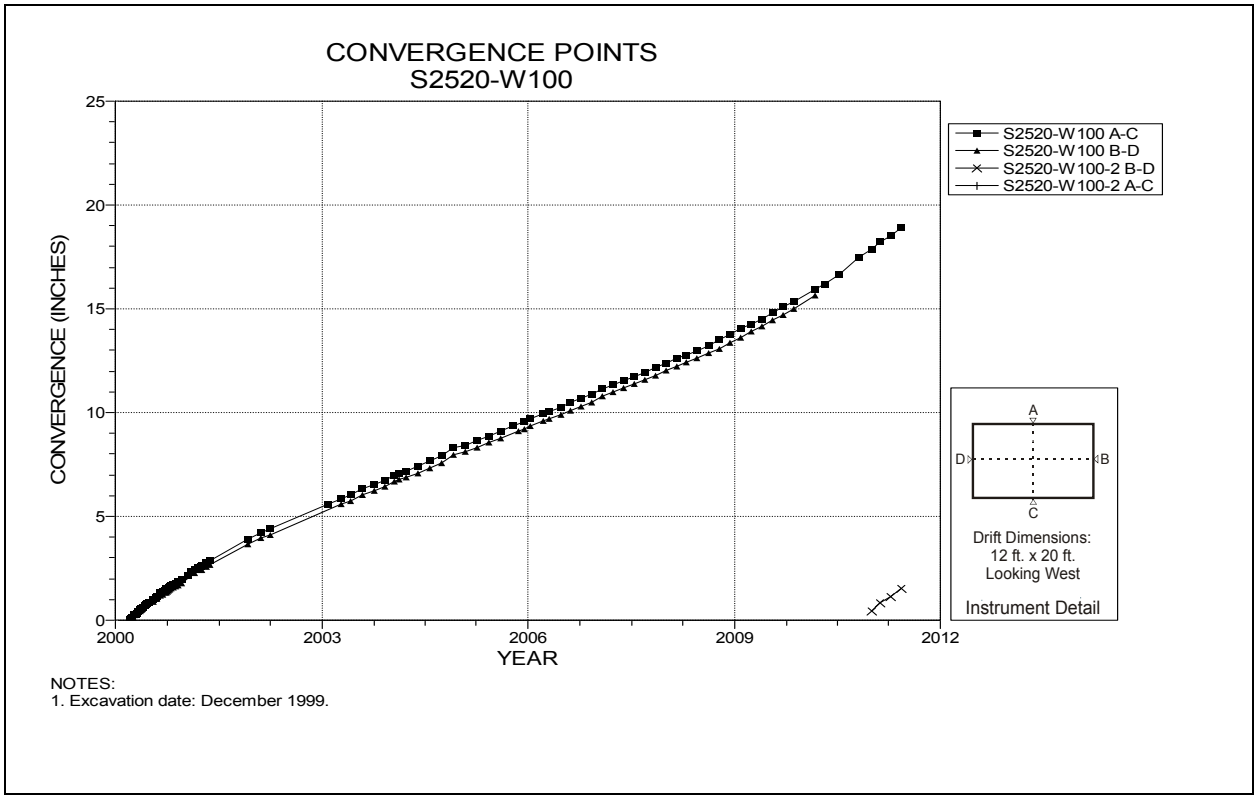


Figure 4-238 Convergence Point Array
S2520 W100 – All Chords

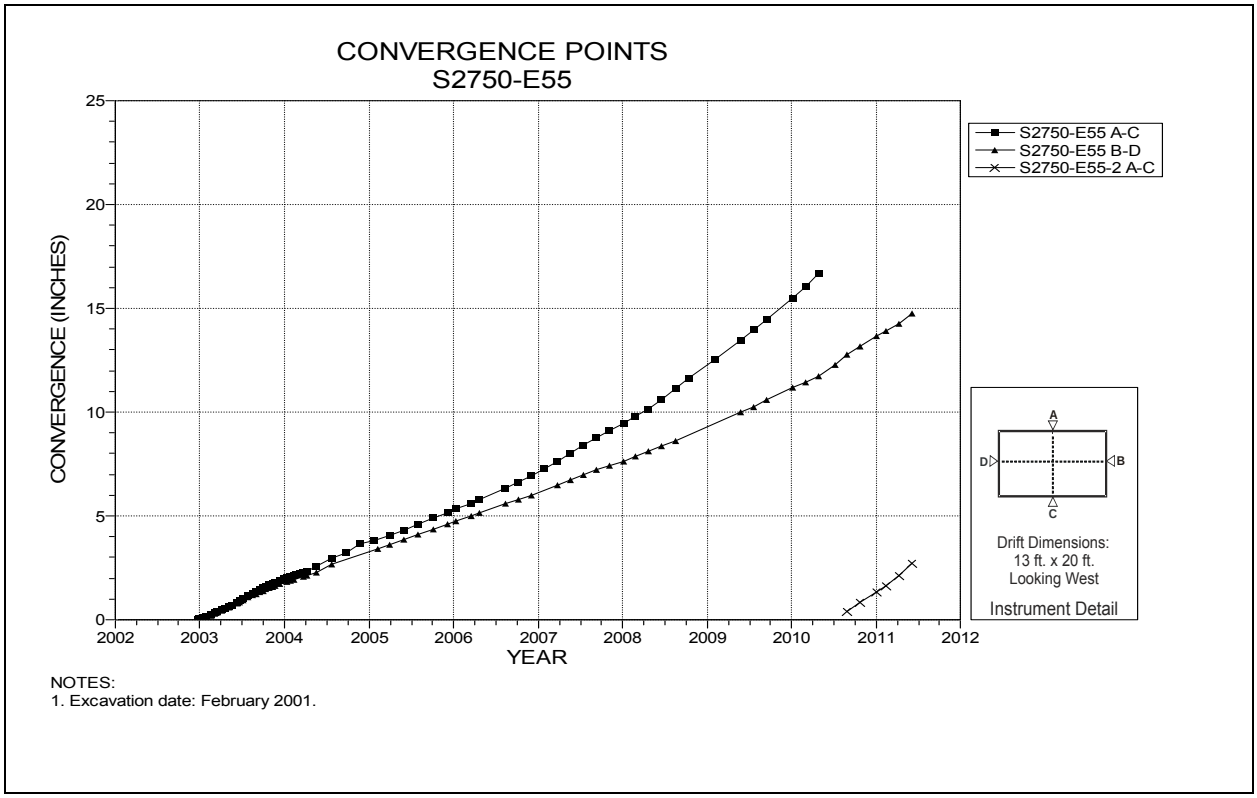


Figure 4-239 Convergence Point Array
S2750 E55 – All Chords

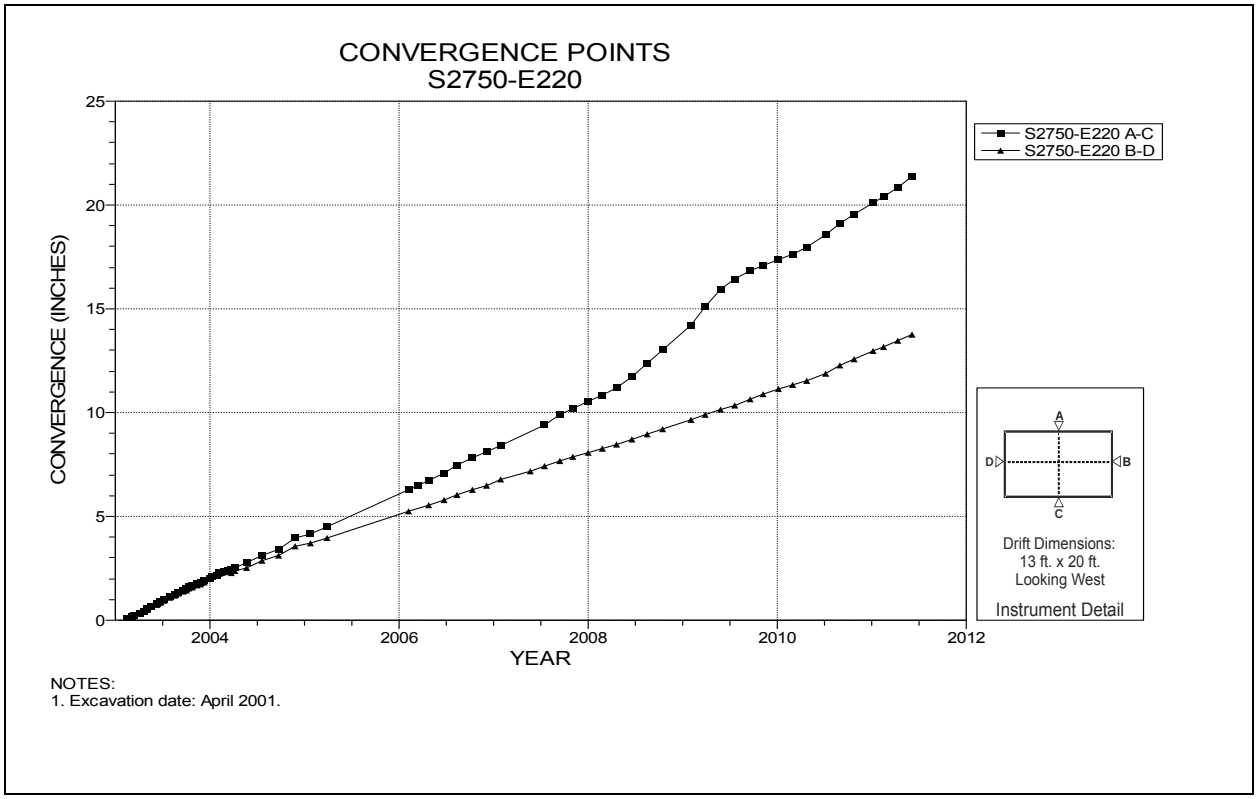


Figure 4-240 Convergence Point Array
S2750 E220 – All Chords

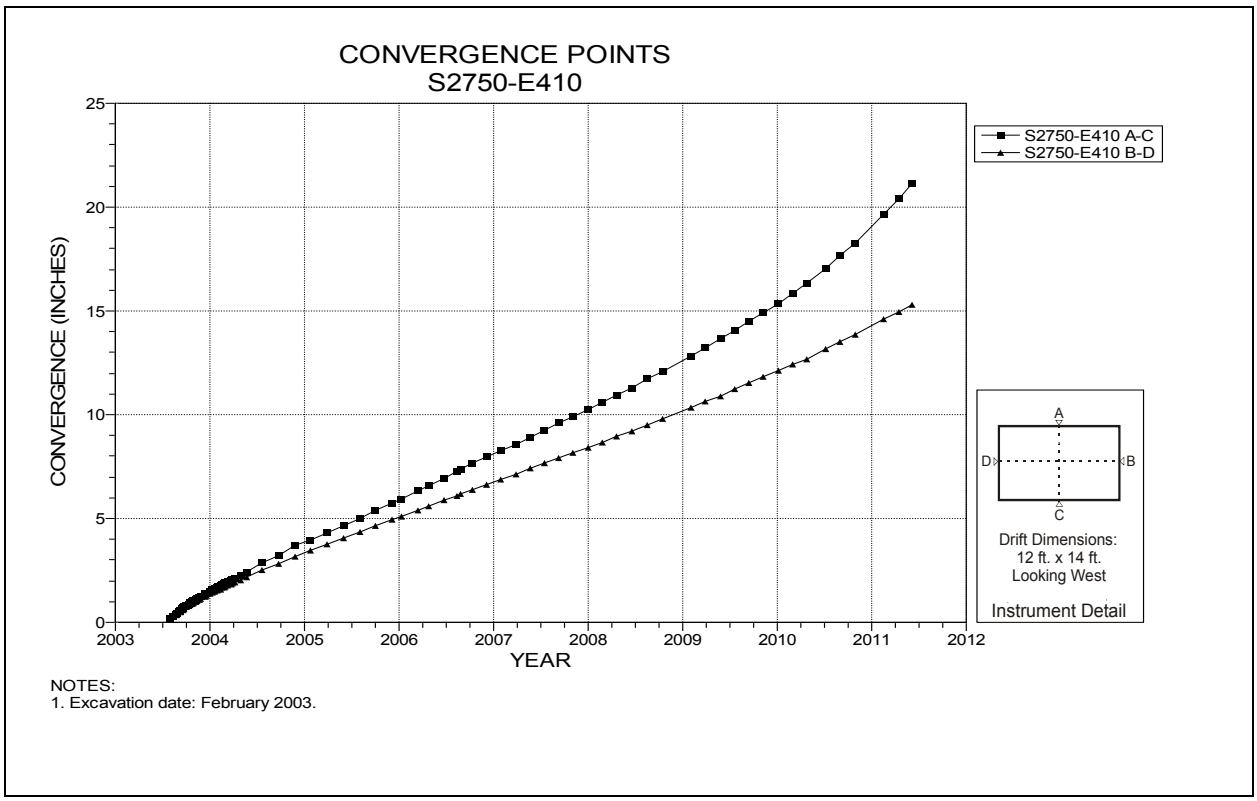


Figure 4-241 Convergence Point Array
S2750 E410 – All Chords

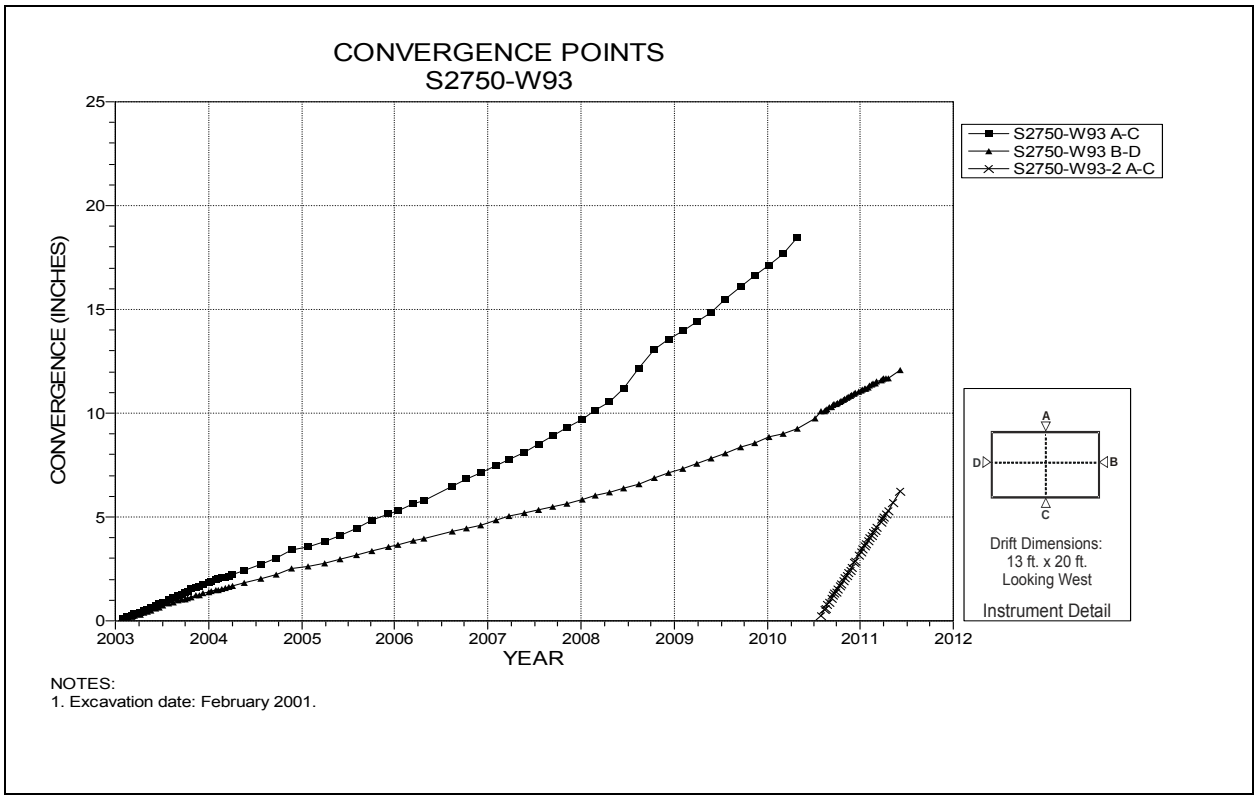


Figure 4-242 Convergence Point Array
S2750 W93 – All Chords

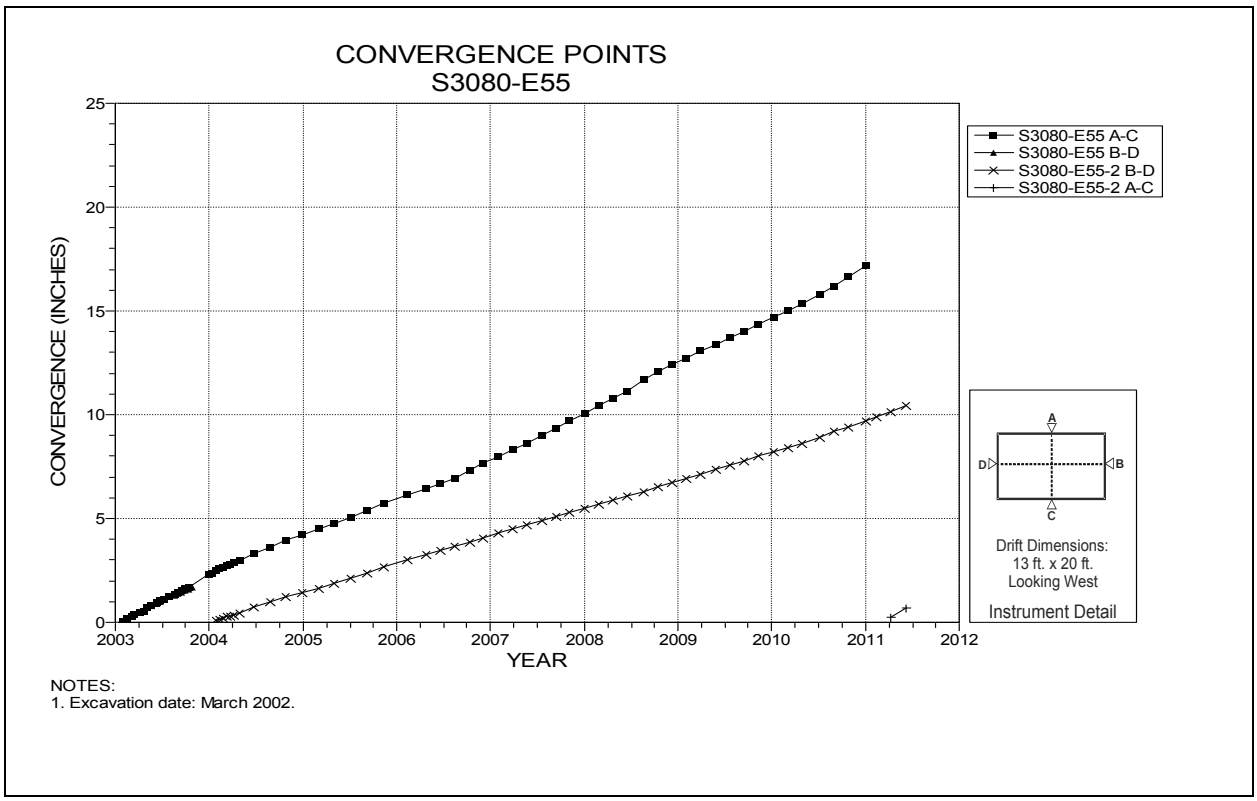


Figure 4-243 Convergence Point Array
S3080 E55 – All Chords

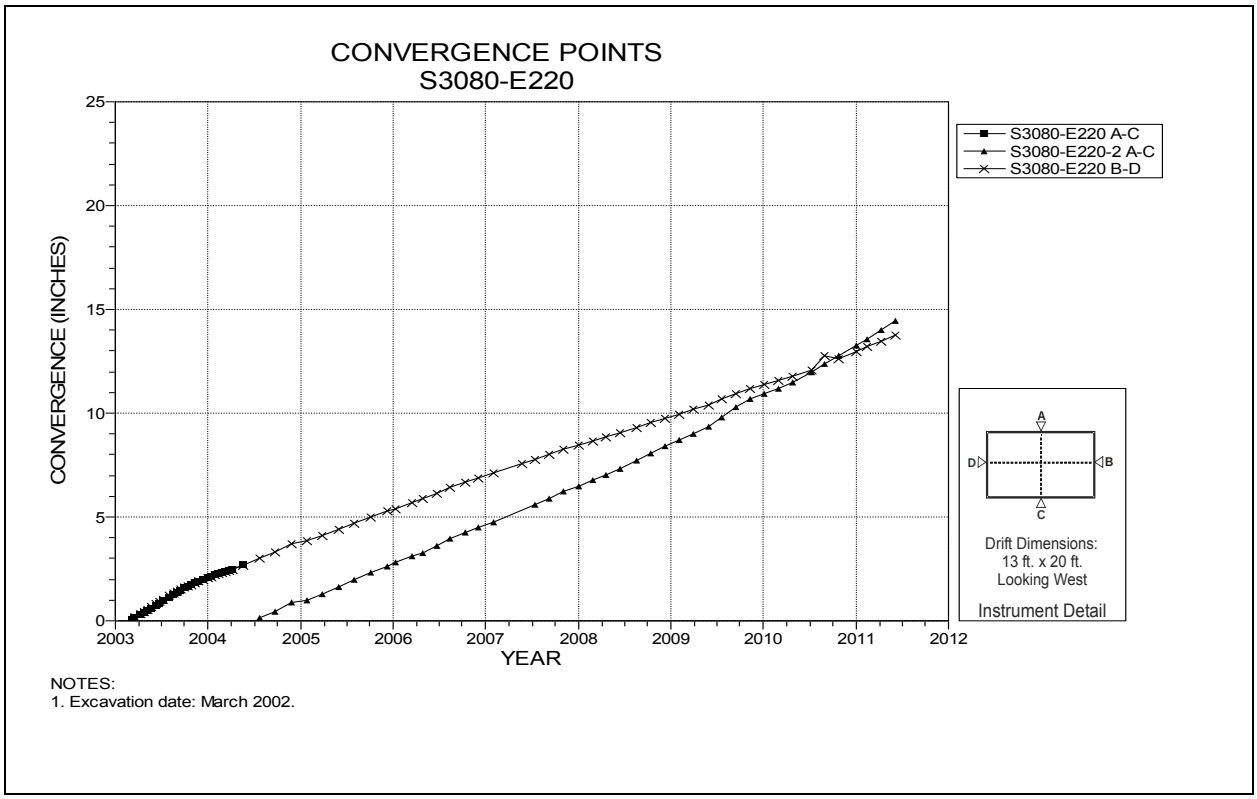


Figure 4-244 Convergence Point Array
S3080 E220 – All Chords

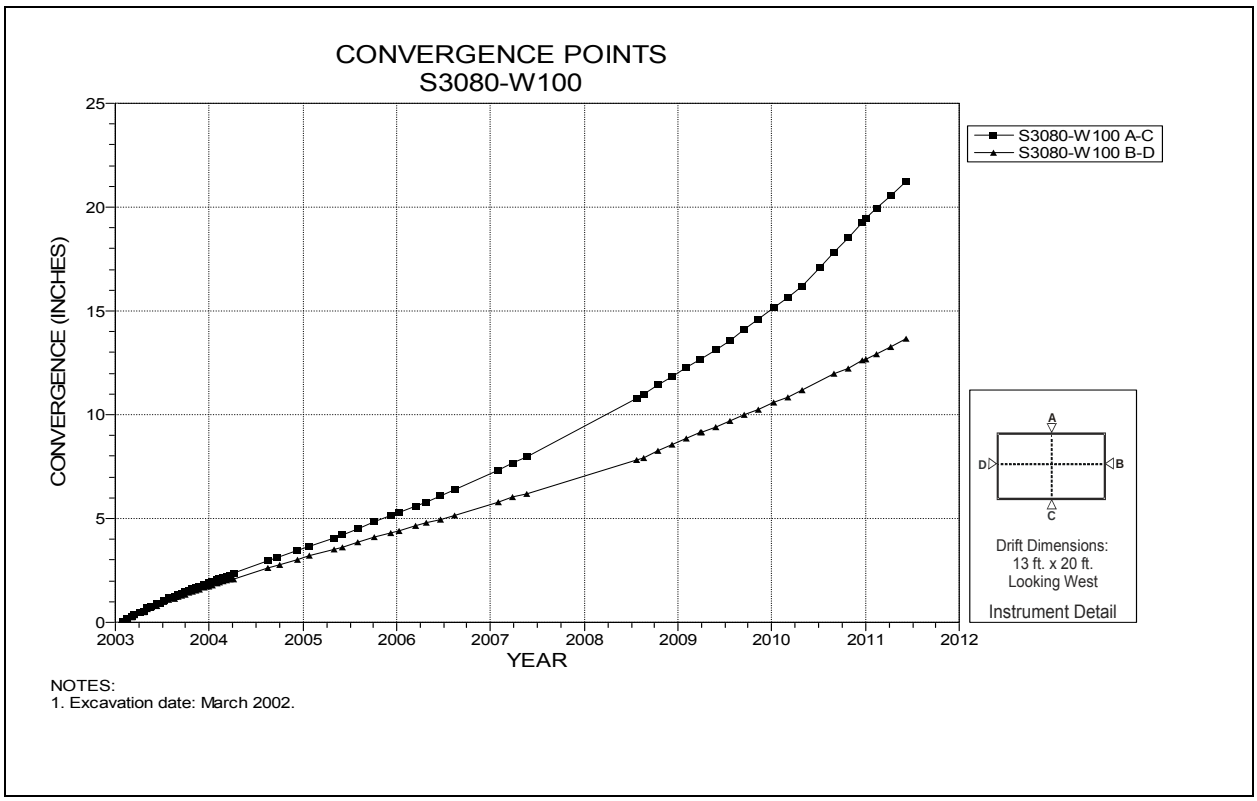


Figure 4-245 Convergence Point Array
S3080 W100 – All Chords

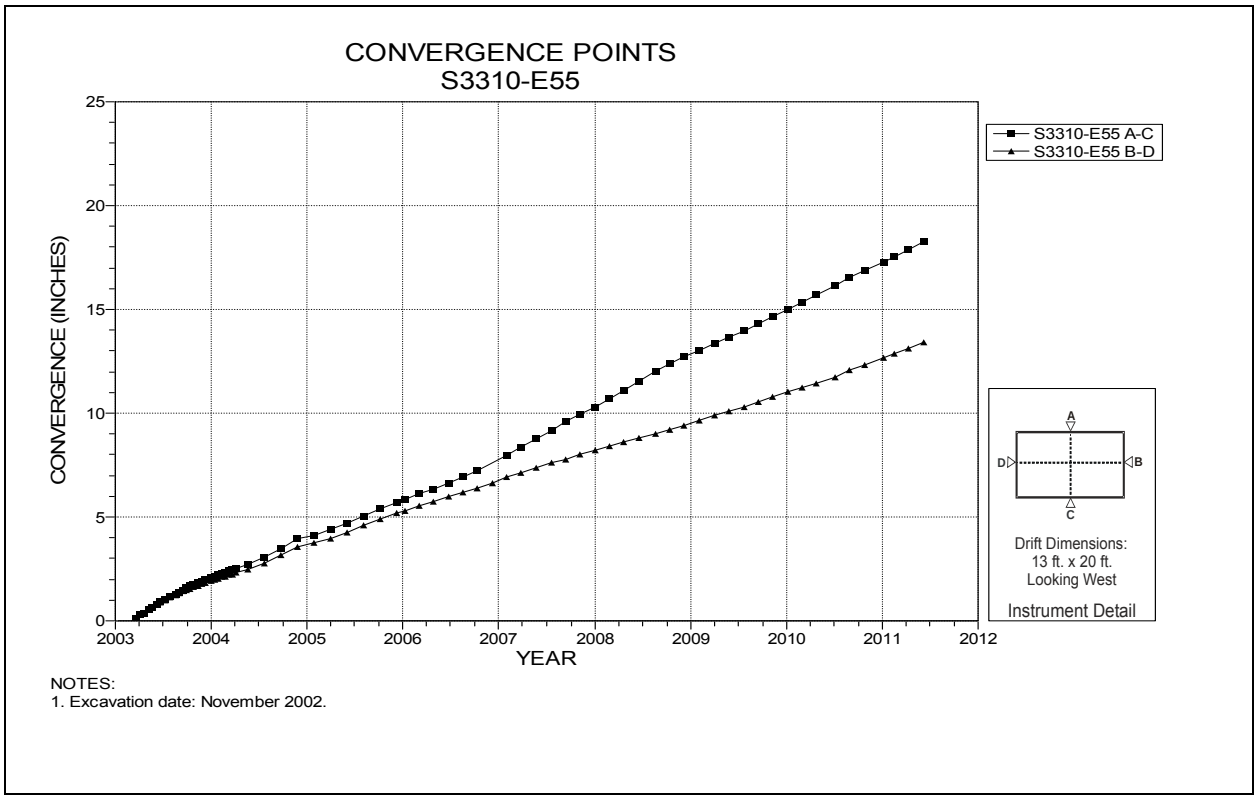


Figure 4-246 Convergence Point Array
S3310 E55 – All Chords

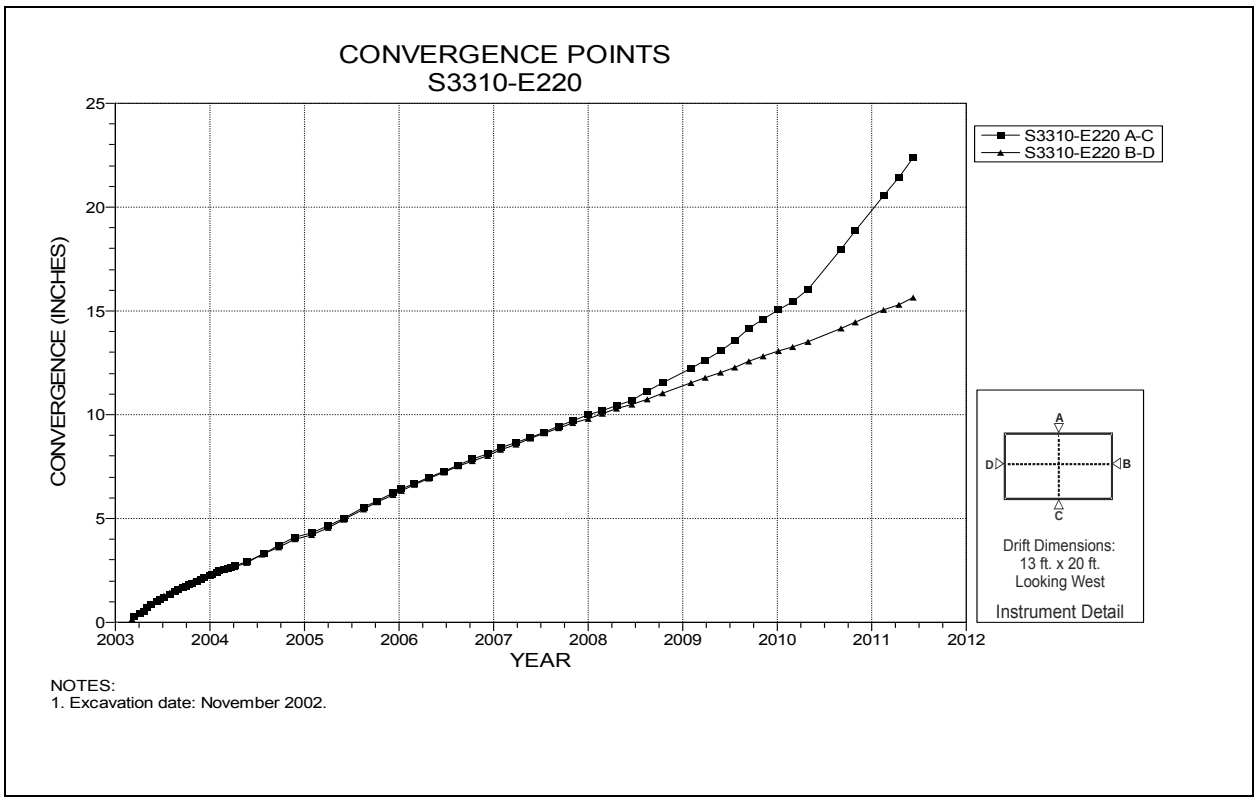


Figure 4-247 Convergence Point Array
S3310 E220 – All Chords

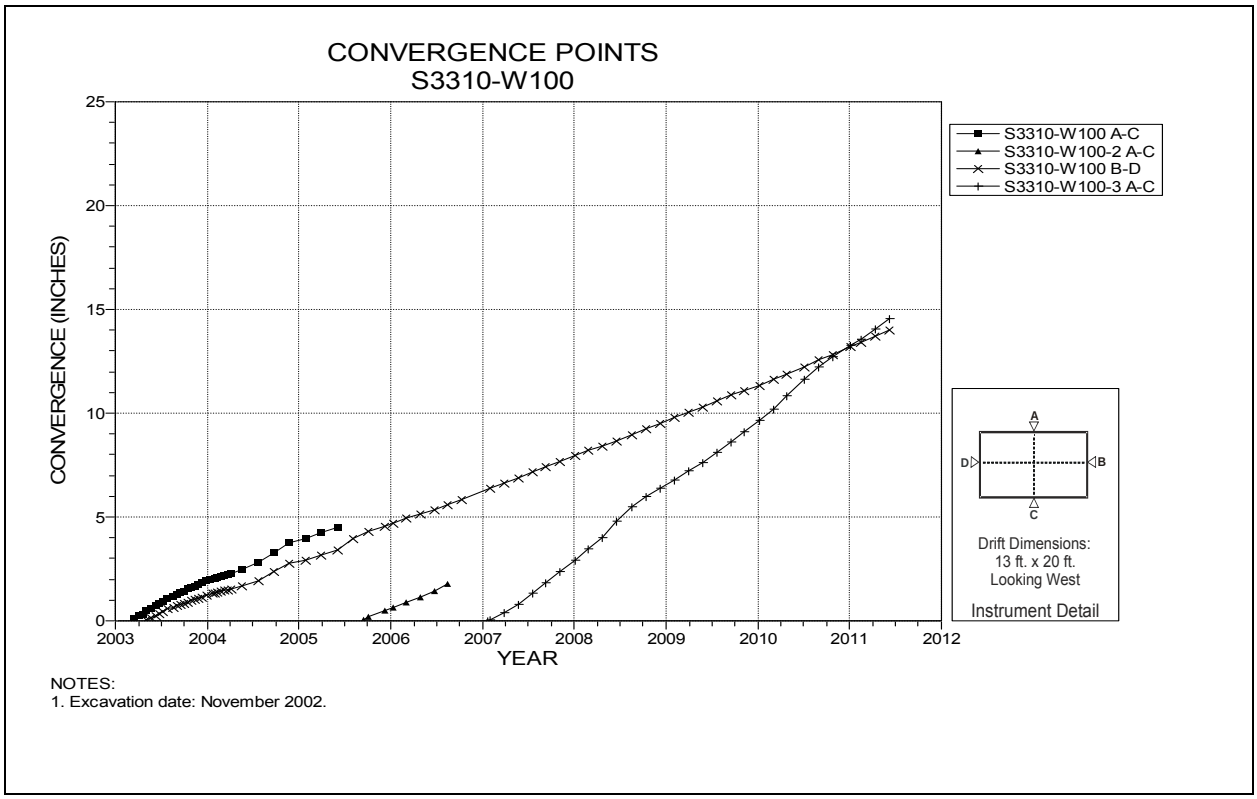


Figure 4-248 Convergence Point Array
S3310 W100 – All Chords

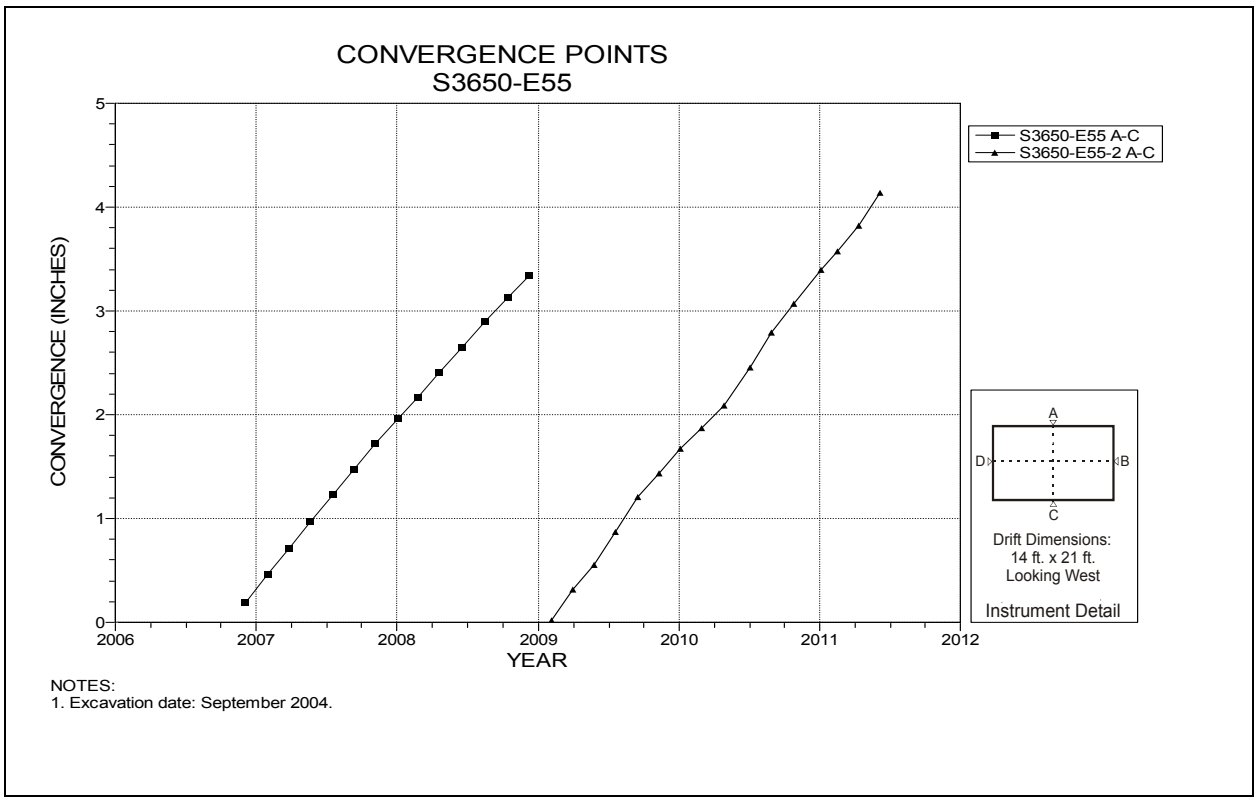


Figure 4-249 Convergence Point Array
S3650 E55 – Roof to Floor

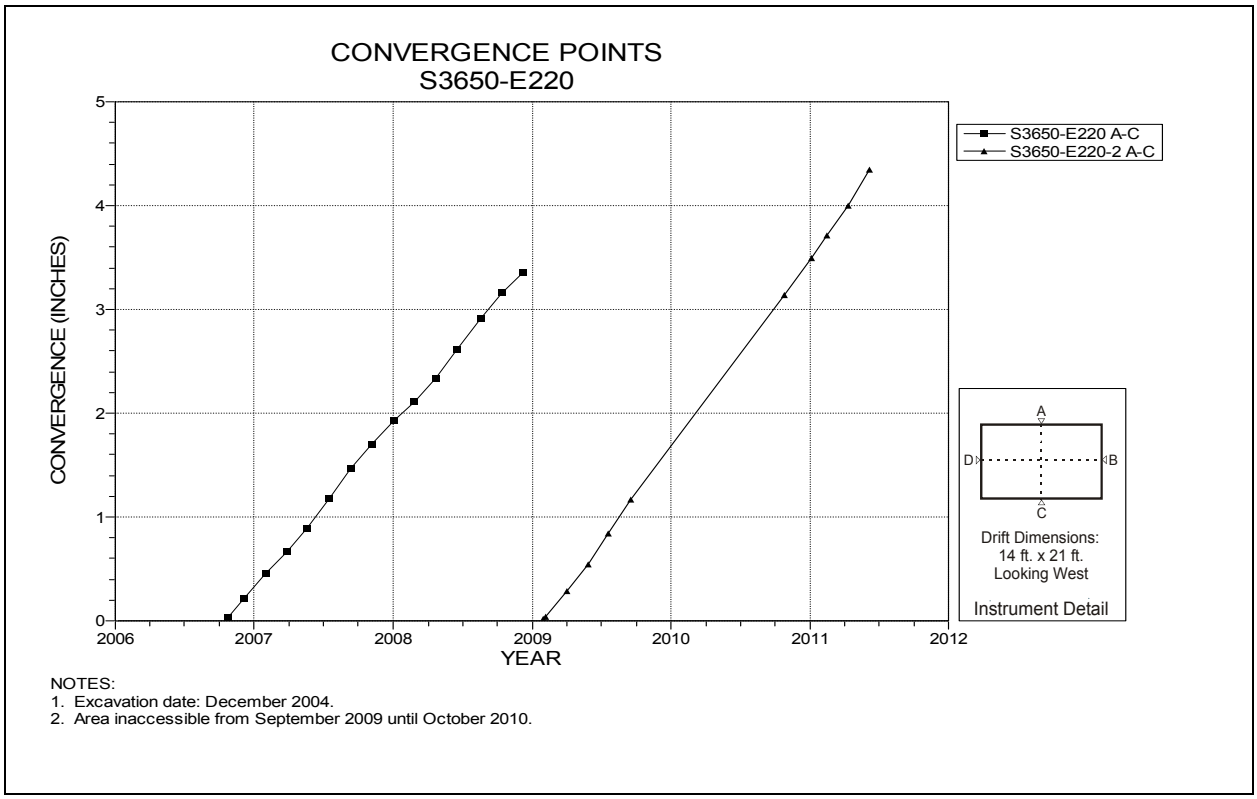
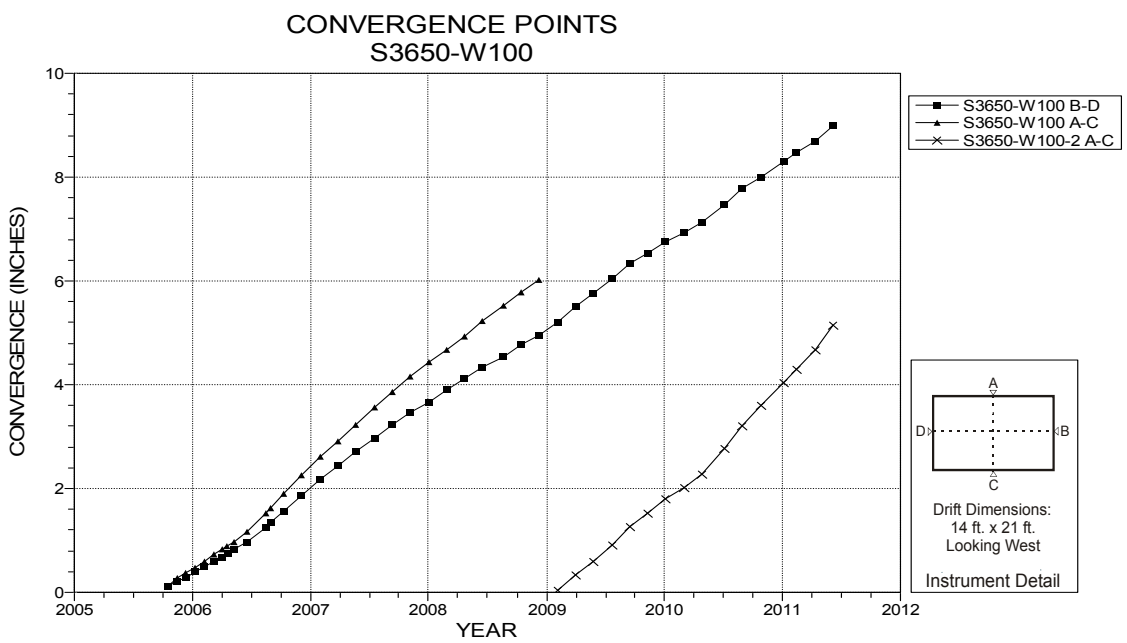
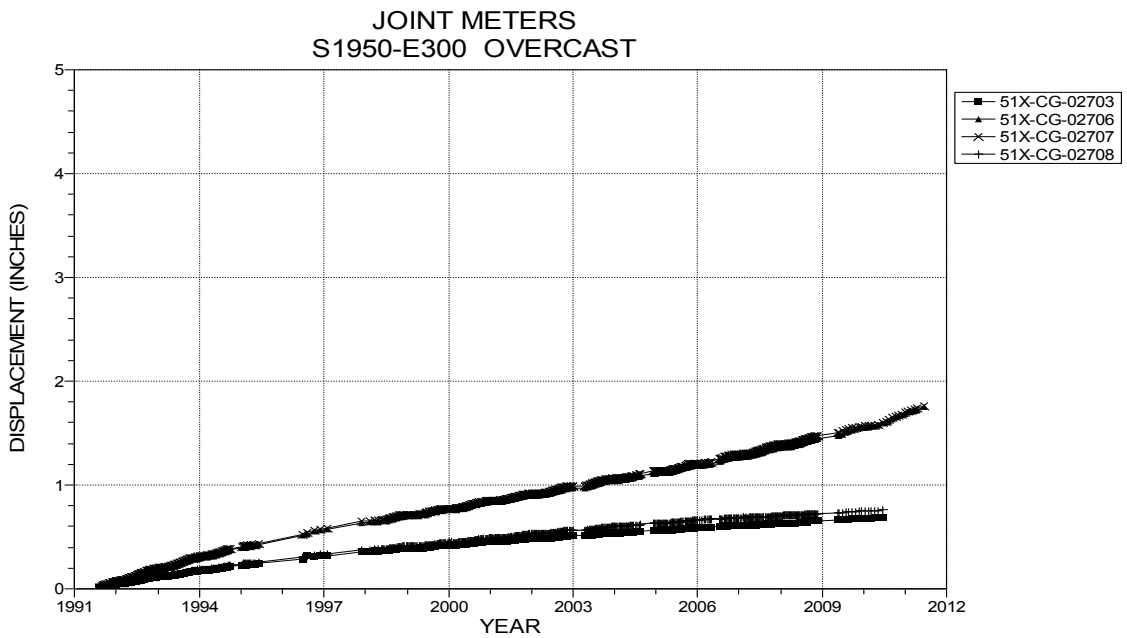


Figure 4-250 Convergence Point Array
S3650 E220 – Roof to Floor



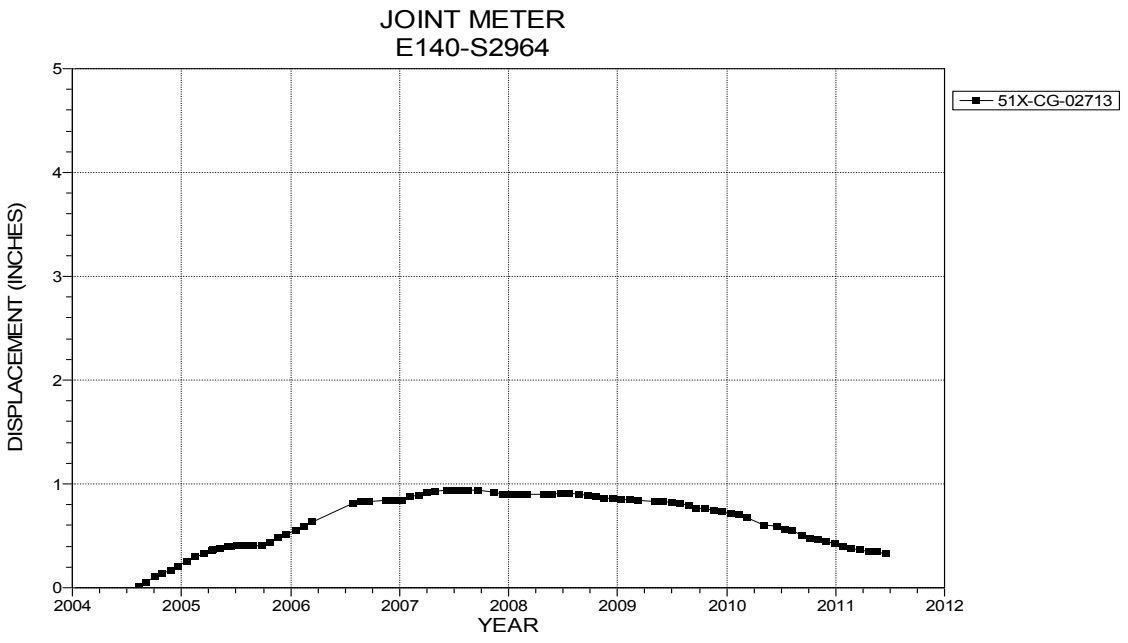
NOTES:
1. Excavation date: February 2005.

Figure 4-251 Convergence Point Array
S3650 W100 – All Chords



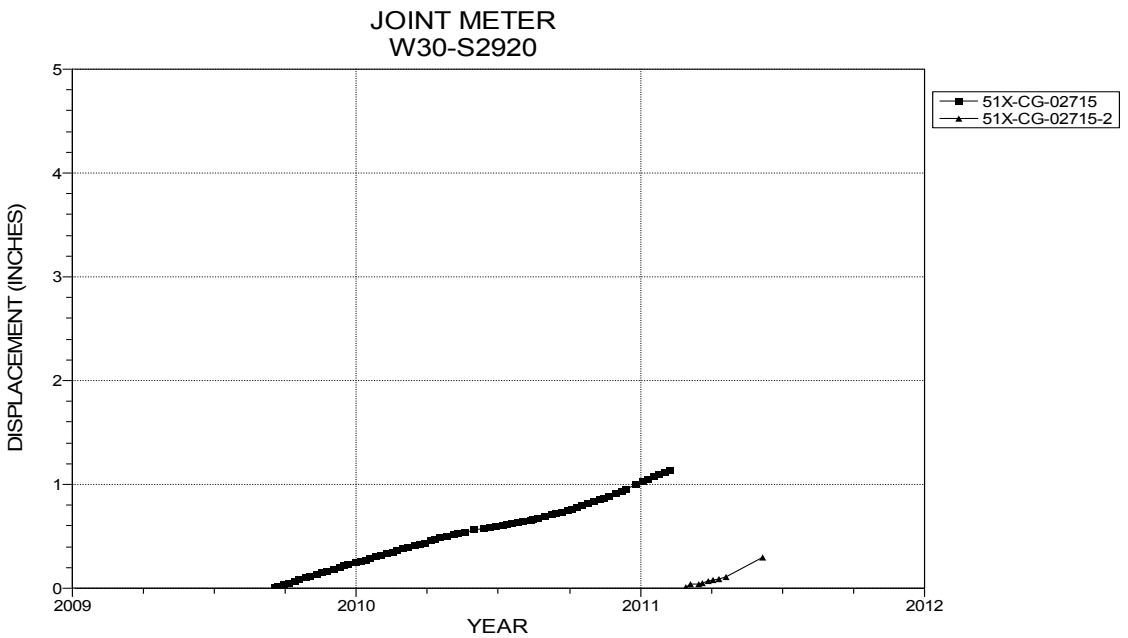
NOTES:
1. Excavation date: March 1985.
2. 51X-CG-02703 and 51X-CG-02708 were disconnected to facilitate the removal of a ventilation overcast.

Figure 4-252 Joint Meters
S1950 E300 Overcast



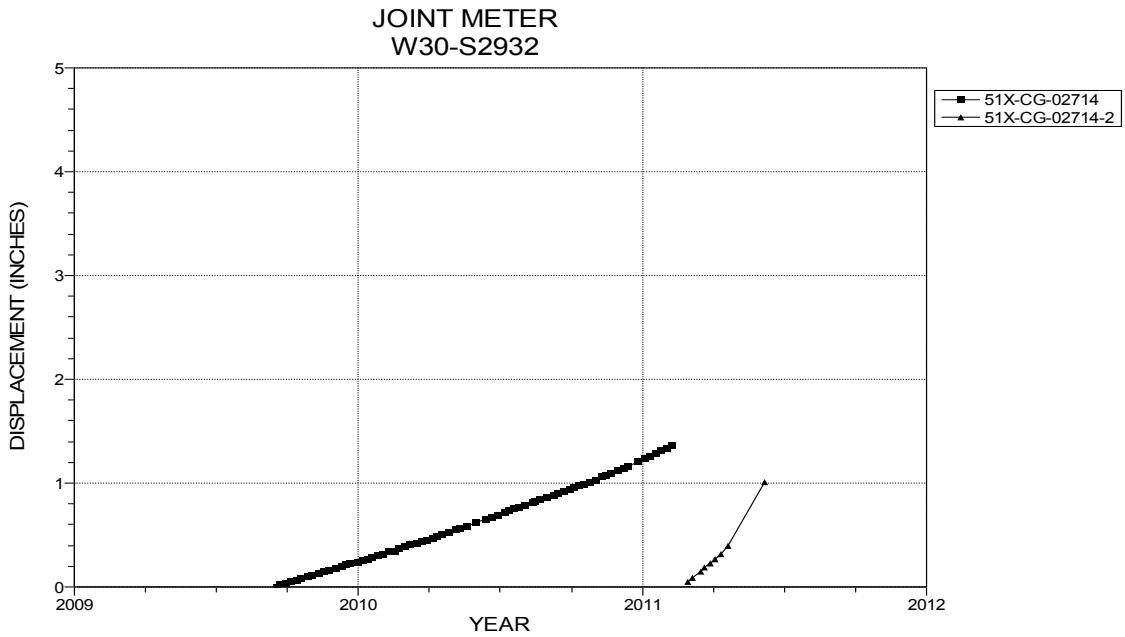
NOTES:
1. Excavation date: January 1983.

Figure 4-253 Joint Meter
E140 S2964



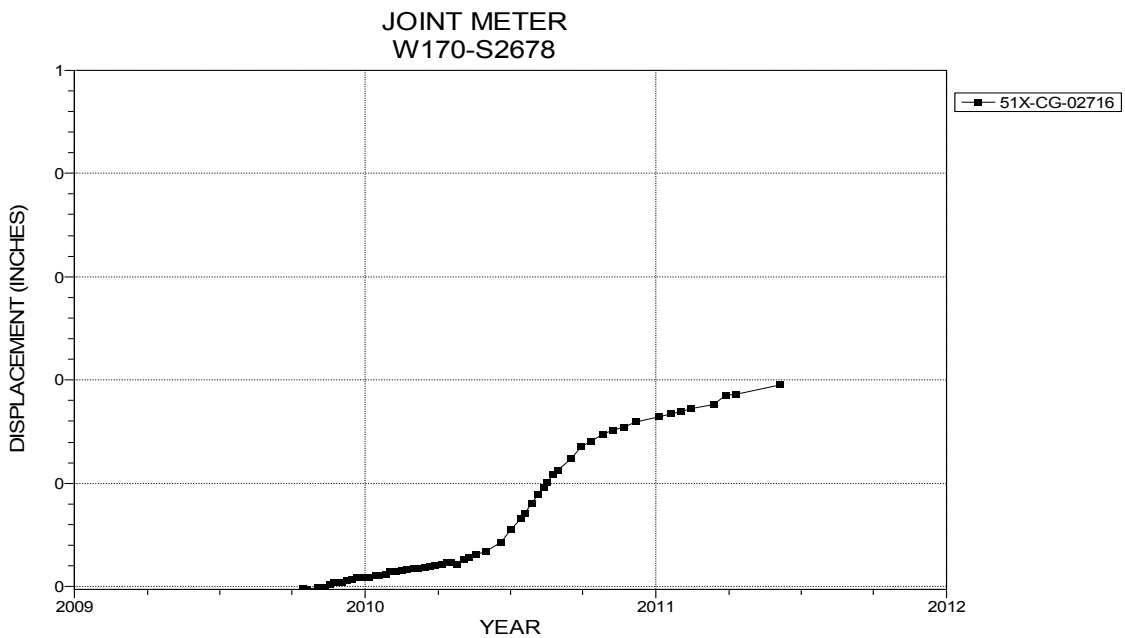
NOTES:
1. Excavation date: October 2001.
2. 51X-CG-02715-2 is a reset of the original installation.

Figure 4-254 Joint Meter W30-S2920



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

Figure 4-255 Joint Meter
W30-S2932



NOTES:
1. Excavation date: December 1982.

Figure 4-256 Joint Meter
W170-S2678

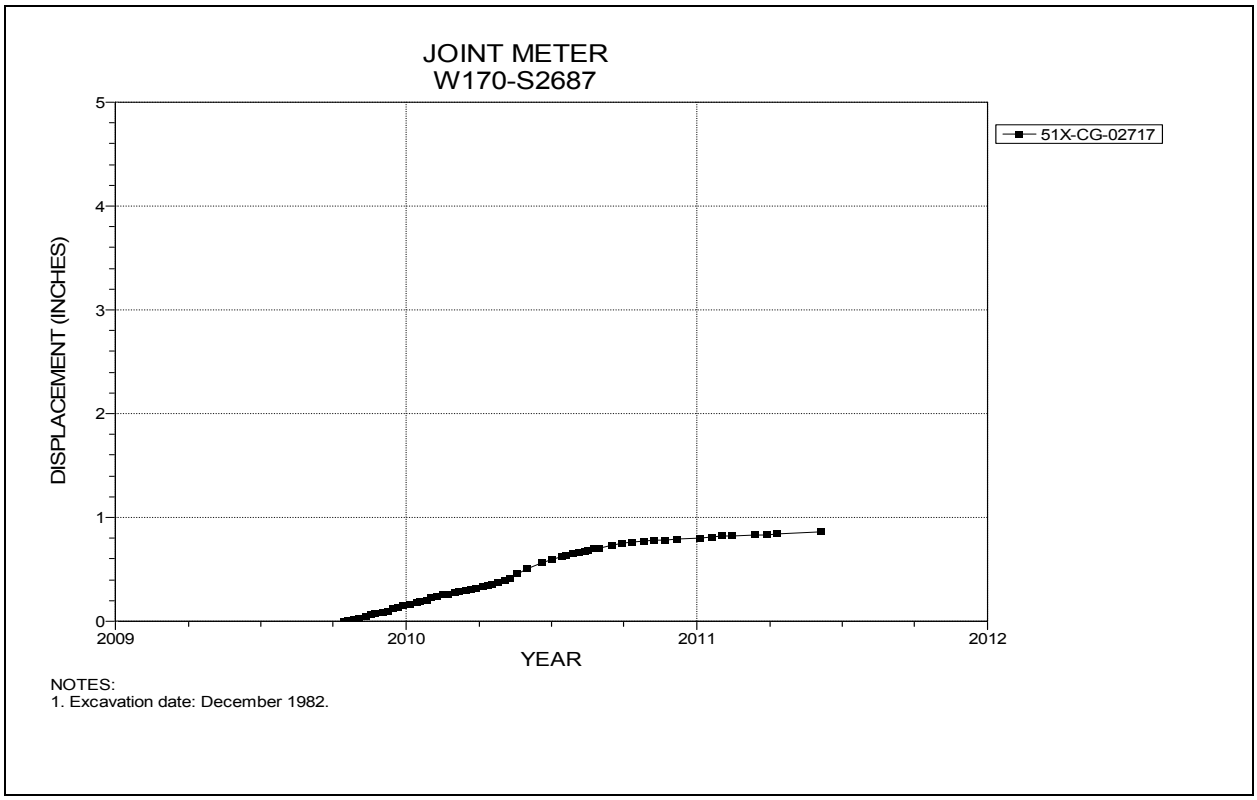


Figure 4-257 Joint Meter
W170-S2687

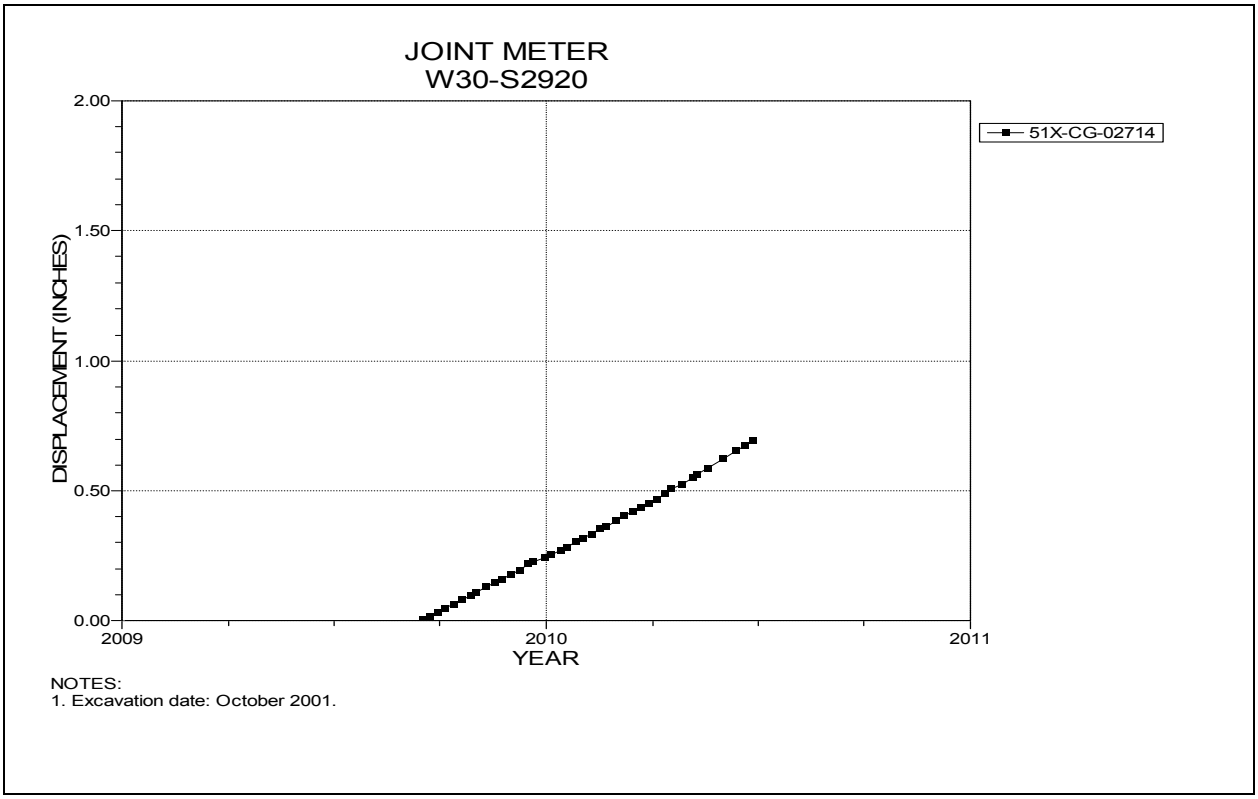
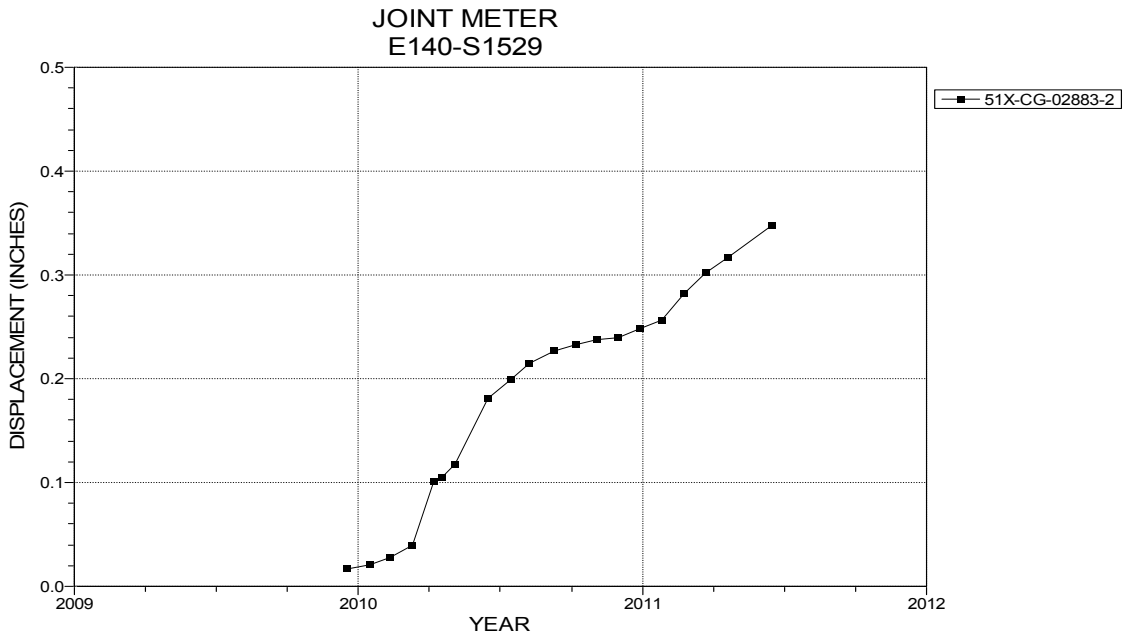
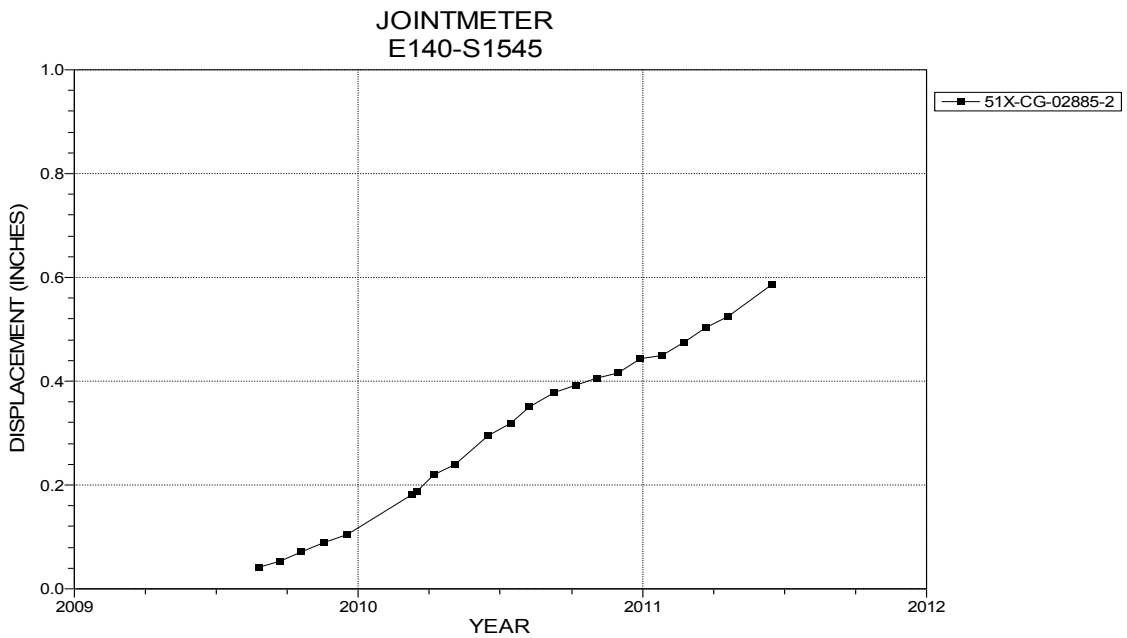


Figure 4-258 Joint Meter E140-S1505



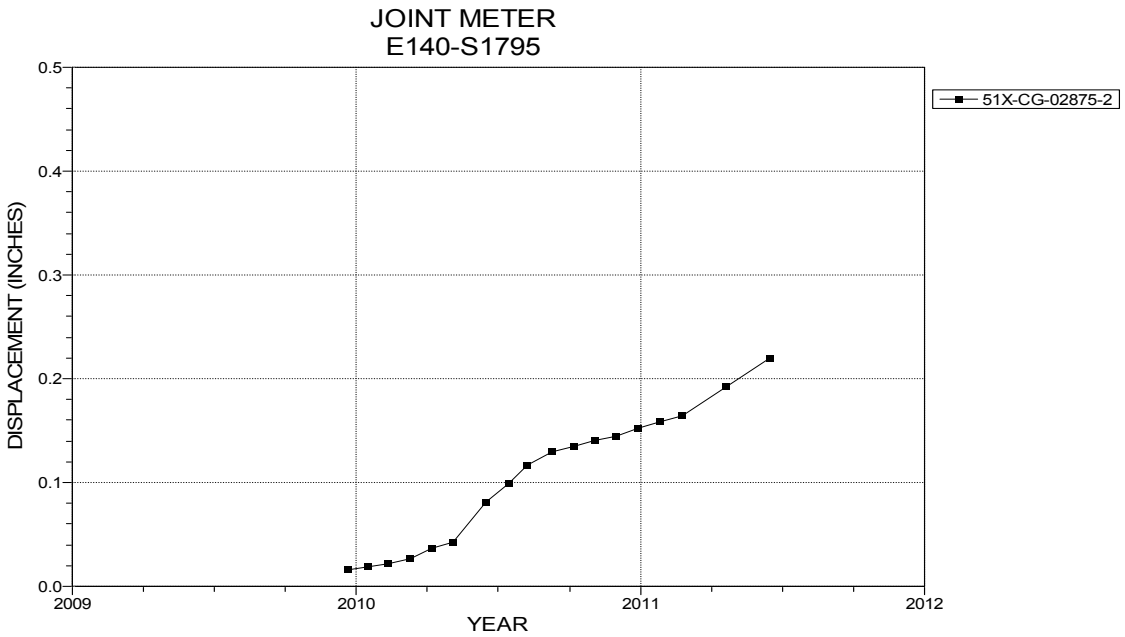
NOTES:
1. Excavation date: December 1982.

Figure 4-259 Joint Meter
E140-S1529



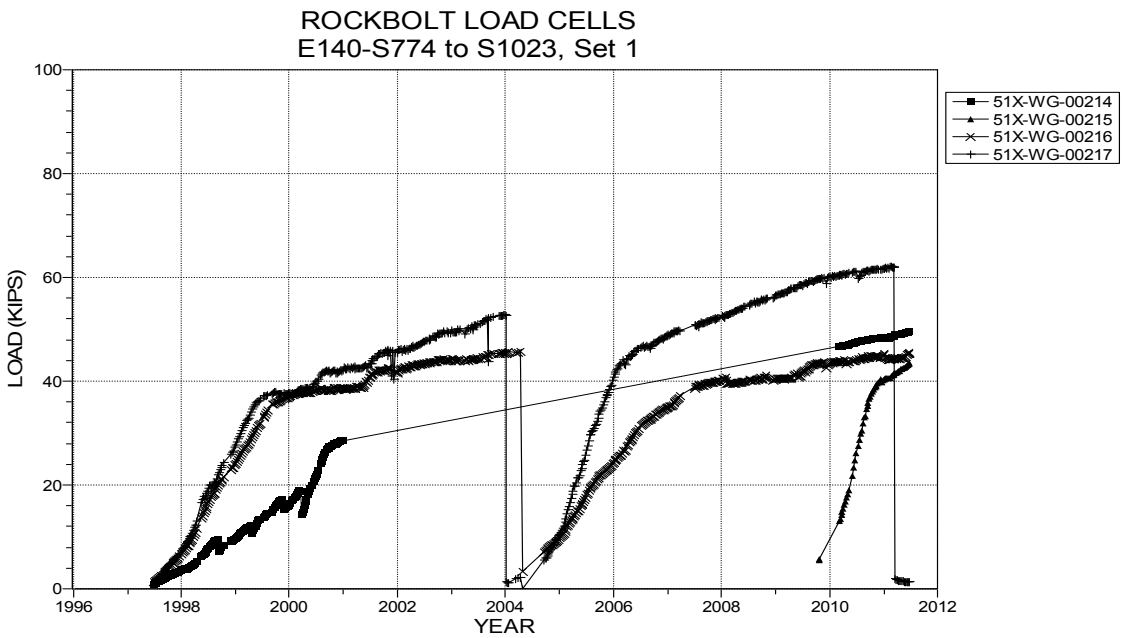
NOTES:
1. Excavation date: December 1982.

Figure 4-260 Joint Meter
E140-S1795



NOTES:
1. Excavation date: December 1982.

Figure 4-261 Joint Meter
E140-S1545



NOTES:

Figure 4-262 Rock Bolt Load Cells
E140 S901 to S910

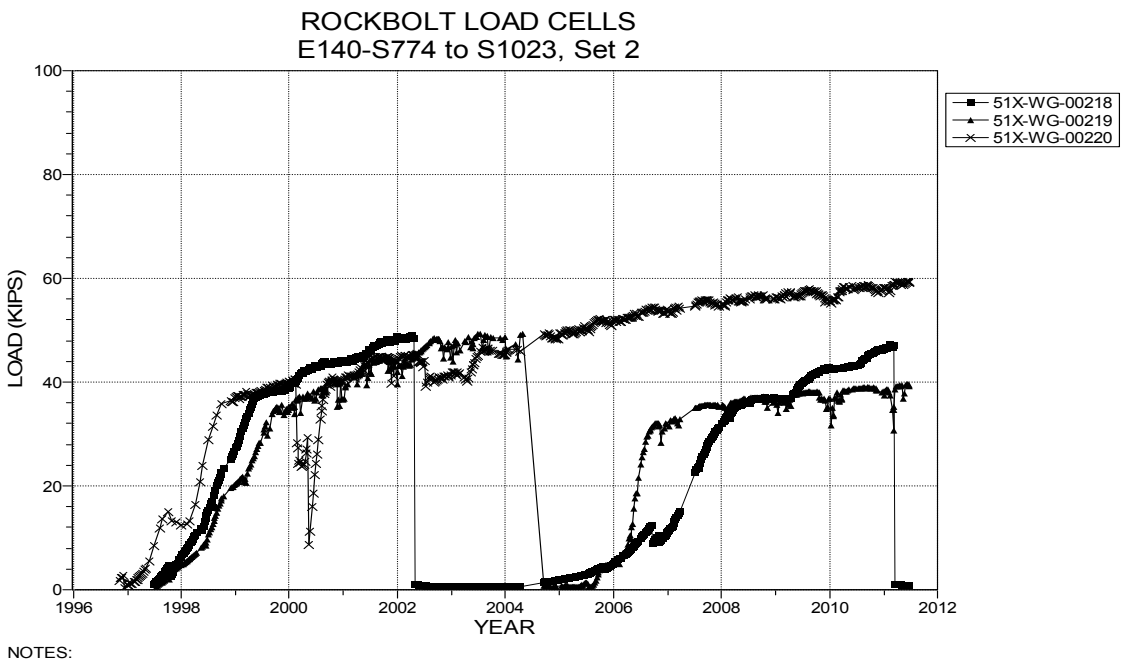


Figure 4-263 Rock Bolt Load Cells
E140 S775 to S1023

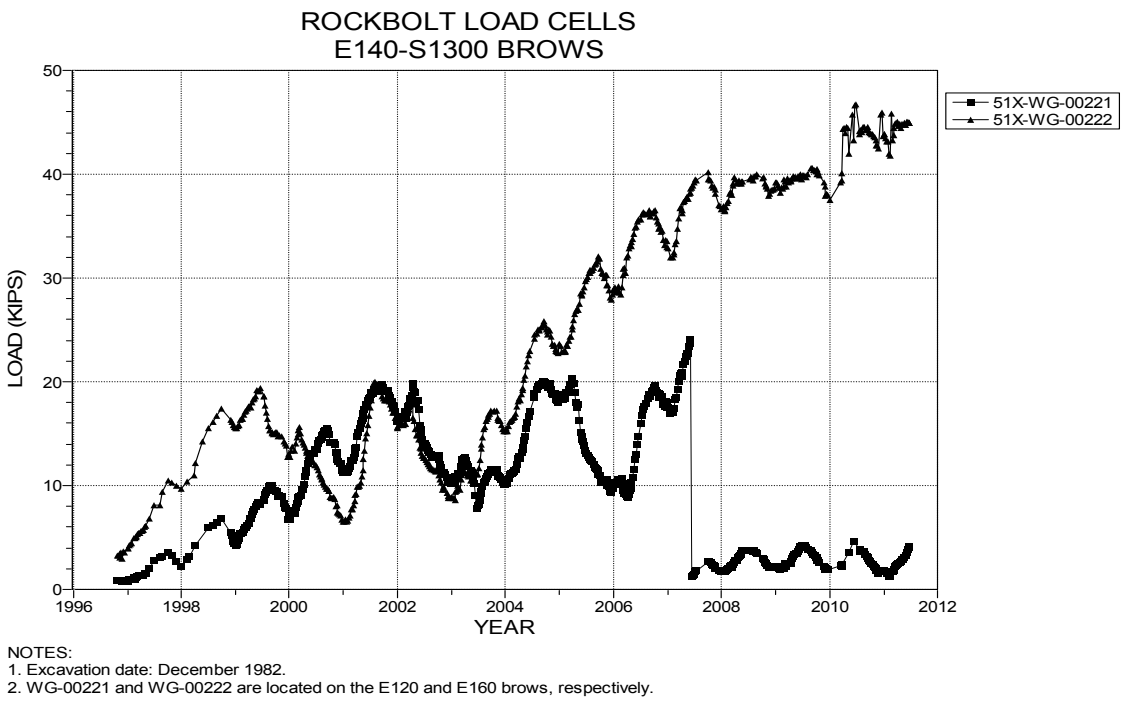
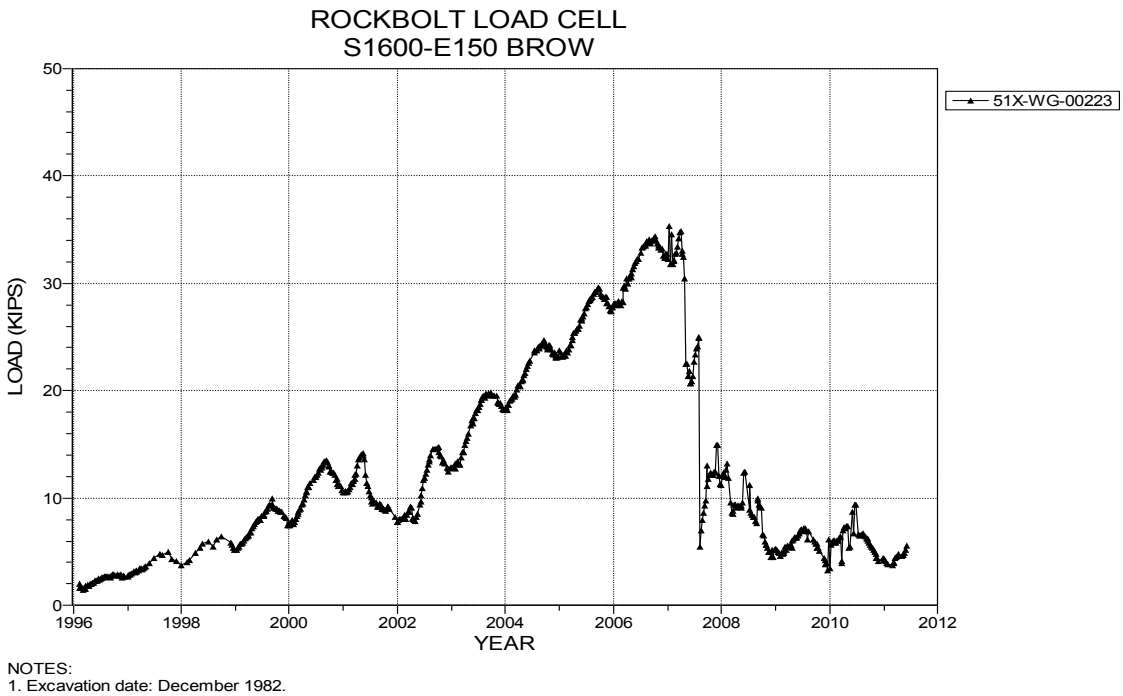
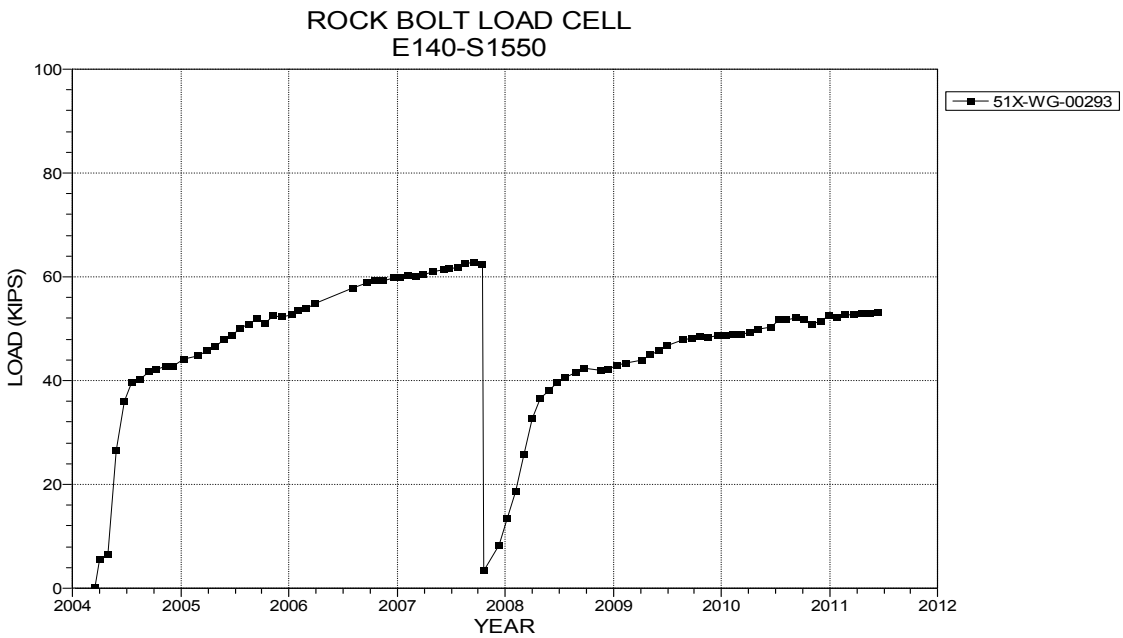


Figure 4-264 Rock Bolt Load Cells
E140-S1300 Brows



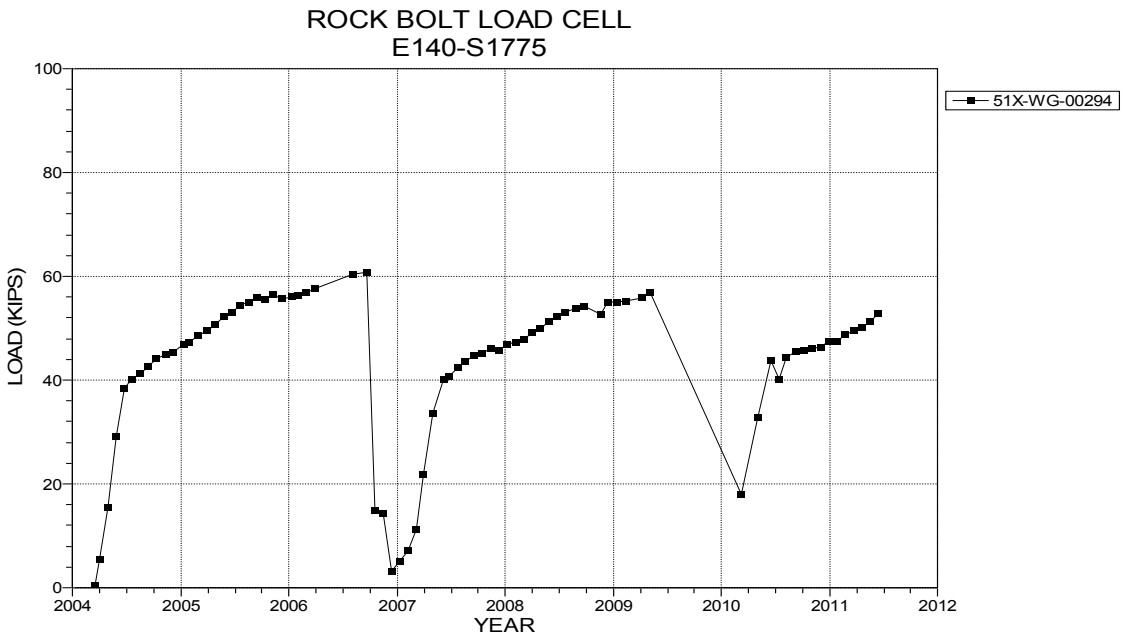
NOTES:
1. Excavation date: December 1982.

Figure 4-265 Rock Bolt Load Cell
S1600-E150 – Brow



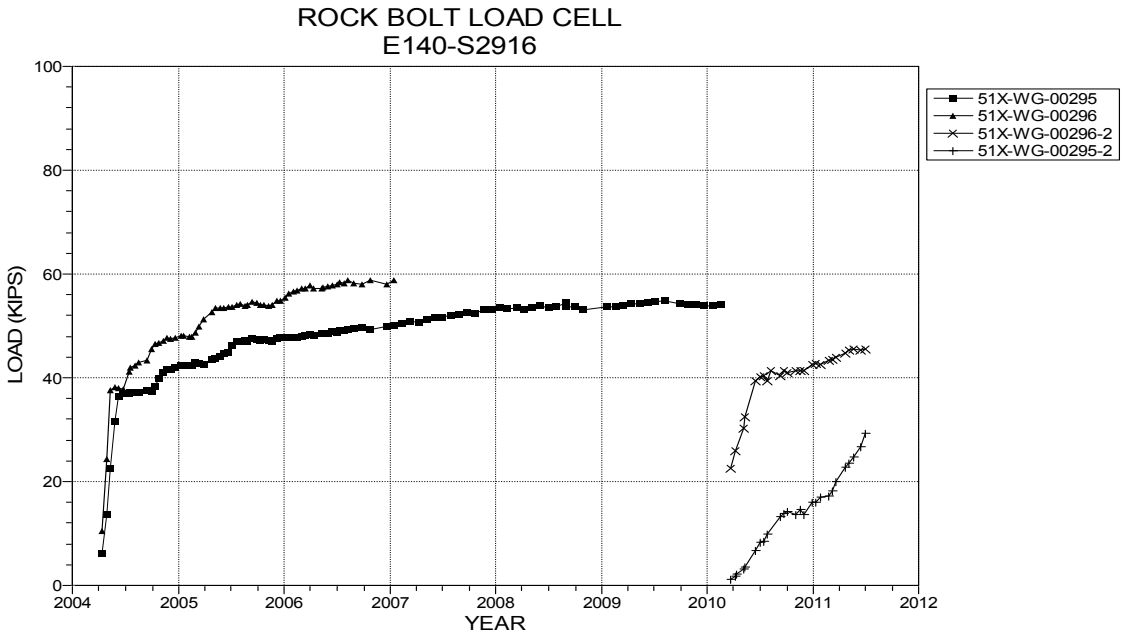
NOTES:
1. Excavation date: December 1982.
2. The bolt broke in October 2007 and was reinstalled.

Figure 4-266 Rock Bolt Load Cell
E140 S1550



NOTES:
1. Excavation date: December 1982.
2. Load cell was reinstalled in October 2006 and March 2010 due to bolt failures.

Figure 4-267 Rock Bolt Load Cell
E140 S1550



NOTES:
1. Excavation date: January 1983.
2. Both load cells were reinstalled on replacement bolts in March 2010.

Figure 4-268 Rock Bolt Load Cells
E140 S2916

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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. Plots of the instrument data are presented as Figures 5-19 through 5-26.

Table 5-5 presents data and analysis of Panel 5. Plots of the instrument data are presented as Figures 5-27 through 5-63.

Table 5-6 presents data and analysis of Panel 6. Plots of the instrument data are presented as Figures 5-64 through 5-123.

Table 5-7 presents data and analysis of Panel 7. Plots of the instrument data are presented as Figures 5-124 through 5-172.

Table 5-1
Panel 1 Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S1600-E311-2 A-C	S1600-E311	5-1	05/25/11	15.782	21.229	0.80	0.74	8%	
S1600-E332-3 A-C	S1600-E332	5-2	05/25/11	15.127	19.554	0.90	0.85	6%	
S1600-E357-2 A-C	S1600-E357	5-3	05/25/11	17.621	23.019	1.07	0.77	39%	
S1600-E382-2 A-C	S1600-E382	5-4	05/25/11	17.446	22.826	0.98	0.74	32%	
S1600-E407-2 A-G	S1600-E407	5-5	05/25/11	19.354	24.796	1.22	0.92	33%	
S1600-E407-2 B-F	S1600-E407	5-5	05/25/11	17.919	22.925	1.12	0.82	37%	
S1600-E407-2 H-L	S1600-E407	5-5	05/25/11	18.928	23.993	1.29	0.87	48%	
S1600-E432-2 A-C	S1600-E432	5-6	05/25/11	22.444	29.203	1.54	1.43	8%	
S1600-E453 A-C	S1600-E453	5-7	05/25/11	4.352	4.352	0.70	0.58	21%	
S1600-E453 B-D	S1600-E453	5-7	05/25/11	4.137	4.137	0.68	0.45	51%	
S1950-E311-7 A-C	S1950-E311	5-8	05/25/11	1.114	30.505	1.46	1.16	26%	
S1950-E311-3 B-D	S1950-E311	5-8	05/25/11	16.201	29.202	1.57	1.32	19%	
S1950-E332-4 A-C	S1950-E332	5-9	05/25/11	18.594	37.196	1.70	1.48	15%	
S1950-E332-4 B-D	S1950-E332	5-9	05/25/11	13.999	31.945	1.76	1.48	19%	
S1950-E357-7 A-C	S1950-E357	5-10	05/25/11	23.591	43.755	2.28	2.04	12%	
S1950-E357-4 B-D	S1950-E357	5-10	05/25/11	14.970	33.429	1.78	1.59	12%	
S1950-E382-5 A-C	S1950-E382	5-11	05/25/11	27.762	46.397	2.73	2.26	21%	
S1950-E382-3 B-D	S1950-E382	5-11	05/25/11	21.803	36.185	2.14	1.61	33%	
S1950-E407-4 A-G	S1950-E407	5-12	05/25/11	27.467	49.291	2.62	2.27	15%	
S1950-E407-3 H-L	S1950-E407	5-12	05/25/11	27.060	47.792	2.40	2.03	18%	
S1950-E407-3 D-J	S1950-E407	5-13	05/25/11	22.793	36.970	1.96	1.69	16%	
S1950-E432-3 A-C	S1950-E432	5-14	05/25/11	27.106	48.901	3.41	1.95	75%	
S1950-E432-3 B-D	S1950-E432	5-14	05/25/11	21.283	35.684	1.71	1.60	7%	

Table 5- Panel 1 Access Drifts Data Analysis

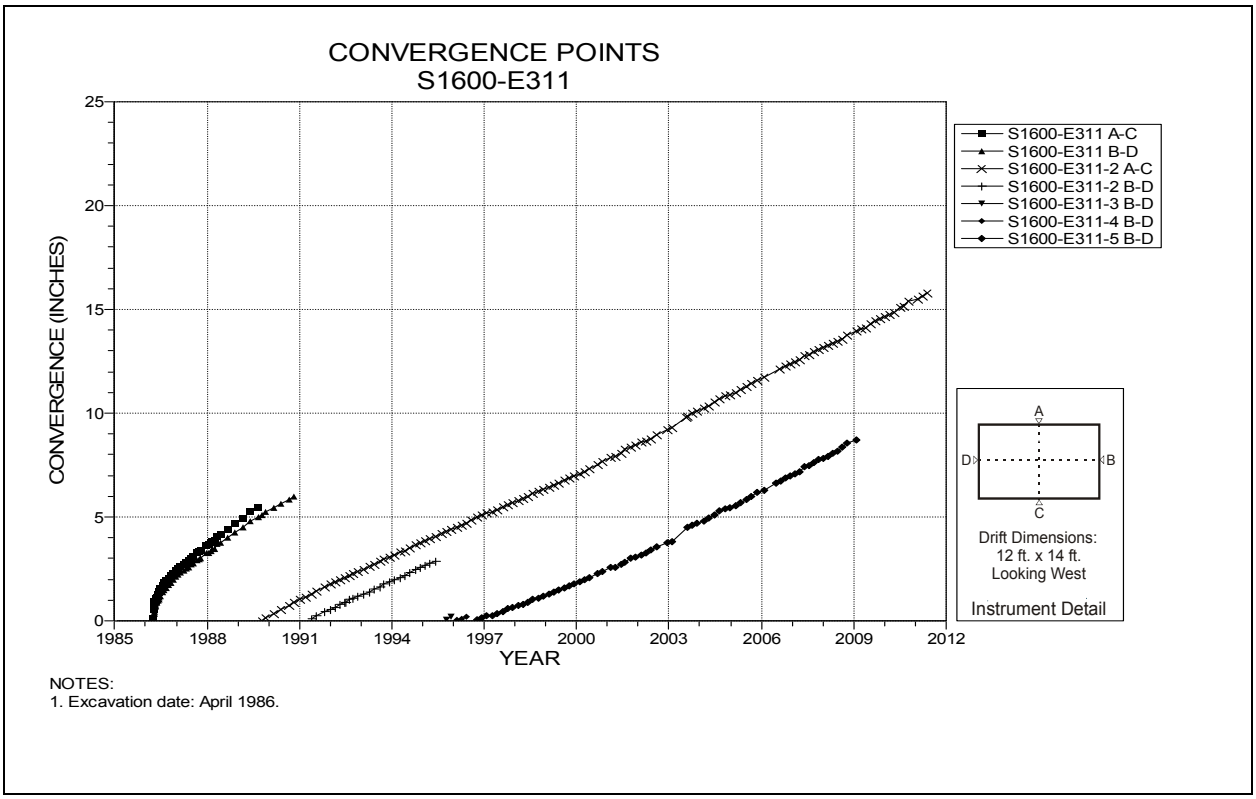


Figure 5-1 Convergence Point Array
S1600 E311 – All Chords

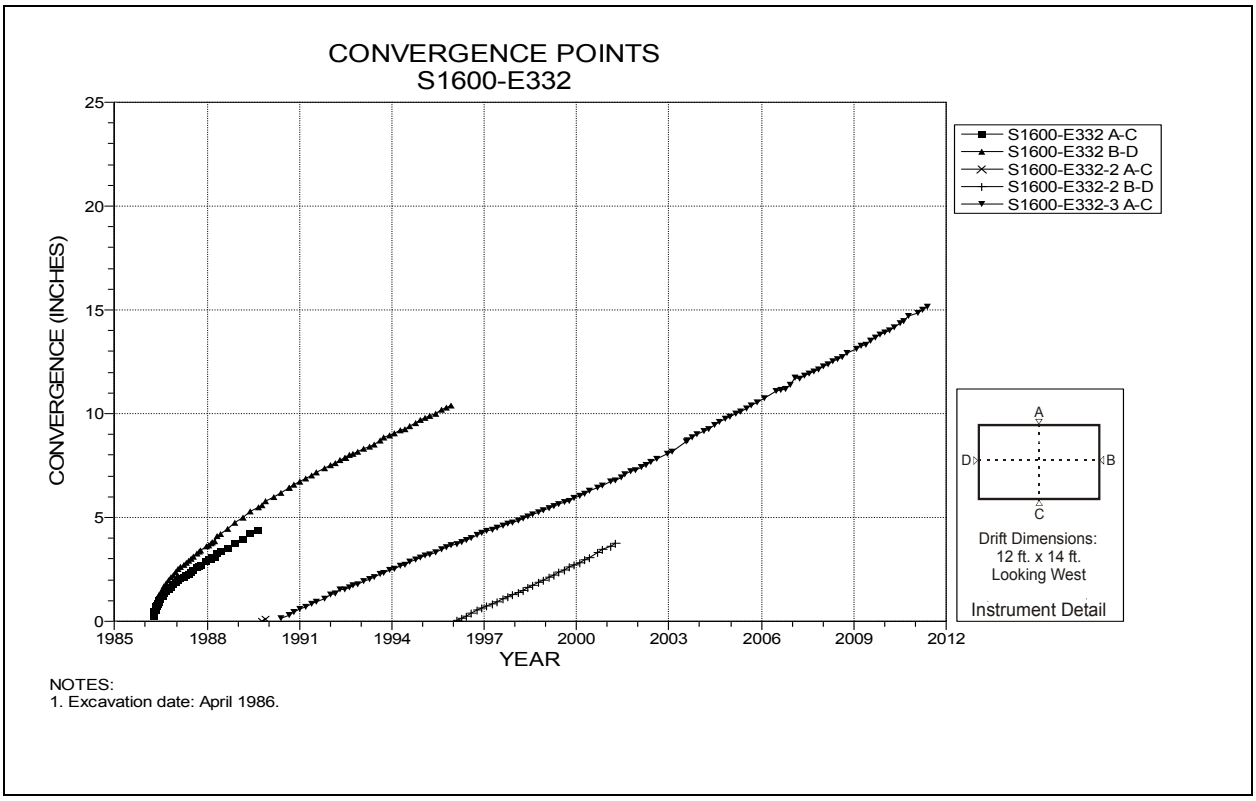


Figure 5-2 Convergence Point Array
S1600 E332 – All Chords

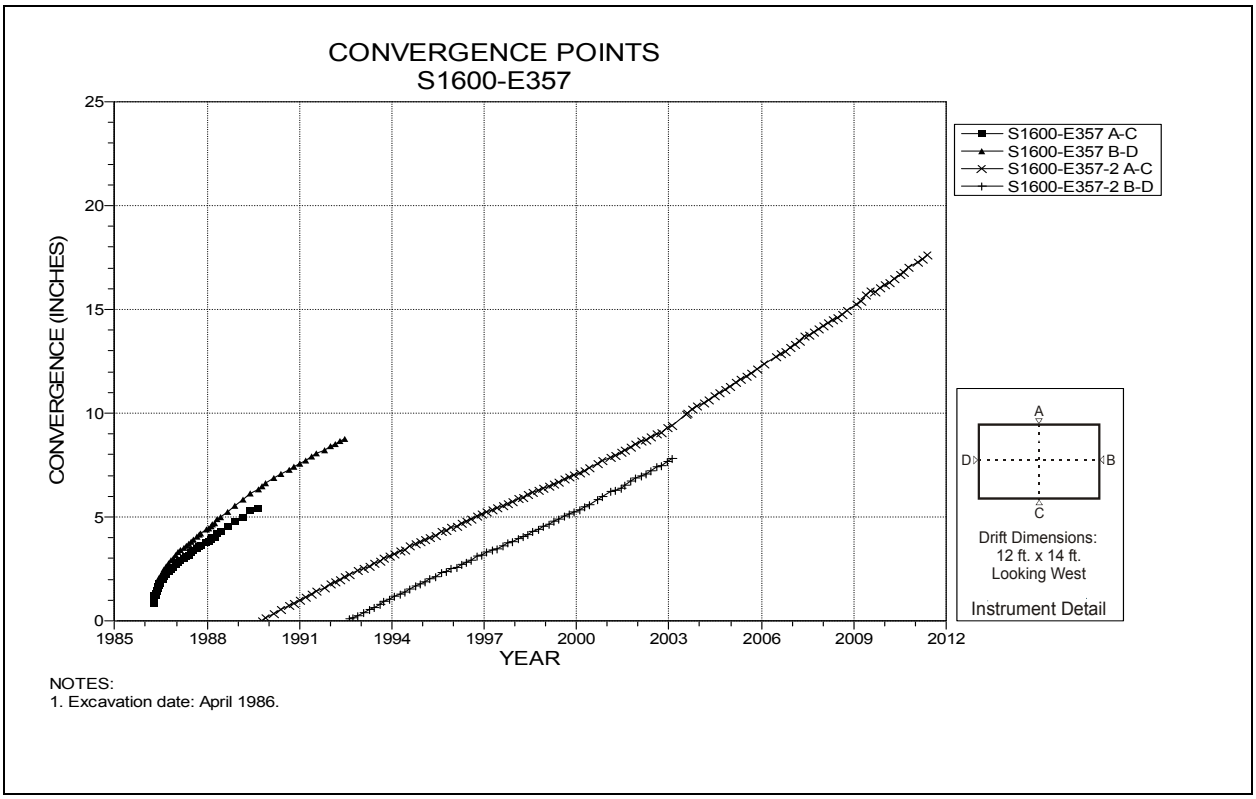


Figure 5-3 Convergence Point Array
S1600 E357 – All Chords

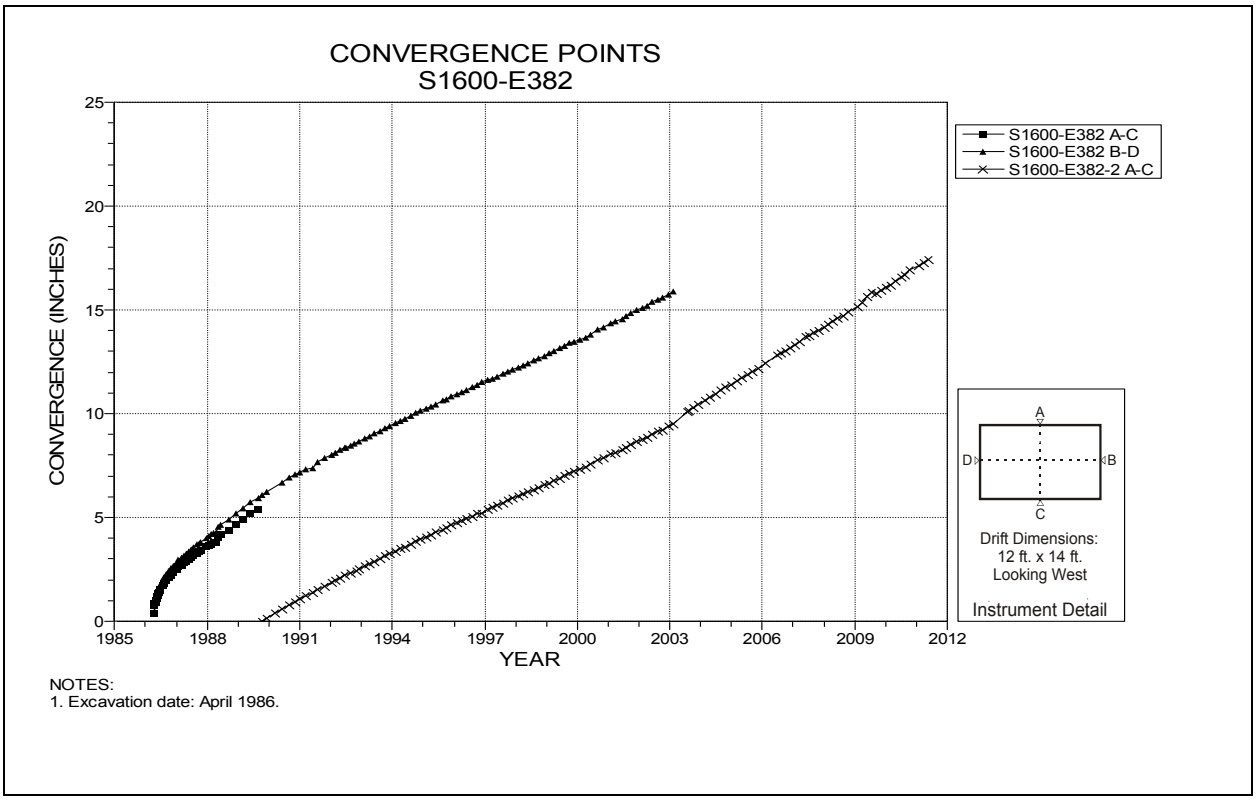


Figure 5-4 Convergence Point Array
S1600 E382 – All Chords

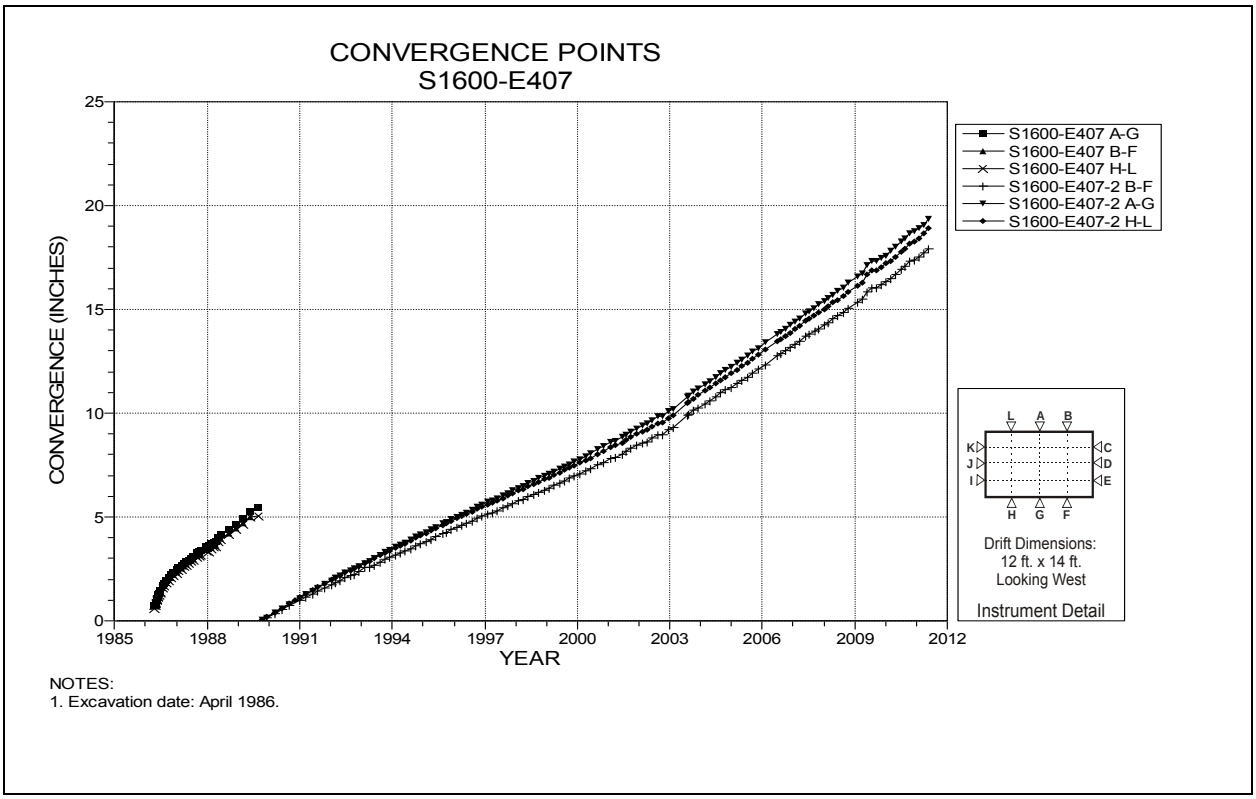


Figure 5-5 Convergence Point Array
S1600 E407 – All Vertical Chords

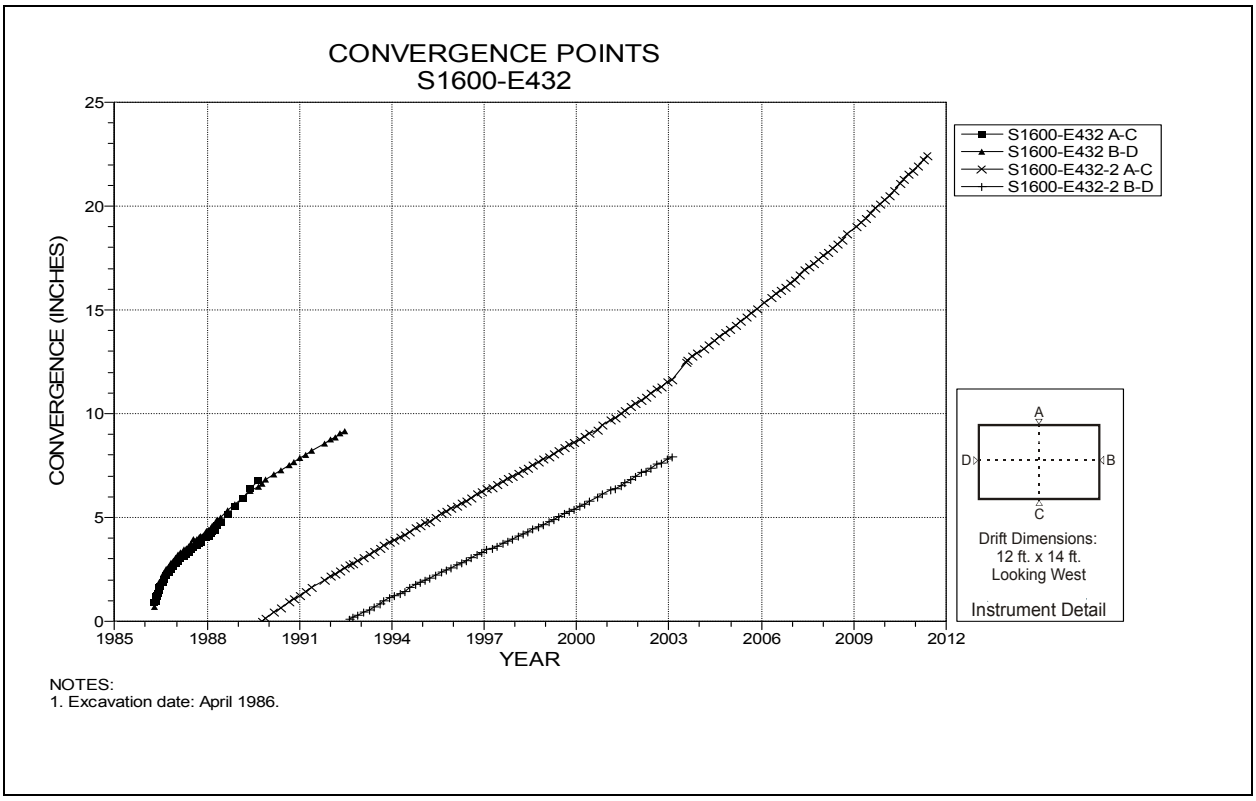


Figure 5-6 Convergence Point Array
S1600 E432 – All Chords

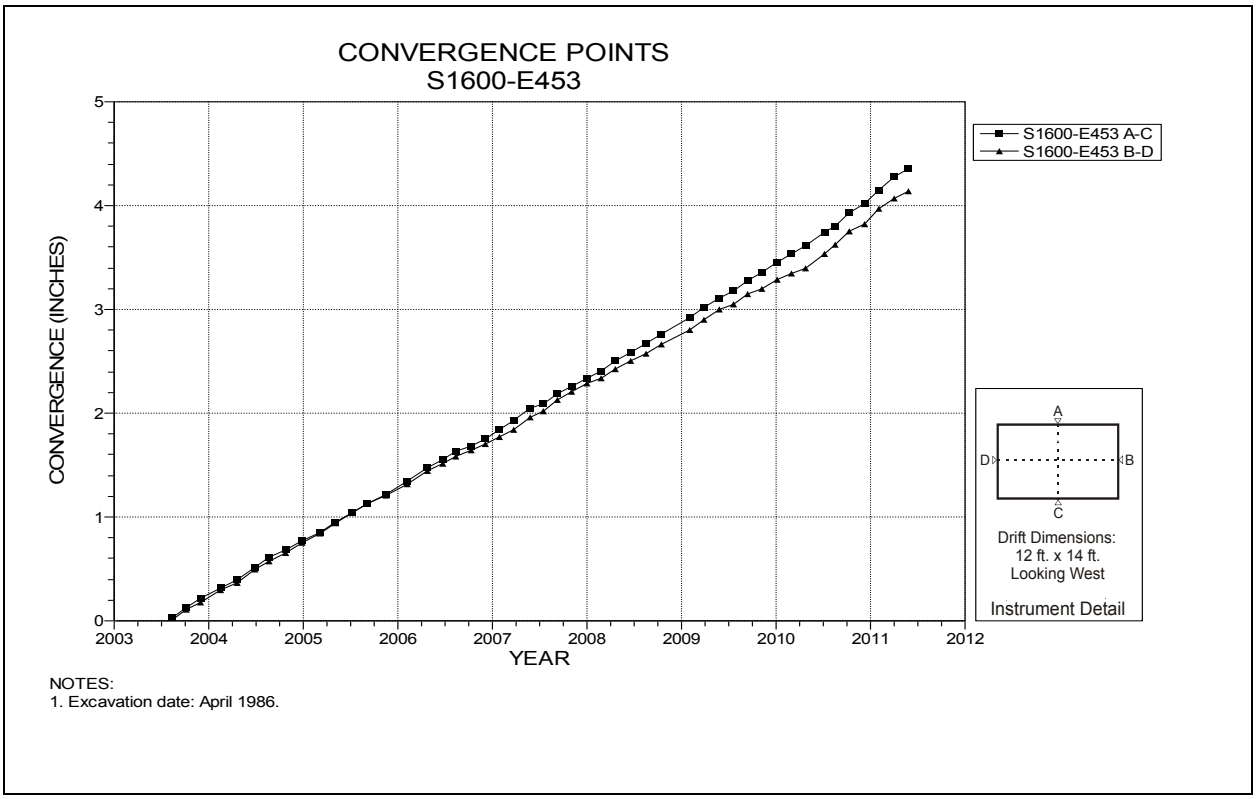


Figure 5-7 Convergence Point Array
S1600 E453 – All Chords

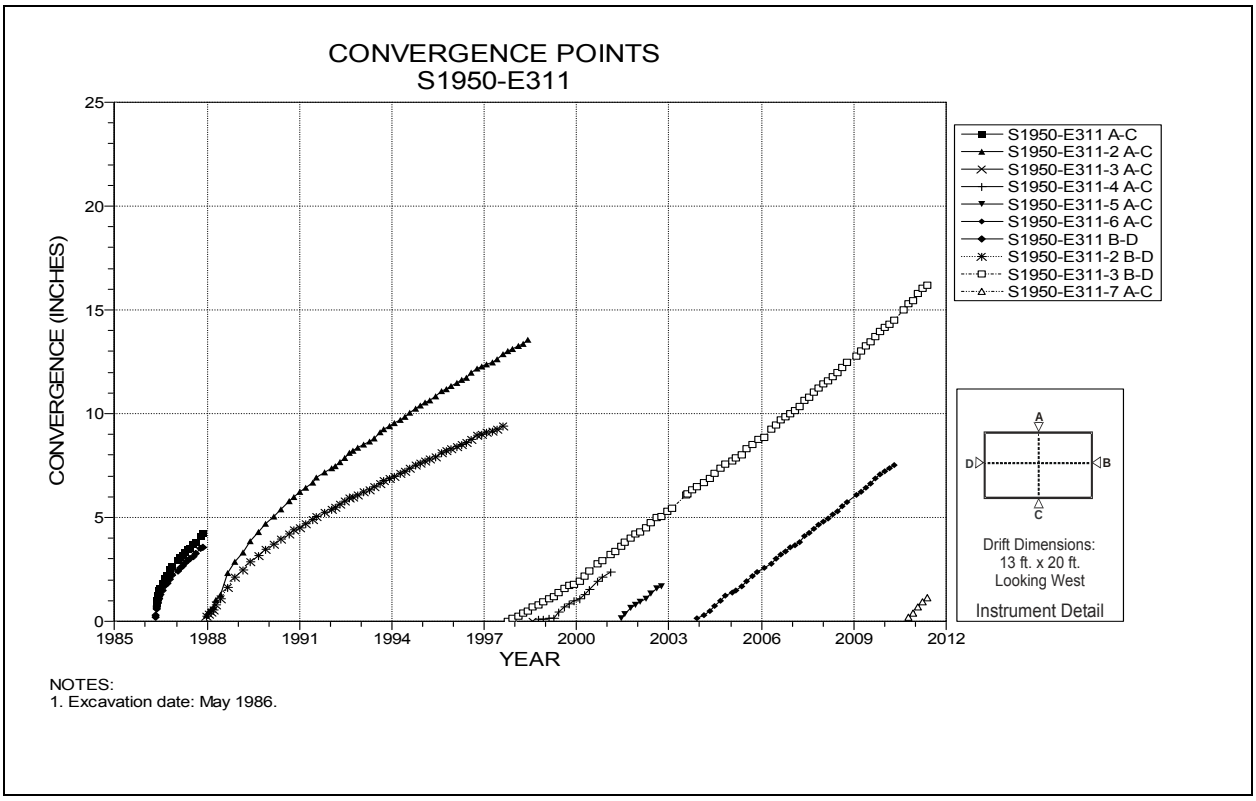


Figure 5-8 Convergence Point Array
S1950 E311 – All Chords

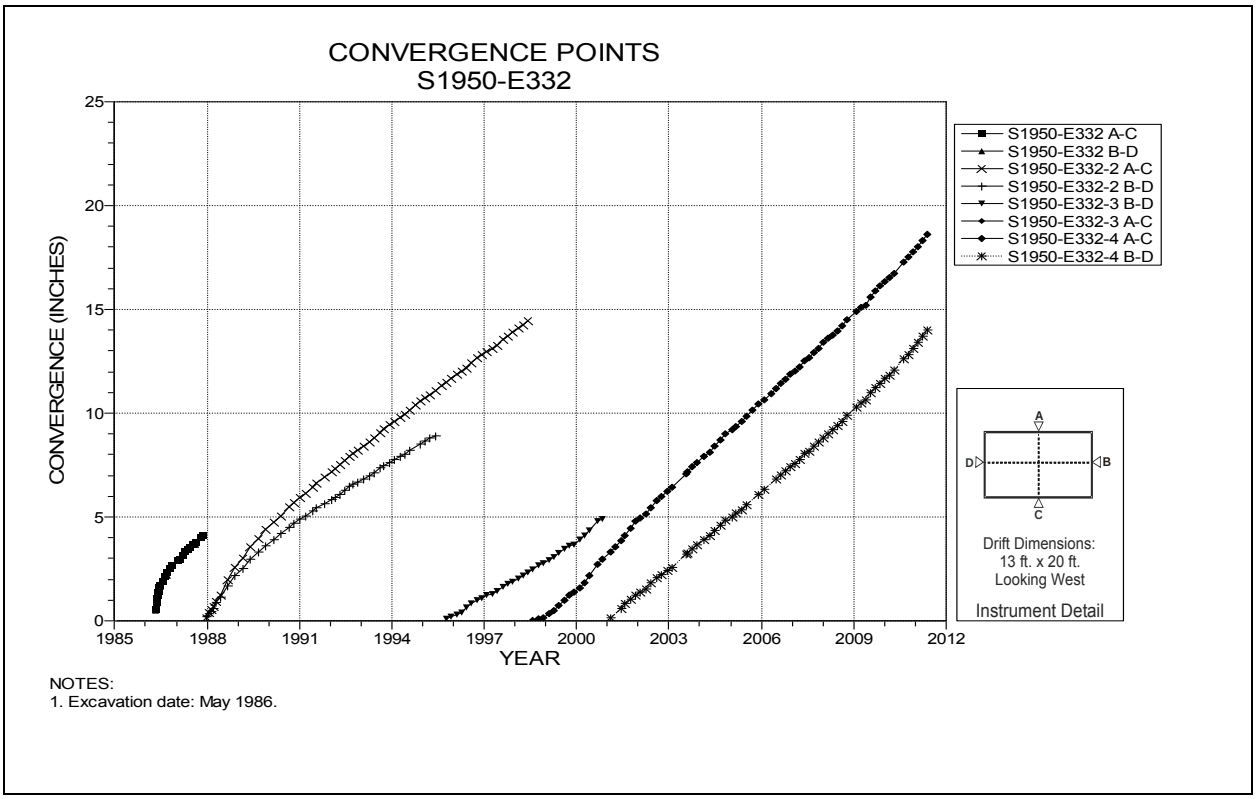


Figure 5-9 Convergence Point Array
S1950 E332 – All Chords

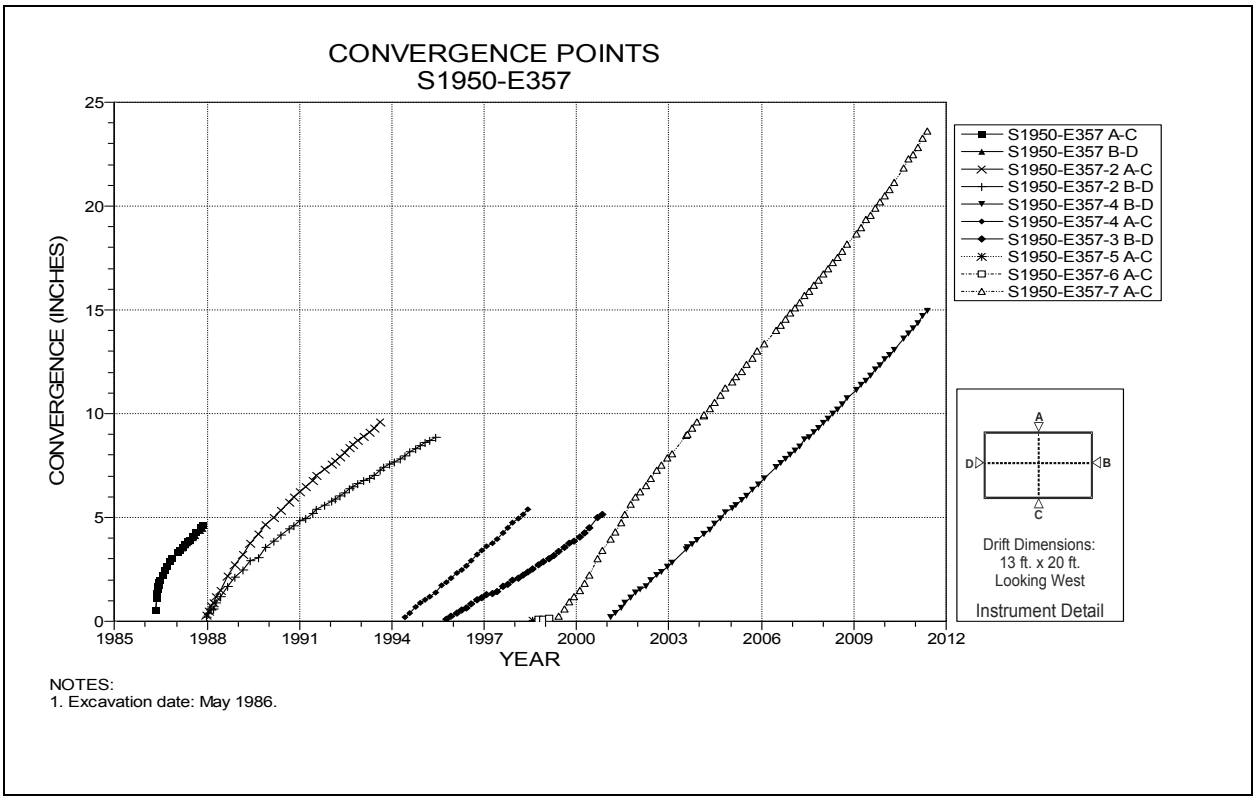


Figure 5-10 Convergence Point Array
S1950 E357 – All Chords

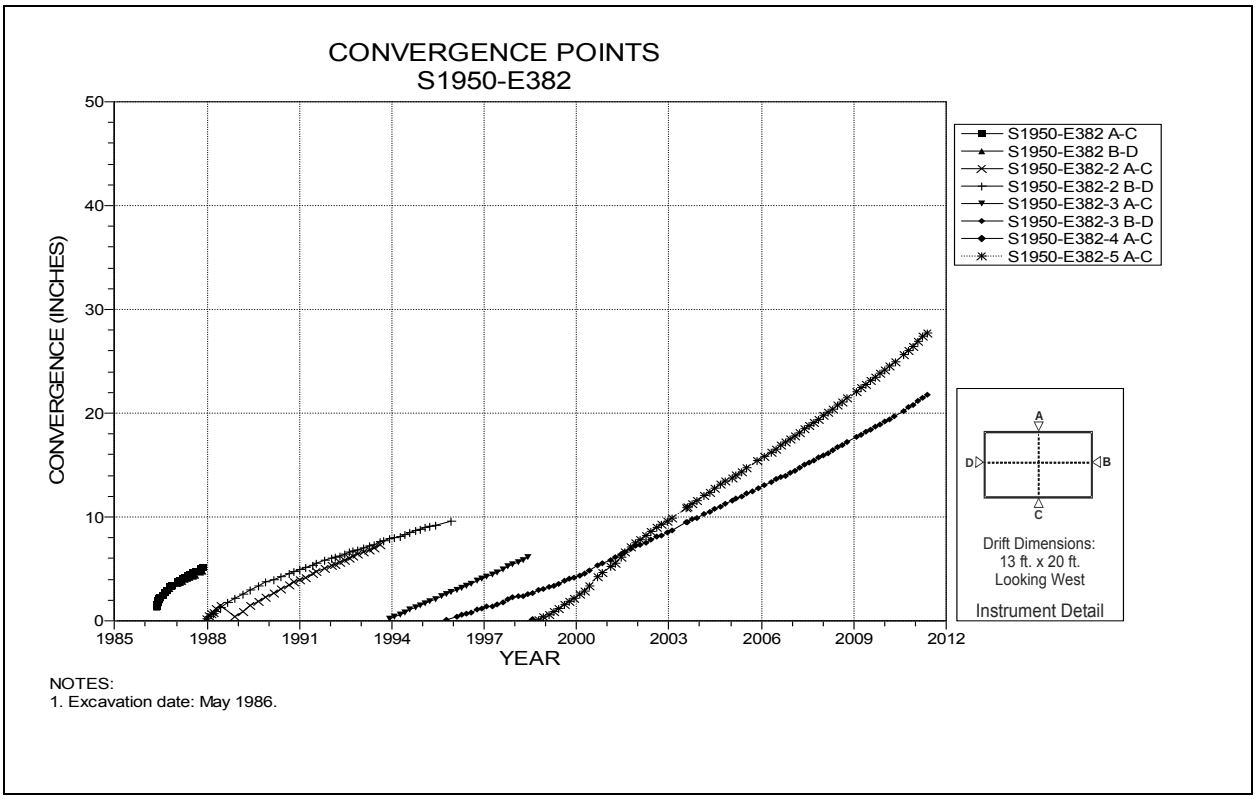


Figure 5-11 Convergence Point Array
S1950 E382 – All Chords

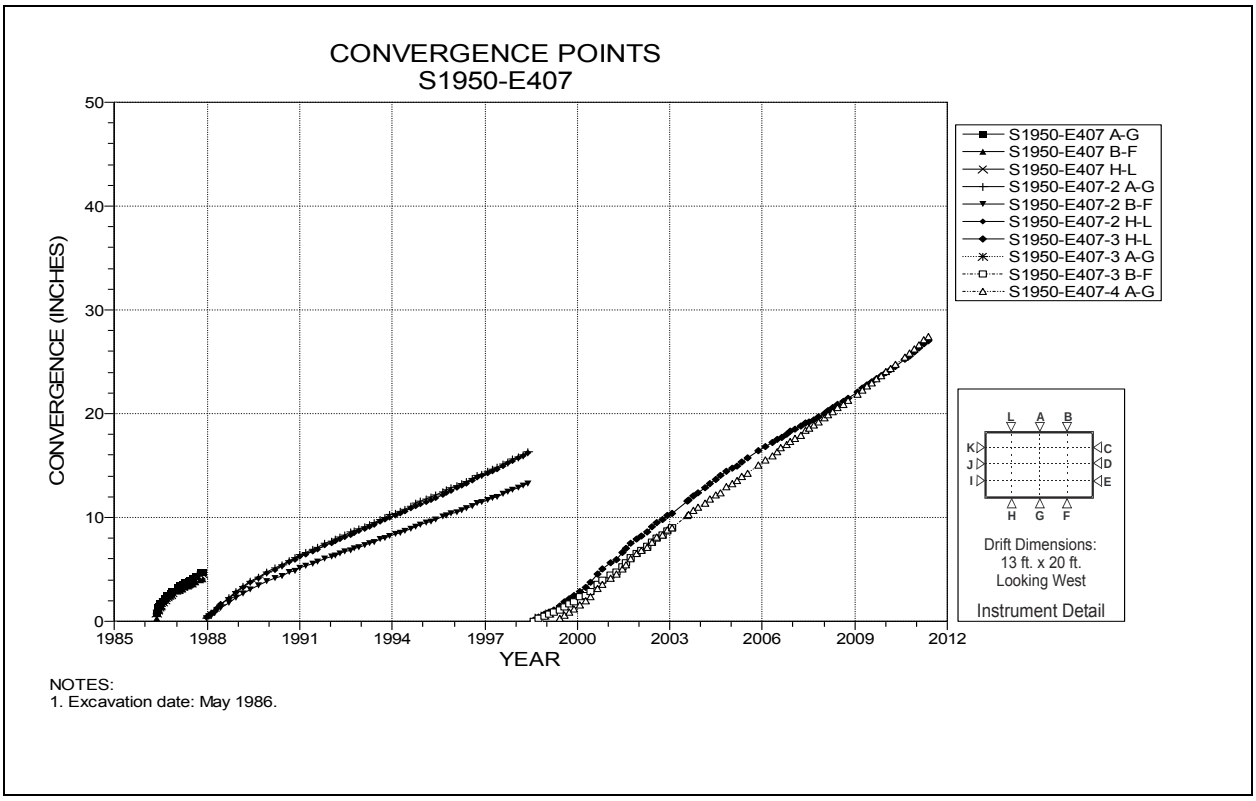


Figure 5-12 Convergence Point Array
S1950 E407 – Roof to Floor

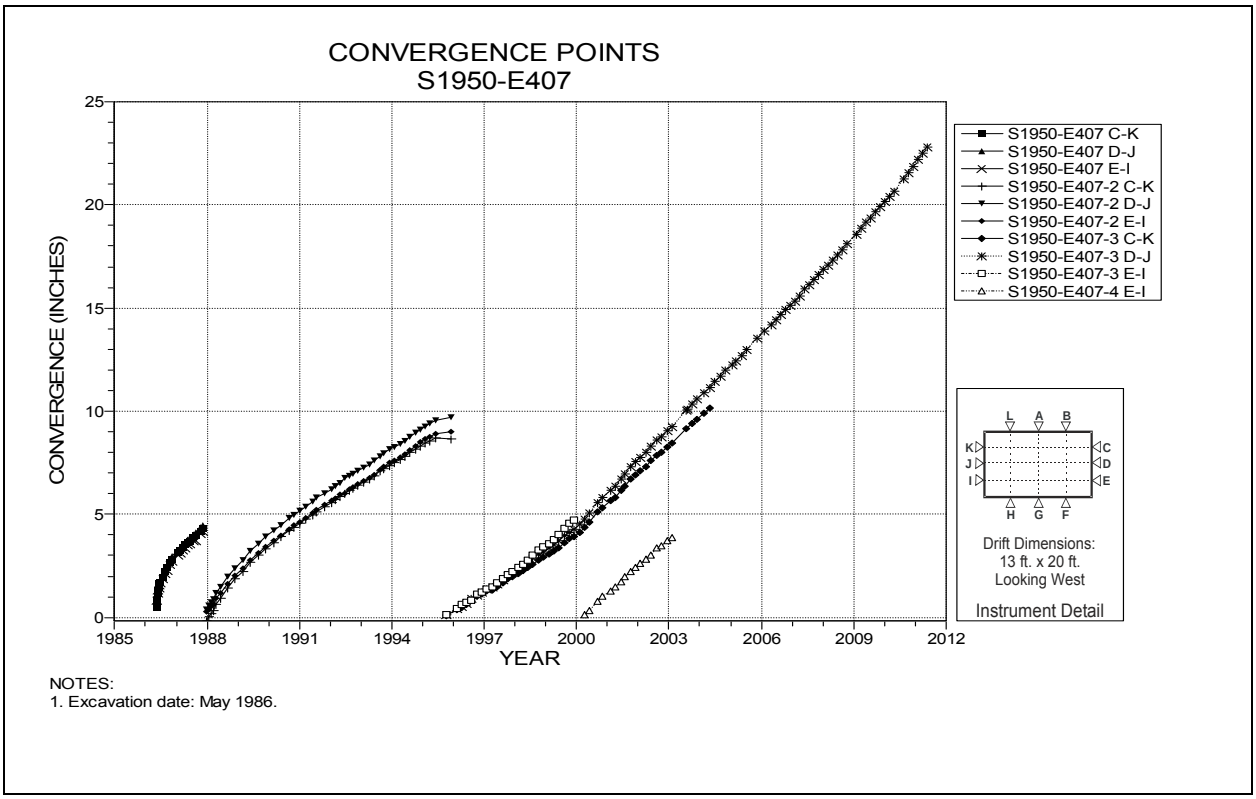


Figure 5-13 Convergence Point Array
S1950 E407 – Rib to Rib

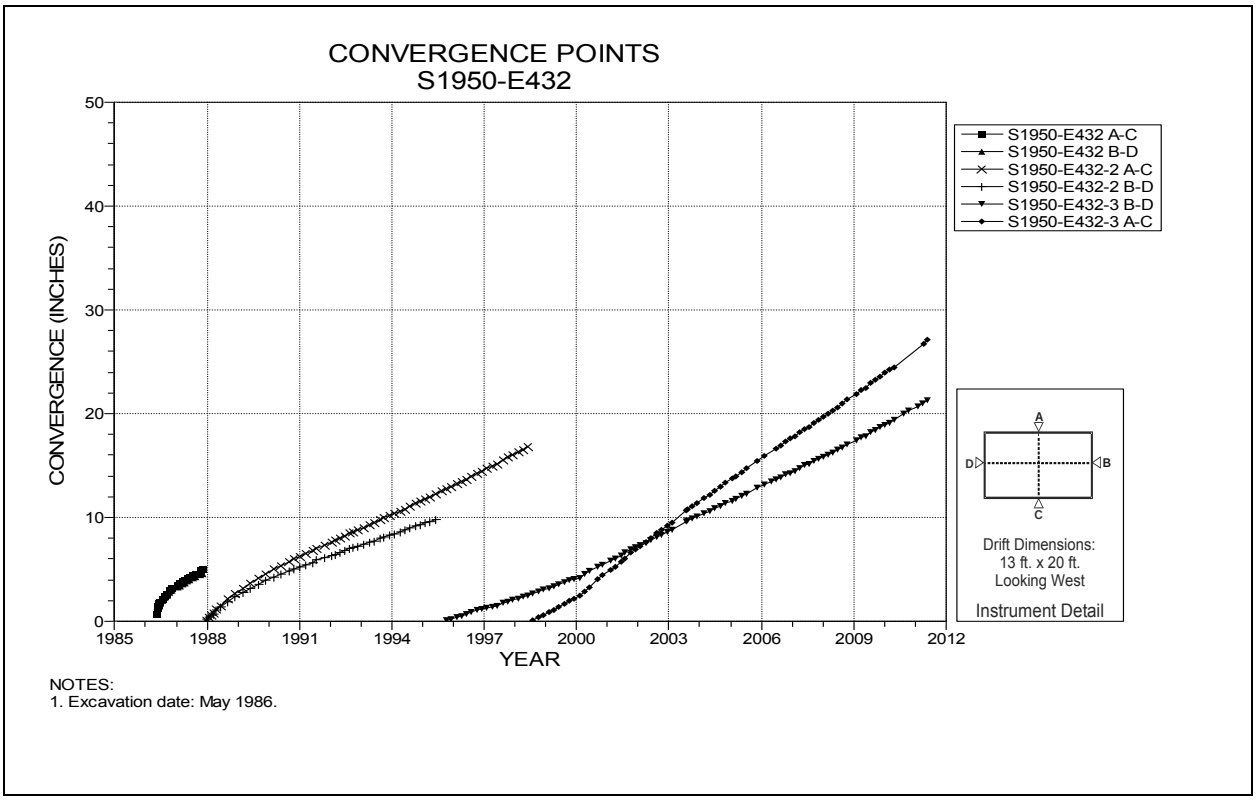


Figure 5-14 Convergence Point Array
S1950 E432 – All Chords

Table 5-2
Panel 2 Access Drifts Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S2180-E410-2 A-C	S2180-E410	5-15	06/07/11	9.136	13.933	1.51	1.23	23%	
S2180-E410 B-D	S2180-E410	5-15	06/07/11	17.692	17.692	2.19	1.70	29%	
S2520-E410-3 A-C	S2520-E410	5-16	06/07/11	20.740	28.876	3.53	3.04	16%	

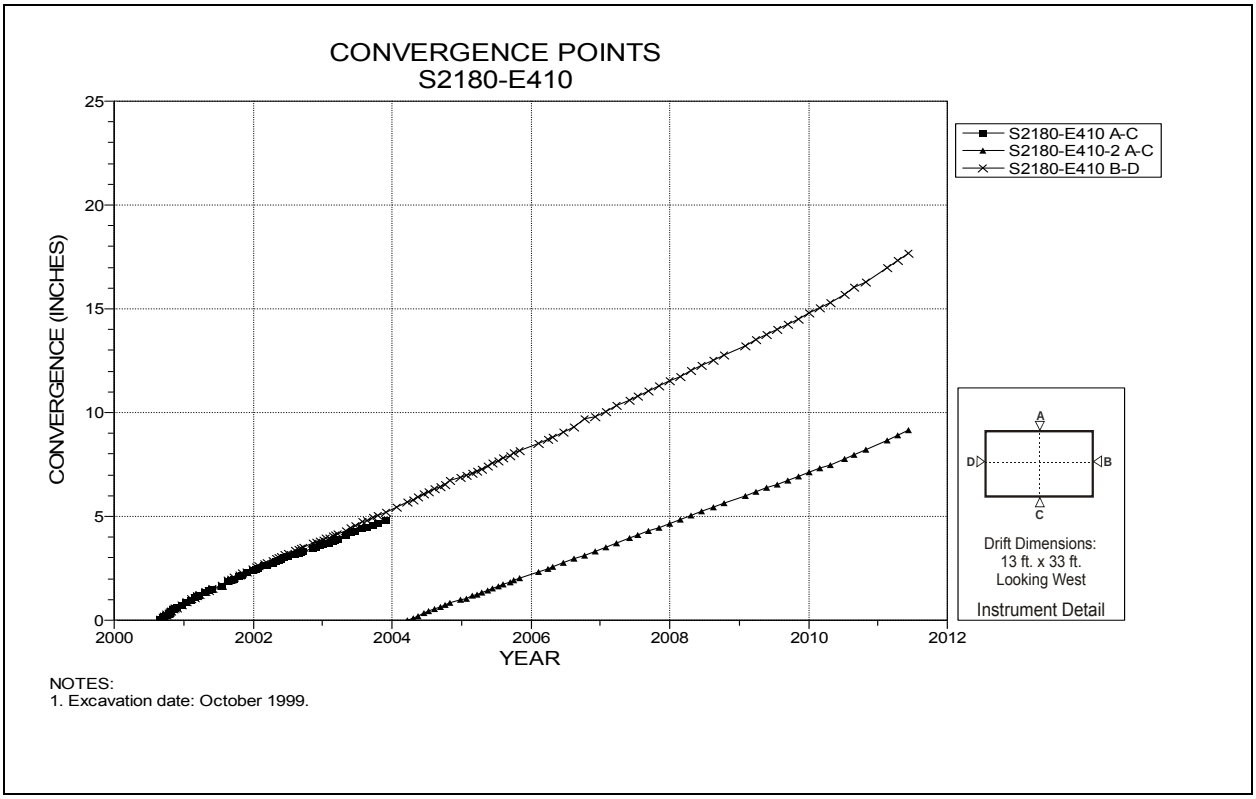


Figure 5-15 Convergence Point Array
S2180 E410 – All Chords

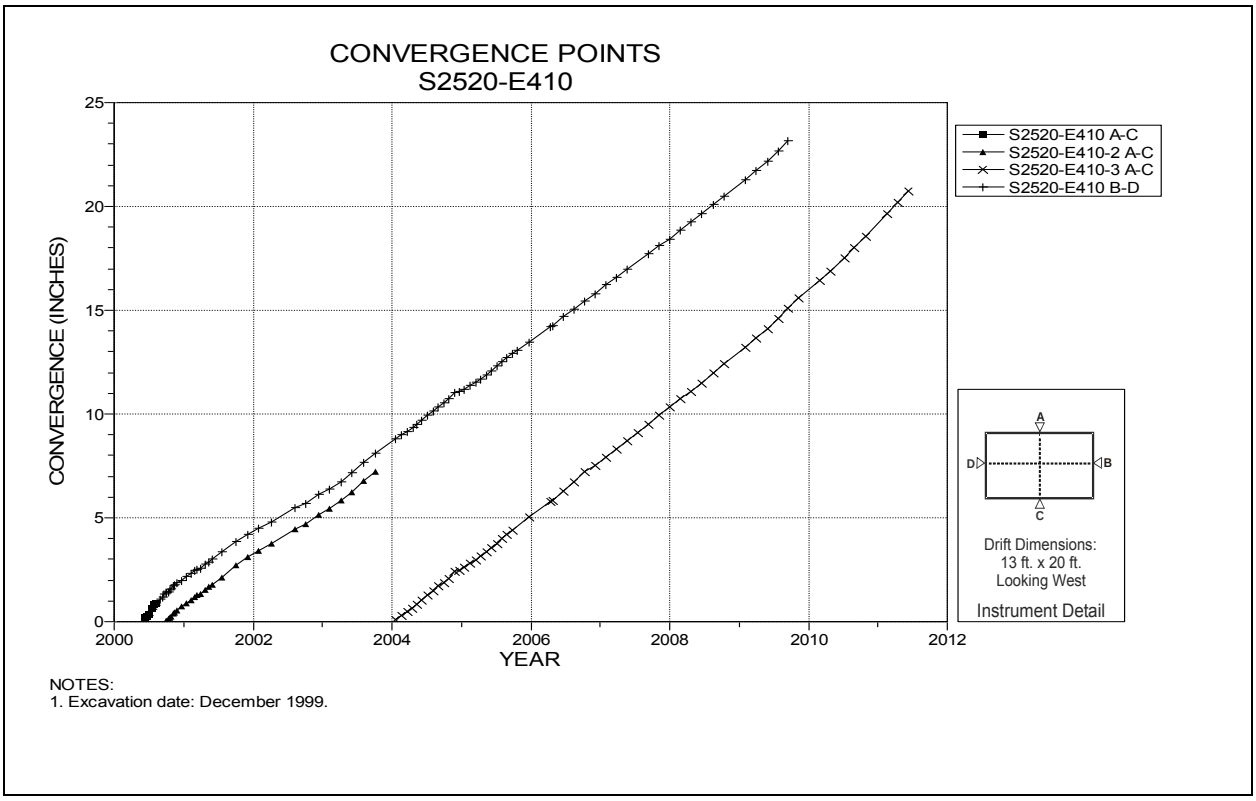


Figure 5-16 Convergence Point Array
S2520 E410 – All Chords

Table 5-3
Panel 3 Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S2750-E410 A-C	S2750-E410	5-17	06/07/11	21.118	21.118	4.46	2.97	50%	
S2750-E410 B-D	S2750-E410	5-17	06/07/11	15.321	15.321	2.37	1.90	25%	
S3080-E410-2 A-C	S3080-E410	5-18	06/06/11	21.990	24.503	4.25	4.07	4%	
S3080-E410 B-D	S3080-E410	5-18	05/23/11	18.080	18.080	2.60	2.17	20%	

Table 5- Panel 3 Data Analysis

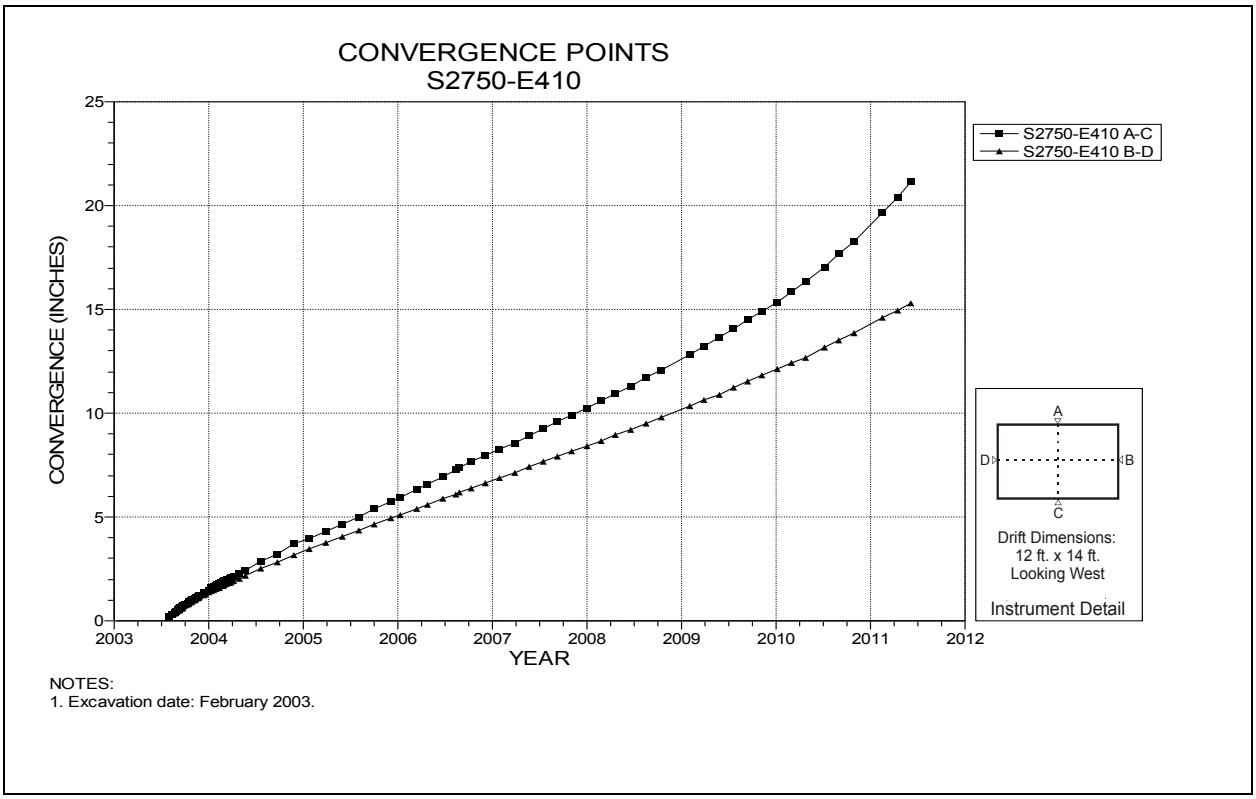


Figure 5-17 Convergence Point Array
S2750 E410 – All Chords

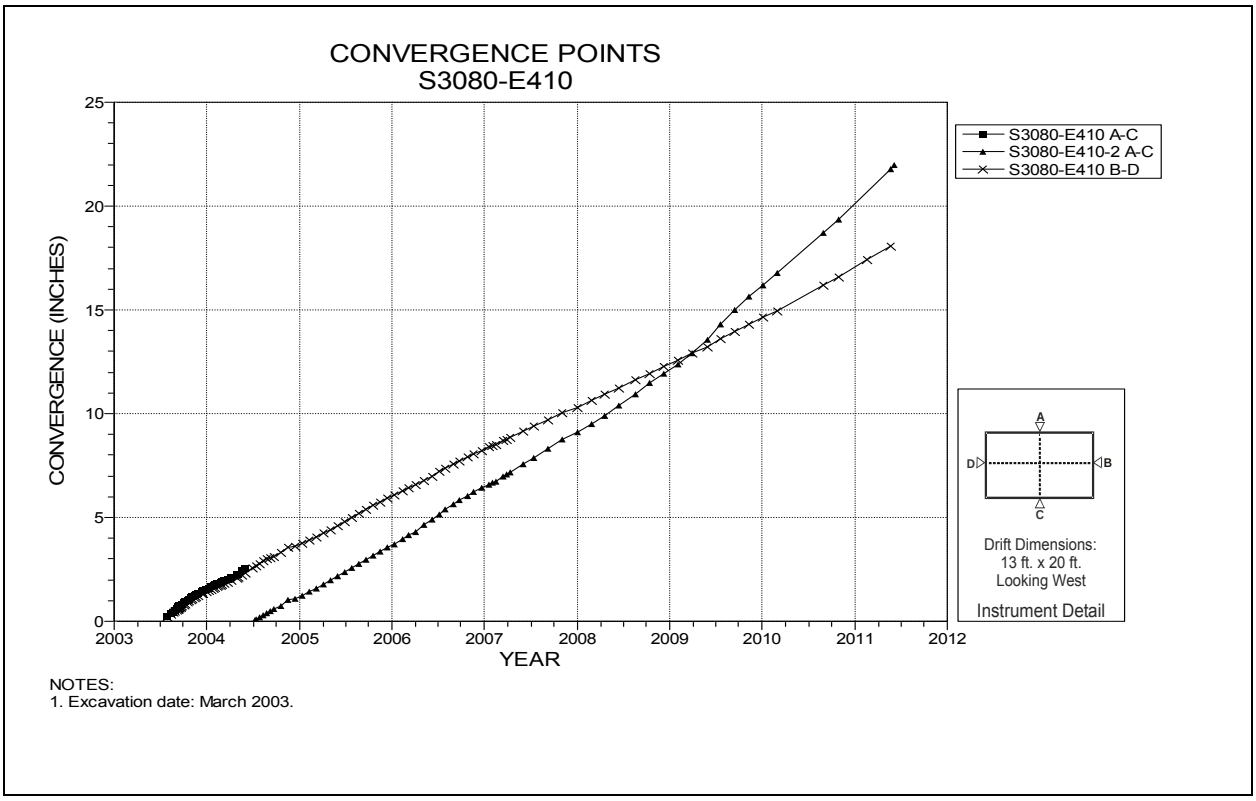


Figure 5-18 Convergence Point Array
S3080 E410 – All Chords

Table 5-4 Panel 4 Data Analysis

EXTENSOMETERS

Field Tag	Location	Figure Number	Date of Last Reading	Collar Displacement Relative to Deepest Anchor (inches)	Displacement Rate 2010 to 2011 (in/year)	Displacement Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
51X-GE-00378	Panel 4 Room 2 – Center Roof	5-19	08/26/10	10.814	3.20	2.37	35%	
51X-GE-00380	Panel 4 Room 4 – Center Roof	5-20	08/26/10	13.485	4.90	3.99	23%	Rate calculated on anchor B.
51X-GE-00381	Panel 4 Room 6 – Center Roof	5-21	08/26/10	10.325	3.95	2.62	51%	
51X-GE-00382	Panel 4 Room 7 – Center Roof	5-22	08/26/10	7.843	2.45	1.85	32%	
51X-GE-00384	S3310-E1125	5-23	08/26/10	12.295	8.50	4.29	98%	
51X-GE-00386	S3650- E725	5-24	08/26/10	8.258	3.27	2.44	34%	
51X-GE-00385	S3650-E1125	5-25	08/26/10	9.696	3.63	2.87	26%	

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S3310-E410 A-C	S3310-E410	5-26	4/14/2011	11.640	11.640	N/A	1.61	N/A	Accessible for one reading this period.

able 5- Panel 4 Data Analysis

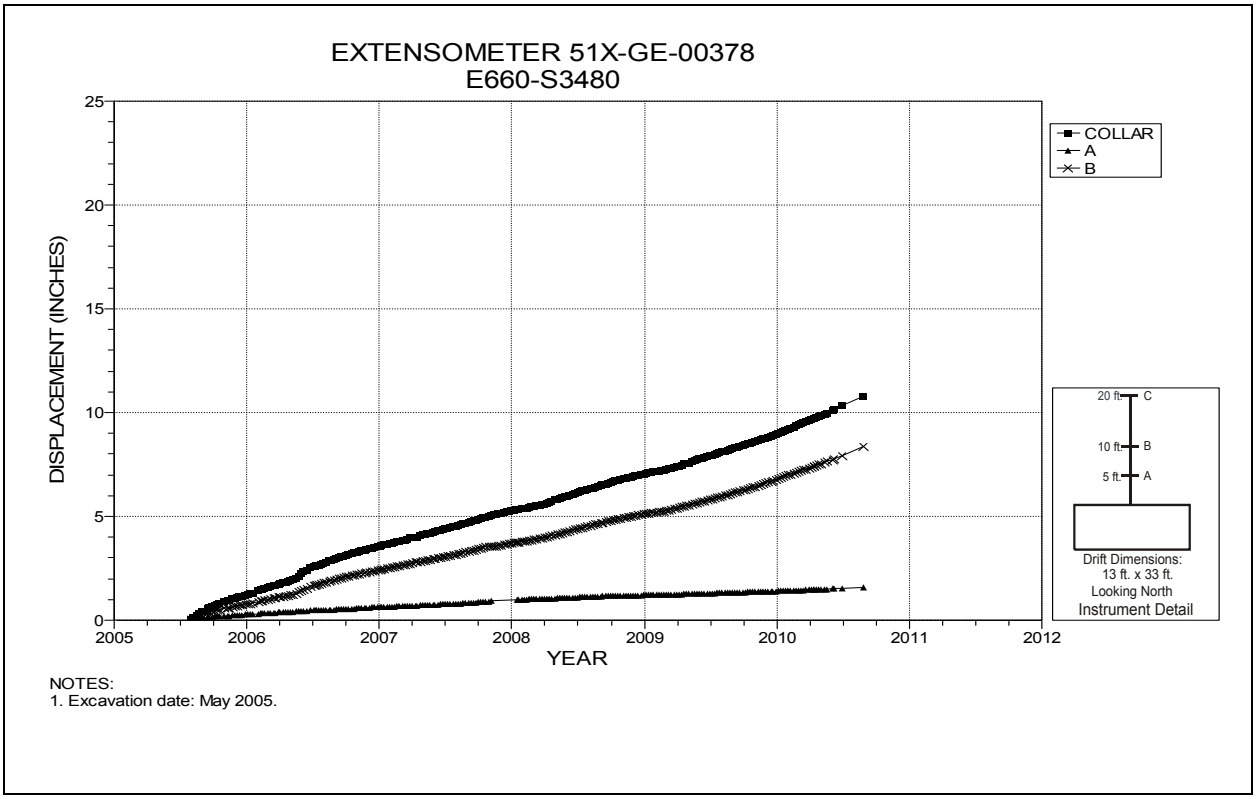


Figure 5-19 Extensometer 51X-GE-00378
Panel 4 Room 2 at E660 S3480 – Room Center – Roof

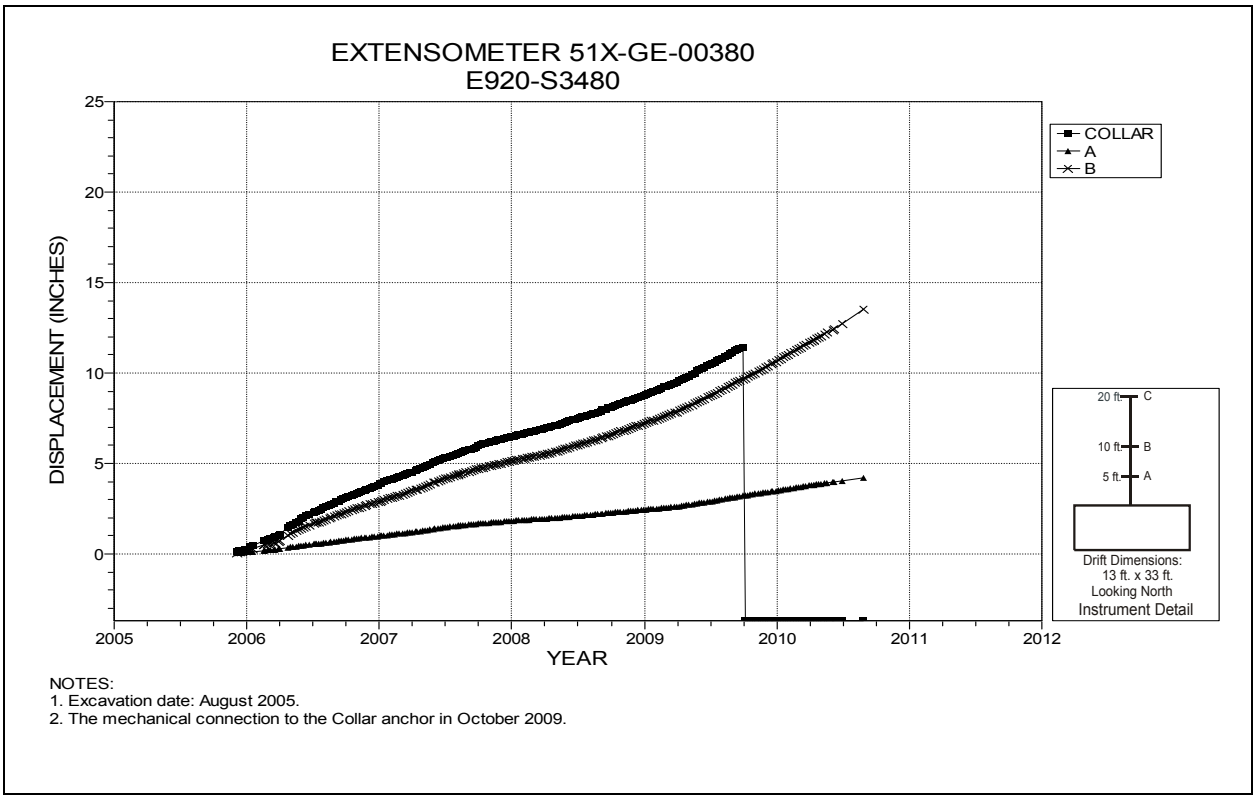


Figure 5-20 Extensometer 51X-GE-00380
Room 4, Panel 4 at E920 S3480 – Room Center – Roof

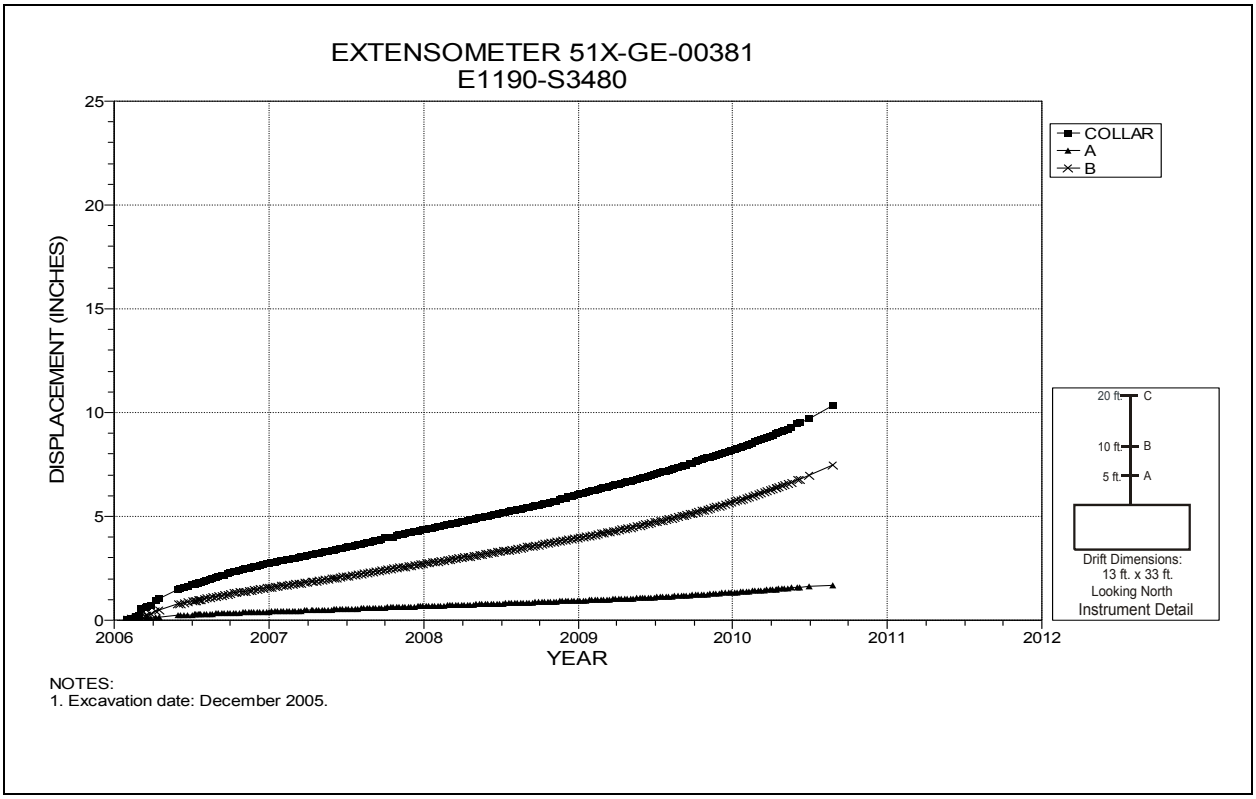


Figure 5-21 Extensometer 51X-GE-00381
Panel 4 Room 6 at E1190 S3480 – Room Center – Roof

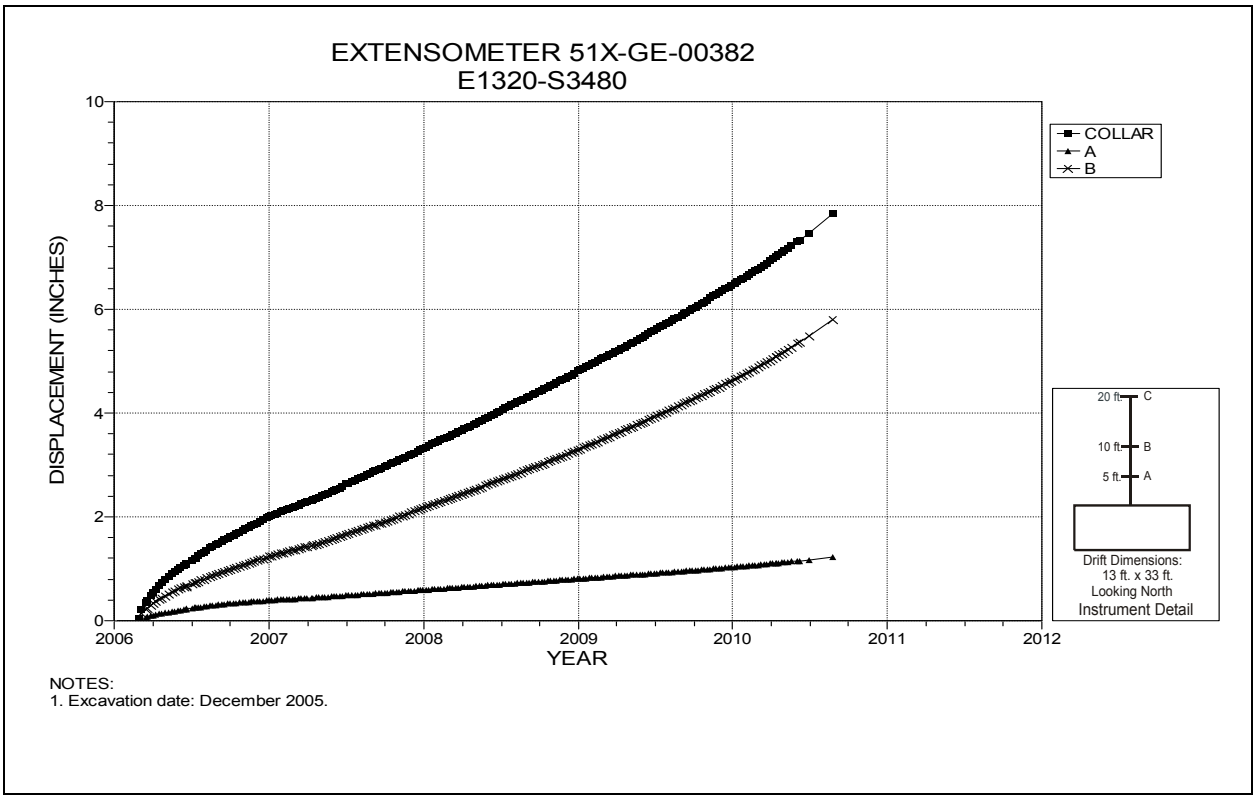


Figure 5-22 Extensometer 51X-GE-00382
Panel 4 Room 7, at E1320 S3480 – Room Center – Roof

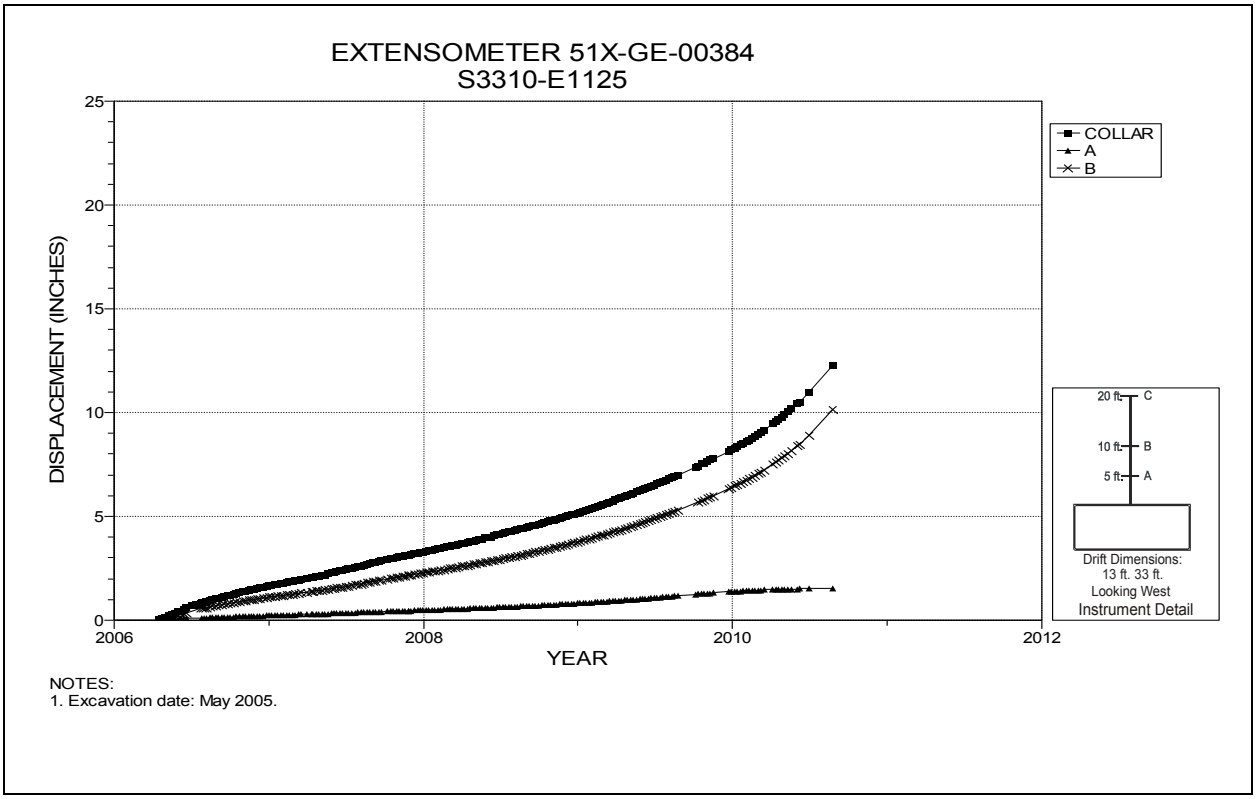


Figure 5-23 Extensometer 51X-GE-00384
S3310 E1125 – Roof

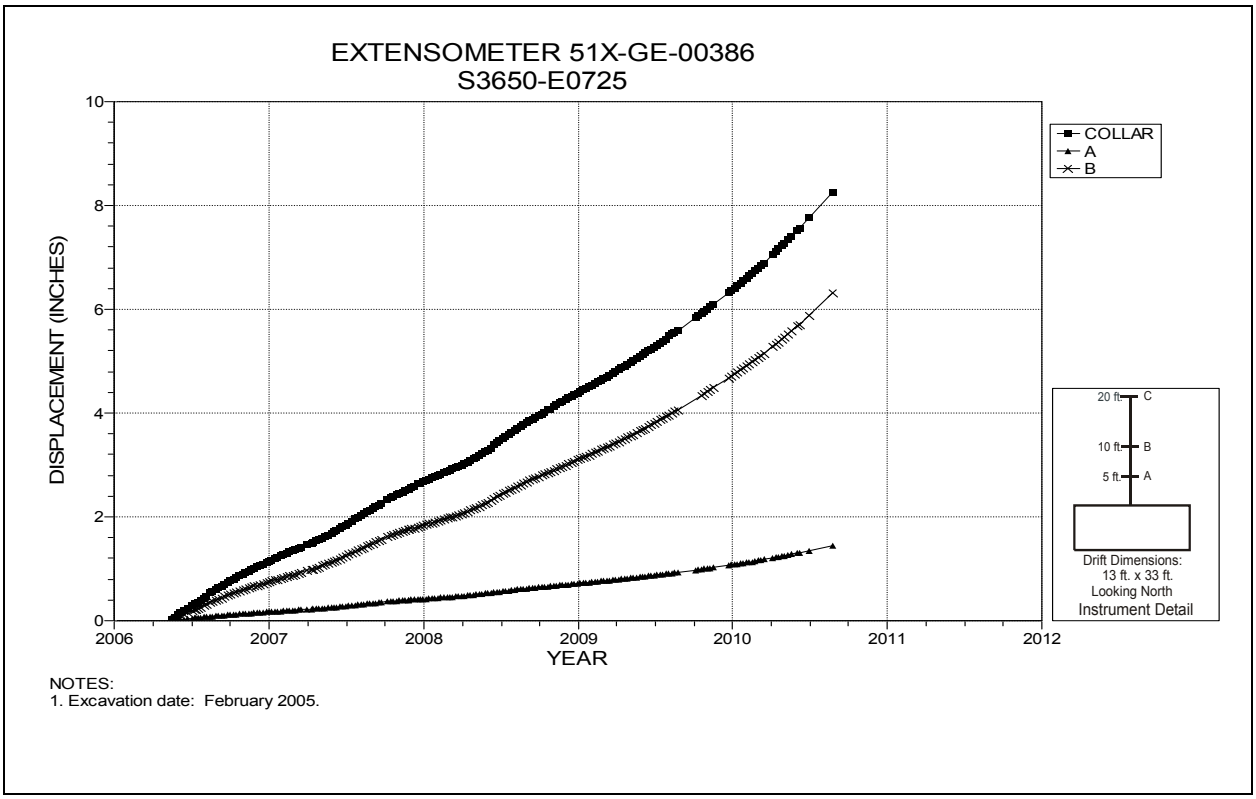


Figure 5-24 Extensometer 51X-GE-00386
S3650 E725 – Roof

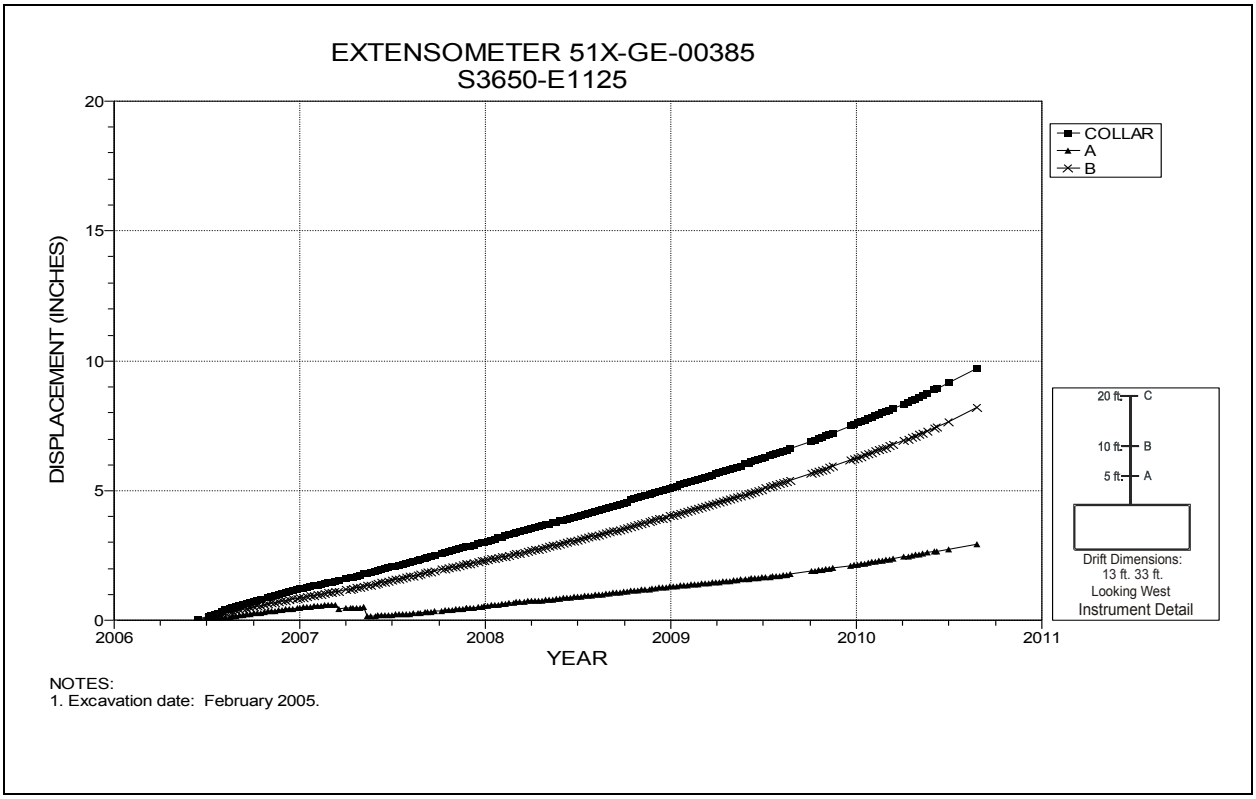


Figure 5-25 Extensometer 51X-GE-00385
S3650 E1125 – Roof

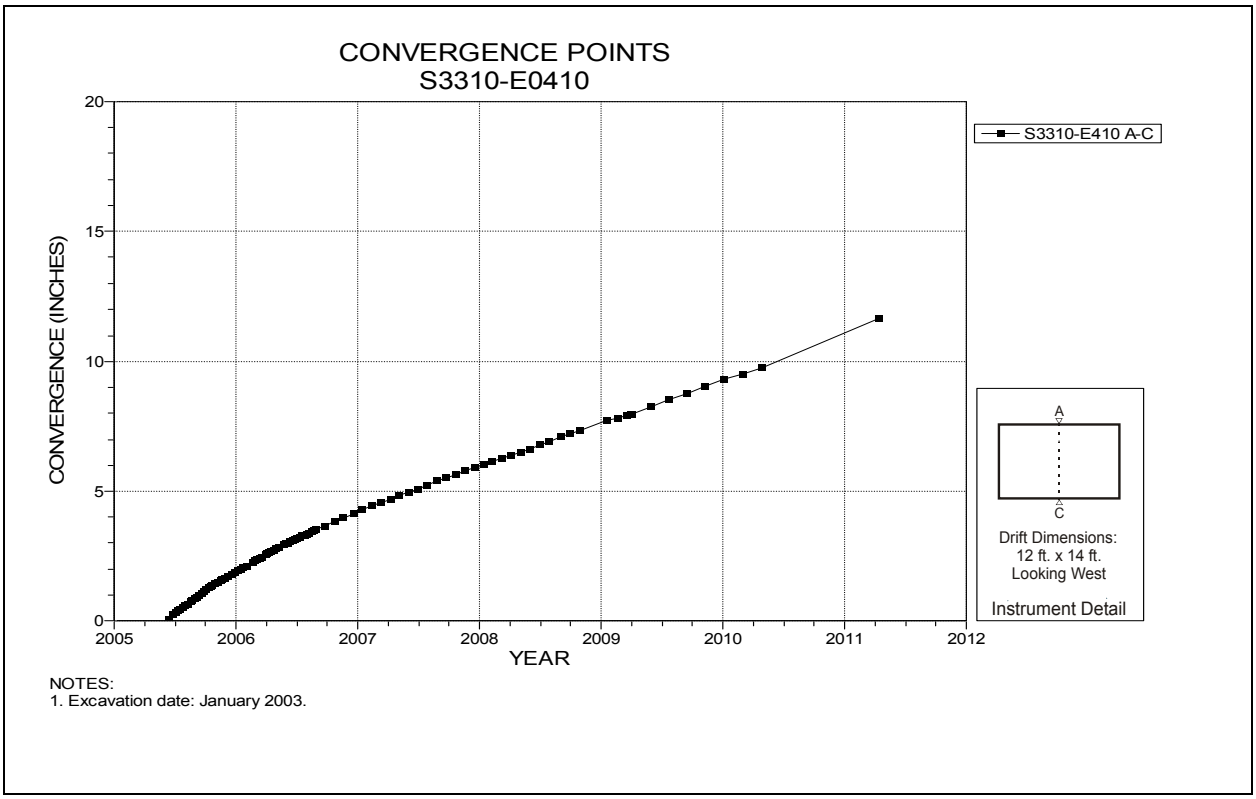


Figure 5-26 Convergence Point Array
S3310 E410 – Roof to Floor

Table 5-5 Panel 5 Data Analysis

EXTENSOMETERS

Field Tag	Location	Figure Number	Date of Last Reading	Collar Displacement Relative to Deepest Anchor (inches)	Displacement Rate 2010 to 2011 (in/year)	Displacement Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
51X-GE-00400	S3310-W585	5-27	06/27/11	8.539	3.77	2.65	42%	
51X-GE-00397	S3310-W985	5-28	06/27/11	5.640	2.18	1.88	16%	
51X-GE-00389	W390-S3480	5-29	06/27/11	11.742	4.38	2.67	64%	
51X-GE-00390	W520-S3480	5-30	06/27/11	10.286	2.87	2.12	35%	
51X-GE-00391-2	W660-S3480	5-31	06/27/11	5.194	3.21	2.07	55%	
51X-GE-00392	W790-S3480	5-32	06/27/11	4.750	1.95	1.35	44%	Rates calculated on anchor B.
51X-GE-00393	W920-S3480	5-33	06/27/11	3.731	1.33	0.97	37%	
51X-GE-00394	W1050-S3480	5-34	06/27/11	3.295	0.93	0.94	-1%	
51X-GE-00395	W1190-S3480	5-35	06/27/11	3.353	0.88	0.98	-10%	
51X-GE-00398-2	S3650-W585	5-36	06/27/11	2.369	1.80	1.28	41%	5
51X-GE-00399	S3650-W985	5-37	06/27/11	3.283	1.00	0.96	4%	

ROCKBOLT LOAD CELLS

Field Tag	Location	Figure Number	Date of Initial Reading	Date of Last Reading	Load (kips)	Comments
51X-WG-00323	S3310-W590	5-38	02/13/08	07/06/10	33.2	
51X-WG-00321	W390-S3480	5-39	01/22/08	08/02/10	1.2	
51X-WG-00322	W520-S3480	5-40	01/22/08	02/17/11	39.9	
51X-WG-00320	W660-S3480	5-41	12/05/07	08/31/10	31.2	
51X-WG-00319	S3650-W585	5-42	10/18/07	09/27/10	30.2	

Table 5-5 (Continued) Panel 5 Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)[1]	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent[1]	Comments
			Date	Inches					
S3310-W285 A-C	S3310-W285	5-43	06/07/11	7.906	7.906	2.19	1.73	27%	
S3310-W390-2 A-C	S3310-W390	5-44	03/16/11	11.754	14.216	3.66	3.24	13%	
S3310-W460 A-C	S3310-W460	5-45	10/25/10	12.372	12.372	4.83	3.84	26%	
S3310-W520-2 A-C	S3310-W520	5-46	10/25/10	15.760	20.060	6.42	5.17	24%	
S3310-W590-2 A-C	S3310-W590	5-47	07/06/10	13.245	16.323	N/A	5.40	N/A	
S3310-W660-2 A-C	S3310-W660	5-48	08/02/10	13.365	17.094	6.05	4.80	26%	
W390-S3395-2 A-C	W390-S3395	5-49	05/09/11	27.037	28.663	6.07	5.74	6%	
W390-S3480-2 A-C	W390-S3480	5-50	05/09/11	24.217	25.408	6.13	4.88	26%	
W390-S3565-2 A-C	W390-S3565	5-51	06/07/11	18.270	19.179	3.64	3.14	16%	
W520-S3395-2 A-C	W520-S3395	5-52	11/22/10	13.314	17.625	5.06	4.11	23%	
W520-S3480-2 A-C	W520-S3480	5-53	02/14/11	15.012	19.504	4.89	4.24	15%	
W520-S3565-2 A-C	W520-S3565	5-54	03/16/11	11.523	15.800	3.31	3.02	10%	
W660-S3395-2 A-C	W660-S3395	5-55	08/02/10	8.678	13.216	4.21	3.27	29%	
W660-S3480-2 A-C	W660-S3480	5-56	08/31/10	11.196	16.032	5.56	4.24	31%	
W660-S3565-2 A-C	W660-S3565	5-57	09/27/10	8.858	13.533	3.62	3.23	12%	
S3650-W285-2 A-C	S3650-W285	5-58	05/09/11	4.907	7.348	2.56	1.81	41%	
S3650-W390-2 A-C	S3650-W390	5-59	06/07/11	17.096	18.669	3.52	2.98	18%	
S3650-W456-3 A-C	S3650-W456	5-60	04/11/11	12.897	17.654	4.00	3.31	21%	
S3650-W520-2 A-C	S3650-W520	5-61	03/16/11	11.690	19.444	3.86	3.43	13%	
S3650-W585-2 A-C	S3650-W585	5-62	09/27/10	9.075	16.753	3.83	3.19	20%	
S3650-W660-2 A-C	S3650-W660	5-63	09/27/10	9.476	15.190	3.96	3.12	27%	

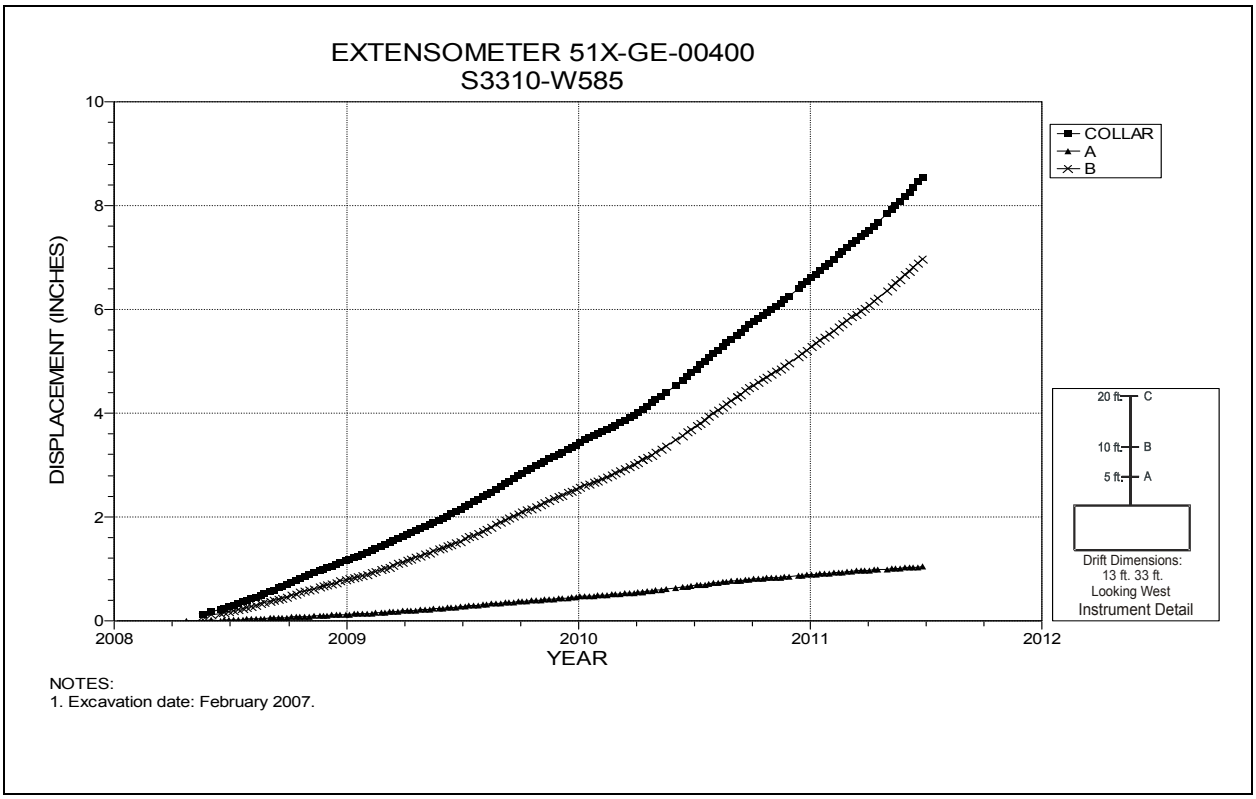


Figure 5-27 Extensometer 51X-GE-00400
S3310 W585 – Roof

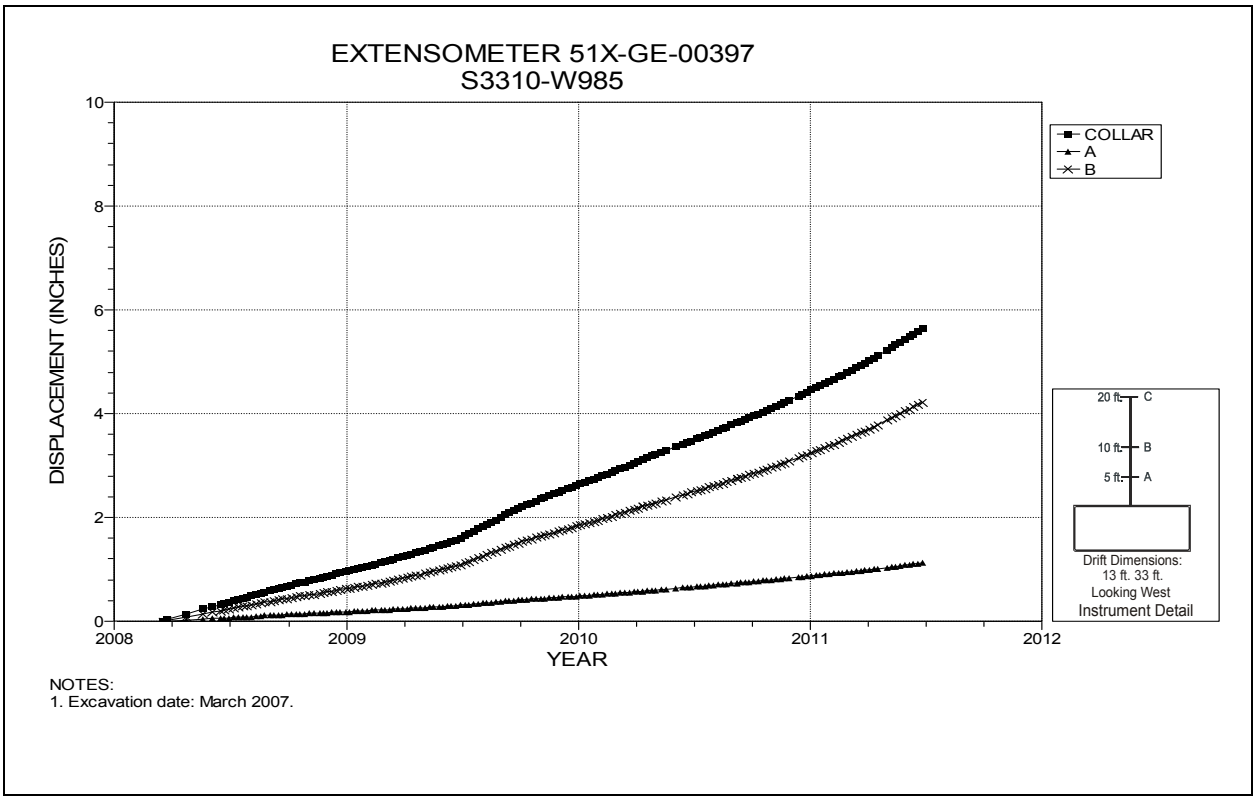


Figure 5-28 Extensometer 51X-GE-00397
S3310 W985 – Roof

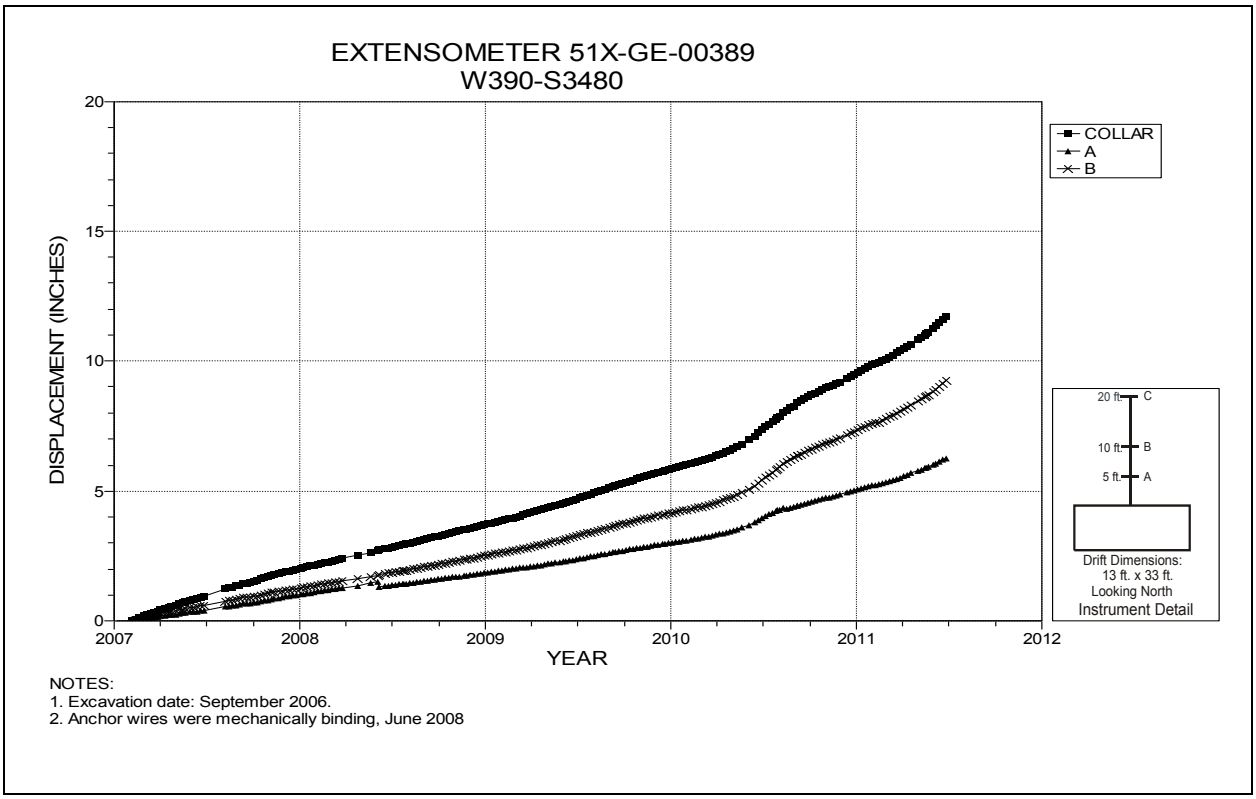


Figure 5-29 Extensometer 51X-GE-00389
Room 1, Panel 5 at W390 S3480 – Room Center – Roof

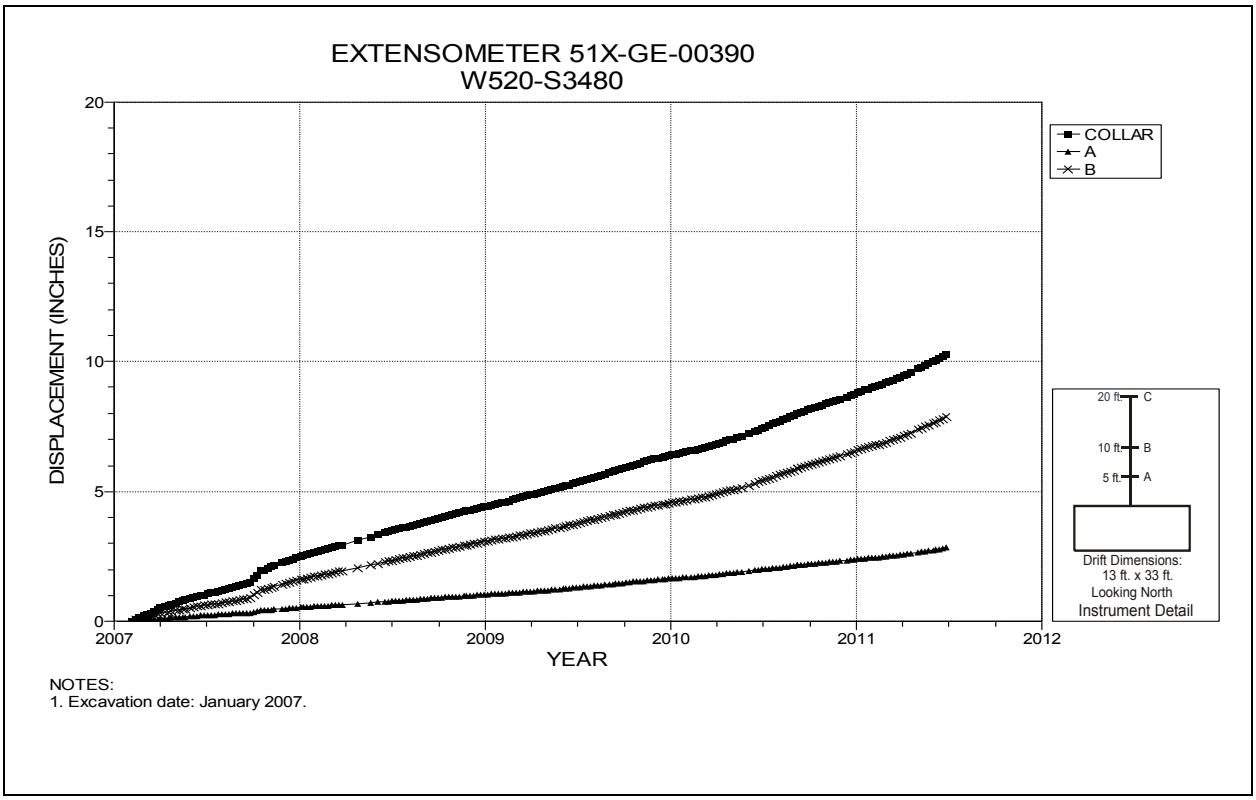


Figure 5-30 Extensometer 51X-GE-00390
Room 2, Panel 5 at W520 S3480 – Room Center – Roof

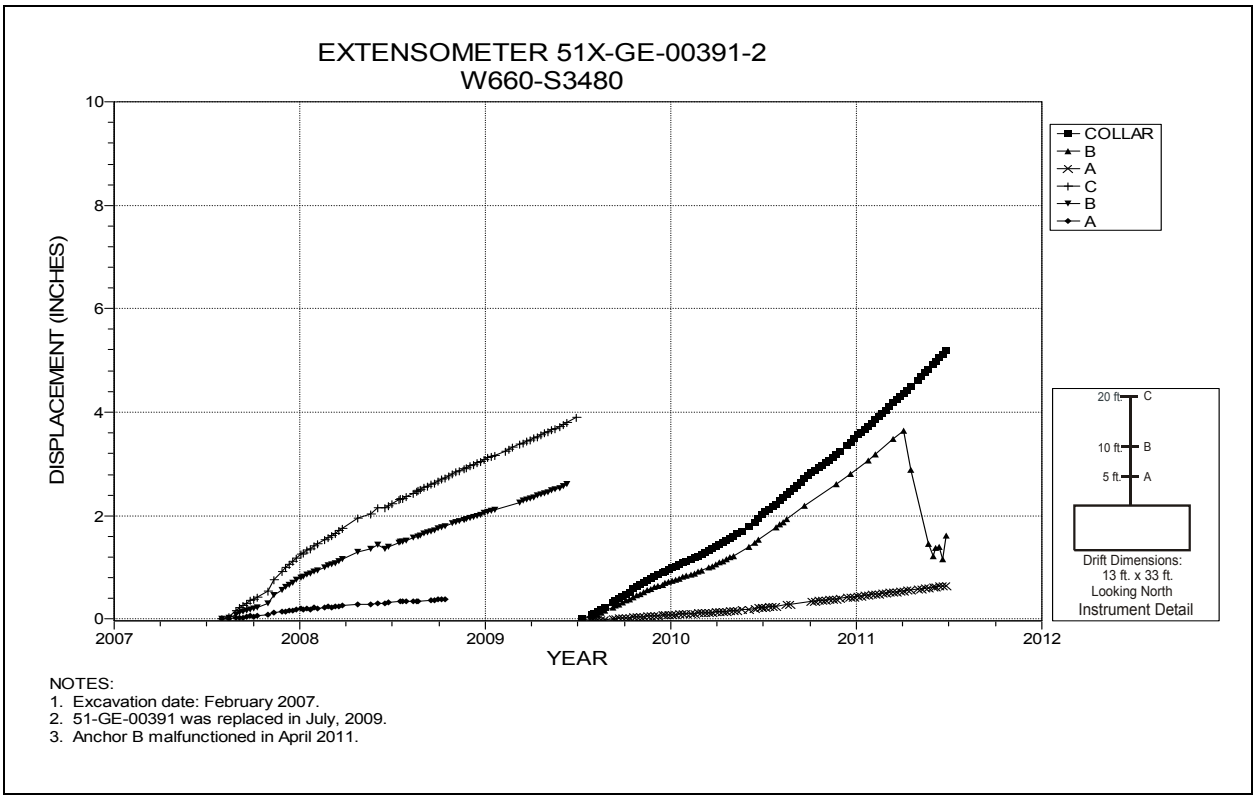


Figure 5-31 Extensometer 51X-GE-00391-2
Room 3, Panel 5 at W660 S3480 – Room Center – Roof

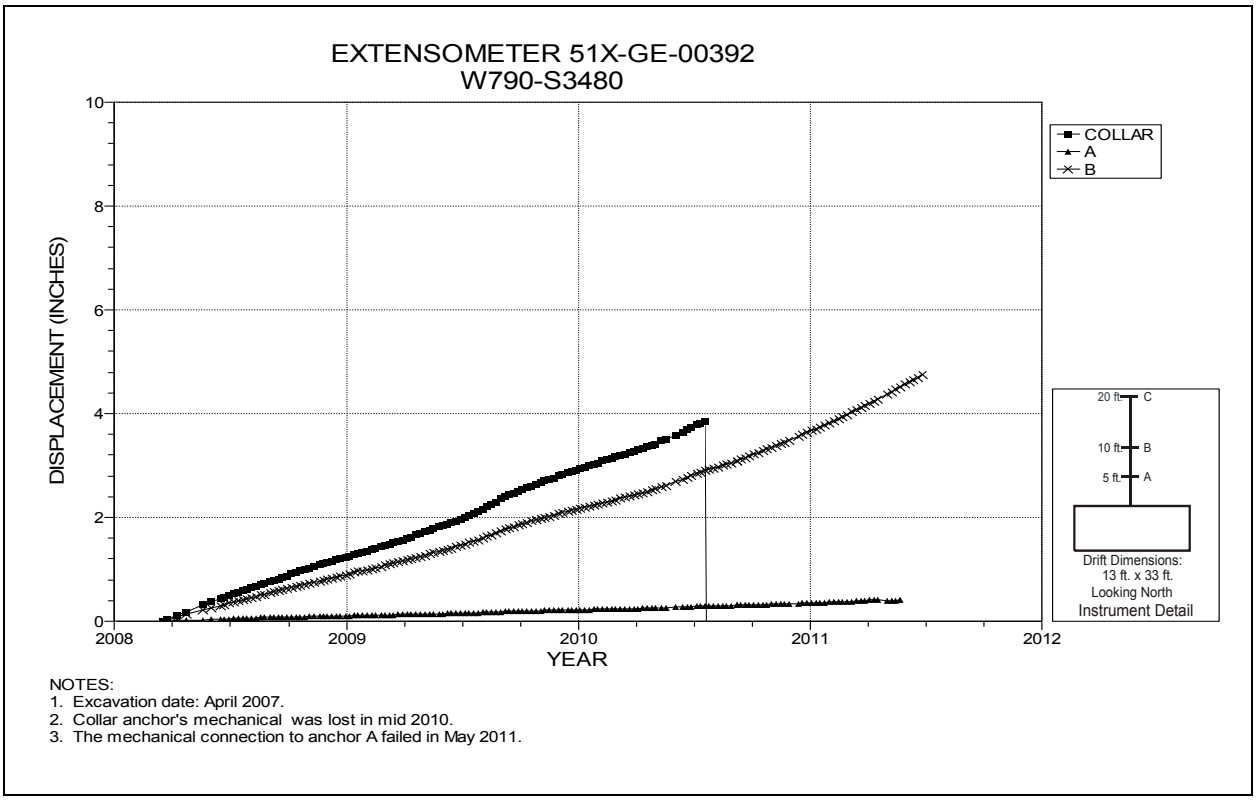


Figure 5-32 Extensometer 51X-GE-00392
Room 4, Panel 5 at W790 S3480 – Room Center – Roof

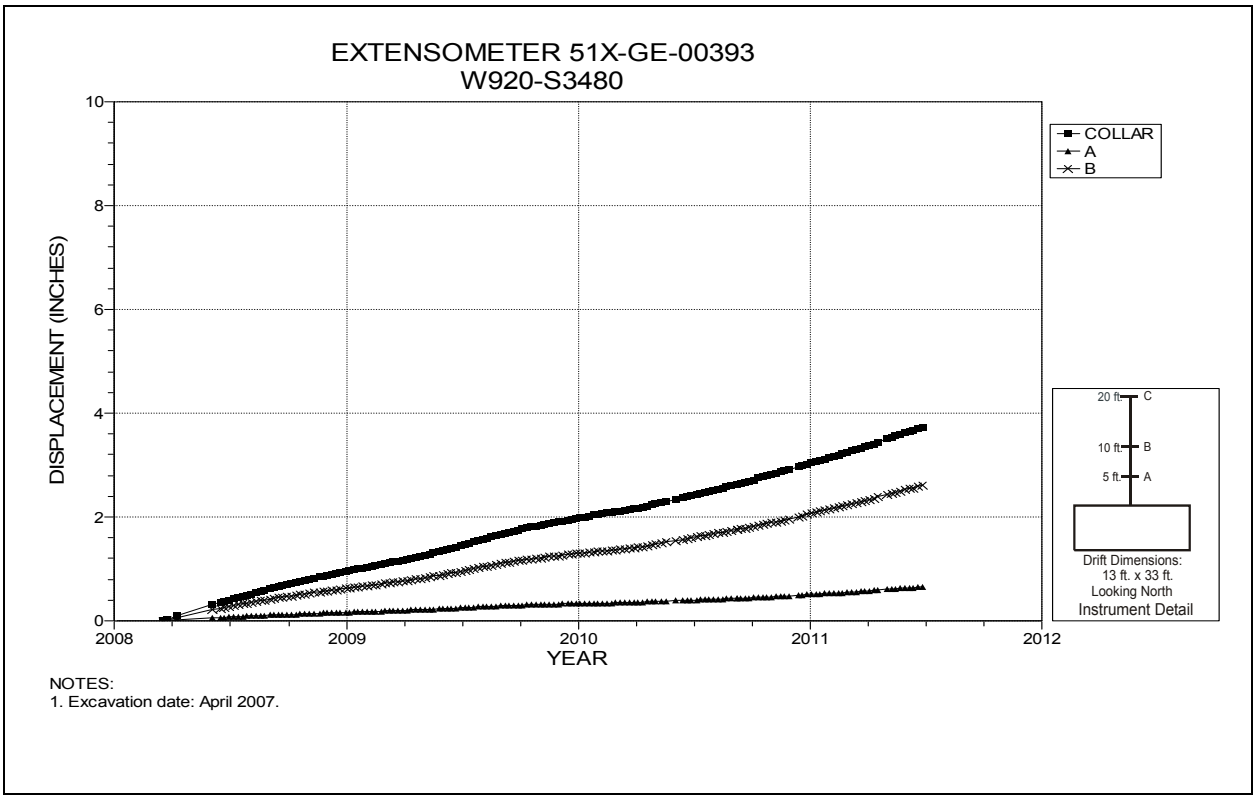


Figure 5-33 Extensometer 51X-GE-00393
Room 5, Panel 5 at W920 S3480 – Room Center – Roof

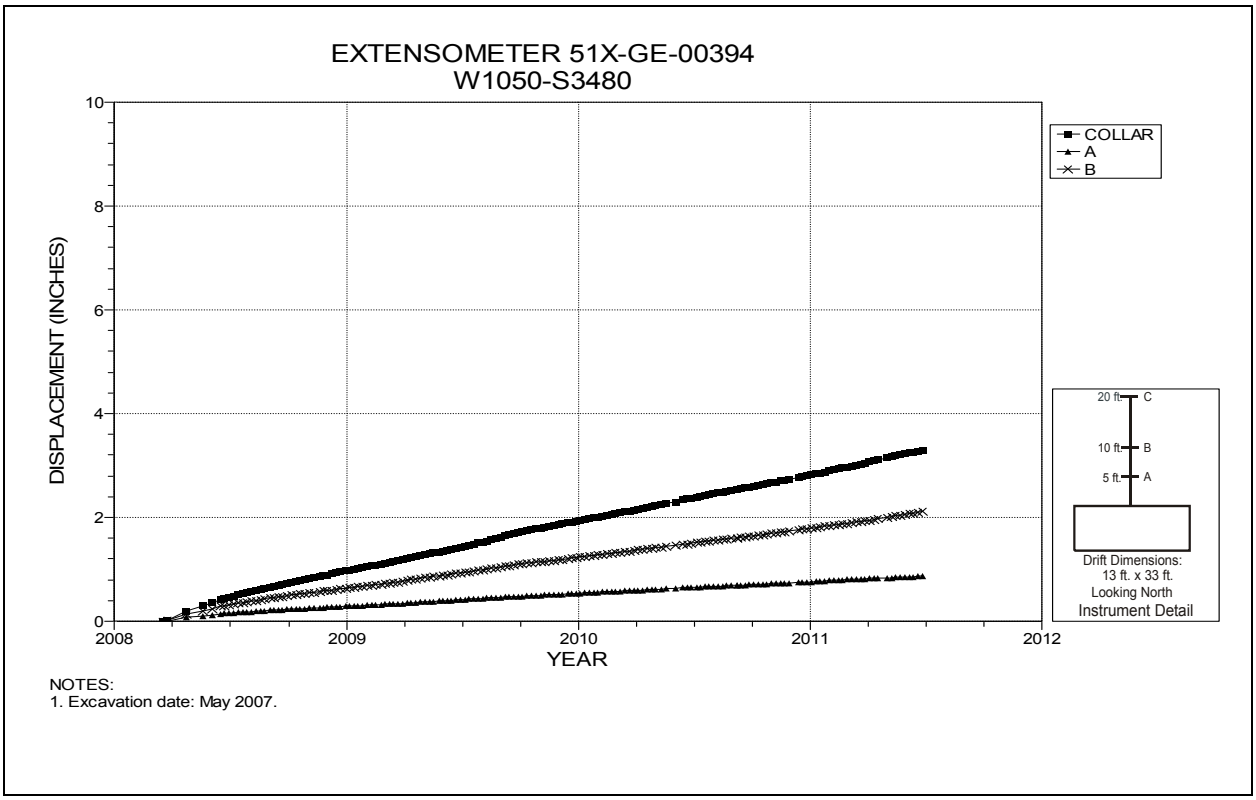


Figure 5-34 Extensometer 51X-GE-00394
Room 6, Panel 5 at W1050 S3480 – Room Center – Roof

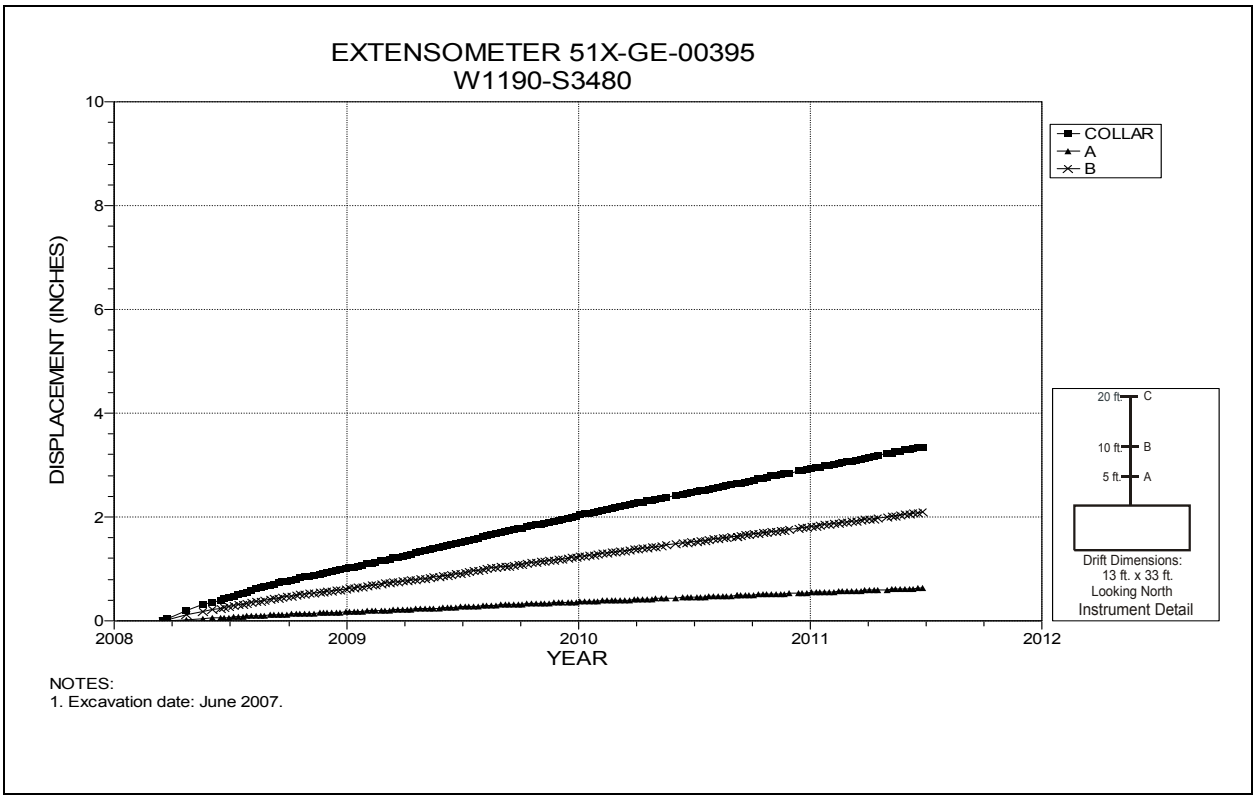


Figure 5-35 Extensometer 51X-GE-00395
Room 7, Panel 5 at W1190 S3480 – Room Center – Roof

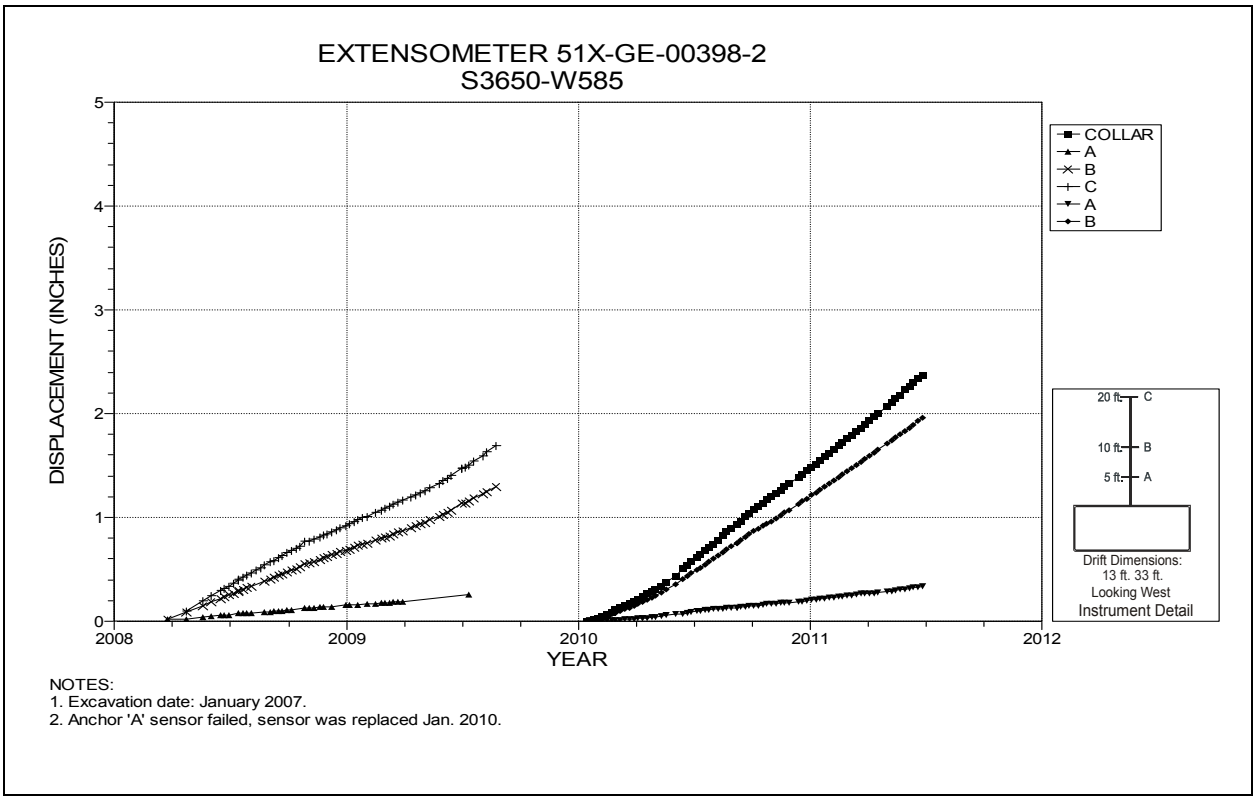


Figure 5-36 Extensometer 51X-GE-00398
S3650 W585 – Roof

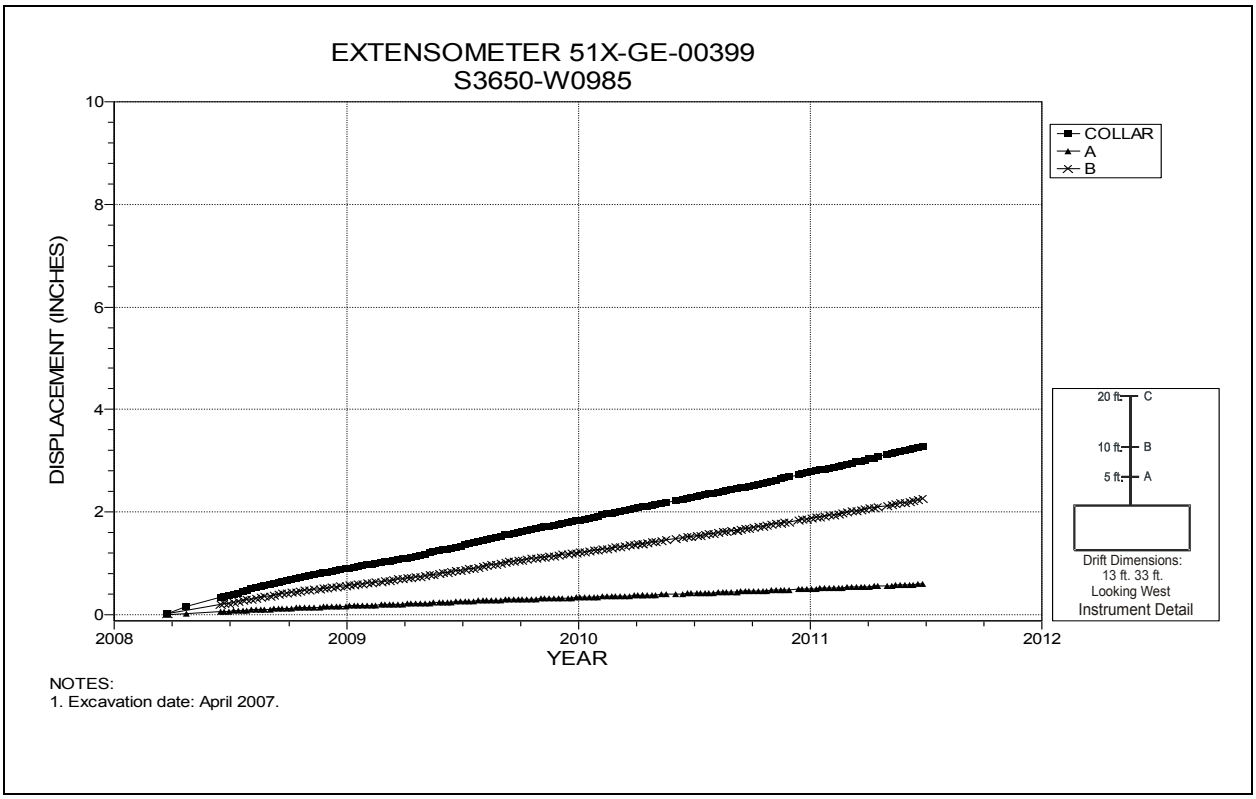


Figure 5-37 Extensometer 51X-GE-00399
S3650 W985 – Roof

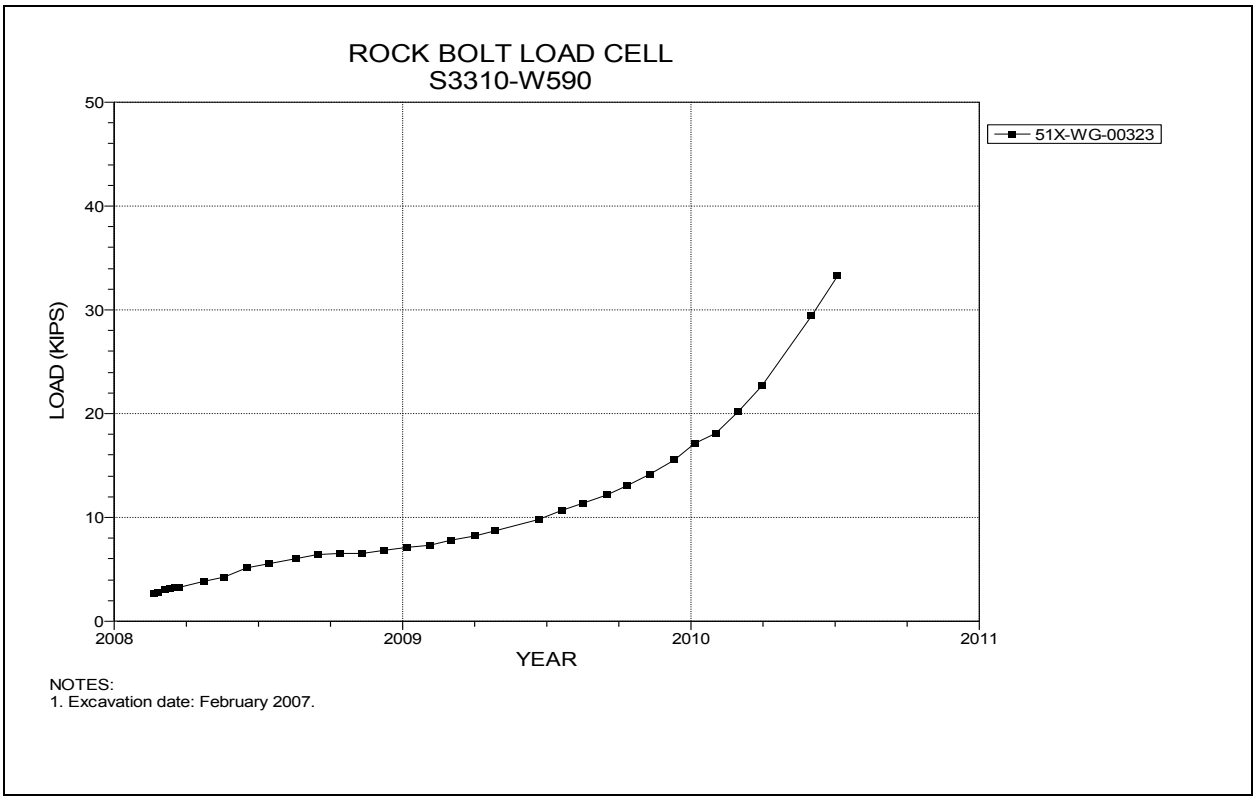


Figure 5-38 Rock Bolt Load Cell 51X-WG-00323
S3310 W590

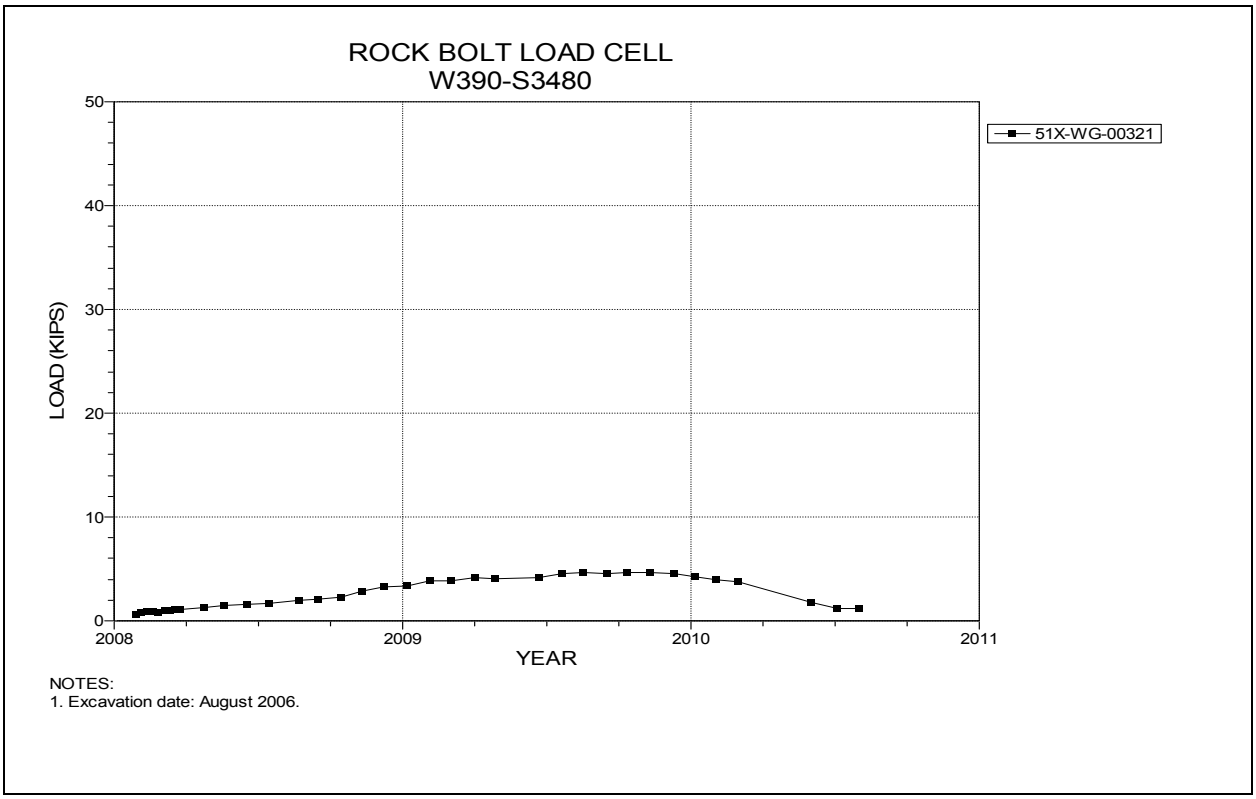


Figure 5-39 Rock Bolt Load Cell 51X-WG-00321
Room 1, Panel 5 at W390 S3480

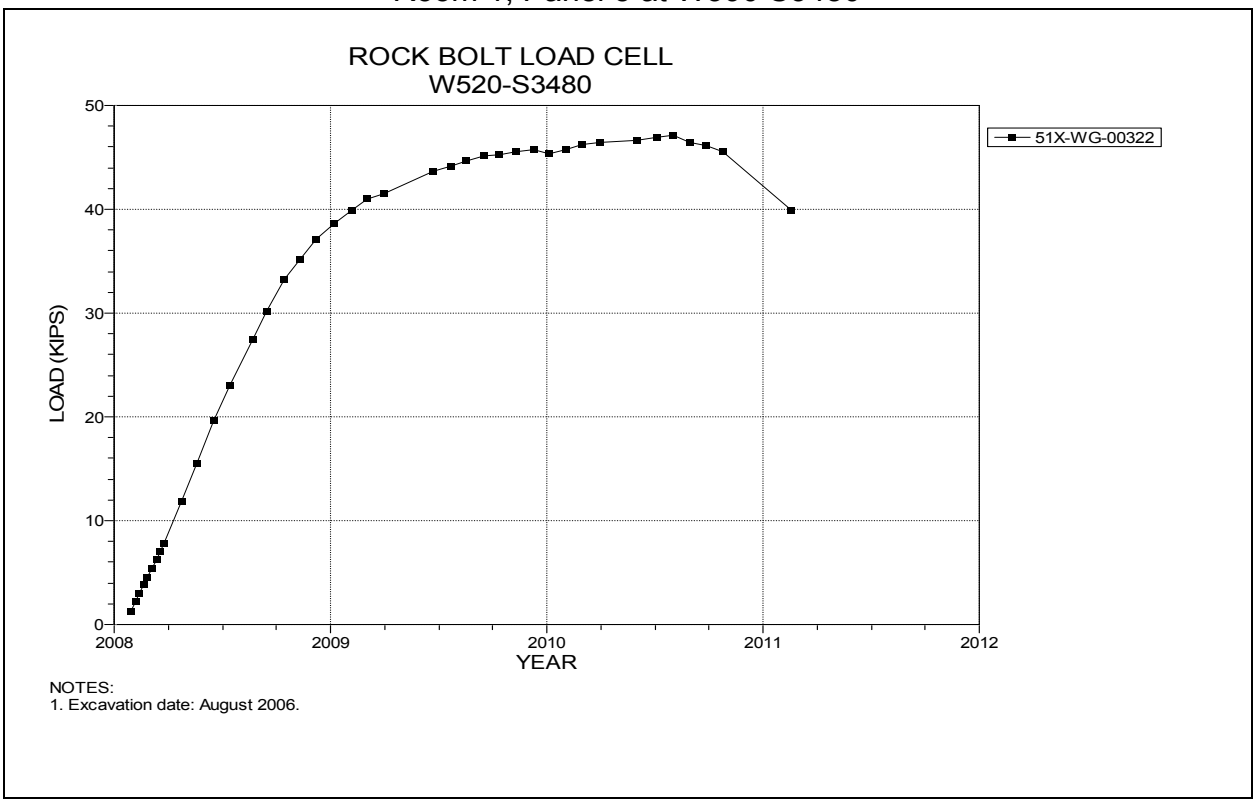
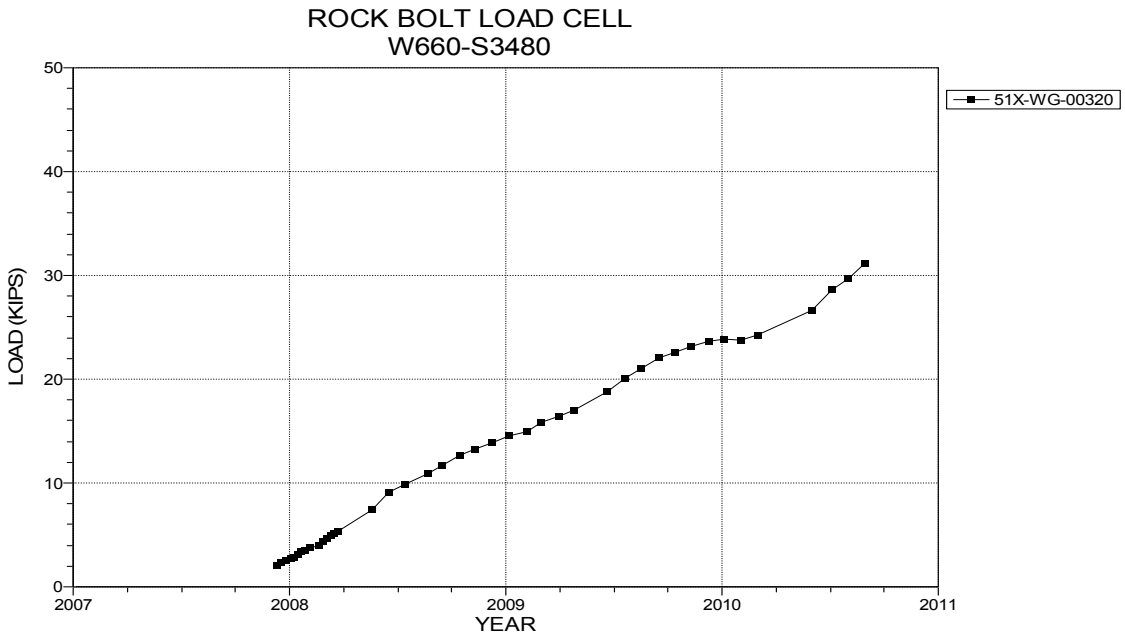
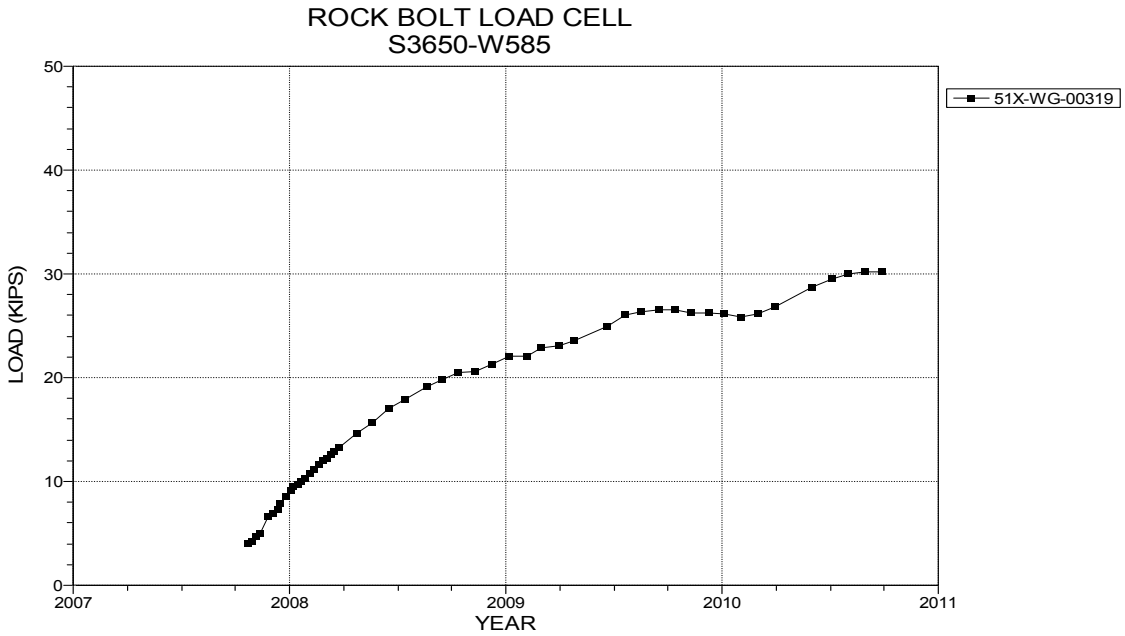


Figure 5-40 Rock Bolt Load Cell 51X-WG-00322
Room 2, Panel 5 at W520 S3480



NOTES:
1. Excavation date: January 2007.

Figure 5-41 Rock Bolt Load Cell 51X-WG-00320
Room 3, Panel 5 at W660 S3480



NOTES:
1. Excavation date: January 2006.

Figure 5-42 Rock Bolt Load Cell 51X-WG-00319
S3650-W585

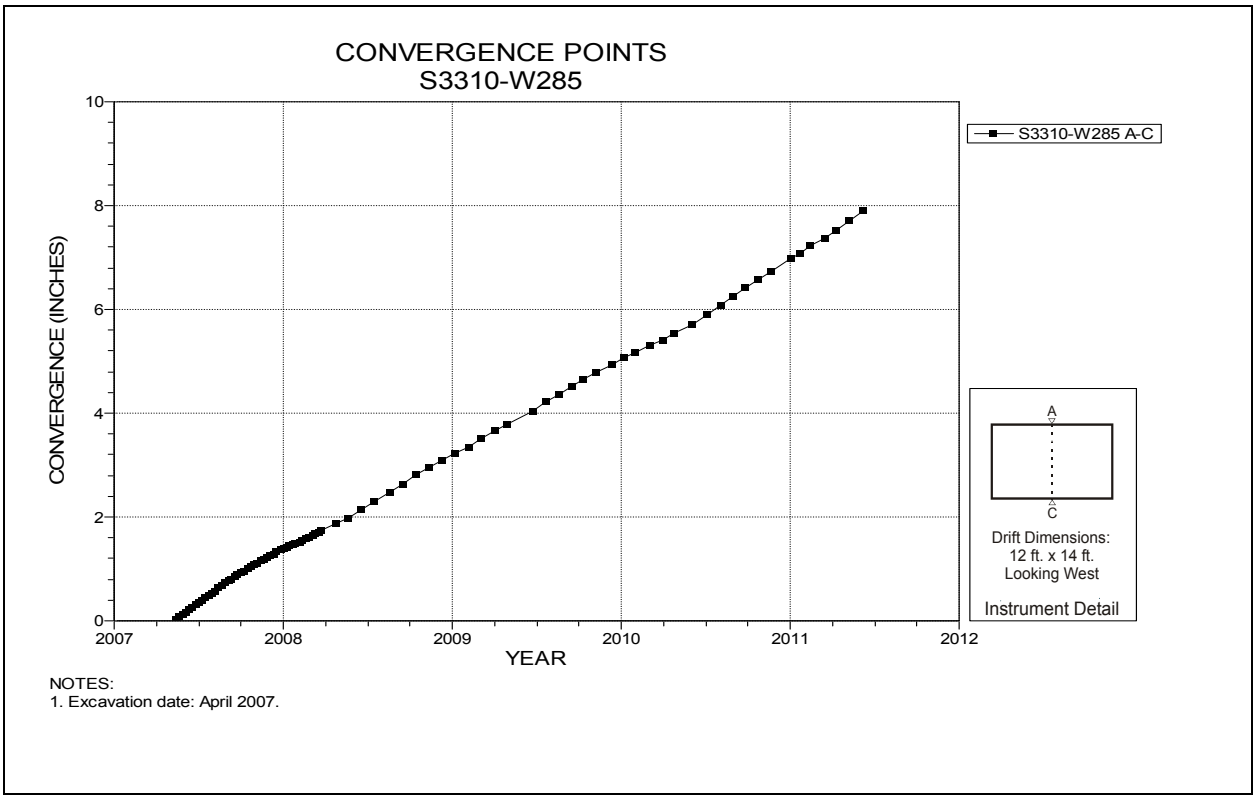


Figure 5-43 Convergence Point Array
S3310 W285 – Roof to Floor

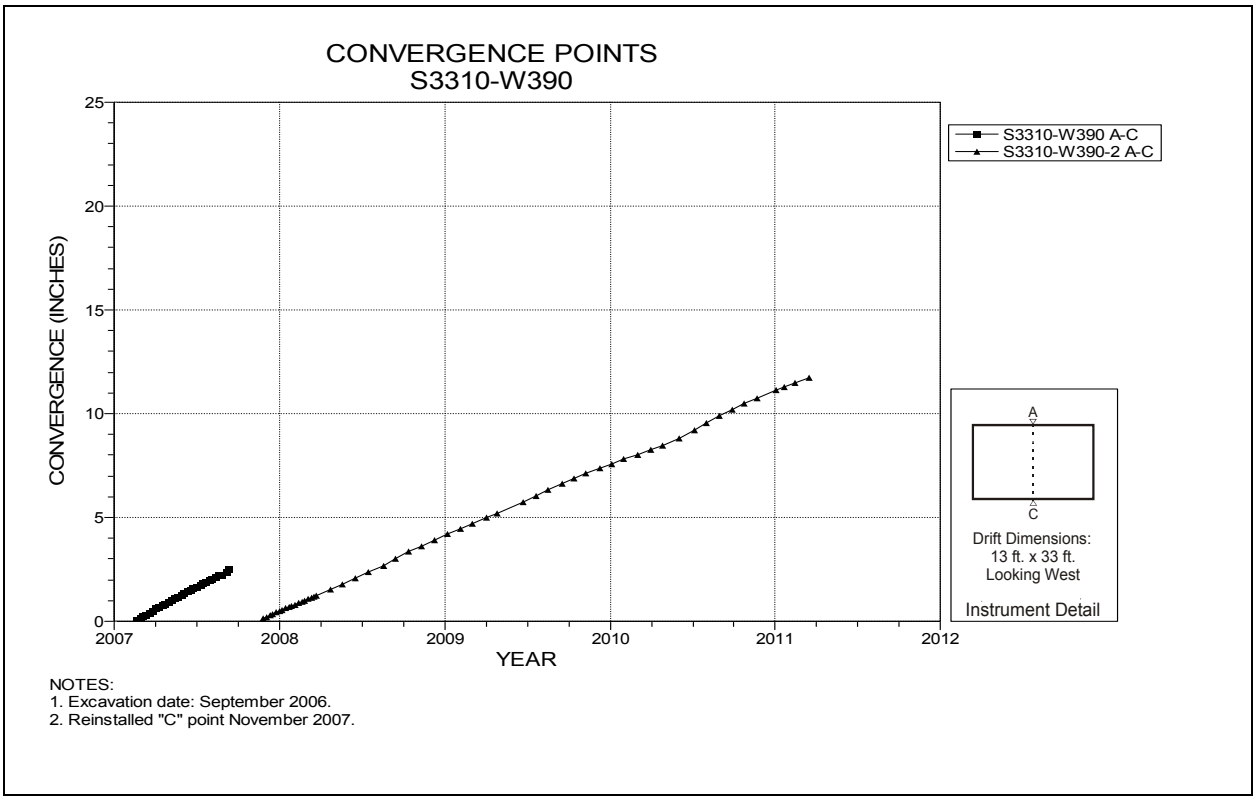


Figure 5-44 Convergence Point Array
S3310 W390 Intersection (Room 1, Panel 5) – Roof to Floor

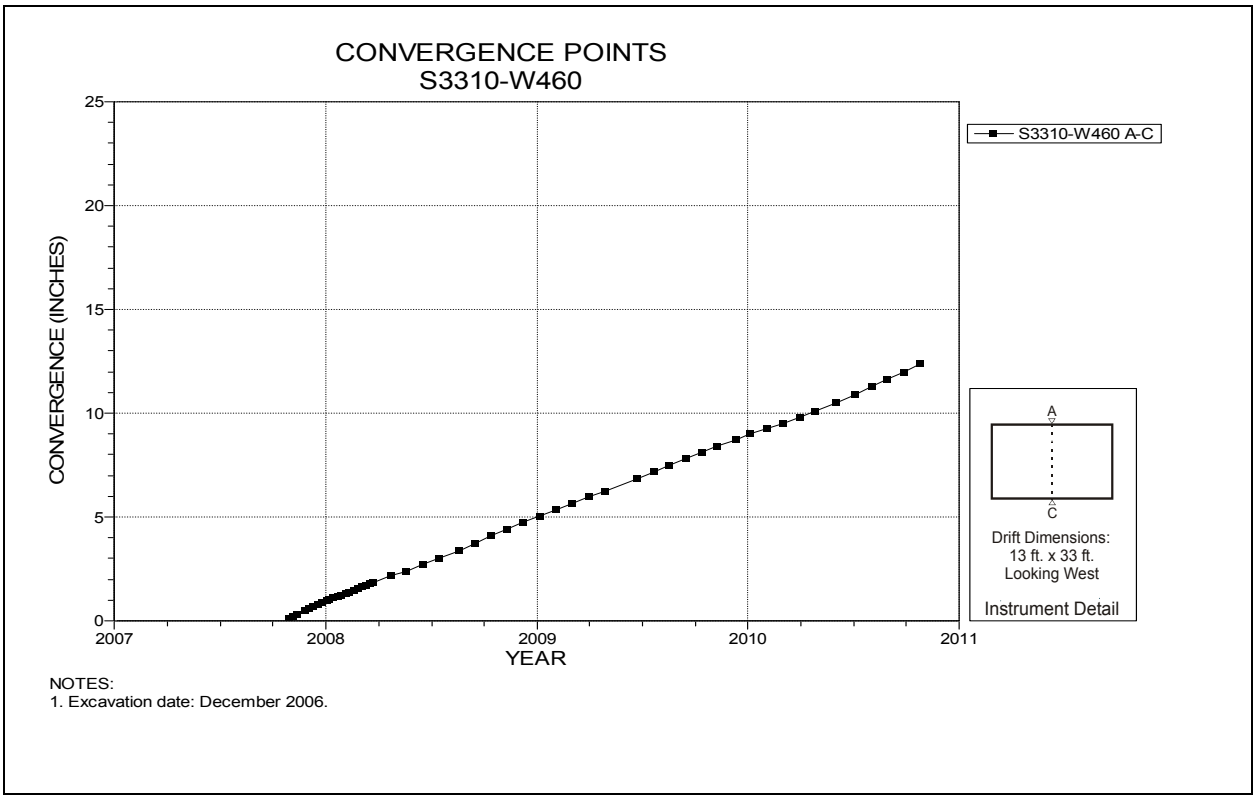


Figure 5-45 Convergence Point Array
S3310 W460 – Roof to Floor

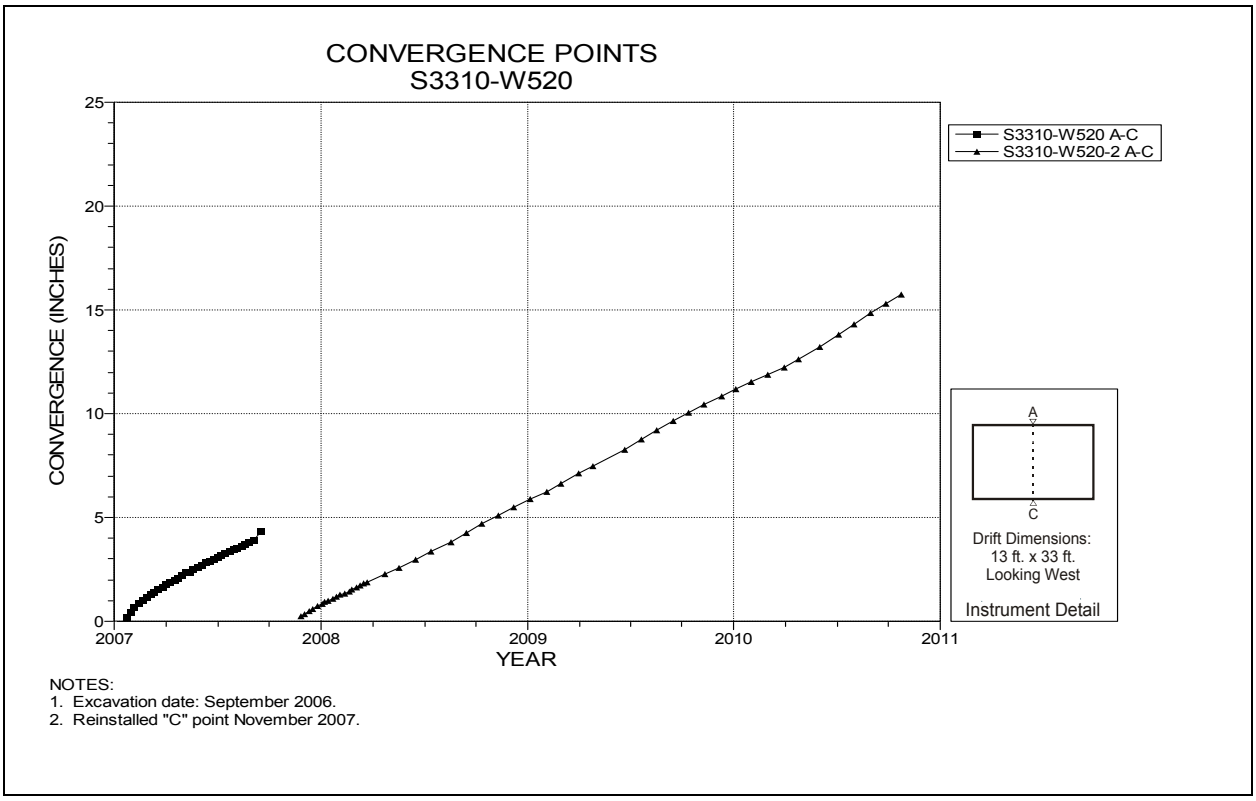


Figure 5-46 Convergence Point Array
S3310 W520 Intersection (Room 2, Panel 5) – Roof to Floor

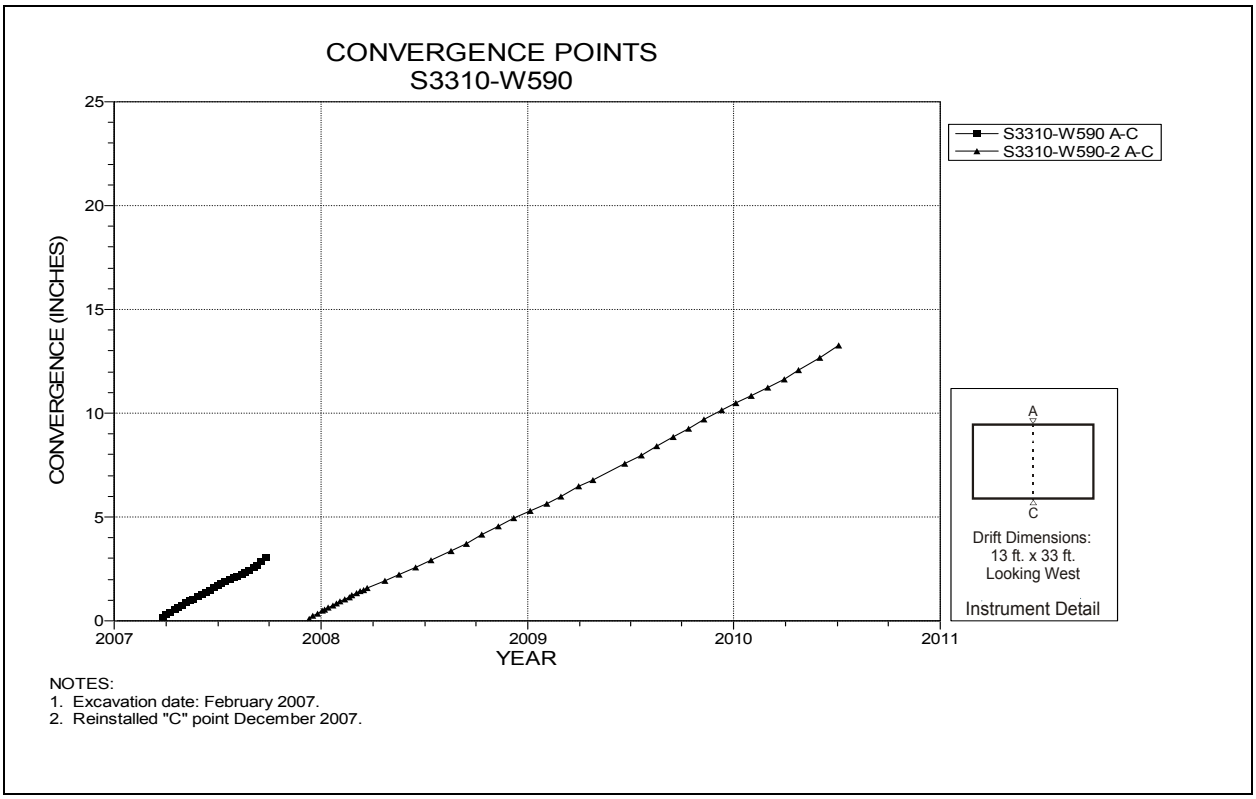


Figure 5-47 Convergence Point Array
S3310 W590 – Roof to Floor

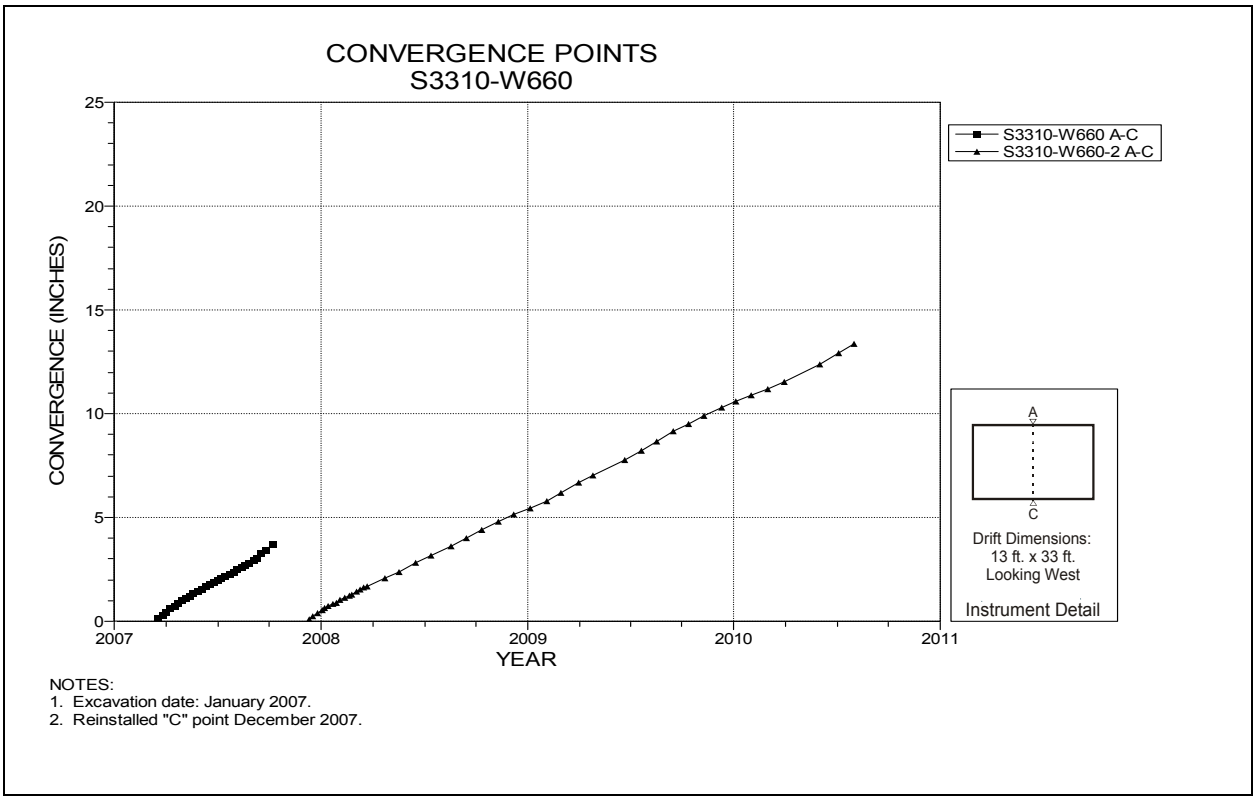


Figure 5-48 Convergence Point Array
S3310 W660 Intersection (Room 3, Panel 5) – Roof to Floor

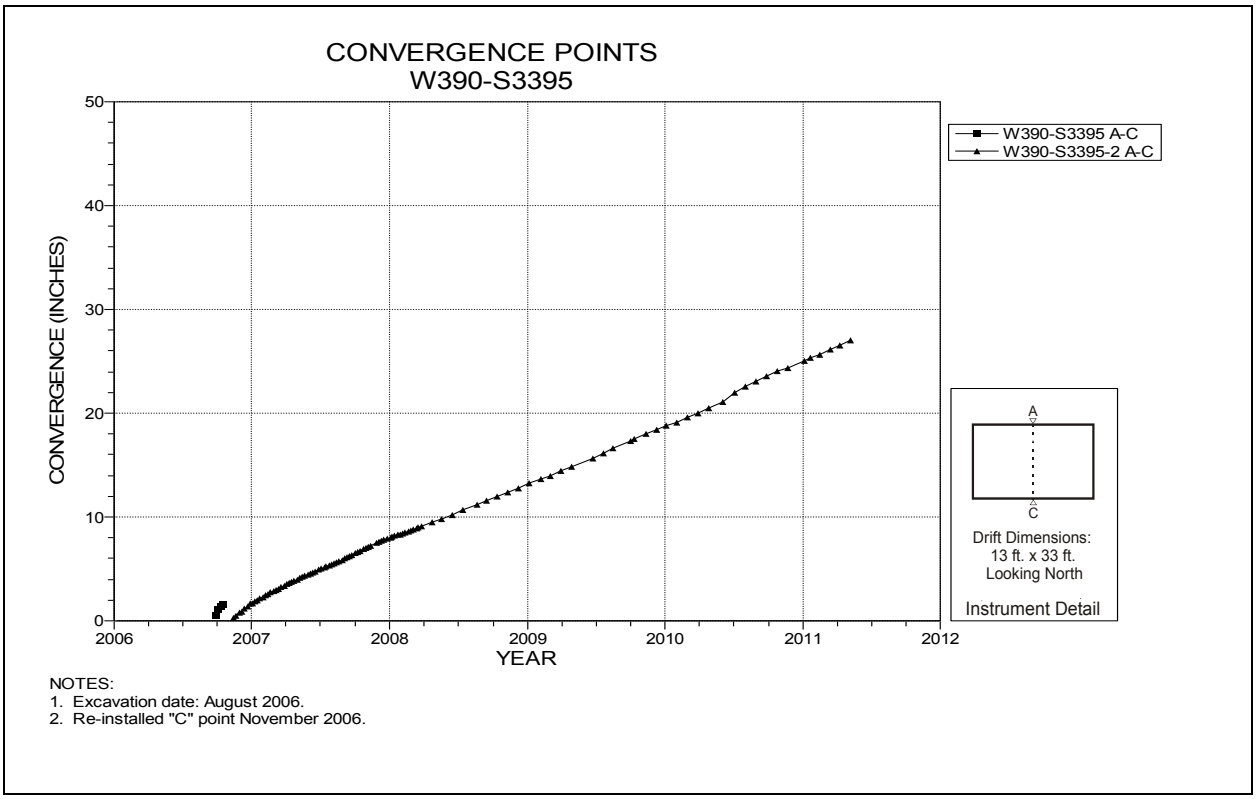


Figure 5-49 Convergence Point Array
Room 1, Panel 5 at W390 S3395 – Roof to Floor

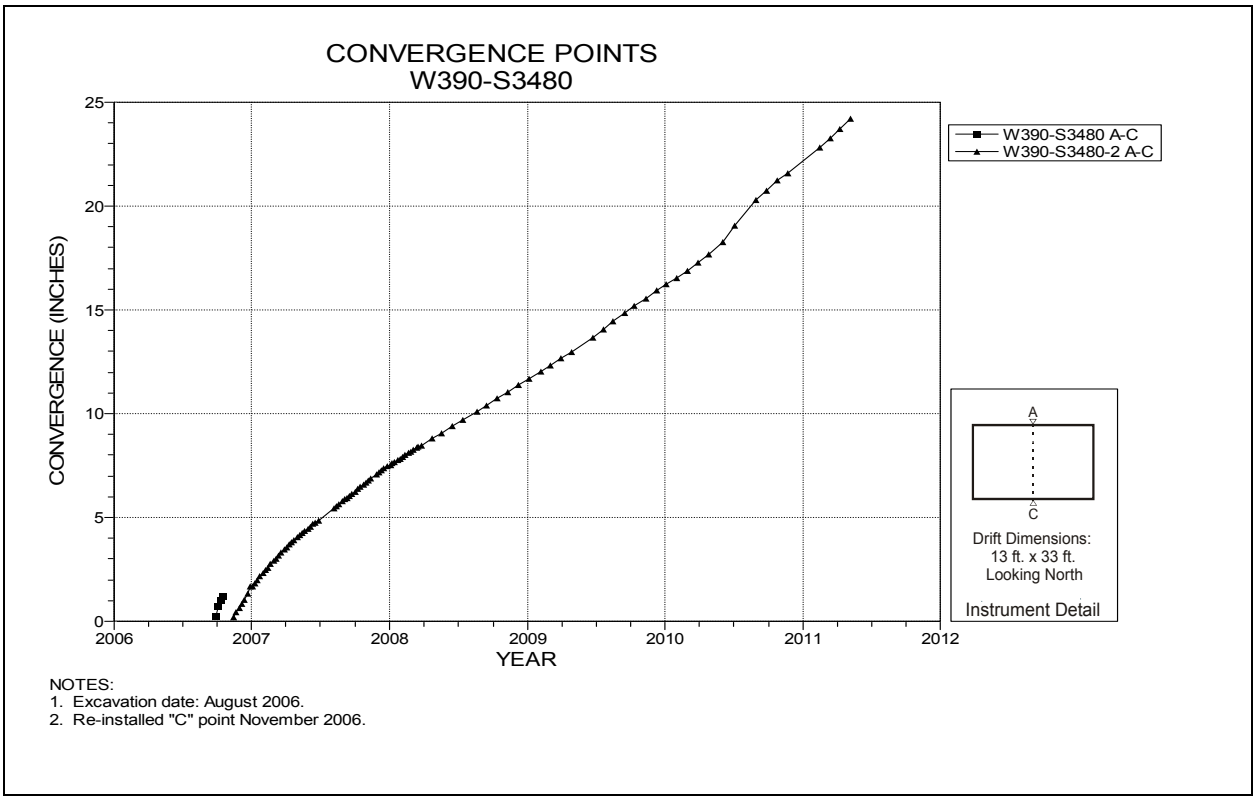


Figure 5-50 Convergence Point Array
Room 1, Panel 5 at W390 S3480 – Room Center – Roof to Floor

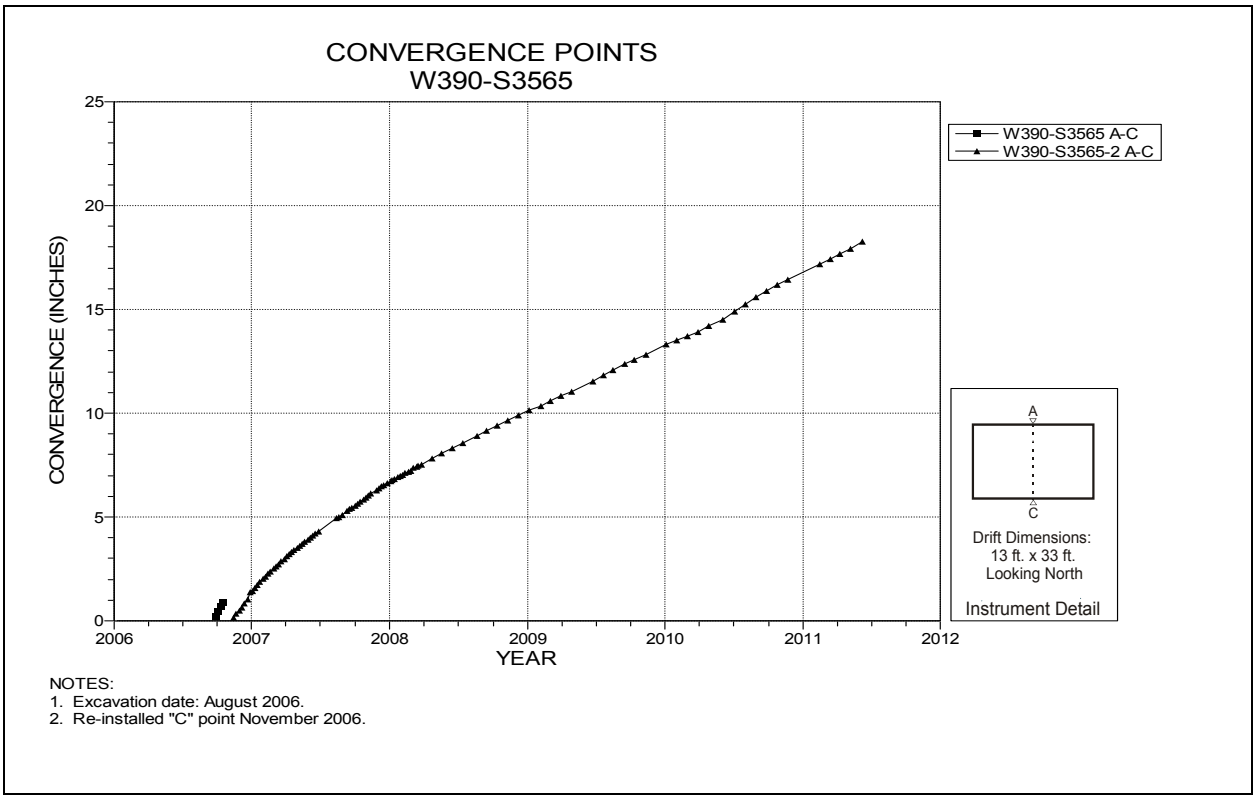


Figure 5-51 Convergence Point Array
Room 1, Panel 5 at W390 S3565 – Roof to Floor

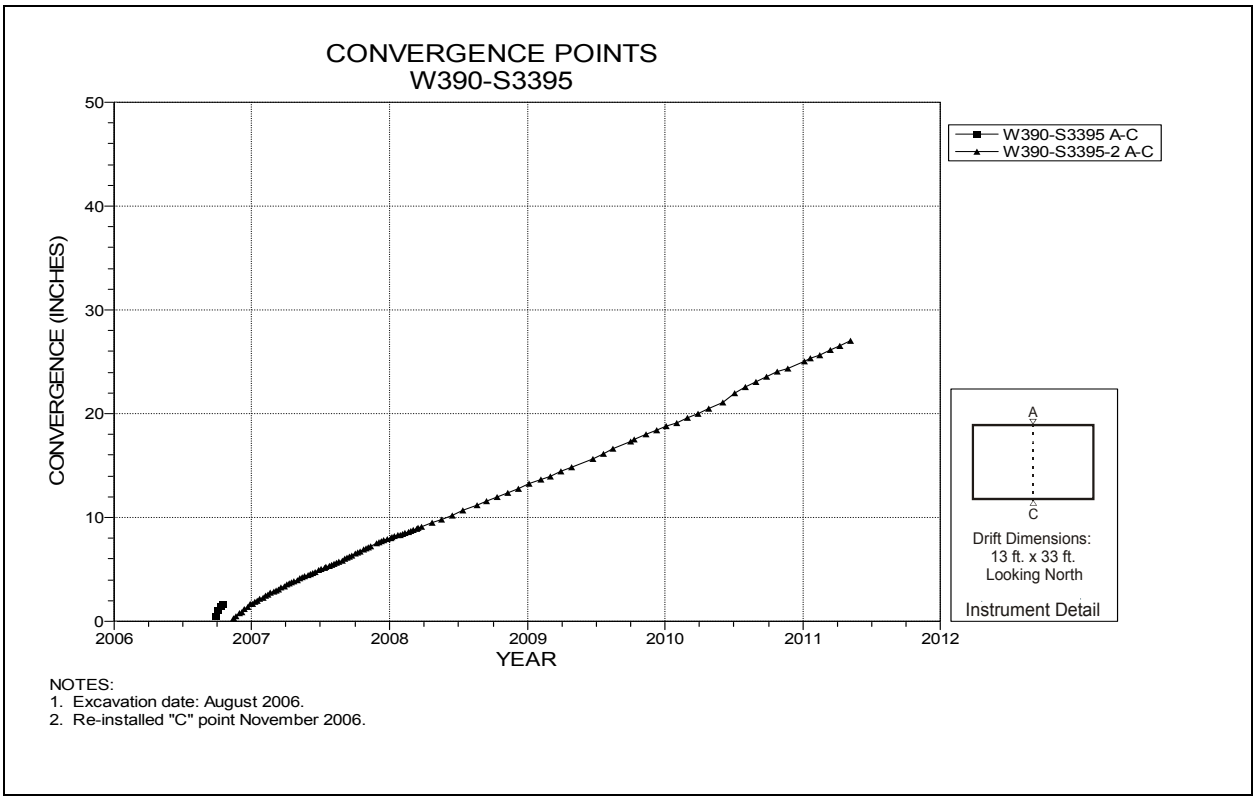


Figure 5-52 Convergence Point Array
Room 2, Panel 5 at W520 S3395 – Roof to Floor

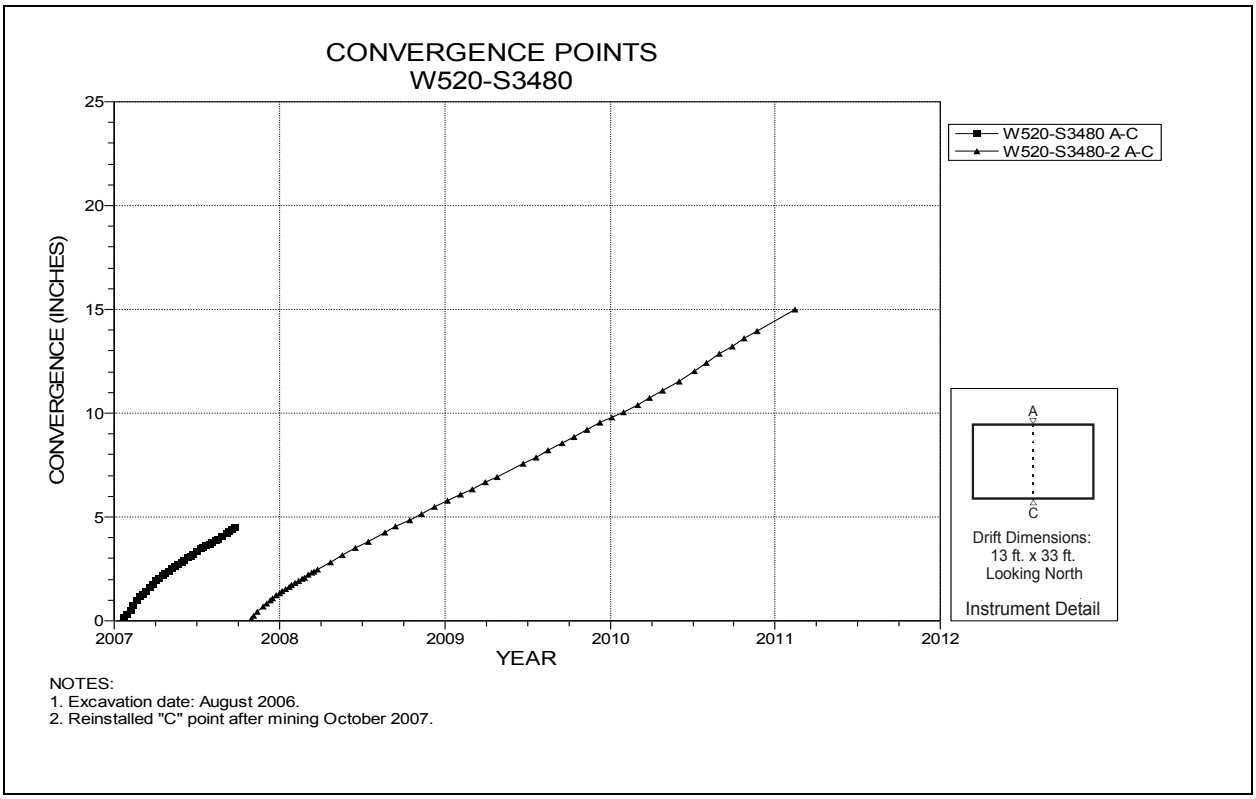


Figure 5-53 Convergence Point Array
Room 2, Panel 5 at W520 S3480 – Room Center – Roof to Floor

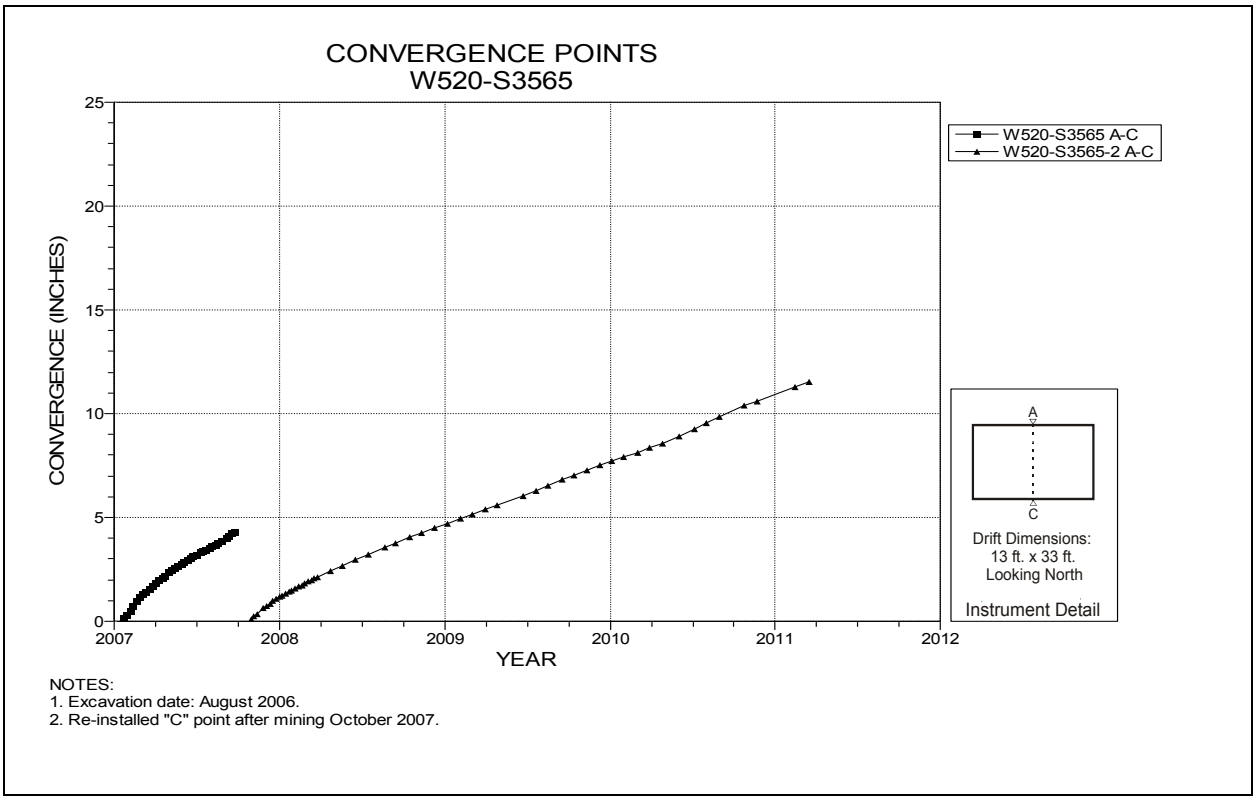


Figure 5-54 Convergence Point Array
Room 2, Panel 5 at W520 S3565 – Roof to Floor

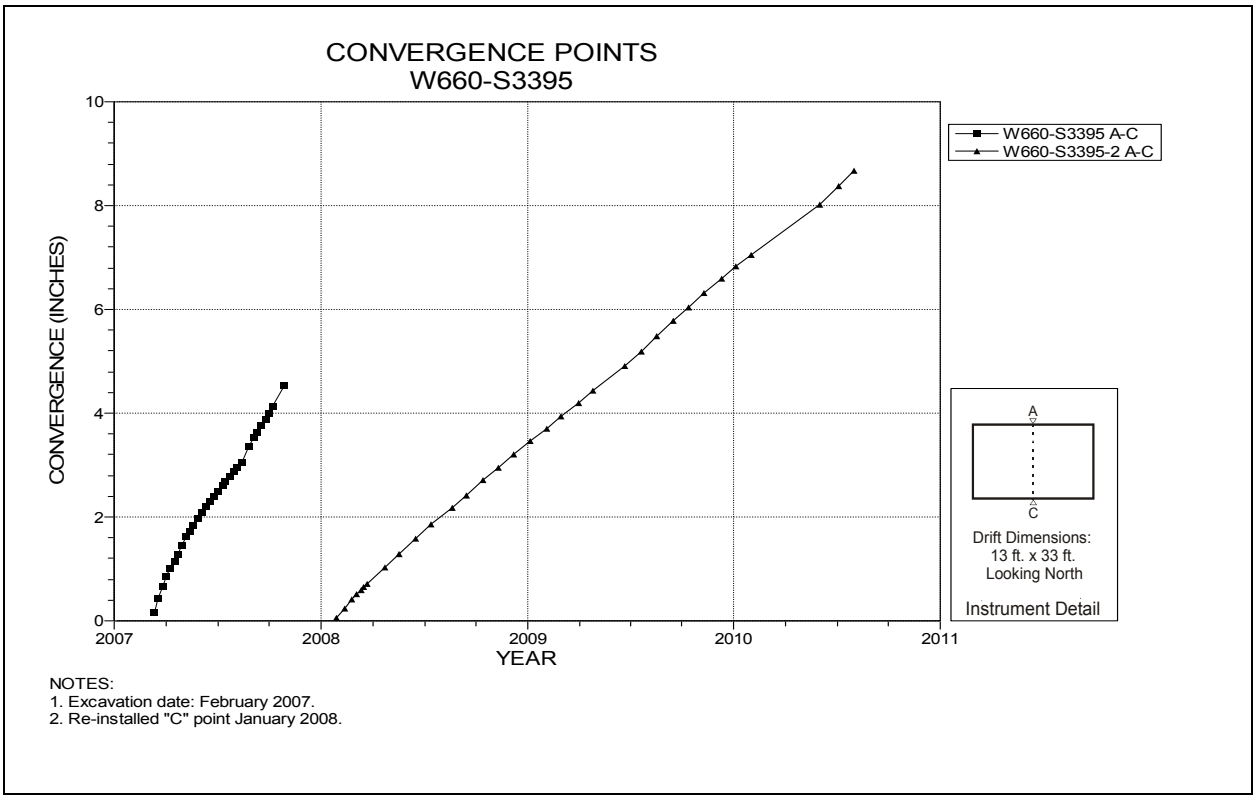


Figure 5-55 Convergence Point Array
Room 3, Panel 5 at W660 S3395 – Roof to Floor

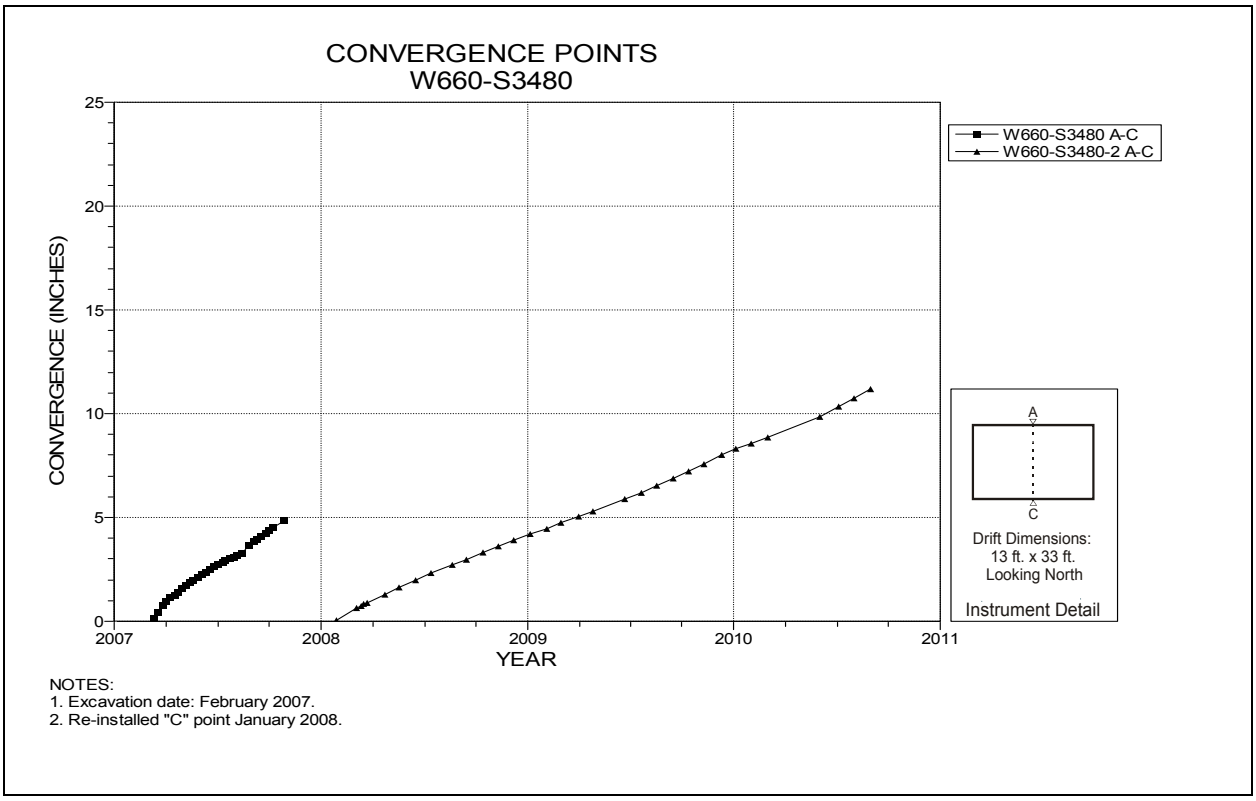


Figure 5-56 Convergence Point Array
Room 3, Panel 5 at W660 S3480 – Room Center – Roof to Floor

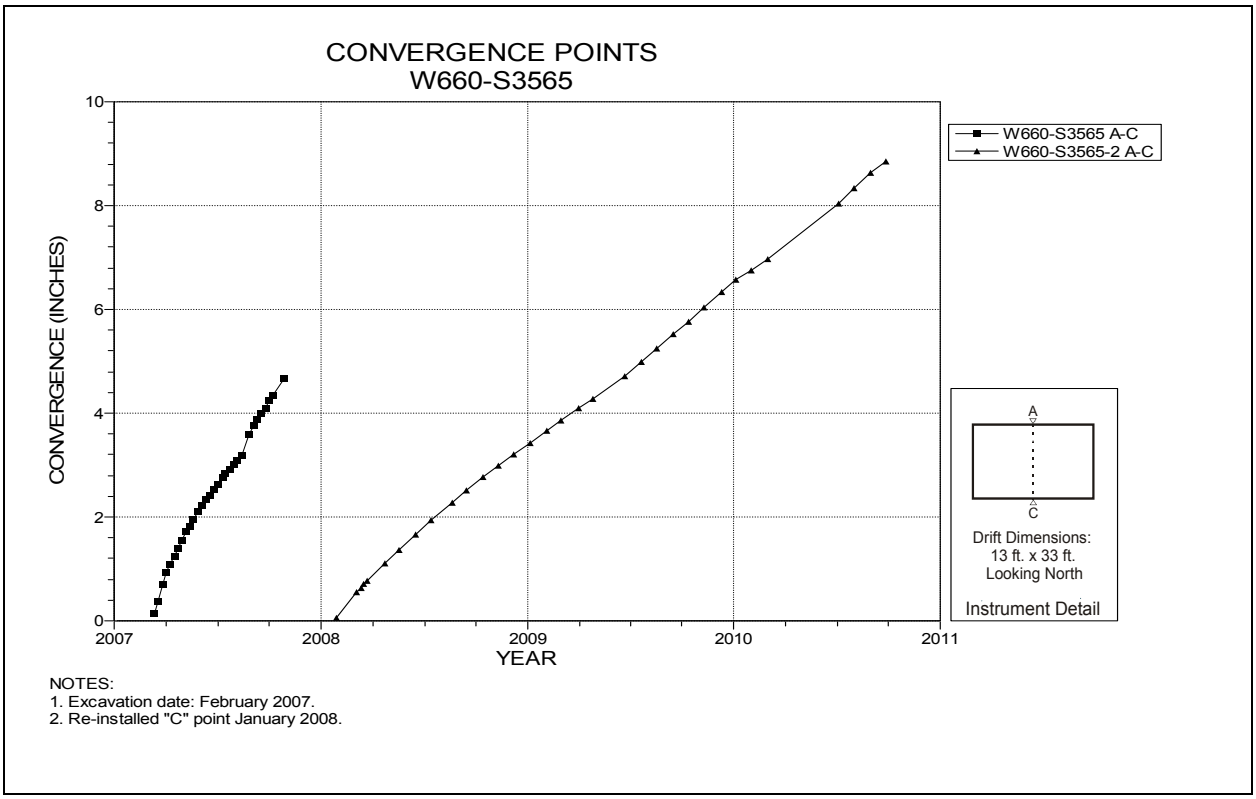


Figure 5-57 Convergence Point Array
Room 3, Panel 5 at W660 S3565 – Roof to Floor

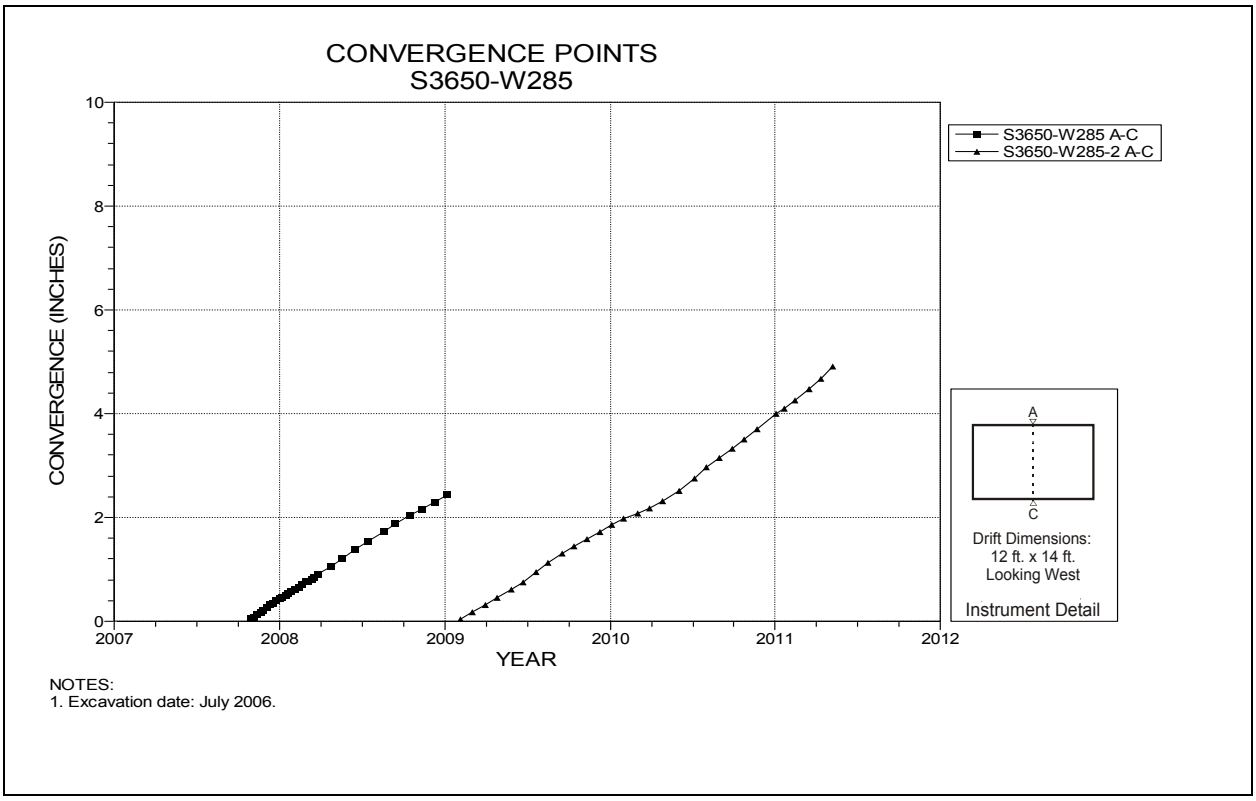


Figure 5-58 Convergence Point Array
S3650 W285 – Roof to Floor

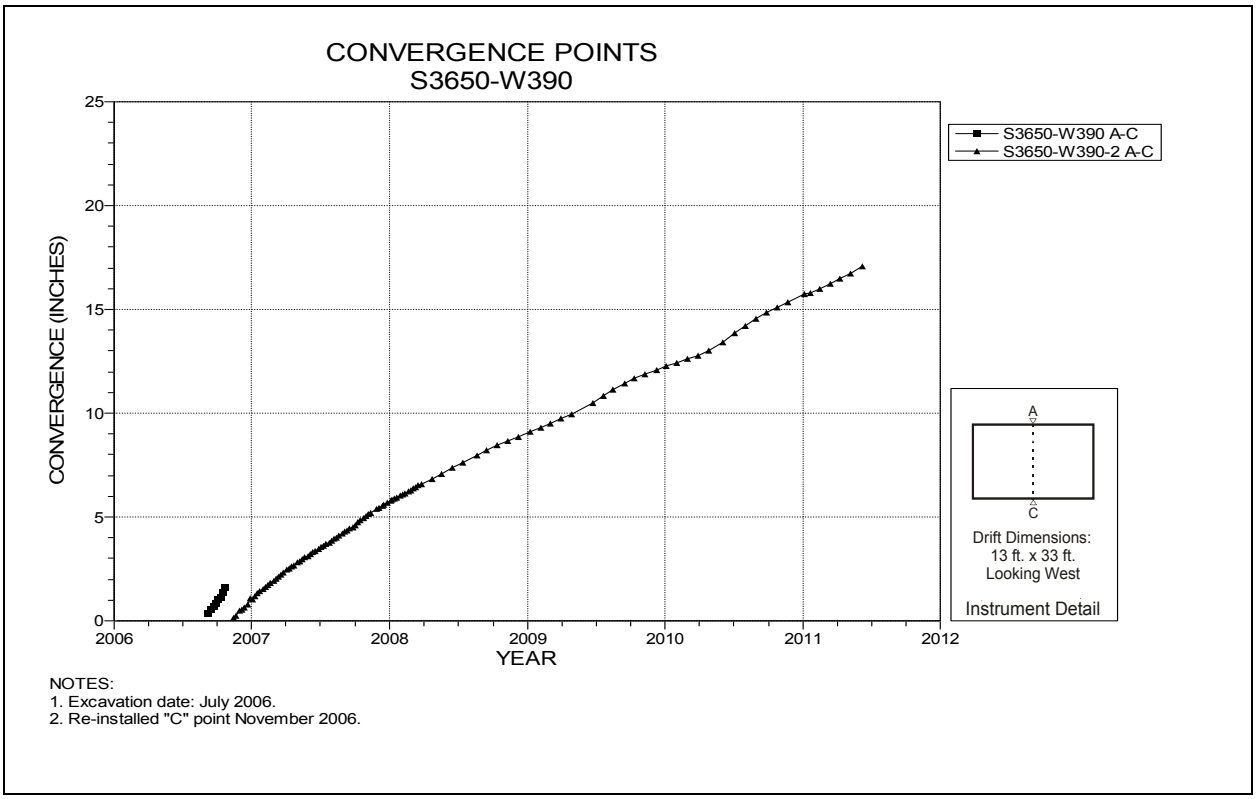


Figure 5-59 Convergence Point Array
S3650 W390 Intersection (Room 1, Panel 5) – Roof to Floor

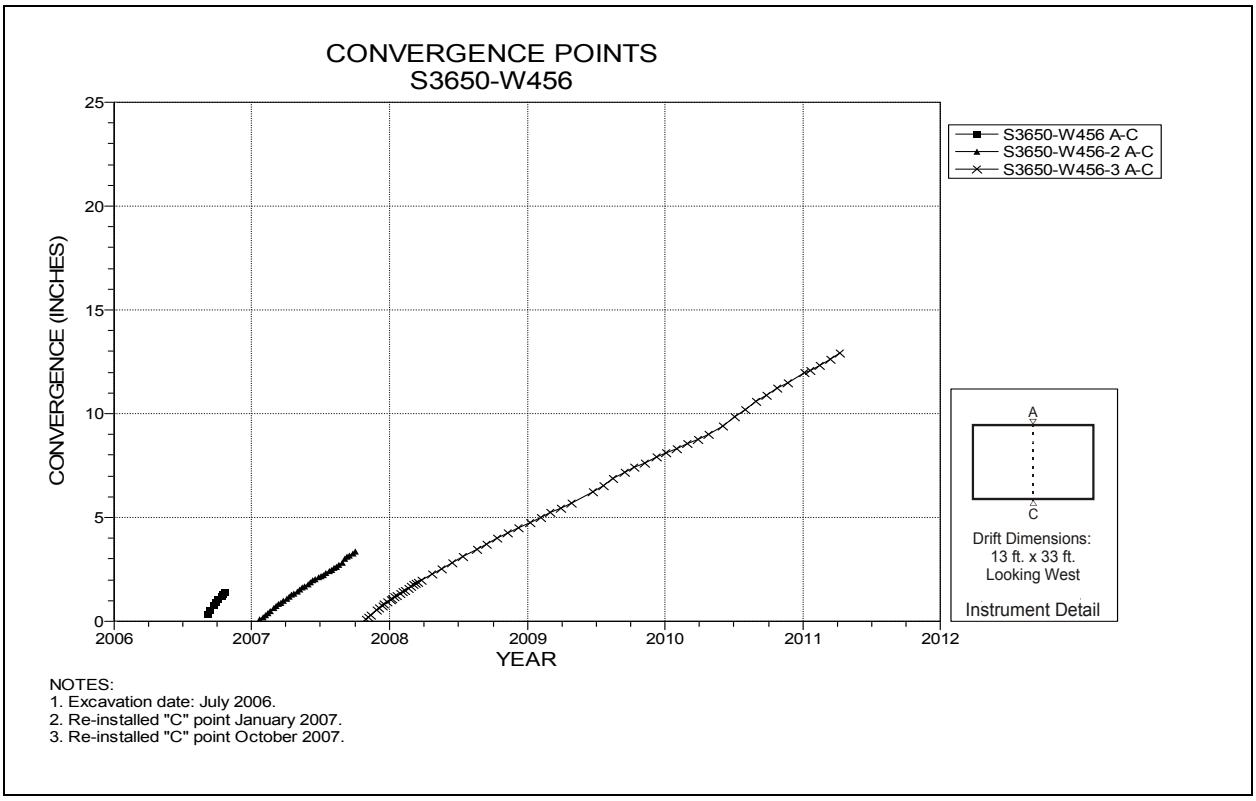


Figure 5-60 Convergence Point Array
S3650 W456 – Roof to Floor

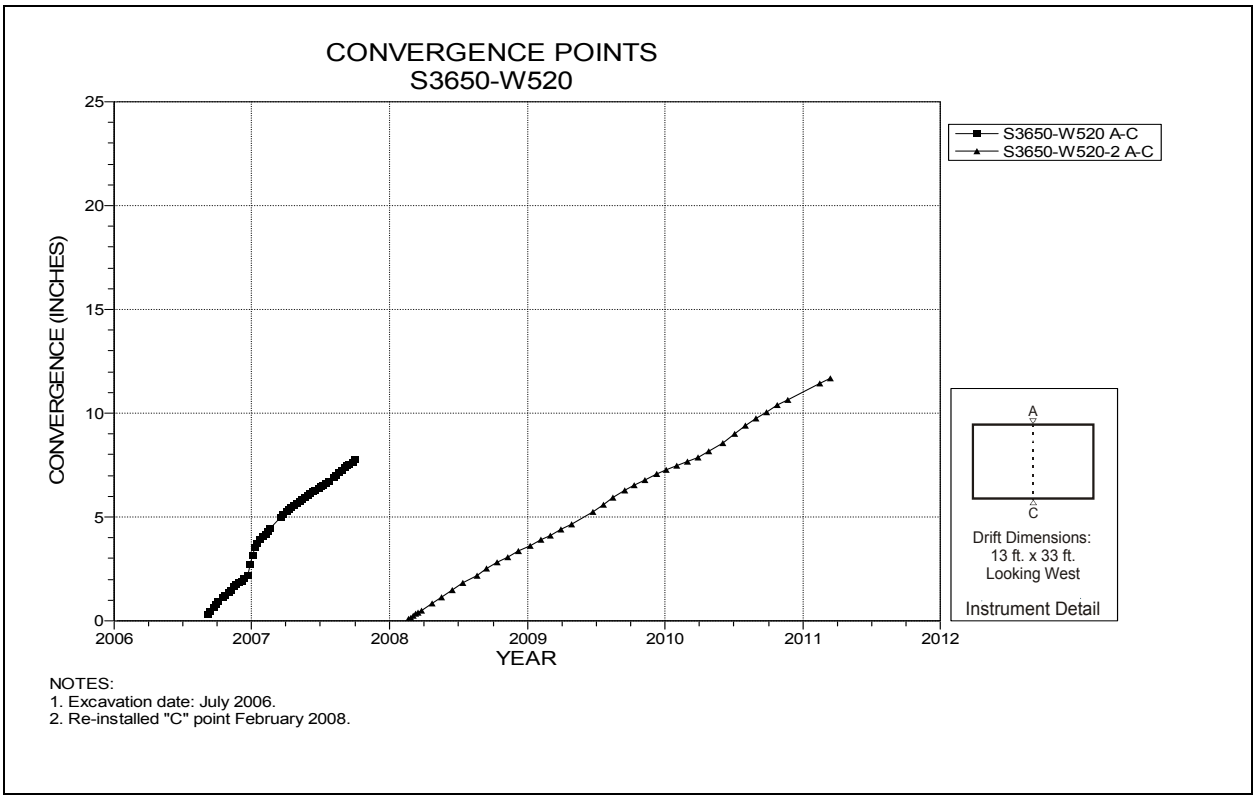


Figure 5-61 Convergence Point Array
S3650 W520 Intersection (Room 2, Panel 5) – Roof to Floor

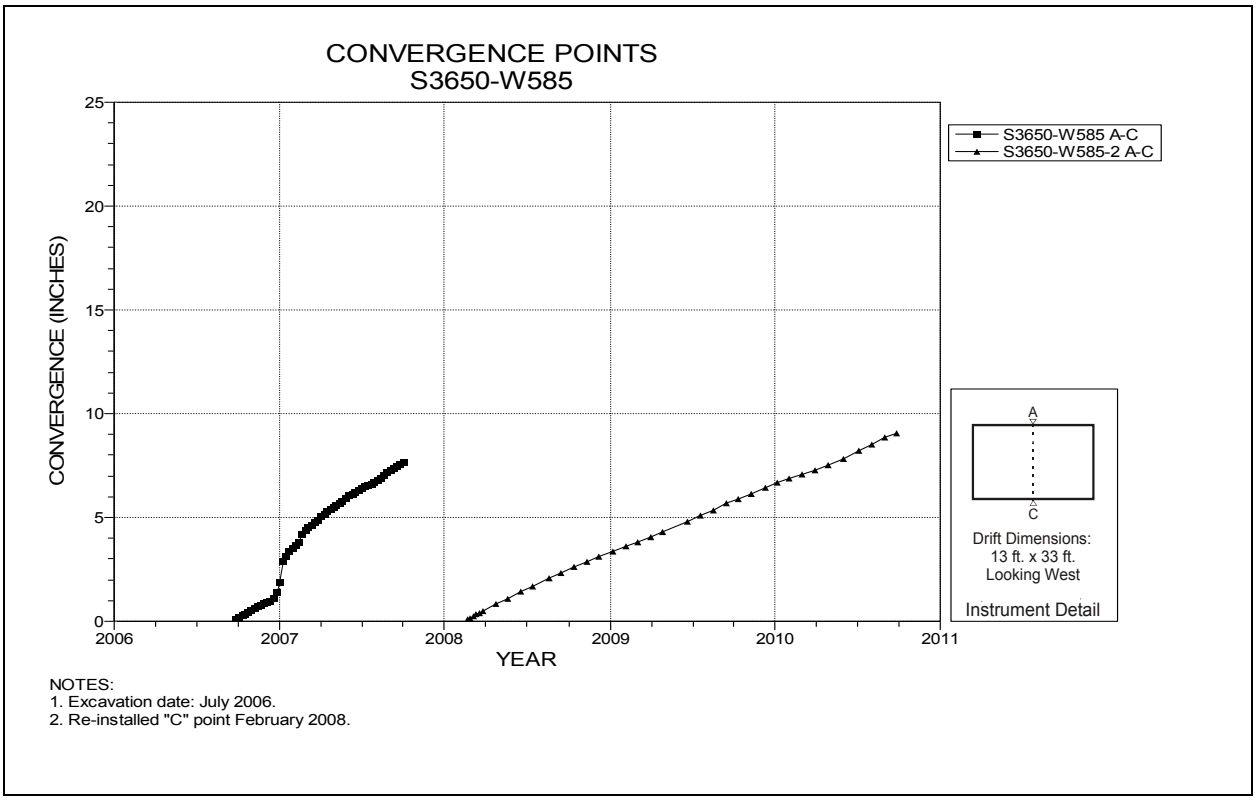


Figure 5-62 Convergence Point Array
S3650 W585 – Roof to Floor

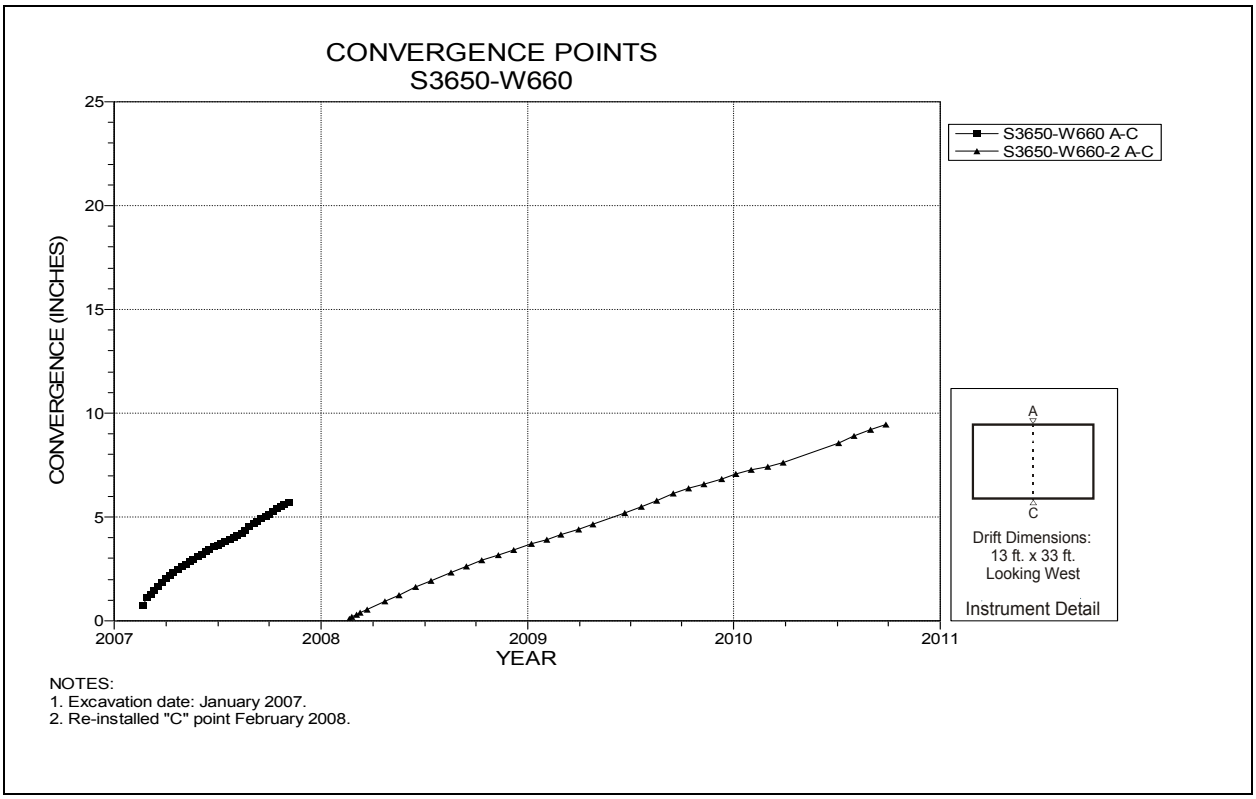


Figure 5-63 Convergence Point Array
S3650 W660 Intersection (Room 3, Panel 5) – Roof to Floor

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 2010 to 2011 (in/year)	Displacement Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
51X-GE-00413-2	S2750-W585	5-64	06/27/11	1.357	3.13	4.06	-23%	
51X-GE-00414	S2750-W985	5-65	06/27/11	1.712	1.56	1.23	27%	
51X-GE-00403	W390-S2916	5-66	06/27/11	11.004	5.66	3.87	46%	
51X-GE-00405	W520-S2916	5-67	06/27/11	6.961	3.85	3.10	24%	
51X-GE-00406	W660-S2916	5-68	06/27/11	4.597	2.51	2.81	-11%	
51X-GE-00407	W790-S2916	5-69	06/27/11	3.952	1.99	2.70	-26%	
51X-GE-00408-2	W920-S2916	5-70	06/27/11	1.494	1.57	1.79	-22%	
51X-GE-00409	W1050-S2916	5-71	06/27/11	3.100	1.85	3.10	-40%	
51X-GE-00410	W1190-S2916	5-72	06/27/11	2.274	1.67	2.16	-23%	
51X-GE-00411	S3080-W585	5-73	06/27/11	4.997	4.07	4.59	-11%	
51X-GE-00412	S3080-W985	5-74	06/27/11	2.289	1.82	1.83	-1%	

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S2750-W285-2 A-C	S2750-W285	5-75	06/20/11	6.621	11.302	6.45	7.14	-10%	
S2750-W390-2 A-C	S2750-W390	5-76	06/20/11	6.341	13.467	6.02	7.95	-24%	
S2750-W460-2 A-C	S2750-W460	5-77	06/21/11	8.583	14.609	8.39	9.62	-13%	
S2750-W520-2 A-C	S2750-W520	5-78	06/21/11	6.843	13.559	6.61	7.63	-13%	
S2750-W590-2 A-C	S2750-W590	5-79	06/21/11	7.560	11.262	7.38	8.08	-9%	
S2750-W660-2 A-C	S2750-W660	5-80	06/21/11	7.184	11.274	6.99	7.83	-11%	
S2750-W725-2 A-C	S2750-W725	5-81	06/21/11	7.240	11.520	7.10	7.91	-10%	
S2750-W790-2 A-C	S2750-W790	5-82	06/21/11	6.930	11.383	6.74	7.06	-5%	
S2750-W855-2 A-C	S2750-W855	5-83	06/21/11	6.303	7.988	6.26	5.32	18%	
S2750-W920-2 A-C	S2750-W920	5-84	06/20/11	6.341	8.265	6.31	5.97	6%	

Table 5-6 (continued) Panel 6 Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S2750-W985-2 A-C	S2750-W985	5-85	06/20/11	5.131	7.041	5.11	4.79	7%	
S2750-W1050-2 A-C	S2750-W1050	5-86	06/20/11	5.128	7.111	5.10	5.48	-7%	
S2750-W1120-2 A-C	S2750-W1120	5-87	06/20/11	4.404	5.020	4.19	3.65	15%	
S2750-W1190-2 A-C	S2750-W1190	5-88	06/20/11	4.860	5.883	3.50	3.74	-6%	
W390-S2833-2 A-C	W390-S2833	5-89	06/20/11	9.769	17.298	9.32	12.13	-23%	
W390-S2916-2 A-C	W390-S2916	5-90	06/20/11	8.913	18.126	8.52	11.00	-23%	
W390-S2998-2 A-C	W390-S2998	5-91	06/20/11	6.308	15.361	5.88	9.78	-40%	
W520-S2833-2 A-C	W520-S2833	5-92	06/21/11	5.399	11.407	5.12	6.94	-26%	
W520-S2916-2 A-C	W520-S2916	5-93	06/21/11	6.917	13.020	6.65	8.12	-18%	
W520-S2998-2 A-C	W520-S2998	5-94	06/21/11	5.113	10.823	4.85	6.78	-28%	
W660-S2833-2 A-C	W660-S2833	5-95	06/21/11	5.656	9.950	5.55	6.70	-17%	
W660-S2916-2 A-C	W660-S2916	5-96	06/21/11	5.608	10.670	5.50	7.51	-27%	
W660-S2998-2 A-C	W660-S2998	5-97	06/21/11	5.450	10.240	5.34	6.29	-15%	
W790-S2833-2 A-C	W790-S2833	5-98	06/21/11	5.607	10.915	5.50	6.62	-17%	
W790-S2916-2 A-C	W790-S2916	5-99	06/21/11	5.199	10.463	5.08	6.57	-23%	
W790-S2998-2 A-C	W790-S2998	5-100	06/21/11	4.838	9.944	4.69	6.57	-29%	
W920-S2833-2 A-C	W920-S2833	5-101	06/20/11	4.736	8.422	4.67	7.85	-41%	
W920-S2916-2 A-C	W920-S2916	5-102	06/20/11	4.790	8.567	4.70	5.40	-13%	
W920-S2998-2 A-C	W920-S2998	5-103	06/20/11	4.195	7.780	4.09	5.36	-24%	
W1050-S2833-2 A-C	W1050-S2833	5-104	06/20/11	4.087	5.029	3.94	5.03	-22%	
W1050-S2916-2 A-C	W1050-S2916	5-105	06/20/11	5.004	6.046	4.94	6.25	-21%	
W1050-S2998-2 A-C	W1050-S2998	5-106	06/20/11	4.002	4.948	3.93	4.67	-16%	
W1190-S2833-2 A-C	W1190-S2833	5-107	06/20/11	5.933	7.361	4.11	4.96	-17%	
W1190-S2916-2 A-C	W1190-S2916	5-108	06/20/11	4.602	6.132	4.51	5.84	-23%	
W1190-S2998-2 A-C	W1190-S2998	5-109	03/30/11	3.335	4.860	4.20	5.03	-17%	
S3080-W285-2 A-C	S3080-W285	5-110	06/20/11	2.944	6.911	2.84	2.92	-3%	
S3080-W390-2 A-C	S3080-W390	5-111	06/20/11	5.046	13.244	4.76	6.66	-29%	
S3080-W460-2 A-C	S3080-W460	5-112	06/20/11	5.819	13.853	5.73	5.68	1%	

Table 5-6 ((Continued)) Panel 6 Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)	Rate Change Percent	Comments
			Date	Inches					
S3080-W520-2 A-C	S3080-W520	5-113	06/20/11	6.364	14.835	6.01	8.20	-27%	
S3080-W585-2 A-C	S3080-W585	5-114	06/20/11	7.284	16.462	6.96	8.64	-19%	
S3080-W660-2 A-C	S3080-W660	5-115	06/20/11	6.392	13.516	6.07	6.82	-11%	
S3080-W725-2 A-C	S3080-W725	5-116	06/20/11	6.012	6.012	5.74	6.33	-9%	
S3080-W790-2 A-C	S3080-W790	5-117	06/20/11	6.456	12.193	6.21	6.98	-11%	
S3080-W855-2 A-C	S3080-W855	5-118	06/20/11	5.605	5.605	5.73	7.29	-21%	
S3080-W920-2 A-C	S3080-W920	5-119	06/20/11	5.153	5.153	5.52	8.37	-34%	
S3080-W985-2 A-C	S3080-W985	5-120	06/20/11	4.647	4.647	4.73	7.07	33%	
S3080-W1050-2 A-C	S3080-W1050	5-121	06/20/11	4.507	6.105	4.31	5.32	-19%	
S3080-W1120-2 A-C	S3080-W1120	5-122	02/28/11	2.710	4.053	3.79	4.55	-17%	
S3080-W1190-2 A-C	S3080-W1190	5-123	02/28/11	2.300	3.528	3.22	4.88	-34%	

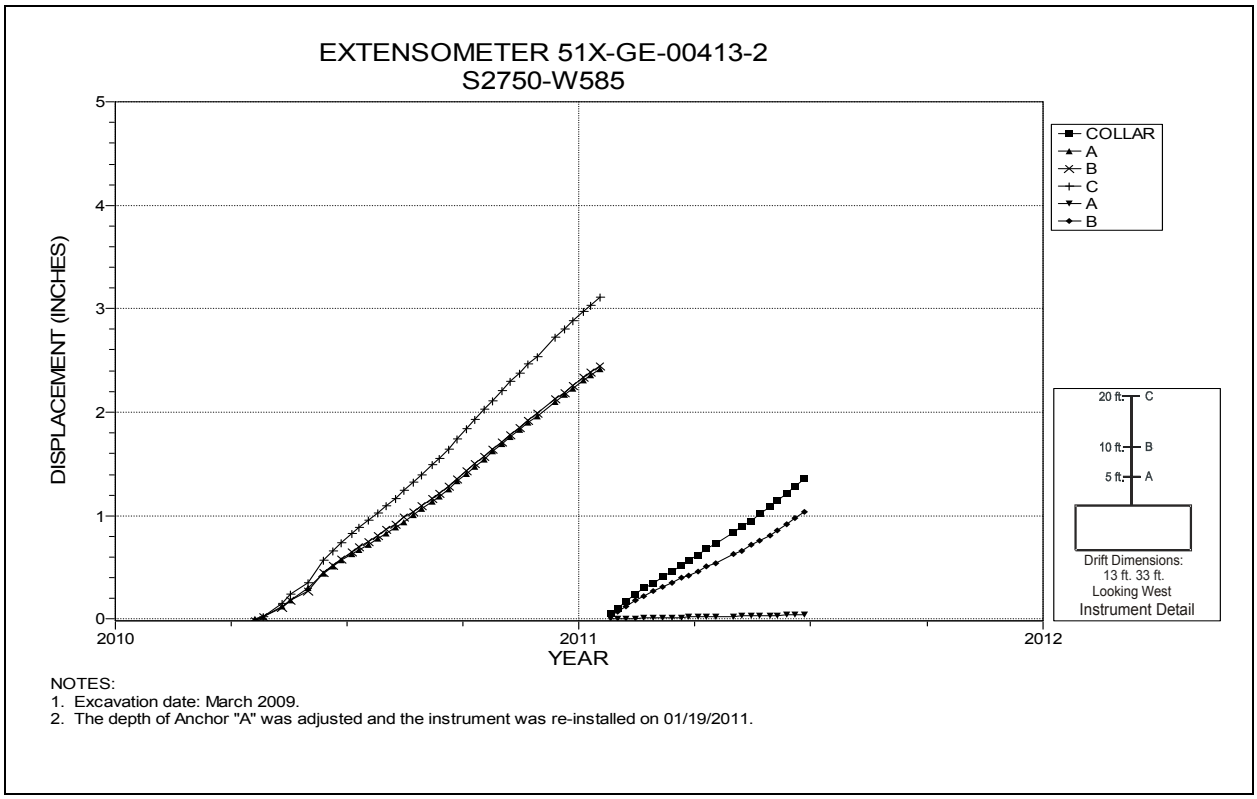


Figure 5-64 Extensometer 51X-GE-00413-2
S2750 W585 – Roof

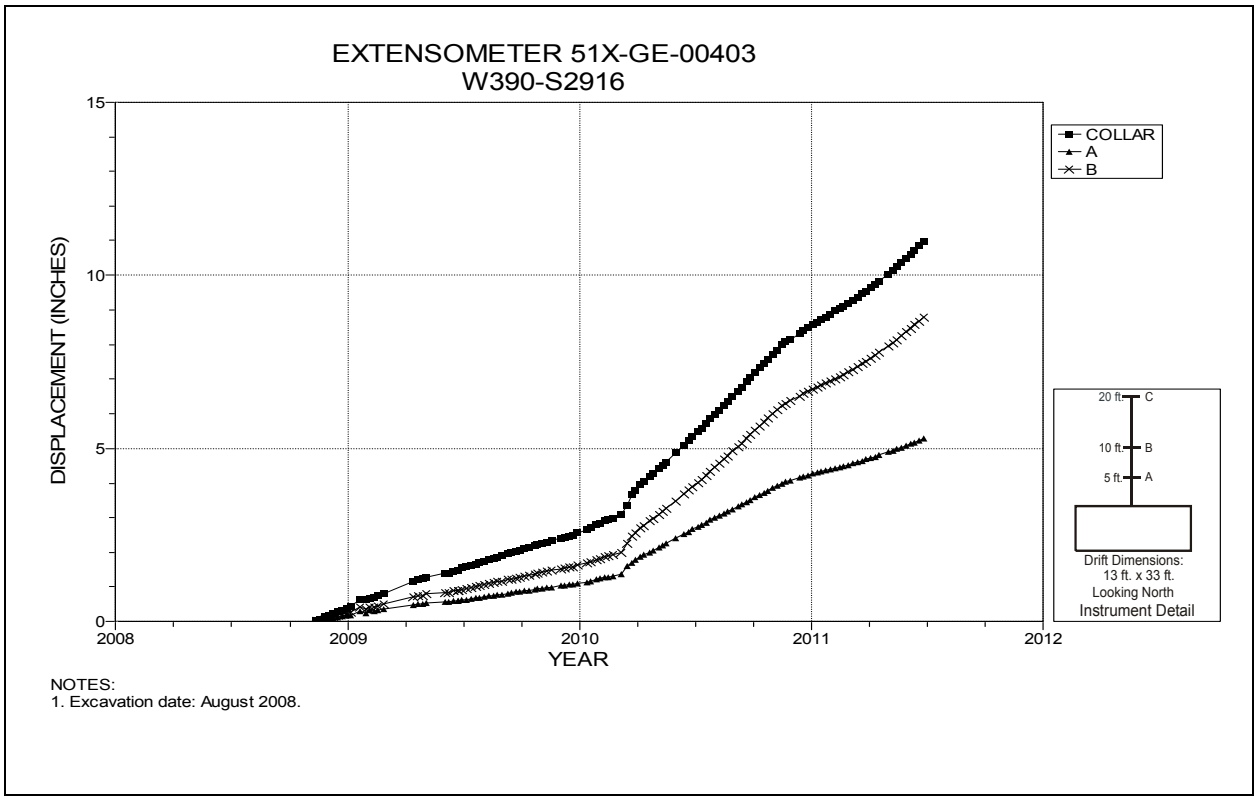


Figure 5-65 Extensometer 51X-GE-00414
S2750 W985 – Roof

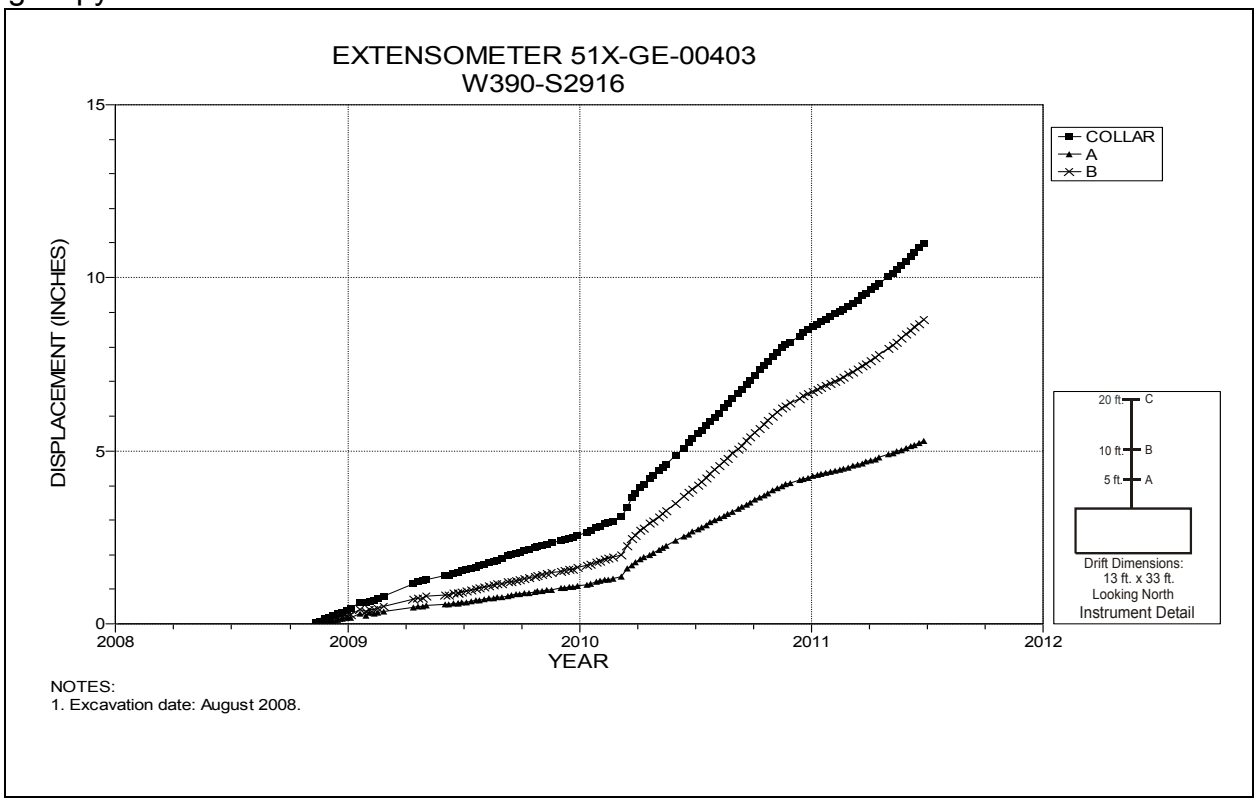


Figure 5-66 Extensometer 51X-GE-00403
Room 1, Panel 6 at W390 S2916 – Roof

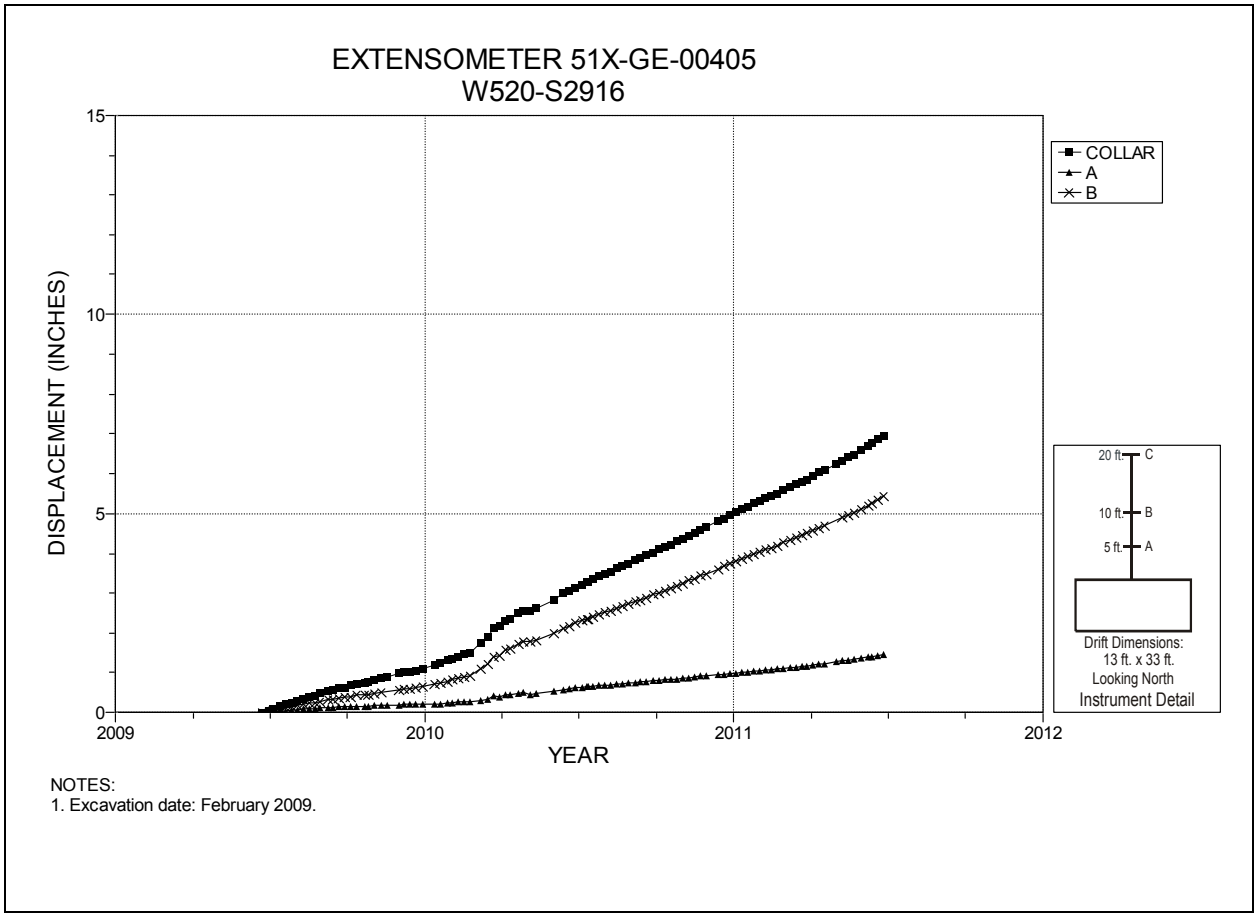


Figure 5-67 Extensometer 51X-GE-00405
Room 2, Panel 6 at W520 S2916 – Room Center – Roof

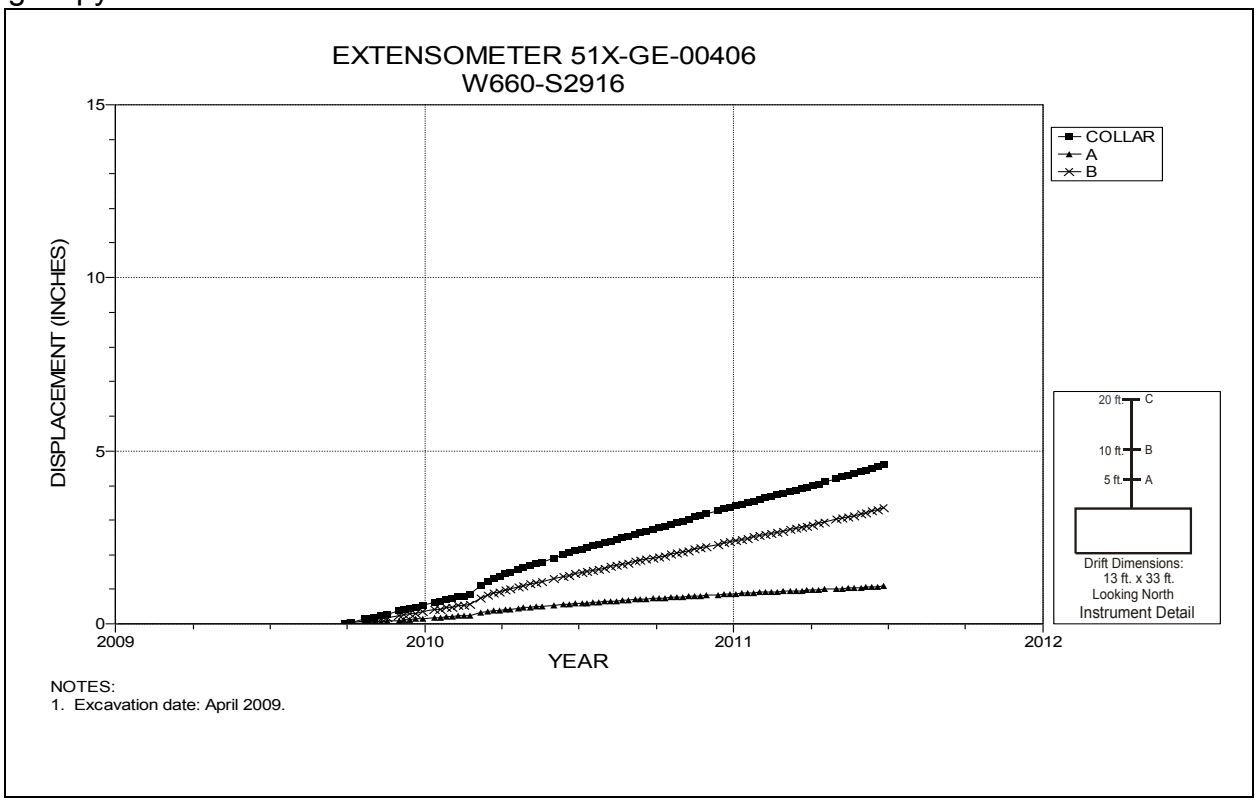


Figure 5-68 Extensometer 51X-GE-00406
Room 3, Panel 6 at W660 S2916– Room Center – Roof

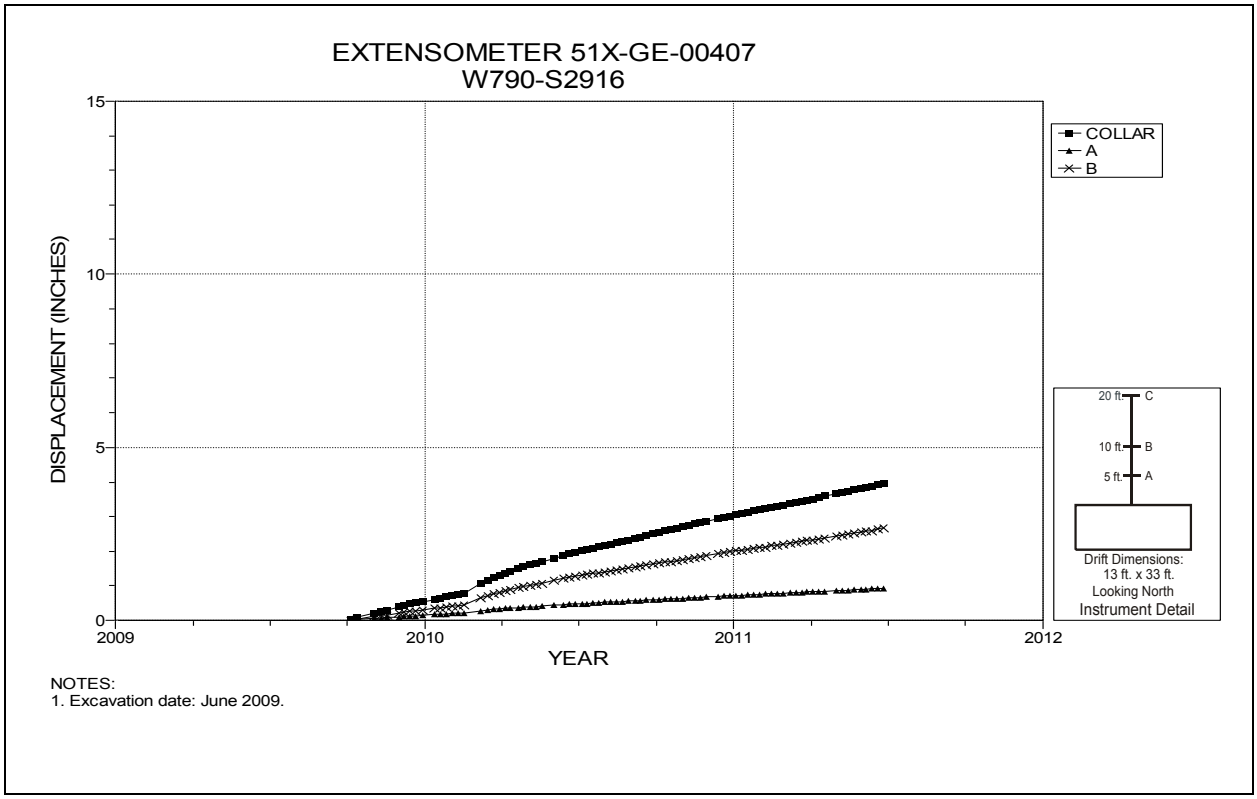
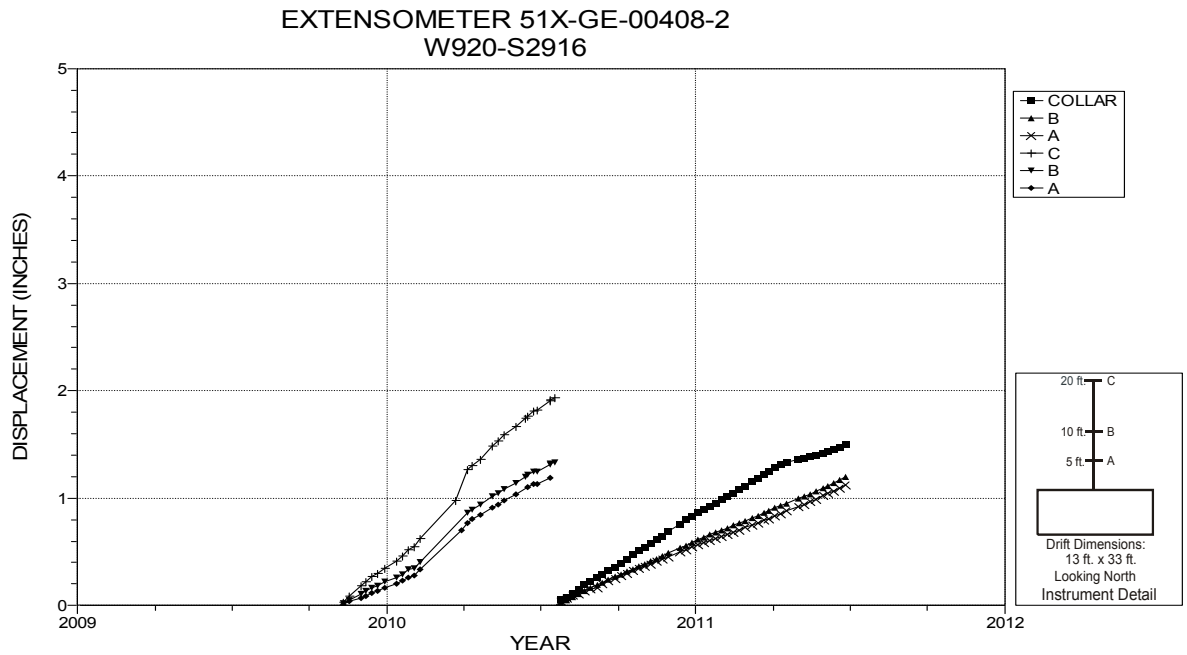
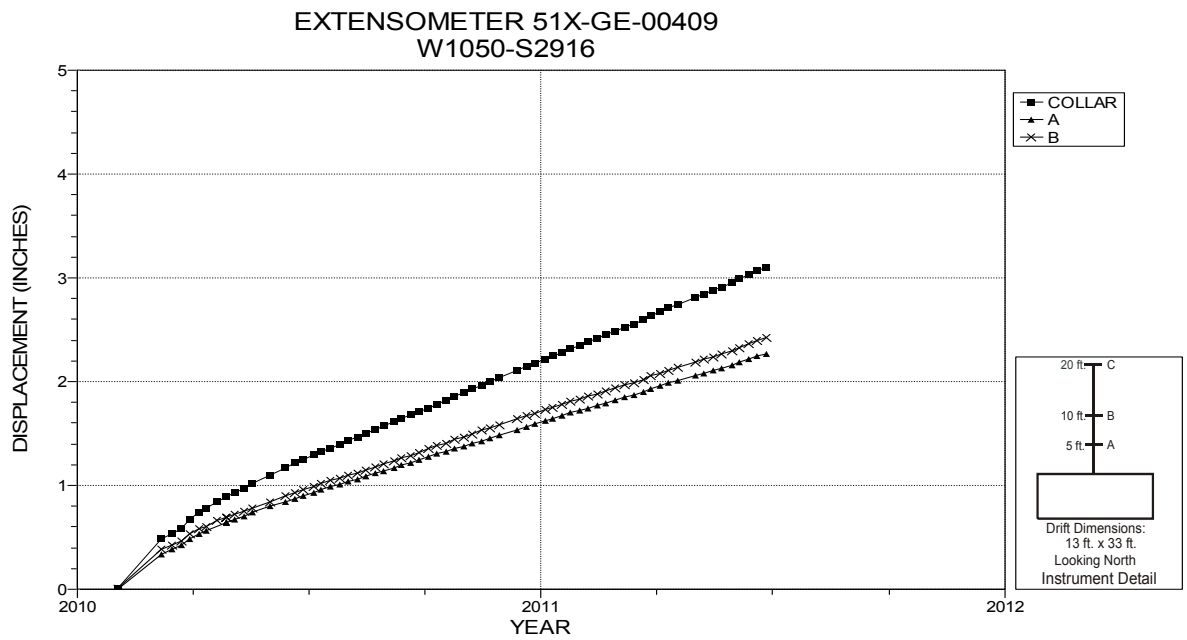


Figure 5-69 Extensometer 51X-GE-00407
Room 4, Panel 6 at W790 S2916 – Room Center – Roof



NOTES:
1. Excavation date: August 2009.
2. The mechanical connection to the Collar anchor was lost and the instrument was re-installed.

Figure 5-70 Extensometer 51X-GE-00408-2
Room 5, Panel 6 at W920 S2916– Room Center – Roof



NOTES:
1. Excavation date: August 2009.

Figure 5-71 Extensometer 51X-GE-00409
Room 6, Panel 6 at W1050 S2916– Room Center – Roof

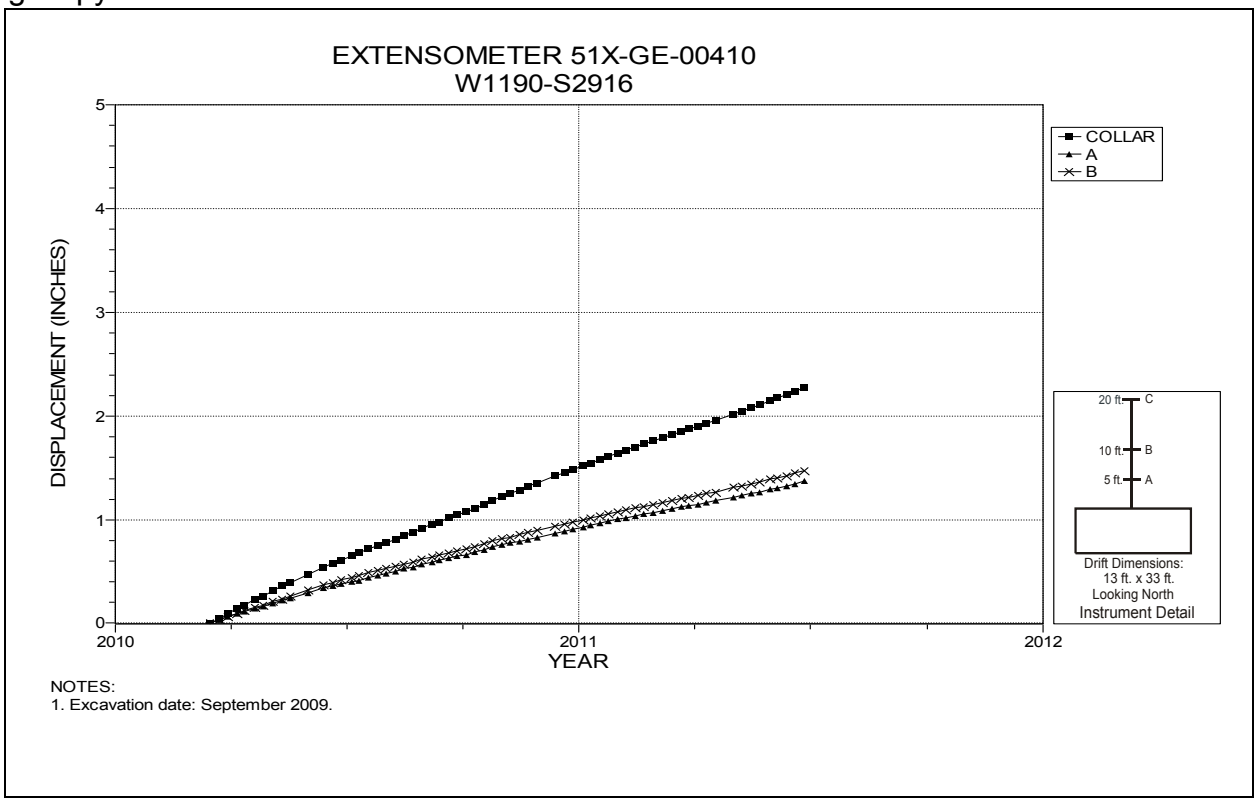


Figure 5-72 Extensometer 51X-GE-00410
Room 7, Panel 6 at W1190 S2916– Room Center – Roof

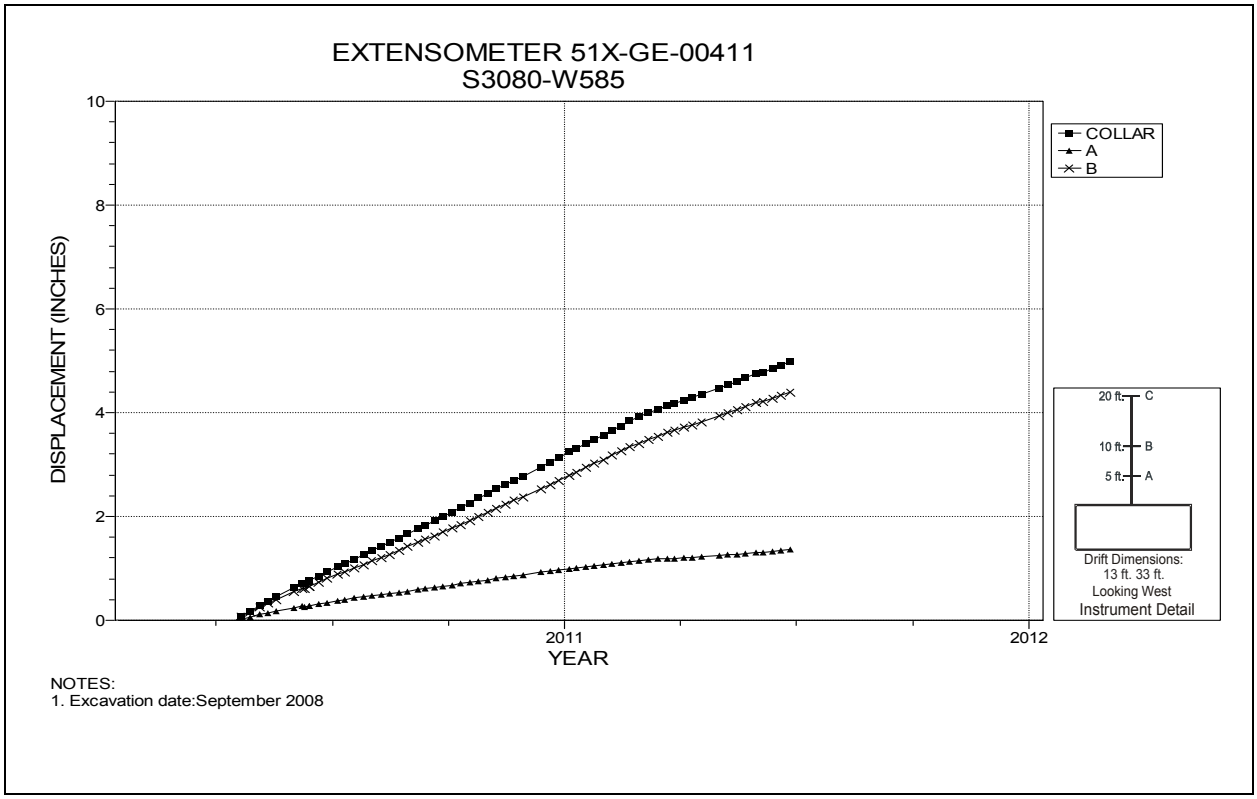


Figure 5-73 Extensometer 51X-GE-00411
S3080 W585 – Roof

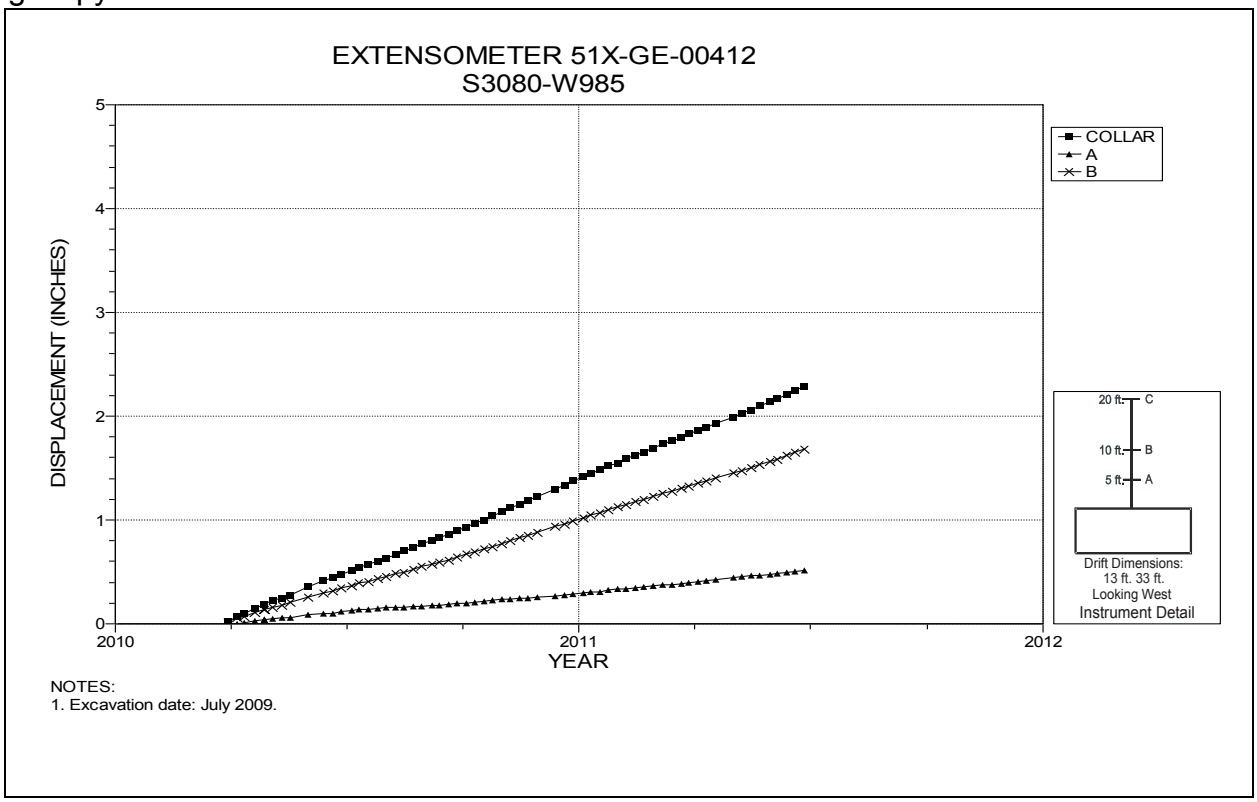


Figure 5-74 Extensometer 51X-GE-00412
S3080 W985 – Roof

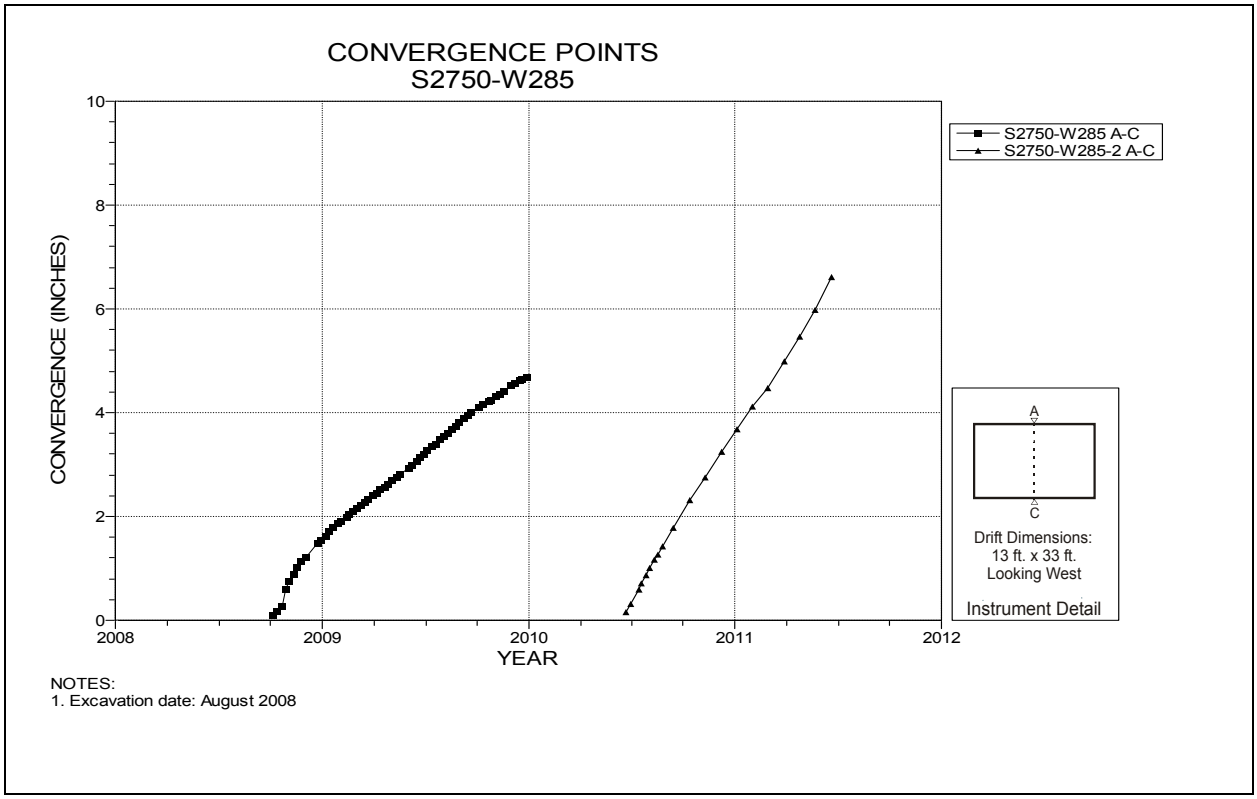


Figure 5-75 Convergence Point Array
S2750 W285 – Roof to Floor

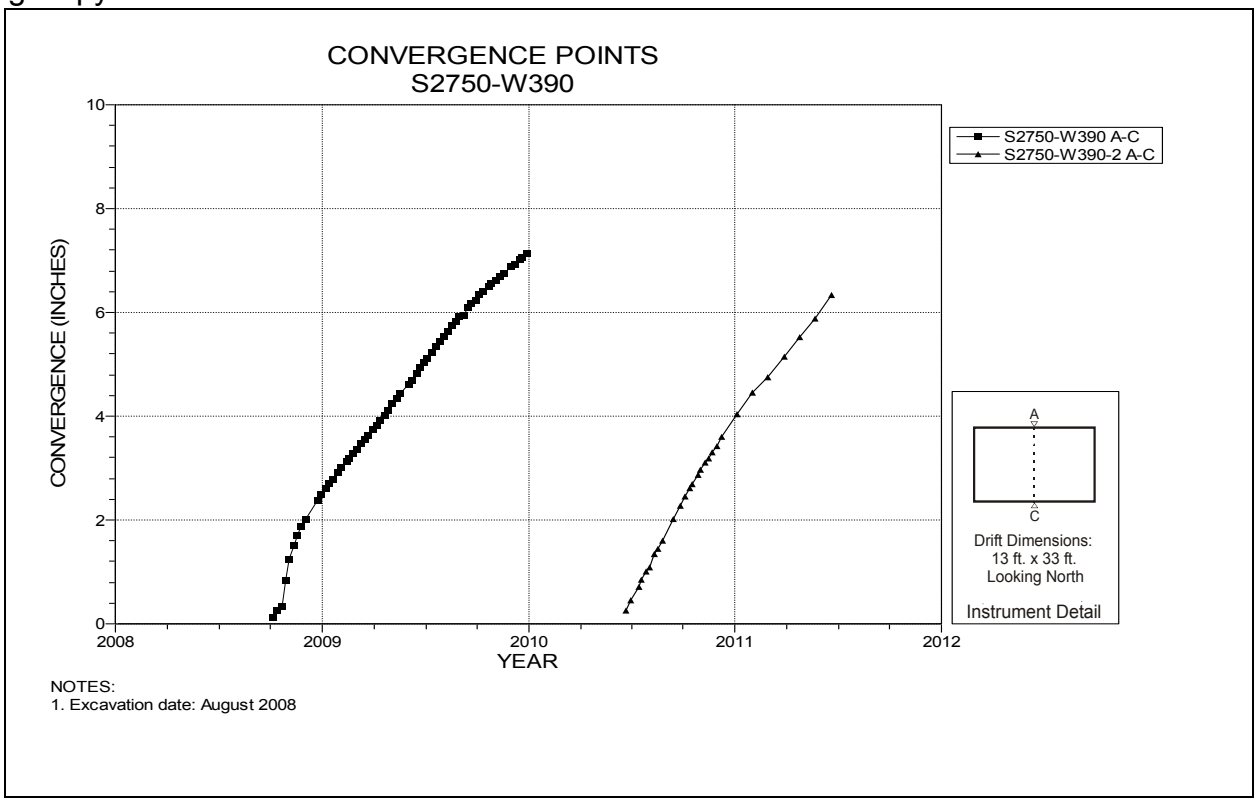


Figure 5-76 Convergence Point Array
S2750 W390 Intersection (Room 1, Panel 6) – Roof to Floor

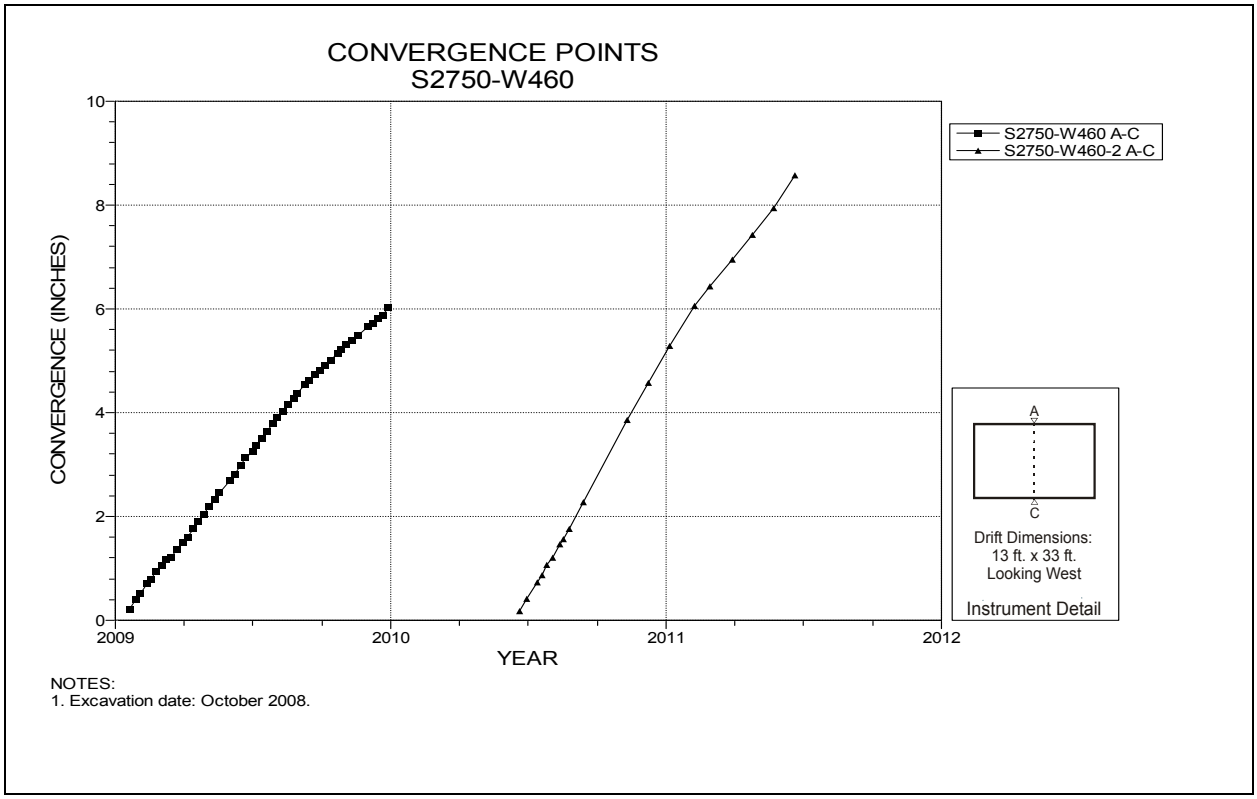


Figure 5-77 Convergence Point Array
S2750 W460 – Roof to Floor

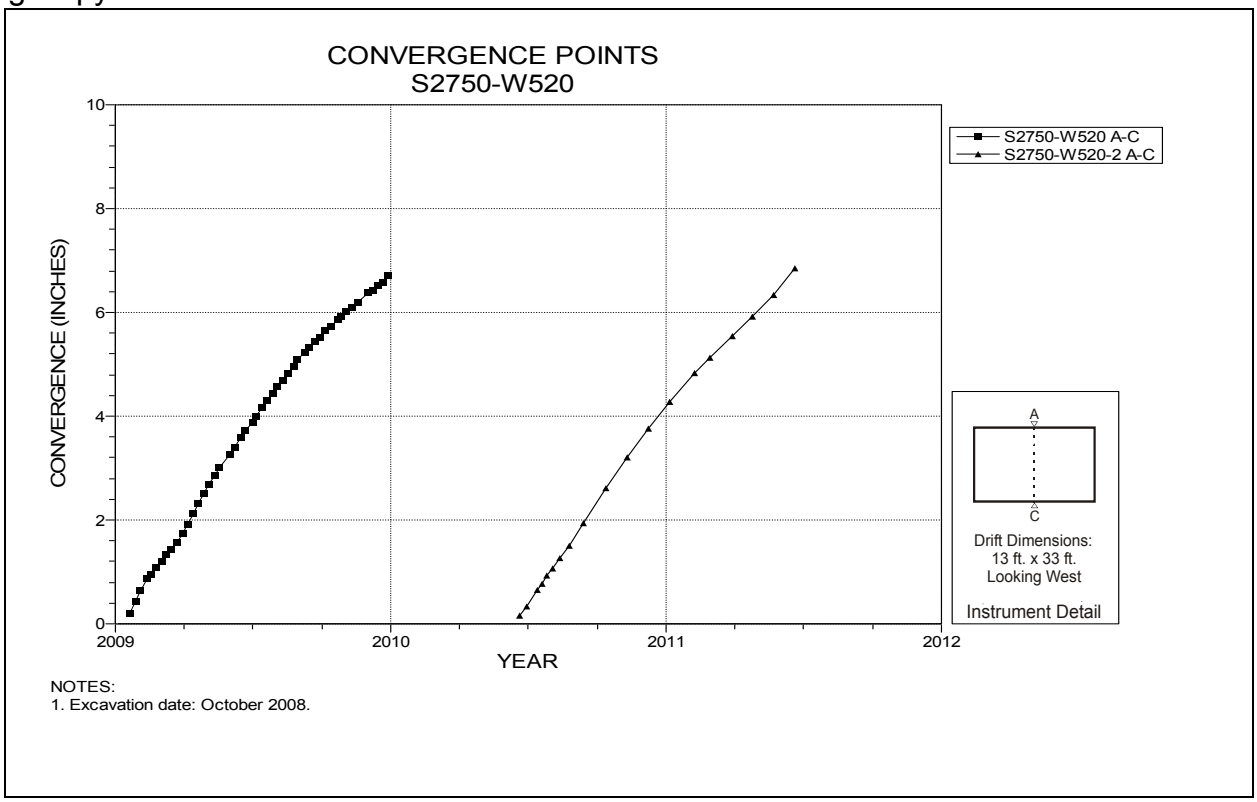


Figure 5-78 Convergence Point Array
S2750 W520 Intersection (Room 2, Panel 6) – Roof to Floor

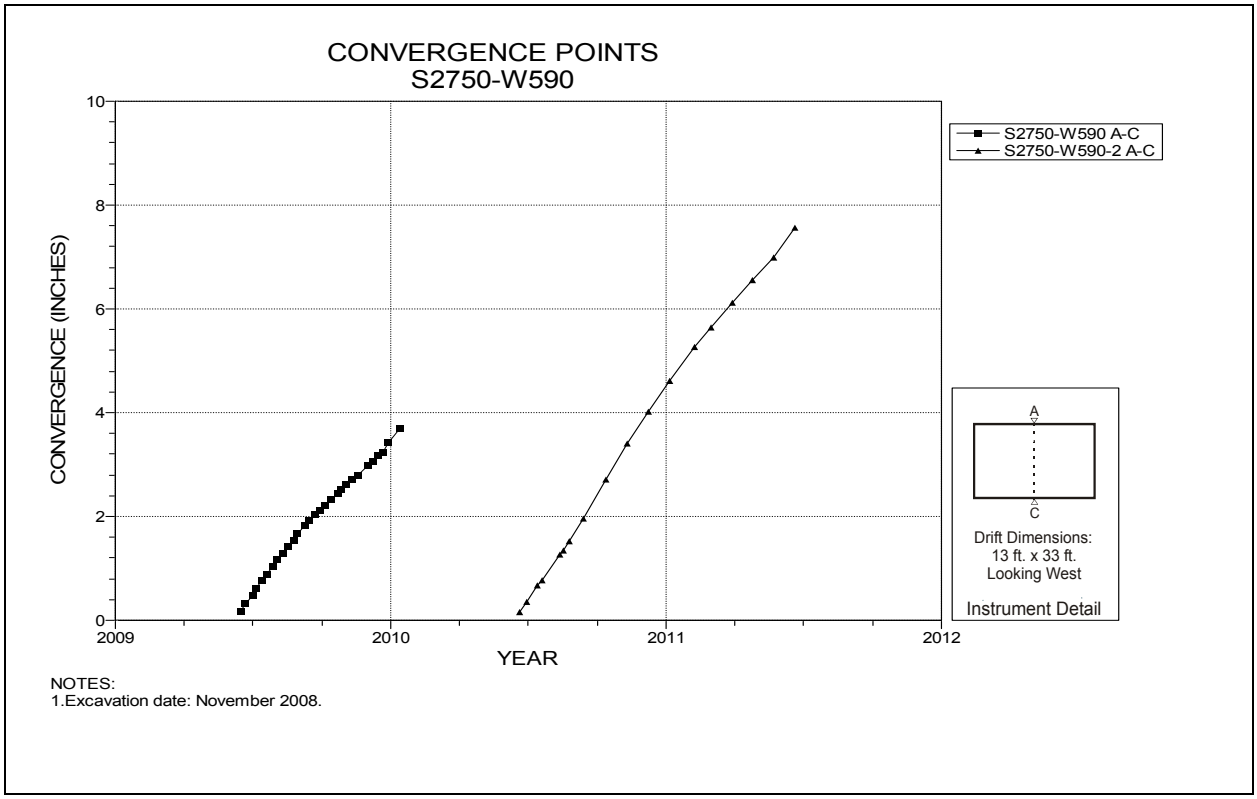
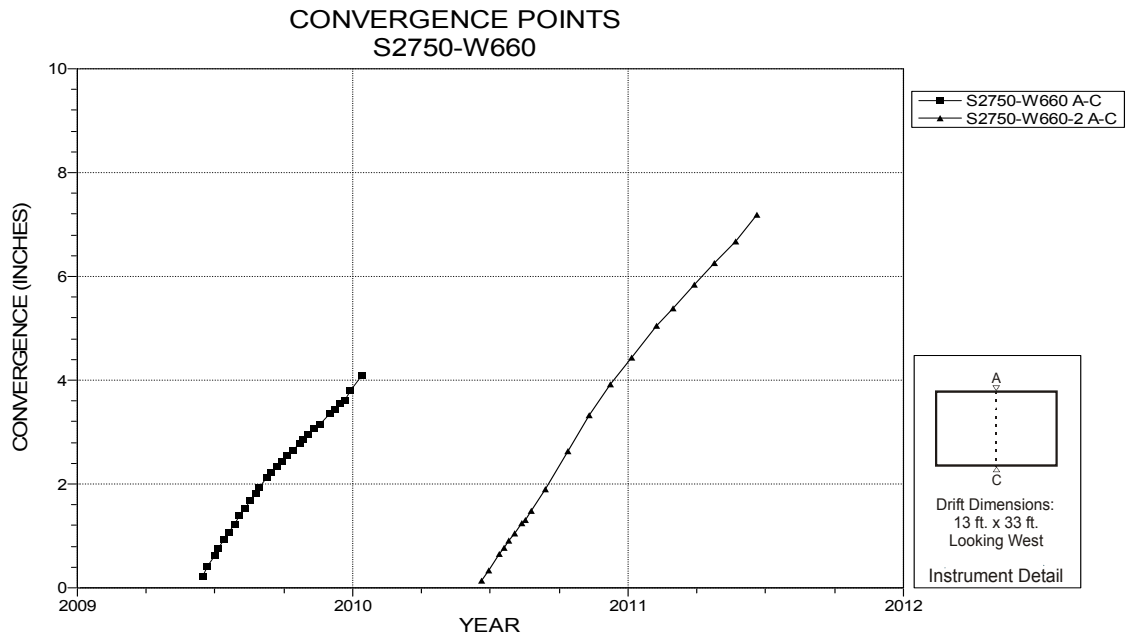
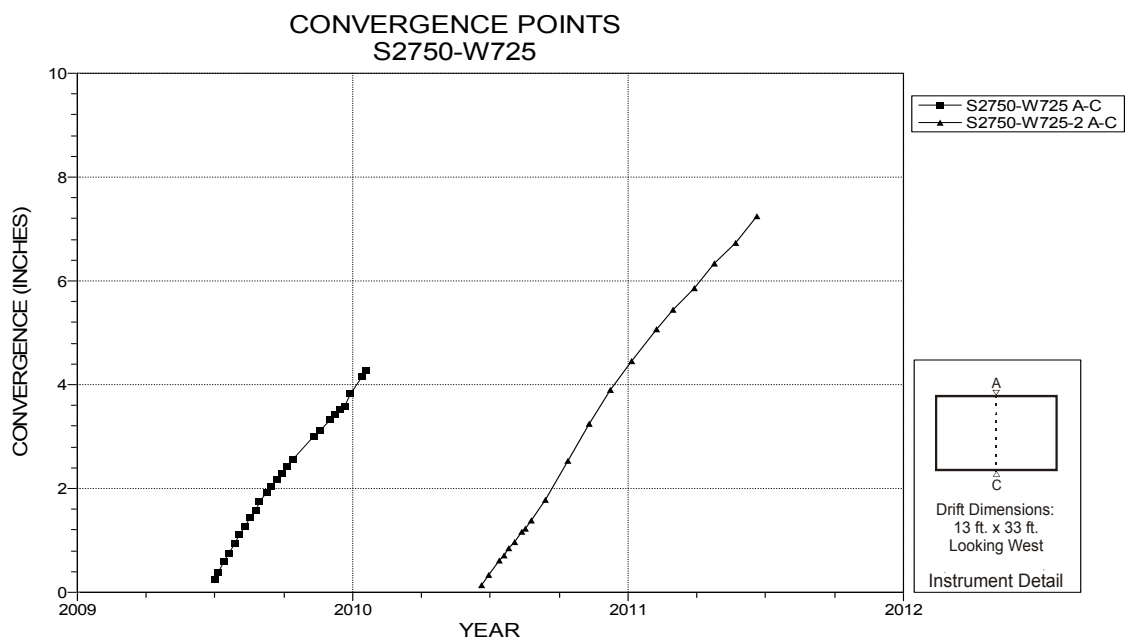


Figure 5-79 Convergence Point Array
S2750 W590 – Roof to Floor



NOTES:
1.Excavation date:April 2009.

Figure 5-80 Convergence Point Array
S2750 W660 Intersection (Room 3 Panel 6) – Roof to Floor



NOTES:
1. Excavation date: April 2009.

Figure 5-81 Convergence Point Array
S2750 W725 – Roof to Floor

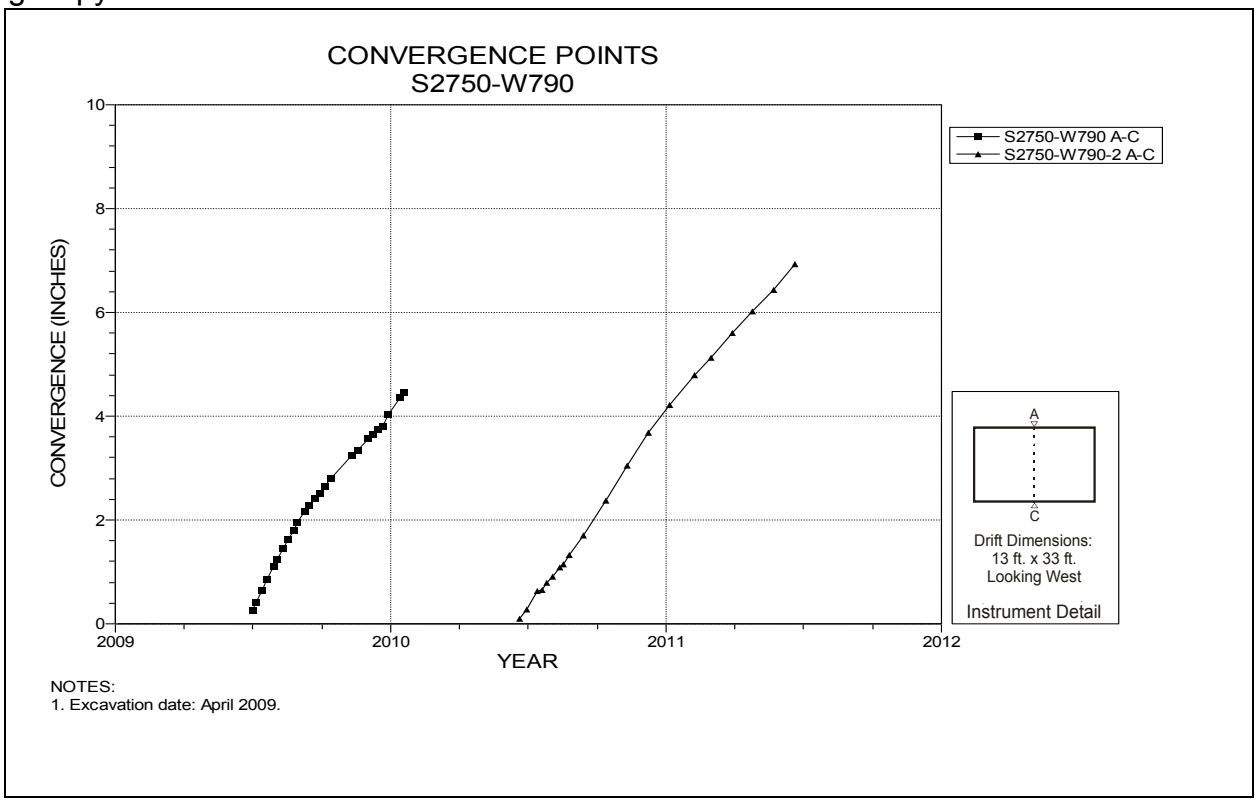


Figure 5-82 Convergence Point Array
S2750 W790 Intersection (Room 4, Panel 6) – Roof to Floor

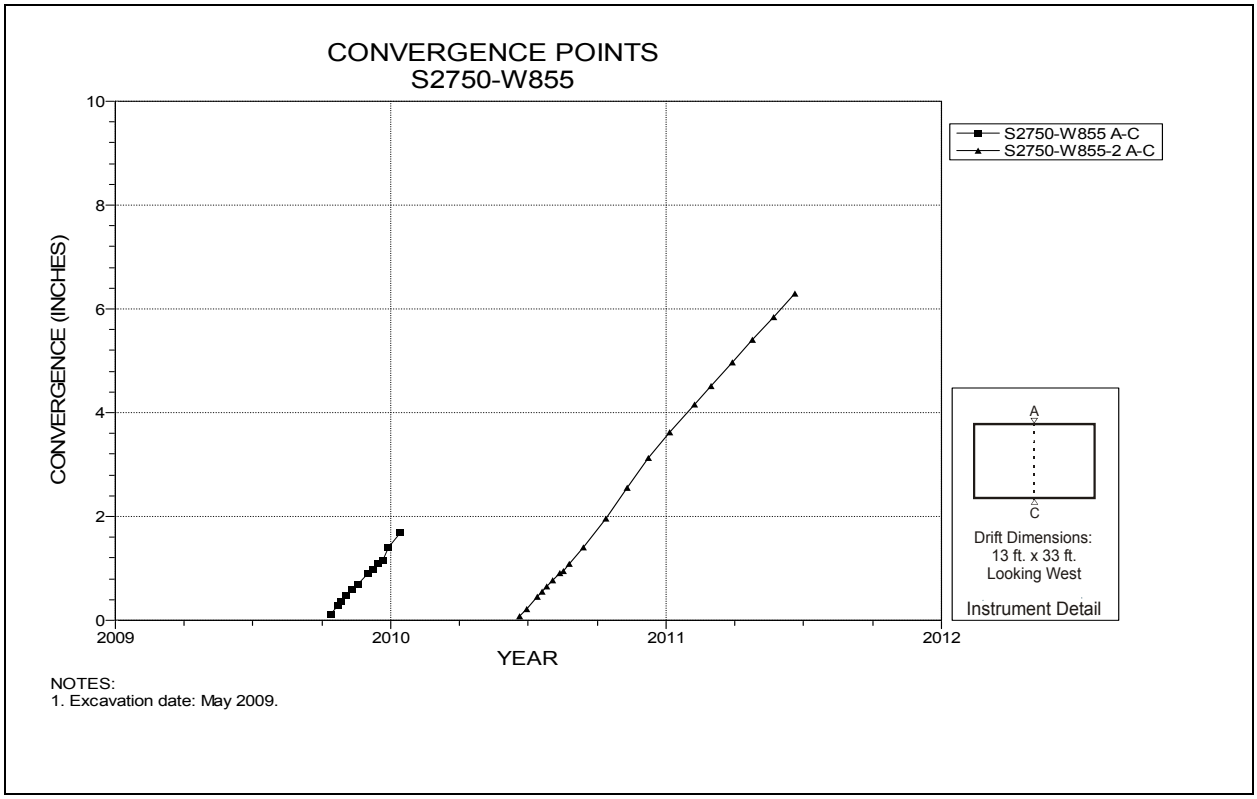


Figure 5-83 Convergence Point Array
S2750 W885 – Roof to Floor

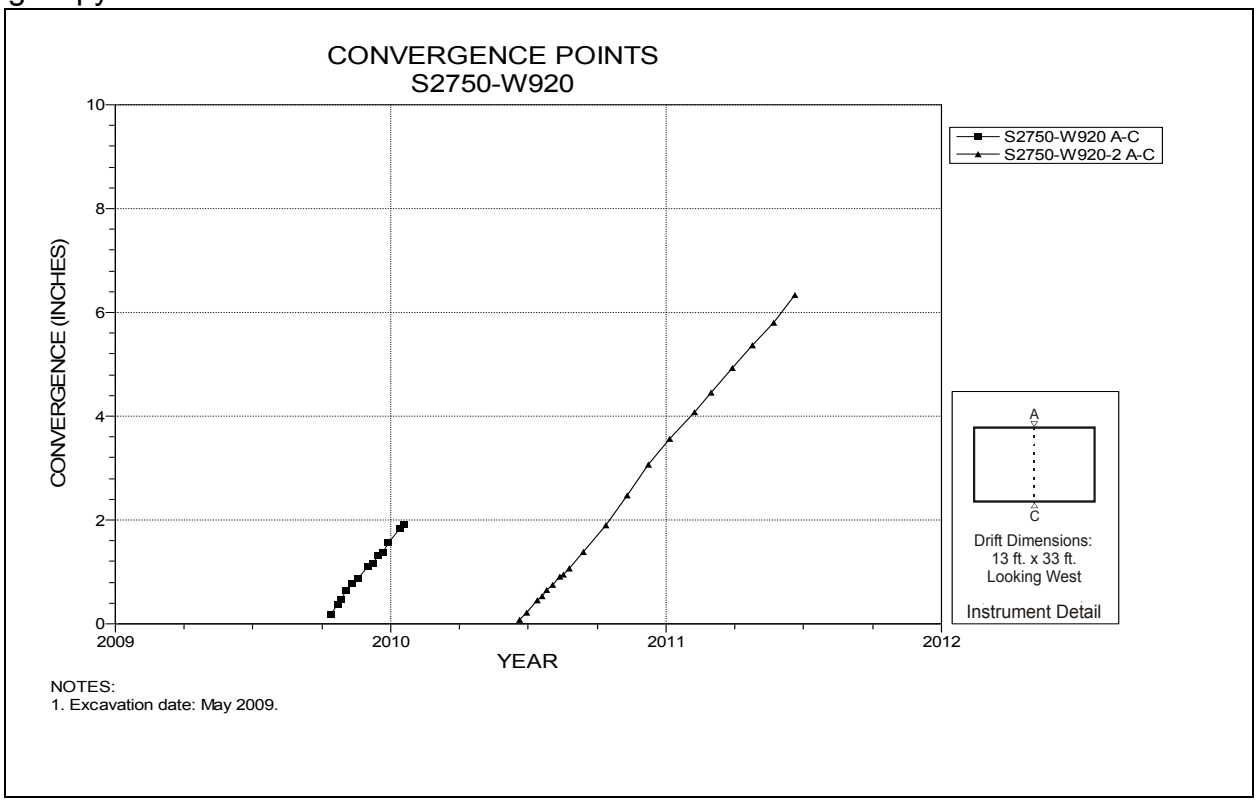


Figure 5-84 Convergence Point Array
S2750 W920 Intersection (Room 5, Panel 6) – Roof to Floor

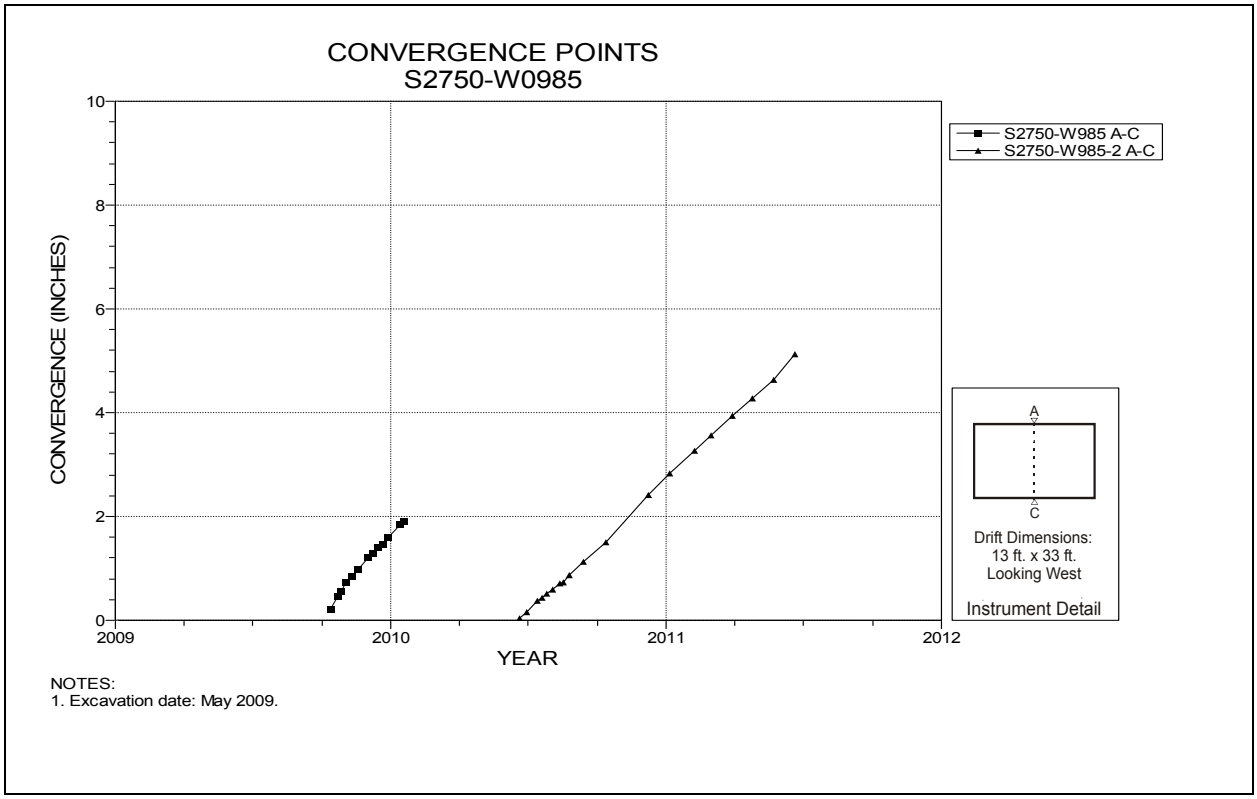


Figure 5-85 Convergence Point Array
S2750 W985 – Roof to Floor

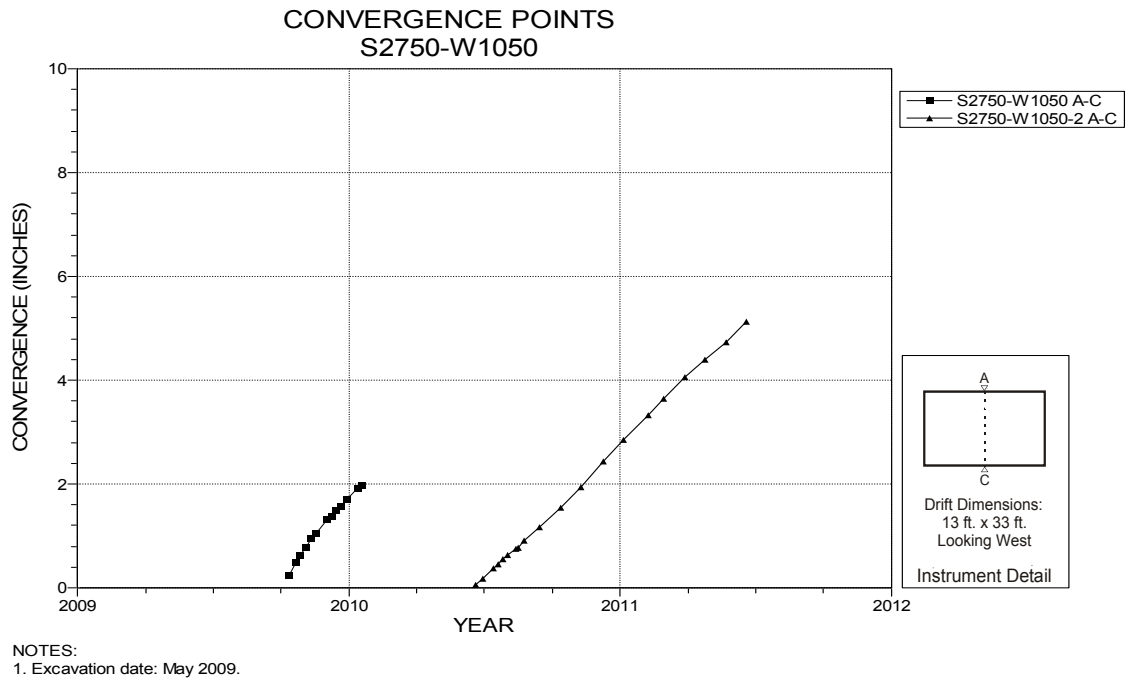


Figure 5-86 Convergence Point Array
S2750 W1050 Intersection (Room 6, Panel 6) – Roof to Floor

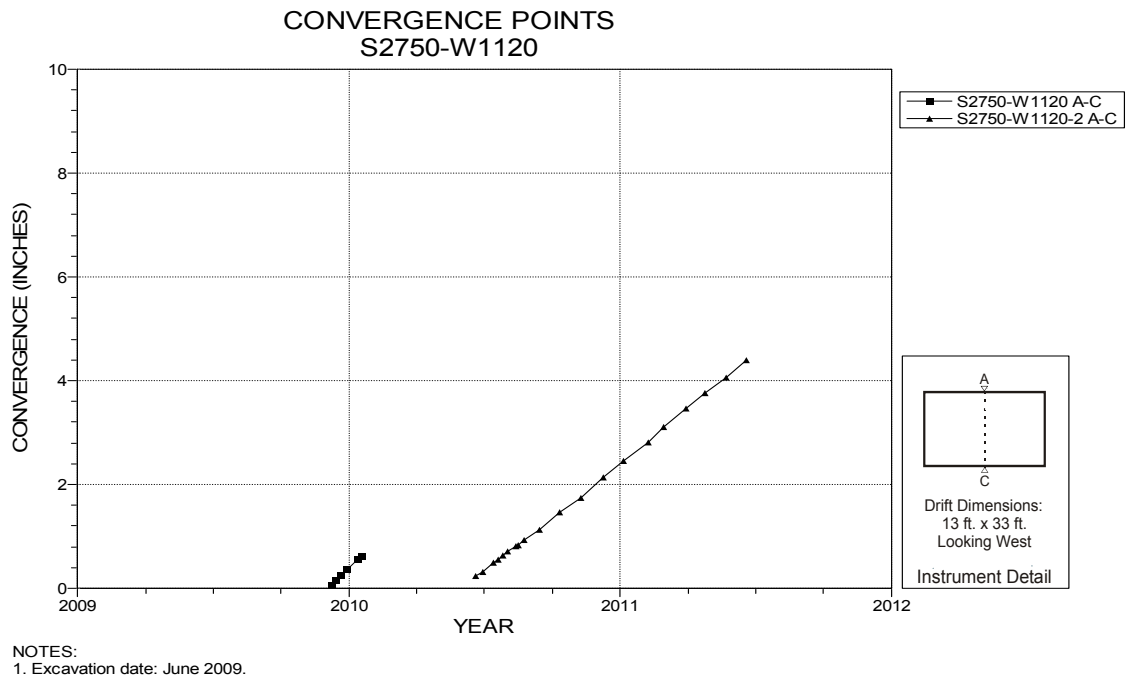


Figure 5-87 Convergence Point Array
S2750 W1120 – Roof to Floor

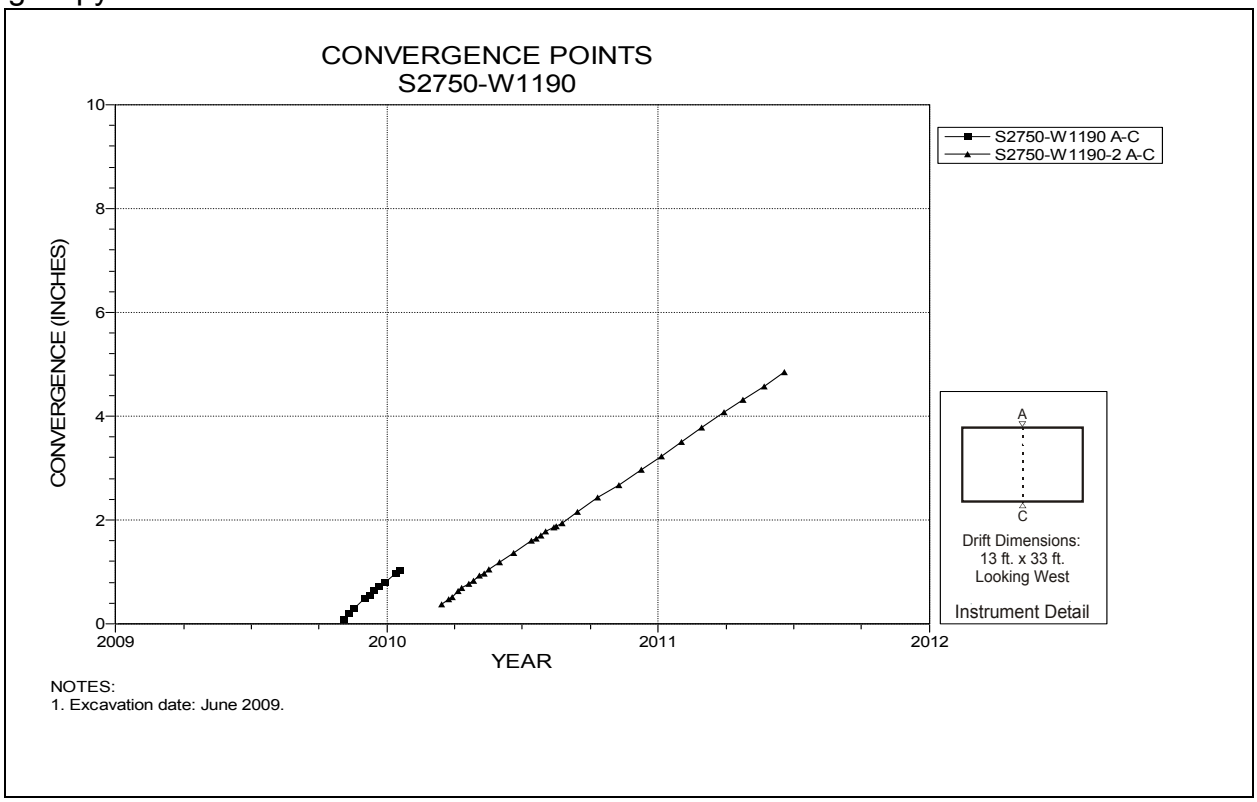


Figure 5-88 Convergence Point Array
S2750 W1190 Intersection (Room 7, Panel 6) – Roof to Floor

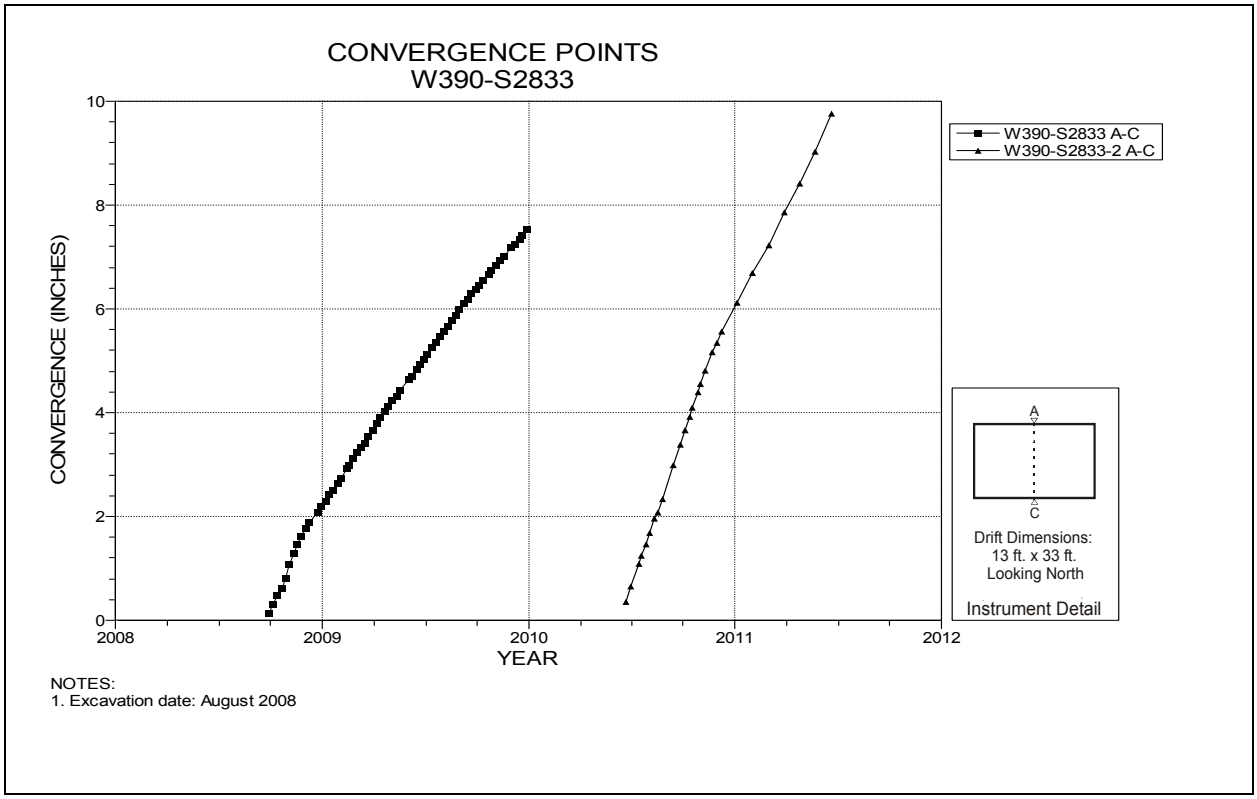


Figure 5-89 Convergence Point Array
Room 1, Panel 6 at W390 W2833 – Roof to Floor

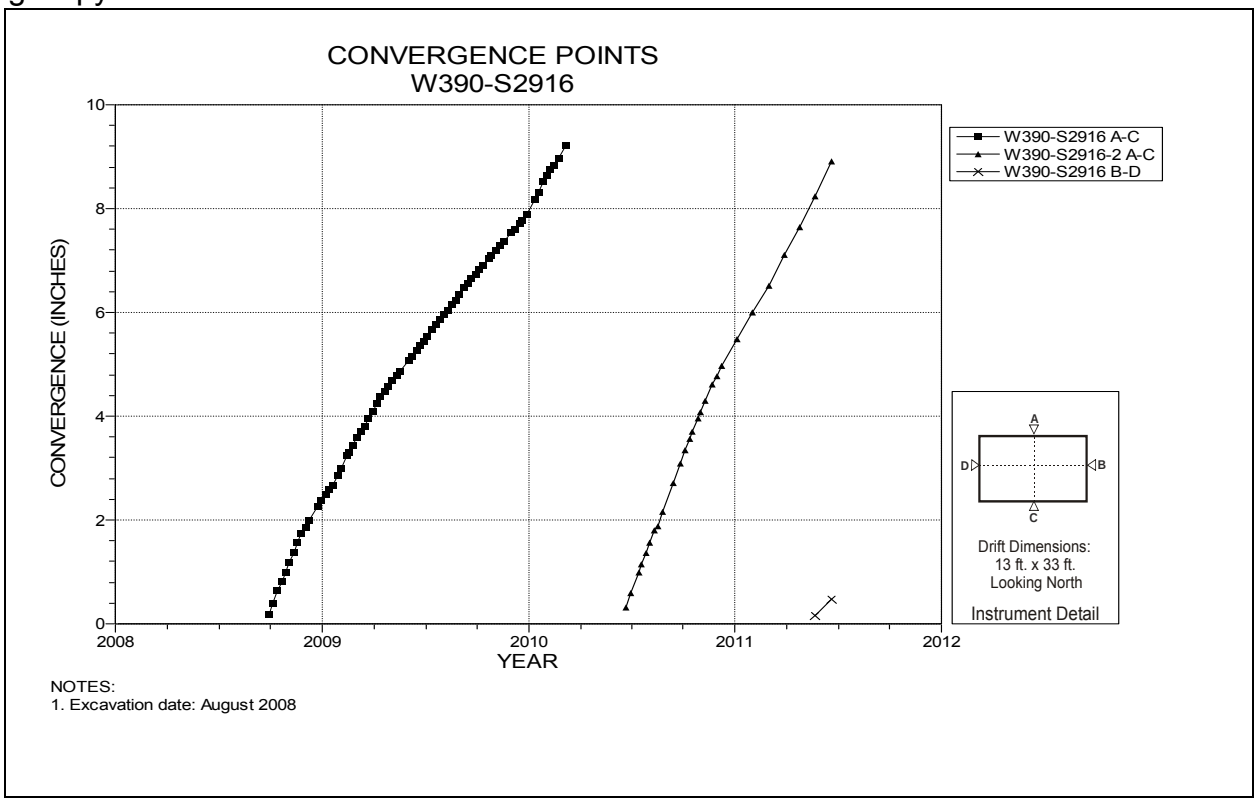


Figure 5-90 Convergence Point Array
Room 1, Panel 6 at W390 S2916– Room Center – Roof to Floor

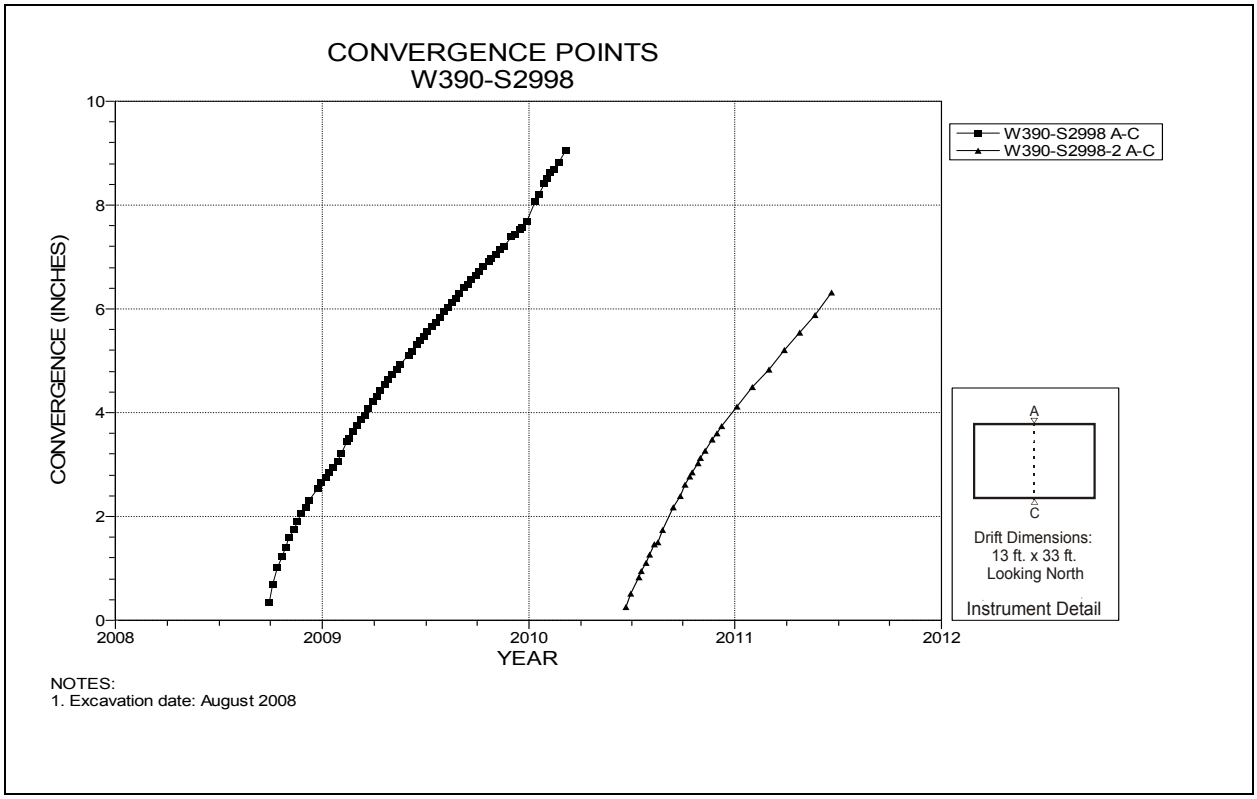


Figure 5-91 Convergence Point Array
Room 1, Panel 6 at W390 S2998 – Roof to Floor

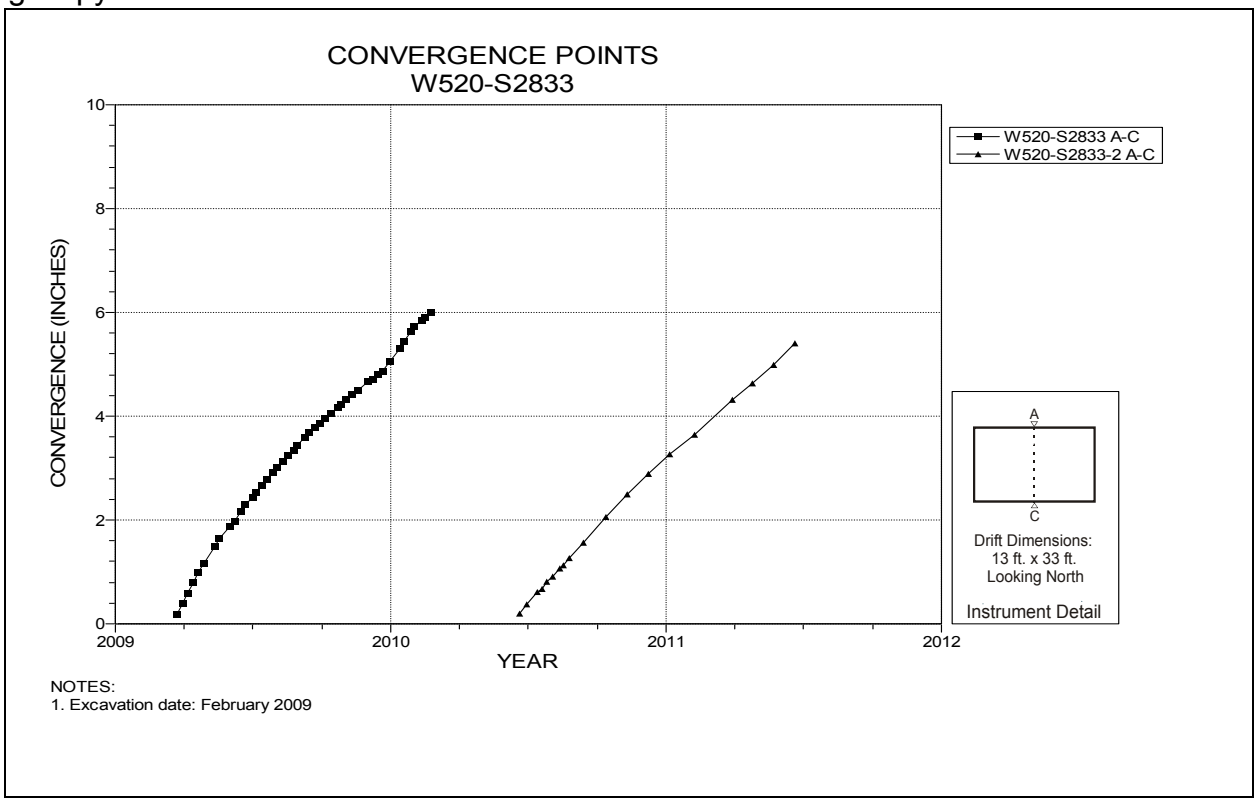


Figure 5-92 Convergence Point Array
Room 2, Panel 6 at W520 S2833 – Roof to Floor

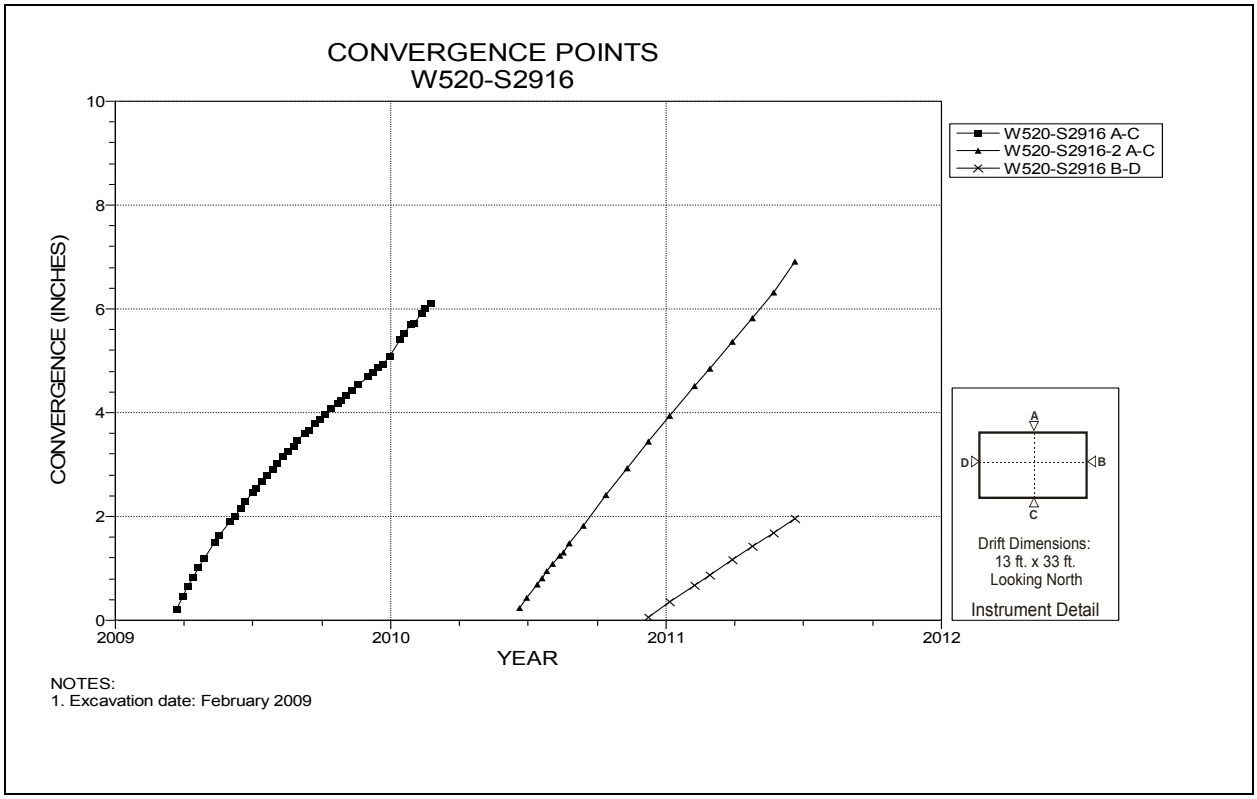


Figure 5-93 Convergence Point Array
Room 2, Panel 6 at W520 S2916– Room Center – Roof to Floor

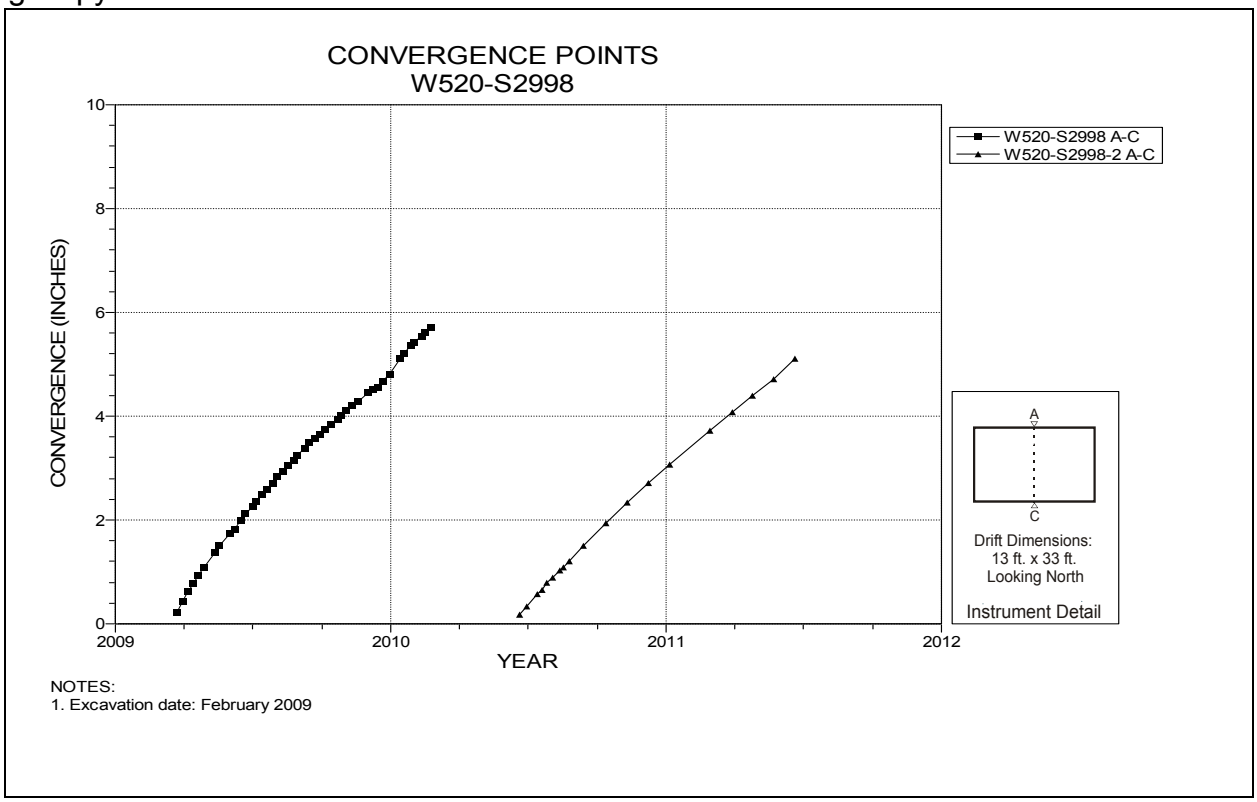


Figure 5-94 Convergence Point Array
Room 2, Panel 6 at W520 S2998 – Roof to Floor

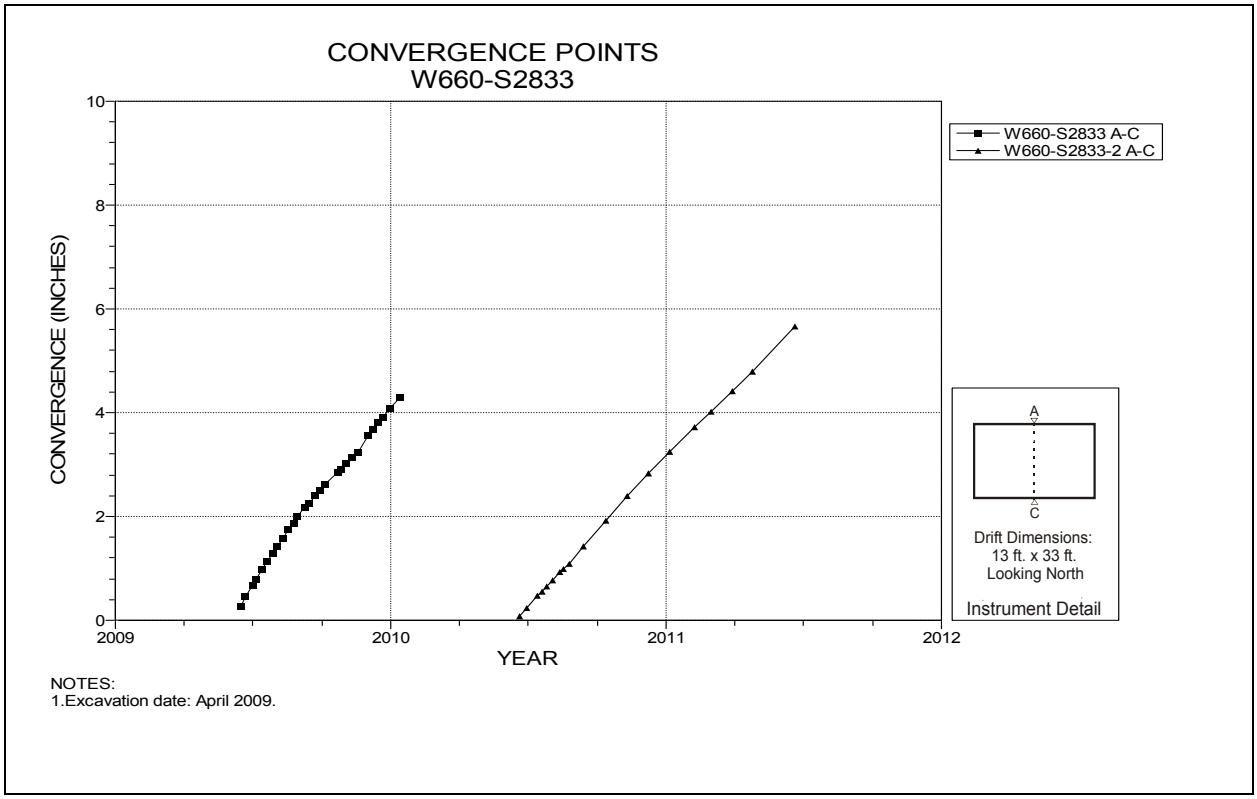


Figure 5-95 Convergence Point Array
Room 3, Panel 6 at W660 S2833 – Roof to Floor

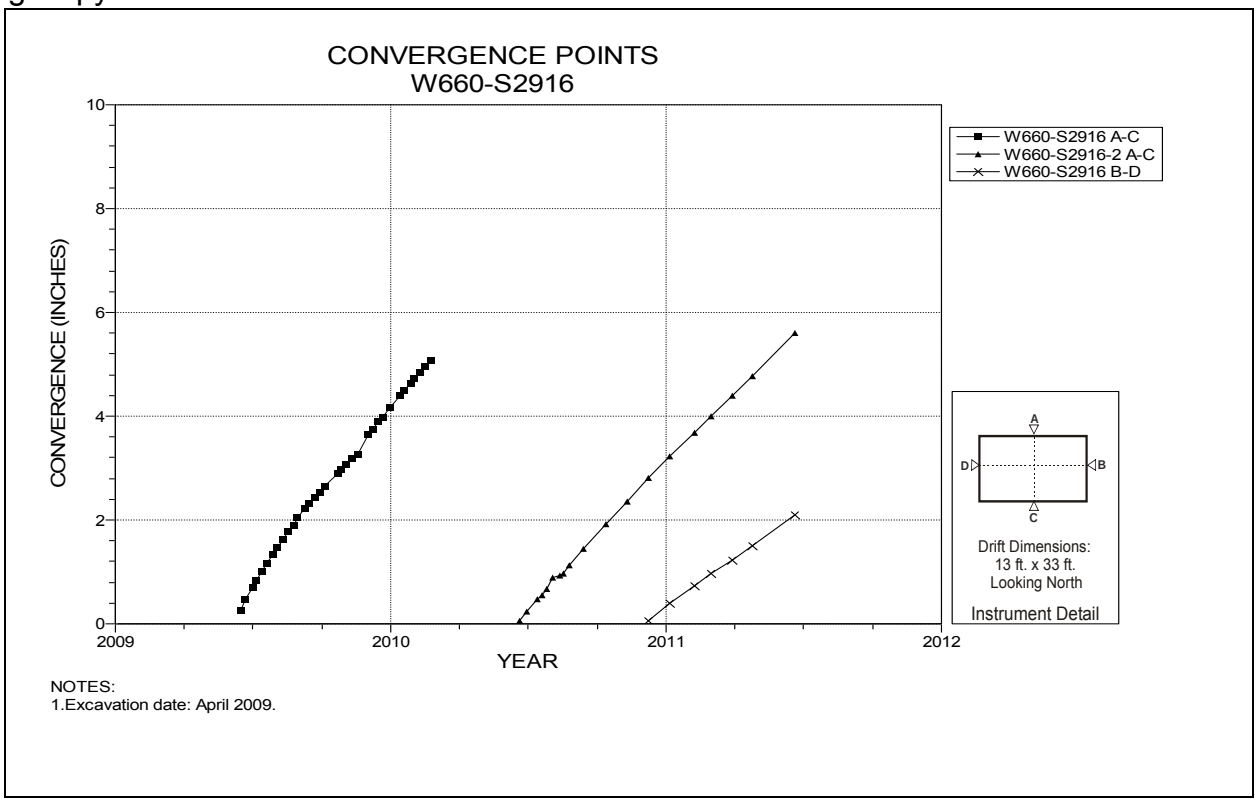


Figure 5-96 Convergence Point Array
Room 3, Panel 6 at W660 S2916– Room Center – Roof to Floor

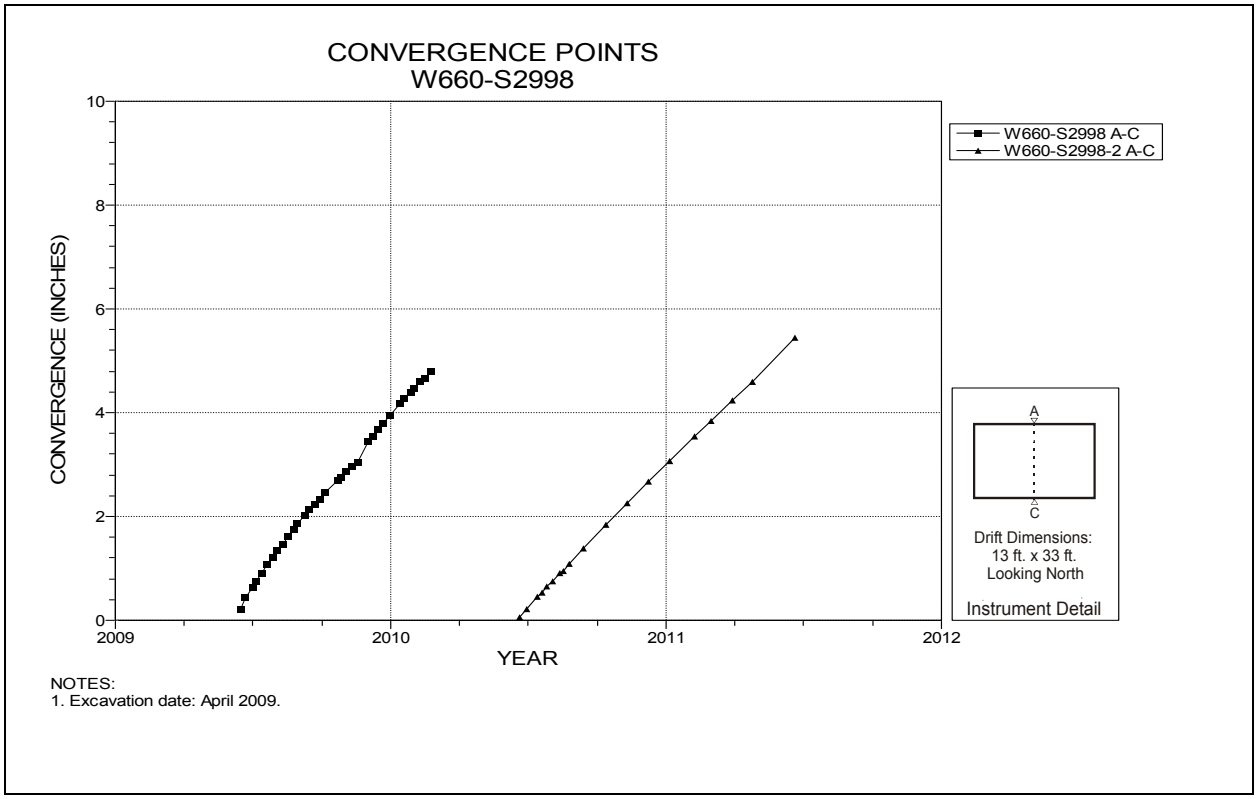


Figure 5-97 Convergence Point Array
Room 3, Panel 6 at W660 S2998 – Roof to Floor

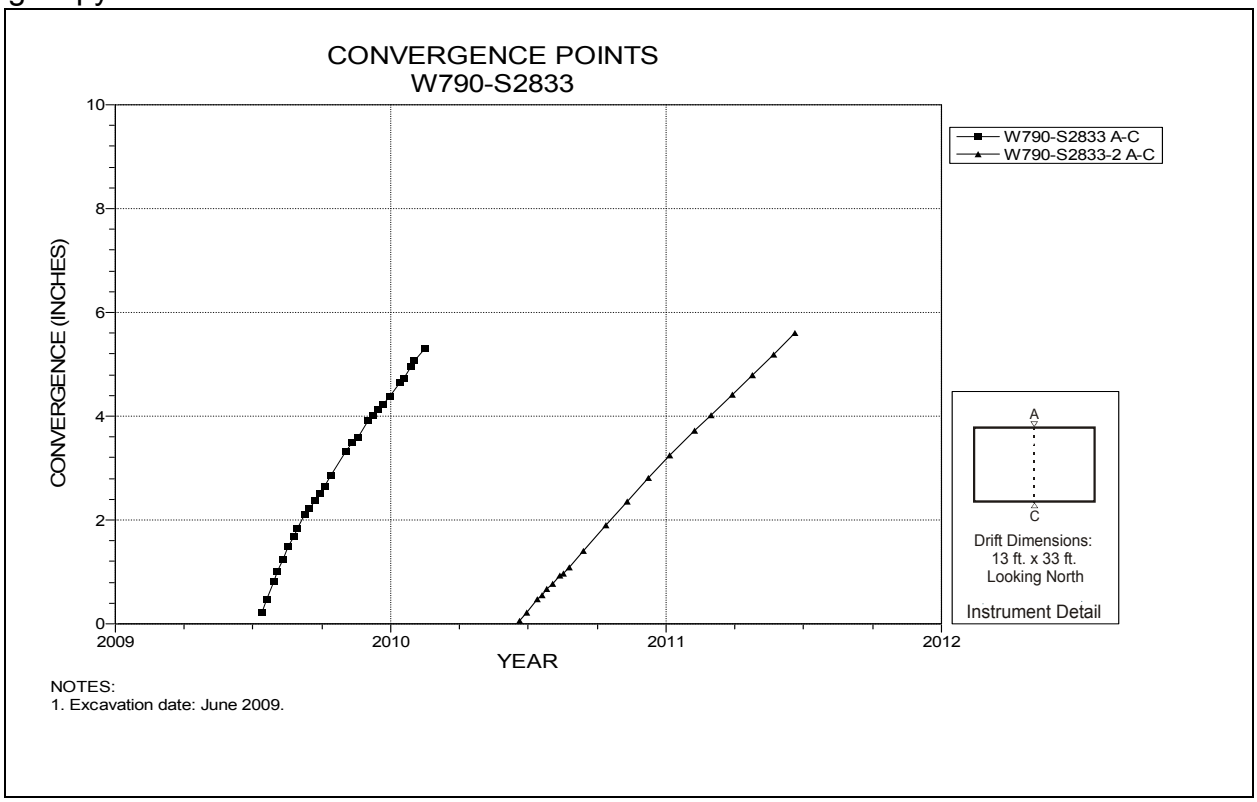


Figure 5-98 Convergence Point Array
Room 4, Panel 6 at W790 S2833 – Roof to Floor

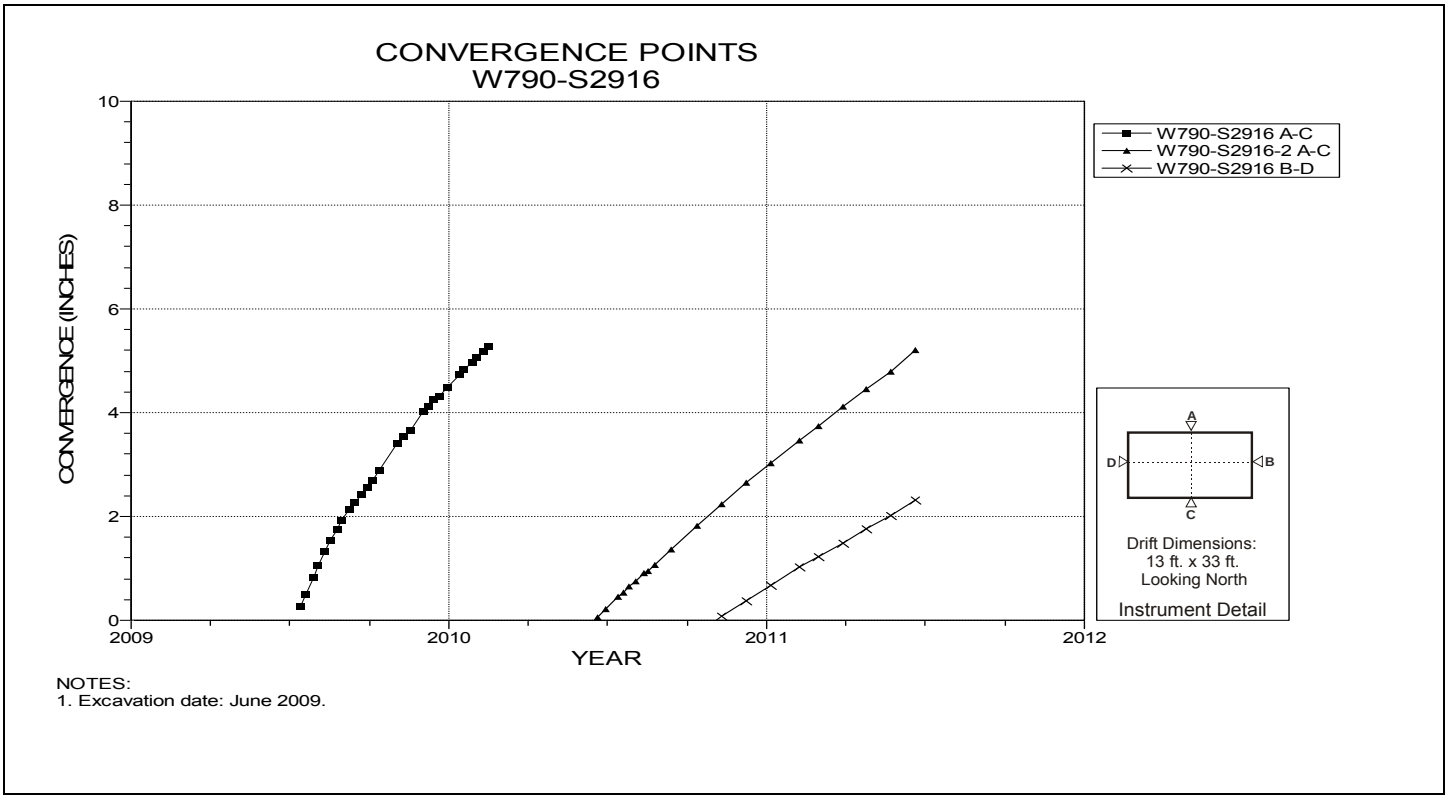


Figure 5-99 Convergence Point Array
Room 4, Panel 6 at W790 S2916– Room Center – Roof to Floor

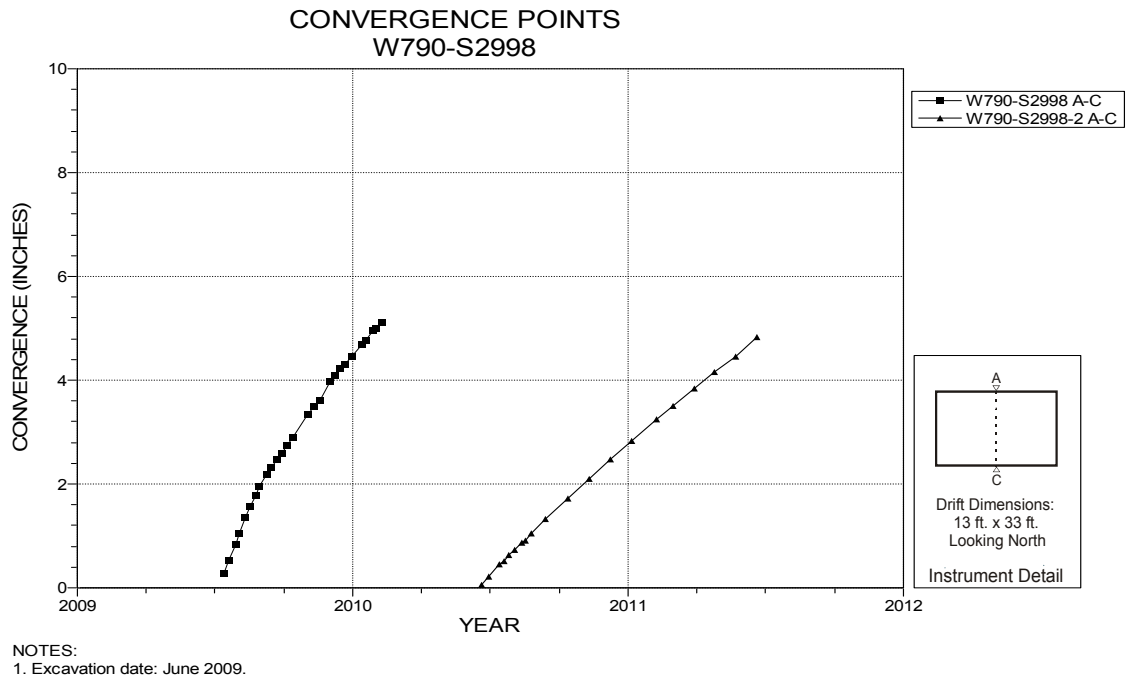


Figure 5-100 Convergence Point Array
Room 4, Panel 6 at W790 S2998 – Roof to Floor

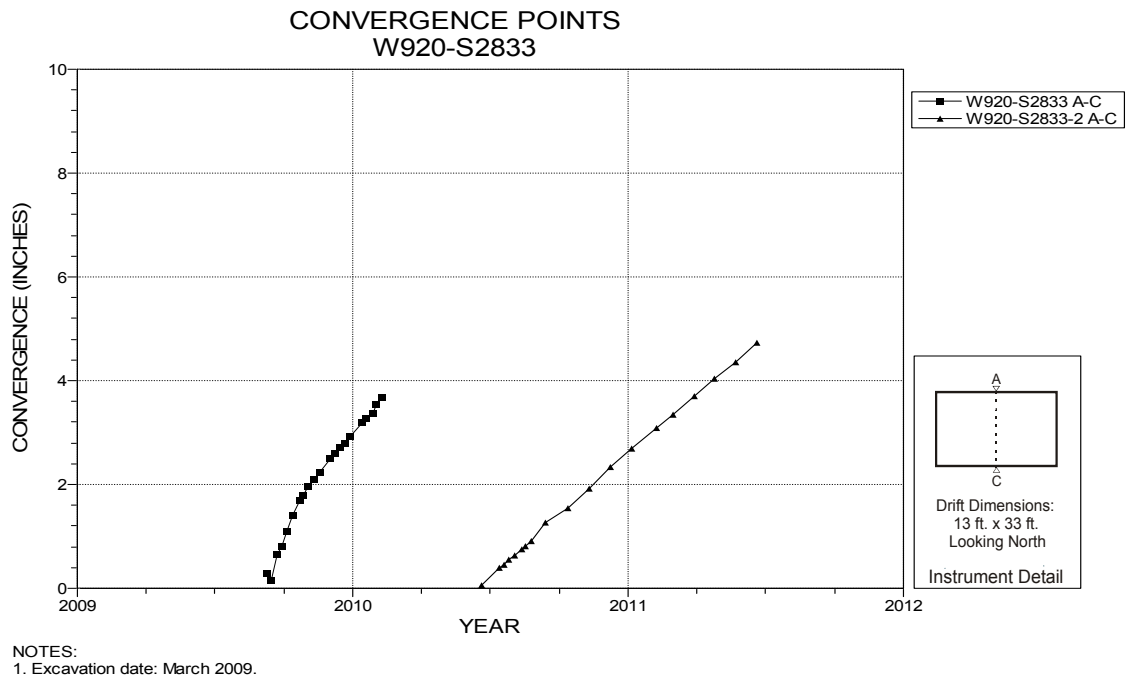


Figure 5-101 Convergence Point Array
Room 5, Panel 6 at W920 S2833 – Roof to Floor

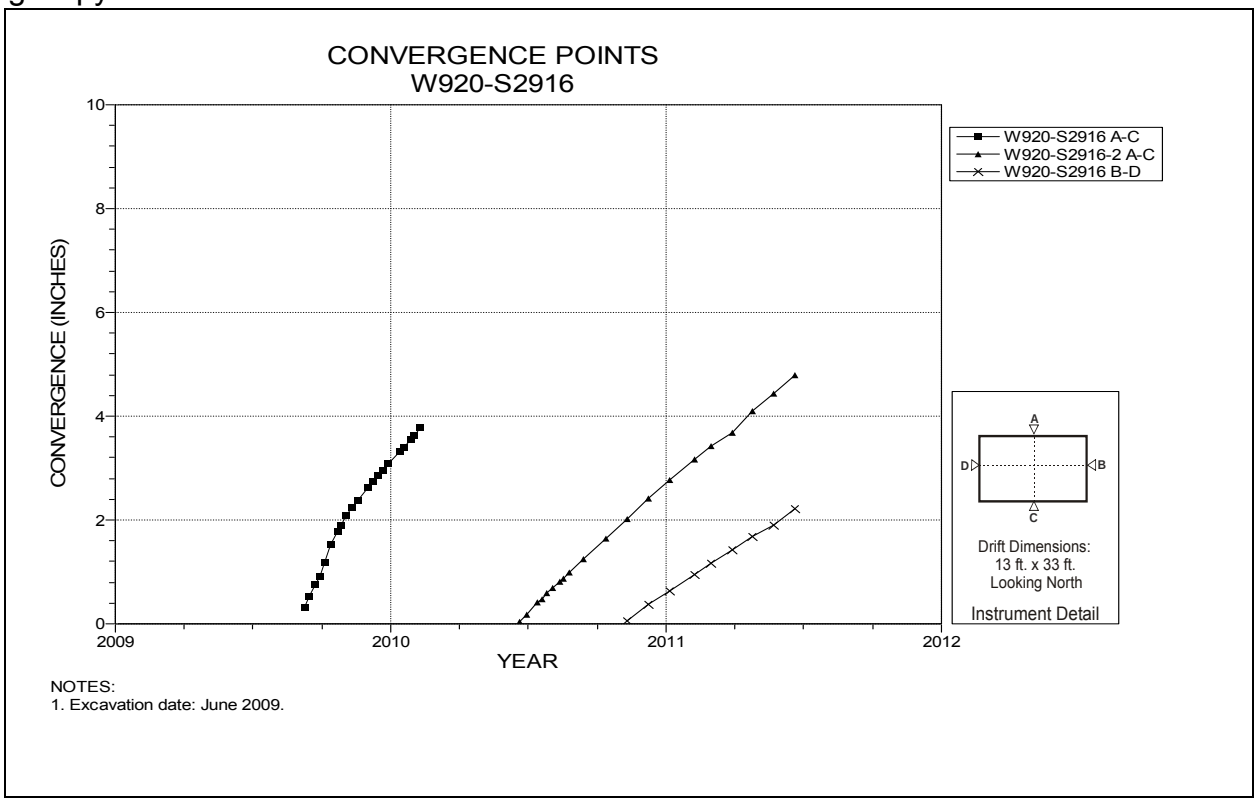


Figure 5-102 Convergence Point Array
Room 5, Panel 6 at W920 S2916– Room Center – Roof to Floor

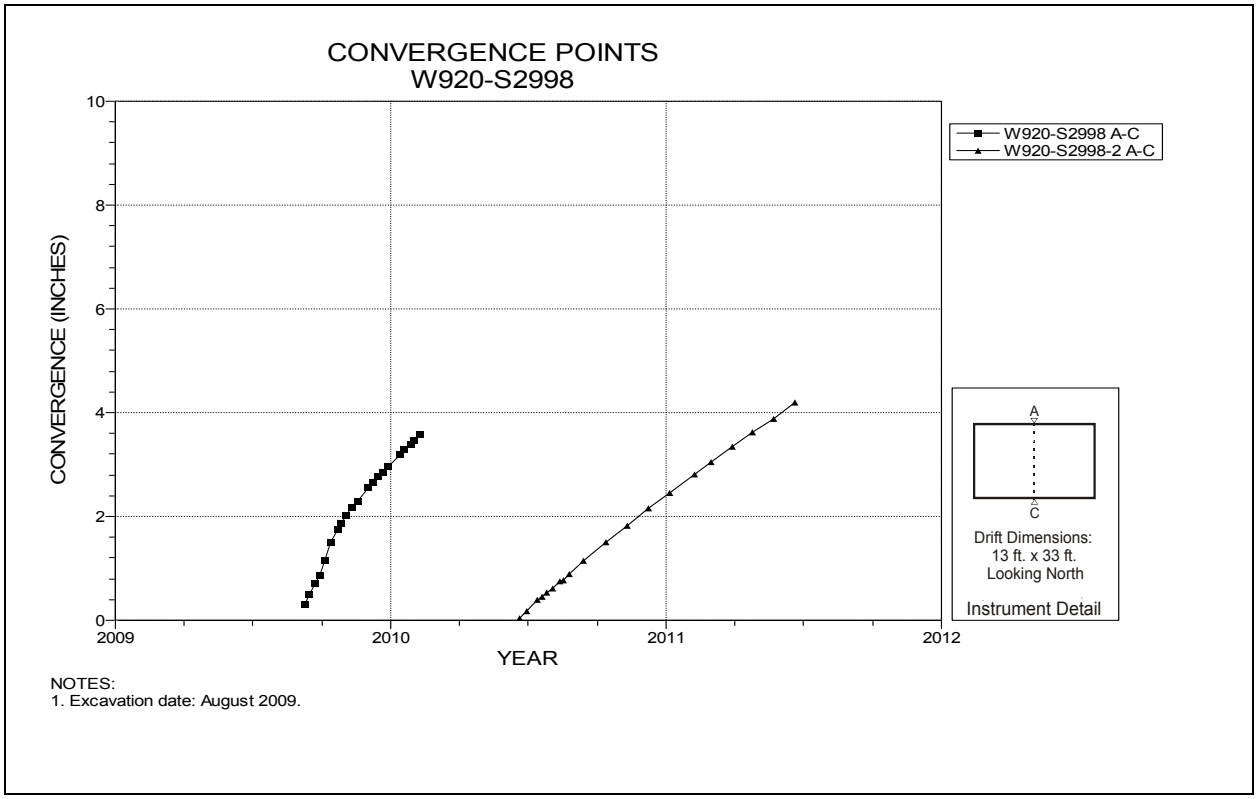


Figure 5-103 Convergence Point Array
Room 5, Panel 6 at W920 S2998 – Roof to Floor

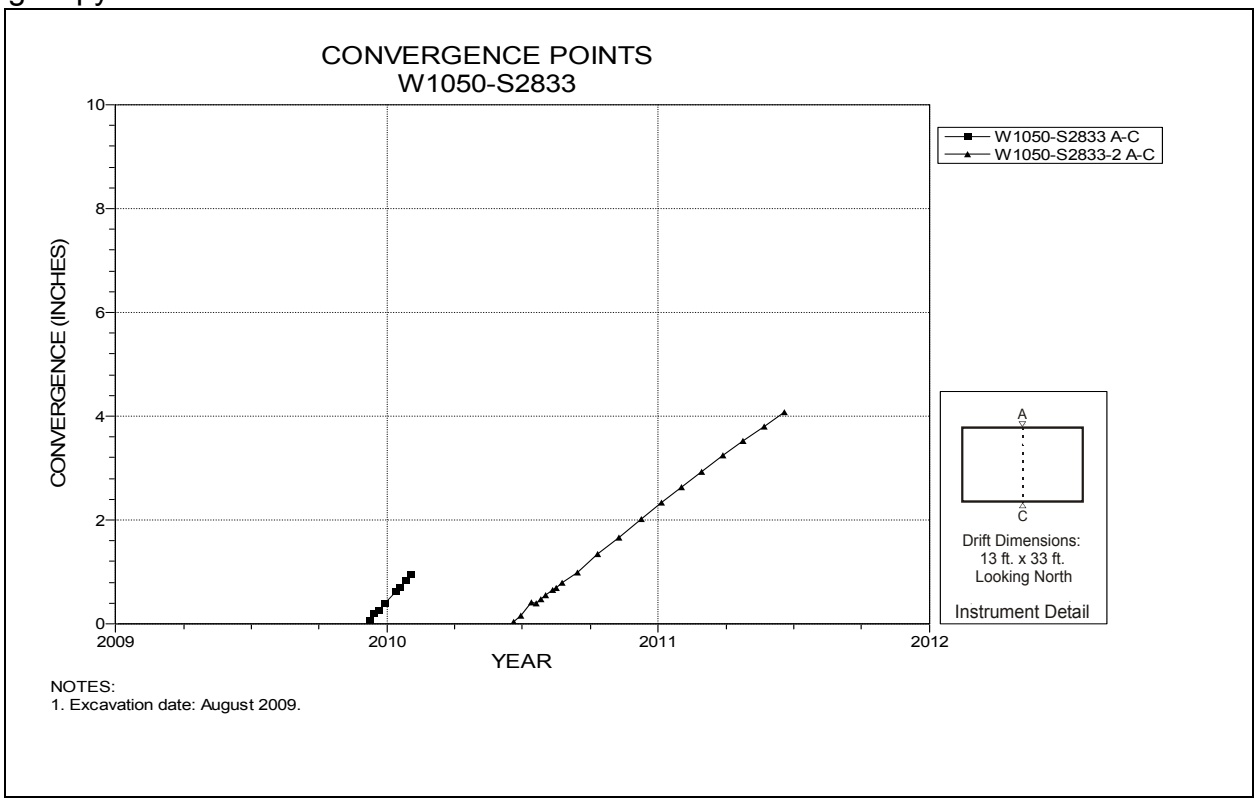


Figure 5-104 Convergence Point Array
Room 6, Panel 6 at W1050 S2833 – Roof to Floor

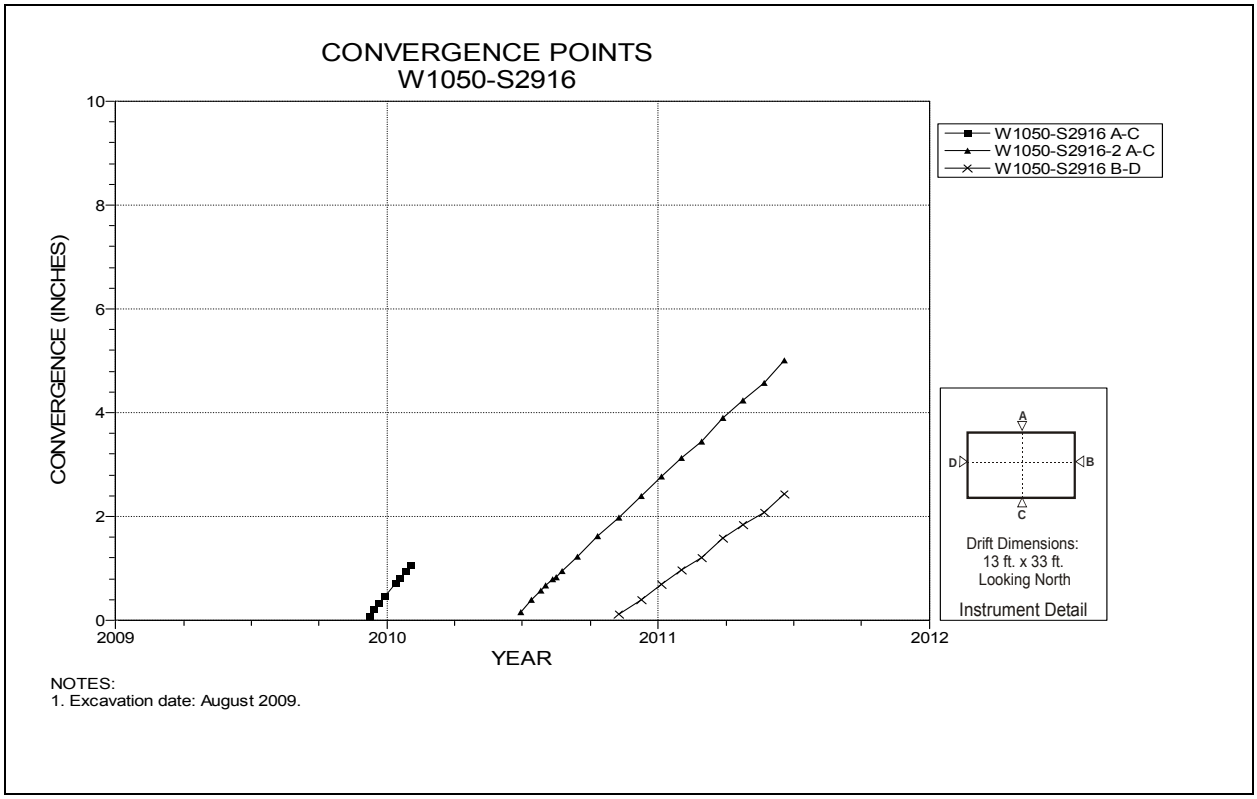


Figure 5-105 Convergence Point Array
Room 6, Panel 6 at W1050 S2916– Room Center – Roof to Floor

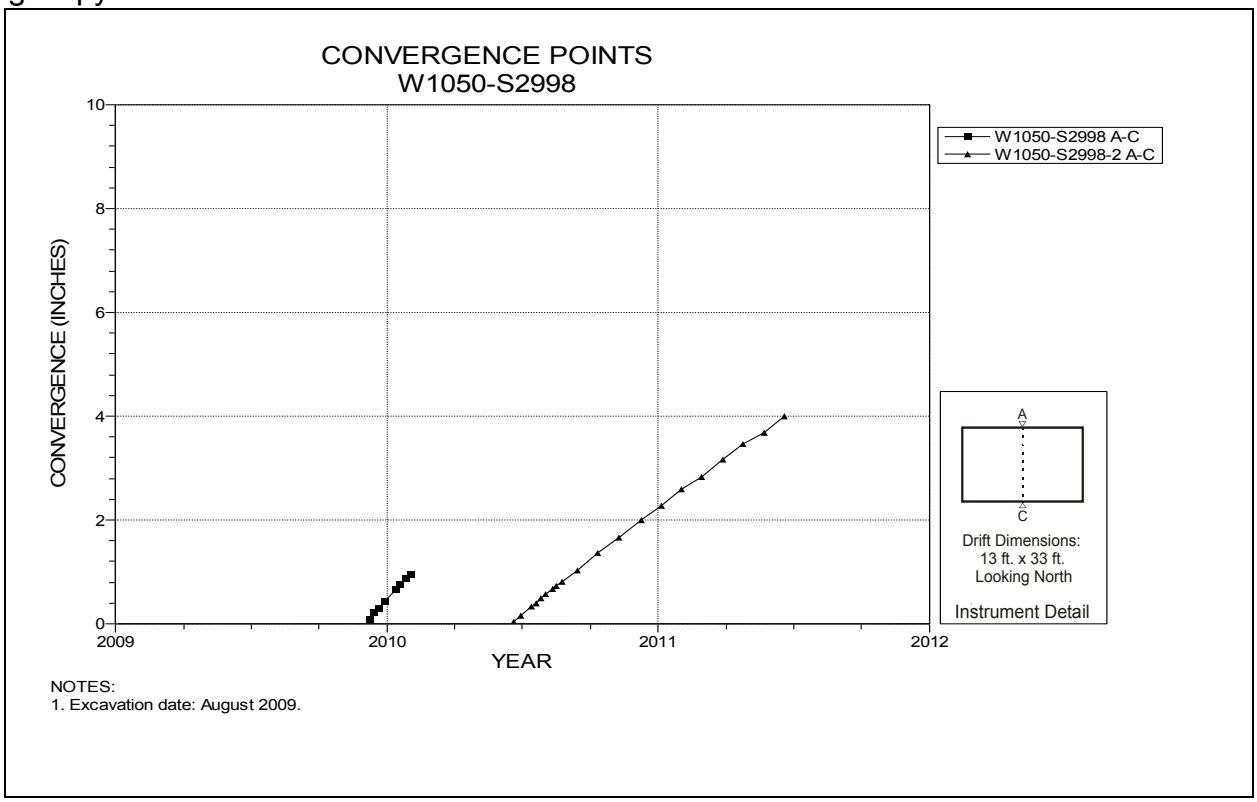


Figure 5-106 Convergence Point Array
Room 6, Panel 6 at W1050 S2998 – Roof to Floor

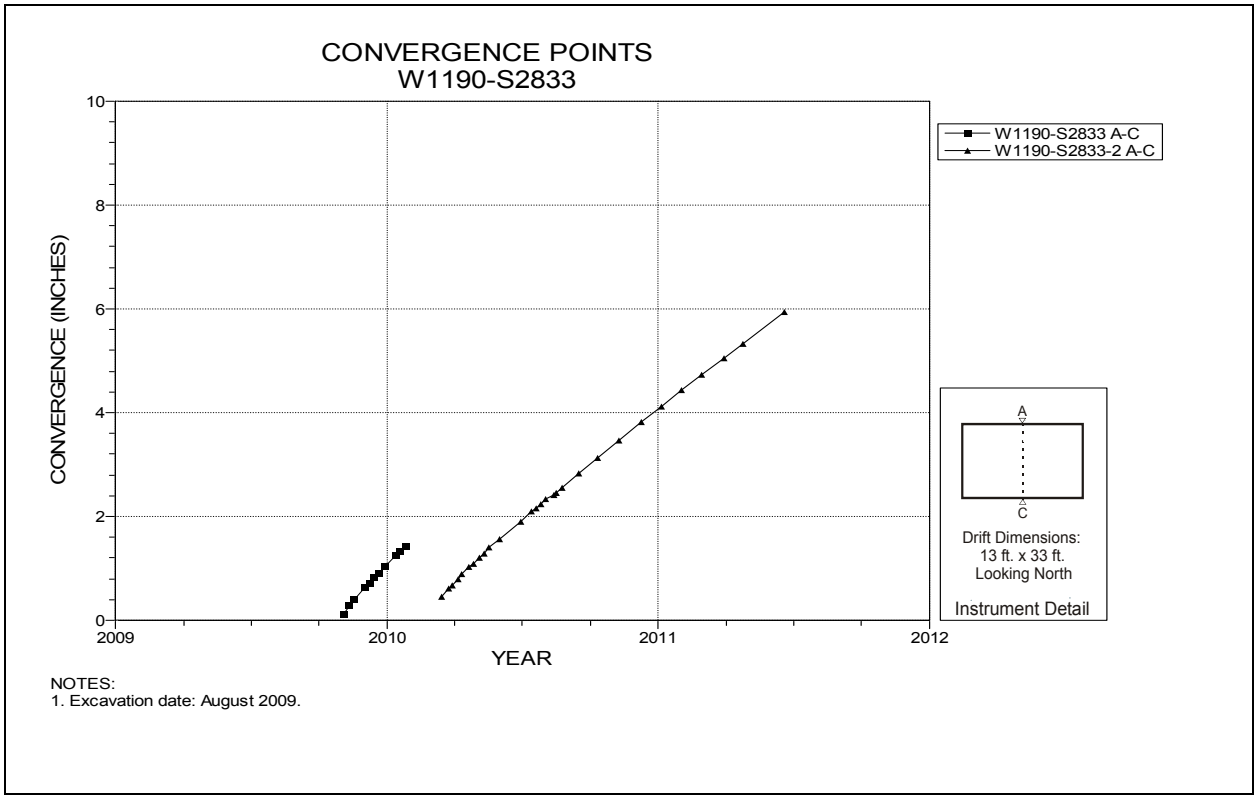


Figure 5-107 Convergence Point Array
Room 7, Panel 6 at W1190 S2833 – Roof to Floor

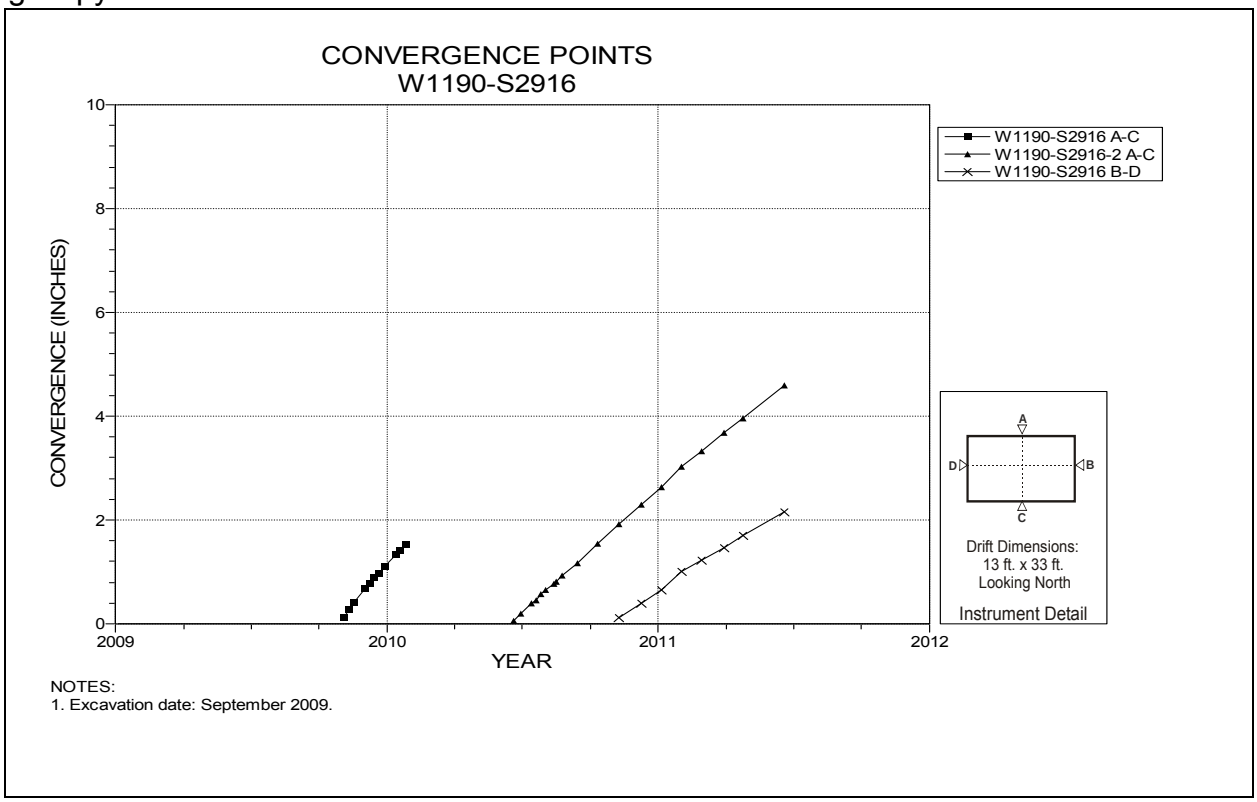


Figure 5-108 Convergence Point Array
Room 7, Panel 6 at W1190 S2916– Room Center – Roof to Floor

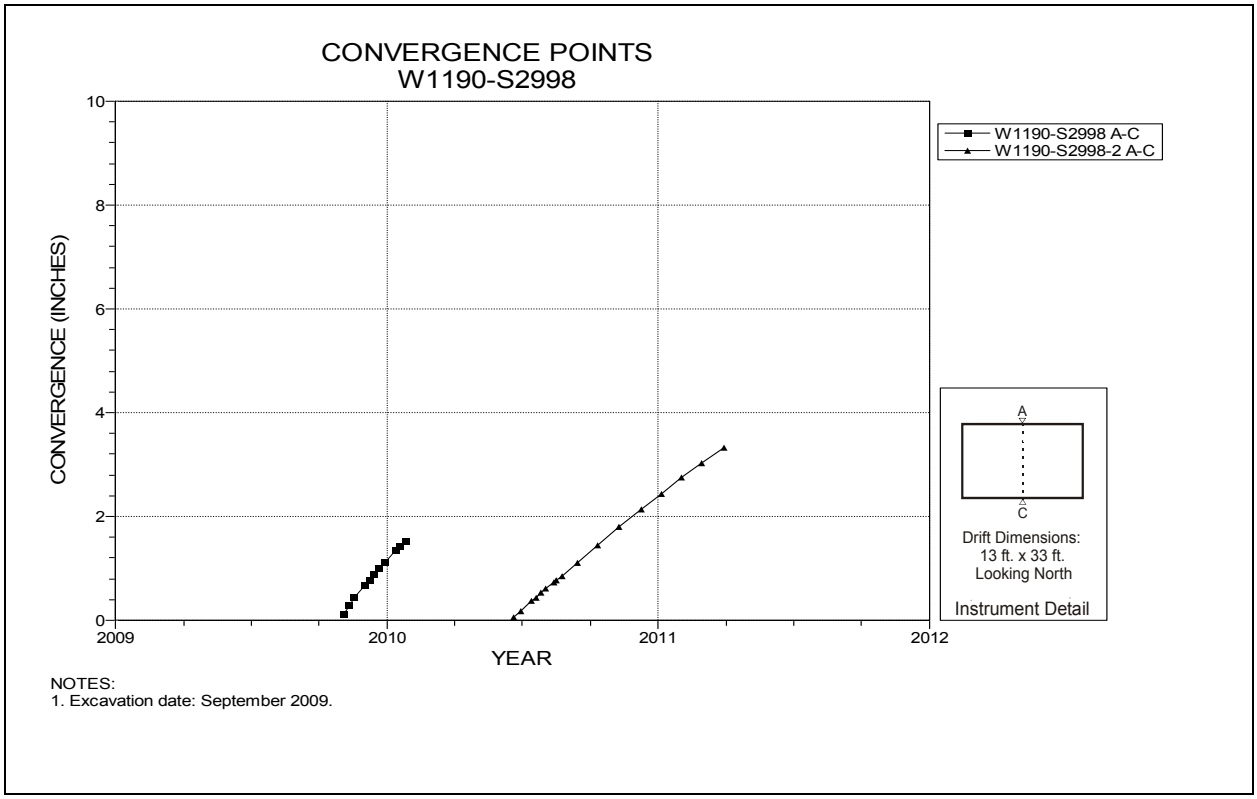


Figure 5-109 Convergence Point Array
Room 7, Panel 6 at W1190 S2998 – Roof to Floor

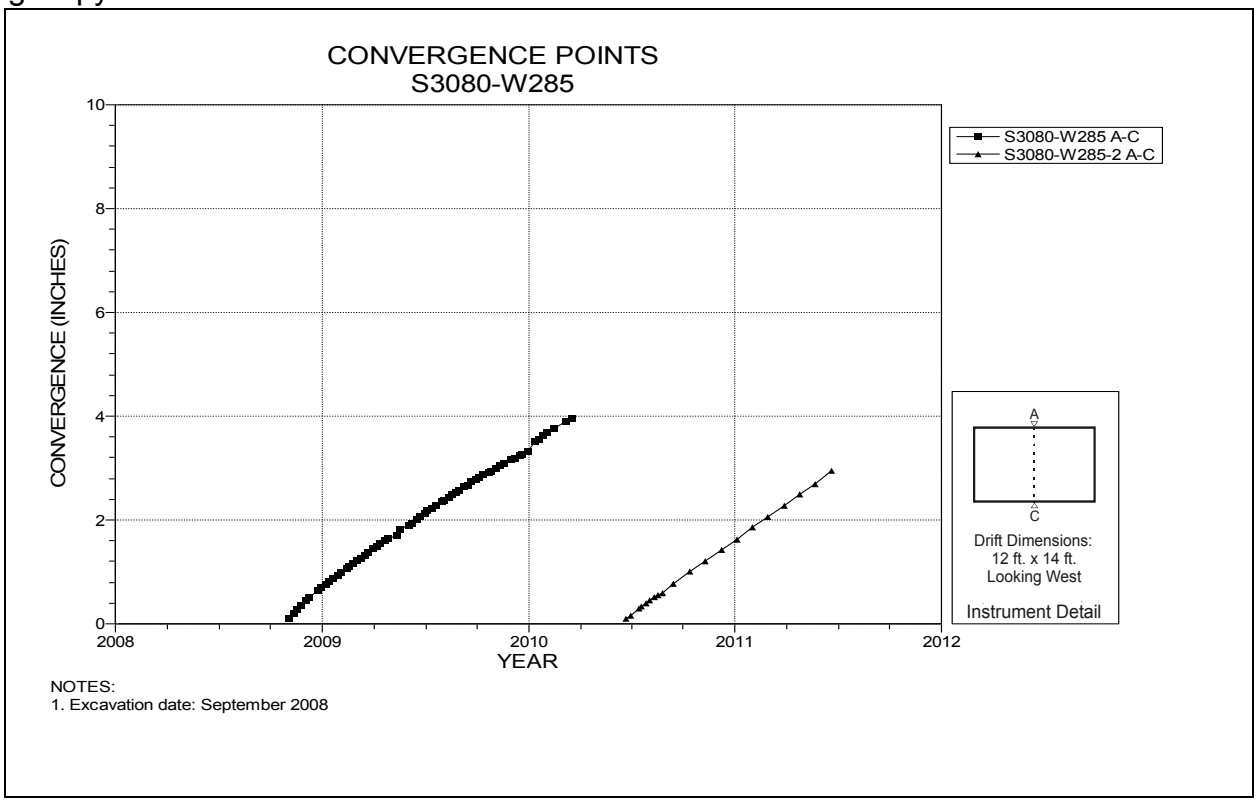


Figure 5-110 Convergence Point Array
S3080 W285 – Roof to Floor

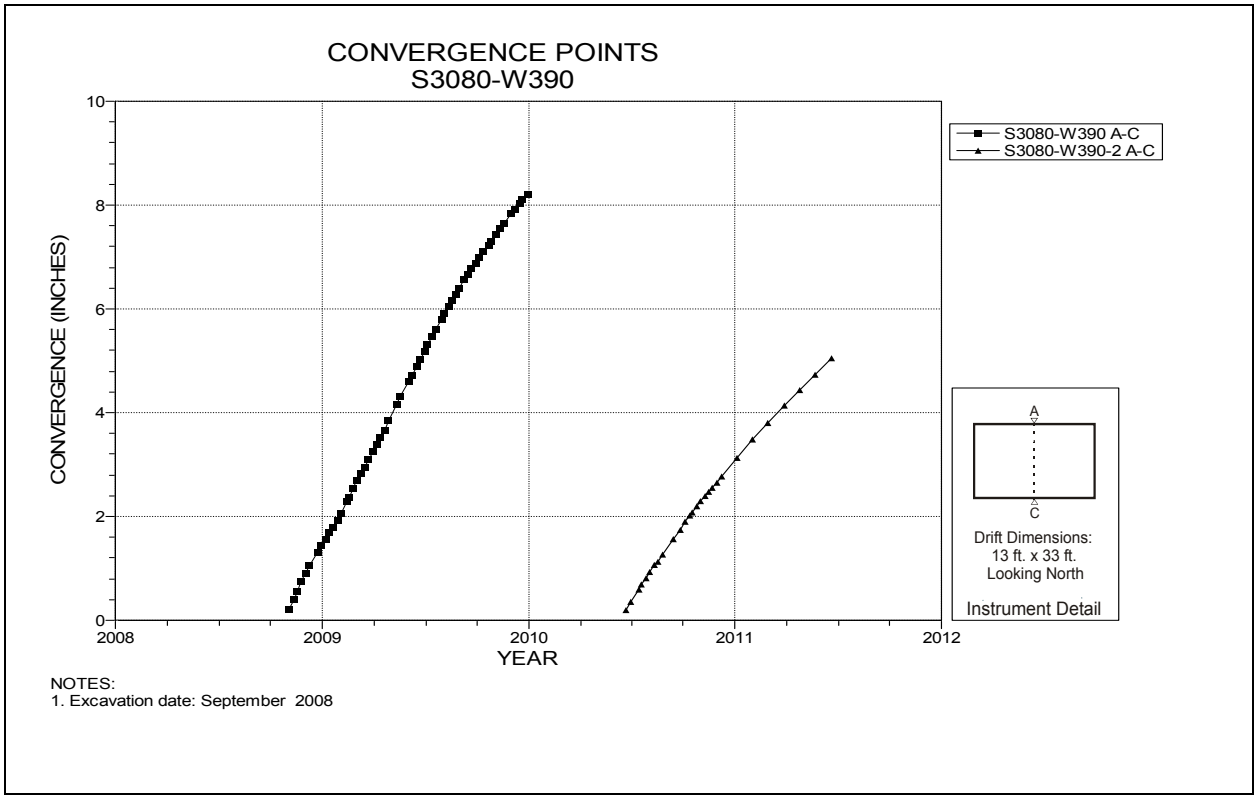
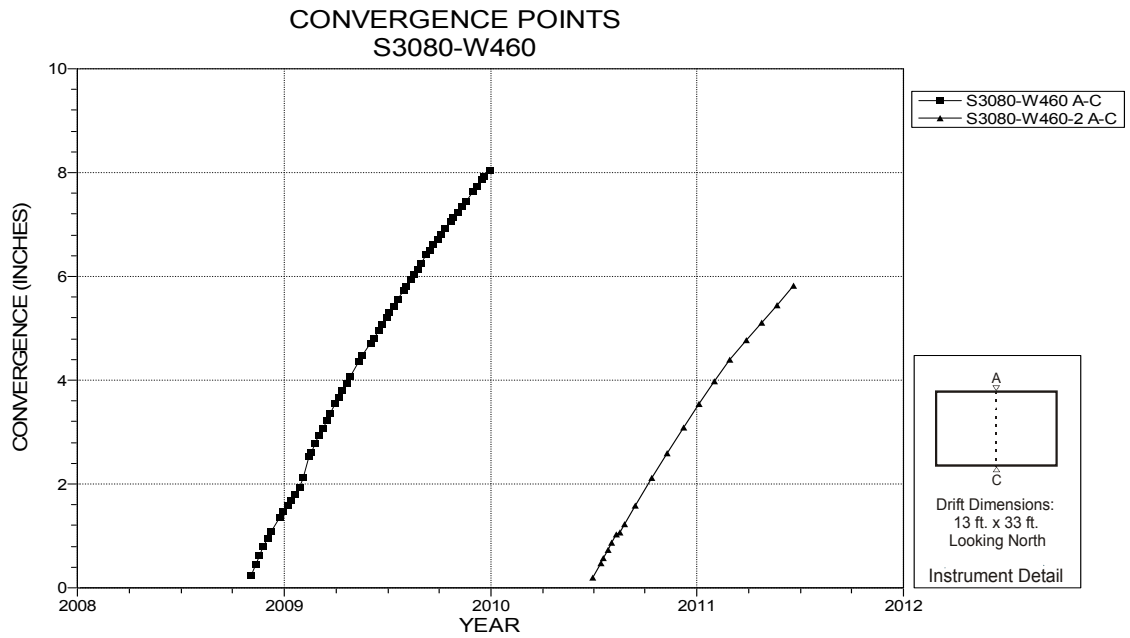
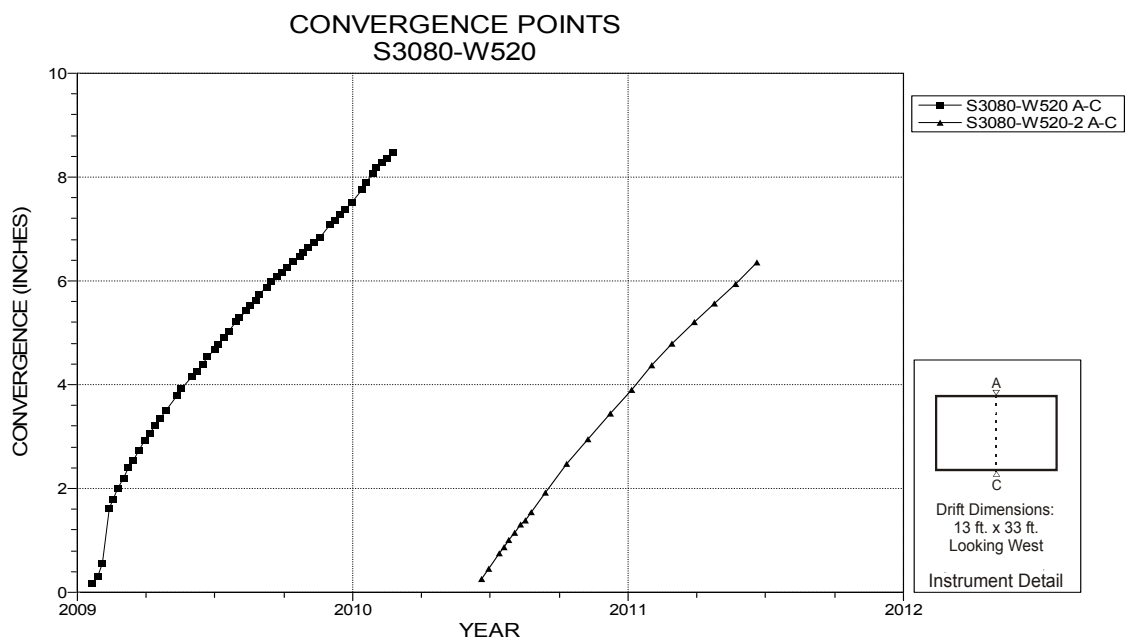


Figure 5-111 Convergence Point Array
S3080 W390 Intersection (Room 1, Panel 6) – Roof to Floor



NOTES:
1. Excavation date: September 2008

Figure 5-112 Convergence Point Array
S3080 W460 – Roof to Floor



NOTES:
1. Excavation date:September 2008.

Figure 5-113 Convergence Point Array
S3080 W520 Intersection (Room 2, Panel 6)– Roof to Floor

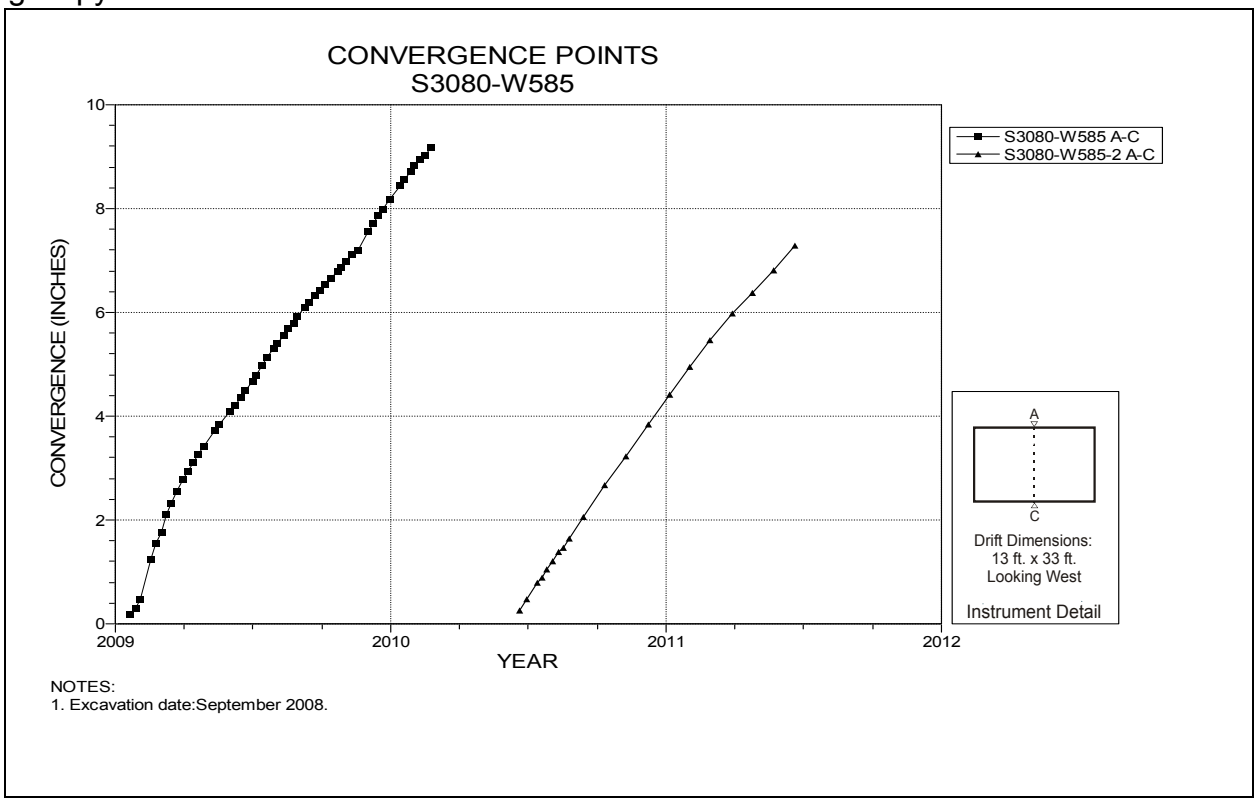


Figure 5-114 Convergence Point Array
S3080 W585 – Roof to Floor

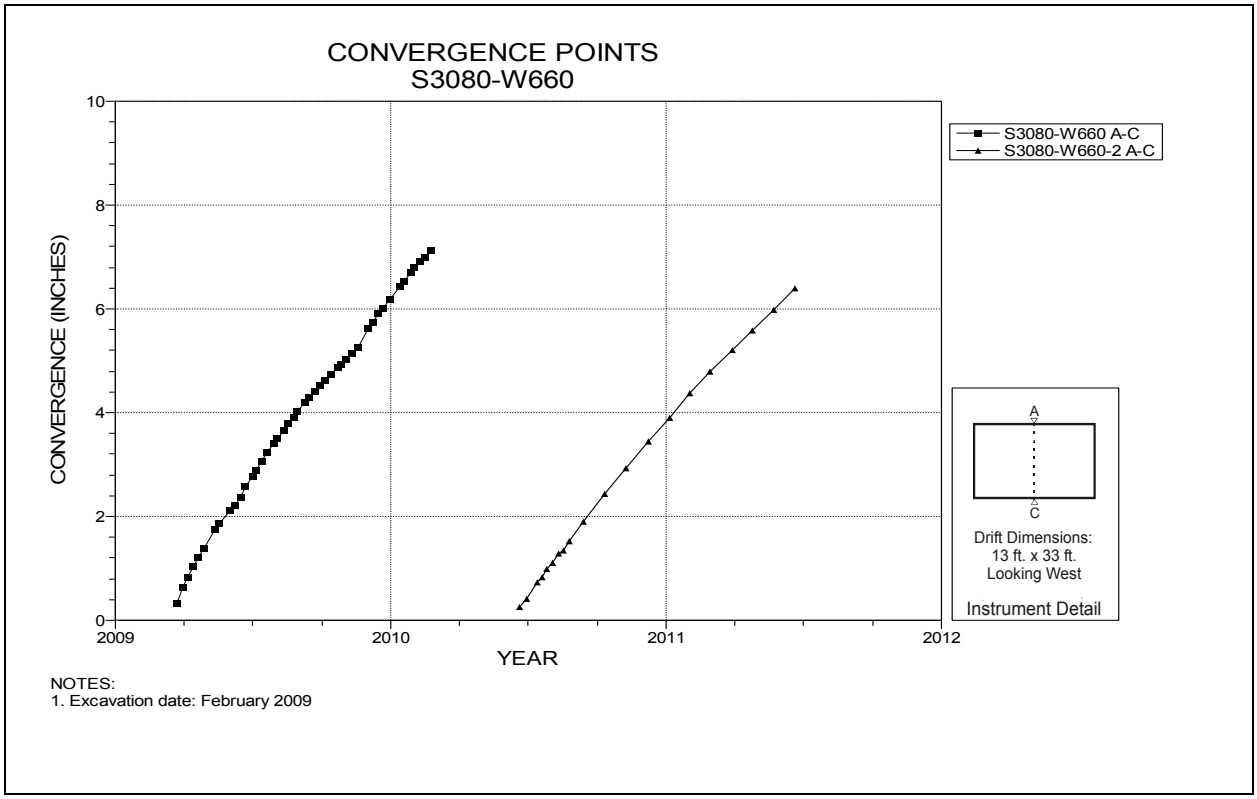


Figure 5-115 Convergence Point Array
S3080 W660 Intersection (Room 3, Panel 6) – Roof to Floor

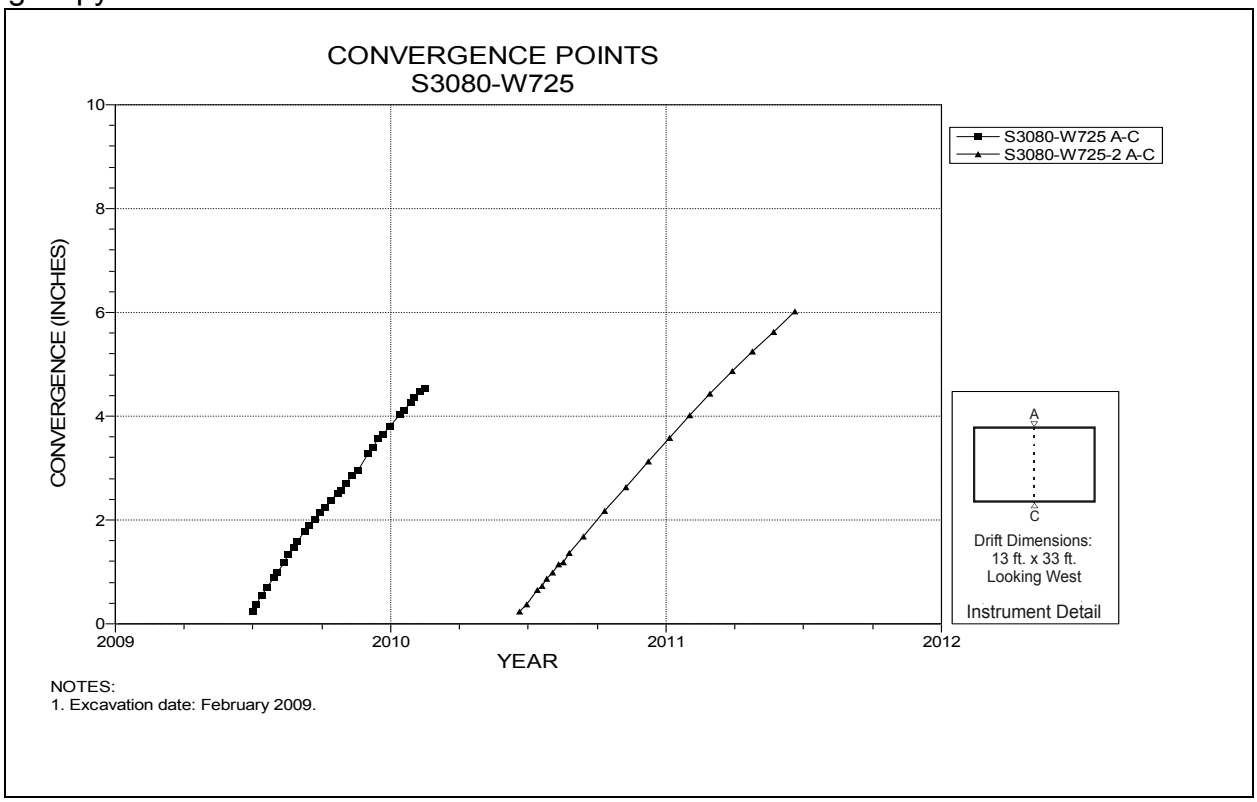


Figure 5-116 Convergence Point Array
S3080 W725 – Roof to Floor

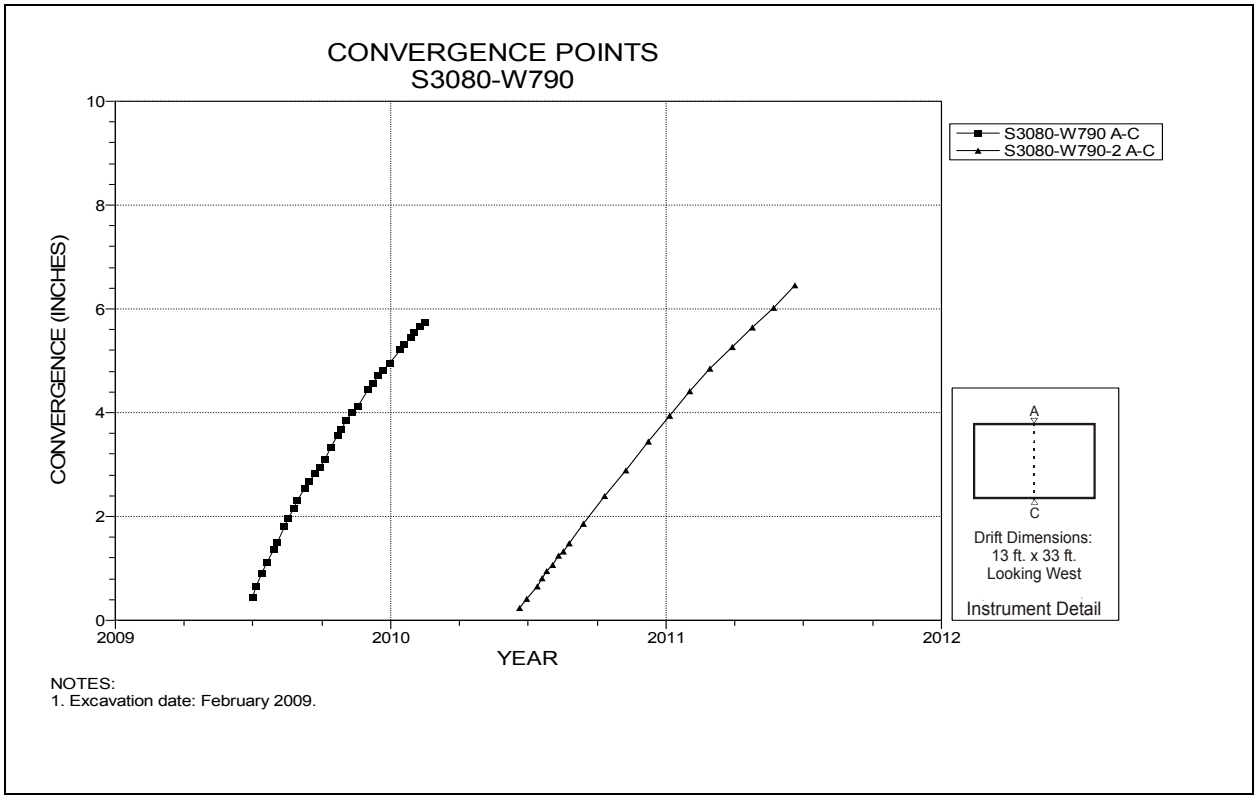


Figure 5-117 Convergence Point Array
S3080 W790 Intersection (Room 4, Panel 6) – Roof to Floor

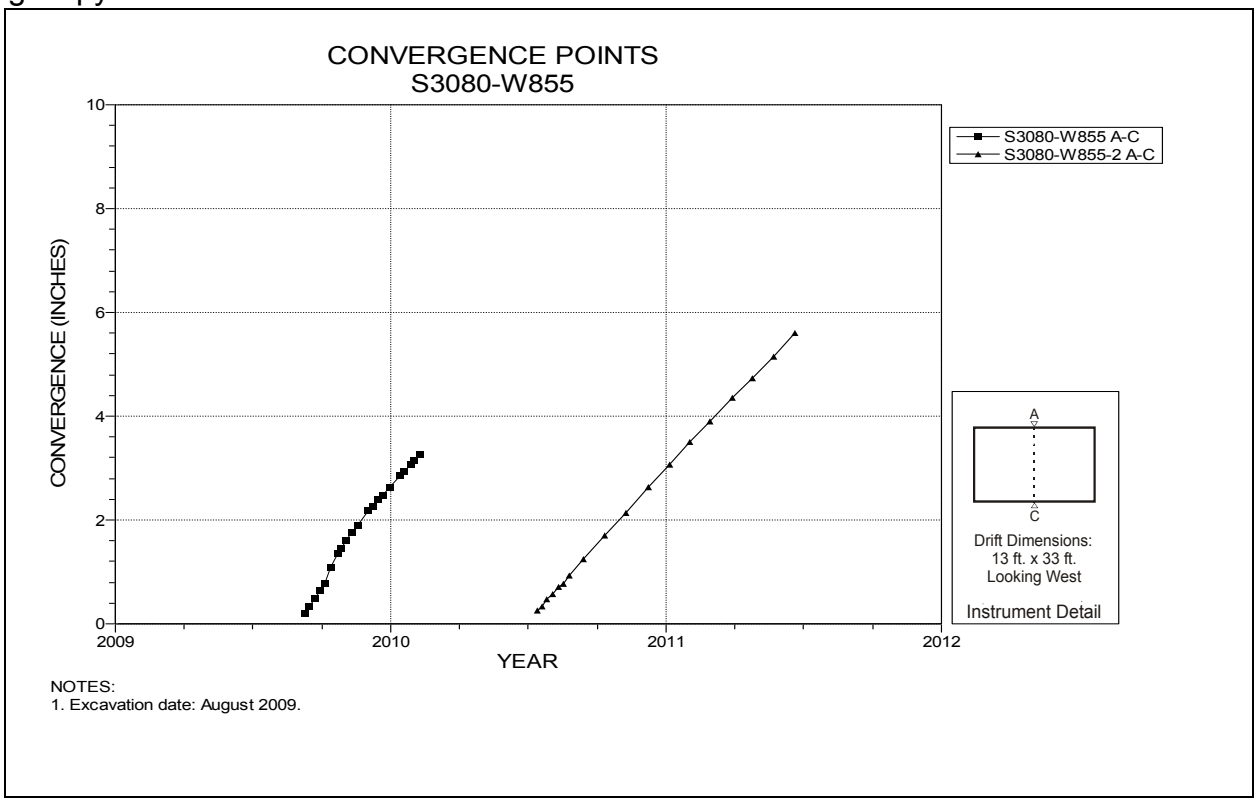


Figure 5-118 Convergence Point Array
S3080 W855 – Roof to Floor

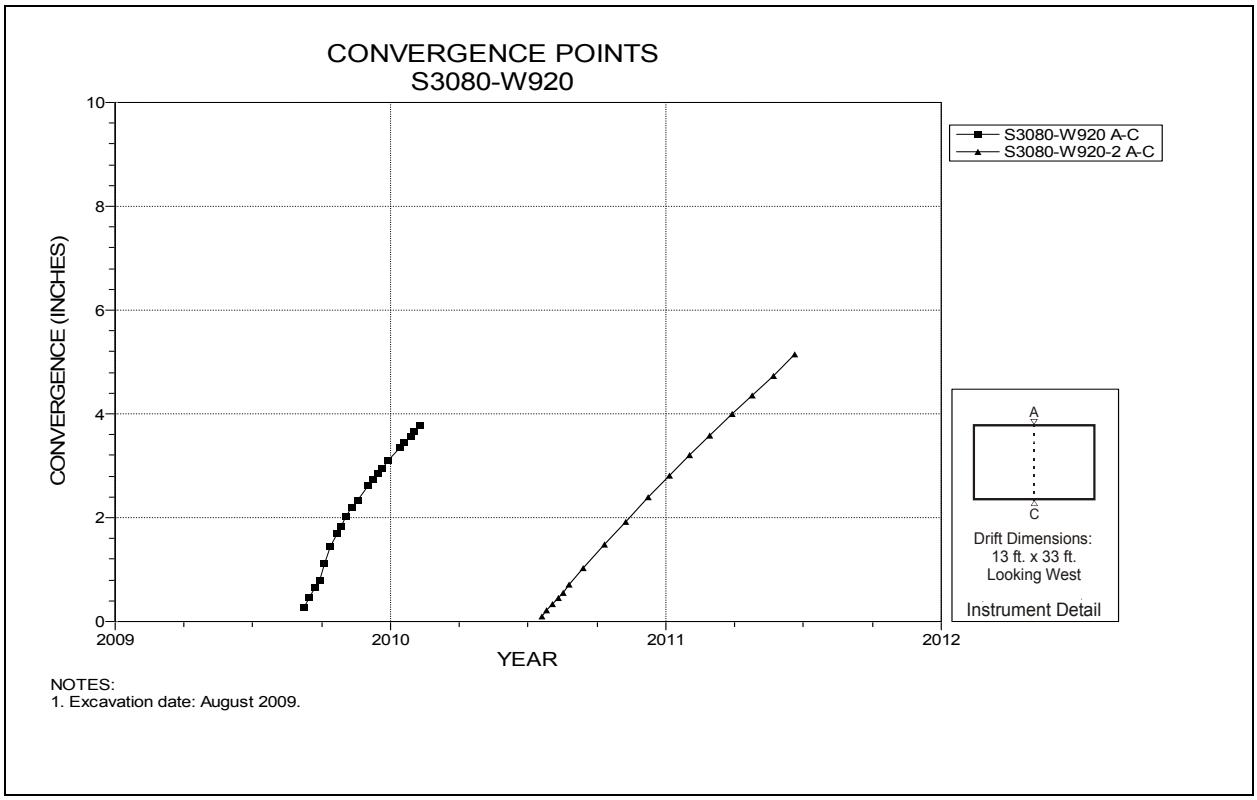


Figure 5-119 Convergence Point Array
S3080 W920 Intersection (Room 5, Panel 6) – Roof to Floor

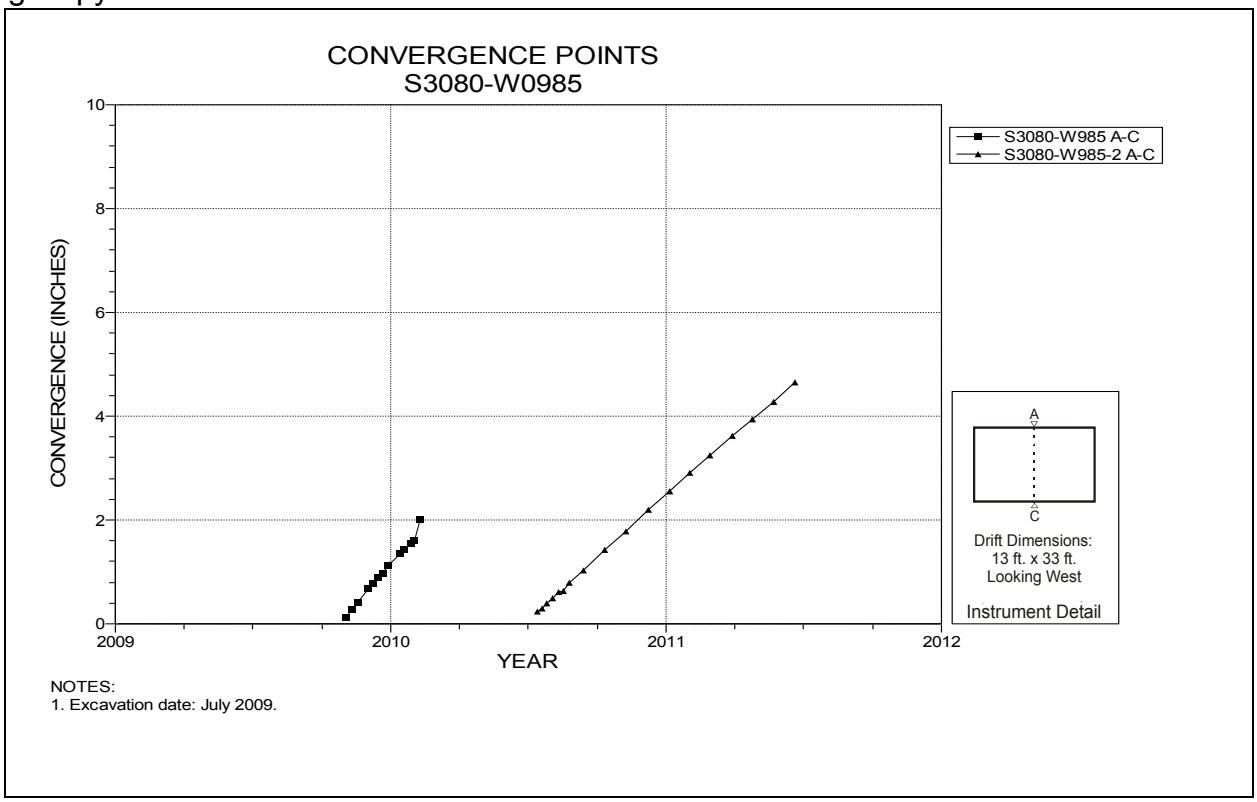


Figure 5-120 Convergence Point Array
S3080 W985 – Roof to Floor

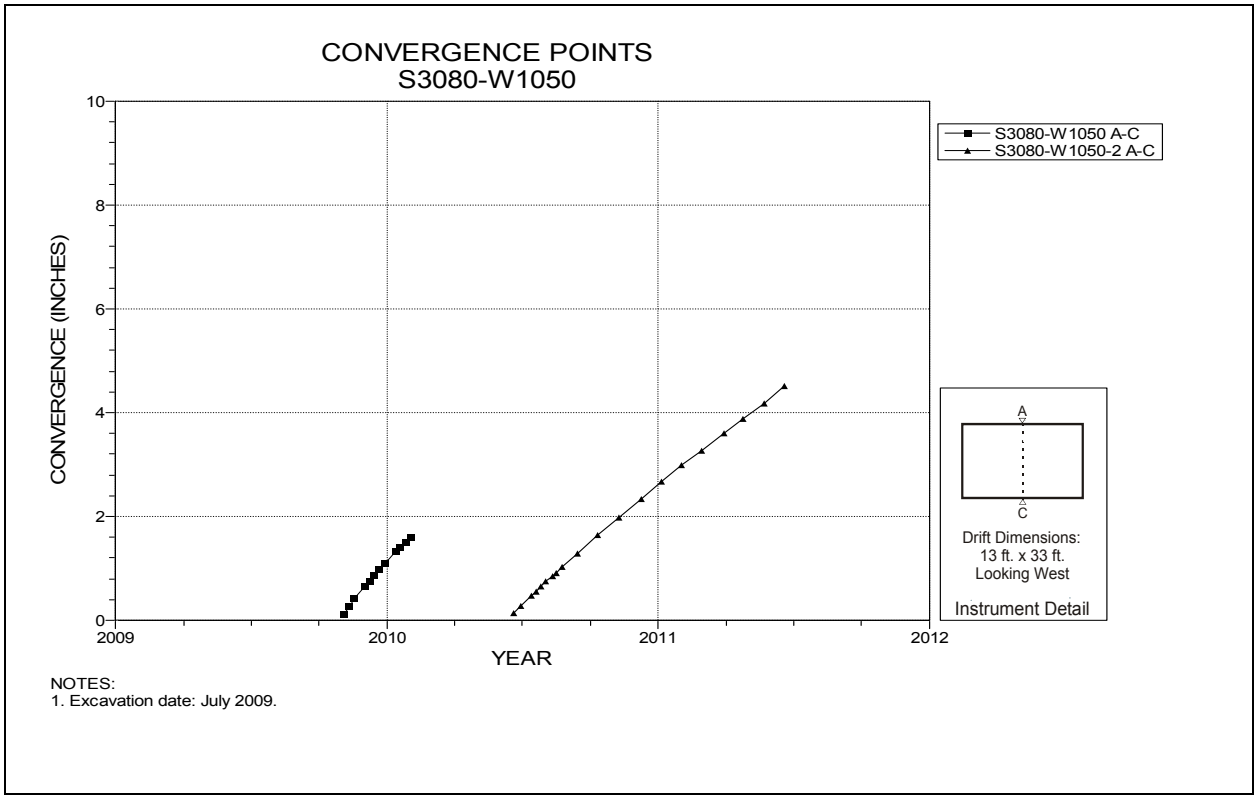


Figure 5-121 Convergence Point Array
S3080 W1050 Intersection (Room 6, Panel 6) – Roof to Floor

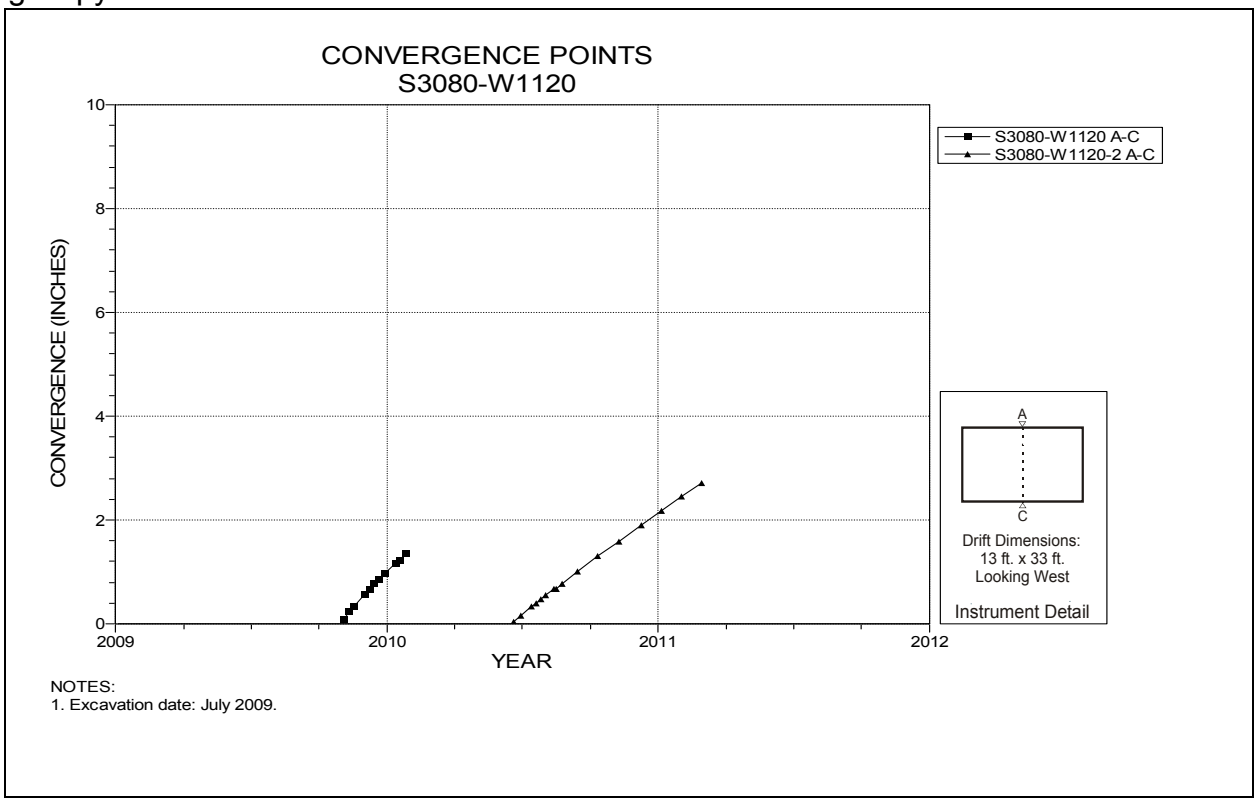


Figure 5-122 Convergence Point Array
S3080 W1120 – Roof to Floor

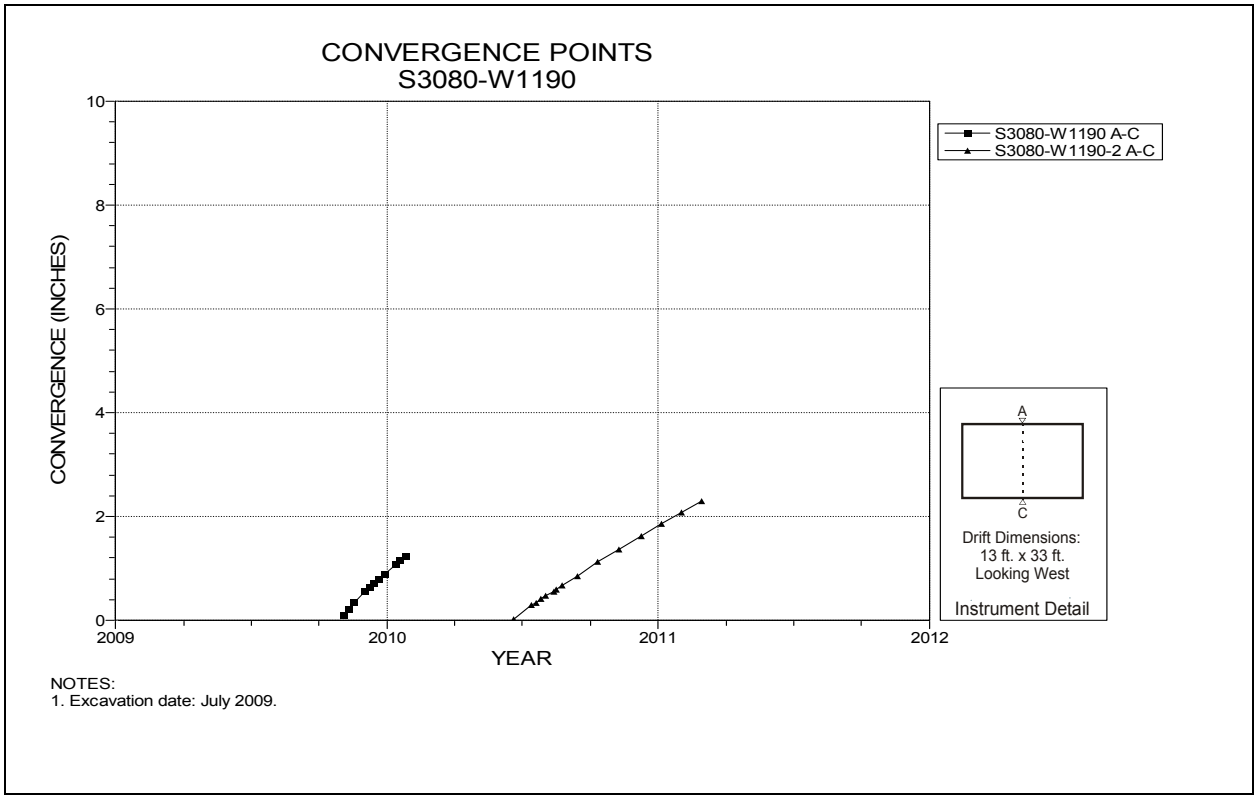


Figure 5-123 Convergence Point Array
S3080 W1190 Intersection (Room 7, Panel 6) – Roof to Floor

Table 5-7
Panel 7 Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)[1]	Rate Change Percent[1]	Comments
			Date	Inches					
S2180-W285-2 A-C	S2180-W285	5-124	06/28/11	0.146	0.592	2.56	N/A	N/A	
S2180-W390-2 A-C	S2180-W390	5-125	06/28/11	0.269	1.200	3.82	N/A	N/A	Rate is from the original install.
S2180-W460-2 A-C	S2180-W460	5-126	06/28/11	0.428	1.550	10.23	N/A	N/A	
S2180-W520-2 A-C	S2180-W520	5-127	06/28/11	0.607	2.109	13.21	N/A	N/A	
S2180-W585-2 A-C	S2180-W585	5-128	06/28/11	0.658	2.136	15.28	N/A	N/A	
S2180-W660-2 A-C	S2180-W660	5-129	06/28/11	0.979	2.627	22.71	N/A	N/A	
S2180-W725-2 A-C	S2180-W725	5-130	06/28/11	0.734	1.464	15.58	N/A	N/A	
S2180-W790-2 A-C	S2180-W790	5-131	06/28/11	0.613	1.919	13.94	N/A	N/A	
S2180-W855-2 A-C	S2180-W855	5-132	06/28/11	0.767	2.124	17.59	N/A	N/A	
S2180-W920-2 A-C	S2180-W920	5-133	06/28/11	0.699	2.202	16.74	N/A	N/A	
S2180-W985-2 A-C	S2180-W985	5-134	06/28/11	1.272	2.624	29.16	N/A	N/A	
S2180-W1050 A-C	S2180-W1050	5-135	06/28/11	0.901	0.901	22.89	N/A	N/A	
S2180-W1120 A-C	S2180-W1120	5-136	06/28/11	0.906	0.906	20.88	N/A	N/A	
S2180-W1190 A-C	S2180-W1190	5-137	05/17/11	1.354	1.354	6.43	N/A	N/A	
W390-S2275 A-C	W390-S2275	5-138	04/12/11	4.875	4.875	7.11	N/A	N/A	
W390-S2350 A-C	W390-S2350	5-139	04/18/11	4.884	4.884	6.97	N/A	N/A	
W390-S2425 A-C	W390-S2425	5-140	06/28/11	5.702	5.702	6.42	N/A	N/A	
W520-S2275 A-C	W520-S2275	5-141	06/28/11	4.532	4.532	6.60	N/A	N/A	
W520-S2350 A-C	W520-S2350	5-142	06/28/11	4.470	4.470	6.42	N/A	N/A	
W520-S2425 A-C	W520-S2425	5-143	06/28/11	4.653	4.653	6.69	N/A	N/A	
W660-S2275 A-C	W660-S2275	5-144	06/28/11	4.622	4.622	6.96	N/A	N/A	
W660-S2350 A-C	W660-S2350	5-145	06/28/11	4.926	4.926	7.39	N/A	N/A	
W660-S2425 A-C	W660-S2425	5-146	06/28/11	5.061	5.061	7.56	N/A	N/A	
W790-S2275 A-C	W790-S2275	5-147	06/28/11	2.298	2.298	7.49	N/A	N/A	
W790-S2350 A-C	W790-S2350	5-148	06/28/11	2.092	2.092	6.69	N/A	N/A	
W790-S2425 A-C	W790-S2425	5-149	06/28/11	2.057	2.057	6.53	N/A	N/A	
W920-S2275 A-C	W920-S2275	5-150	06/28/11	2.375	2.375	7.24	N/A	N/A	
W920-S2350 A-C	W920-S2350	5-151	06/28/11	2.276	2.276	6.87	N/A	N/A	

Table 5-7, (Continued)
Panel 7 Data Analysis

CONVERGENCE POINTS

Field Tag	Location	Figure Number	Last Reading 2010 to 2011		Cumulative Displacement (inches)	Closure Rate 2010 to 2011 (in/year)	Closure Rate 2009 to 2010 (in/year)[1]	Rate Change Percent[1]	Comments
			Date	Inches					
W920-S2425 A-C	W920-S2425	5-152	06/28/11	2.305	2.305	6.95	N/A	N/A	
W1050-S2275 A-C	W1050-S2275	5-153	06/06/11	2.134	2.134	8.33	N/A	N/A	
W1050-S2350 A-C	W1050-S2350	5-154	06/06/11	2.140	2.140	8.31	N/A	N/A	
W1050-S2425 A-C	W1050-S2425	5-155	06/06/11	2.141	2.141	8.32	N/A	N/A	
W1190-S2275 A-C	W1190-S2275	5-156	05/17/11	1.672	1.672	8.03	N/A	N/A	
W1190-S2350 A-C	W1190-S2350	5-157	05/31/11	1.914	1.914	7.59	N/A	N/A	
W1190-S2425 A-C	W1190-S2425	5-158	05/31/11	2.015	2.015	7.87	N/A	N/A	
S2520-W285-2 A-C	S2520-W285	5-159	06/28/11	0.502	2.046	3.32	N/A	N/A	
S2520-W390 A-C	S2520-W390	5-160	06/28/11	3.994	3.994	5.68	N/A	N/A	
S2520-W455 A-C	S2520-W455	5-161	06/28/11	4.439	4.439	6.24	N/A	N/A	
S2520-W520 A-C	S2520-W520	5-162	06/28/11	7.292	7.292	7.30	N/A	N/A	
S2520-W585 A-C	S2520-W585	5-163	06/28/11	4.910	4.910	7.42	N/A	N/A	
S2520-W660 A-C	S2520-W660	5-164	06/28/11	5.328	5.328	8.00	N/A	N/A	
S2520-W725 A-C	S2520-W725	5-165	06/28/11	2.130	2.130	6.89	N/A	N/A	
S2520-W790 A-C	S2520-W790	5-166	06/28/11	2.219	2.219	7.19	N/A	N/A	
S2520-W855 A-C	S2520-W855	5-167	06/28/11	2.149	2.149	6.98	N/A	N/A	
S2520-W920 A-C	S2520-W920	5-168	06/28/11	2.169	2.169	7.00	N/A	N/A	
S2520-W985 A-C	S2520-W985	5-169	06/28/11	2.374	2.374	7.65	N/A	N/A	
S2520-W1050 A-C	S2520-W1050	5-170	06/06/11	2.042	2.042	8.11	N/A	N/A	
S2520-W1120 A-C	S2520-W1120	5-171	06/06/11	1.940	1.940	7.91	N/A	N/A	
S2520-W1190 A-C	S2520-W1190	5-172	06/06/11	1.637	1.637	6.33	N/A	N/A	

Table 5-6 Panel 6 Data Analysis

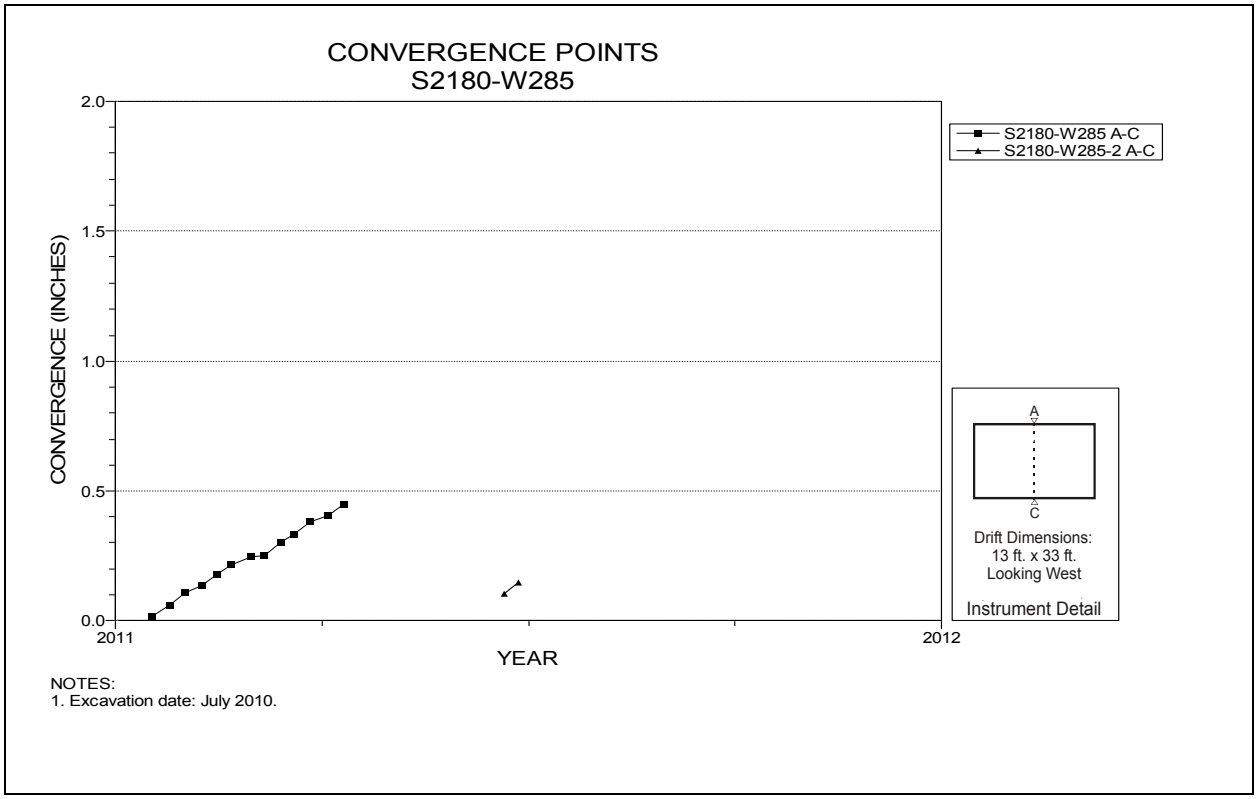


Figure 5-124 Convergence Point Array
S2180 W285 – Roof to Floor

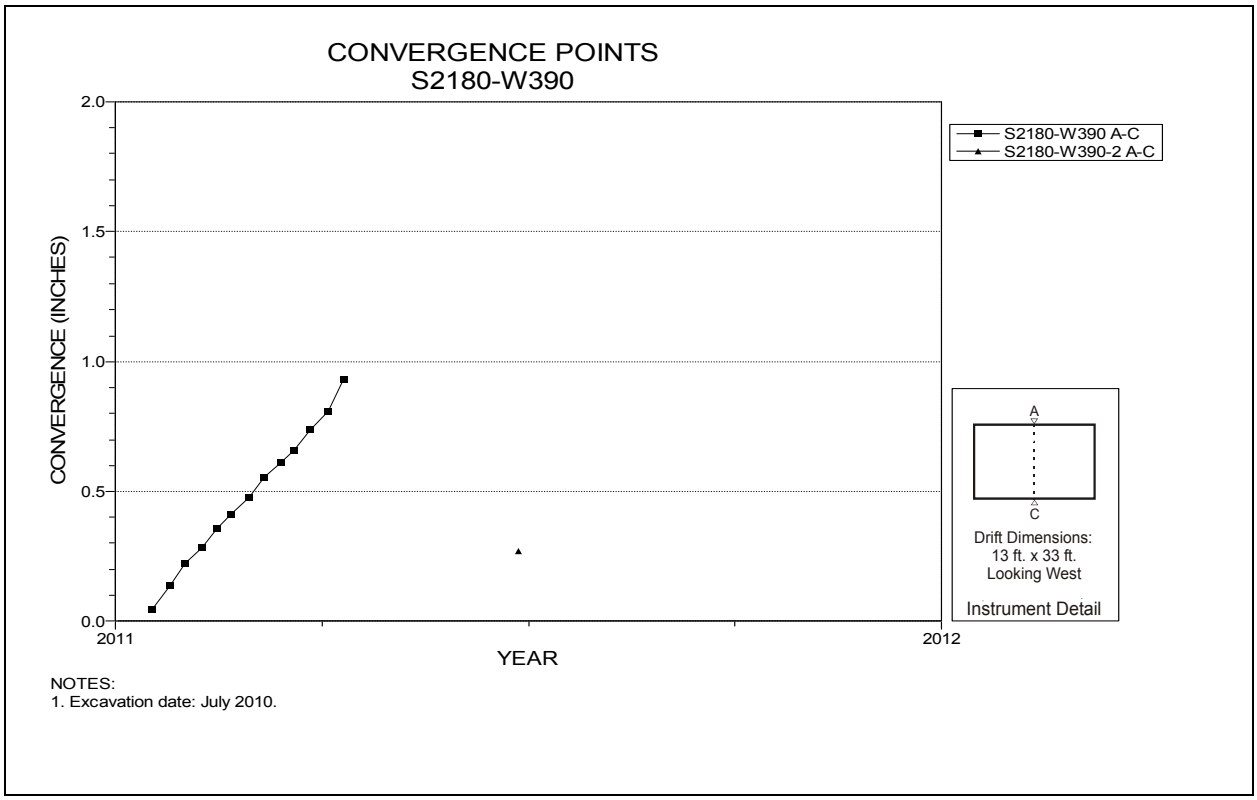


Figure 5-125 Convergence Point Array
S2180 W390 Intersection (Room 1, Panel 7) – Roof to Floor

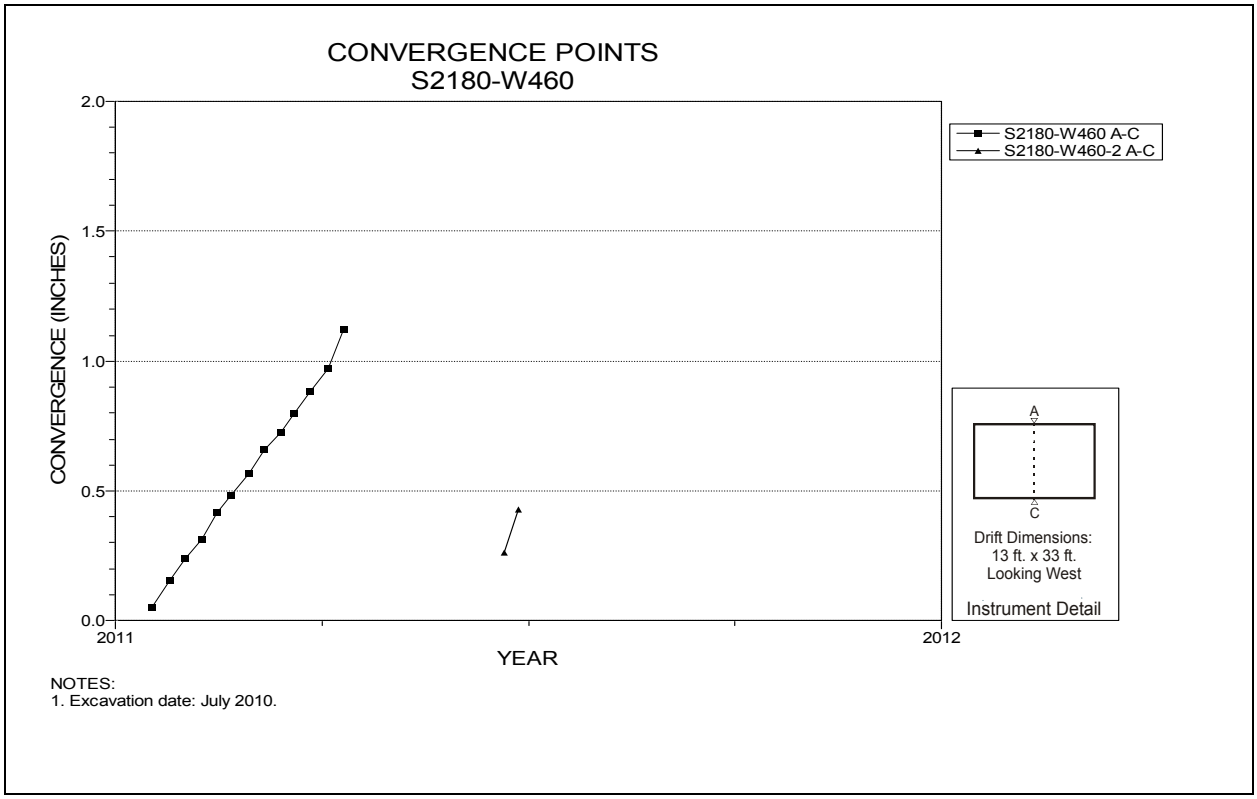


Figure 5-126 Convergence Point Array
S2180 W460 – Roof to Floor

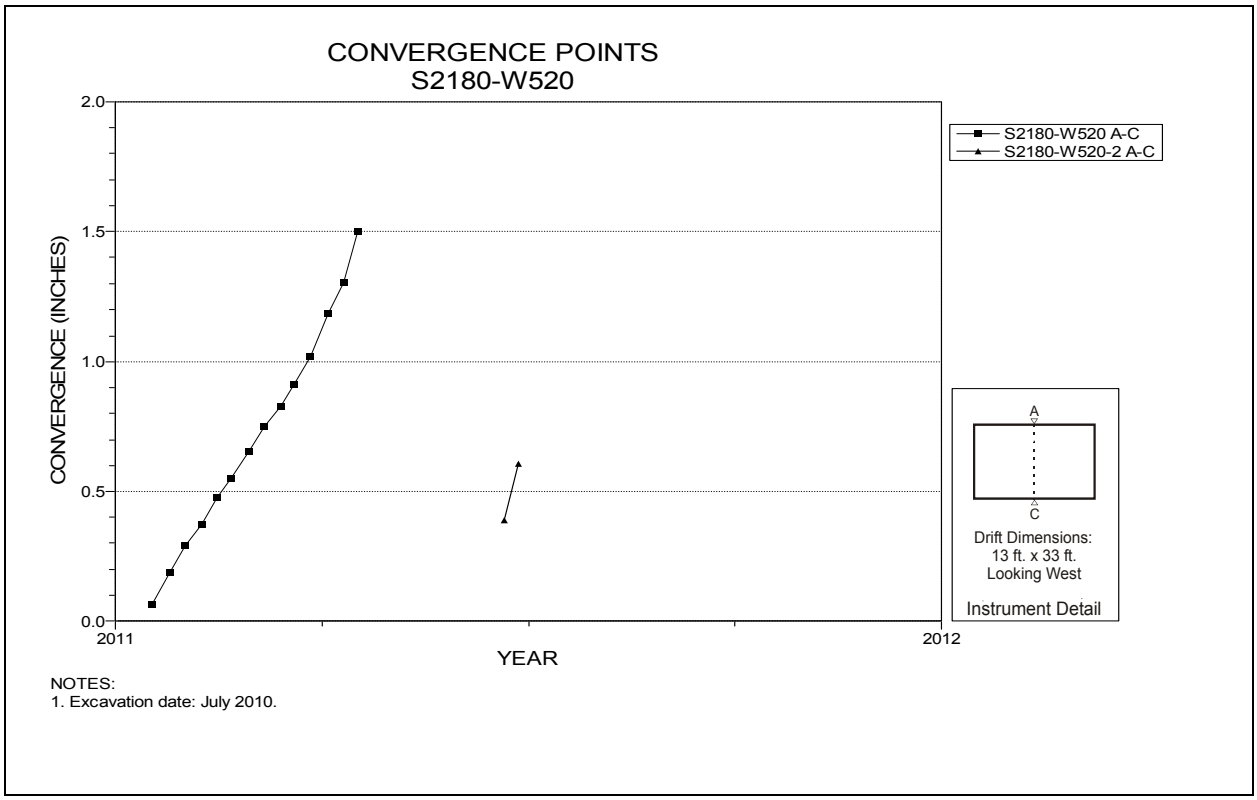


Figure 5-127 Convergence Point Array
S2180 W520 Intersection (Room 2, Panel 7) – Roof to Floor

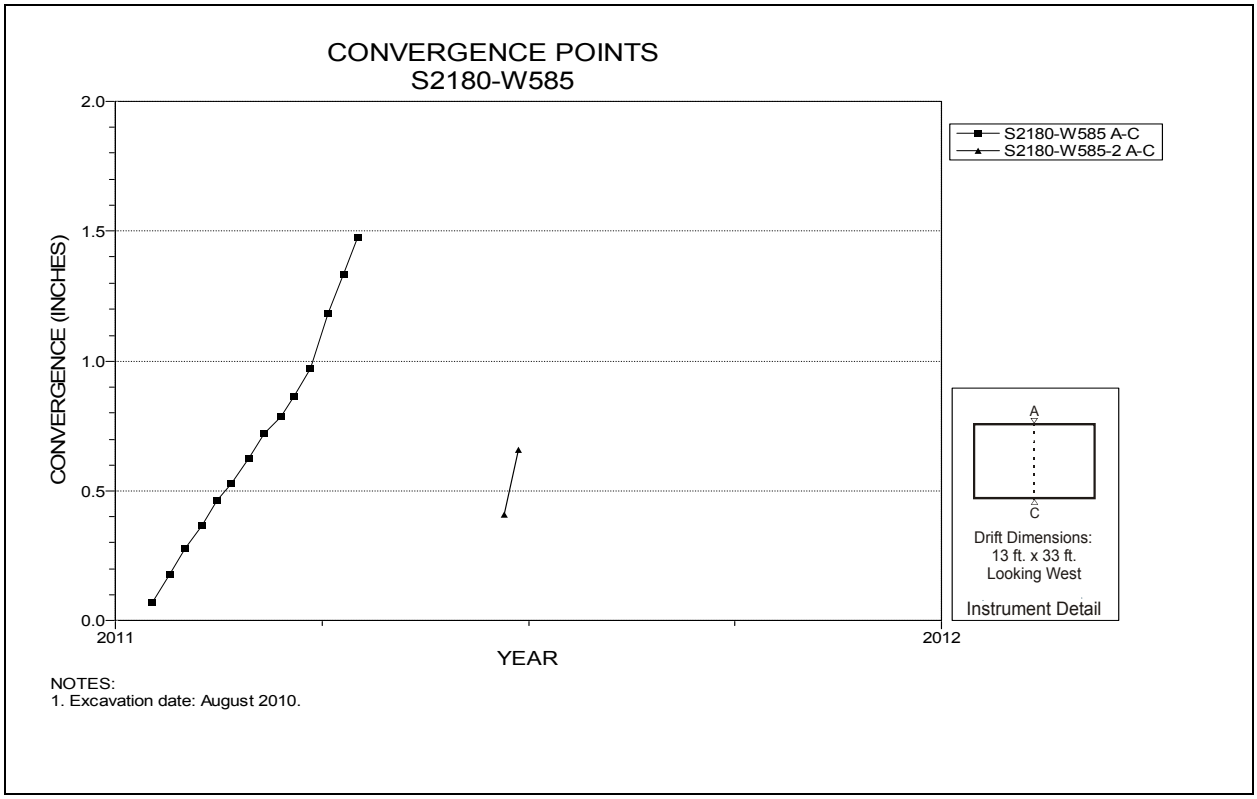


Figure 5-128 Convergence Point Array
S2180 W585 – Roof to Floor

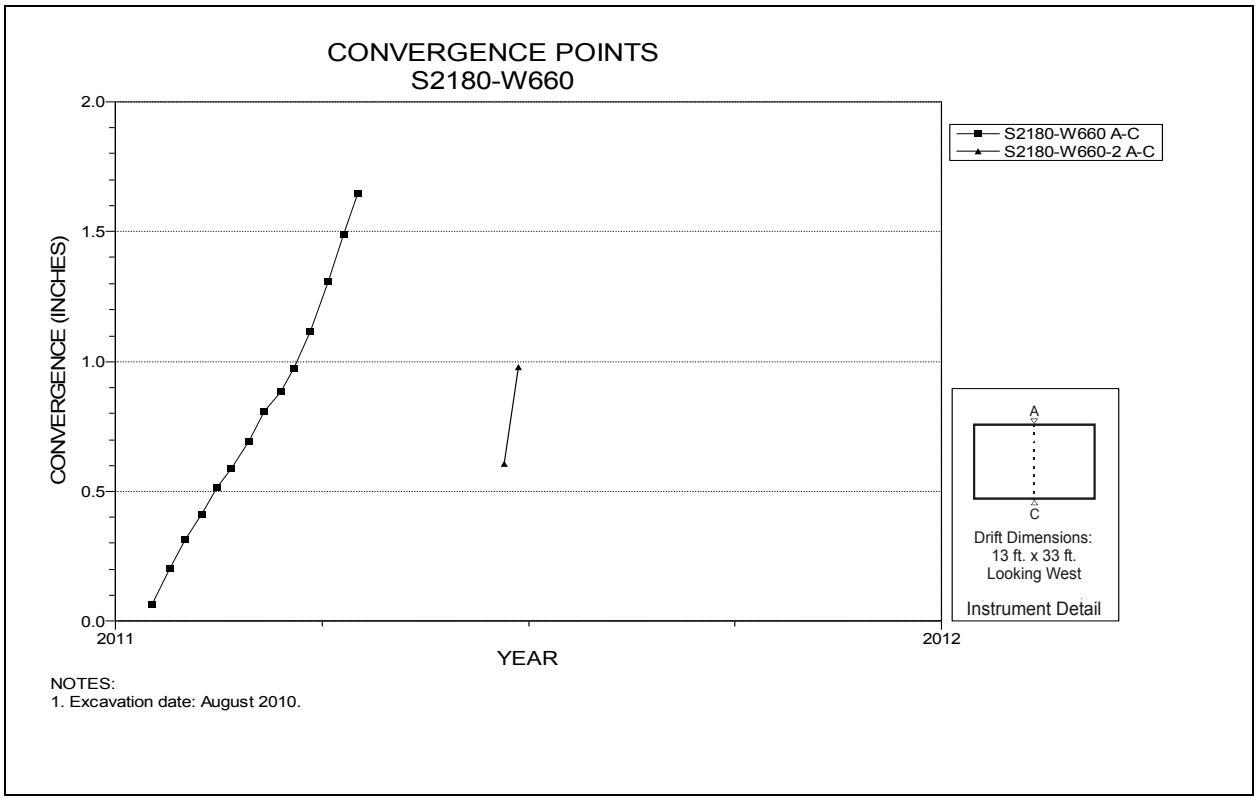


Figure 5-129 Convergence Point Array
S2180 W660 Intersection (Room 3 Panel 7) – Roof to Floor

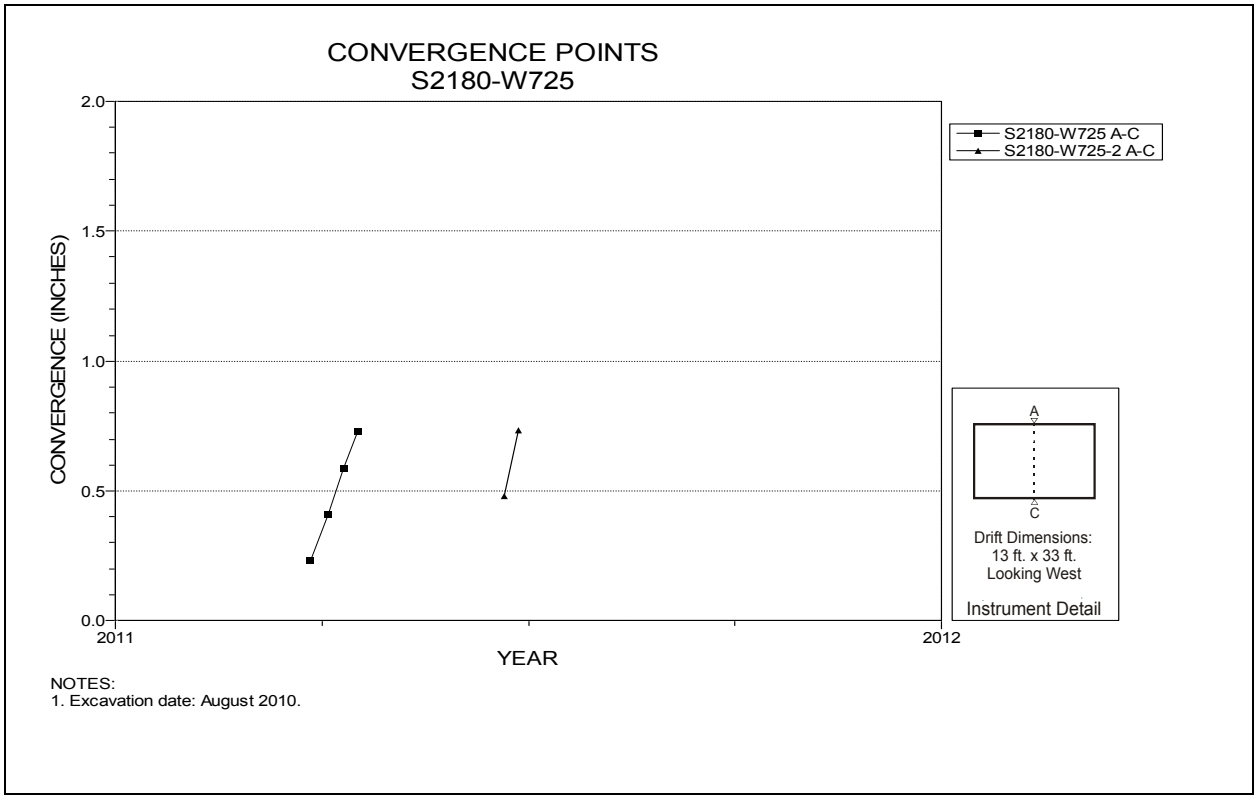
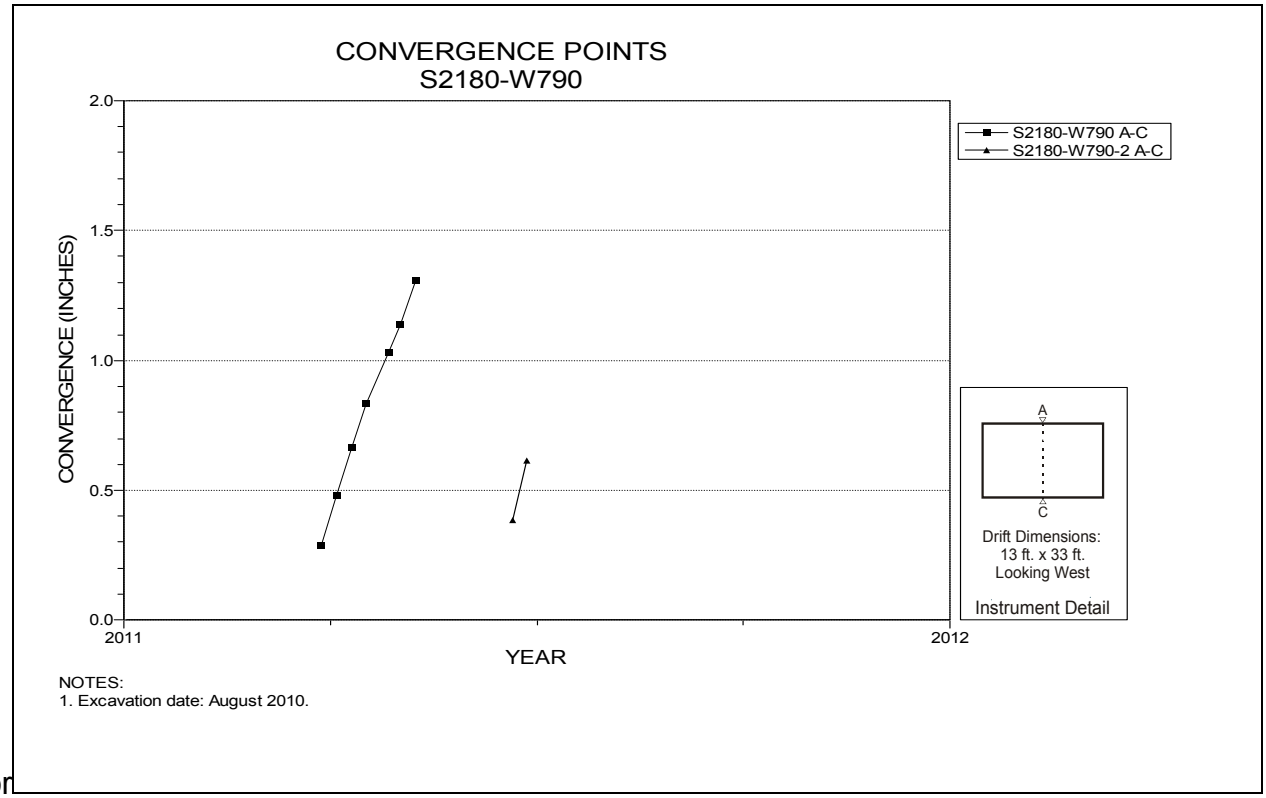


Figure 5-130 Convergence Point Array
S2180 W725 – Roof to



Floor

Figure 5-131 Convergence Point Array
S2180 W790 Intersection (Room 4, Panel 7) – Roof to Floor

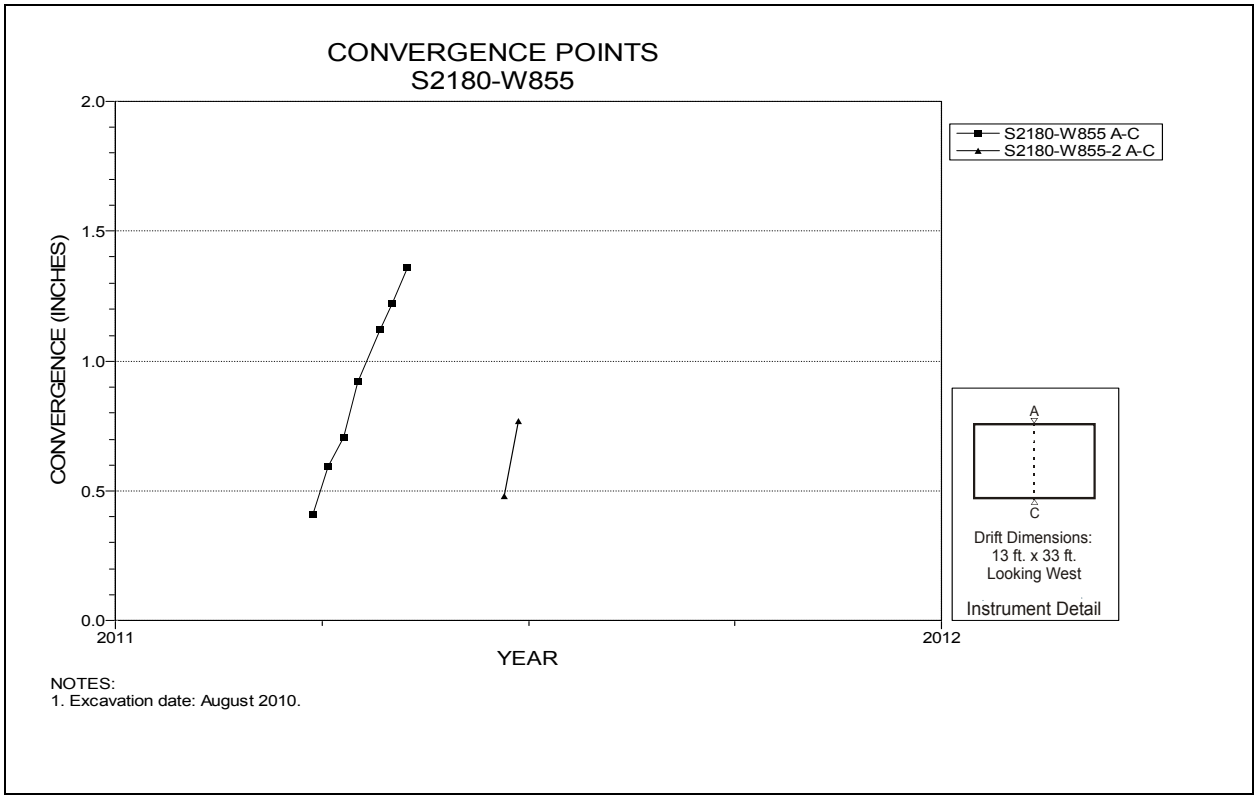


Figure 5-132 Convergence Point Array
S2180 W885 – Roof to Floor

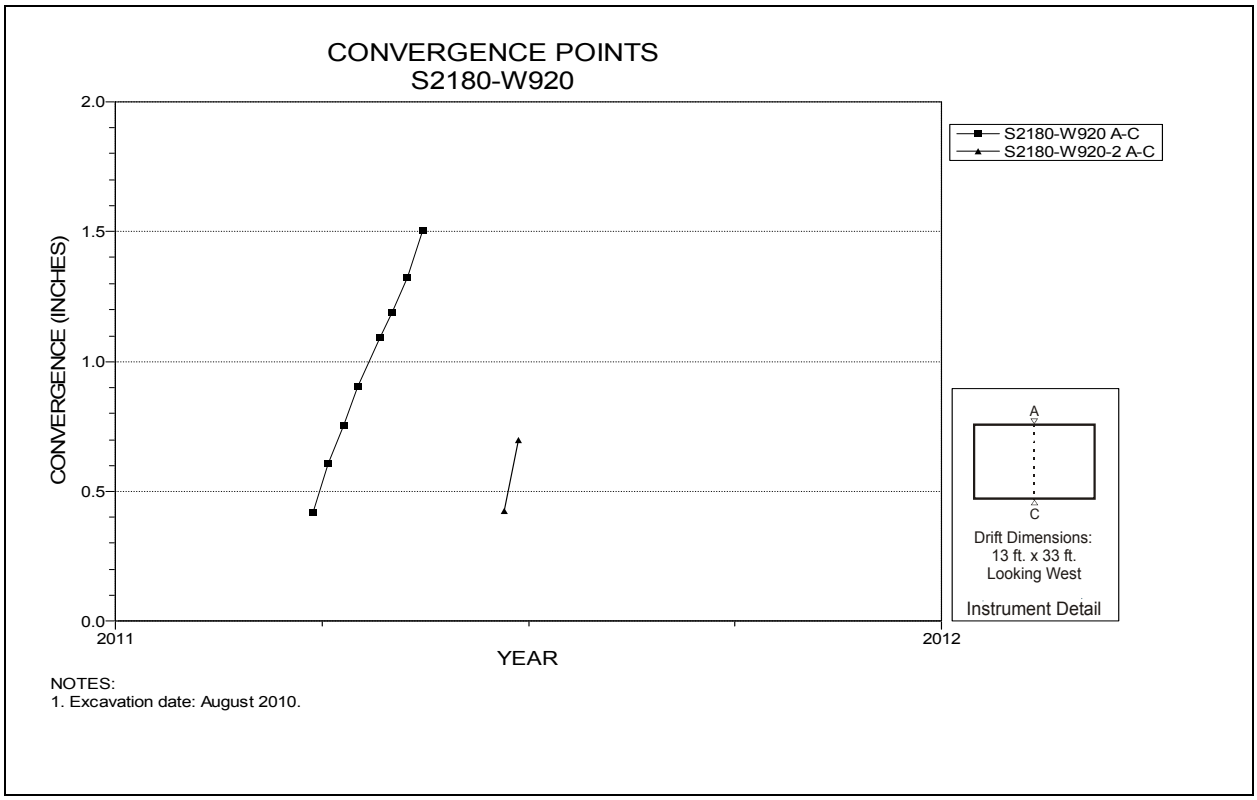


Figure 5-133 Convergence Point Array
S2180 W920 Intersection (Room 5, Panel 7) – Roof to Floor

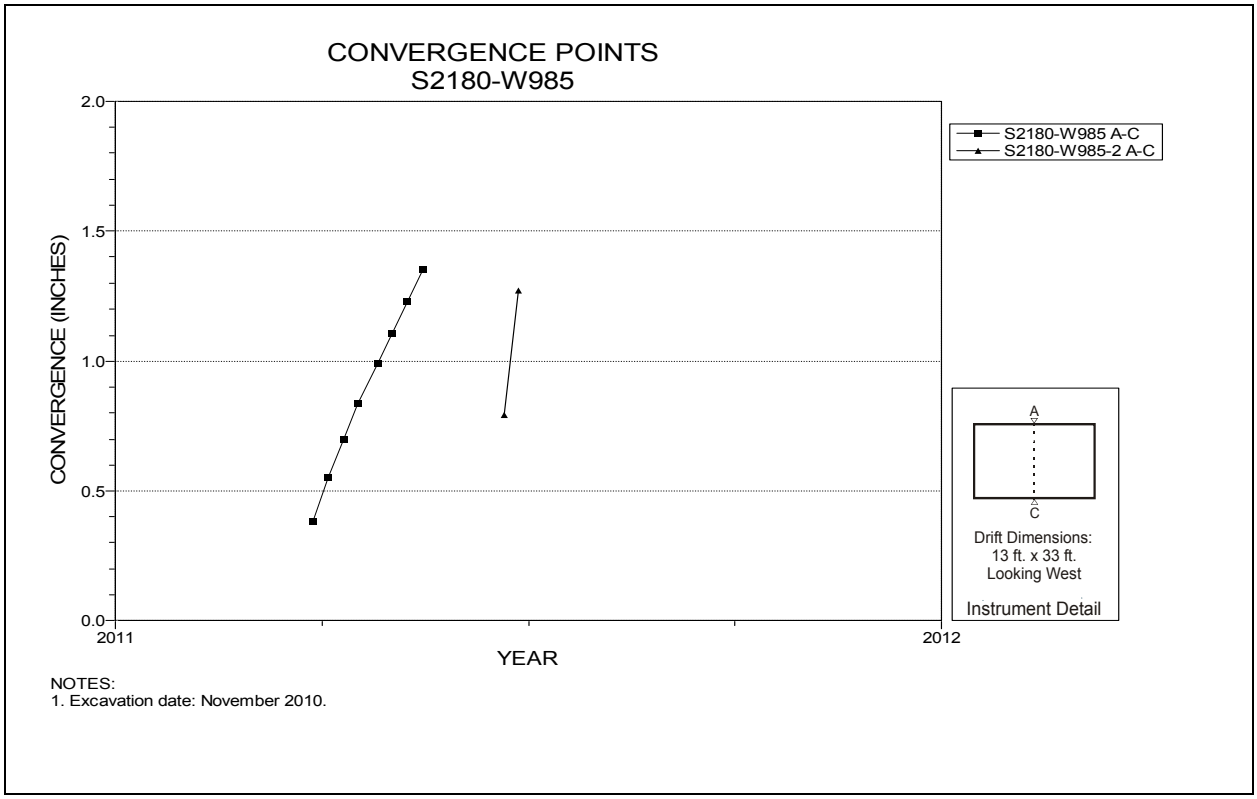


Figure 5-134 Convergence Point Array
S2180 W985 – Roof to Floor

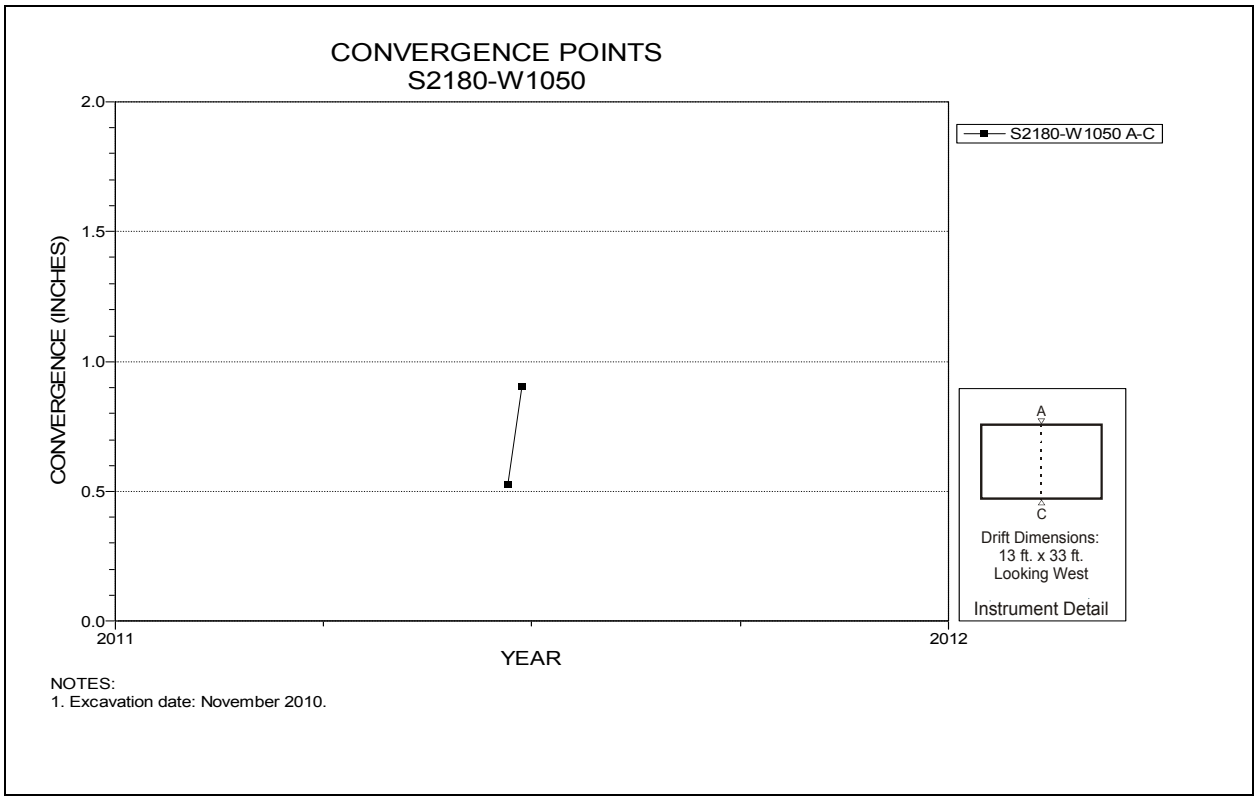


Figure 5-135 Convergence Point Array
S2180 W1050 Intersection (Room 6, Panel 7) – Roof to Floor

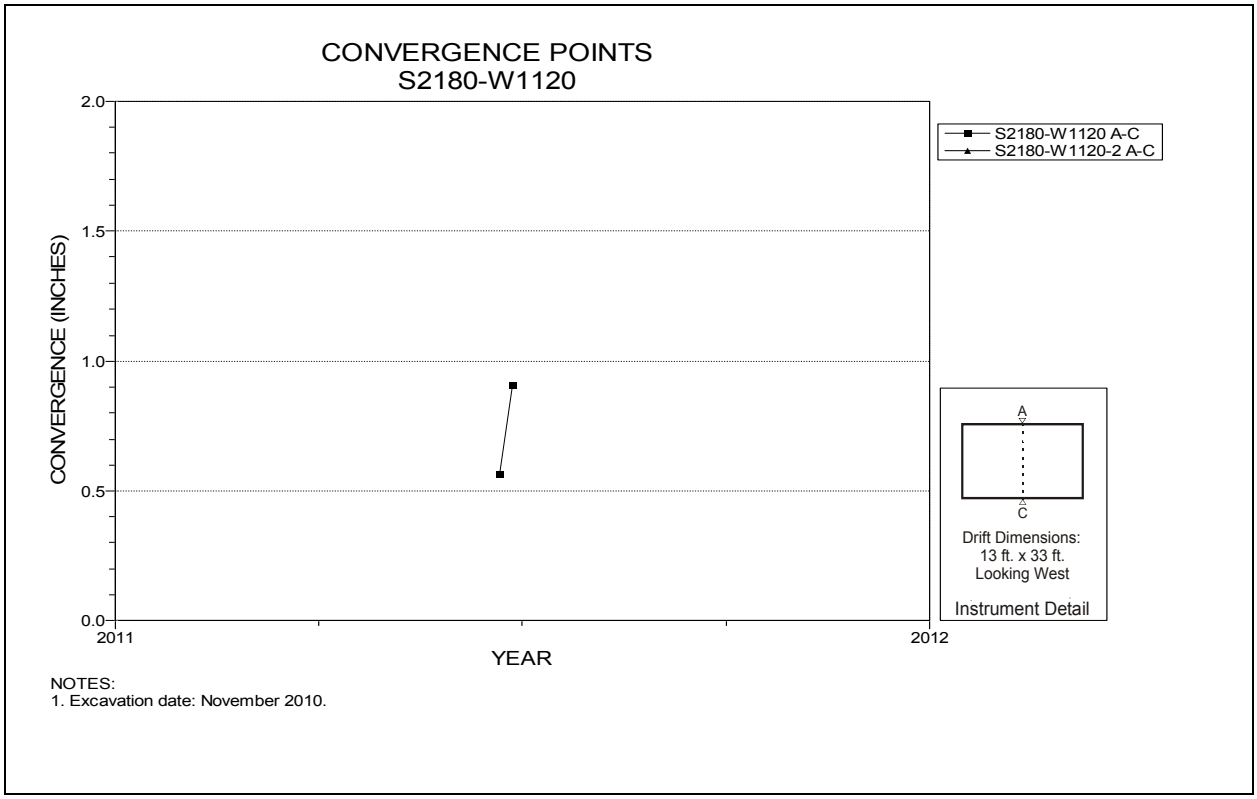


Figure 5-136 Convergence Point Array
S2180 W1120 – Roof to Floor

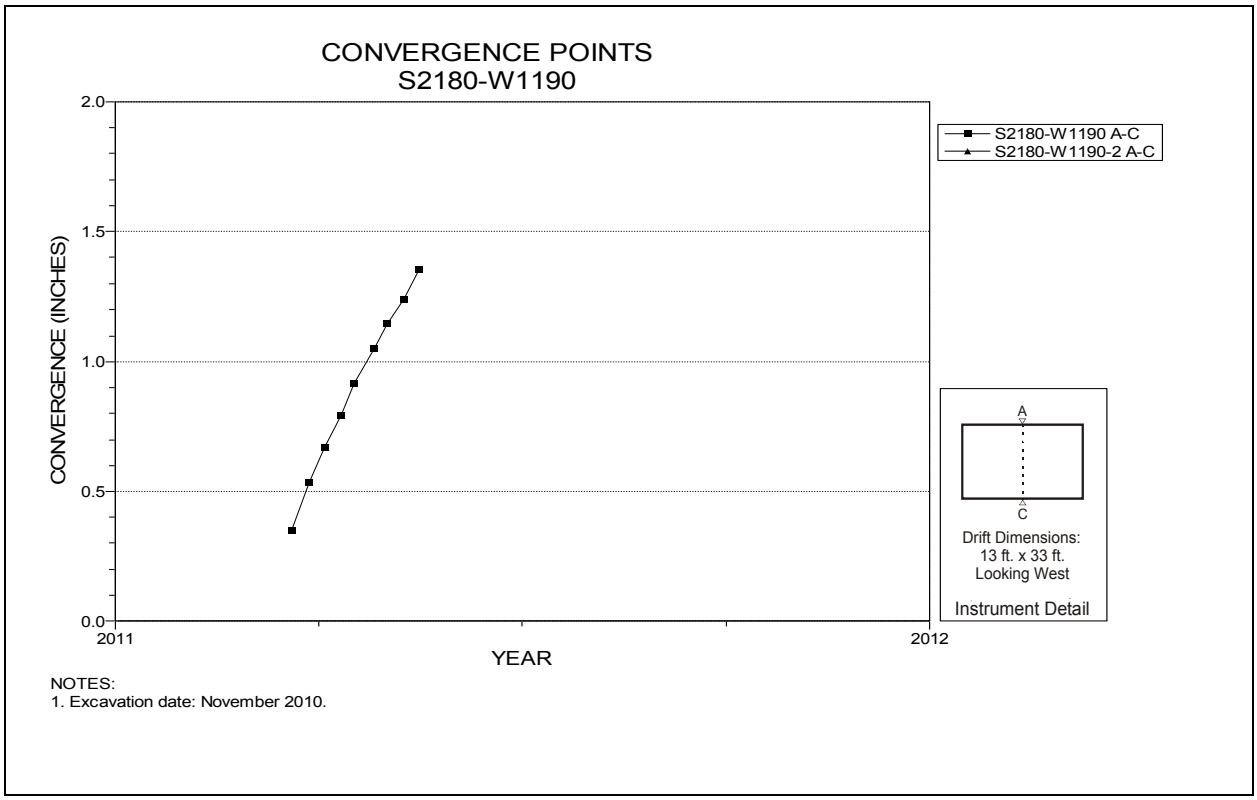


Figure 5-137 Convergence Point Array
S2180 W1190 Intersection (Room 7, Panel 7) – Roof to Floor

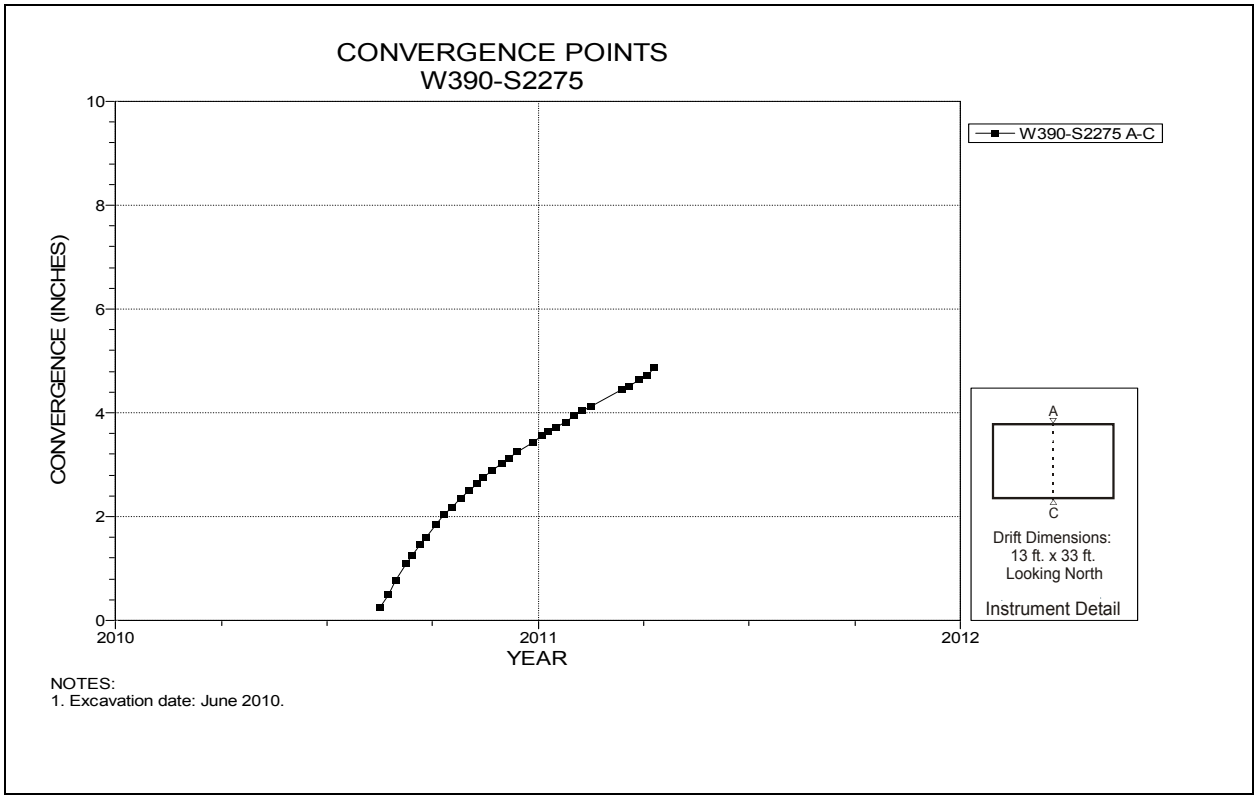


Figure 5-138 Convergence Point Array
Room 1, Panel 7 at W390 S2275 – Roof to Floor

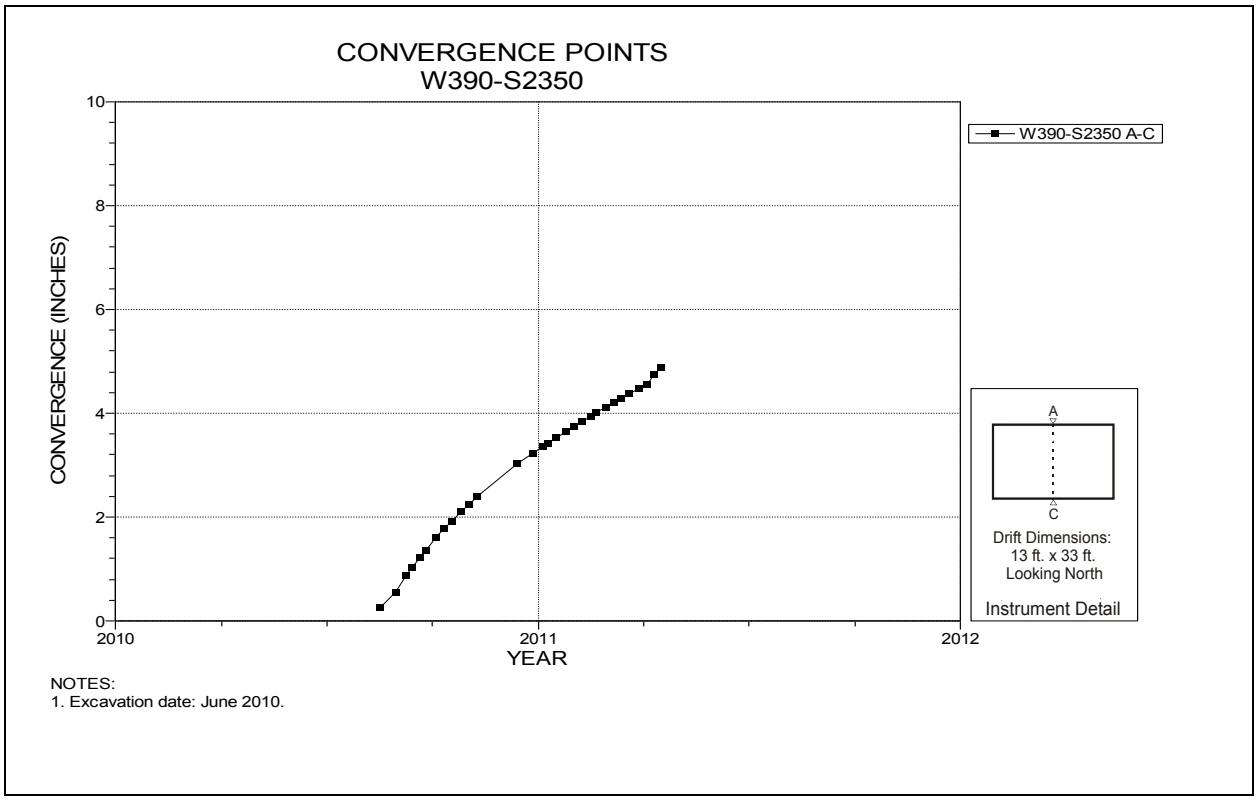


Figure 5-139 Convergence Point Array
Room 1, Panel 7 at W390 S2350– Room Center – Roof to Floor

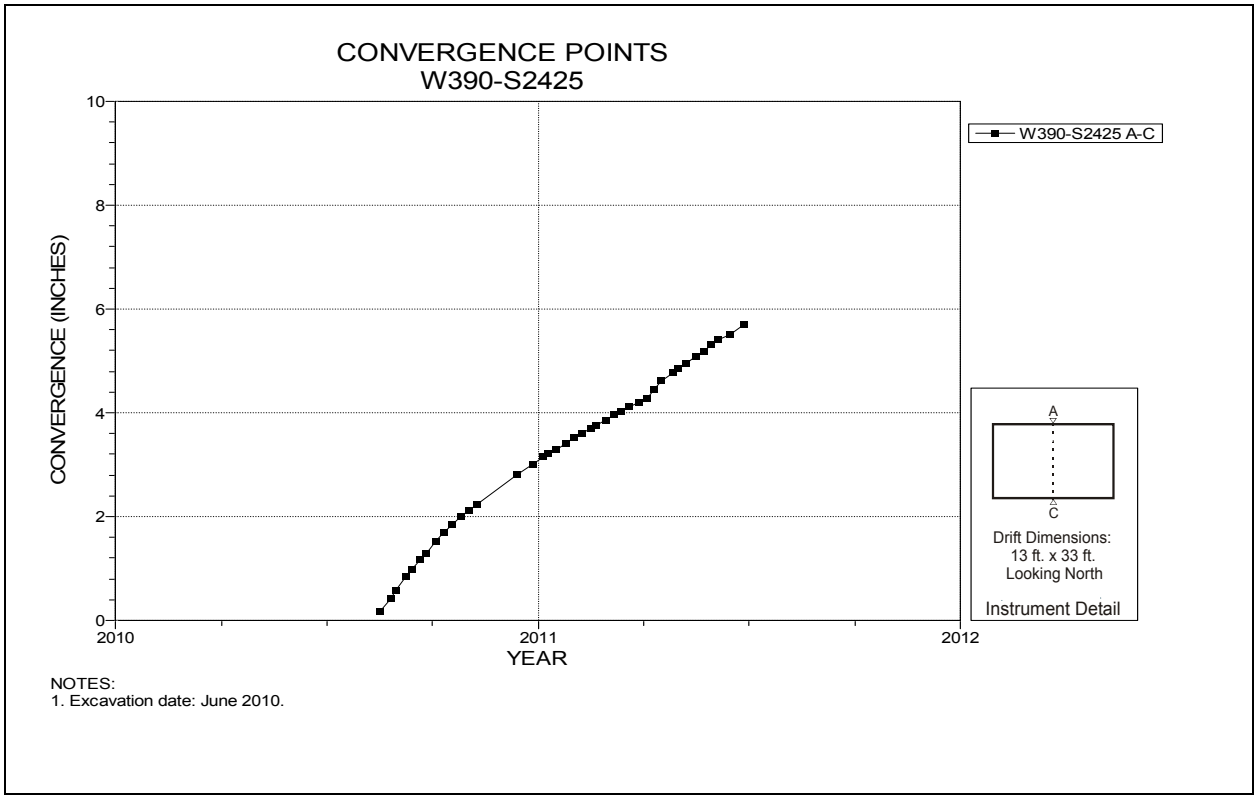


Figure 5-140 Convergence Point Array
Room 1, Panel 7 at W390 S2425 – Roof to Floor

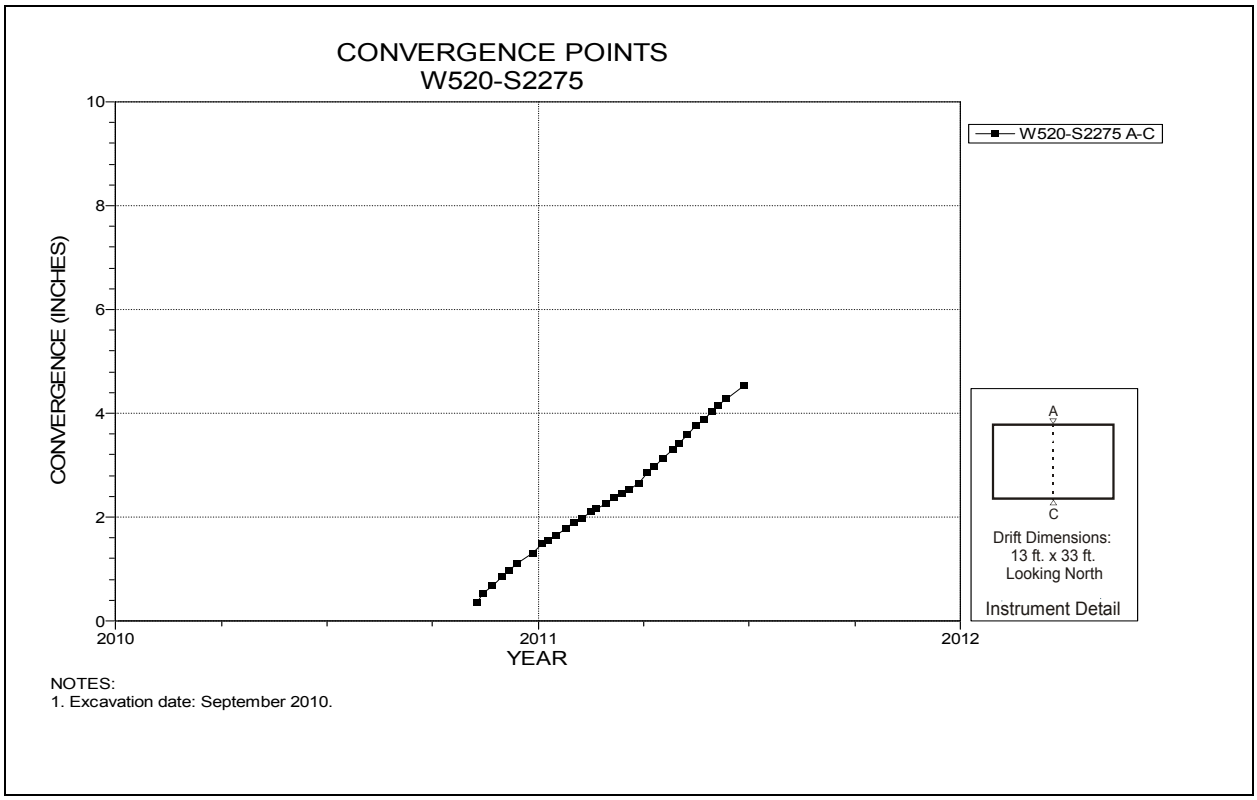
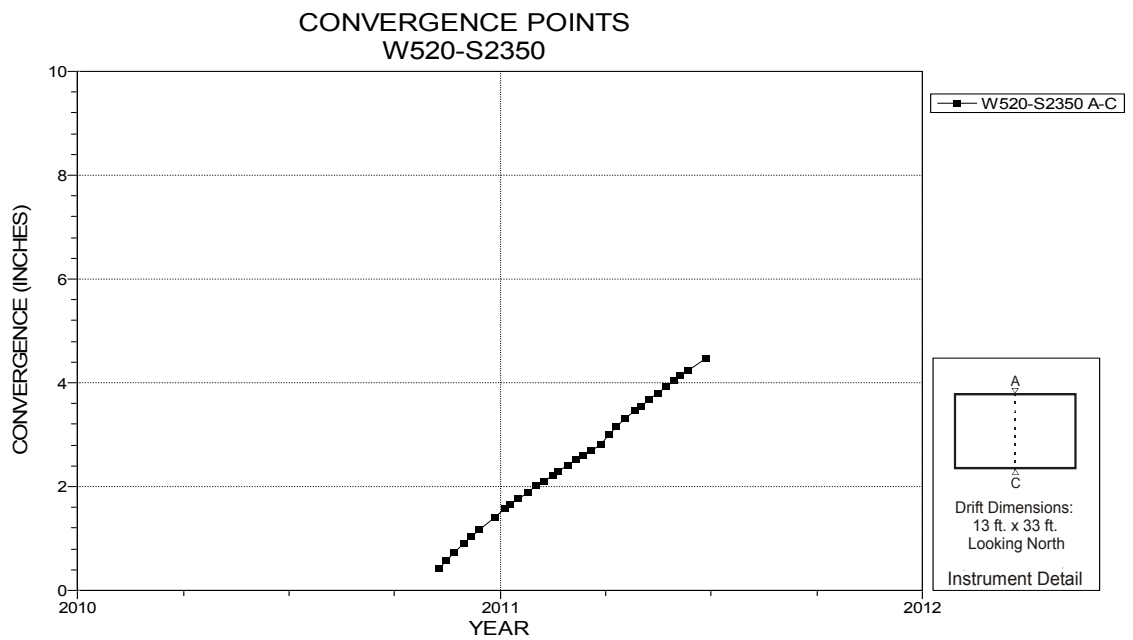
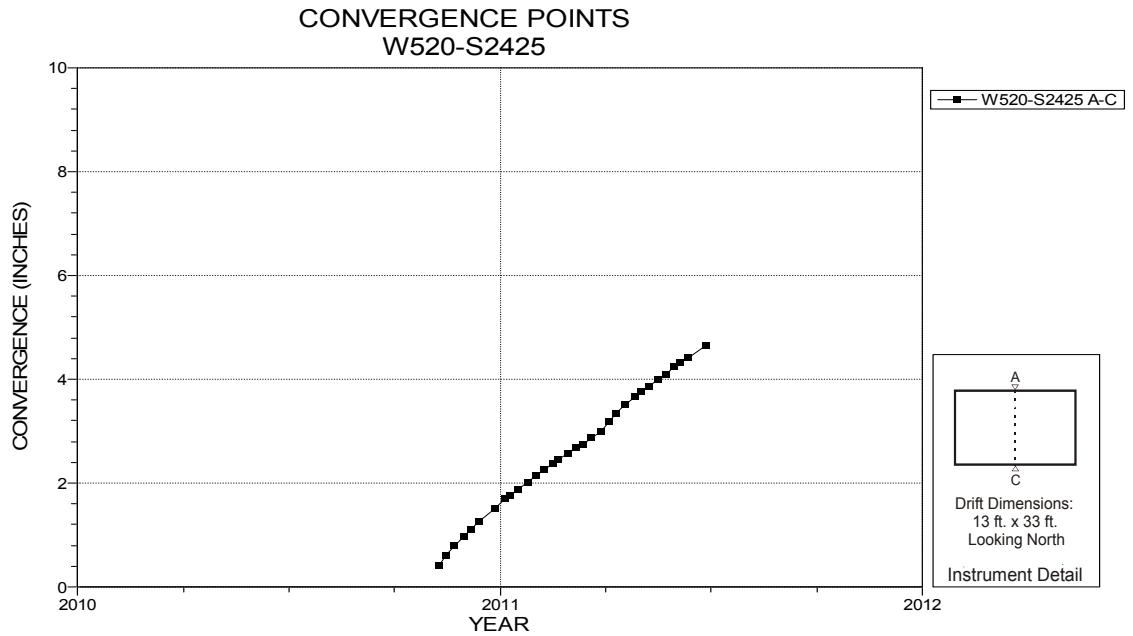


Figure 5-141 Convergence Point Array
Room 2, Panel 7 at W520 S2275 – Roof to Floor



NOTES:
1. Excavation date: September 2010.

Figure 5-142 Convergence Point Array
Room 2, Panel 7 at W520 S2350– Room Center – Roof to Floor



NOTES:
1. Excavation date: September 2010.

Figure 5-143 Convergence Point Array
Room 2, Panel 7 at W520 S2425 – Roof to Floor

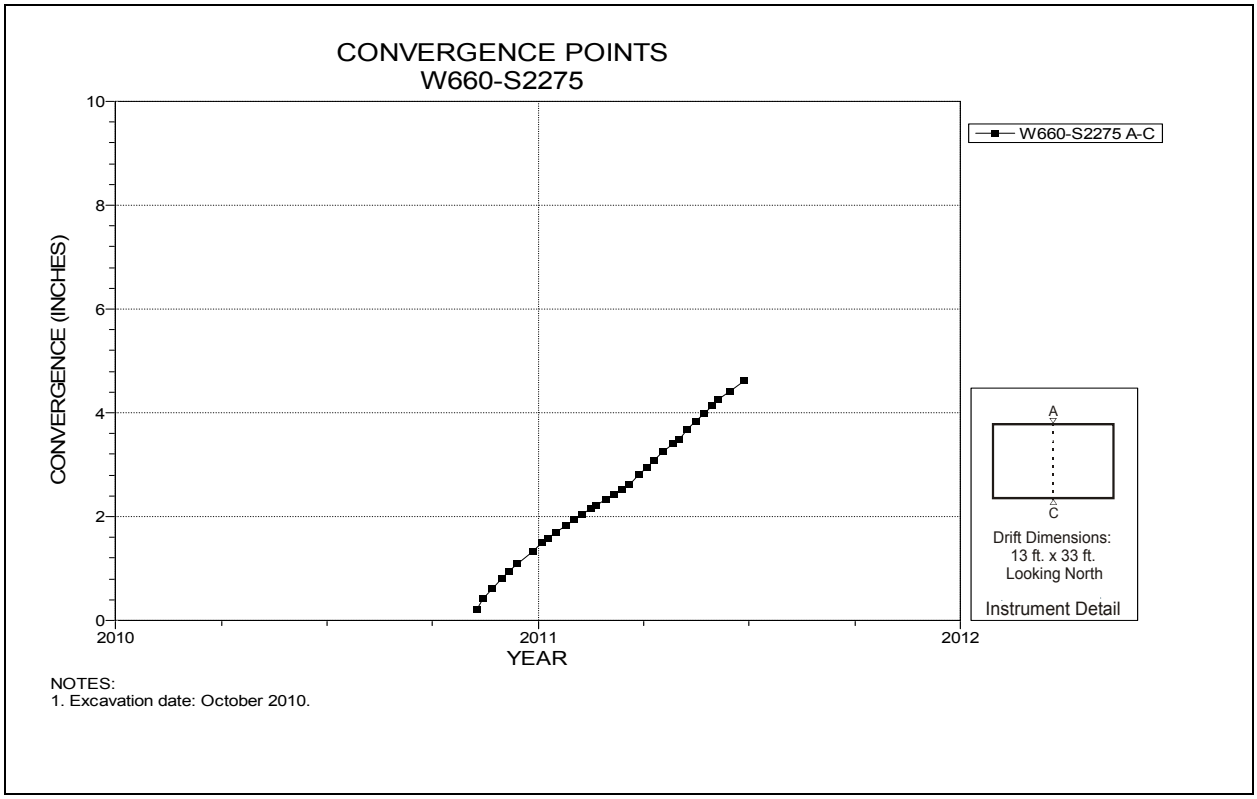


Figure 5-144 Convergence Point Array
Room 3, Panel 7 at W660 S2275 – Roof to Floor

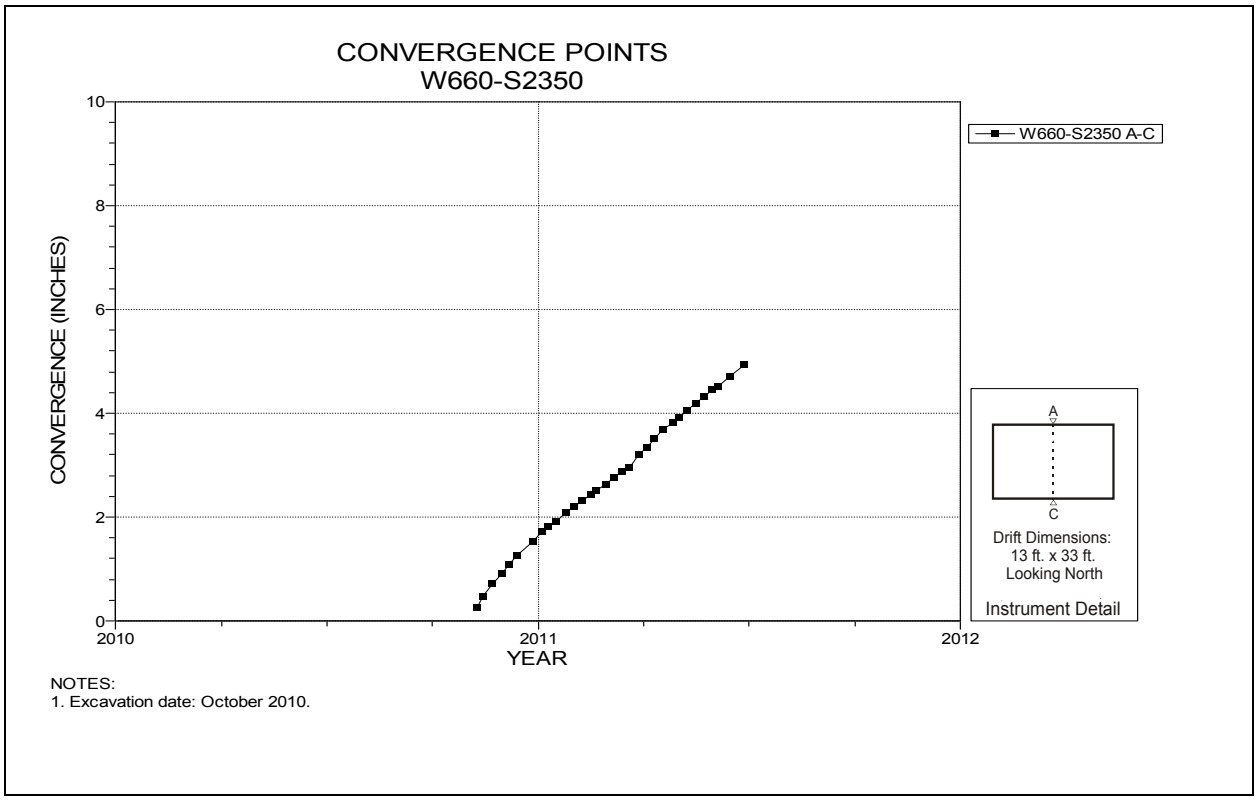


Figure 5-145 Convergence Point Array
Room 3, Panel 7 at W660 S2350– Room Center – Roof to Floor

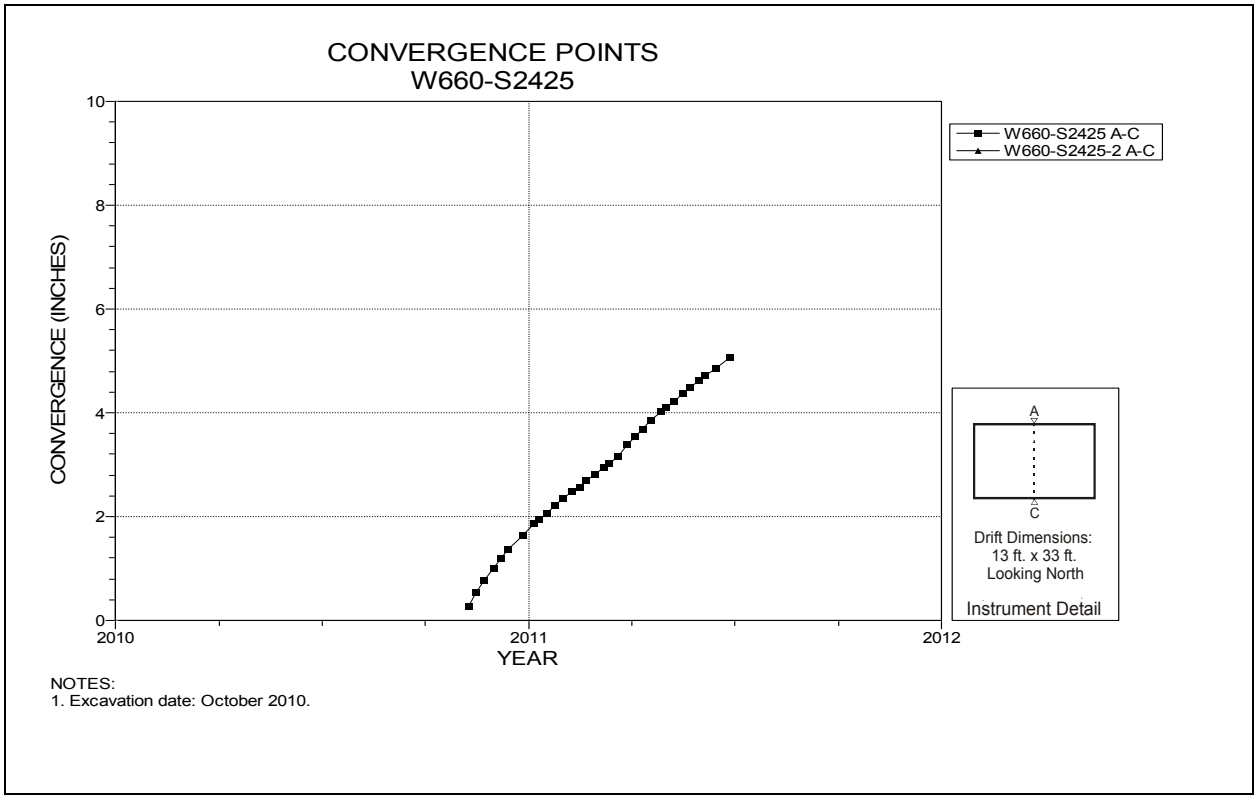


Figure 5-146 Convergence Point Array
Room 3, Panel 7 at W660 S2425 – Roof to Floor

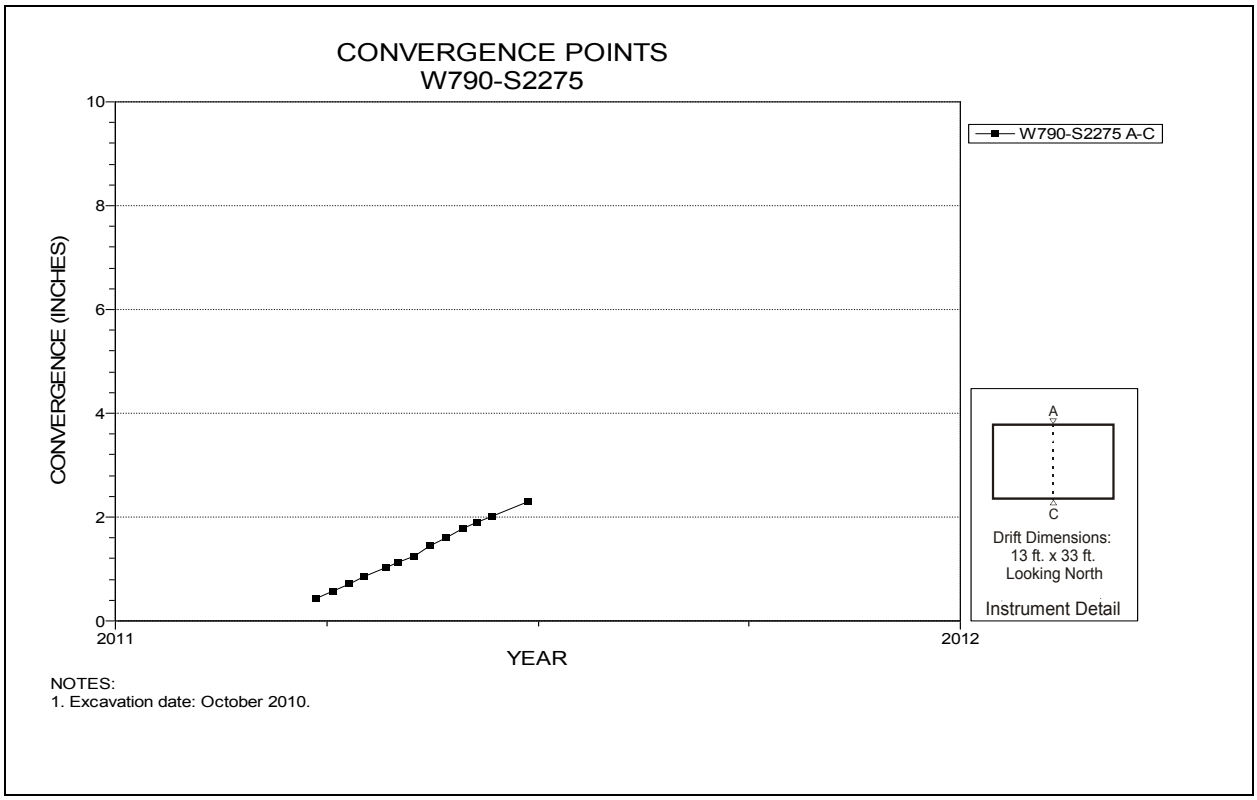


Figure 5-147 Convergence Point Array
Room 4, Panel 7 at W790 S2275 – Roof to Floor

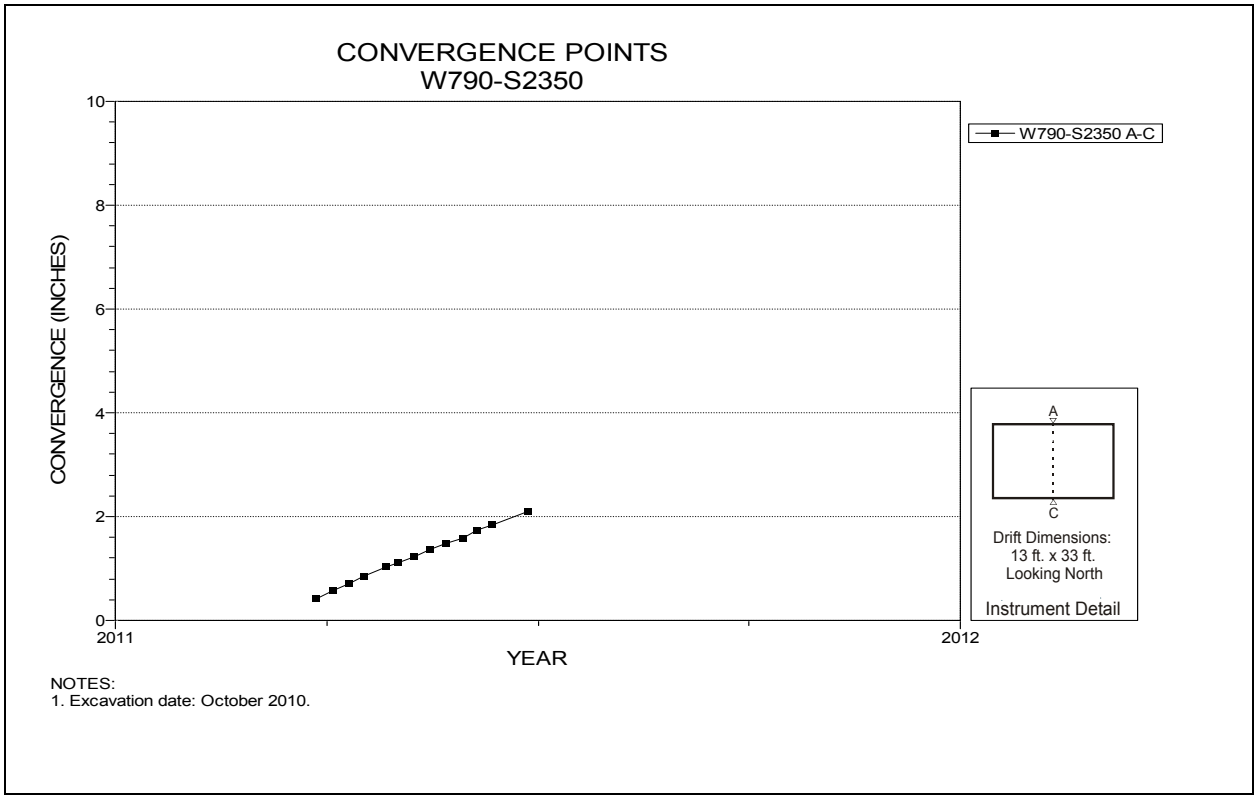


Figure 5-148 Convergence Point Array
Room 4, Panel 7 at W790 S2350– Room Center – Roof to Floor

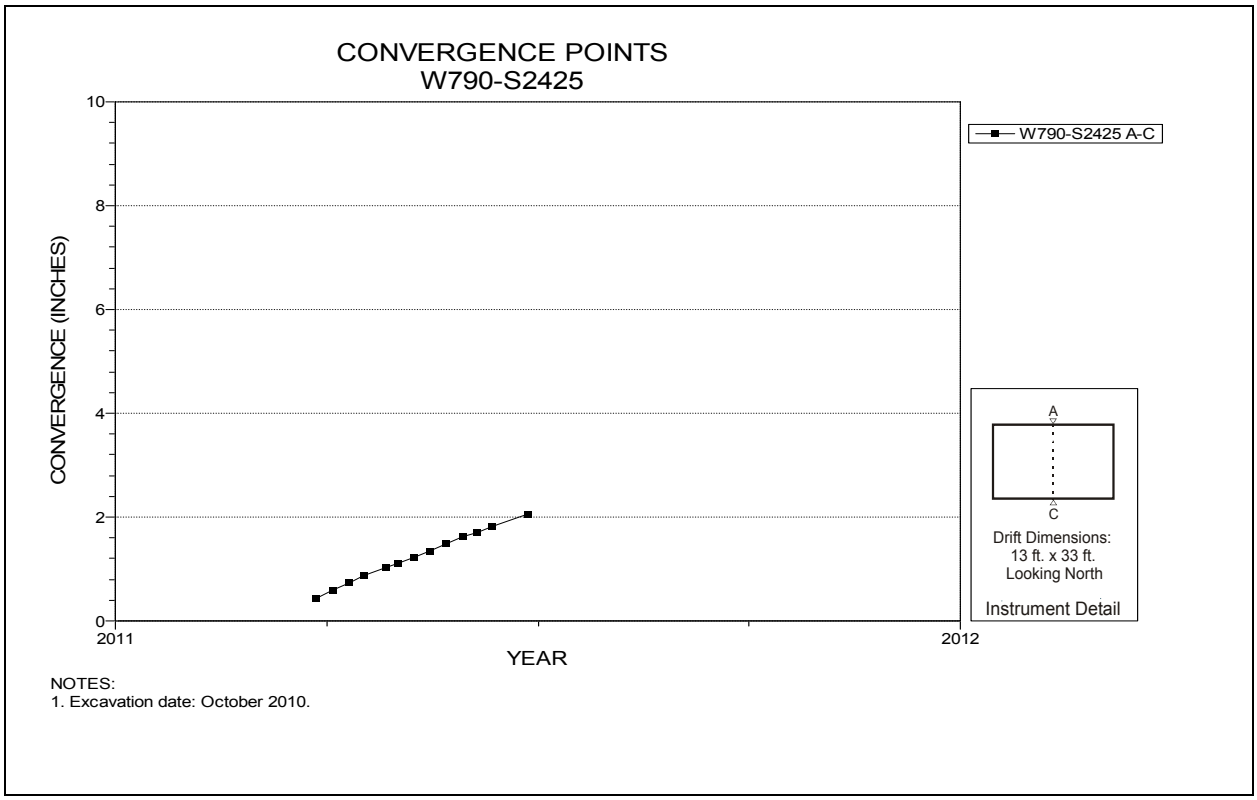


Figure 5-149 Convergence Point Array
Room 4, Panel 7 at W790 S2425 – Roof to Floor

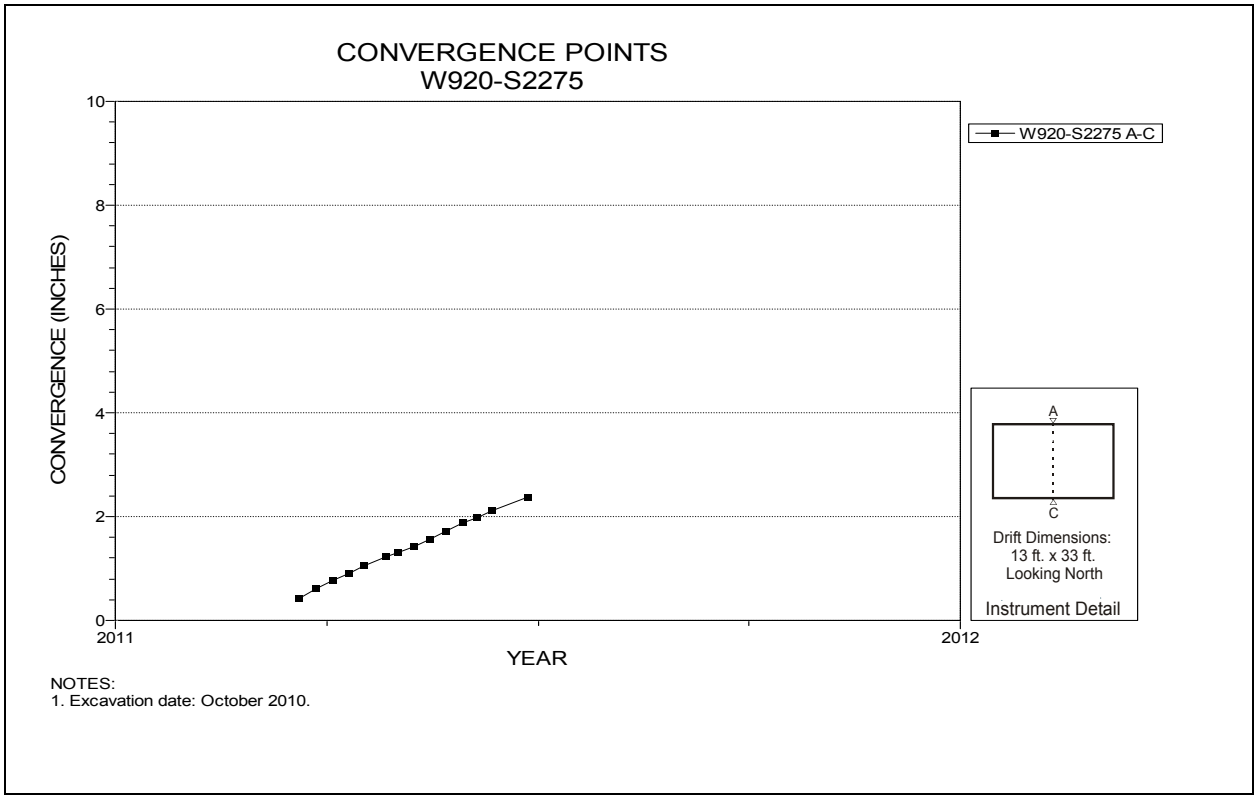


Figure 5-150 Convergence Point Array
Room 5, Panel 7 at W920 S2275 – Roof to Floor

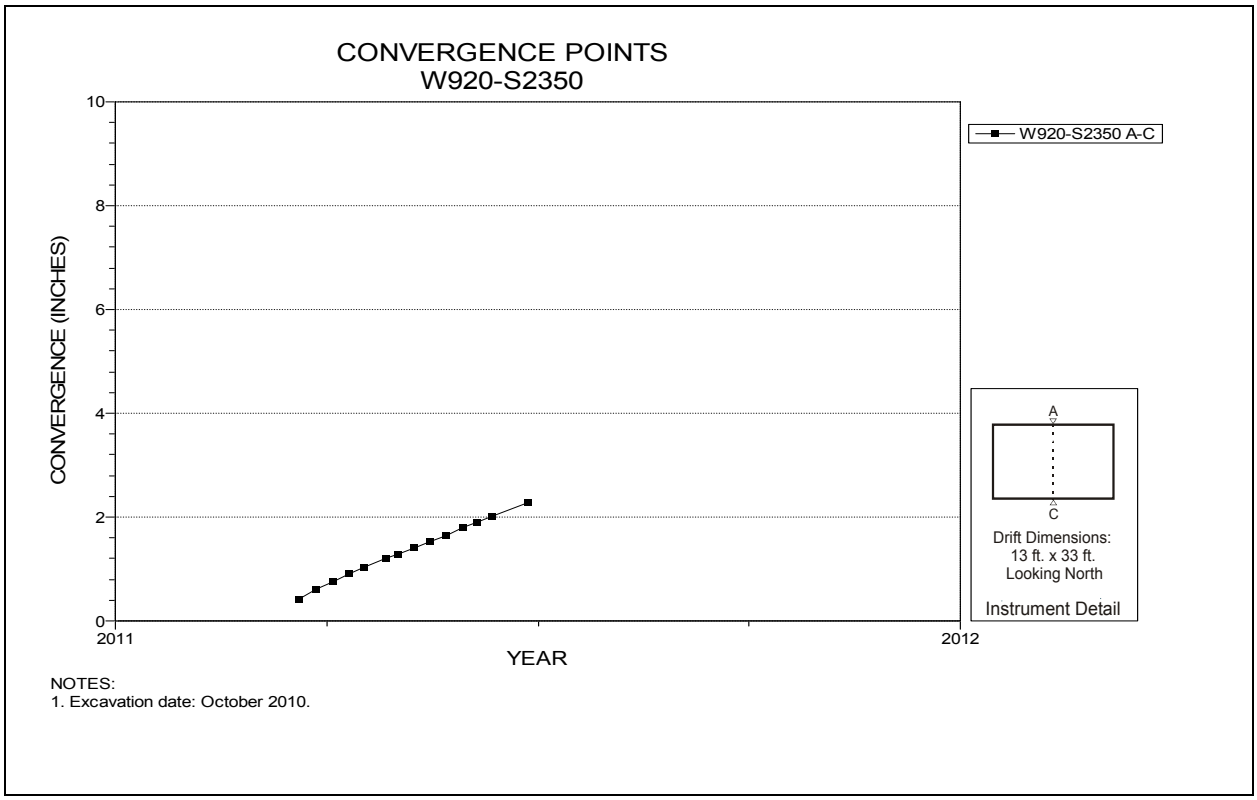


Figure 5-151 Convergence Point Array
Room 5, Panel 7 at W920 S2350– Room Center – Roof to Floor

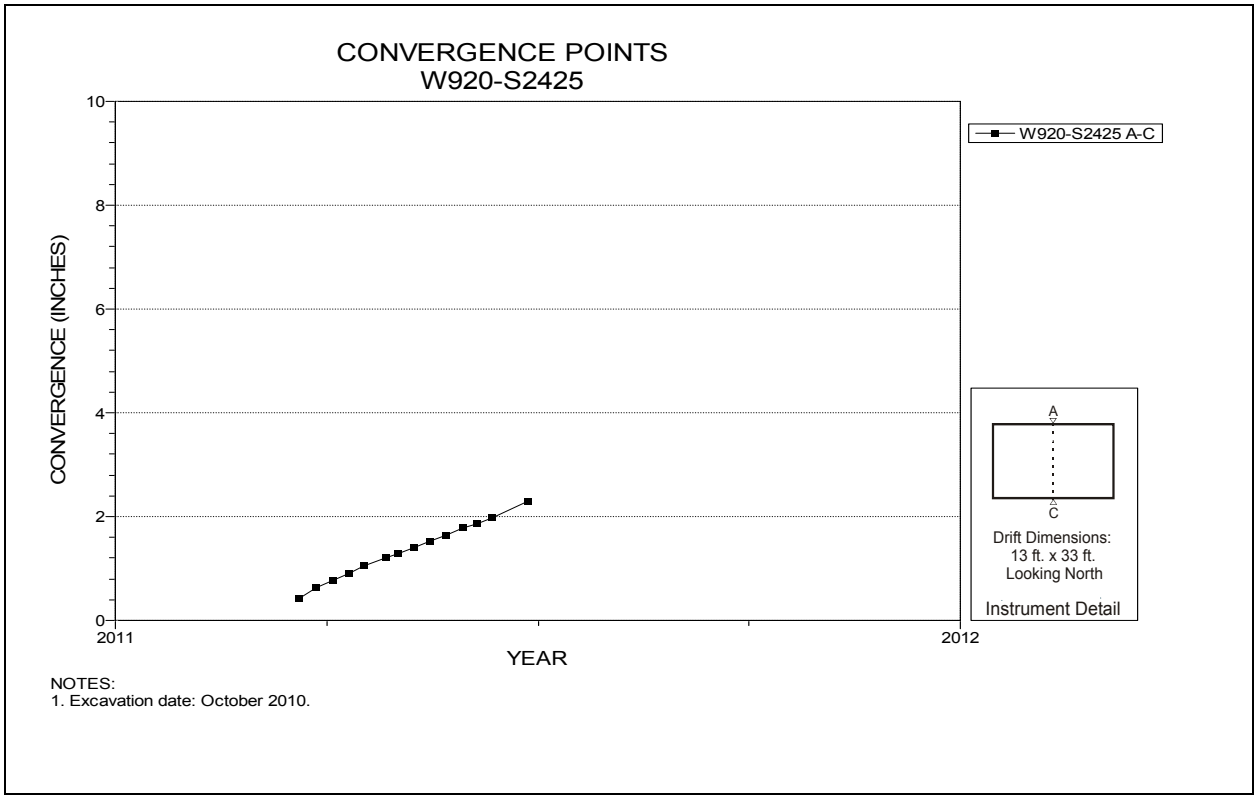


Figure 5-152 Convergence Point Array
Room 5, Panel 7 at W920 S2425 – Roof to Floor

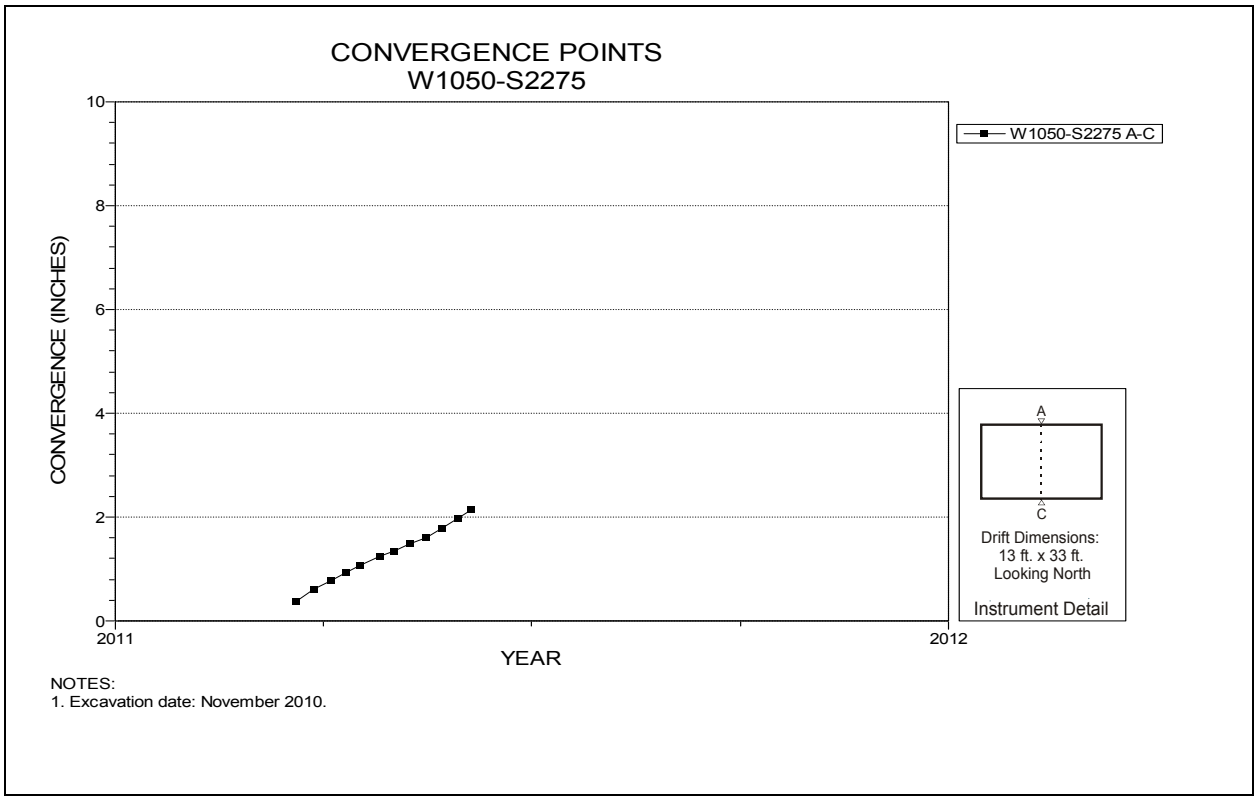


Figure 5-153 Convergence Point Array
Room 6, Panel 7 at W1050 S2275 – Roof to Floor

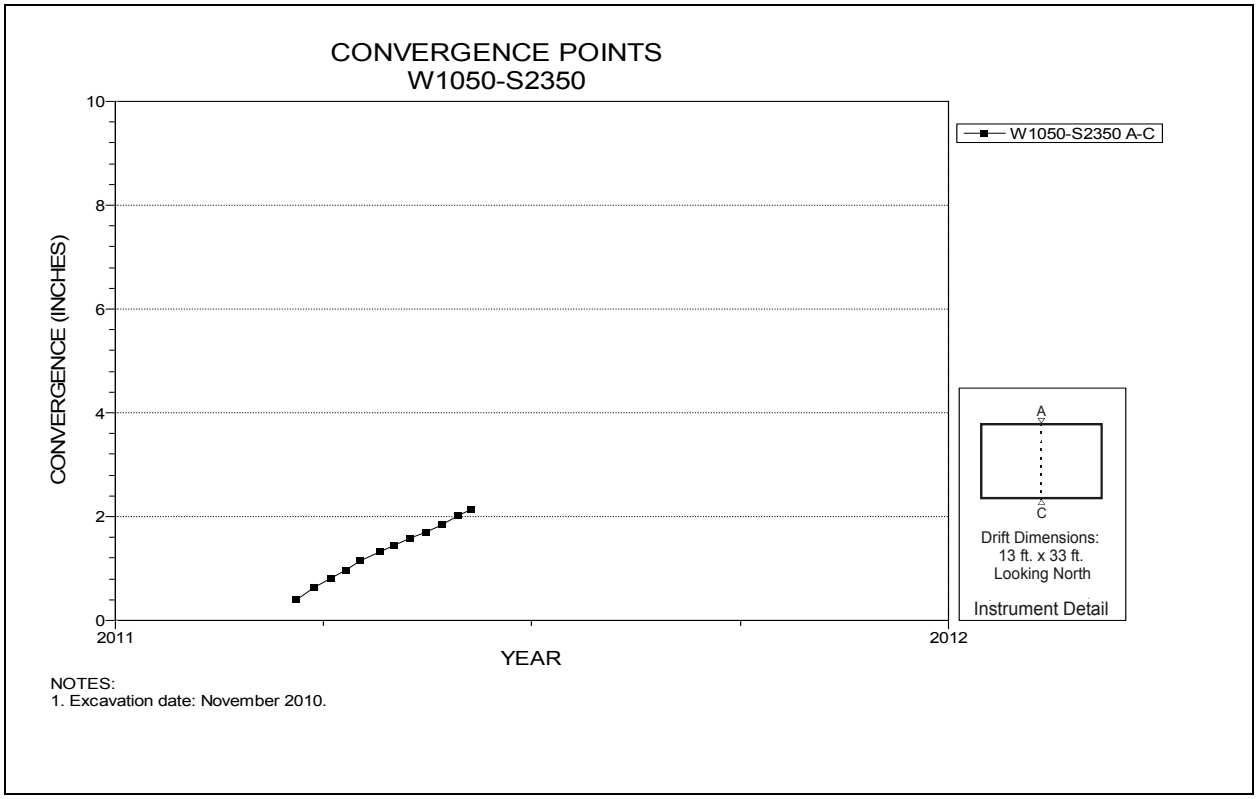


Figure 5-154 Convergence Point Array
Room 6, Panel 7 at W1050 S2350– Room Center – Roof to Floor

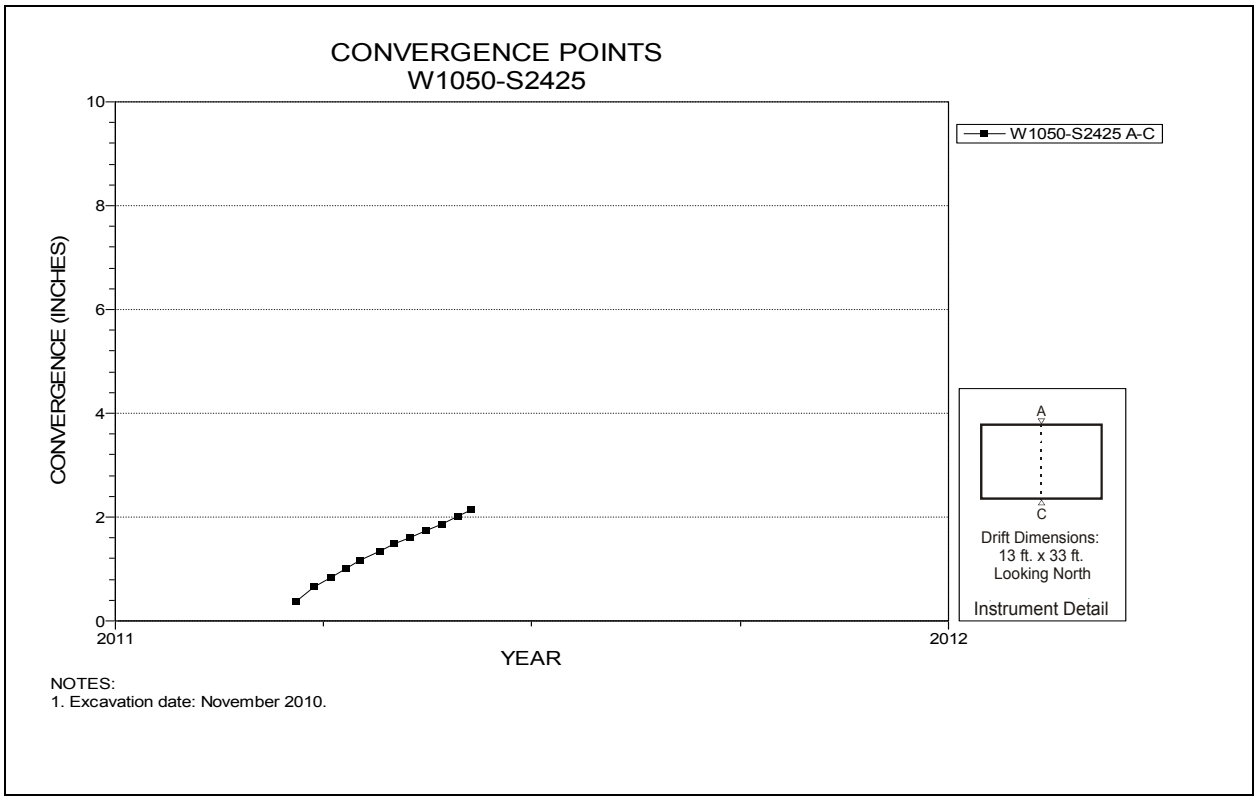


Figure 5-155 Convergence Point Array
Room 6, Panel 7 at W1050 S2425 – Roof to Floor

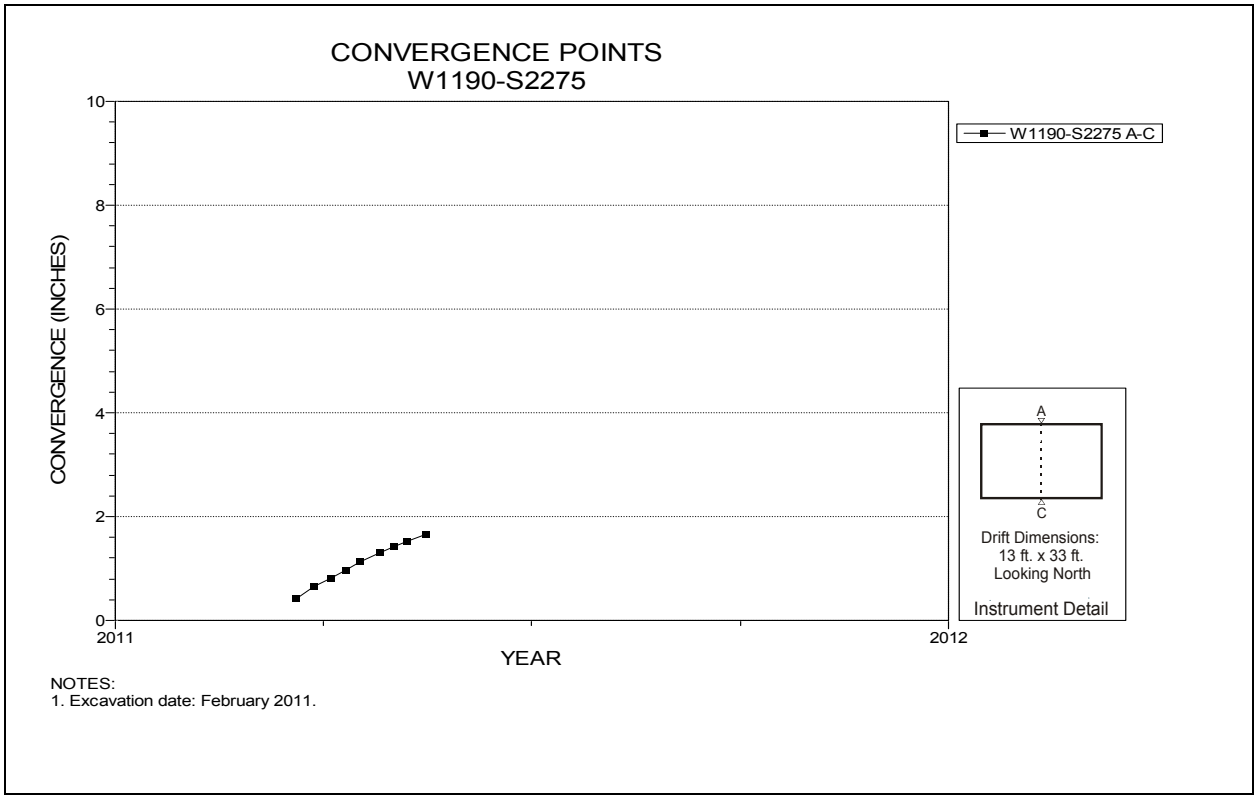


Figure 5-156 Convergence Point Array
Room 7, Panel 7 at W1190 S2275 – Roof to Floor

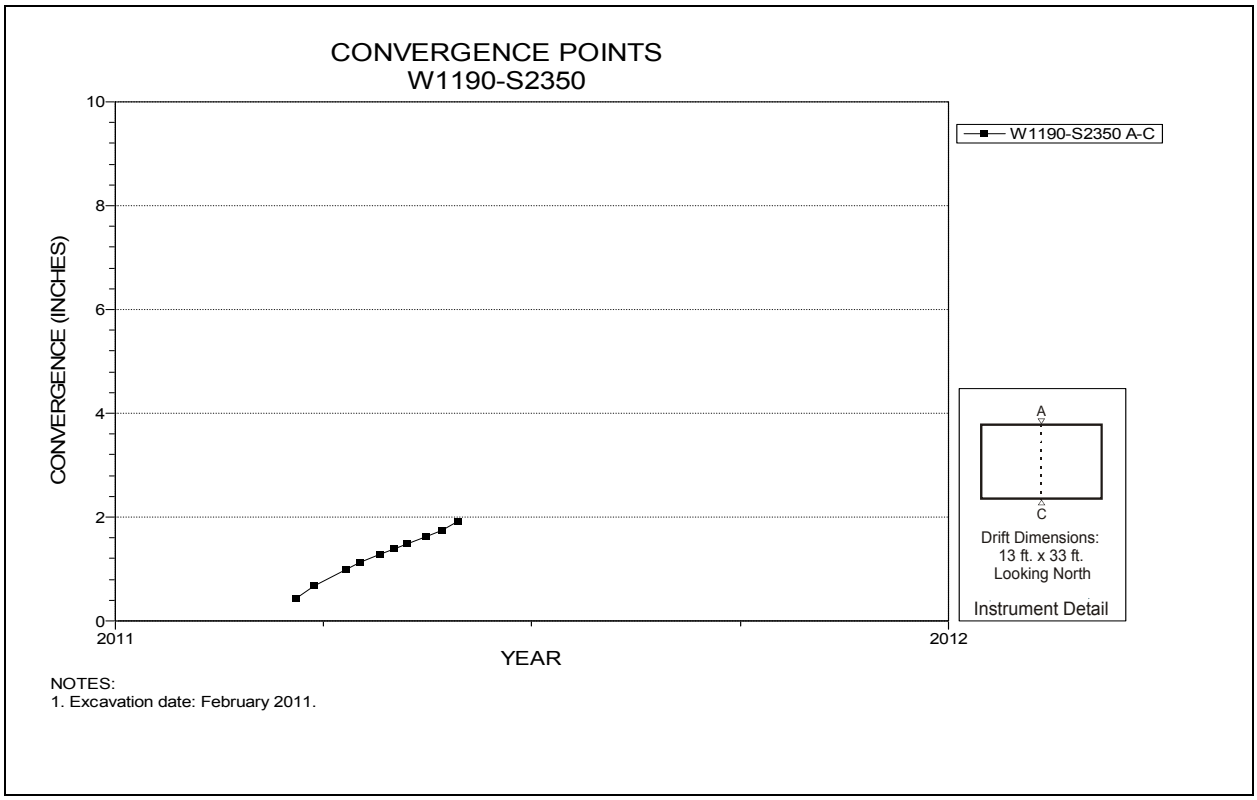


Figure 5-157 Convergence Point Array
Room 7, Panel 7 at W1190 S2350– Room Center – Roof to Floor

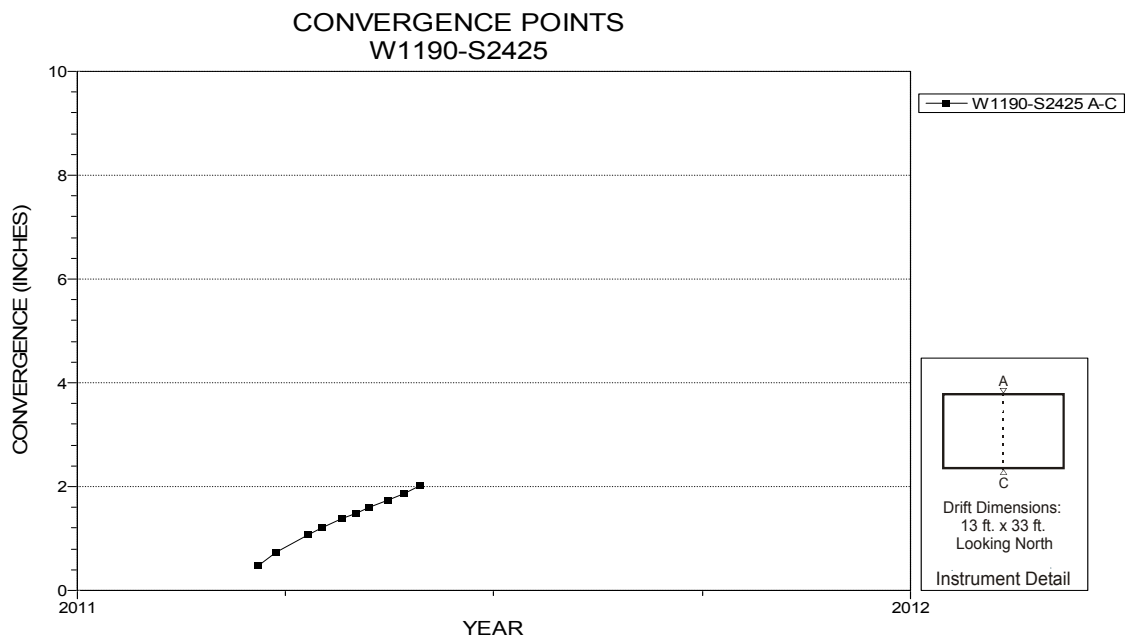


Figure 5-158 Convergence Point Array
Room 7, Panel 7 at W1190 S2425 – Roof to Floor

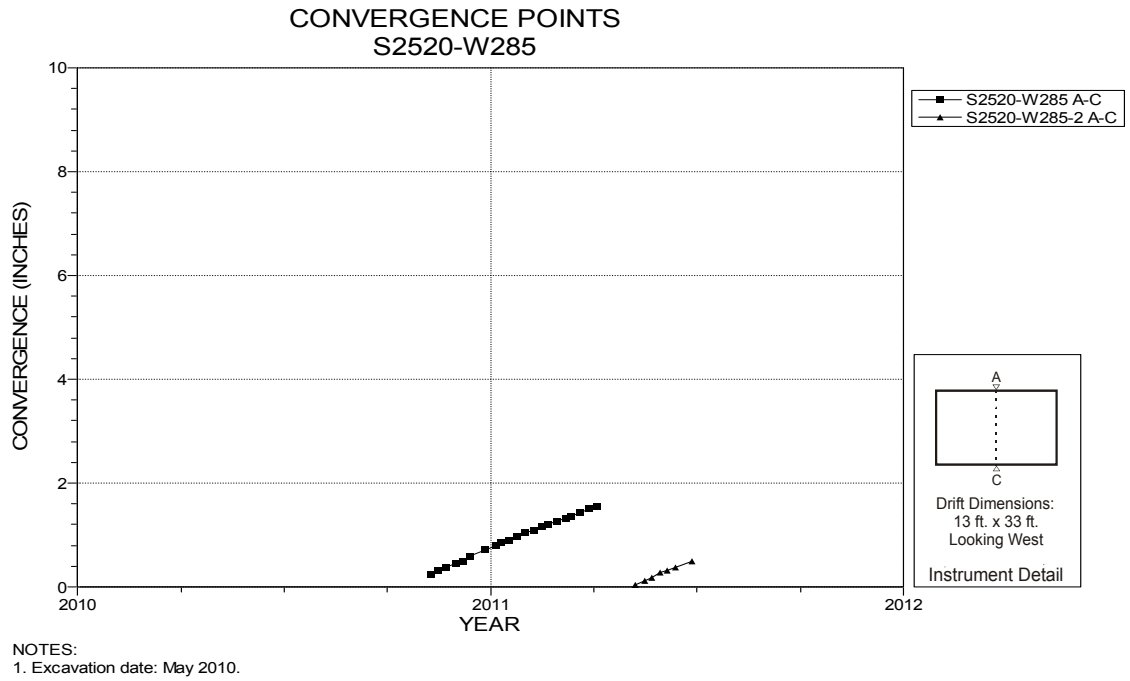


Figure 5-159 Convergence Point Array
S3080 W285 – Roof to Floor

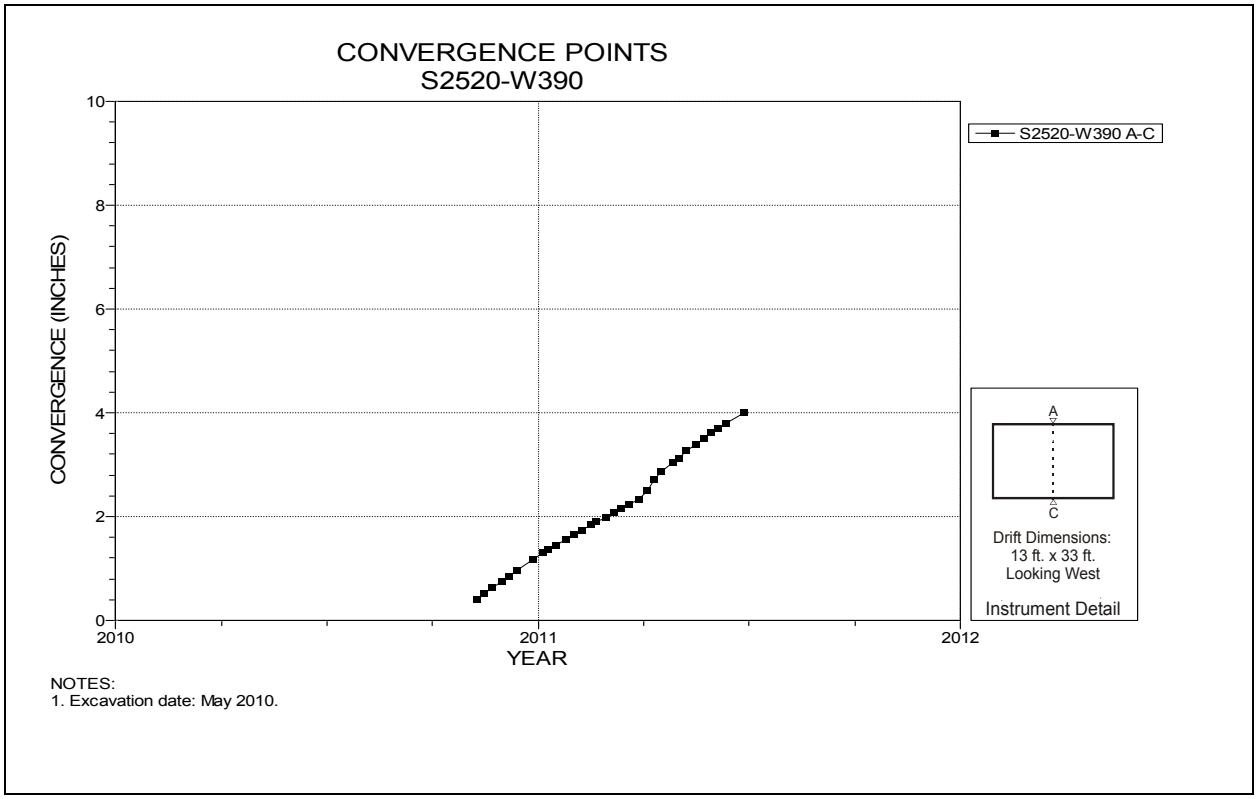


Figure 5-160 Convergence Point Array
S2520 W390 Intersection (Room 1, Panel 7) – Roof to Floor

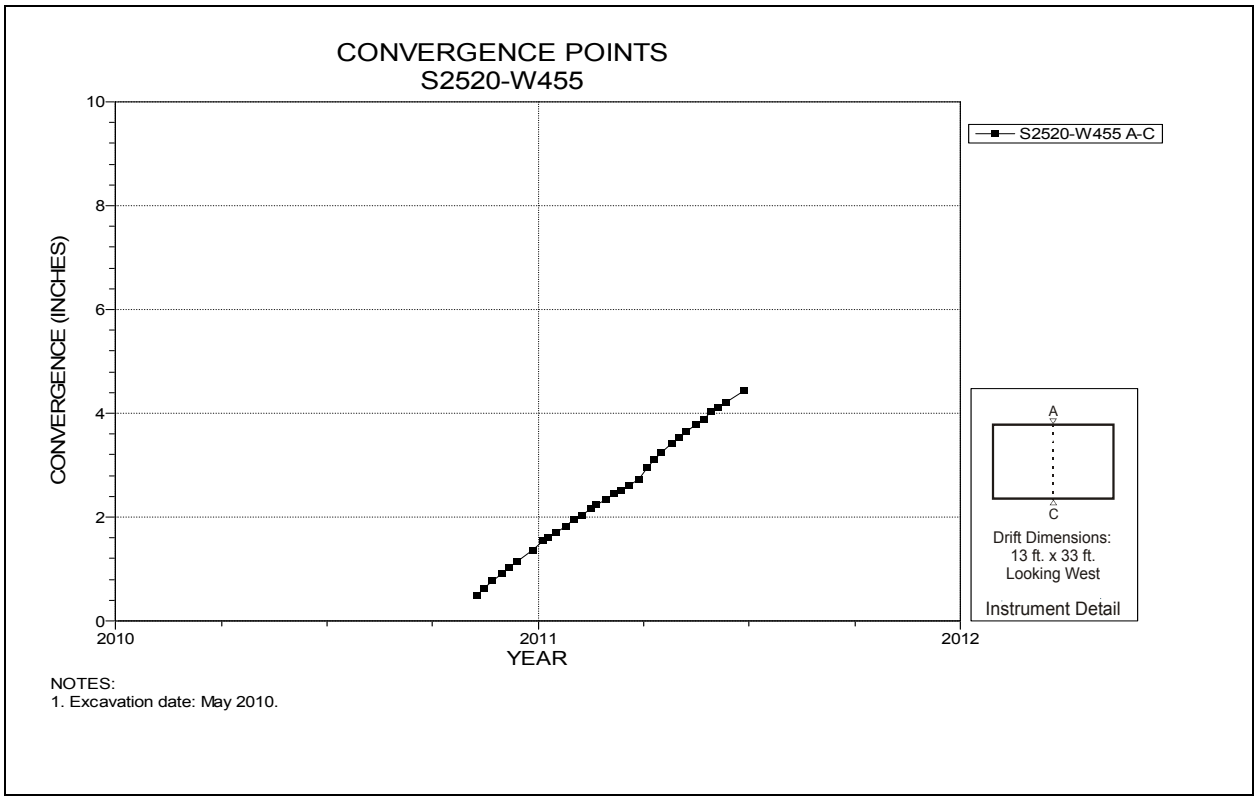


Figure 5-161 Convergence Point Array
S2520 W455 – Roof to Floor

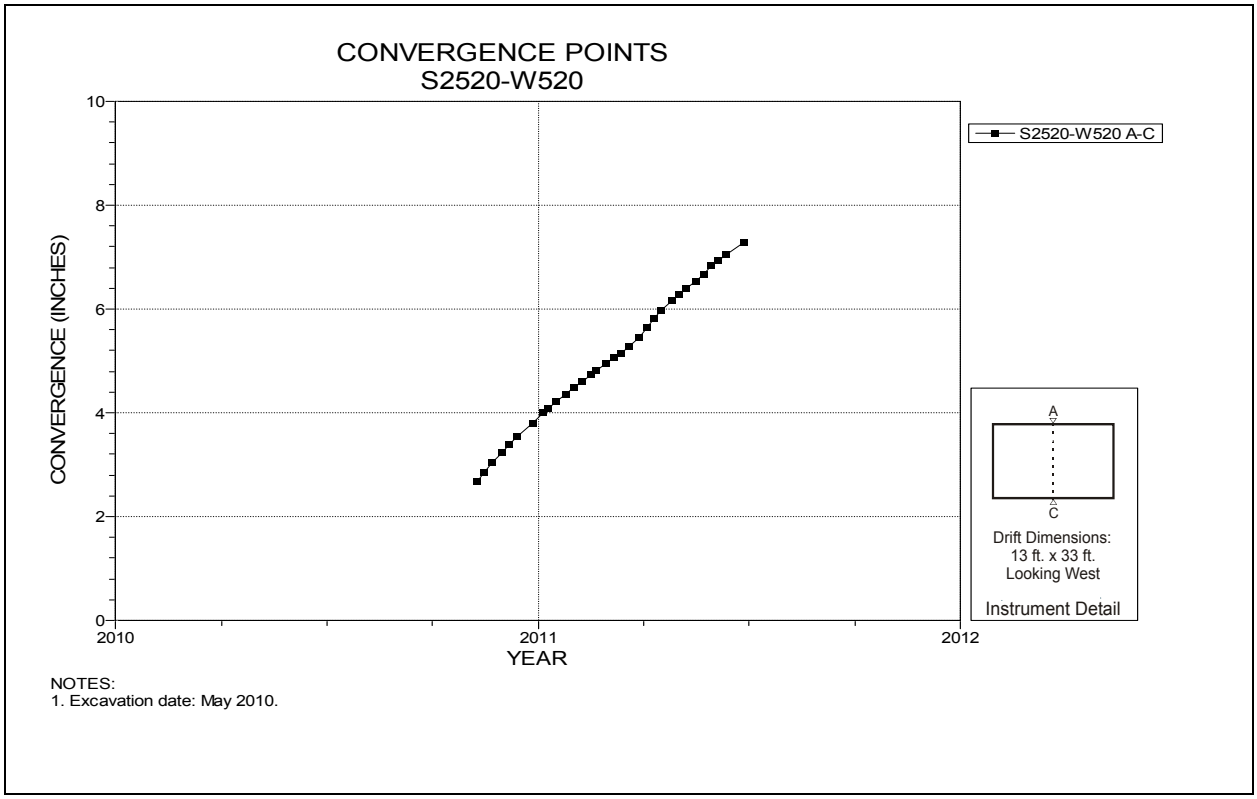


Figure 5-162 Convergence Point Array
S2520 W520 Intersection (Room 2, Panel 7) – Roof to Floor

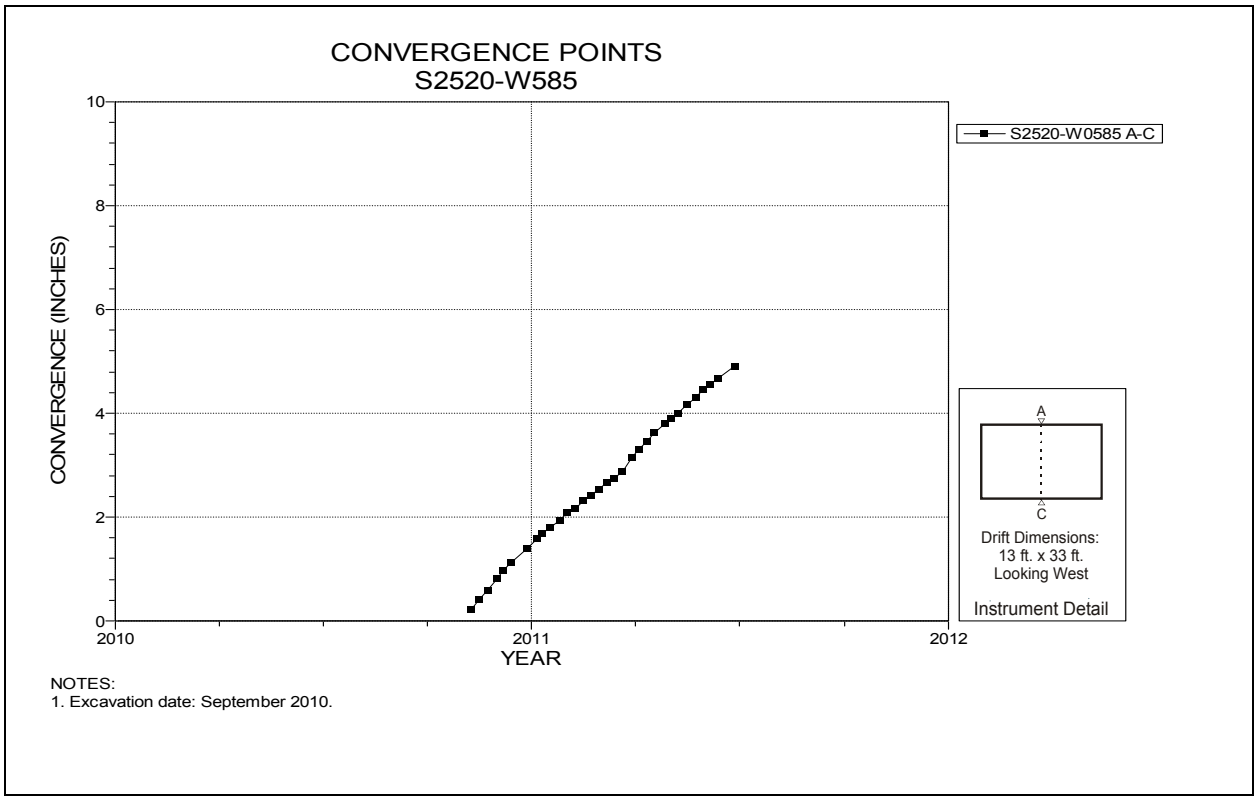


Figure 5-163 Convergence Point Array
S2520 W585 – Roof to Floor

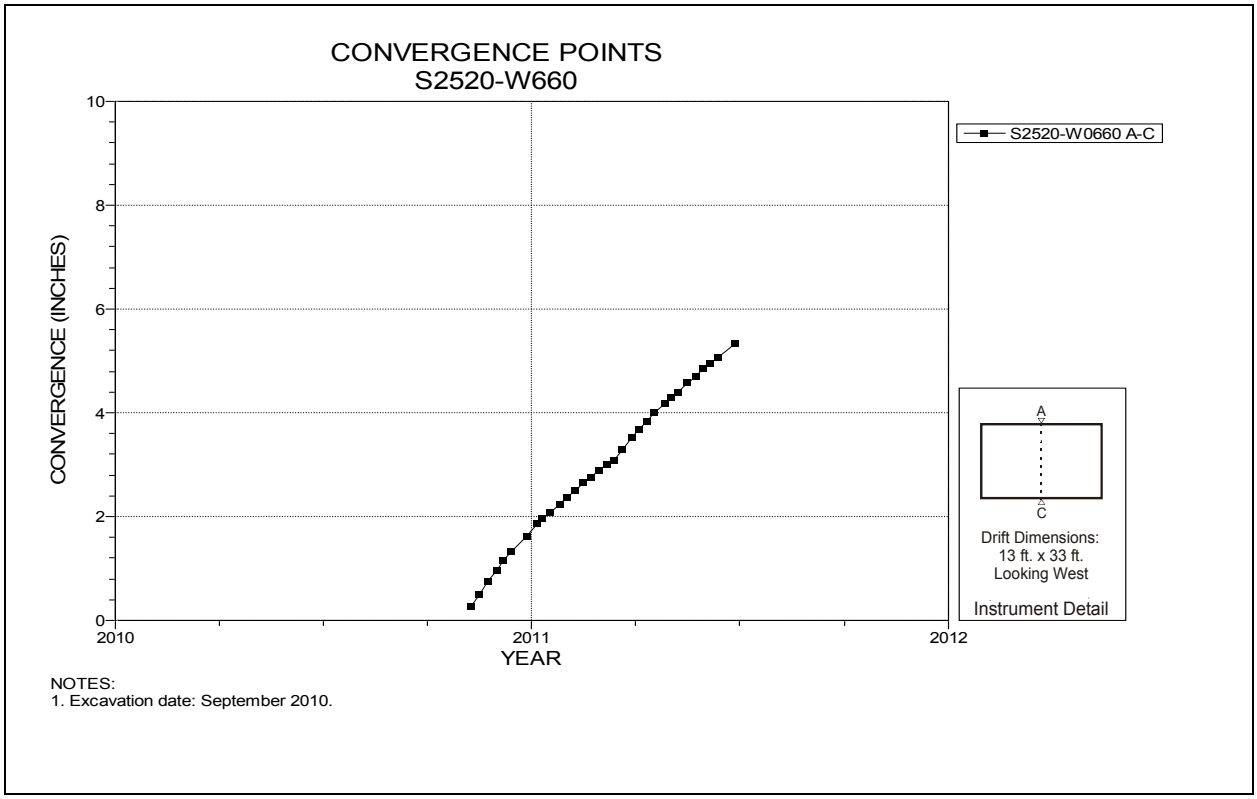


Figure 5-164 Convergence Point Array
S2520 W660 Intersection (Room 3, Panel 7) – Roof to Floor

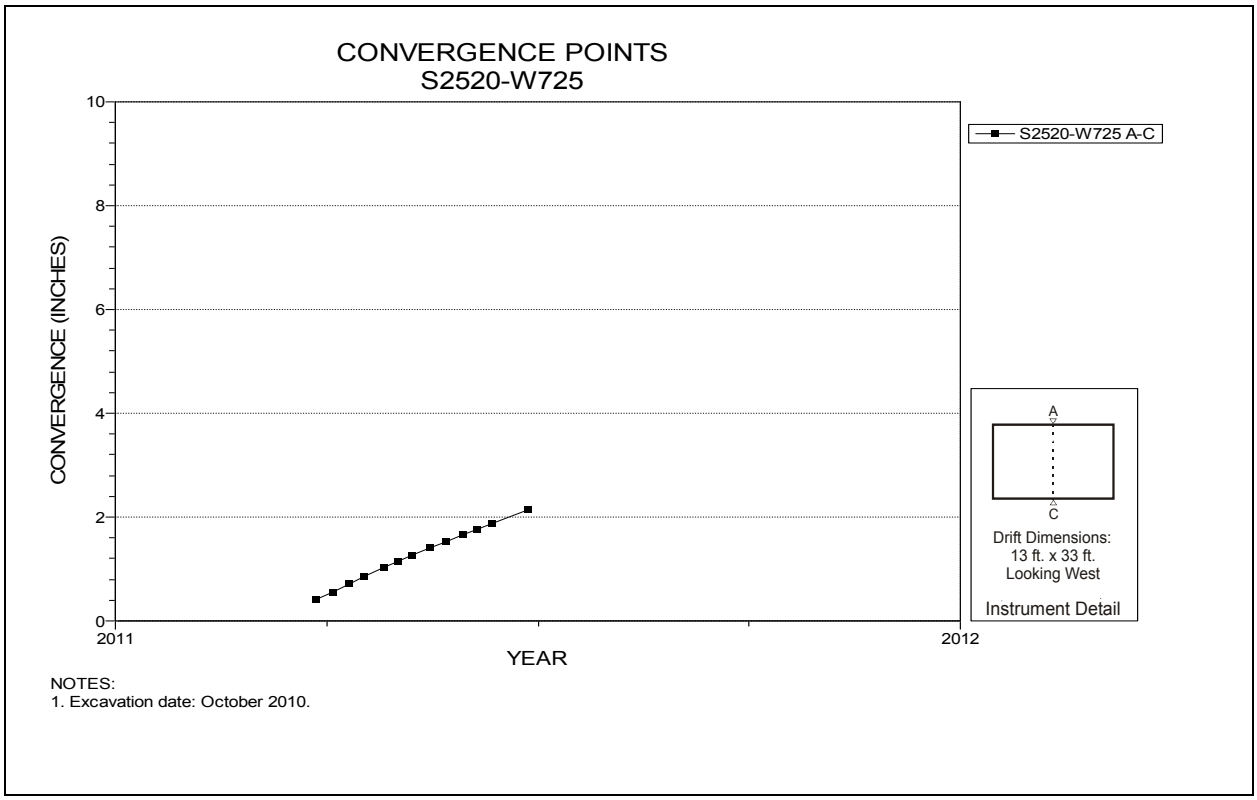


Figure 5-165 Convergence Point Array
S2520 W725 – Roof to Floor

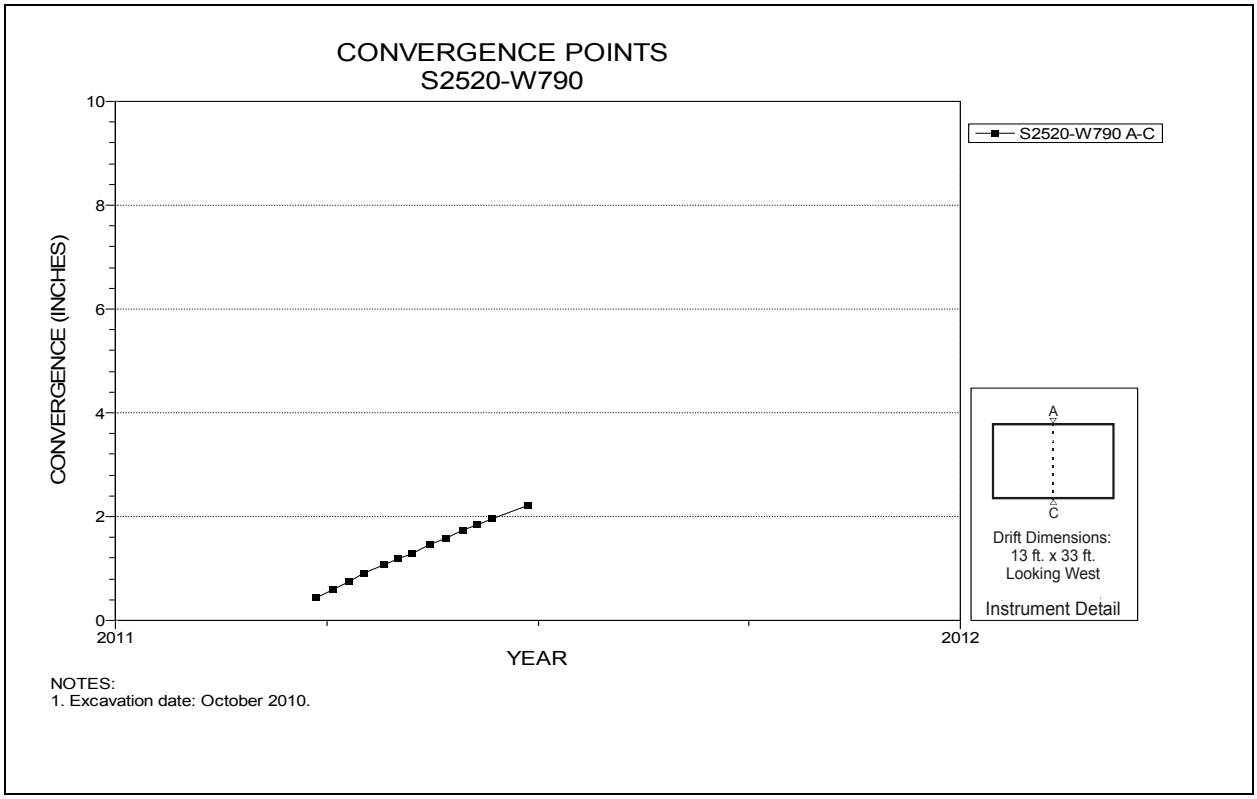


Figure 5-166 Convergence Point Array
S2520 W790 Intersection (Room 4, Panel 7) – Roof to Floor

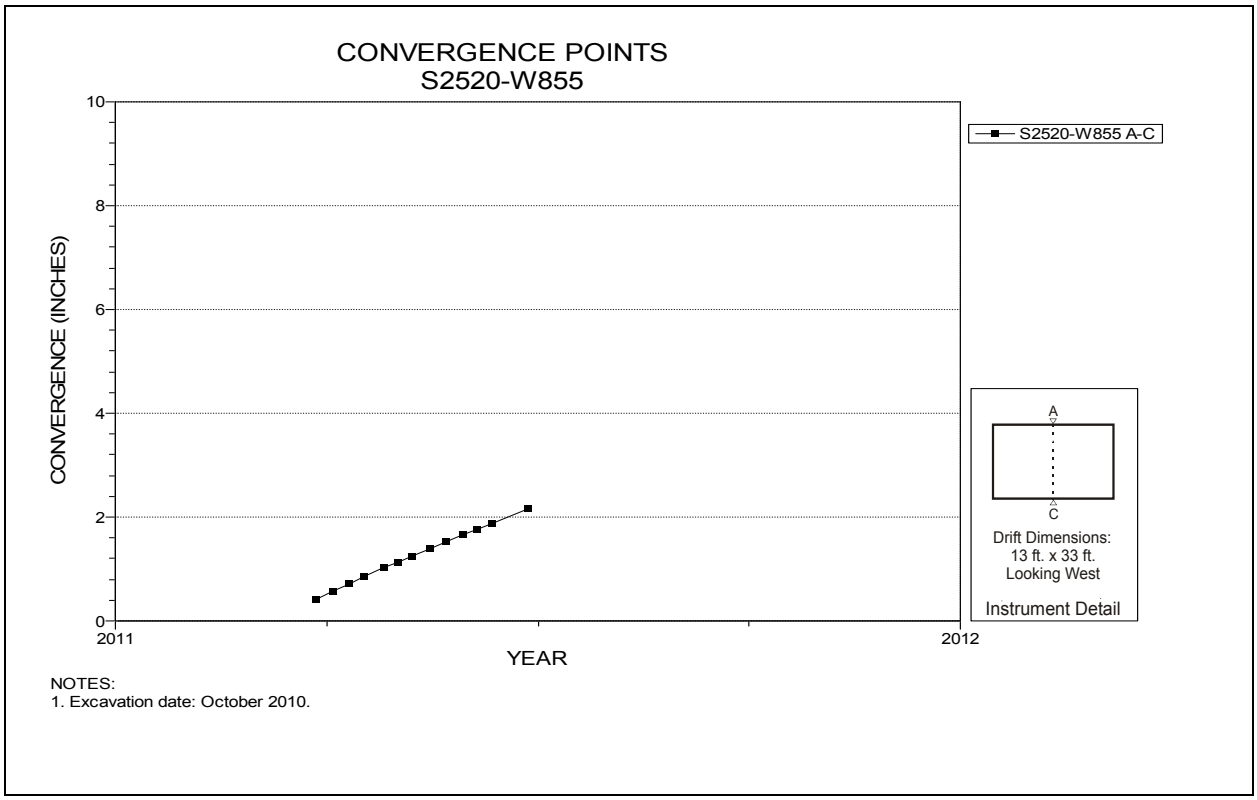


Figure 5-167 Convergence Point Array
S2520 W855 – Roof to Floor

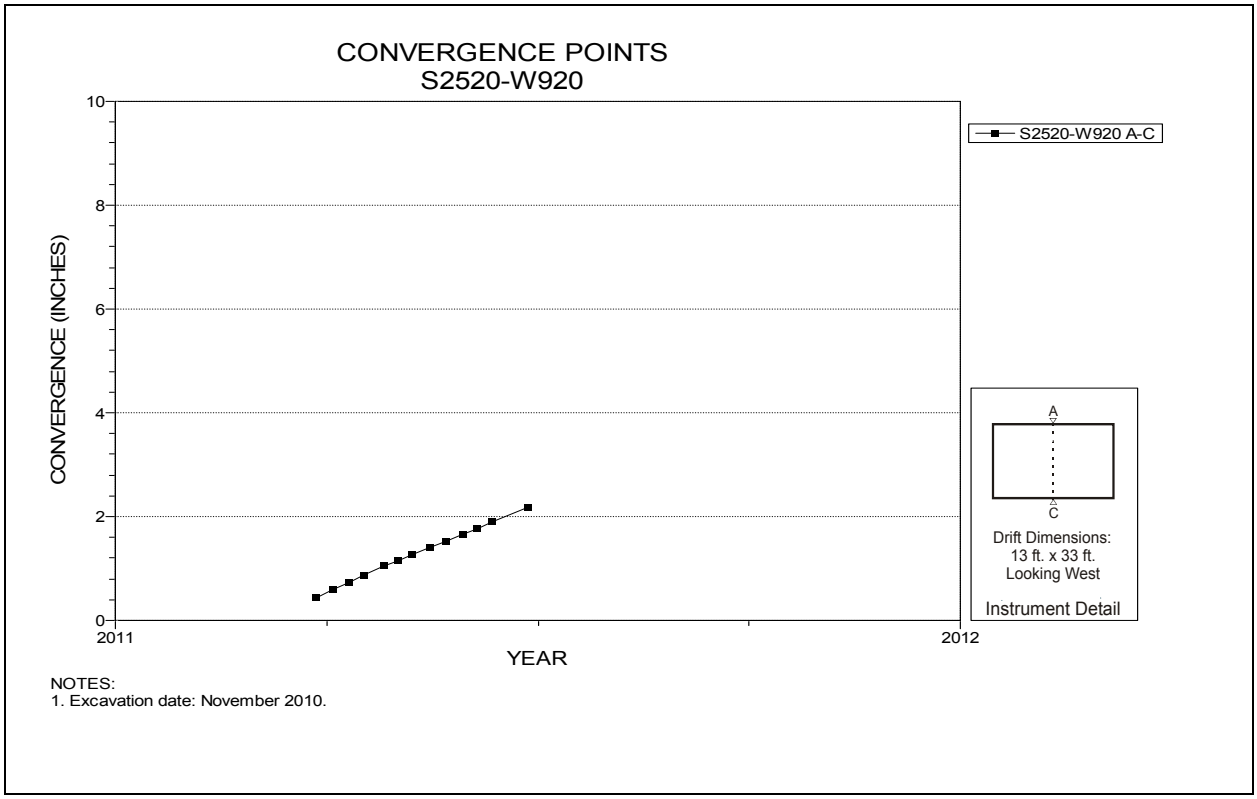


Figure 5-168 Convergence Point Array
S2520 W920 Intersection (Room 5, Panel 7) – Roof to Floor

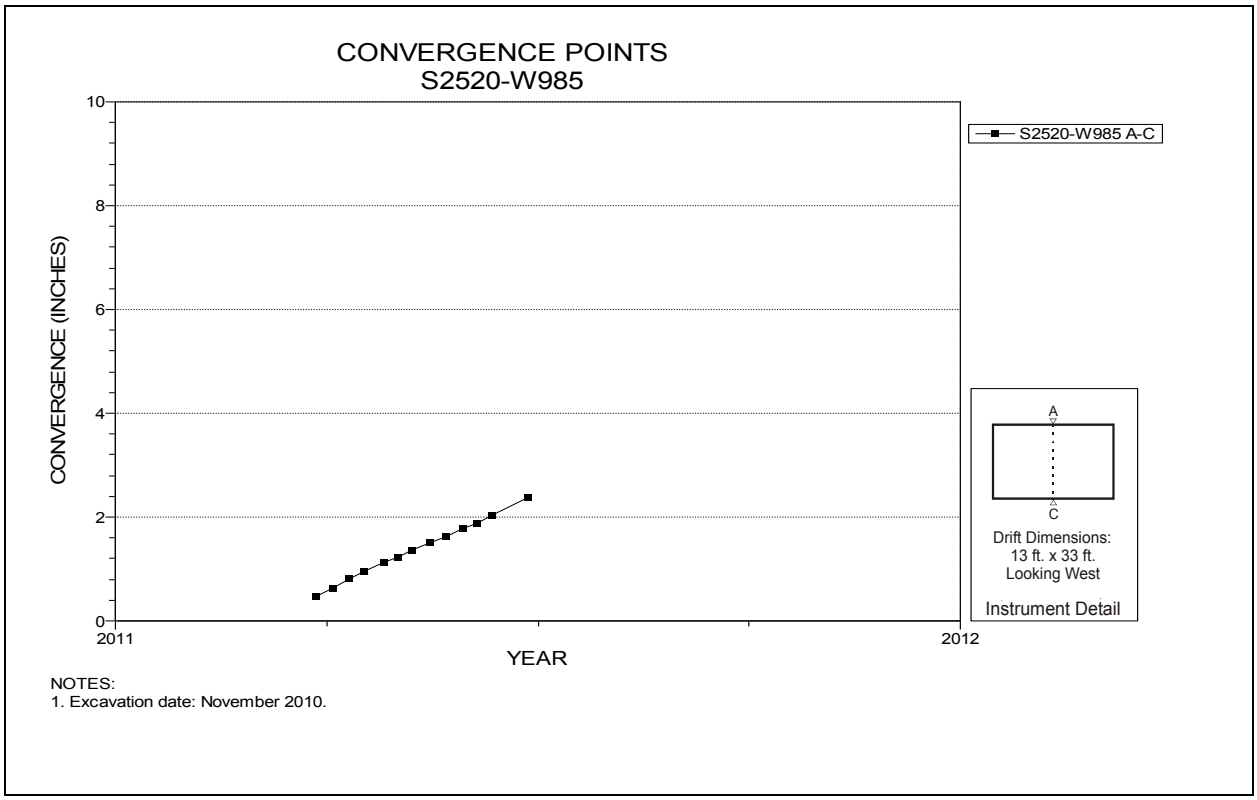


Figure 5-169 Convergence Point Array
S2520 W985 – Roof to Floor

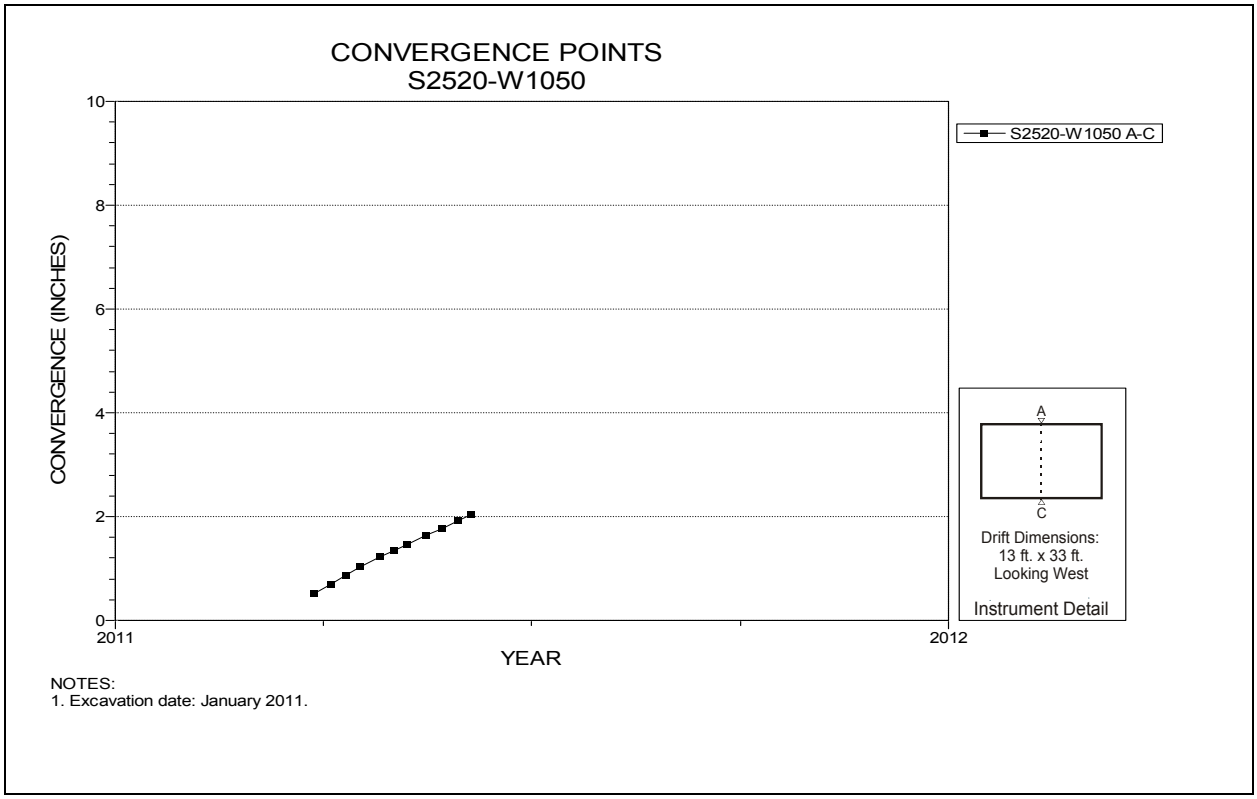


Figure 5-170 Convergence Point Array
S2520 W1050 Intersection (Room 6, Panel 7) – Roof to Floor

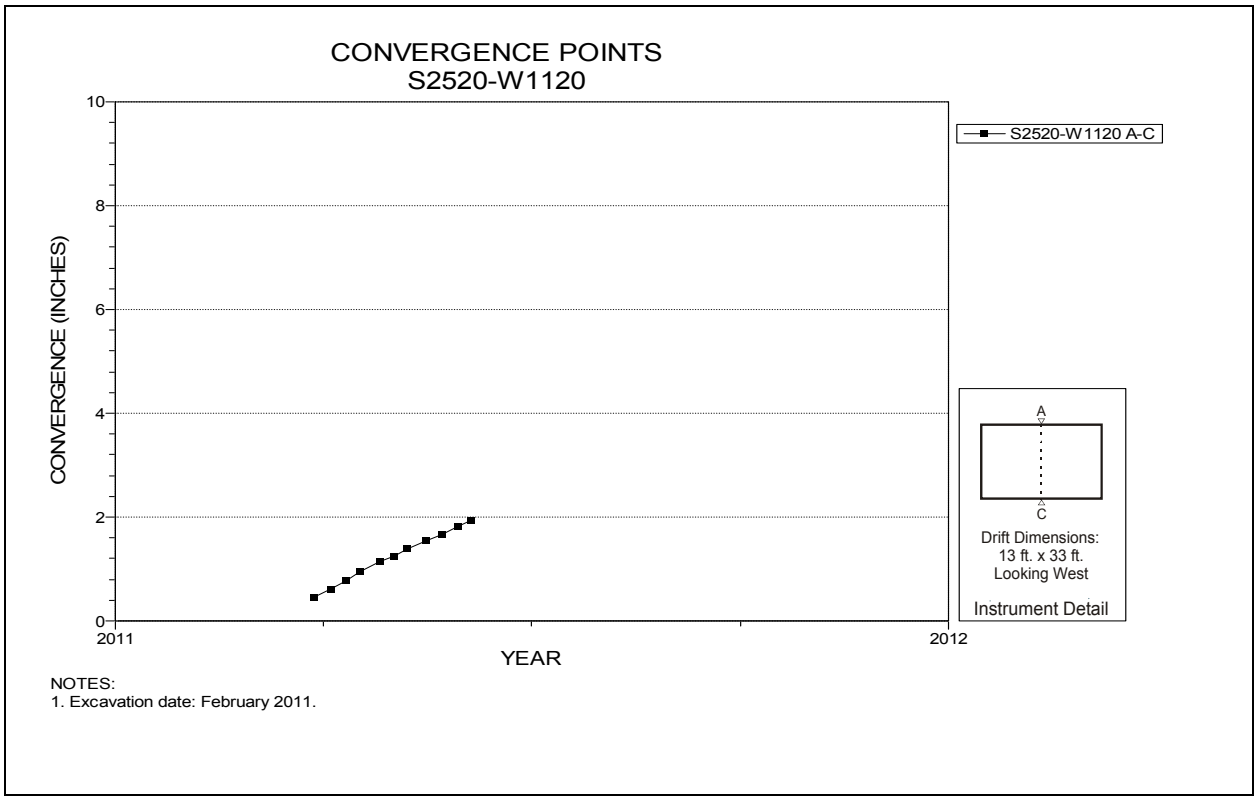


Figure 5-171 Convergence Point Array
S2520 W1120 – Roof to Floor

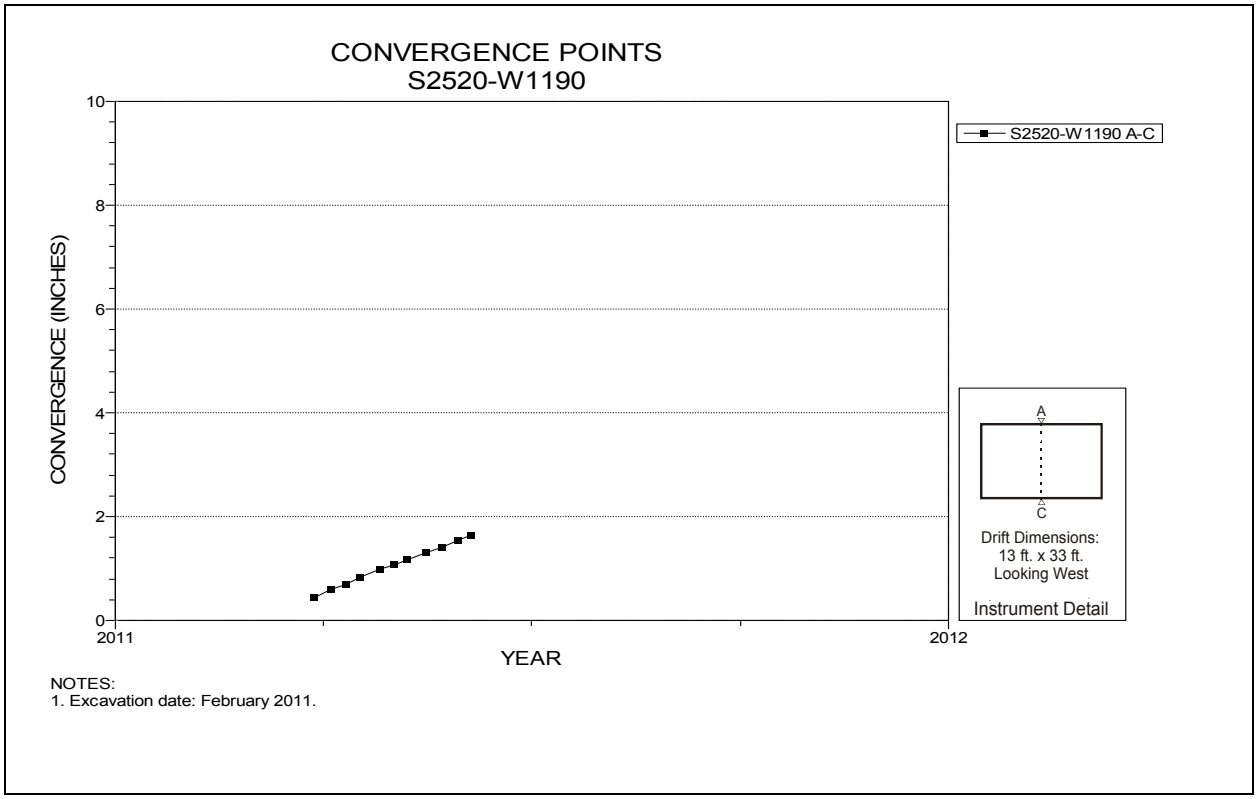


Figure 5-172 Convergence Point Array
S2520 W1190 Intersection (Room 7, Panel 7) – Roof to Floor

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6.0 Instrumentation 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, fracture maps of excavation surfaces, and stratigraphic mapping of new panel excavations.

6.1 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 6-1 presents the observed offset data for boreholes, the observed fractures and fracture zones, and the calculated fracture densities. Table 6-2 is a summary of new boreholes drilled during this reporting period.

6.2 Fracture Mapping

This section presents graphical results of the fracture mapping done in Panel 6 of the Waste Disposal Area. Figures 6-1 through 6-39 are plan view fracture maps for the roof.

6.3 Stratigraphic Mapping

This section presents graphical results of stratigraphic mapping performed in Panel 7 of the Waste Disposal Area. At the time of this report only Room 7 was completed to final as mined. Figure 6-40 is a plan view for the west rib in Room 7.

Table 6-1
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH485	E140-N1400	1/7/04	6/21/11				Separation		1.3	0.13	0.13	S	0.04	0.02
OH485		1/7/04	6/21/11				Separation		1.7	0.13	0.00			
OH485		1/7/04	6/21/11	2		6.3	Hangup	0.3	6.3	0.00	1.50	S	0.50	0.20
OH485		1/7/04	6/21/11				BOH		20.4	0.00	0.00			
OH484	E140-N1265	1/7/04	6/21/11				Separation		1.5	1.00	0.25	W	0.08	0.03
OH484		1/7/04	6/21/11	1		5.3	Separation	0.2	5.3	0.06	0.13	E	0.04	0.02
OH484		1/7/04	6/21/11				Rough Spot		5.8	0.00	0.25	W	0.08	0.03
OH484		1/7/04	6/21/11				Separation		5.9	0.25	0.25	W	0.08	0.03
OH484		1/7/04	6/21/11				BOH		20.5	0.00	0.00			
OH483	E140-N90	1/7/04	6/21/11				Separation		1.3	0.50	1.00	W	0.33	0.13
OH483		1/7/04	6/21/11				Separation		1.4	0.75	0.13	W	0.04	0.02
OH483		1/7/04	6/21/11				Separation		2.5	0.25	0.13	W	0.04	0.02
OH483		1/7/04	6/21/11				Separation		3.3	0.50	0.00			
OH483		1/7/04	6/21/11	4		7.0	Separation	0.6	7.0	0.13	1.75	W	0.58	0.23
OH483		1/7/04	6/21/11				Separation		7.4	0.25	0.00			
OH483		1/7/04	6/21/11				BOH		20.7	0.00	0.00			
OH492	E140-N790	1/9/04	6/21/11	0		6.6	Separation	0.0	6.6	0.25	0.25	W	0.08	0.03
OH492		1/9/04	6/21/11				BOH		20.3	0.00	0.00			

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH521	E140-N90	11/20/04	6/20/11	0		6.8	Separation	0.0	6.8	0.13	0.19	E	0.06	0.03
OH521		11/20/04	6/20/11				Separation		8.1	0.13	0.00			
OH521		11/20/04	6/20/11				Separation		9.1	0.25	0.00			
OH521		11/20/04	6/20/11				Separation		9.9	0.13	0.13	E	0.04	0.02
OH521		11/20/04	6/20/11				BOH		20.3	0.00	0.00			
OH523	E140-S164	11/20/04	6/20/11				Rough Spot		5.5	0.00	0.00			
OH523		11/20/04	6/20/11	0		5.5	Separation	0.0	7.6	0.13	0.00			
OH523		11/20/04	6/20/11				Separation		8.3	0.13	0.00			
OH523		11/20/04	6/20/11				Separation		8.9	0.13	0.00			
OH523		11/20/04	6/20/11				BOH		20.4	0.00	0.00			
OH498-1	E140-N415	3/2/09	3/21/11	0		6.4	Separation	0.0	6.4	0.25	0.13	W	0.04	0.06
OH498-1		3/2/09	3/21/11				Separation		6.6	0.25	0.13	W	0.04	0.06
OH498-1		3/2/09	3/21/11				BOH		12.9	0.00	0.00			
OH499-1	E140-S520	3/2/09	6/7/11				BOH		12.4	0.00	0.00			
OH620	E140-S700	11/17/05	6/7/11				Separation		4.3	0.13	0.00			
OH620		11/17/05	6/7/11				Separation		4.8	0.13	0.00			
OH620		11/17/05	6/7/11	2		5.8	Separation	0.3	5.8	0.50	0.00			
OH620		11/17/05	6/7/11				Separation		6.1	0.13	0.00			
OH620		11/17/05	6/7/11				BOH		16.8	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH874	E140-S850	3/2/09	6/7/11				Separation		3.6	0.13	1.75	W	0.58	0.77
OH874		3/2/09	6/7/11				Separation		3.8	2.50	0.00			
OH874		3/2/09	6/7/11				Separation		4.3	0.13	0.00			
OH874		3/2/09	6/7/11				Separation		4.9	0.13	0.00			
OH874		3/2/09	6/7/11	4		6.3	Separation	0.6	6.3	0.13	0.50	E	0.17	0.22
OH874		3/2/09	6/7/11				Separation		7.1	0.13	1.00	E	0.33	0.44
OH874		3/2/09	6/7/11				Separation		7.2	0.25	0.00			
OH874		3/2/09	6/7/11				BOH		20.1	0.00	0.00			
OH575	E140-S1000	6/16/05	6/7/11				Separation		3.5	0.13	0.00			
OH575		6/16/05	6/7/11				Separation		4.2	2.50	3.00		1.00	0.50
OH873	E140-S1145	3/2/09	6/7/11				Separation		1.1	0.13	2.75	E	0.92	1.21
OH873		3/2/09	6/7/11				Separation		1.7	0.13	0.00			
OH873		3/2/09	6/7/11				Separation		2.5	0.75	0.00			
OH873		3/2/09	6/7/11				Separation		3.0	0.13	0.00			
OH873		3/2/09	6/7/11				Separation		3.7	2.50	0.00			
OH873		3/2/09	6/7/11				Separation		5.1	0.13	0.00			
OH873		3/2/09	6/7/11	6		5.2	Separation	1.2	5.2	1.50	0.00			
OH873		3/2/09	6/7/11				Separation		6.1	0.50	0.00			
OH873		3/2/09	6/7/11				BOH		6.6	0.13	0.00			
OH578	E140-S1300	6/16/05	6/7/11	0		6.7	Separation	0.0	6.7	0.13	0.00			
OH578		6/16/05	6/7/11				BOH		20.3	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH872	E140-S1390	3/2/09	6/7/11				Separation		1.5	0.25	0.13	W	0.04	0.06
OH872		3/2/09	6/7/11				Separation		3.0	0.38	0.13	W	0.04	0.06
OH872		3/2/09	6/7/11	2		5.2	Separation	0.4	5.2	0.13	0.00			
OH872		3/2/09	6/7/11				Separation		6.5	0.13	0.00			
OH872		3/2/09	6/7/11				Separation		7.0	0.13	0.00			
OH872		3/2/09	6/7/11				BOH		21.1	0.00	0.00			
OH580-1	E140-S1463	6/16/05	6/7/11				Separation		0.9	0.13	0.38	W	0.13	0.06
OH580-1		6/16/05	6/7/11				Separation		1.0	0.13	0.13	W	0.04	0.02
OH580-1		6/16/05	6/7/11				Separation		1.6	1.25	0.13	W	0.04	0.02
OH580-1		6/16/05	6/7/11				Separation		2.5	3.00	0.25	W	0.08	0.04
OH580-1		6/16/05	6/7/11				Separation		4.1	0.13	0.00			
OH580-1		6/16/05	6/7/11				Separation		4.3	2.50	0.19	W	0.06	0.03
OH580-1		6/16/05	6/7/11				Separation		4.7	0.13	0.19	W	0.06	0.03
OH580-1		6/16/05	6/7/11	7		5.1	Separation	1.4	5.1	5.00	0.00			
OH580-1		6/16/05	6/7/11				Separation		5.6	0.25	0.00			
OH580-1		6/16/05	6/7/11				Separation		6.4	0.50	0.00			
OH580-1		6/16/05	6/7/11				Separation		7.0	0.25	0.00			
OH580-1		6/16/05	6/7/11				Separation		7.5	0.13	1.25	W	0.42	0.21
OH580-1		6/16/05	6/7/11				BOH		20.4	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH582	E140-S1600	6/16/05	6/7/11	0		6.6	Separation	0.0	6.6	0.25	0.00			
OH582		6/16/05	6/7/11				Separation		6.2	0.13	0.06	E	0.02	0.01
OH582		6/16/05	6/7/11				BOH		20.3	0.00	0.00			
OH871	E140-S1680	3/2/09	6/7/11				Separation		1.1	0.13	0.13	W	0.04	0.06
OH871		3/2/09	6/7/11				Separation		1.7	0.00	0.00			
OH871		3/2/09	6/7/11				Separation		2.7	0.00	0.00			
OH871		3/2/09	6/7/11	3		5.2	Separation	0.6	5.2	0.25	0.50	E	0.17	0.22
OH871		3/2/09	6/7/11				Separation		5.3	4.00	0.75	NW	0.25	0.33
OH871		3/2/09	6/7/11				Separation		6.4	0.75	2.00	W	0.67	0.88
OH871		3/2/09	6/7/11				Separation		6.7	0.38	0.00			
OH871		3/2/09	6/7/11				BOH		20.5	0.00	0.00			
OH143-3	E140-S1782	3/2/09	6/7/11				Separation		1.1	0.13	0.00			
OH143-3		3/2/09	6/7/11				Separation		1.6	0.75	0.38	W	0.13	0.17
OH143-3		3/2/09	6/7/11				Separation		2.6	4.00	0.38	W	0.13	0.17
OH143-3		3/2/09	6/7/11				Separation		4.0	3.00	0.19	NE	0.06	0.08
OH143-3		3/2/09	6/7/11	4		5.2	Separation	0.8	5.2	2.50	0.00			
OH143-3		3/2/09	6/7/11				Separation		5.5	0.13	0.00			
OH143-3		3/2/09	6/7/11				Separation		6.3	0.13	0.00			
OH143-3		3/2/09	6/7/11				BOH		7.1	1.00	3.00		1.00	1.32

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH146-3	E140-S1832	3/2/09	6/7/11				Separation		0.8	0.13	0.00			
OH146-3		3/2/09	6/7/11				Separation		1.4	0.50	0.00			
OH146-3		3/2/09	6/7/11				Separation		2.3	5.50	0.00			
OH146-3		3/2/09	6/7/11				Separation		3.8	2.50	0.25	W	0.08	0.11
OH146-3		3/2/09	6/7/11	4		4.8	Separation	0.8	4.8	6.50	0.50	E	0.17	0.22
OH146-3		3/2/09	6/7/11				Separation		6.5	6.00	0.50	E	0.17	0.22
OH146-3		3/2/09	6/7/11				BOH		7.0	0.00	3.00		1.00	1.32
OH583	E140-S1950	6/16/05	6/7/11				Separation		1.9	0.25	0.25	E	0.08	0.04
OH583		6/16/05	6/7/11				Separation		2.0	0.06	0.00			
OH583		6/16/05	6/7/11				Rough Spot		5.1	0.00	0.13	E	0.04	0.02
OH583		6/16/05	6/7/11				Separation		5.7	0.06	0.25	W	0.08	0.04
OH583		6/16/05	6/7/11	4		6.0	Separation	0.7	6.0	2.00	1.25	E	0.42	0.21
OH583		6/16/05	6/7/11				Separation		6.8	0.13	0.00			
OH583		6/16/05	6/7/11				Rough Spot		7.1	0.00	0.00			
OH583		6/16/05	6/7/11				BOH		20.6	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH474-1	E140-S2000	3/24/09	3/14/11				Separation		1.4	1.50	0.13	E	0.04	0.06
OH474-1		3/24/09	3/14/11				Separation		2.8	1.25	0.00			
OH474-1		3/24/09	3/14/11				Separation		3.2	2.00	0.13	S	0.04	0.06
OH474-1		3/24/09	3/14/11	3		5.3	Separation	0.6	5.3	0.25	0.50	E	0.17	0.25
OH474-1		3/24/09	3/14/11				Separation		5.4	0.25	0.00			
OH474-1		3/24/09	3/14/11				Separation		5.7	0.50	0.00			
OH474-1		3/24/09	3/14/11				Separation		6.2	1.25	0.50	E	0.17	0.25
OH474-1		3/24/09	3/14/11				Separation		6.6	0.25	0.00			
OH474-1		3/24/09	3/14/11				Separation		6.7	0.25	0.00			
OH474-1		3/24/09	3/14/11				Separation		7.0	1.00	0.00			
OH474-1		3/24/09	3/14/11				Separation		7.3	0.25	0.00			
OH474-1		3/24/09	3/14/11				BOH		20.5	0.00	0.00			
OH472-1	E140-S2333	3/1/09	6/7/11				Separation		4.9	0.13	0.00			
OH472-1		3/1/09	6/7/11				Separation		5.3	0.50	0.00			
OH472-1		3/1/09	6/7/11	2		5.9	Separation	0.3	5.9	1.00	0.00			
OH472-1		3/1/09	6/7/11				Separation		6.2	0.75	0.00			
OH472-1		3/1/09	6/7/11				Separation		6.5	0.13	0.00			
OH472-1		3/1/09	6/7/11				BOH		20.2	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH586-1	E140-S2358	3/2/09	6/6/11				Separation		1.4	0.75	0.00			
OH586-1		3/2/09	6/6/11				Separation		2.0	0.25	0.25	E	0.08	0.11
OH586-1		3/2/09	6/6/11				Separation		2.3	0.75	0.50	E	0.17	0.22
OH586-1		3/2/09	6/6/11				Separation		3.6	6.00	0.00			
OH586-1		3/2/09	6/6/11	4		4.6	Separation	0.9	4.6	0.25	3.00		1.00	1.33
OH870	E140-S2456	3/24/09	6/6/11				Separation		1.7	0.25	0.25	W	0.08	0.11
OH870		3/24/09	6/6/11				Separation		3.6	1.50	0.50	W	0.17	0.23
OH870		3/24/09	6/6/11				Separation		5.5	0.25	0.00			
OH870		3/24/09	6/6/11	3		5.9	Separation	0.5	5.9	5.00	0.00			
OH870		3/24/09	6/6/11				Separation		6.4	3.00	0.00			
OH870		3/24/09	6/6/11				Separation		7.1	1.00	2.50	W	0.83	1.13
OH588	E140-S2520	6/16/05	6/6/11				Separation		1.5	0.25	0.25	E	0.08	0.04
OH588		6/16/05	6/6/11				Separation		2.1	0.13	2.50	E	0.83	0.42
OH588		6/16/05	6/6/11	2		5.4	Separation	0.4	5.4	0.00	0.00			
OH468-1	E140-S2640	3/1/09	6/6/11				Separation		0.9	1.00	0.00			
OH468-1		3/1/09	6/6/11				Separation		1.7	2.00	0.25	E	0.08	0.11
OH468-1		3/1/09	6/6/11				Separation		2.4	3.00	0.25	E	0.08	0.11
OH468-1		3/1/09	6/6/11				Separation		4.7	1.50	0.25	E	0.08	0.11
OH468-1		3/1/09	6/6/11				Separation		5.0	0.25	0.50	E	0.17	0.22
OH468-1		3/1/09	6/6/11	5		5.6	Separation	0.9	5.6	0.50	1.00	E	0.33	0.44
OH468-1		3/1/09	6/6/11				Separation		5.7	0.50	0.00			
OH468-1		3/1/09	6/6/11				Separation		6.5	1.00	0.00			
OH468-1		3/1/09	6/6/11				Separation		20.6	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH589-1	E140-S2750	3/15/09	6/6/11	0		5.1	Separation	0.0	5.1	0.25	0.25	S	0.08	0.11
OH589-1		3/15/09	6/6/11				Separation		5.6	0.50	0.00			
OH589-1		3/15/09	6/6/11				Separation		6.8	0.75	0.00			
OH589-1		3/15/09	6/6/11				Separation		7.7	1.00	0.25	NE	0.08	0.11
OH589-1		3/15/09	6/6/11				BOH		20.3	0.00	0.00			
OH500-1	E140-S2920	3/15/09	3/14/11				Separation		1.0	0.50	2.00	E	0.67	1.00
OH500-1		3/15/09	3/14/11				Separation		2.0	0.75	1.00	E	0.33	0.50
OH500-1		3/15/09	3/14/11				Separation		4.6	0.13	0.00			
OH500-1		3/15/09	3/14/11	3		5.6	Separation	0.5	5.6	2.50	0.00			
OH500-1		3/15/09	3/14/11				Separation		5.3	0.13	0.00			
OH500-1		3/15/09	3/14/11				Separation		5.9	0.38	0.00			
OH500-1		3/15/09	3/14/11				BOH		6.4	0.00	3.00		1.00	1.50
OH501-1		3/15/09	3/14/11				Separation		0.8	1.50	0.19	E	0.06	0.09
OH501-1	E140-S2984	3/15/09	3/14/11				Separation		1.7	3.00	0.19	E	0.06	0.09
OH501-1		3/15/09	3/14/11				Separation		4.8	0.25	0.00			
OH501-1		3/15/09	3/14/11				Separation		5.4	2.00	0.00			
OH501-1		3/15/09	3/14/11	4		5.3	Separation	0.8	5.6	1.50	0.00			
OH501-1		3/15/09	3/14/11				BOH		5.8	0.00	3.00		1.00	1.50

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH590-1	E140-S3080	3/15/09	6/6/11				Separation		0.3	0.25	0.00			
OH590-1		3/15/09	6/6/11				Separation		1.4	0.25	0.25	SE	0.08	0.11
OH590-1		3/15/09	6/6/11				Separation		1.5	0.25	0.00			
OH590-1		3/15/09	6/6/11	3		5.4	Separation	0.6	5.4	0.25	0.50	E	0.17	0.22
OH590-1		3/15/09	6/6/11				Separation		5.6	0.13	0.00			
OH590-1		3/15/09	6/6/11				Separation		5.7	0.25	0.50	W	0.17	0.22
OH590-1		3/15/09	6/6/11				Separation		7.0	0.13	0.00			
OH590-1		3/15/09	6/6/11				BOH		20.2	0.00	0.00			
OH493-1	E140-S3180	3/15/09	6/6/11				Separation		1.0	0.25	0.00			
OH493-1		3/15/09	6/6/11				Separation		1.1	4.50	0.00			
OH493-1		3/15/09	6/6/11	2		5.4	Separation	0.4	5.4	0.50	1.25	E	0.42	0.56
OH493-1		3/15/09	6/6/11				Separation		5.7	1.50	0.50	NW	0.17	0.22
OH493-1		3/15/09	6/6/11				Separation		6.6	0.25	0.00			
OH493-1		3/15/09	6/6/11				Separation		8.2	0.25	0.00			
OH493-1		3/15/09	6/6/11				BOH		20.3	0.00	0.00			
OH605-1	E140-S3380	3/15/09	6/8/11				Separation		1.2	0.50	0.00			
OH605-1		3/15/09	6/8/11				Separation		2.0	2.50	0.00			
OH605-1		3/15/09	6/8/11				Separation		3.8	0.50	0.00			
OH605-1		3/15/09	6/8/11	3		4.7	Separation	0.6	4.7	0.25	2.00	E	0.67	0.90
OH605-1		3/15/09	6/8/11				BOH		20.4	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH606-1	E140-E3480	3/15/09	6/6/11				Separation		0.3	0.50	0.00			
OH606-1		3/15/09	6/6/11				Separation		4.3	0.25	1.50	W	0.50	0.67
OH606-1		3/15/09	6/6/11	3		4.5	Separation	0.7	4.5	0.50	0.25	NW	0.08	0.11
OH606-1		3/15/09	6/6/11				BOH		20.6	0.00	0.00			
OH571	E140-S3527	2/19/05	6/6/11				Separation		4.3	0.25	0.00			
OH571		2/19/05	6/6/11	1		4.4	Separation	0.2	4.4	0.25	0.38	E	0.13	0.06
OH571		2/19/05	6/6/11				Separation		5.0	0.50	0.25	E	0.08	0.04
OH571		2/19/05	6/6/11				Separation		5.3	0.25	1.00	W	0.33	0.16
OH571		2/19/05	6/6/11				BOH		20.9	0.00	0.00			
OH607	E140-S3580	9/1/05	6/6/11				Separation		0.8	0.13	0.25	E	0.08	0.04
OH607		9/1/05	6/6/11				Separation		1.0	0.13	0.00			
OH607		9/1/05	6/6/11				Separation		4.0	0.13	0.00			
OH607		9/1/05	6/6/11				Separation		5.2	0.25	0.00			
OH607		9/1/05	6/6/11				Separation		5.3	0.25	0.00			
OH607		9/1/05	6/6/11	5		5.4	Separation	0.9	5.4	0.25	0.25	N	0.08	0.04
OH607		9/1/05	6/6/11				Separation		7.0	1.00	0.00			
OH607		9/1/05	6/6/11				BOH		21.0	0.00	0.00			
OH567	E140-S3650	2/19/05	3/8/11	0		5.2	Separation	0.0	5.2	0.25	2.00	N	0.67	0.33
OH567		2/19/05	3/8/11				Separation		6.5	0.50	1.00	N	0.33	0.17

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH860	E0-N1266	3/8/09	6/21/11				Separation		1.5	2.50	0.00			
OH860		3/8/09	6/21/11	1		6.7	Separation	0.1	3.0	3.00	0.00			
OH860		3/8/09	6/21/11				Separation		6.7	0.25	0.00			
OH860		3/8/09	6/21/11				Separation		6.9	0.50	0.00			
OH860		3/8/09	6/21/11				Separation		7.3	0.13	0.00			
OH488	E0-N1100	1/7/04	6/21/11				Separation		1.1	0.75	0.13	S	0.04	0.02
OH488		1/7/04	6/21/11	1		6.0	Separation	0.2	6.0	0.50	0.25	SW	0.08	0.03
OH488		1/7/04	6/21/11				Separation		6.5	0.13	0.25	W	0.08	0.03
OH488		1/7/04	6/21/11				BOH		20.3	0.00	0.00			
OH859	E0-N920	3/8/09	6/21/11				Separation		1.0	0.75	0.00			
OH859		3/8/09	6/21/11	1		6.3	Separation	0.2	6.3	0.13	0.00			
OH859		3/8/09	6/21/11				BOH		20.2	0.00	0.00			
OH490	E0-N780	1/9/04	6/21/11				Separation		0.7	0.13	0.13	E	0.04	0.02
OH490		1/9/04	6/21/11				Separation		1.3	0.13	0.13	E	0.04	0.02
OH490		1/9/04	6/21/11				Separation		2.0	0.25	0.13	E	0.04	0.02
OH490	E0-N780	1/9/04	6/21/11	3		6.0	Rough Spot	0.5	6.0	0.00	1.00	E	0.33	0.13
OH490		1/9/04	6/21/11				Separation		6.2	0.13	1.00	E	0.33	0.13
OH490		1/9/04	6/21/11				Separation		6.6	0.06	0.00			
OH490		1/9/04	6/21/11				BOH		20.4	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH888	W30-S700	3/8/09	6/13/11	0		8.4	Separation	0.0	8.4	0.25	0.00			
OH888		3/8/09	6/13/11				BOH		20.1	0.00	0.00			
OH887	W30-S870	3/10/09	6/13/11	N/A			Separation		1.7	0.25	0.00			
OH887		3/10/09	6/13/11				BOH		20.0	0.00	0.00			
OH886	W30-S1000	3/3/09	6/13/11	0		8.7	Separation	0.0	8.7	0.25	0.25	SW	0.08	0.11
OH886		3/3/09	6/13/11				BOH		20.0	0.00	0.00			
OH885	W30-S1150	3/3/09	6/13/11				Separation		0.5	0.25	0.13	SW	0.04	0.05
OH885		3/3/09	6/13/11				Separation		0.7	0.25	0.13	W	0.04	0.05
OH885		3/3/09	6/13/11				Separation		1.4	0.25	0.13	W	0.04	0.05
OH885		3/3/09	6/13/11				Separation		2.0	0.50	0.50	W	0.17	0.22
OH885		3/3/09	6/13/11	4		6.1	Separation		6.1	0.50	0.50	W	0.17	0.22
OH885		3/3/09	6/13/11				BOH		20.2	0.00	0.00			
OH884	W30-S1300	3/3/09	6/13/11				Separation		0.7	0.25	0.00			
OH884		3/3/09	6/13/11	1		8.4	Hangup	0.1	8.4	0.00	0.00			
OH884		3/3/09	6/13/11				BOH		20.1	0.00	0.00			
OH883	W30-S1485	3/3/09	6/14/11				BOH		20.2	0.00	0.00			
OH882	W30-S1600	3/3/09	6/14/11	0		7.8	Separation	0.0	7.8	0.25	0.00			
OH882		3/3/09	6/14/11				BOH		20.0	0.00	0.00			
OH881	S30-S1780	3/3/09	6/14/11				BOH		20.5	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH880	S30-S1950	3/3/09	6/14/11	0		8.2	Separation	0.0	8.2	0.13	0.00			
OH880		3/3/09	6/14/11				BOH		20.9	0.00	0.00			
OH879	W30-S2060	3/3/09	6/15/11				BOH		20.1	0.00	0.00			
OH877	W30-S2350	3/11/09	6/14/11				Separation		0.7	0.38	0.00			
OH877		3/11/09	6/14/11	1		7.9	Separation	0.1	7.9	0.13	0.00			
OH877		3/11/09	6/14/11				BOH		20.1	0.00	0.00			
OH876	W30-S2520	3/2/09	6/14/11				Separation		0.6	0.13	0.00			
OH876		3/2/09	6/14/11	1		7.1	Rough Spot	0.1	7.1	0.00	0.00			
OH876		3/2/09	6/14/11				BOH		17.8	0.00	0.00			
OH875	W30-S2750	3/2/09	6/14/11				Rough Spot		4.9	0.00	0.00			
OH875		3/2/09	6/14/11	1		5.6	Separation	0.2	5.6	0.13	0.13	S	0.04	0.05
OH875		3/2/09	6/14/11				Separation		5.8	0.13	0.19	S	0.06	0.08
OH875		3/2/09	6/14/11				Separation		6.0	0.13	0.00			
OH875		3/2/09	6/14/11				Separation		6.4	0.13	0.00			
OH875		3/2/09	6/14/11				Rough Spot		7.0	0.00	0.00			
OH875		3/2/09	6/14/11				Separation		7.4	0.13	0.00			
OH875		3/2/09	6/14/11				BOH		20.2	0.00	0.00			
OH455	W30-S2850	8/1/03	5/31/11				Separation		1.2	0.13	0.50	W	0.17	0.06
OH455		8/1/03	5/31/11				Separation		1.8	0.25	0.50	W	0.17	0.06
OH455		8/1/03	5/31/11				Separation		2.7	4.00	0.00			
OH455		8/1/03	5/31/11	3		6.0	Separation	0.5	6.0	0.13	0.00			
OH455		8/1/03	5/31/11				Separation		6.8	0.25	0.00			
OH455		8/1/03	5/31/11				BOH		20.4	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH456	W30-S2950	8/1/03	5/31/11				Separation		1.5	1.00	0.25	W	0.08	0.03
OH456		8/1/03	5/31/11	1		5.0	Separation	0.2	5.0	0.13	0.00			
OH456		8/1/03	5/31/11				BOH		20.3	0.00	0.00			
OH463	W30-S3080	9/2/03	5/31/11				Separation		1.4	4.00	1.75	NE	0.58	0.23
OH463		9/2/03	5/31/11	1		5.9	Separation		5.9	0.50	1.75	NE	0.58	0.23
OH465	W30-S3200	9/2/03	5/31/11				Separation		0.9	0.13	0.75	E	0.25	0.10
OH465		9/2/03	5/31/11				Separation		1.4	0.75	0.25	E	0.08	0.03
OH465		9/2/03	5/31/11	2		5.5	Separation	0.4	5.5	0.50	0.00			
OH465		9/2/03	5/31/11				Hangup		5.9	0.00	0.00			
OH465		9/2/03	5/31/11				BOH		22.2	0.00	0.00			
OH449	S30-S3310	8/15/03	5/31/11				Separation		4.9	0.25	0.25	NW	0.08	0.03
OH449		8/15/03	5/31/11				Separation		5.6	0.25	0.00			
OH449		8/15/03	5/31/11	2		5.9	Separation	0.3	5.9	0.50	0.50	SE	0.17	0.06
OH449		8/15/03	5/31/11				Separation		6.5	0.25	0.00			
OH449		8/15/03	5/31/11				BOH		21.5	0.00	0.00			
OH514-1	W30-S3400	3/15/09	5/31/11				Separation		1.3	0.25	0.25	E	0.08	0.11
OH514-1		3/15/09	5/31/11	1		5.4	Separation	0.2	5.4	0.25	0.00			
OH514-1		3/15/09	5/31/11				Separation		6.6	0.13	0.00			
OH514-1		3/15/09	5/31/11				BOH		20.1	0.00	0.00			
OH515-1	W30-S3490	3/15/09	5/31/11				Separation		1.4	0.25	0.00			
OH515-1		3/15/09	5/31/11	1		5.7	Separation	0.2	5.7	0.13	0.00			
OH515-1		3/15/09	5/31/11				BOH		20.2	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH565	W30-S3650	2/15/09	6/6/11	0		5.6	Separation	0.0	5.6	0.50	0.00			
OH565		2/15/09	6/6/11				Separation		5.9	0.13	0.00			
OH565		2/15/09	6/6/11				Separation		6.1	0.25	1.25	N	0.42	0.54
OH565		2/15/09	6/6/11				Separation		7.1	0.13	0.00			
OH565		2/15/09	6/6/11				Clay		16.1	0.00	0.00			
OH565		2/15/09	6/6/11				BOH		20.7	0.00	0.00			
OH899	W170-S1000	3/24/09	5/24/11	0		9.1	Separation	0.0	9.1	0.06	0.50	E	0.17	0.23
OH899		3/24/09	5/24/11				BOH		20.0	0.00	0.00			
OH898	W170-S1150	3/24/09	5/24/11				BOH		21.1	0.00	0.00			
OH897	W170-S1300	3/24/09	5/24/11	0		8.4	Separation	0.0	8.4	0.13	0.00			
OH897	W170-S1300	3/24/09	5/24/11				BOH		20.1	0.00	0.00			
OH896	W170-S1482	3/24/09	5/24/11	0		8.3	Separation	0.0	8.3	0.13	0.00			
OH896		3/24/09	5/24/11				Separation		14.9	0.06	0.00			
OH896		3/24/09	5/24/11				BOH		17.3	0.00	0.00			
OH895	W170-S1600	3/24/09	5/24/11	0		8.7	Separation	0.0	8.7	0.25	0.25	E	0.08	0.12
OH895		3/24/09	5/24/11				BOH		20.0	0.00	0.00			
OH894	W170-S1780	3/24/09	5/24/11				BOH		20.0	0.00	0.00			
OH893	W170-S1950	3/24/09	5/24/11				Separation		0.8	0.13	0.00			
OH893		3/24/09	5/24/11	1		8.3	Separation	0.1	8.3	0.06	0.00			
OH893		3/24/09	5/24/11				BOH		20.0	0.00	0.00			
OH892	W170-S2055	3/24/09	5/24/11				Separation		1.0	0.06	0.00			
OH892		3/24/09	5/24/11				BOH		19.4	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH891	W170-S2180	3/24/09	5/24/11	0		7.6	Separation	0.0	7.6	0.25	0.00			
OH891		3/24/09	5/24/11				BOH		20.0	0.00	0.00			
OH890	W170-S2345	3/11/09	12/7/10	0		7.9	Hangup	0.0	7.9	0.00	0.13	E	0.04	0.07
OH890		3/11/09	12/7/10				BOH		20.1	0.00	0.00			
OH889	W170-S2520	3/11/09	12/9/10				Separation		1.7	0.13	0.00			
OH889		3/11/09	12/9/10	1		7.9	Clay G	0.1	7.9	0.00	0.00			
OH889		3/11/09	12/9/10				BOH		20.0	0.00	0.00			
OH900	W170-S2635	3/11/09	12/9/10				Separation		2.6	0.25	0.00			
OH900		3/11/09	12/9/10				Separation		3.1	0.25	0.25	E	0.08	0.14
OH900		3/11/09	12/9/10				Separation		3.7	0.38	0.00			
OH900		3/11/09	12/9/10				Separation		3.8	0.13	0.00			
OH900		3/11/09	12/9/10	4		4.3	Separation	1.0	4.3	0.25	0.00			
OH900		3/11/09	12/9/10				Separation		20.3	0.00	0.00			
OH442	W170-S2820	8/15/03	5/31/11				Separation		1.4	0.25	0.75	W	0.25	0.10
OH442		8/15/03	5/31/11				Separation		2.3	2.00	0.50	W	0.17	0.06
OH442		8/15/03	5/31/11				Separation		2.8	0.13	0.00			
OH442		8/15/03	5/31/11	3		4.9	Separation	0.6	4.9	0.25	0.00			
OH443-1	W170-S2900	3/1/09	12/9/10				Separation		0.4	1.00	0.00			
OH443-1		3/1/09	12/9/10				Separation		2.6	0.25	0.06	E	0.02	0.04
OH443-1		3/1/09	12/9/10				Separation		3.1	0.25	1.25	E	0.42	0.70
OH443-1		3/1/09	12/9/10	3		6.0	Separation*	0.5	3.7	0.25	0.00			
OH443-1		3/1/09	12/9/10				BOH		20.0	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH444	W170-S3000	8/15/03	5/31/11				Separation		0.9	0.13	0.13	NW		
OH444		8/15/03	5/31/11				Separation		1.3	1.00	0.25	NW	0.08	0.03
OH444		8/15/03	5/31/11				Separation		1.4	0.25	0.00			
OH444		8/15/03	5/31/11				Separation		2.3	6.00	0.50	S	0.17	0.06
OH444		8/15/03	5/31/11				Separation		4.5	0.50	0.00			
OH444		8/15/03	5/31/11	5		4.7	Separation	1.1	4.7	3.00	1.25	E	0.42	0.16
OH444		8/15/03	5/31/11				Separation		20.8	0.00	0.00			
OH446	W170-S3200	8/15/03	5/31/11				Separation		1.5	0.50	1.75	E	0.58	0.22
OH446		8/15/03	5/31/11				Separation		4.8	0.25	0.00			
OH446		8/15/03	5/31/11				Separation		5.3	0.13	0.00			
OH446		8/15/03	5/31/11	3		5.4	Separation	0.6	5.4	0.75	0.00			
OH446		8/15/03	5/31/11				BOH		24.0	0.00	0.00			
OH447	W170-S3310	8/15/03	3/31/11				Separation		1.4	0.13	0.00			
OH447		8/15/03	3/31/11	1		5.5	Separation	0.2	5.5	0.13	0.00			
OH447		8/15/03	3/31/11				BOH		23.0	0.00	0.00			
OH608-1	W170-S3395	3/1/09	5/31/11				Separation		0.7	0.50	0.50	E	0.17	0.22
OH608-1		3/1/09	5/31/11				Separation		1.2	0.75	0.25	E	0.08	0.11
OH608-1		3/1/09	5/31/11				Separation		2.0	3.00	0.25	E	0.08	0.11
OH608-1		3/1/09	5/31/11	3		6.1	Separation	0.5	6.1	0.50	0.00			
OH608-1		3/1/09	5/31/11				Separation		6.3	0.13	0.00			
OH608-1		3/1/09	5/31/11				BOH		20.5	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH609-1	W170-S3485	3/1/09	5/31/11				Separation		1.2	0.25	0.13	E	0.04	0.06
OH609-1		3/1/09	5/31/11				Separation		2.2	3.00	0.00			
OH609-1		3/1/09	5/31/11	2		5.9	Separation	0.3	5.9	0.50	0.00			
OH609-1		3/1/09	5/31/11				BOH		20.4	0.00	0.00			
OH610-1	W170-S3580	3/1/09	12/6/10	0		5.7	Separation	0.0	5.7	0.38	0.00			
OH610-1		3/1/09	12/6/10				BOH		20.2	0.00	0.00			
OH573	W170-S3650	4/27/05	12/6/10	0		5.4	Separation	0.0	5.4	0.13	0.00			
OH573		4/27/05	12/6/10				BOH		50.0	0.00	0.00			
OH869	E300-S1430	3/24/09	6/2/11	0		8.0	Rough Spot	0.0	8.0	0.00	0.00			
OH869		3/24/09	6/2/11				BOH		20.0	0.00	0.00			
OH868	E300-S1780	3/24/09	6/2/11	0		7.7	Rough Spot	0.0	7.7	0.00	0.00			
OH868		3/24/09	6/2/11				BOH		20.1	0.00	0.00			
OH867	E300-S2060	3/24/09	6/2/11				BOH		20.0	0.00	0.00			
OH866	E300-S2340	3/24/09	6/2/11	0		8.0	Separation	0.0	1.1	0.25	0.00			
OH866		3/24/09	6/2/11				BOH		20.0	0.00	0.00			
OH865	E300-S2630	3/24/09	6/2/11				Separation		4.0	1.00	1.25	E	0.42	0.57
OH865		3/24/09	6/2/11	1		7.2	Clay	0.1	7.2	0.00	0.00			
OH865		3/24/09	6/2/11				BOH		20.3	0.00	0.00			
OH422	E300-S2825	8/15/03	6/2/11	0		6.4	Separation	0.0	6.4	0.25	0.00			
OH422		8/15/03	6/2/11				BOH		20.7	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH423	E300-S2890	7/30/03	6/2/11				Separation		0.9	0.25	0.13	NE	0.04	0.02
OH423		7/30/03	6/2/11				Separation		1.2	1.00	0.50	E	0.17	0.06
OH423		7/30/03	6/2/11				Separation		1.6	0.50	0.00			
OH423		7/30/03	6/2/11				Separation		4.8	0.25	0.50	W	0.17	0.06
OH423		7/30/03	6/2/11				Separation		5.0	0.13	0.00			
OH423		7/30/03	6/2/11	5		5.4	Separation	0.9	5.4	0.25	0.00			
OH423		7/30/03	6/2/11				BOH		18.5	0.00	0.00			
OH425	E300-S3020	7/30/03	6/2/11				Separation		0.3	0.25	0.00			
OH425		7/30/03	6/2/11				Separation		1.6	1.50	0.00			
OH425		7/30/03	6/2/11				Separation		2.6	0.25	0.00			
OH425		7/30/03	6/2/11	3		5.9	Separation	0.5	5.9	0.25	0.00			
OH425		7/30/03	6/2/11				Separation		6.9	0.50	0.00			
OH425		7/30/03	6/2/11				Rough Spot		11.8	0.00	0.00			
OH425		7/30/03	6/2/11				BOH		20.1	0.00	0.00			
OH459	E300-S3140	8/1/03	6/20/11				Separation		1.0	0.13	0.00			
OH459		8/1/03	6/20/11				Separation		1.6	0.13	0.00			
OH459		8/1/03	6/20/11	2		5.7	Separation	0.4	5.7	0.13	0.00			
OH459		8/1/03	6/20/11				BOH		20.5	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH458	E300-S3200	8/1/03	6/21/11				Separation		1.6	0.50	0.00			
OH458		8/1/03	6/21/11				Separation		4.9	0.13	0.00			
OH458		8/1/03	6/21/11	2		5.3	Separation	0.4	5.3	0.25	0.00			
OH458		8/1/03	6/21/11				Separation		5.8	0.13	0.00			
OH458		8/1/03	6/21/11				Separation		6.4	0.13	0.00			
OH458		8/1/03	6/21/11				BOH		20.5	0.00	0.00			
OH457	E300-S3260	8/1/03	6/21/11				Separation		1.3	0.25	0.19	E	0.06	0.02
OH457		8/1/03	6/21/11	1		5.2	Separation	0.2	5.2	0.13	0.13	E	0.04	0.02
OH457		8/1/03	6/21/11				Separation		5.3	0.13	0.00			
OH457		8/1/03	6/21/11				Hangup		6.2	0.00	0.00			
OH457		8/1/03	6/21/11				BOH		21.0	0.00	0.00			
OH453	E300-S3310	8/15/03	6/21/11	0		5.2	Separation	0.0	5.2	0.13	1.50	W	0.50	0.19
OH453		8/15/03	6/21/11				Separation		5.7	0.13	0.00			
OH453		8/15/03	6/21/11				Separation		5.9	0.13	0.00			
OH453		8/15/03	6/21/11				Separation		6.2	0.38	0.00			
OH622	E300-S3400	6/15/06	6/21/11				Separation		1.0	0.38	0.38	E	0.13	0.07
OH622		6/15/06	6/21/11				Separation		4.2	0.06	0.00			
OH622		6/15/06	6/21/11				Separation		4.4	0.06	0.00			
OH622		6/15/06	6/21/11				Separation		4.8	0.13	0.00			
OH622		6/15/06	6/21/11				Separation		5.0	0.13	0.00			
OH622		6/15/06	6/21/11	5		5.6	Separation	0.9	5.6	0.13	0.00			
OH622		6/15/06	6/21/11				BOH		20.6	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH604	E300-S3480	7/18/05	12/6/10				Separation		1.3	0.13	0.13	E	0.04	0.02
OH604		7/18/05	12/6/10	1		0.4	Separation	2.5	5.4	0.38	0.00			
OH604		7/18/05	12/6/10				BOH		20.6	0.00	0.00			
OH623	E300-S3450	6/15/06	6/21/11				Separation		1.3	0.38	0.19	E	0.06	0.04
OH623		6/15/06	6/21/11	1		5.5	Separation	0.2	5.5	0.25	0.13	E	0.04	0.02
OH623		6/15/06	6/21/11				Hangup		5.7	0.00	0.13	E	0.04	0.02
OH623		6/15/06	6/21/11				BOH		20.7	0.00	0.00			
OH624	E300-S3550	6/15/06	6/20/11	0		5.8	Separation	0.0	5.8	0.38	0.06	E	0.02	0.01
OH624		6/15/06	6/20/11				Separation		6.2	0.13	0.00			
OH624		6/15/06	6/20/11				BOH		20.7	0.00	0.00			
OH569	E300-S3650	4/20/05	6/20/11	0		5.0	Separation	0.0	5.0	0.38	1.00	N	0.33	0.16
OH569		4/20/05	6/20/11				Separation		5.8	0.13	0.00			
OH569		4/20/05	6/20/11				BOH		20.8	0.00	0.00			
OH564	W90-S3650	4/20/05	6/6/11				Separation		1.3	1.50	0.50	S	0.17	0.08
OH564		4/20/05	6/6/11	1		5.7	Separation	0.2	5.7	3.00	0.75	N	0.25	0.12
OH564		4/20/05	6/6/11				BOH		20.9	0.00	0.00			
OH566	E50-S3650	4/20/05	6/6/11	0		6.3	Separation	0.0	6.3	0.13	0.00			
OH566		4/20/05	6/6/11				Clay		6.7	0.00	0.00			
OH566		4/20/05	6/6/11				Separation		7.3	0.25	0.25	S	0.08	0.04
OH566		4/20/05	6/6/11				BOH		20.8	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH464	E65-S3080	9/2/03	12/6/10				Separation		1.3	0.50	0.38	S	0.13	0.05
OH464		9/2/03	12/6/10				Separation		2.1	0.25	0.00			
OH464		9/2/03	12/6/10	2		4.4	Rubble	0.5	4.4	0.25	0.00			
OH464		9/2/03	12/6/10				BOH		18.5	0.00	0.00			
OH462	W100-S3080	9/2/03	5/31/11				Separation		1.8	0.25	0.25	S	0.08	0.03
OH462		9/2/03	5/31/11				Separation		2.6	2.50	0.00			
OH462		9/2/03	5/31/11	2		5.2	Separation	0.4	5.2	0.75	1.00	N	0.33	0.13
OH462		9/2/03	5/31/11				Separation		5.4	0.50	0.00			
OH462		9/2/03	5/31/11				Separation		5.5	0.13	0.00			
OH462		9/2/03	5/31/11				Separation		5.9	0.25	0.00			
OH462		9/2/03	5/31/11				Separation		6.4	0.25	0.00			
OH462		9/2/03	5/31/11				Separation		6.6	0.13	0.00			
OH462		9/2/03	5/31/11				BOH		22.6	0.00	0.00			
OH503-1	E230-S3080	6/14/10	6/20/11				Separation		1.3	2.50	1.00	S	0.33	0.98
OH503-1		6/14/10	6/20/11				Separation		2.3	0.13	0.00			
OH503-1		6/14/10	6/20/11				Separation		3.6	0.13	0.00			
OH503-1		6/14/10	6/20/11				Separation		5.2	0.13	0.00			
OH503-1		6/14/10	6/20/11	4		5.7	Separation	0.7	5.7	0.25	0.13	S	0.04	0.12
OH503-1		6/14/10	6/20/11				BOH		20.1	0.00	0.00			
OH460	W100-S2750	9/2/03	5/31/11				Separation		1.5	1.50	0.75	S	0.25	0.10
OH460		9/2/03	5/31/11				Separation		2.6	7.00	0.00			
OH460		9/2/03	5/31/11	2		7.0	Separation	0.3	7.0	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH861	E386-S1950	3/24/09	6/20/11				Separation		2.6	0.75	0.00			
OH861		3/24/09	6/20/11	1		4.4	Separation	0.2	4.4	0.75	1.50	S	0.50	0.67
OH861		3/24/09	6/20/11				Separation		5.5	0.38	1.75	N	0.58	0.78
OH861		3/24/09	6/20/11				BOH		7.5	0.00	3.00			
OH862	E227-S1950	3/24/09	6/20/11	0		4.8	Separation	0.0	4.8	0.13	2.50	S	0.83	1.12
OH862		3/24/09	6/20/11				Separation		6.5	0.25	0.00			
OH862		3/24/09	6/20/11				BOH		20.3	0.00	0.00			
OH863	E386-S1600	3/24/09	6/20/11				BOH		20.1	0.00	0.00			
OH864	E227-S1600	3/24/09	6/20/11	0		5.4	Separation	0.0	5.4	0.13	0.00			
OH864		3/24/09	6/20/11				Separation		6.0	0.13	0.00			
OH864		3/24/09	6/20/11				BOH		20.1	0.00	0.00			
OH855	S90-W380	3/4/09	6/14/11				BOH		20.1	0.00	0.00			
OH856	S90-W620	3/4/09	6/14/11				Separation		1.0	0.13	0.00			
OH856		3/4/09	6/14/11	1		8.9	Separation	0.1	8.9	0.25	0.13	W	0.04	0.05
OH856		3/4/09	6/14/11				BOH		20.1	0.00	0.00			
OH857	S90-W880	3/4/09	6/14/11	0		8.8	Rough Spot	0.0	8.8	0.00	0.00			
OH857		3/4/09	6/14/11				BOH		20.4	0.00	0.00			
OH850	W80-N300	3/8/09	6/21/11				Separation		2.9	0.06	0.00			
OH850		3/8/09	6/21/11				Separation		4.4	0.13	0.00			
OH850		3/8/09	6/21/11				Separation		6.9	0.25	0.00			
OH850		3/8/09	6/21/11	3		8.3	Separation	0.4	8.3	0.13	1.00	S	0.33	0.44
OH850		3/8/09	6/21/11				BOH		20.1	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH858	N216-W469	3/8/09	6/21/11				Separation		5.5	0.25	0.00			
OH858		3/8/09	6/21/11	1		6.9	Separation	0.1	6.9	0.25	0.25	S	0.08	0.11
OH858		3/8/09	6/21/11				BOH		20.0	0.00	0.00			
OH852	E195-N785	3/8/09	6/21/11	0		5.1	Separation	0.0	5.1	0.13	0.00			
OH852		3/8/09	6/21/11				Separation		5.8	0.25	1.25	S	0.42	0.55
OH852		3/8/09	6/21/11				Separation		6.2	0.25	1.00	N	0.33	0.44
OH852		3/8/09	6/21/11				BOH		20.0	0.00	0.00			
OH901-1	W395-S2832	2/7/11	5/23/11				Separation		1.7	0.50	0.00			
OH901-1		2/7/11	5/23/11				Separation		4.3	0.25	0.13	SE	0.04	0.43
OH901-1		2/7/11	5/23/11				Separation		4.4	0.25	0.00			
OH901-1		2/7/11	5/23/11				Separation		4.5	0.13	0.00			
OH901-1		2/7/11	5/23/11	4		5.2	Separation	0.8	5.2	0.50	0.25	W	0.08	0.87
OH901-1		2/7/11	5/23/11				Separation		5.3	2.00	0.50	E	0.17	1.74
OH901-1		2/7/11	5/23/11				Separation		5.7	2.50	0.25	E	0.08	0.87
OH901-1		2/7/11	5/23/11				BOH		20.0	0.00	0.00			
OH902-1	W395-S2912	2/7/11	5/23/11				Separation		1.1	0.13	0.13	E	0.04	0.43
OH902-1		2/7/11	5/23/11				Separation		2.1	0.25	0.13	NE	0.04	0.43
OH902-1		2/7/11	5/23/11				Separation		5.1	0.13	0.00			
OH902-1		2/7/11	5/23/11	3		5.3	Separation	0.6	5.3	0.50	1.00	E	0.33	3.48
OH902-1		2/7/11	5/23/11				Separation		5.4	1.00	0.00			
OH902-1		2/7/11	5/23/11				Separation		5.7	3.00	0.25	E	0.08	0.87
OH902-1		2/7/11	5/23/11				BOH		20.1	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH903-1	W395-S2994	2/7/11	5/23/11				Separation		0.4	0.50	0.00			
OH903-1		2/7/11	5/23/11				Separation		4.7	1.00	0.00			
OH903-1		2/7/11	5/23/11	2		5.1	Separation	0.4	5.1	3.00	0.00			
OH903-1		2/7/11	5/23/11				BOH		20.0	0.00	0.00			
OH904	W525-S2843	12/17/08	5/23/11				Separation		0.9	0.25	0.25	E	0.08	0.10
OH904		12/17/08	5/23/11				Separation		4.9	0.50	0.00			
OH904		12/17/08	5/23/11				Separation		5.2	0.50	0.00			
OH904		12/17/08	5/23/11	3		5.3	Separation	0.6	5.3	1.00	0.75	E	0.25	0.31
OH904		12/17/08	5/23/11				BOH		20.5	0.00	0.00			
OH905	W525-S2912	3/12/09	5/23/11				Separation		1.5	0.25	0.50	SE	0.17	0.23
OH905		3/12/09	5/23/11				Separation		4.9	0.25	0.25	E	0.08	0.11
OH905		3/12/09	5/23/11				Separation		5.1	0.13	0.13	W	0.04	0.06
OH905		3/12/09	5/23/11				Separation		5.2	0.13	0.13	W	0.04	0.06
OH905		3/12/09	5/23/11	4		5.4	Separation	0.7	5.4	0.50	0.13	E	0.04	0.06
OH905		3/12/09	5/23/11				Separation		5.9	2.00	0.00			
OH905		3/12/09	5/23/11				BOH		20.6	0.00	0.00			
OH906	W525-S2942	3/12/09	5/23/11	0		5.1	Separation	0.0	5.1	4.00	0.50	E	0.17	0.23
OH906		3/12/09	5/23/11				BOH		20.4	0.00	0.00			
OH907	W656-S2800	4/25/09	3/8/11				Separation		1.1	0.13	0.19	E	0.06	0.10
OH907		4/25/09	3/8/11				Separation		5.2	0.13	0.00			
OH907		4/25/09	3/8/11				Separation		5.3	0.38	0.00			
OH907		4/25/09	3/8/11	3		5.4	Separation	0.6	5.4	2.00	0.50	E	0.17	0.27
OH907		4/25/09	3/8/11				BOH		20.9	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH908	W656-S2895	4/25/09	6/20/11	0		5.6	Separation	0.0	5.6	3.00	0.75	E		
OH908		4/25/09	6/20/11				BOH		20.9	0.00	0.00			
OH909	W656-S3000	4/25/09	6/20/11				Separation		5.2	0.38	0.38	E	0.13	0.17
OH909		4/25/09	6/20/11	1		5.6	Separation	0.2	5.6	0.75	1.75	E	0.58	0.81
OH909		4/25/09	6/20/11				BOH		20.7	0.00	0.00			
OH910	W790-S2800	6/24/09	5/23/11				Separation		5.4	1.00	0.00			
OH910		6/24/09	5/23/11	1		5.6	Separation	0.2	5.6	0.50	0.75	E	0.25	0.39
OH910		6/24/09	5/23/11				BOH		20.4	0.00	0.00			
OH911	W790-S2895	6/24/09	5/23/11	0		5.4	Separation	0.0	5.4	2.00	0.25	E	0.08	0.13
OH911		6/24/09	5/23/11				BOH		20.4	0.00	0.00			
OH912	W790-S3000	6/24/09	5/23/11				Separation		5.1	0.25	0.00			
OH912		6/24/09	5/23/11	1		5.4	Separation	0.2	5.4	1.50	0.50	E	0.17	0.26
OH912		6/24/09	5/23/11				BOH		20.6	0.00	0.00			
OH913	W920-S2800	8/14/09	5/23/11	0		4.5	Separation	0.0	4.5	0.50	0.25	E	0.08	0.14
OH913		8/14/09	5/23/11				Separation		5.1	0.75	0.00			
OH913		8/14/09	5/23/11				BOH		20.4	0.00	0.00			
OH914	W920-S2895	8/14/09	5/23/11	0		4.1	Separation	0.0	4.1	1.50	0.13	N	0.04	0.07
OH914		8/14/09	5/23/11				BOH		20.4	0.00	0.00			
OH915	W920-S3000	8/14/09	5/23/11				Separation		3.9	0.13	0.25	E	0.08	0.14
OH915		8/14/09	5/23/11	1		5.4	Separation	0.2	5.4	0.50	0.75	E	0.25	0.42
OH915		8/14/09	5/23/11				BOH		20.3	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH916	W1060-S2842	10/4/09	5/17/11				Separation		4.3	0.13	0.00			
OH916		10/4/09	5/17/11	1		5.2	Separation	0.2	5.2	0.38	0.06	E	0.02	0.04
OH916		10/4/09	5/17/11				BOH		20.4	0.00	0.00			
OH917	W1060-S2918	10/4/09	6/20/11				Separation		3.3	0.25	0.19	E	0.06	0.11
OH917		10/4/09	6/20/11				Separation		4.3	0.13	0.00			
OH917		10/4/09	6/20/11	2		4.8	Separation	0.4	4.8	1.00	0.00			
OH917		10/4/09	6/20/11				BOH		20.6	0.00	0.00			
OH918	W1060-S2993	10/4/09	6/20/11				Separation		5.0	0.13	0.00			
OH918		10/4/09	6/20/11	1		5.1	Separation	0.2	5.1	0.13	0.19	E	0.06	0.11
OH918		10/4/09	6/20/11				Separation		6.6	0.13	0.00			
OH918		10/4/09	6/20/11				BOH		20.5	0.00	0.00			
OH919	W1195-S2837	10/3/09	3/8/11				Separation		5.1	0.13	0.06	W	0.02	0.04
OH919		10/3/09	3/8/11	1		5.3	Separation	0.2	5.3	0.13	0.06	E	0.02	0.04
OH919		10/3/09	3/8/11				BOH		20.5	0.00	0.00			
OH920	W1195-S2921	10/3/09	3/8/11	0		5.0	Separation	0.0	5.0	1.75	0.13	E	0.04	0.09
OH920		10/3/09	3/8/11				BOH		20.4	0.00	0.00			
OH921	W1195-S2990	10/3/09	3/8/11	0		5.1	Separation	0.0	5.1	0.13	0.00			
OH921		10/3/09	3/8/11				Separation		6.6	0.13	0.00			
OH921		10/3/09	3/8/11				BOH		19.5	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH922-1	W394-S2750	2/6/11	5/17/11				Separation		1.0	1.00	0.13	S	0.04	0.46
OH922-1		2/6/11	5/17/11				Separation		4.5	0.25	0.00			
OH922-1		2/6/11	5/17/11				Separation		5.3	0.75	0.00			
OH922-1		2/6/11	5/17/11	3		5.7	Separation	0.5	5.7	1.50	0.00			
OH922-1		2/6/11	5/17/11				Separation		5.9	0.13	0.00			
OH922-1		2/6/11	5/17/11				Separation		7.2	0.13	0.00			
OH922-1		2/6/11	5/17/11				Separation		8.2	0.06	0.00			
OH922-1		2/6/11	5/17/11				BOH		20.0	0.00	0.00			
OH923-1	W461-S2750	2/6/11	5/17/11				Separation		1.1	1.25	0.13	S	0.04	0.46
OH923-1		2/6/11	5/17/11				Separation		2.2	0.13	0.00			
OH923-1		2/6/11	5/17/11				Separation		2.7	0.25	0.00			
OH923-1		2/6/11	5/17/11				Separation		3.5	0.13	0.00			
OH923-1		2/6/11	5/17/11	4		5.6	Separation	0.7	5.6	3.00	0.38	S	0.13	1.37
OH923-1		2/6/11	5/17/11				Separation		6.1	3.00	0.00			
OH923-1		2/6/11	5/17/11				BOH		20.2	0.00	0.00			
OH924-1	W528-S2750	2/6/11	5/17/11				Separation		0.9	0.13	0.00			
OH924-1		2/6/11	5/17/11				Separation		5.2	1.00	0.13	S	0.04	0.46
OH924-1		2/6/11	5/17/11	2		5.6	Separation	0.4	5.6	3.50	0.06	S	0.02	0.23
OH924-1		2/6/11	5/17/11				BOH		20.1	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH925-1	W618-S2750	2/6/11	5/17/11				Separation		4.5	0.13	0.00			
OH925-1		2/6/11	5/17/11				Separation		4.8	0.38	0.00			
OH925-1		2/6/11	5/17/11	2		5.2	Separation	0.4	5.2	2.00	0.50	S	0.17	1.83
OH925-1		2/6/11	5/17/11				Separation		6.2	0.13	0.00			
OH925-1		2/6/11	5/17/11				BOH		20.1	0.00	0.00			
OH926-1	W656-S2750	2/11/11	5/17/11				Separation		1.2	0.13	0.00			
OH926-1		2/11/11	5/17/11				Separation		4.7	0.13	0.00			
OH926-1		2/11/11	5/17/11	2		5.4	Separation	0.4	5.4	3.50	0.13	SE	0.04	0.48
OH926-1		2/11/11	5/17/11				BOH		20.1	0.00	0.00			
OH927-1	W725-S2750	2/6/11	5/17/11				Separation		0.9	0.13	0.13	S	0.04	0.46
OH927-1		2/6/11	5/17/11				Separation		4.6	0.25	0.00			
OH927-1		2/6/11	5/17/11				Separation		5.4	0.06	0.00			
OH927-1		2/6/11	5/17/11	3		5.1	Separation	0.6	5.1	2.00	0.13	S	0.04	0.46
OH927-1		2/6/11	5/17/11				BOH		20.4	0.00	0.00			
OH928-1	W790-S2750	2/6/11	5/17/11				Separation		5.4	0.75	0.00			
OH928-1		2/6/11	5/17/11	1		5.8	Separation	0.2	5.8	3.00	0.00			
OH928-1		2/6/11	5/17/11				BOH		20.0	0.00	0.00			
OH929-1	W860-S2750	2/6/11	5/17/11				Separation		4.6	0.13	0.00			
OH929-1		2/6/11	5/17/11				Separation		5.0	0.13	0.00			
OH929-1		2/6/11	5/17/11				Separation		5.1	0.38	0.00			
OH929-1		2/6/11	5/17/11	3		5.4	Separation	0.6	5.4	1.00	0.00			
OH929-1		2/6/11	5/17/11				BOH		20.3	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH930-1	W920-S2750	2/6/11	5/17/11				Separation		1.0	0.13	0.00			
OH930-1		2/6/11	5/17/11	1		5.3	Separation	0.2	5.3	0.50	1.25	S	0.42	4.56
OH930-1		2/6/11	5/17/11				Separation		6.1	0.25	0.00			
OH930-1		2/6/11	5/17/11				Separation		6.8	0.13	0.00			
OH930-1		2/6/11	5/17/11				Hangup		15.9	0.00	0.00			
OH930-1		2/6/11	5/17/11				BOH		21.0	0.00	0.00			
OH931-1	W985-S2750	2/6/11	5/17/11				BOH		20.4	0.00	0.00			
OH932-1	W1060-S2750	2/6/11	5/17/11	0		5.8	Separation	0.0	5.8	0.06	1.75	S	0.58	6.39
OH932-1		2/6/11	5/17/11				Separation		6.4	0.13	0.00			
OH932-1		2/6/11	5/17/11				Hangup		15.9	0.00	0.00			
OH932-1		2/6/11	5/17/11				BOH		20.4	0.00	0.00			
OH933	W1125-S2750	6/3/09	3/8/11	0		5.6	Separation	0.0	5.6	0.50	0.25	S	0.08	0.14
OH933		6/3/09	3/8/11				BOH		20.3	0.00	0.00			
OH934-1	W1185-S2750	2/6/11	2/10/11	0		6.0	Separation	0.0	6.0	0.13	0.00			
OH934-1		2/6/11	2/10/11				BOH		20.1	0.00	0.00			
OH935-1	W395-S3080	2/7/11	5/17/11				Separation		5.2	0.75	0.00			
OH935-1		2/7/11	5/17/11	1		5.6	Separation	0.2	5.6	4.00	0.19	NW	0.06	0.69
OH935-1		2/7/11	5/17/11				BOH		19.9	0.00	0.00			
OH936-1	W464-W3080	2/7/11	5/17/11				Separation		1.3	0.50	2.00	S	0.67	7.37
OH936-1		2/7/11	5/17/11				Separation		4.7	0.13	0.00			
OH936-1		2/7/11	5/17/11	2		5.6	Separation	0.4	5.6	4.00	1.00	S	0.33	3.69
OH936-1		2/7/11	5/17/11				BOH		20.6	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH937-1	W525-S3080	2/7/11	5/17/11				Separation		1.2	0.13	0.00			
OH937-1		2/7/11	5/17/11	1		5.4	Separation	0.2	5.4	2.25	0.13	N	0.04	0.46
OH937-1		2/7/11	5/17/11				Separation		6.0	0.25	0.00			
OH937-1		2/7/11	5/17/11				BOH		20.1	0.00	0.00			
OH938-1	W590-S3080	2/7/11	5/17/11				Separation		1.1	0.13	0.00			
OH938-1		2/7/11	5/17/11	1		5.1	Separation	0.2	5.1	1.25	0.38	E	0.13	1.38
OH938-1		2/7/11	5/17/11				Separation		4.7	0.13	0.00			
OH938-1		2/7/11	5/17/11				Separation		5.6	0.25	0.00			
OH938-1		2/7/11	5/17/11				Separation		5.7	1.00	3.00		1.00	11.06
OH939-1	W660-S3080	2/7/11	5/17/11				Separation		1.2	0.25	0.00			
OH939-1		2/7/11	5/17/11	1		5.2	Separation	0.2	5.2	4.50	0.38	N	0.13	1.38
OH939-1		2/7/11	5/17/11				BOH		20.0	0.00	0.00			
OH940	W730-S3080	3/12/09	5/17/11				Separation		5.0	2.00	0.00			
OH940		3/12/09	5/17/11				Separation		5.6	0.25	0.00			
OH940		3/12/09	5/17/11	2		5.8	Separation	0.3	5.8	3.00	0.13	N	0.04	0.06
OH940		3/12/09	5/17/11				BOH		20.1	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH941-1	W790-S3080	2/7/11	5/17/11				Separation		0.9	0.13	0.00			
OH941-1		2/7/11	5/17/11				Separation		4.9	2.00	0.13	NE	0.04	0.46
OH941-1		2/7/11	5/17/11	2		5.3	Separation	0.4	5.3	1.00	0.00			
OH941-1		2/7/11	5/17/11				Separation		5.6	2.00	0.00			
OH941-1		2/7/11	5/17/11				Separation		5.8	2.00	0.00			
OH941-1		2/7/11	5/17/11				Separation		6.6	0.13	0.13	NW	0.04	0.46
OH941-1		2/7/11	5/17/11				Separation		7.0	0.13	0.00			
OH941-1		2/7/11	5/17/11				BOH		20.0	0.00	0.00			
OH942-1	W860-S3080	2/7/11	5/17/11				Separation		0.9	0.13	0.00			
OH942-1		2/7/11	5/17/11				Separation		4.1	1.50	0.19	N	0.06	0.69
OH942-1		2/7/11	5/17/11	2		4.9	Separation	0.4	4.9	5.00	0.50	NE	0.17	1.84
OH942-1		2/7/11	5/17/11				BOH		20.2	0.00	0.00			
OH942-1		2/7/11	5/17/11				Separation		5.6	0.38	0.25	N	0.08	0.92
OH943-1	W920-S3080	2/7/11	5/17/11	0		5.1	Separation	0.0	5.1	2.50	0.06	N	0.02	0.23
OH943-1		2/7/11	5/17/11				BOH		20.0	0.00	0.00			
OH944	W980-S3080	7/18/09	5/17/11	0		5.2	Separation	0.0	5.2	1.50	0.00			
OH944		7/18/09	5/17/11				BOH		20.3	0.00	0.00			
OH945	W1060-S3080	7/18/09	5/17/11	0		5.3	Separation	0.0	5.3	0.13	1.75	N	0.58	0.96
OH945		7/18/09	5/17/11				Separation		6.8	0.13	0.00			
OH945		7/18/09	5/17/11				BOH		20.3	0.00	0.00			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH946	W1120-S3080	10/3/09	3/8/11				Separation		5.3	0.13	0.00			
OH946		10/3/09	3/8/11	1		5.4	Separation	0.2	5.4	0.50	0.13		0.04	0.09
OH946		10/3/09	3/8/11				BOH		20.3	0.00	0.00			
OH947-1	W1185-S3080	2/7/11	2/10/11	0		5.3	Separation	0.0	5.3	0.13	0.00			
OH947-1		2/7/11	2/10/11				BOH		20.0	0.00	0.00			
OH1001	W390-S2271	9/23/10	5/23/11	0		8.5	Separation	0.0	8.5	0.06	0.1	E	0.04	0.19
OH1001		9/23/10	5/23/11				BOH		20.3	0.00	0.0			
OH1002	W390-S2350	9/23/10	5/23/11				BOH		0.0	0.00	0.0			
OH1003	W390-S2422	9/23/10	5/23/11				BOH		19.9	0.00	0.0			
OH1004	W520-S2271	9/14/10	5/24/11	0		8.0	Rough Spot	0.0	8.0	0.00	0.0			
OH1004		9/14/10	5/24/11				BOH		20.4	0.00	0.0			
OH1005	W520-S2350	9/14/10	5/24/11	0		8.6	Hangup	0.0	8.6	0.00	0.1	E	0.02	0.09
OH1005		9/14/10	5/24/11				BOH		20.3	0.00	0.0			
OH1006	W520-S2422	9/14/10	5/24/11				BOH		19.9	0.00	0.0			
OH1007	W660-S2271	11/15/10	5/24/11	0		8.1	Hangup	0.0	8.1	0.00	0.0			
OH1007		11/15/10	5/24/11				BOH		20.3	0.00	0.0			
OH1008	W660-S2350	11/15/10	5/24/11				BOH		20.3	0.00	0.0			
OH1009	W660-S2422	11/15/10	5/24/11				BOH		20.2	0.00	0.0			
OH1010	W790-S2271	11/15/10	5/24/11				BOH		20.3	0.00	0.0			
OH1011	W790-S2350	11/15/10	5/24/11				BOH		20.3	0.00	0.0			
OH1012	W790-S2422	12/21/10	5/24/11	0		6.5	Separation	0.0	6.5	0.13	0.0			
OH1012		12/21/10	5/24/11				BOH		20.3	0.00	0.0			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH1013	W920-S2271	3/1/11	5/24/11				BOH		20.3	0.00	0.0			
OH1014	W920-S2350	3/1/11	5/24/11	0		7.4	Separation	0.0	7.4	0.25	0.0			
OH1014		3/1/11	5/24/11				BOH		20.3	0.00	0.0			
OH1015	W920-S2422	3/1/11	5/24/11				BOH		20.2	0.00	0.0			
OH1016	W1050-S2520	3/1/11	5/24/11				BOH		20.0	0.00	0.0			
OH1017	W1050-S2350	3/1/11	5/24/11				BOH		19.9	0.00	0.0			
OH1018	W1050-S2422	3/1/11	5/24/11				BOH		19.9	0.00	0.0			
OH1019	W1190-S2271	3/21/11	5/24/11				BOH		20.0	0.00	0.0			
OH1020	W1190-S2350	3/21/11	5/24/11	0		7.8	Separation	0.0	7.8	0.06	0.0			
OH1020		3/21/11	5/24/11				BOH		20.3	0.00	0.0			
OH1021	W1190-S2422	3/21/11	5/24/11				BOH		20.3	0.00	0.0			
OH1022	W390-S2180	9/14/10	5/23/11	0		8.4	Separation	0.0	8.4	0.13	0.5	S	0.17	0.73
OH1022		9/14/10	5/23/11				Separation		14.5	0.06	0.3	S	0.08	0.36
OH1022		9/14/10	5/23/11				BOH		20.4	0.00	0.0			
OH1023	W455-S2180	9/14/10	5/23/11	0		8.4	Separation	0.0	8.4	0.06	0.3	N	0.08	0.36
OH1023		9/14/10	5/23/11				BOH		20.3	0.00	0.0			
OH1024	W520-S2180	9/14/10	5/23/11	0		8.4	Separation	0.0	8.4	0.06	0.5	S	0.17	0.73
OH1024		9/14/10	5/23/11				BOH		20.2	0.00	0.0			
OH1025	W590-S2180	9/14/10	5/23/11	0		8.5	Separation	0.0	8.5	0.13	0.3	N	0.08	0.36
OH1025		9/14/10	5/23/11				BOH		20.3	0.00	0.0			
OH1026	W660-S2180	9/14/10	5/23/11	0		8.0	Separation	0.0	8.0	0.06	1.0	S	0.33	1.45
OH1026		9/14/10	5/23/11				BOH		20.1	0.00	0.0			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH1027	W725-S2180	9/14/10	5/23/11	0		7.9	Separation	0.0	7.9	0.06	0.8	N	0.25	1.09
OH1027		9/14/10	5/23/11				BOH		20.3	0.00	0.0			
OH1028	W790-S2180	9/14/10	5/23/11	0		8.0	Separation	0.0	8.0	0.13	0.3	S	0.08	0.36
OH1028		9/14/10	5/23/11				BOH		20.0	0.00	0.0			
OH1029	W855-S2180	9/14/10	5/23/11	0		8.1	Separation	0.0	8.1	0.13	1.0	N	0.33	1.45
OH1029		9/14/10	5/23/11				BOH		20.3	0.00	0.0			
OH1030	W920-S2180	9/14/10	5/23/11	0		8.3	Separation	0.0	8.3	0.13	0.8	S	0.25	1.09
OH1030		9/14/10	5/23/11				BOH		20.0	0.00	0.0			
OH1031	W985-S2180	9/14/10	5/23/11	0		7.8	Separation	0.0	7.8	0.25	0.3	N	0.08	0.36
OH1031		9/14/10	5/23/11				BOH		20.4	0.00	0.0			
OH1032	W1050-S2180	9/14/10	5/23/11	0		7.3	Separation	0.0	7.3	0.25	0.3	S	0.08	0.36
OH1032		9/14/10	5/23/11				BOH		20.6	0.00	0.0			
OH1033	W1120-S2180	3/1/11	5/23/11				BOH		20.3	0.00	0.0			
OH1034	W1190-S2180	3/21/11	5/23/11	0		6.9	Hangup	0.0	6.9	0.00	0.3	SE	0.08	1.45
OH1034		3/21/11	5/23/11				BOH		20.0	0.00	0.0			
OH1035	W390-S2520	9/10/10	5/23/11	0		7.8	Separation	0.0	7.8	0.13	0.0			
OH1035		9/10/10	5/23/11				Separation		13.7	0.25	0.0			
OH1035		9/10/10	5/23/11				BOH		20.2	0.00	0.0			
OH1036	W455-S2520	9/10/10	5/23/11				BOH		19.4	0.00	0.0			
OH1037	W520-S2520	11/15/10	5/23/11	0		7.7	Separation	0.0	7.7	0.13	0.0			
OH1037		11/15/10	5/23/11				Separation		13.8	0.06	0.0			
OH1037		11/15/10	5/23/11				BOH		20.4	0.00	0.0			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-1, (Continued)
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[3]	Feature Depth (ft)	Separation (in)	Offset (in.)	Compass	Hole Closure (%)	Offset Rate (in/yr)
OH1038	W590-S2520	11/15/10	5/23/11	0		7.9	Separation	0.0	7.9	0.25	0.0			
OH1038		11/15/10	5/23/11				BOH		21.6	0.00	0.0			
OH1039	W660-S2520	11/15/10	5/23/11	0		7.6	Separation	0.0	7.6	0.06	0.0			
OH1039		11/15/10	5/23/11				Separation		13.4	0.06	0.0			
OH1039		11/15/10	5/23/11				BOH		20.3	0.00	0.0			
OH1040	W725-S2520	11/15/10	5/23/11				BOH		20.2	0.00	0.0			
OH1041	W790-S2520	11/15/10	5/23/11	0		7.7	Separation	0.0	7.7	0.06	1.0	N	0.33	1.93
OH1041		11/15/10	5/23/11				BOH		20.2	0.00	0.0			
OH1042	W855-S2520	11/15/10	5/23/11	0		6.9	Separation	0.0	6.9	0.06	0.0			
OH1042		11/15/10	5/23/11				Separation		20.3	0.00	0.0			
OH1043	W920-S2520	3/1/11	5/23/11	0		7.9	Separation	0.0	7.9	0.25	0.0			
OH1043		3/1/11	5/23/11				Hangup		14.3	0.00	0.0			
OH1043		3/1/11	5/23/11				BOH		20.0	0.00	0.0			
OH1044	W985-S2520	3/1/11	5/23/11				BOH		20.2	0.00	0.0			
OH1045	W1050-S2520	3/1/11	5/23/11	0		7.4	Separation	0.0	7.4	0.25	0.0			
OH1045		3/1/11	5/23/11				Separation		13.7	0.06	0.0			
OH1045		3/1/11	5/23/11				BOH		20.2	0.00	0.0			
OH1046	W1120-S2520	3/21/11	5/23/11				BOH		20.2	0.00	0.0			
OH1047	W1190-S2520	3/21/11	5/23/11	0		7.2	Separation	0.0	7.2	0.25	0.3	NE	0.08	1.45
OH1047		3/21/11	5/23/11				BOH		20.3	0.00	0.0			

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

[2] Number of fracture zones (FZ) in immediate roof beam, FZ = 0 unless otherwise noted

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

Table 6-2 Summary of New Boreholes[1]

Hole	Location	Northing	Easting	Drill Date	Depth (feet)	Dia. (inches)	Purpose Of Hole
OH901-1	W395-S2832	6855	6500	2/6/2011	19.9	3	Observation
OH902-1	W395-S2912	6775	6500	2/6/2011	20	3	Observation
OH903-1	W395-S2994	6693	6500	2/6/2011	20	3	Observation
OH922-1	W395-S2750	6937	6500	2/6/2011	20	3	Observation
OH923-1	W461-S2750	6937	6433	2/6/2011	20	3	Observation
OH924-1	W528-S2750	6937	6367	2/6/2011	20	3	Observation
OH925-1	W618-S2750	6937	6277	2/6/2011	20	3	Observation
OH926-1	W656-S2750	6937	6235	2/6/2011	20	3	Observation
OH927-1	W725-S2750	6937	6170	2/6/2011	20	3	Observation
OH928-1	W790-S2750	6937	6105	2/6/2011	19.9	3	Observation
OH929-1	W860-S2750	6937	6035	2/6/2011	20.1	3	Observation
OH930-1	W920-S2750	6937	5975	2/6/2011	20	3	Observation
OH931-1	W985-S2750	6937	5915	2/6/2011	20	3	Observation
OH932-1	W1060-S2750	6937	5835	2/6/2011	20	3	Observation
OH934-1	W1185-S2750	6937	5710	2/6/2011	20.1	3	Observation
OH935-1	W395-S3080	6607	6500	2/7/2011	19.9	3	Observation
OH936-1	W463-S3080	6607	5432	2/7/2011	20	3	Observation
OH937-1	W529-S3080	6607	6370	2/7/2011	20	3	Observation
OH938-1	W590-S3080	6607	6305	2/7/2011	20	3	Observation
OH939-1	W662-S3080	6607	6235	2/7/2011	20	3	Observation
OH940-1	W730-S3080	6607	6185	2/7/2011	20	3	Observation
OH941-1	W795-S3080	6607	6105	2/7/2011	21.5	3	Observation
OH942-1	W860-S3080	6607	6035	2/7/2011	20	3	Observation
OH943-1	W925-S3080	6607	5975	2/7/2011	20.1	3	Observation
OH1001	S2271-W390	7416	6505	9/23/2010	20.3	3	Observation
OH1002	S2350-W390	7337	6505	9/23/2010	20.3	3	Observation
OH1003	S2422-W390	7265	6505	9/23/2010	19.9	3	Observation
OH1004	S2271-W520	7416	6375	9/14/2010	20.5	3	Observation
OH1005	S2350-W520	7337	6375	9/14/2010	20.3	3	Observation
OH1006	S2422-W520	7265	6375	9/14/2010	20	3	Observation
OH1007	S2271-W660	7416	6235	11/15/2010	20.1	3	Observation
OH1008	S2350-W660	7337	6235	11/15/2010	20.2	3	Observation
OH1009	S2422-W660	7265	6235	11/15/2010	20.1	3	Observation
OH1010	S2271-W790	7416	6105	11/15/2010	20.3	3	Observation
OH1011	S2350-W790	7337	6105	11/15/2010	20.3	3	Observation
OH1012	S2422-W790	7265	6105	12/21/2010	20.2	3	Observation

Table 6-2 (Continued) Summary of New Boreholes [1]

Hole	Location	Northing	Easting	Drill Date	Depth (feet)	Dia. (inches)	Purpose OF Hole
OH1013	S2271-W920	7416	5975	3/1/2011	20.3	3	Observation
OH1014	S2350-W920	7337	5975	3/1/2011	20.2	3	Observation
OH1015	S2422-W920	7265	5975	3/1/2011	20.2	3	Observation
OH1016	S2271-W1050	7416	5845	3/1/2011	20.1	3	Observation
OH1017	S2350-W1050	7337	5845	3/1/2011	20	3	Observation
OH1018	S2422-W1050	7265	5845	3/1/2011	20	3	Observation
OH1019	S2271-W1190	7416	5705	3/21/2011	20	3	Observation
OH1020	S2350-W1190	7337	5705	3/21/2011	20.2	3	Observation
OH1021	S2422-W1190	7265	5705	3/21/2011	20.1	3	Observation
OH1022	S2180-W390	7507	6505	9/14/2010	20.4	3	Observation
OH1023	S2180-W455	7507	6440	9/14/2010	20.3	3	Observation
OH1024	S2180-W520	7507	6375	9/14/2010	20.3	3	Observation
OH1025	S2180-W590	7507	6305	9/14/2010	20.1	3	Observation
OH1026	S2180-W620	7507	6235	9/14/2010	20.1	3	Observation
OH1027	S2180-W725	7507	6170	9/14/2010	20.2	3	Observation
OH1028	S2180-W790	7507	6105	9/14/2010	20.2	3	Observation
OH1029	S2180-W855	7507	6040	9/14/2010	20.3	3	Observation
OH1030	S2180-W920	7507	5975	9/14/2010	20.1	3	Observation
OH1031	S2180-W985	7507	5910	9/14/2010	20.3	3	Observation
OH1032	S2180-W1050	7507	5845	9/14/2010	20.4	3	Observation
OH1033	S2180-W1120	7507	5775	3/1/2011	20.2	3	Observation
OH1034	S2180-W1190	7507	5705	3/21/2011	20	3	Observation
OH1035	S2180-W390	7167	6505	9/10/2010	21.3	3	Observation
OH1036	S2180-W455	7167	6440	9/10/2010	21.4	3	Observation
OH1037	S2180-W520	7167	6375	11/15/2010	20.5	3	Observation
OH1038	S2180-W590	7167	6305	11/15/2010	21.5	3	Observation
OH1039	S2180-W660	7167	6235	11/15/2010	20.2	3	Observation
OH1040	S2180-W725	7167	6170	11/15/2010	20.1	3	Observation
OH1041	S2180-W790	7167	6105	11/15/2010	20.1	3	Observation
OH1042	S2180-W855	7167	6040	11/15/2010	20.2	3	Observation
OH1043	S2180-W920	7167	5975	3/1/2010	20.1	3	Observation
OH1044	S2180-W985	7167	5910	3/1/2010	20.2	3	Observation
OH1045	S2180-W1050	7167	5845	3/1/2010	20.1	3	Observation
OH1046	S2180-W1120	7167	5775	3/21/2010	20.1	3	Observation
OH1047	S2180-W1190	7167	5705	3/21/2010	20.1	3	Observation

[1] All Boreholes drilled vertically upwards into the back.

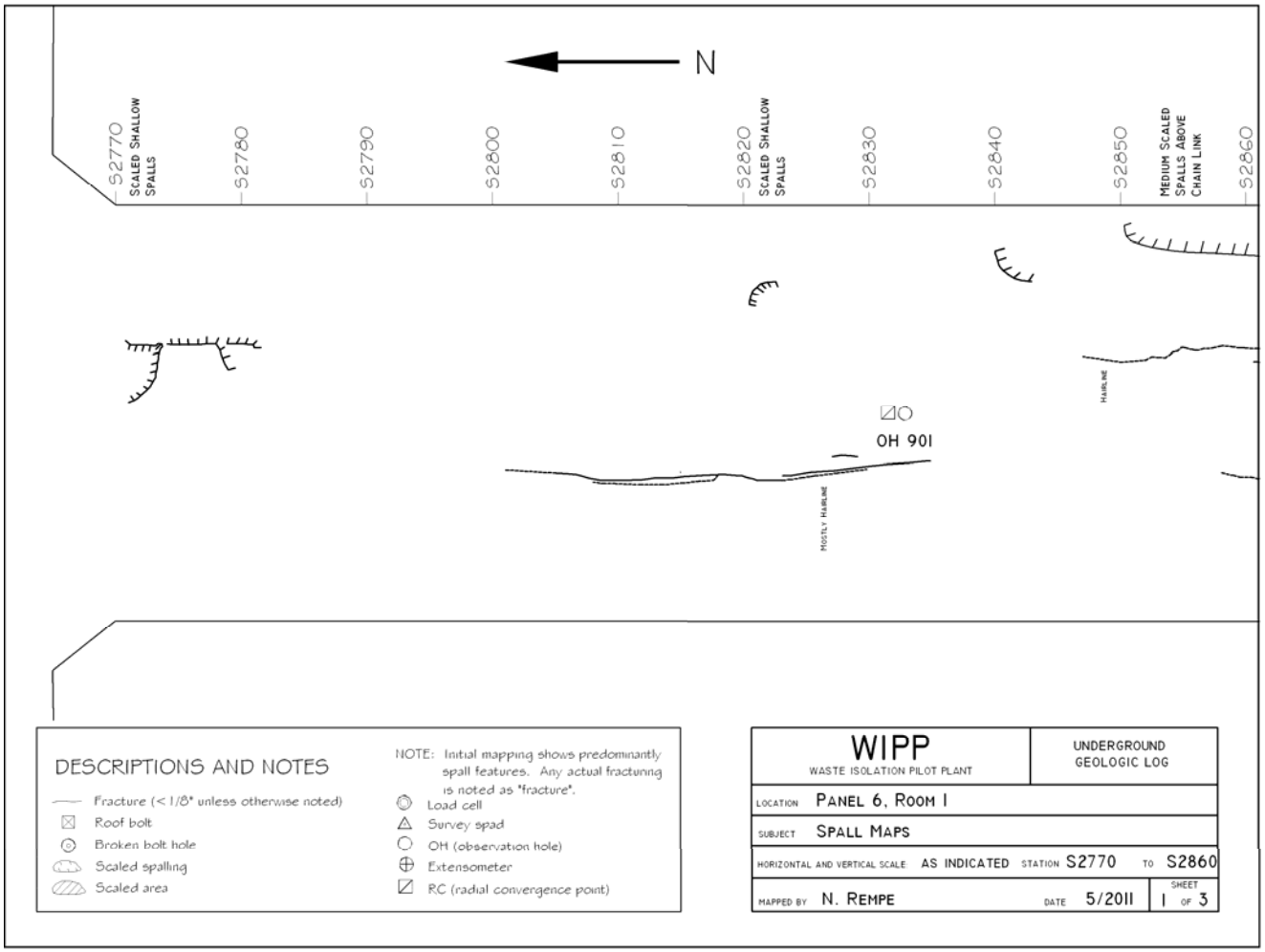

Figure 6-1 Panel 6 Room 1, S2770 S3060 Roof Fractures (Sheet 1 of 3)

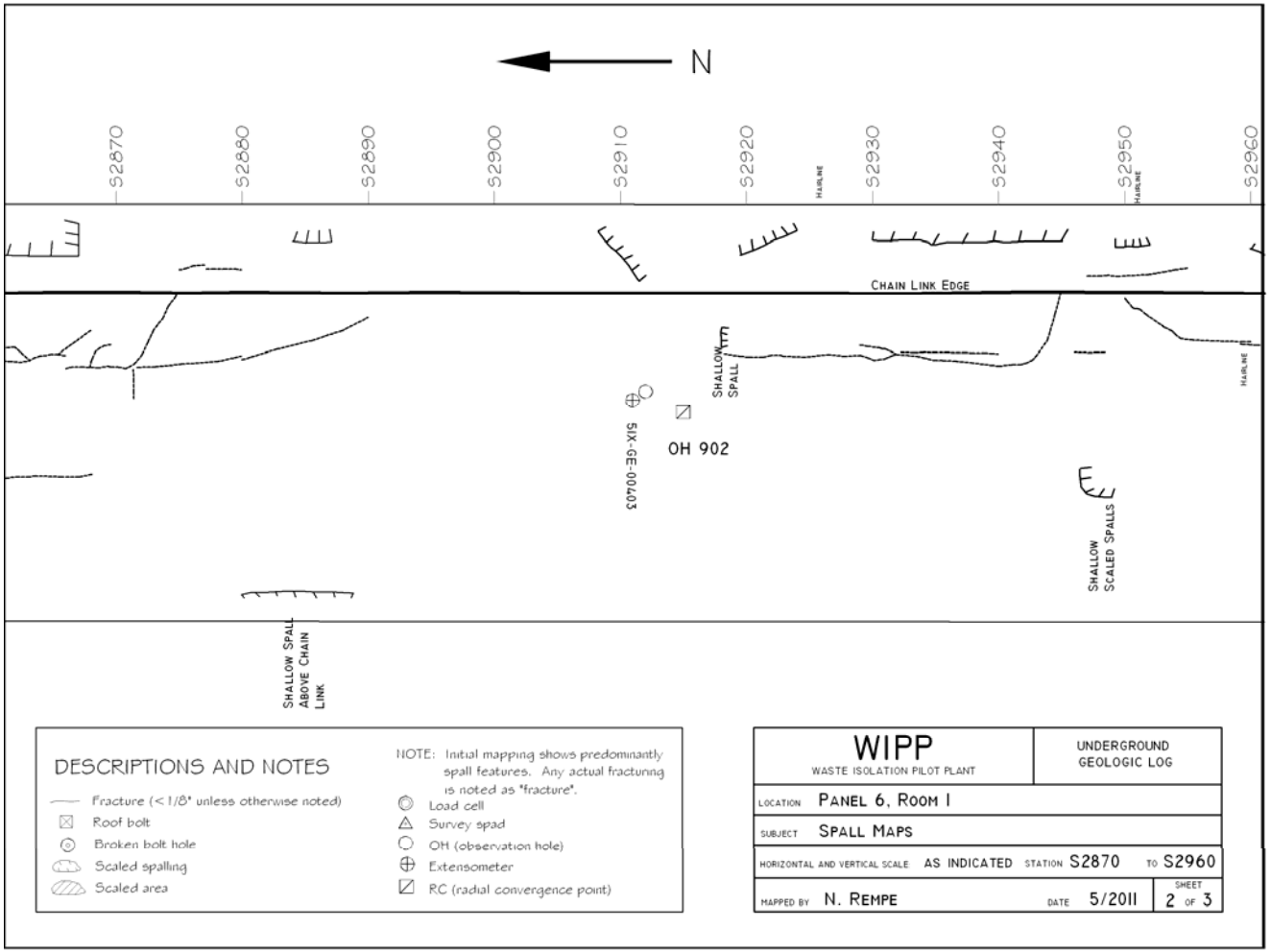

Figure 6-2 Panel 6 Room 1, S2770 S3060 Roof Fractures (Sheet 2 of 3)

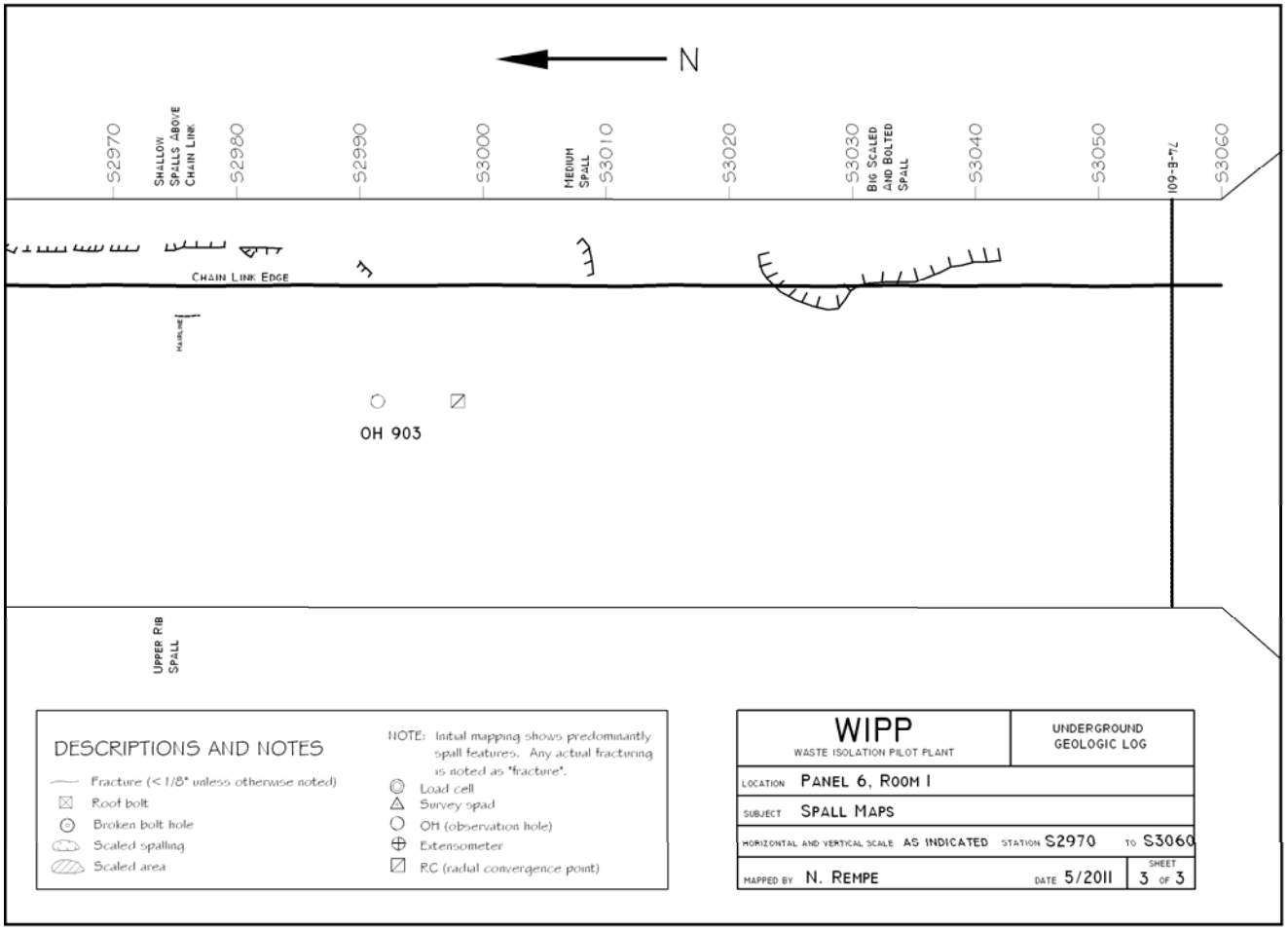

Figure 6-3 Panel 6 Room 1, S2770-S3060 Roof Fractures (Sheet 3 of 3)

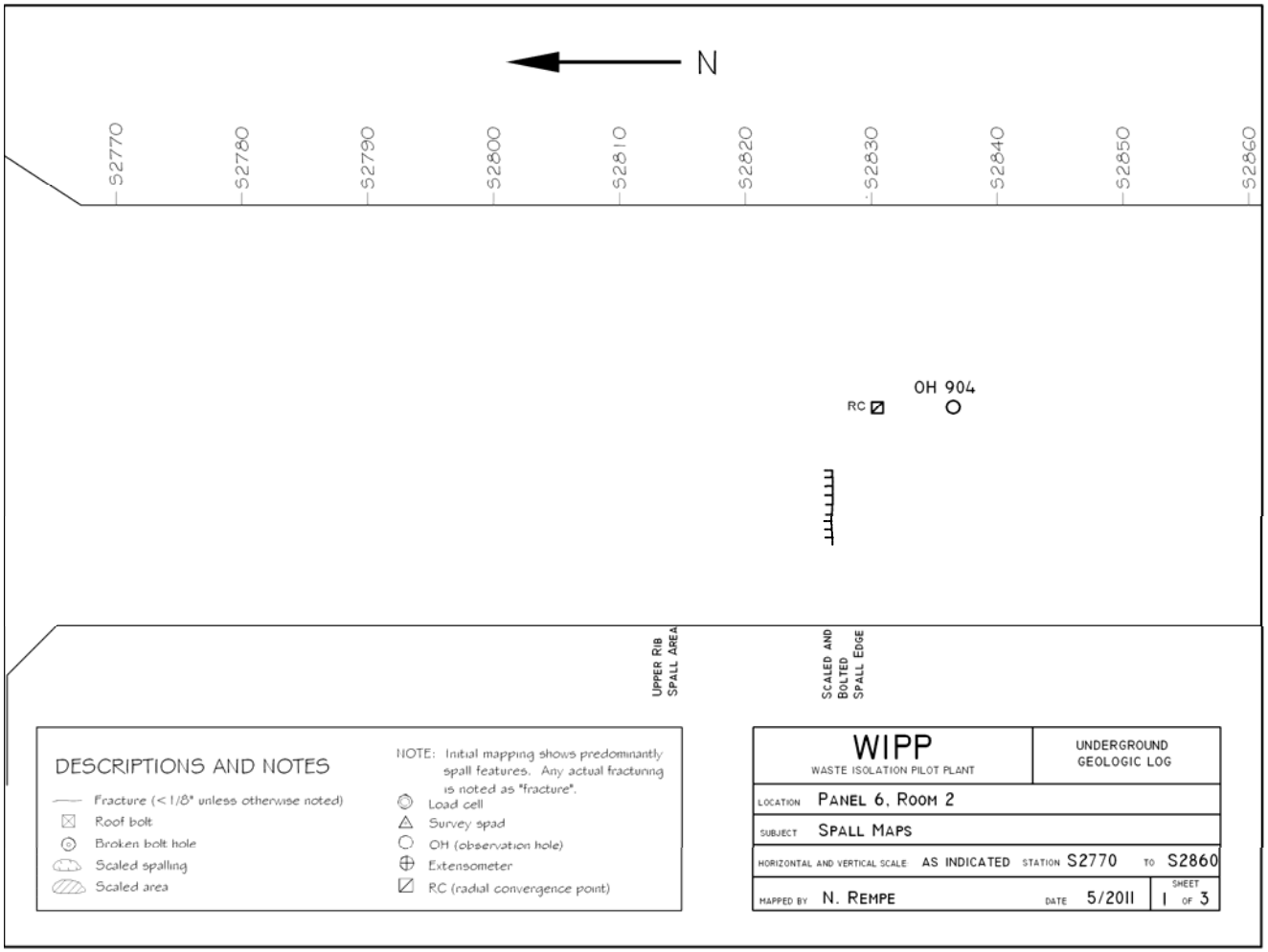

Figure 6-4 Panel 6 Room 2, S2770-S3060 Roof Fractures (Sheet 1 of 3)

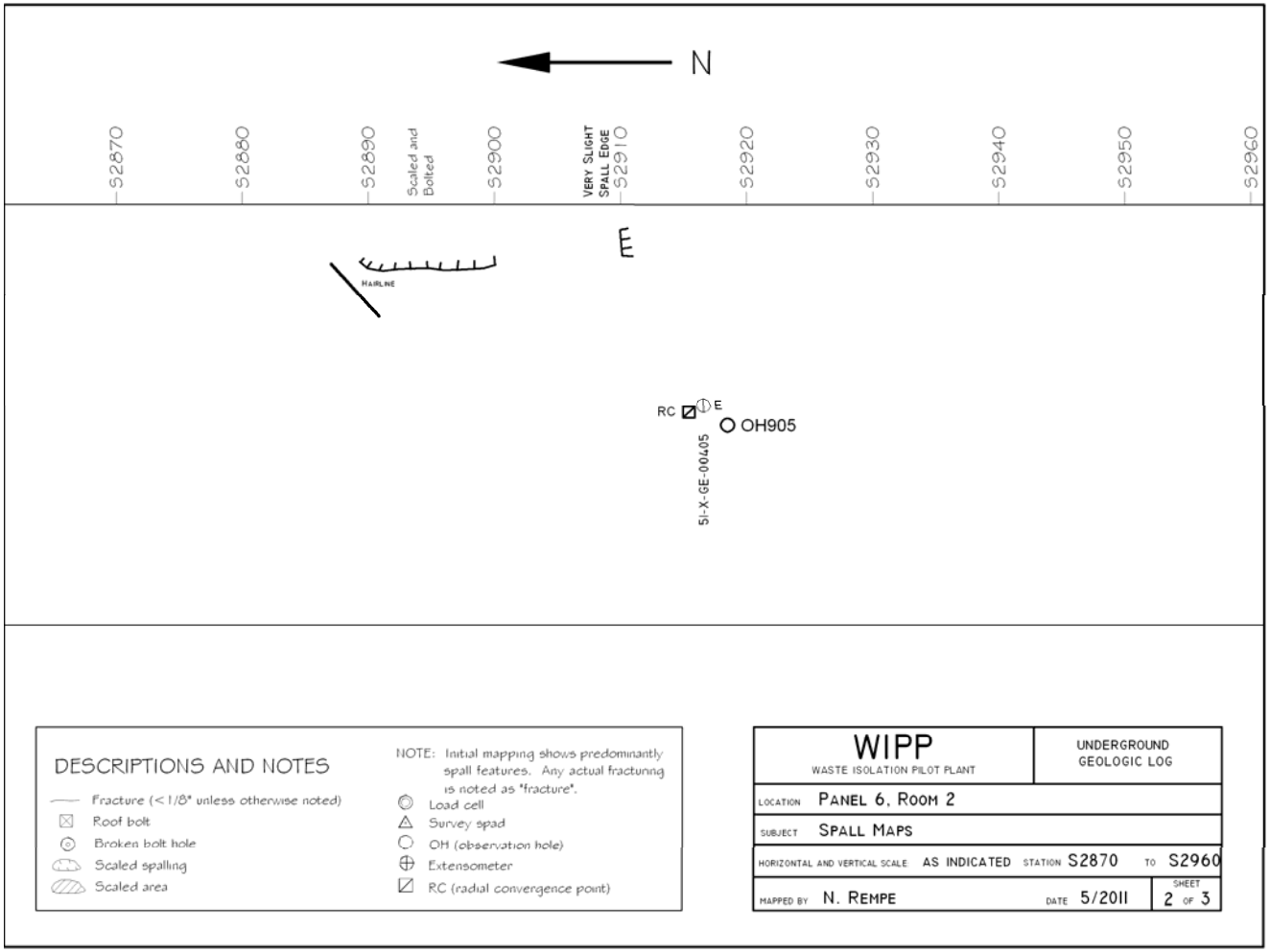

Figure 6-5 Panel 6 Room 2, S2770-S3060 Roof Fractures (Sheet 2 of 3)

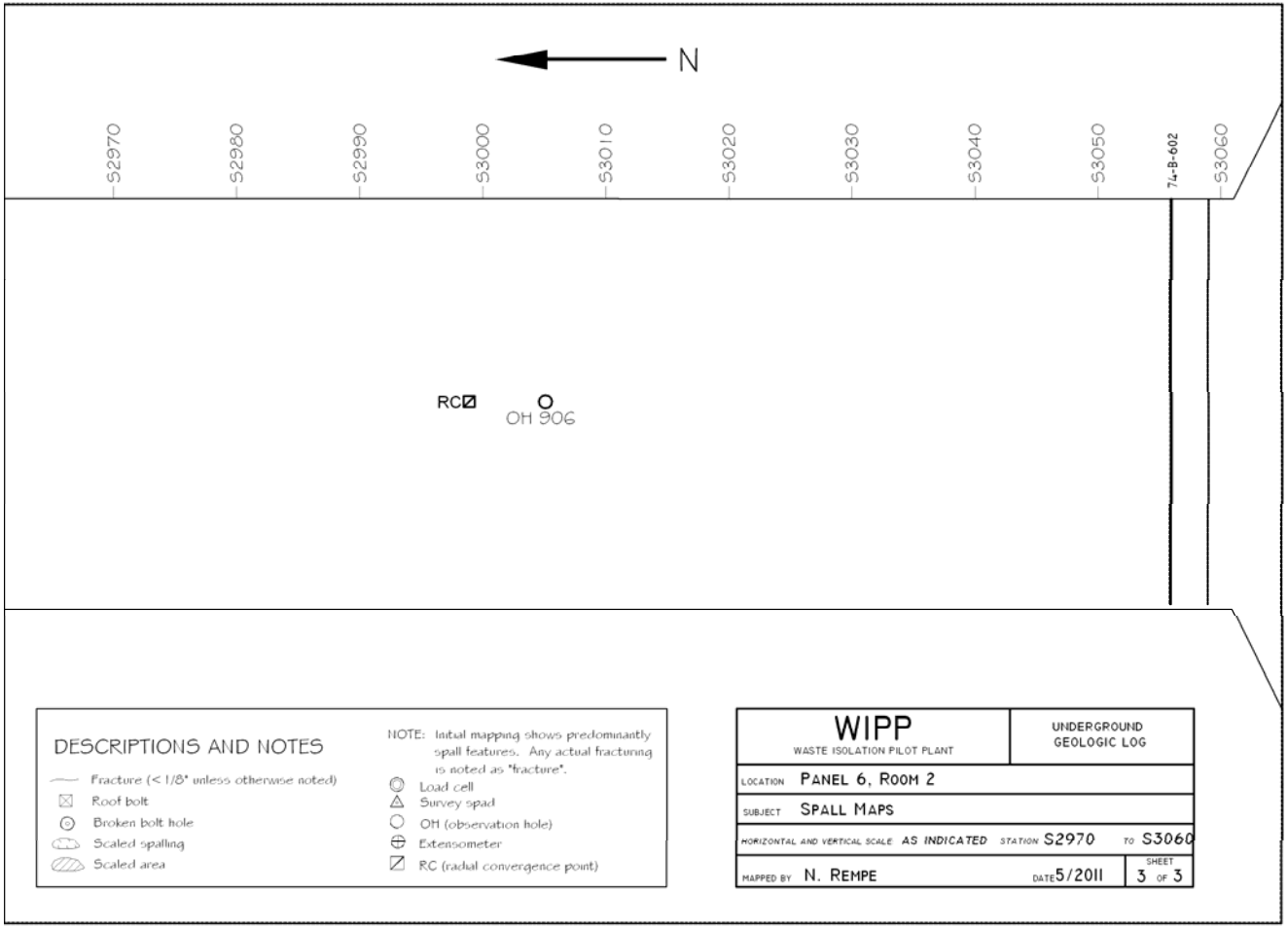

Figure 6-6 Panel 6 Room 2, S2770-S3060 Roof Fractures (Sheet 3 of 3)

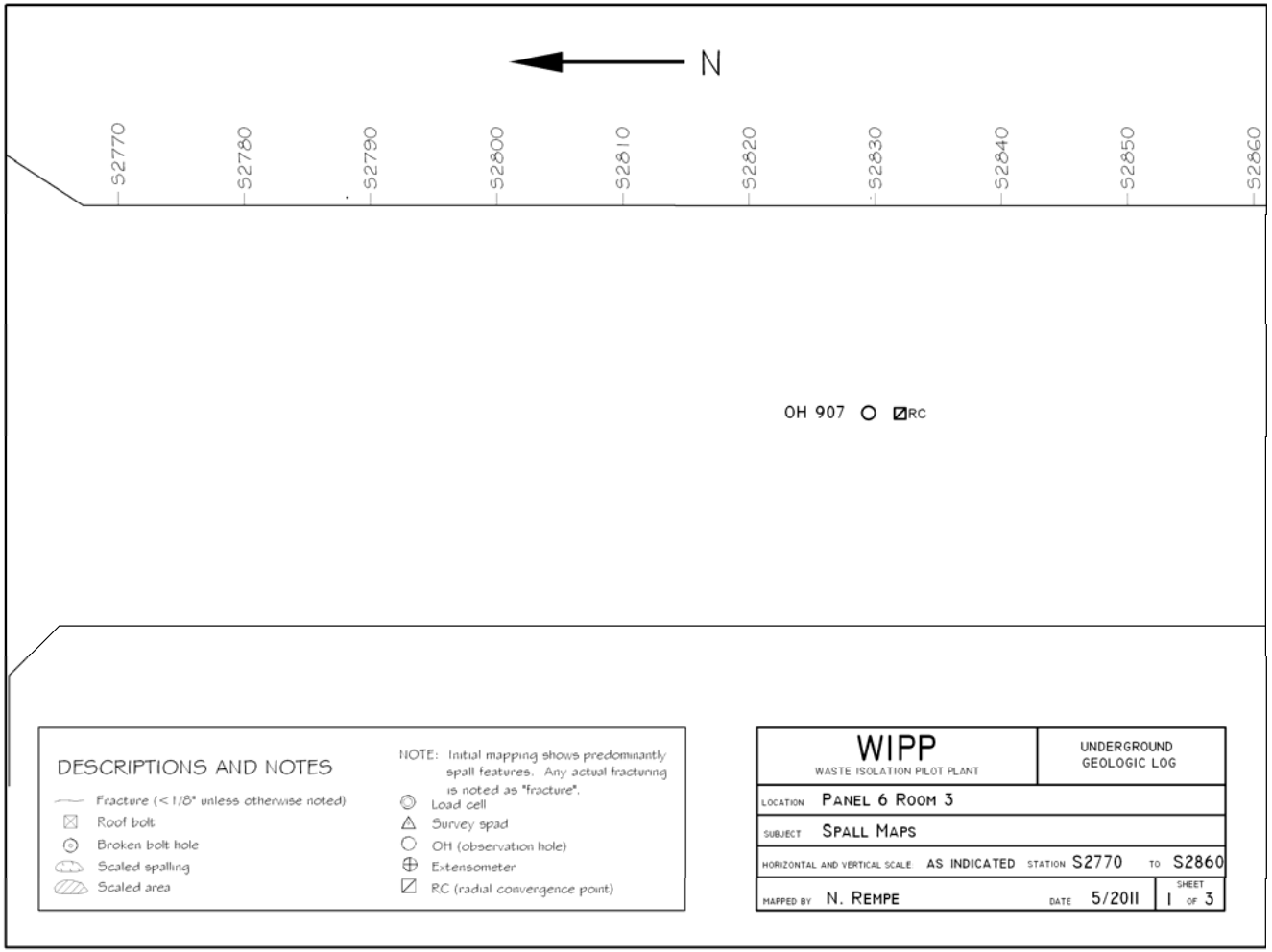

Figure 6-7 Panel 6 Room 3, S2770-S3060 Roof Fractures (Sheet 1 of 3)

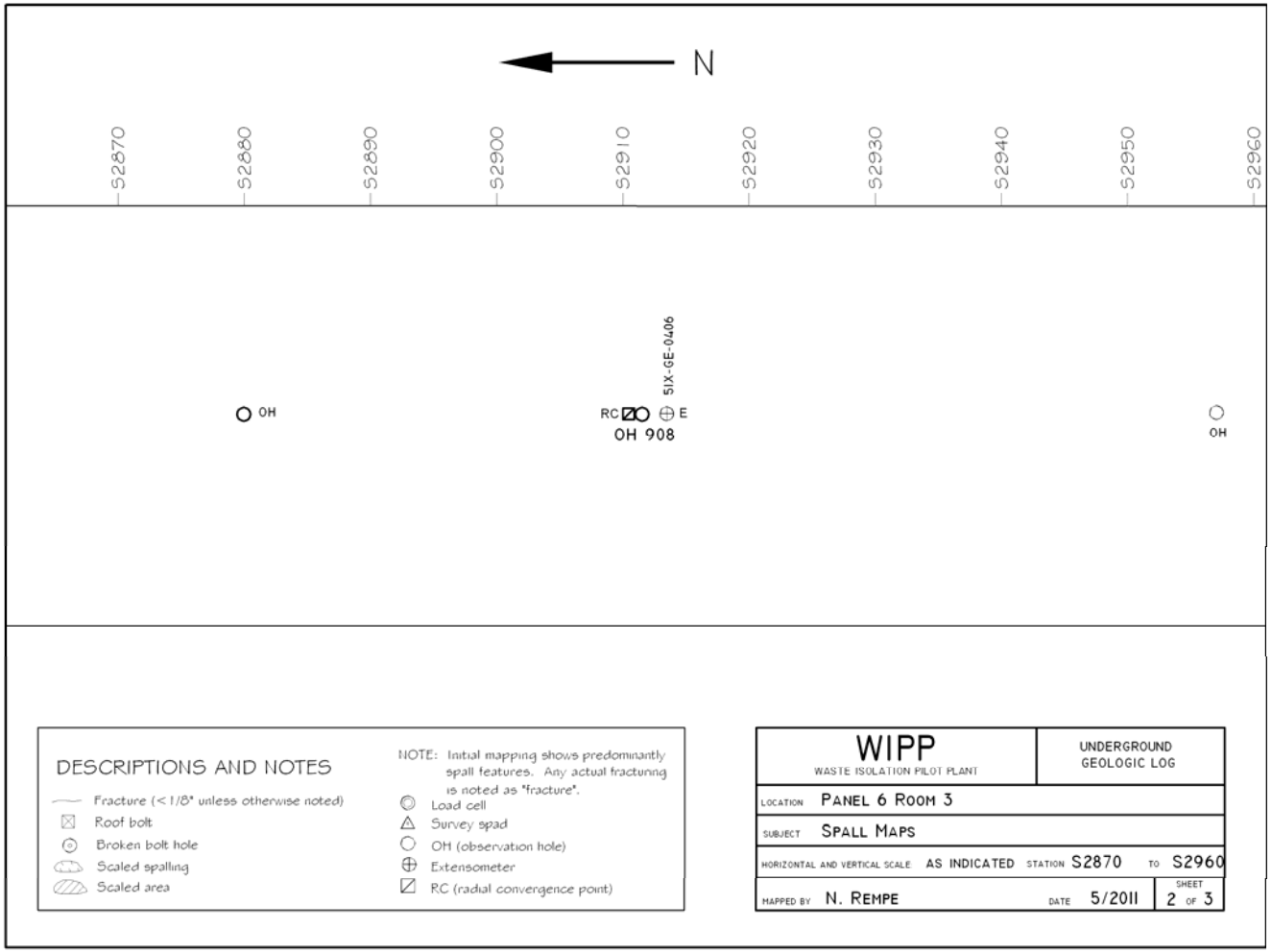

Figure 6-8 Panel 6 Room 3, S2770-S3060 Roof Fractures (Sheet 2 of 3)

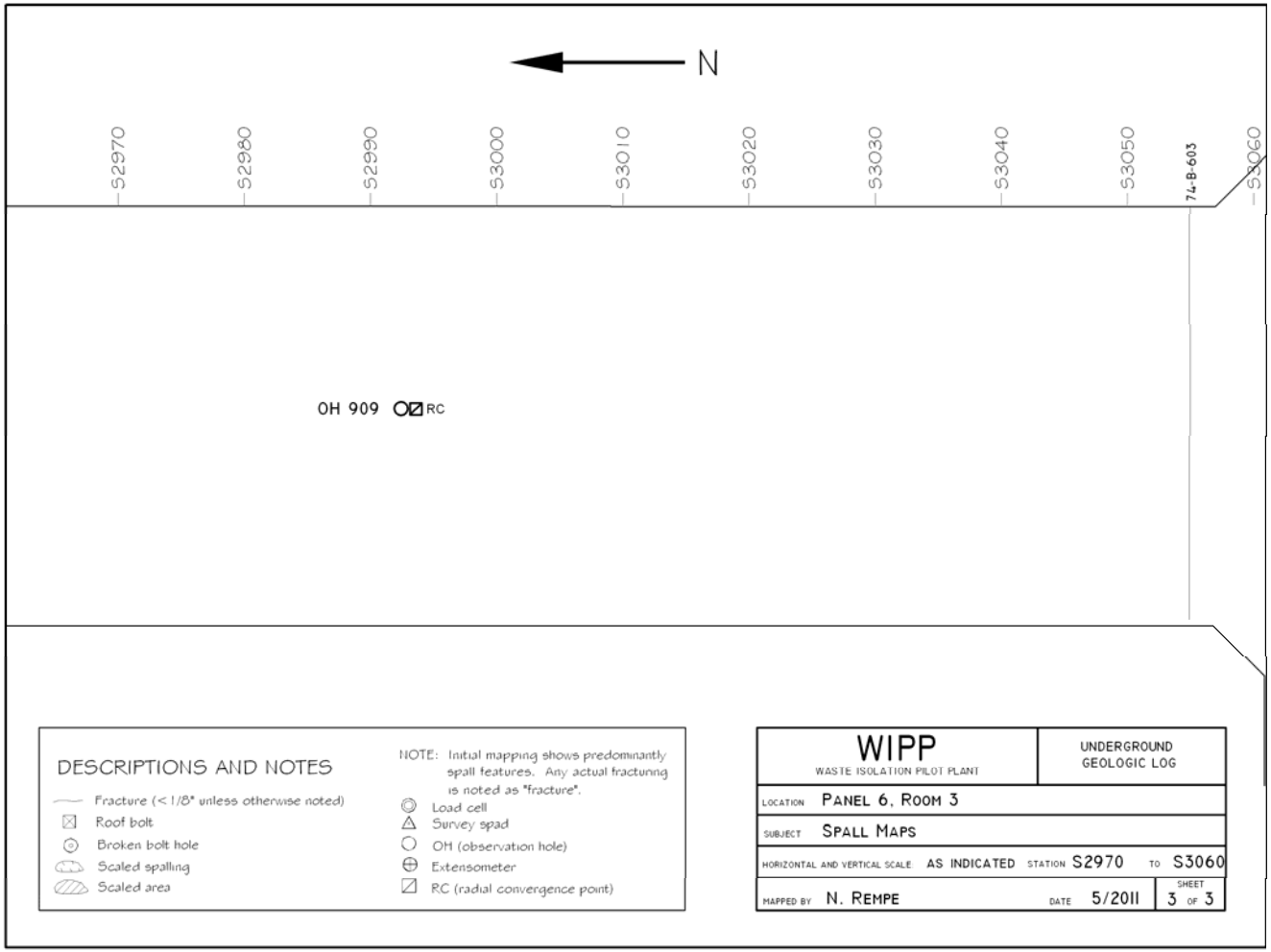

Figure 6-9 Panel 6 Room 3, S2770-S3060 Roof Fractures (Sheet 3 of 3)

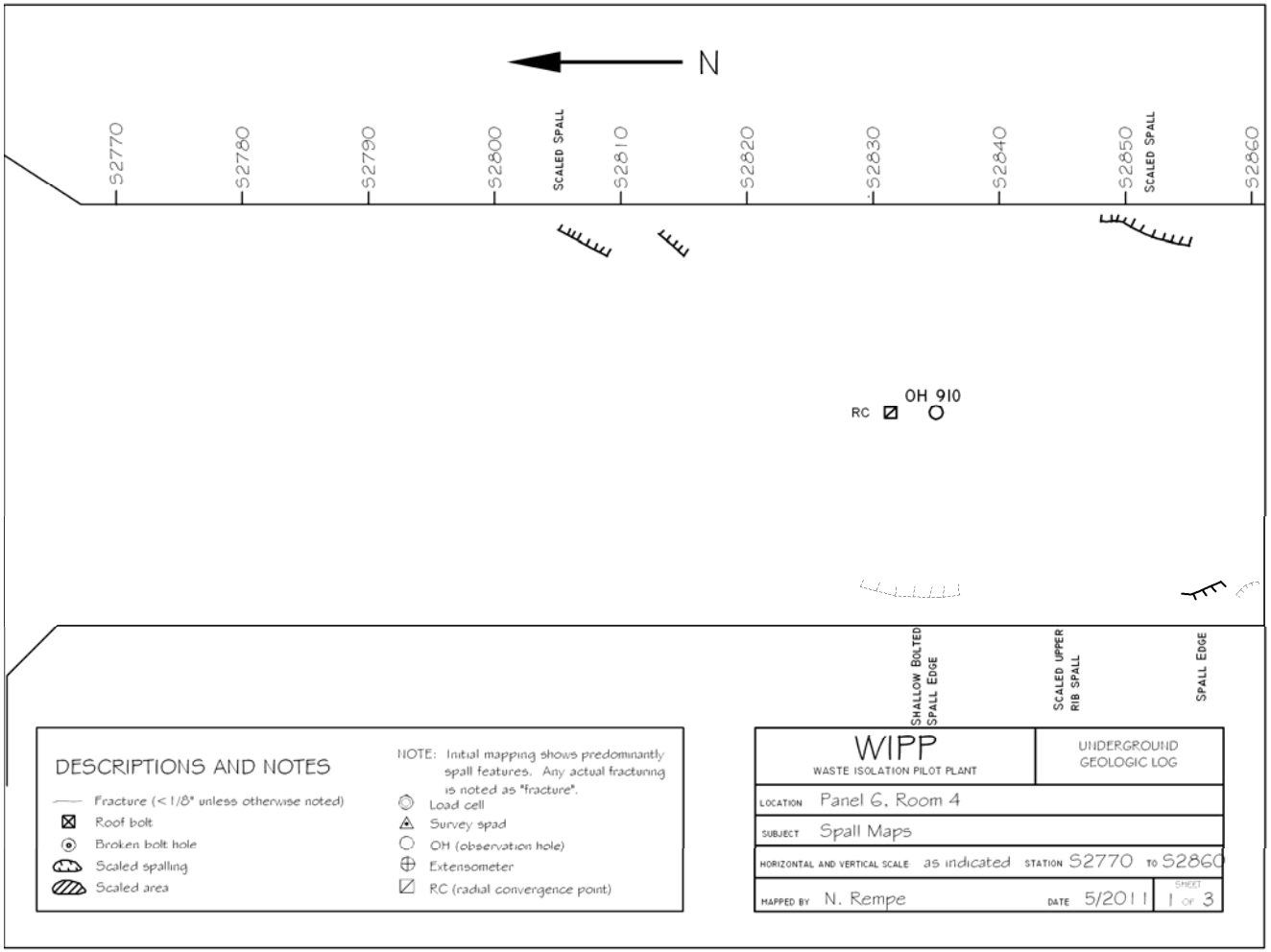

Figure 6-10 Panel 6 Room 2, S2770-S3060 Roof Fractures (Sheet 1 of 3)

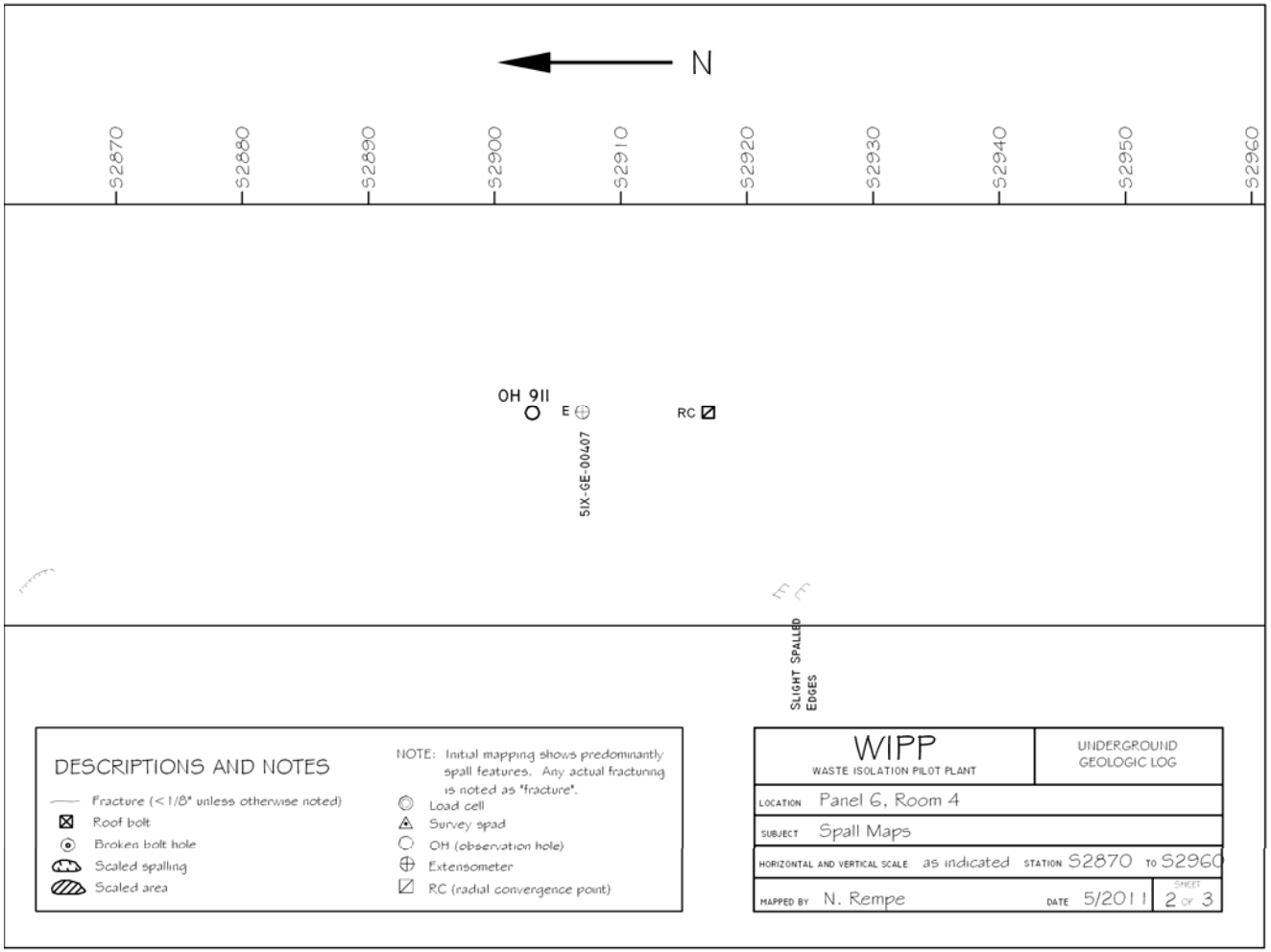

Figure 6-11 Panel 6 Room 4, S2770-S3060 Roof Fractures (Sheet 2 of 3)

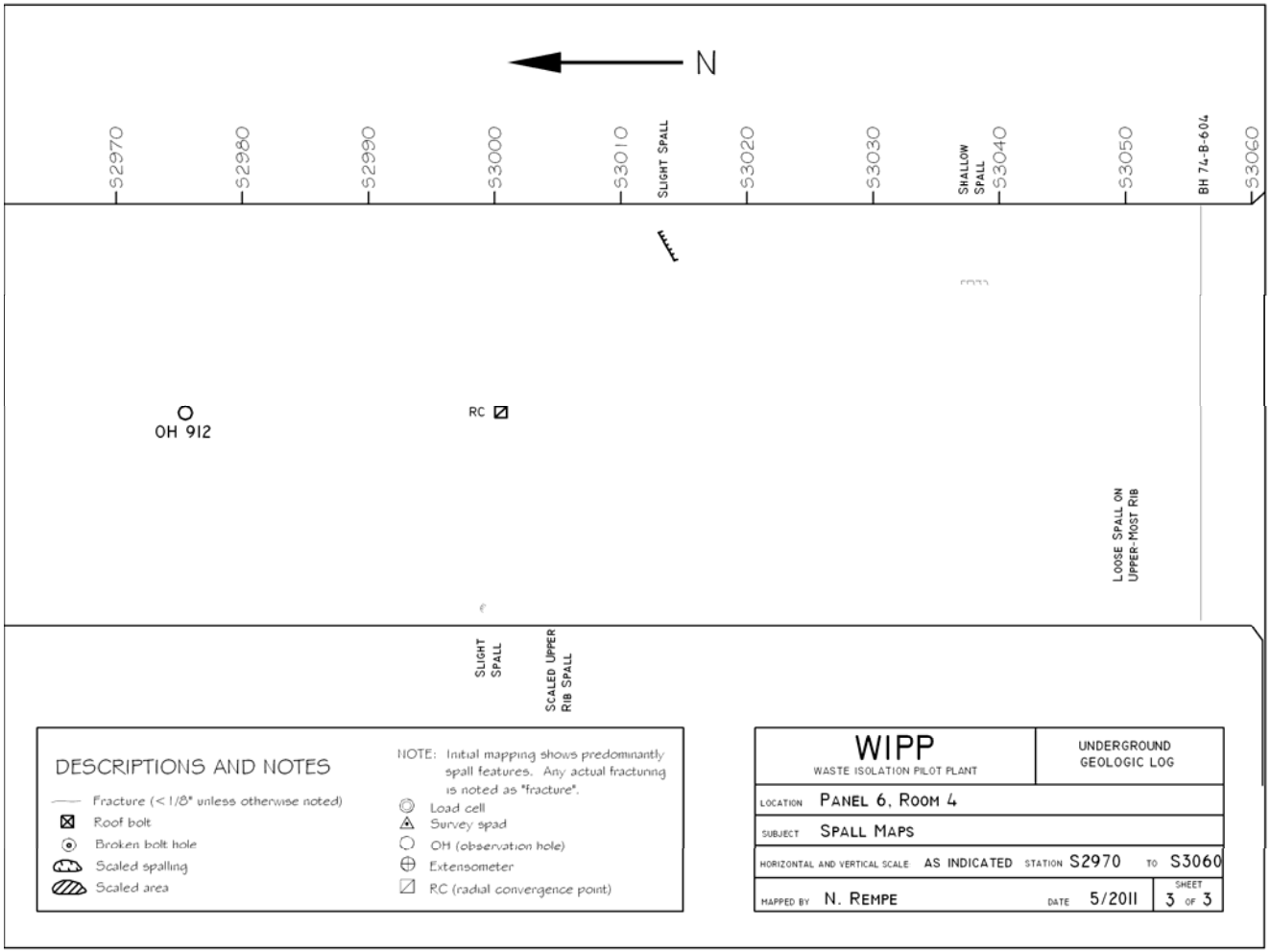

Figure 6-12 Panel 6 Room 4, S2770-S3060 Roof Fractures (Sheet 3 of 3)

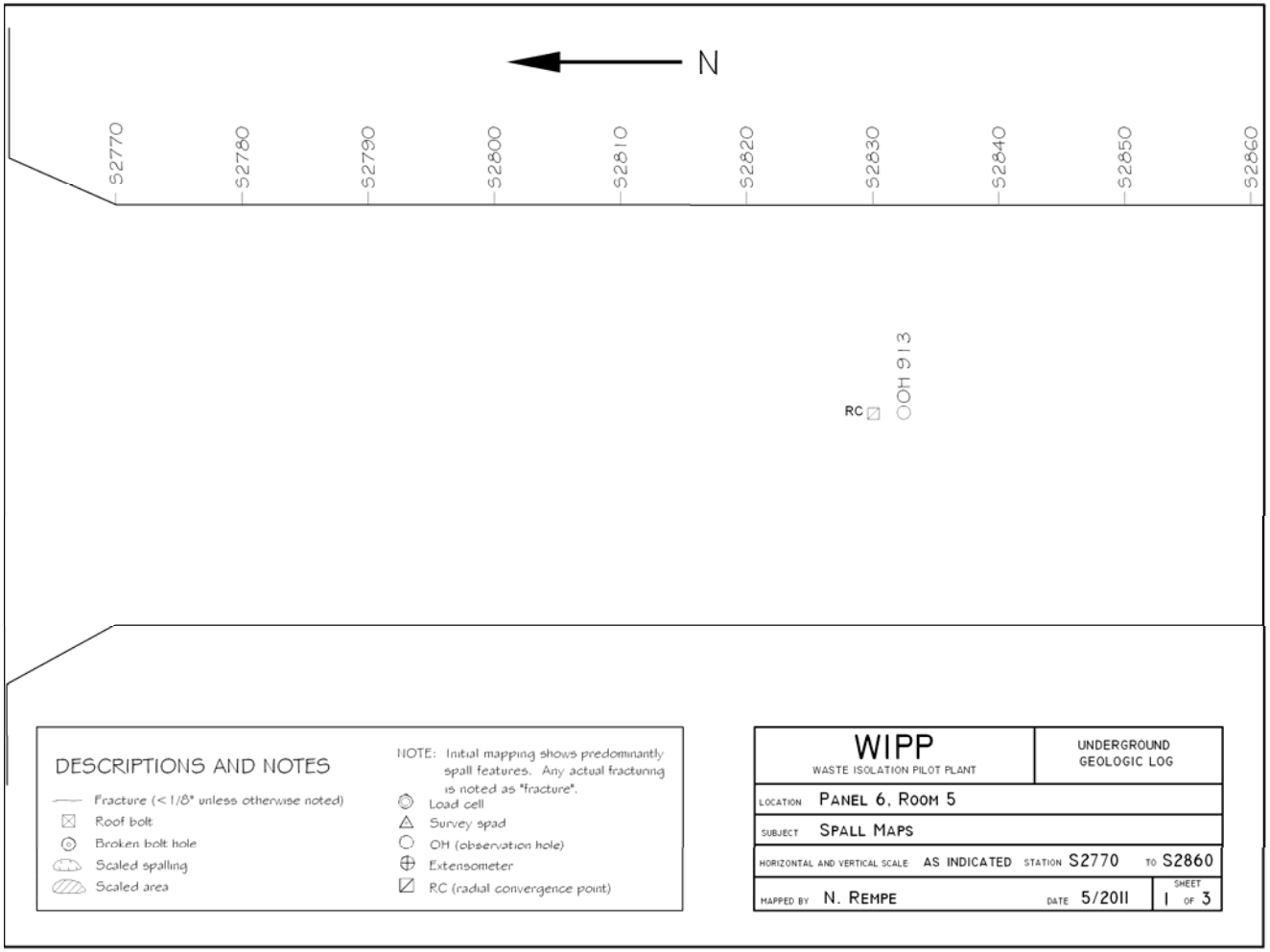

Figure 6-13 Panel 6 Room 5, S2770-S3060 Roof Fractures (Sheet 1 of 3)

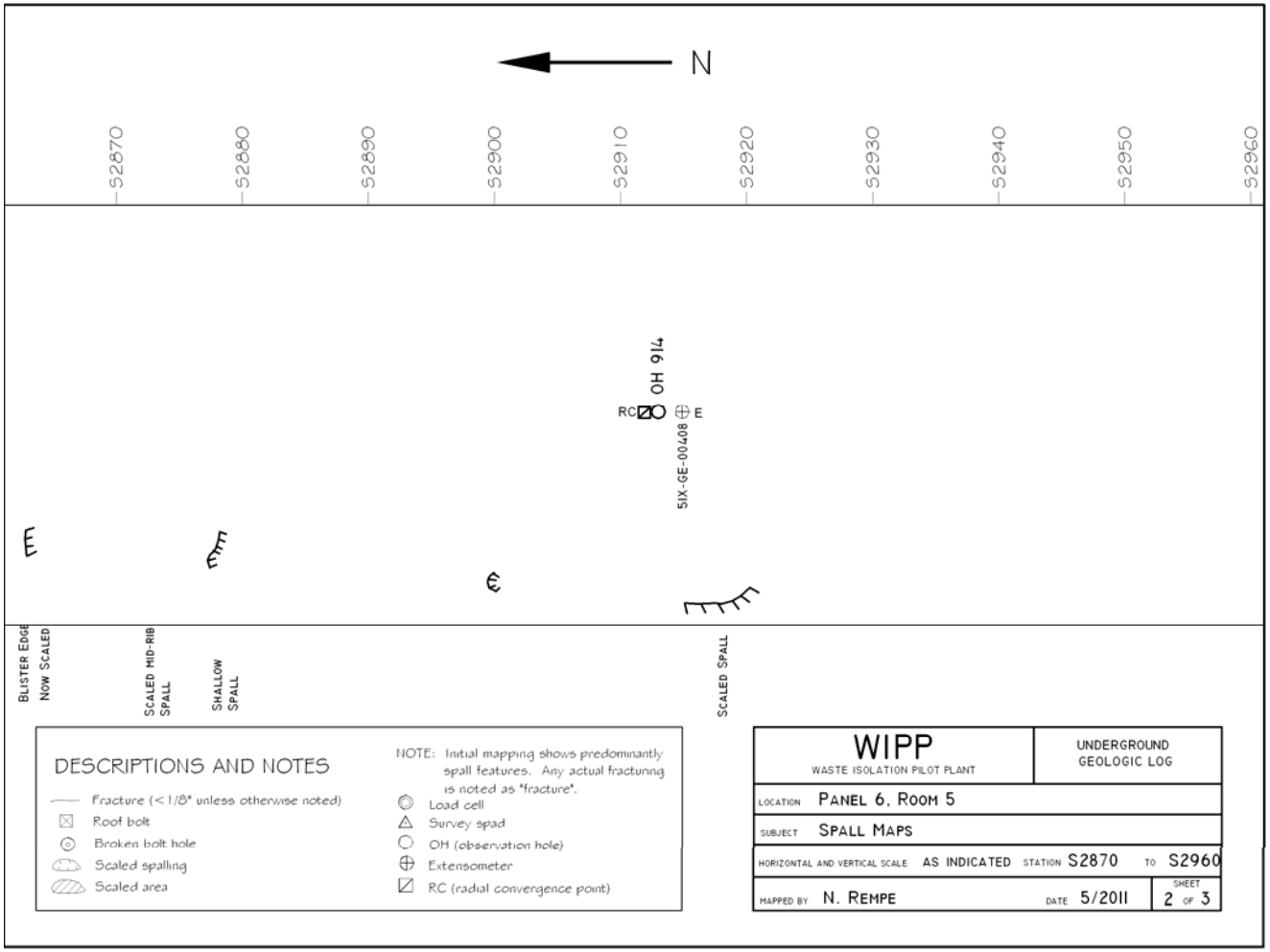

Figure 6-14 Panel 6 Room 4, S2770-S3060 Roof Fractures (Sheet 2 of 3)

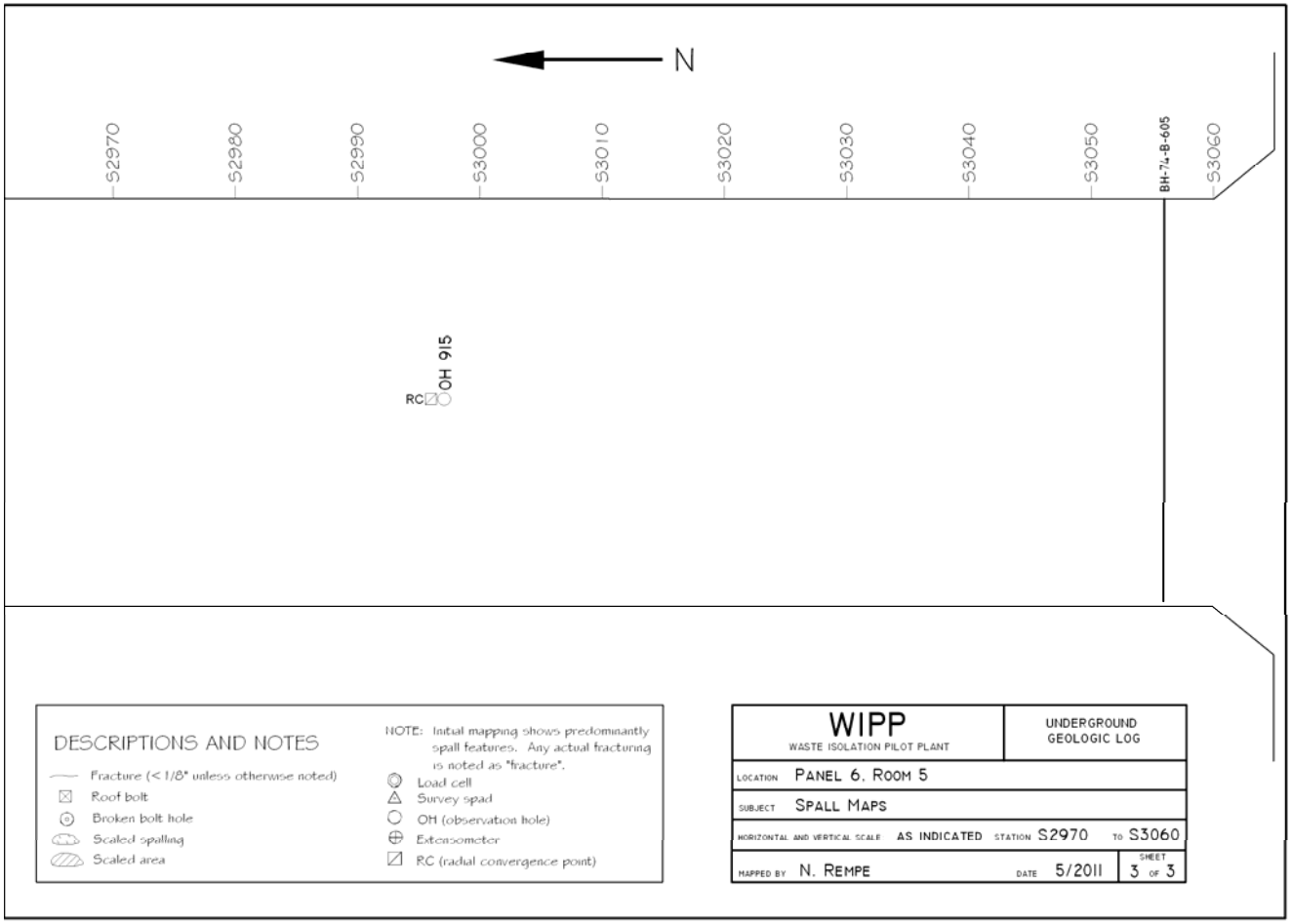

Figure 6-15 Panel 6 Room 5, S2770-S3060 Roof Fractures (Sheet 3 of 3)

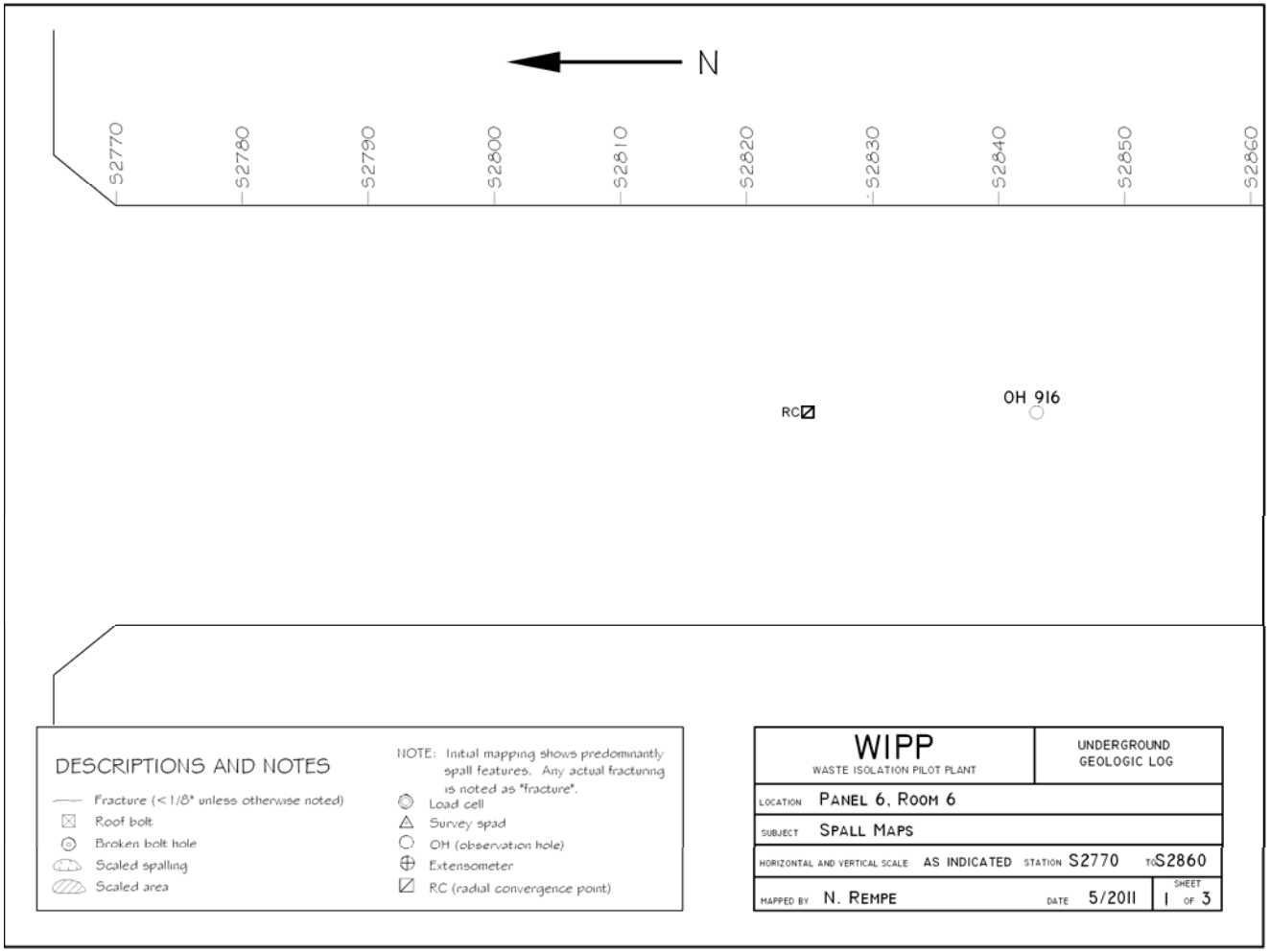

Figure 6-16 Panel 6 Room 6, S2770-S3060 Roof Fractures (Sheet 1 of 3)

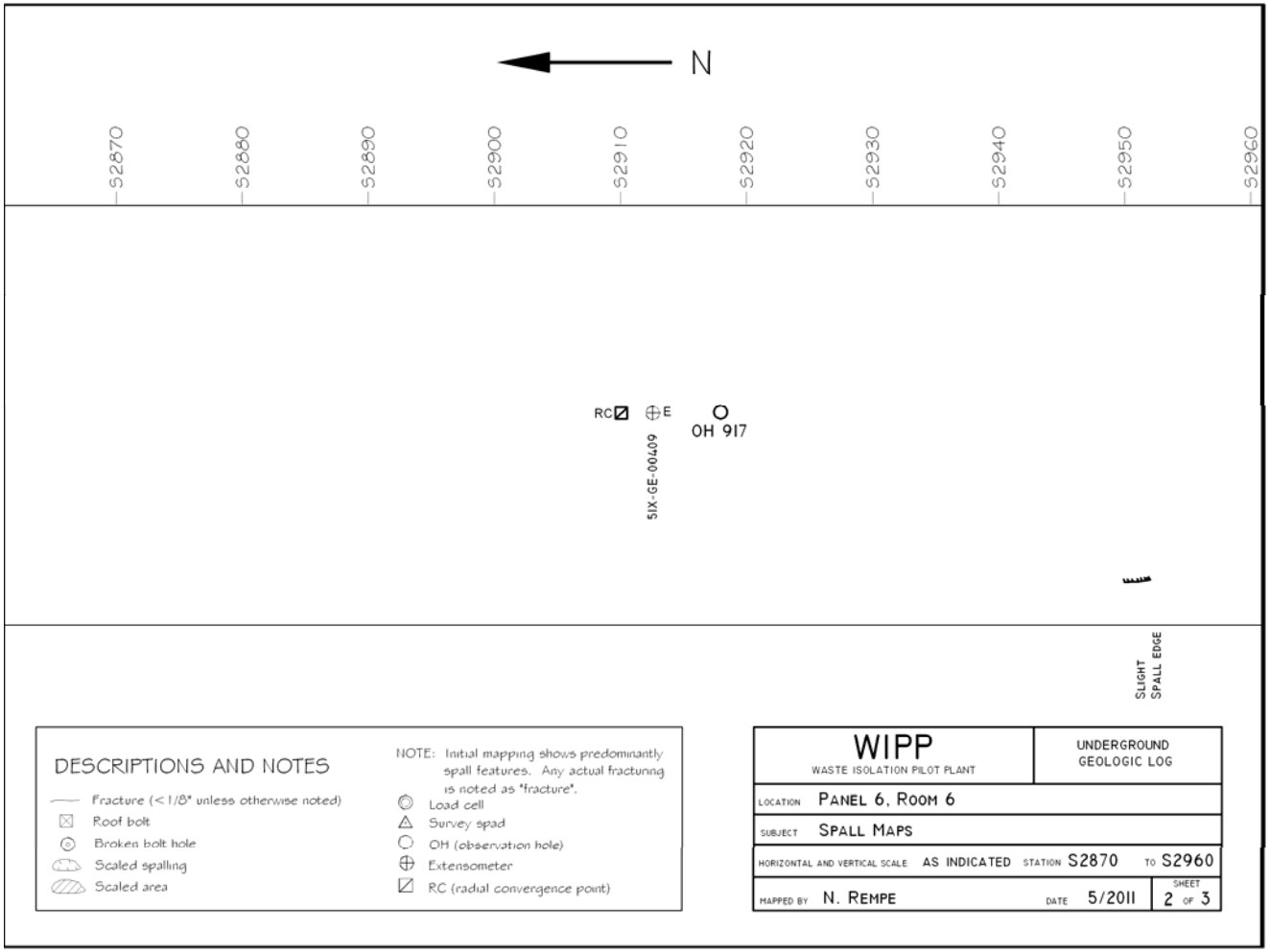

Figure 6-17 Panel 6 Room 6, S2770-S3060 Roof Fractures (Sheet 2 of 3)

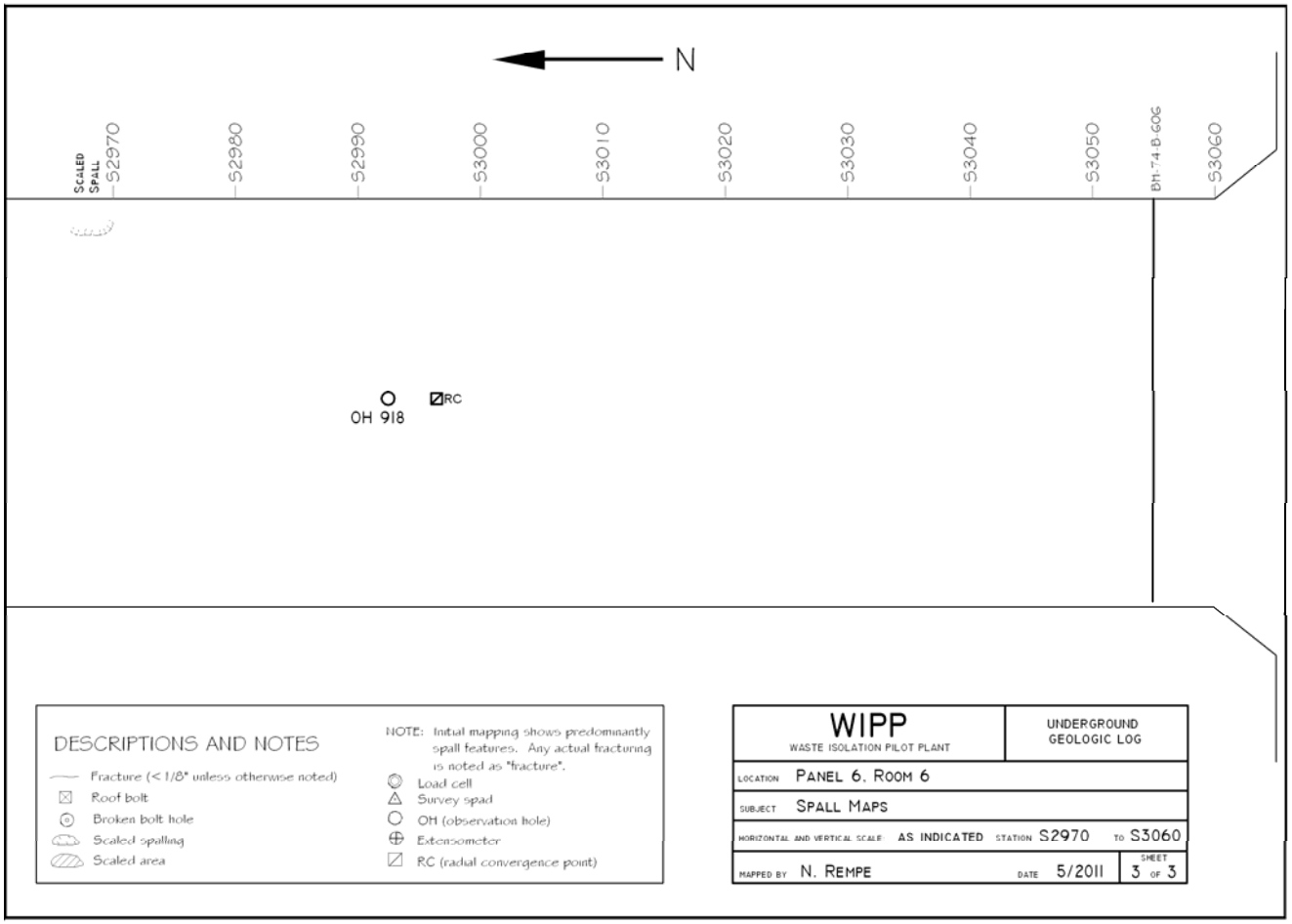

Figure 6-18 Panel 6 Room 6, S2770-S3060 Roof Fractures (Sheet 3 of 3)

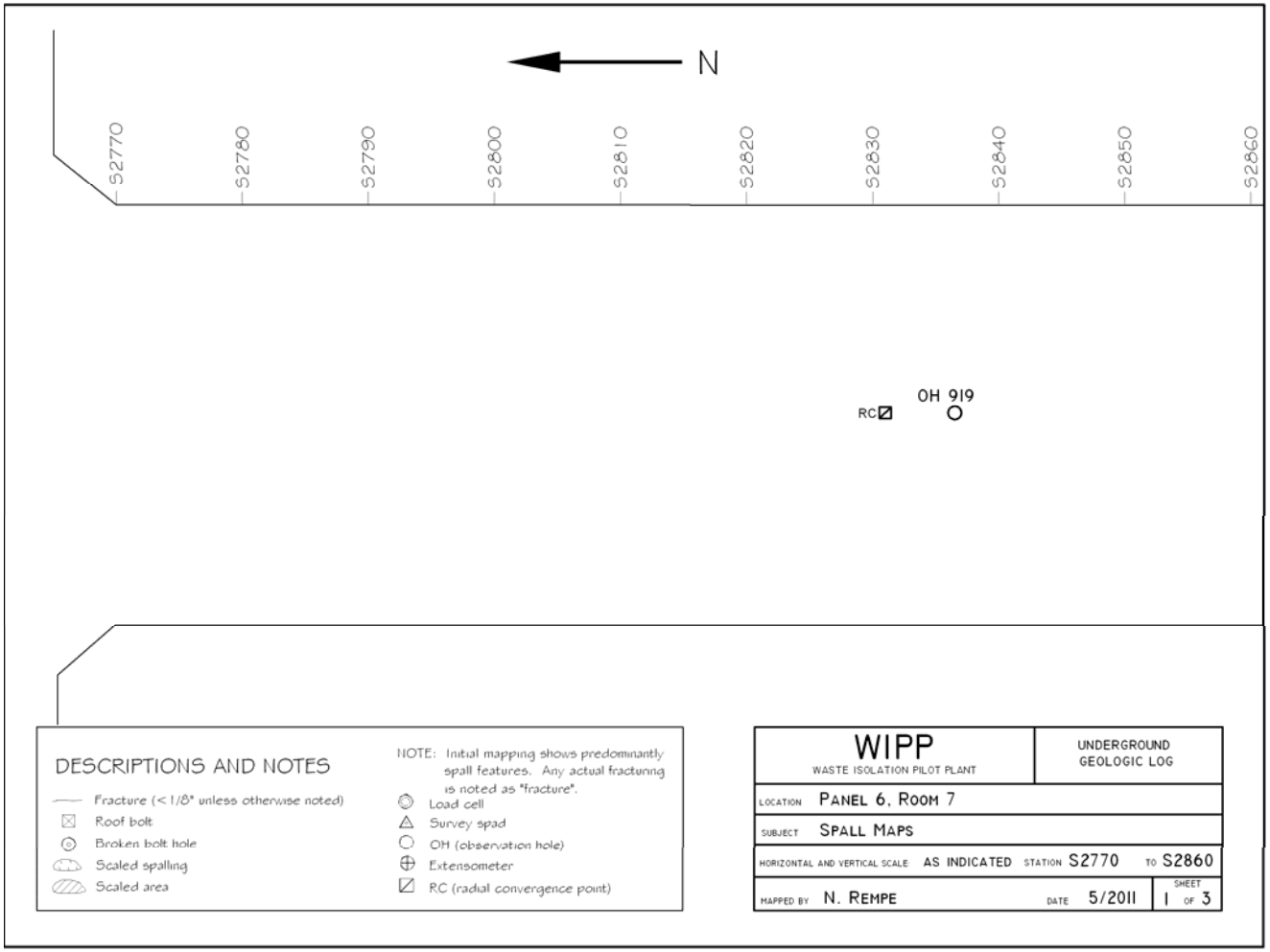

Figure 6-19 Panel 6 Room 7, S2770-S3060 Roof Fractures (Sheet 1 of 3)

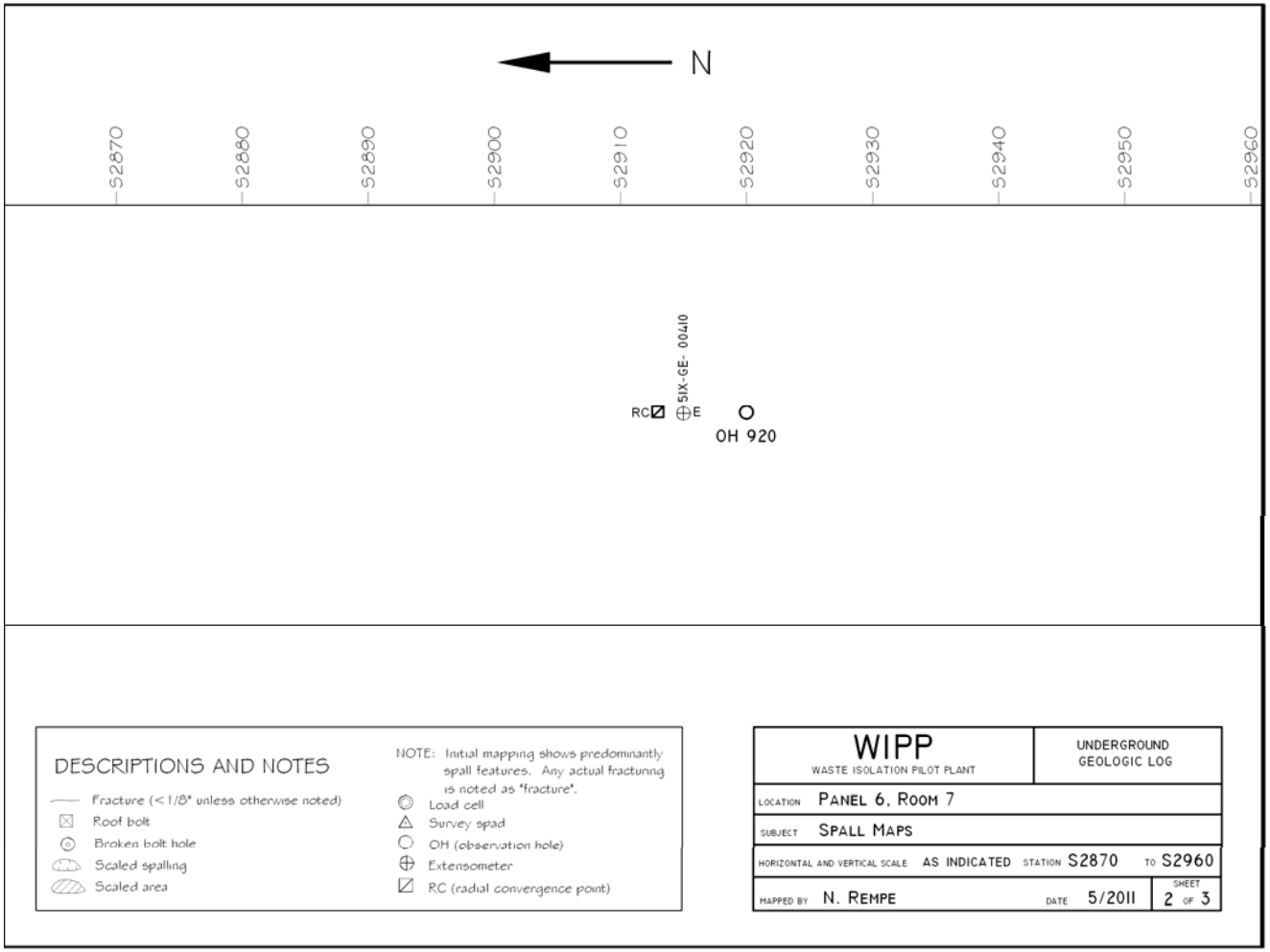

Figure 6-20 Panel 6 Room 7, S2770-S3060 Roof Fractures (Sheet 2 of 3)

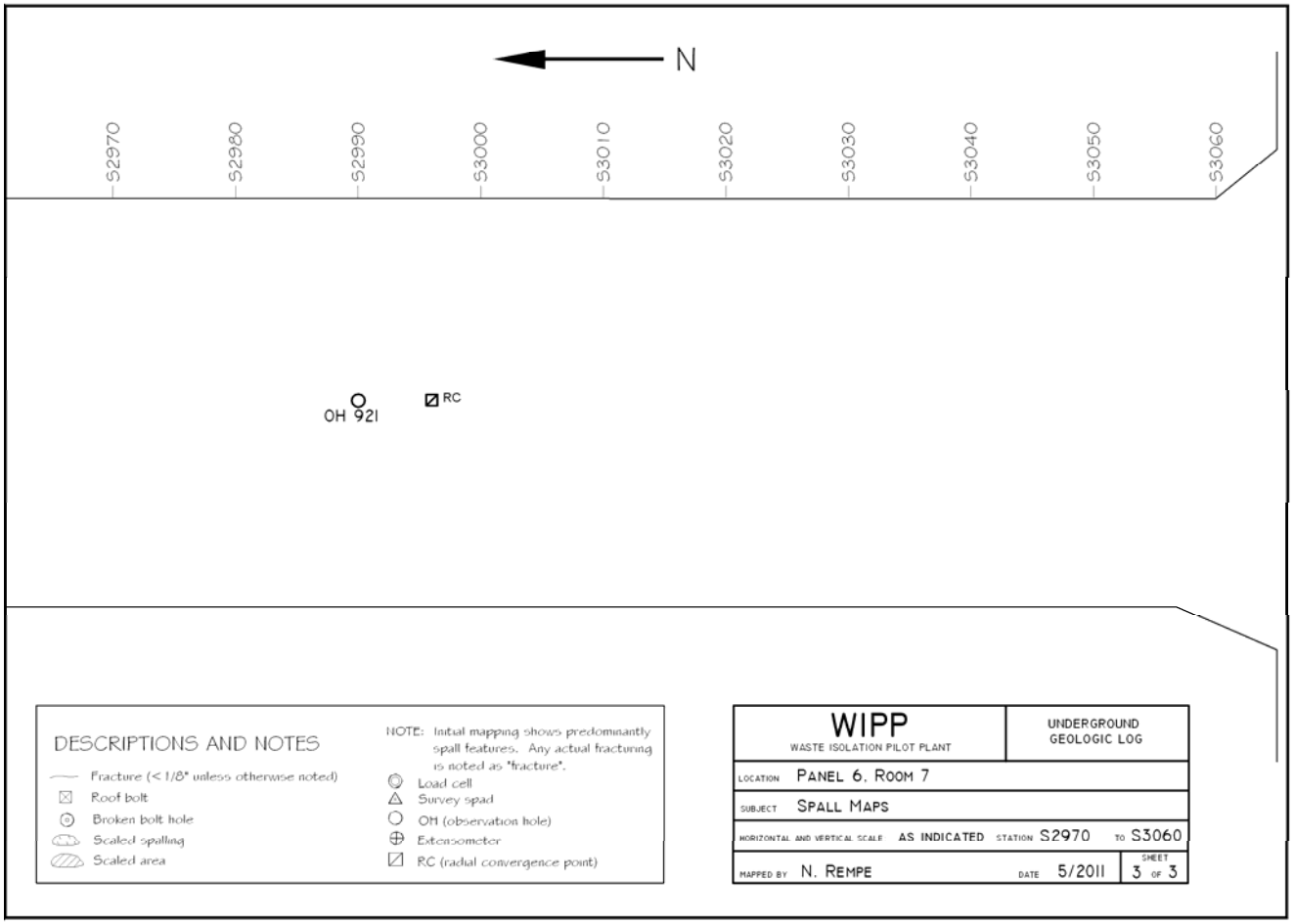

Figure 6-21 Panel 6 Room 7, S2770-S3060 Roof Fractures (Sheet 3 of 3)

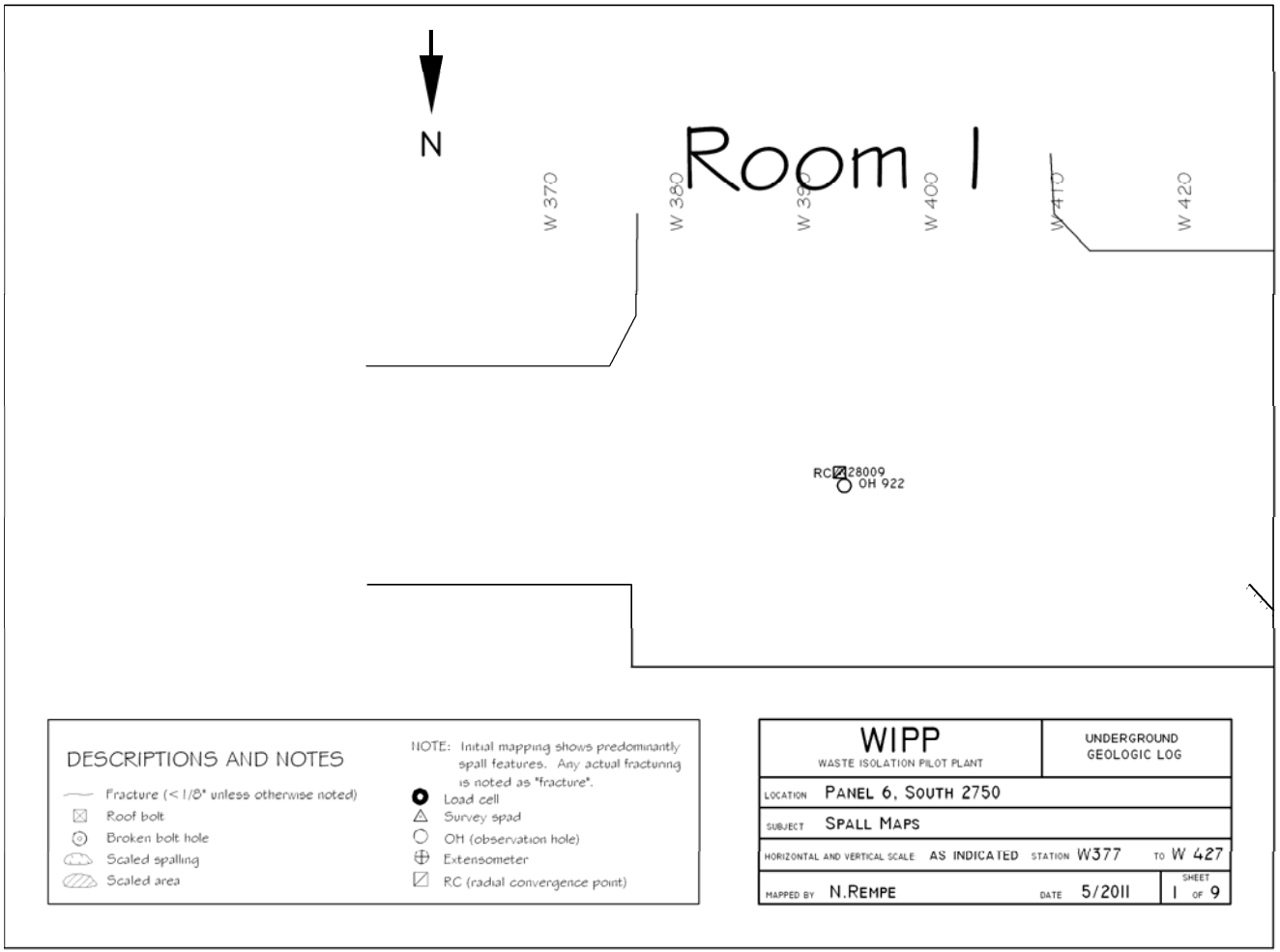

Figure 6-22 Panel 6 S2750, W390-W1210 Roof Fractures (Sheet 1 of 9)

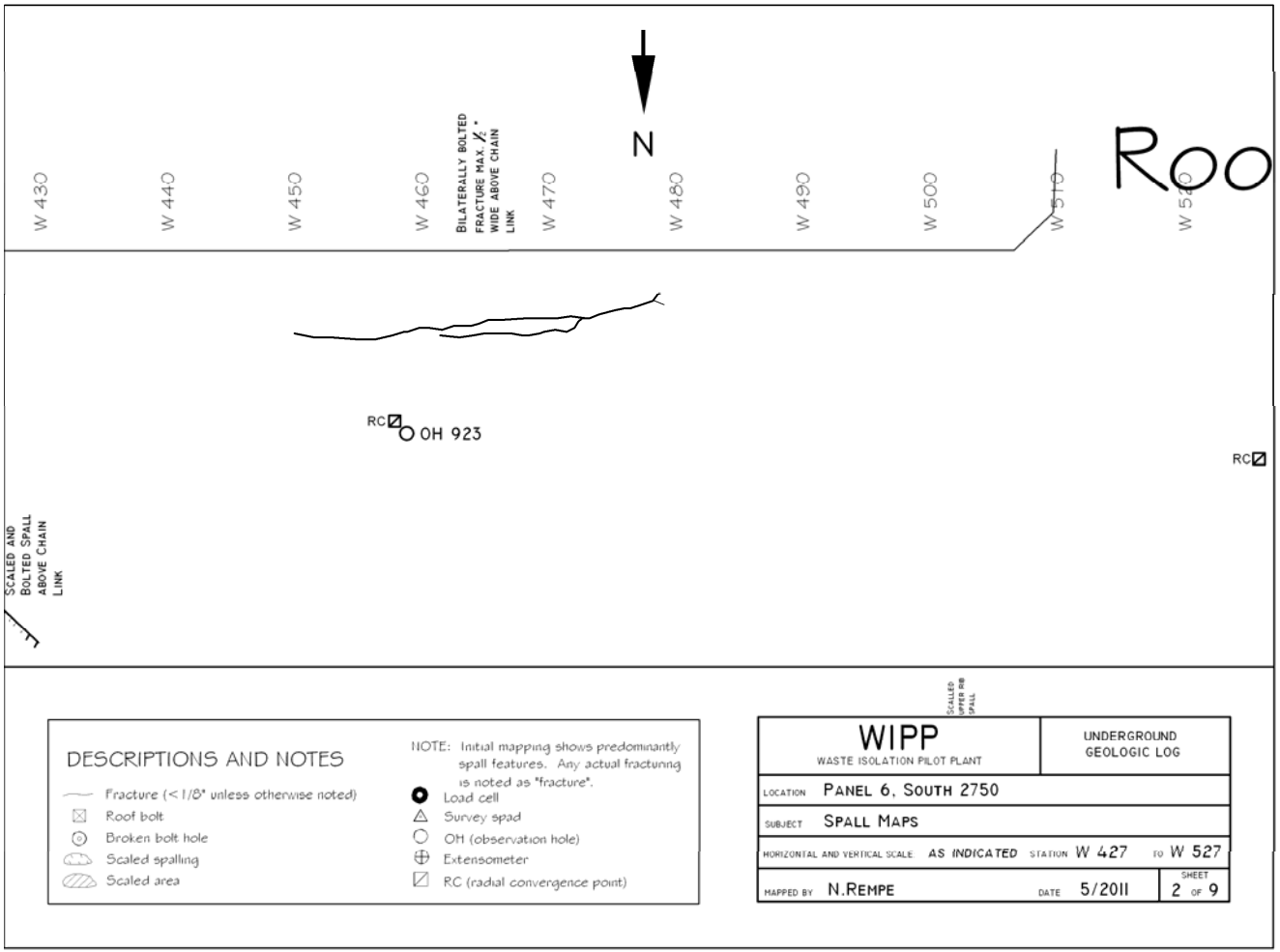

Figure 6-23 Panel 6 S2750, W390-W1210 Roof Fractures (Sheet 2 of 9)

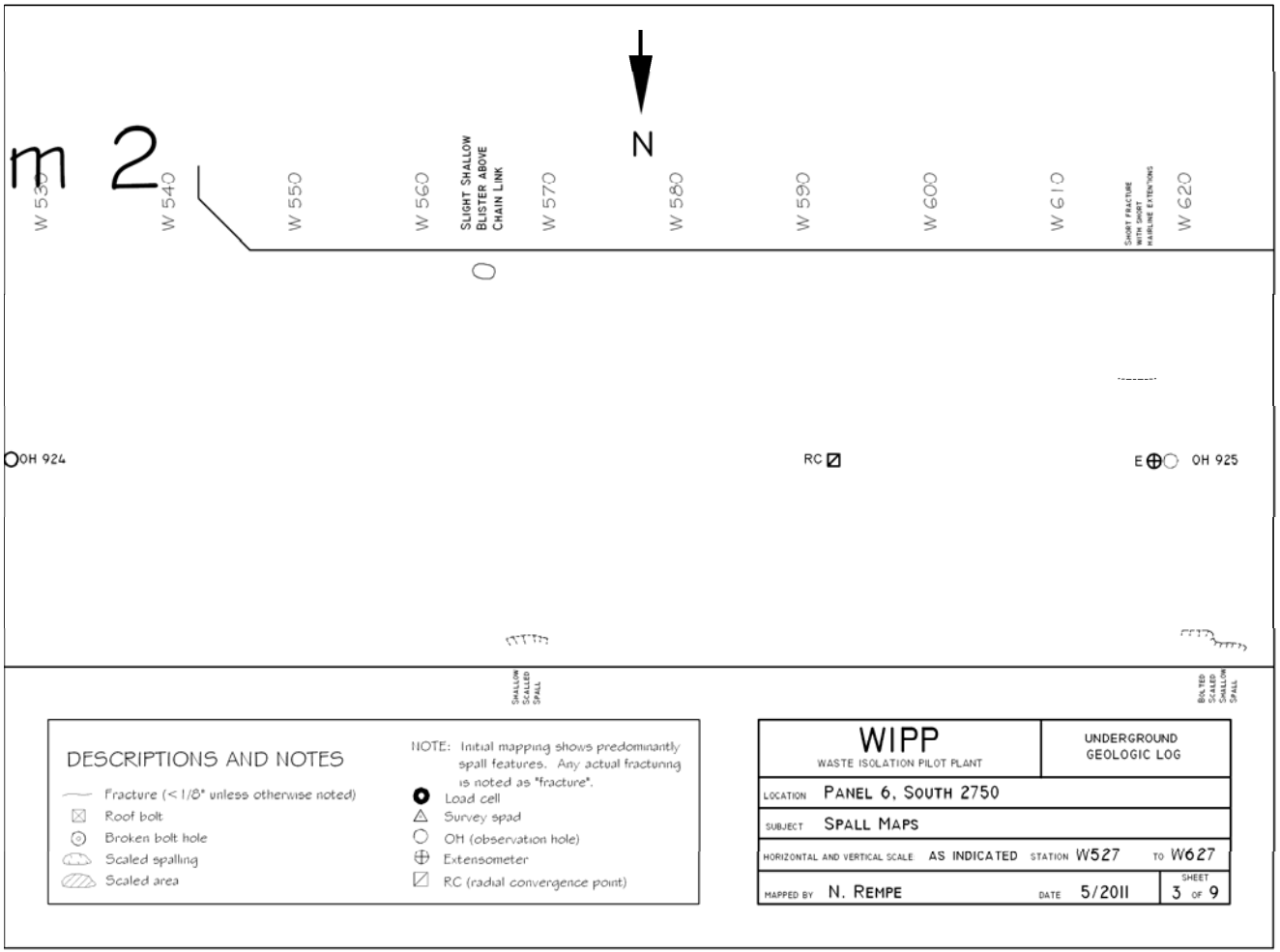

Figure 6-24 Panel 6 S2750, W390-W1210 Roof Fractures (Sheet 3 of 9)

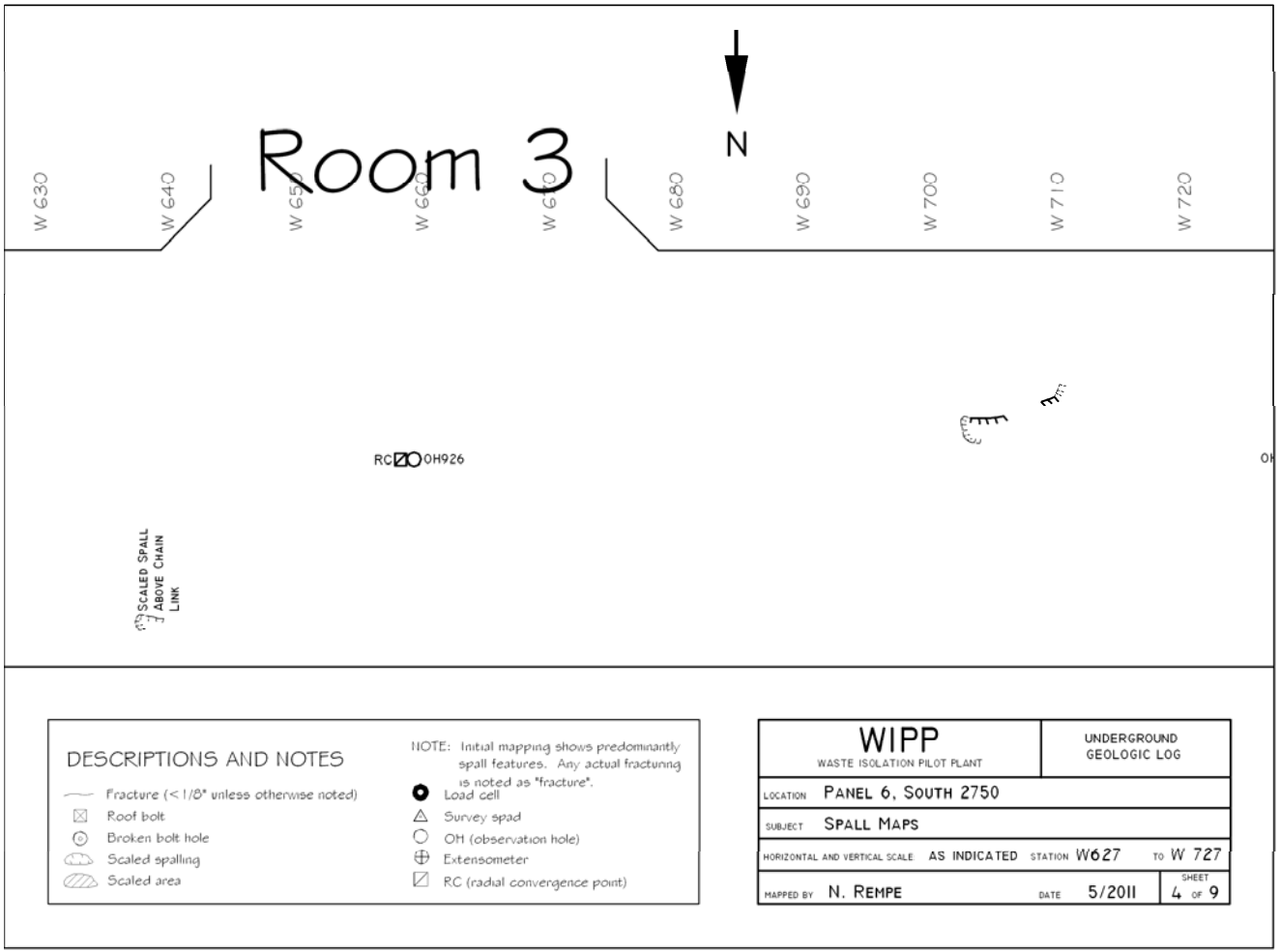

Figure 6-25 Panel 6 S2750, W390-W1210 Roof Fractures (Sheet 4 of 9)

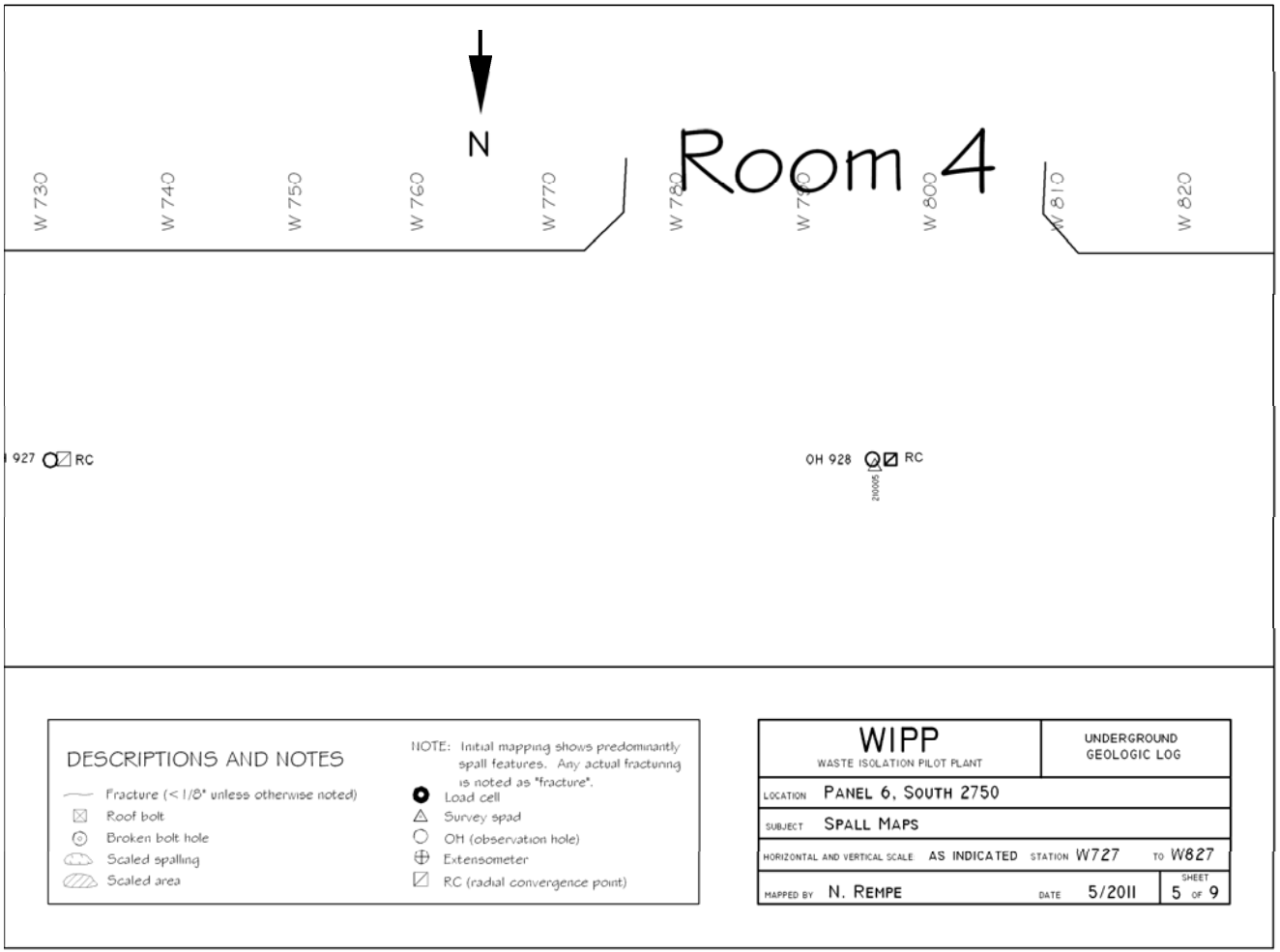

Figure 6-26 Panel 6 S2750, W390-W1210 Roof Fractures (Sheet 5 of 9)

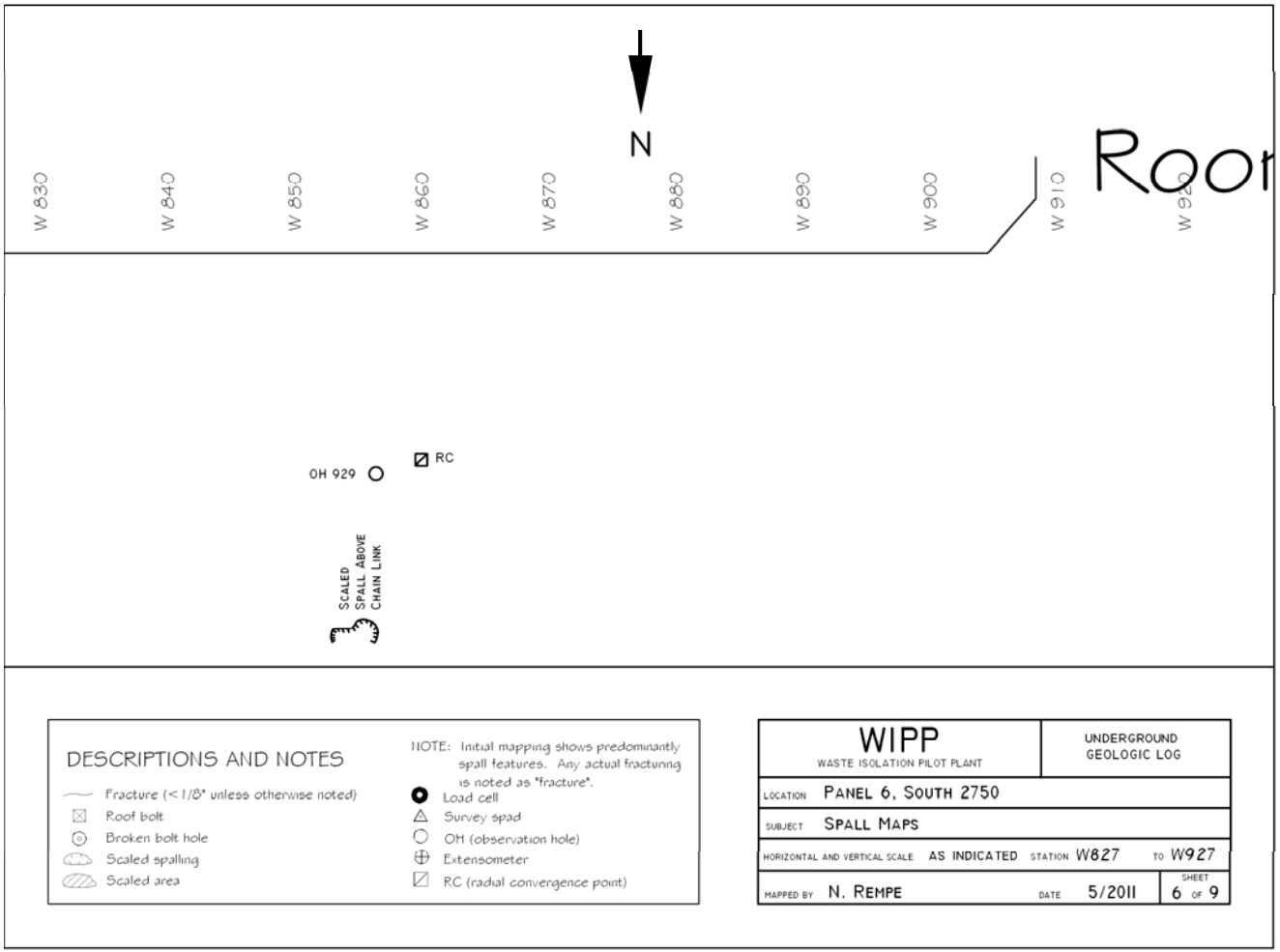

Figure 6-27 Panel 6 S2750, W390-W1210 Roof Fractures (Sheet 6 of 9)

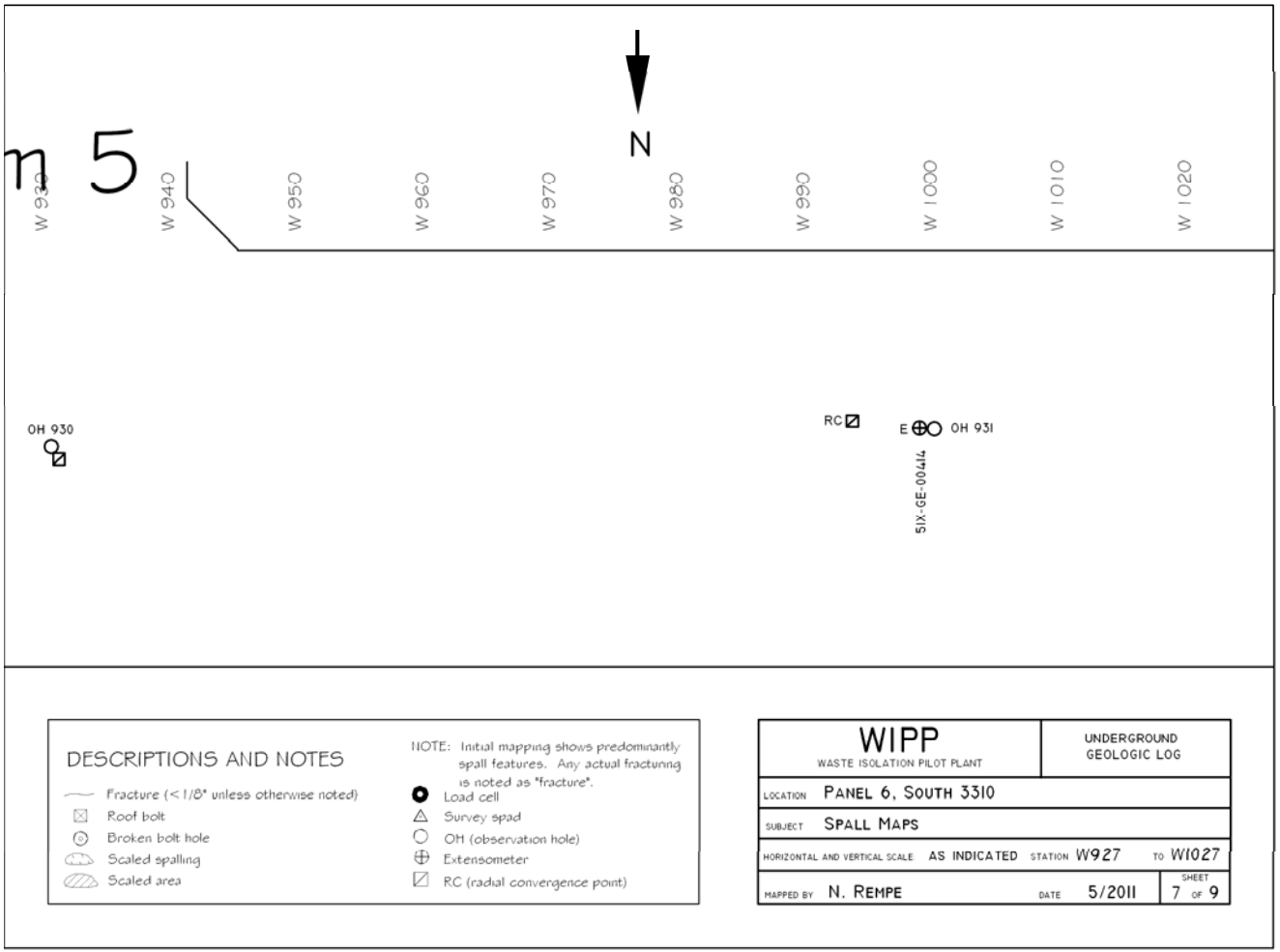

Figure 6-28 Panel 6 S2750, W390-W1210 Roof Fractures (Sheet 7 of 9)

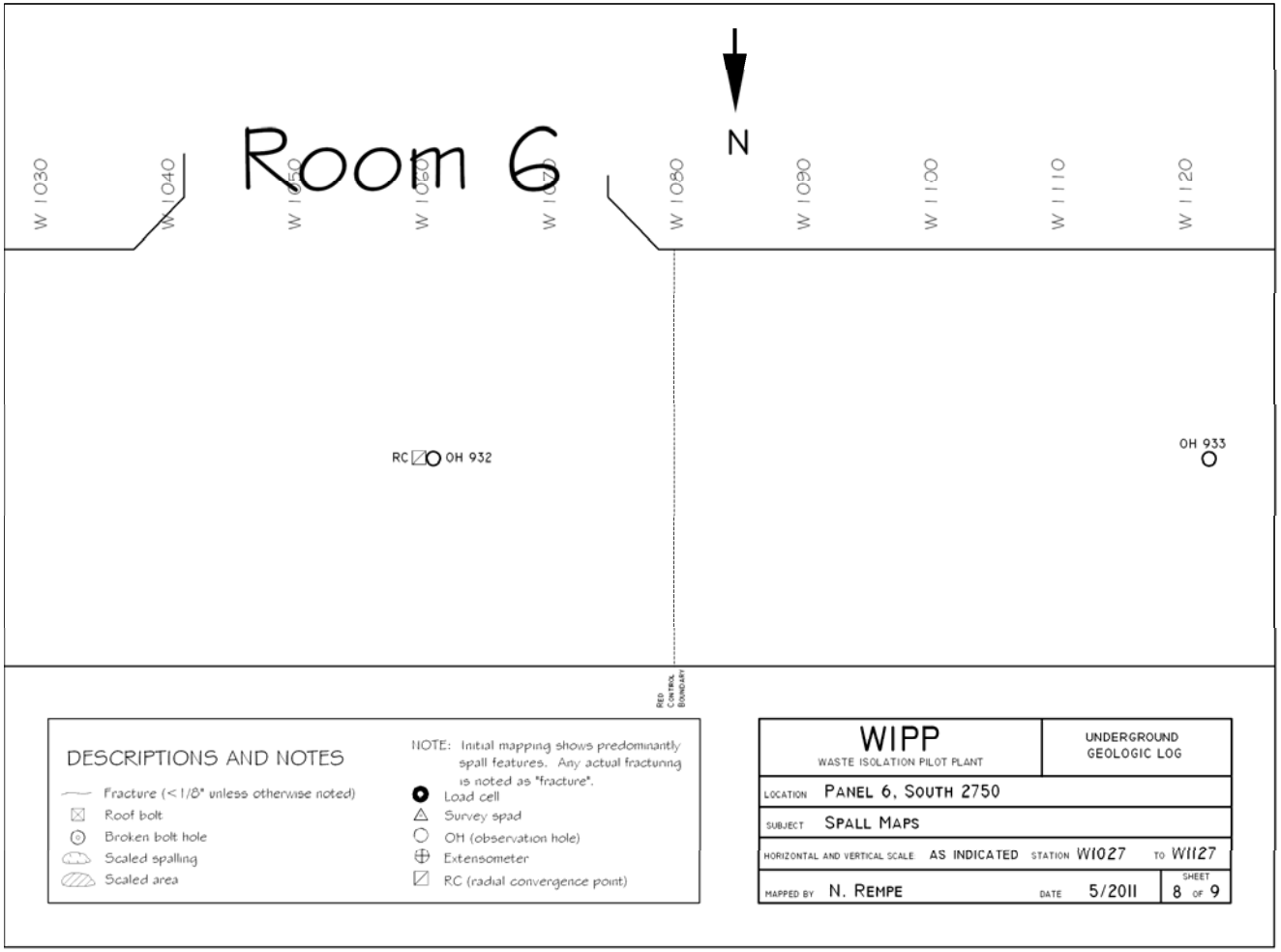

Figure 6-29 Panel 6 S2750, W390-W1210 Roof Fractures (Sheet 8 of 9)

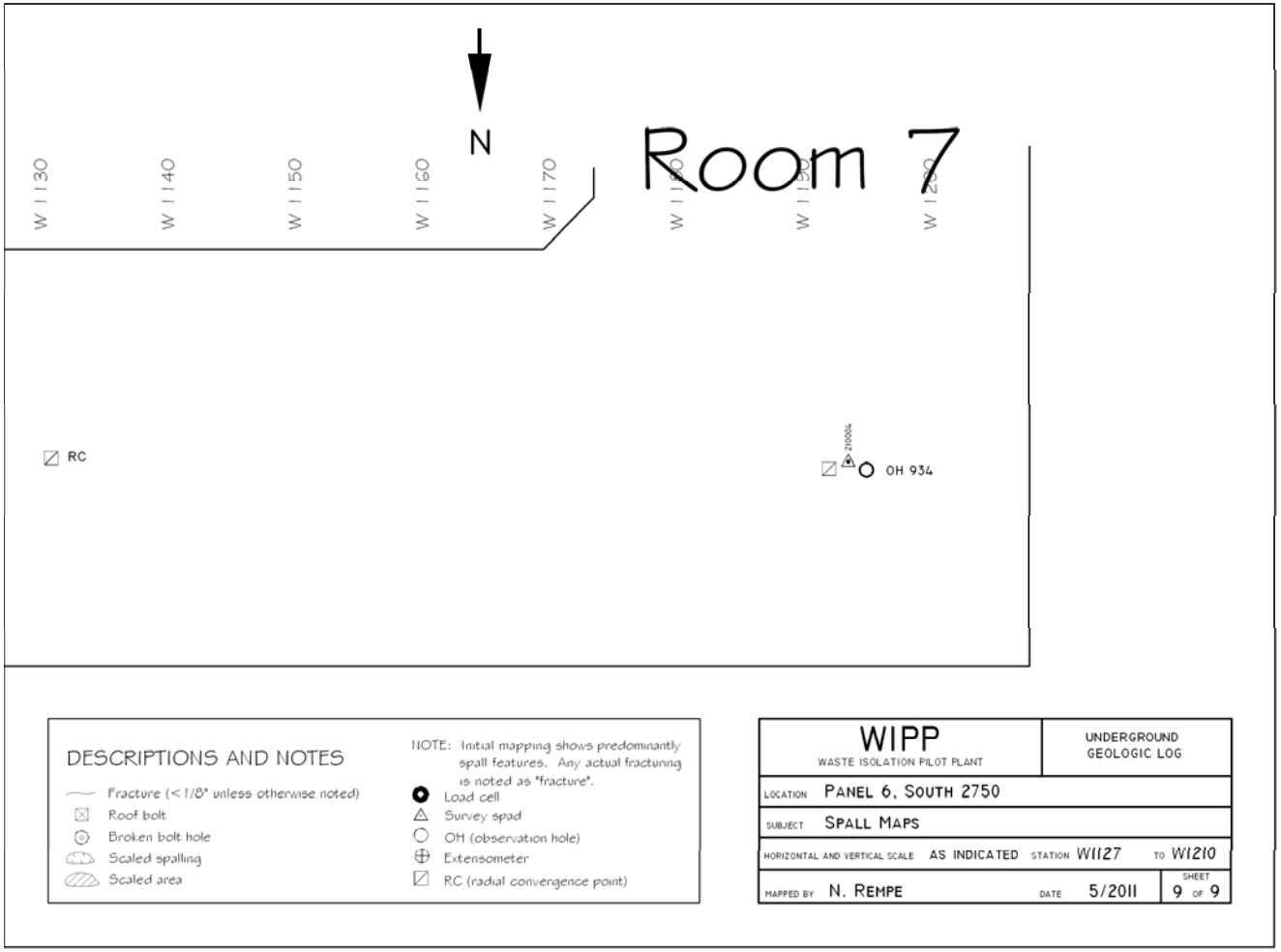

Figure 6-30 Panel 6 S2750, W390-W1210 Roof Fractures (Sheet 9 of 9)

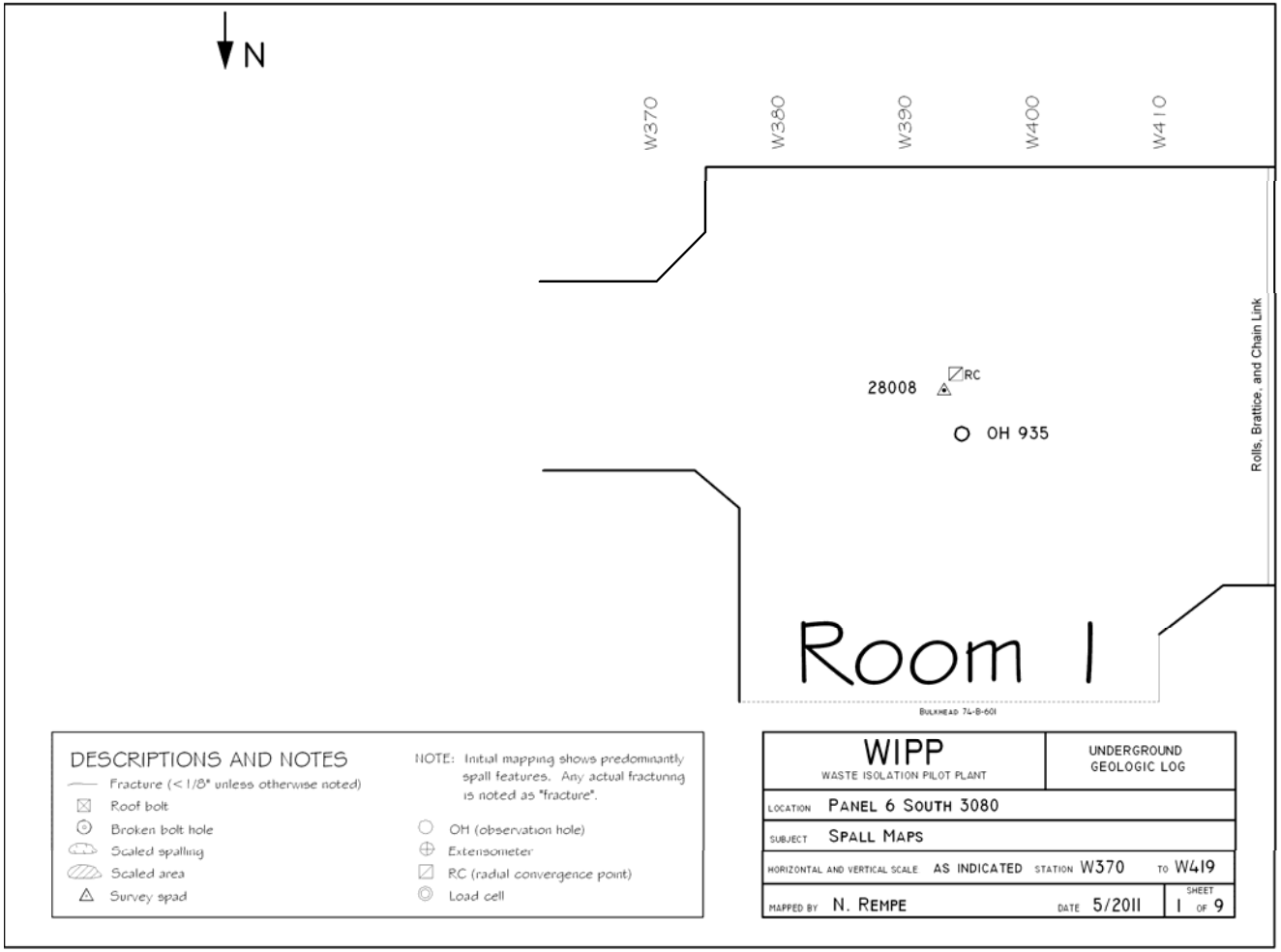

Figure 6-31 Panel 6 S3080, W390-W1210 Roof Fractures (Sheet 1 of 9)

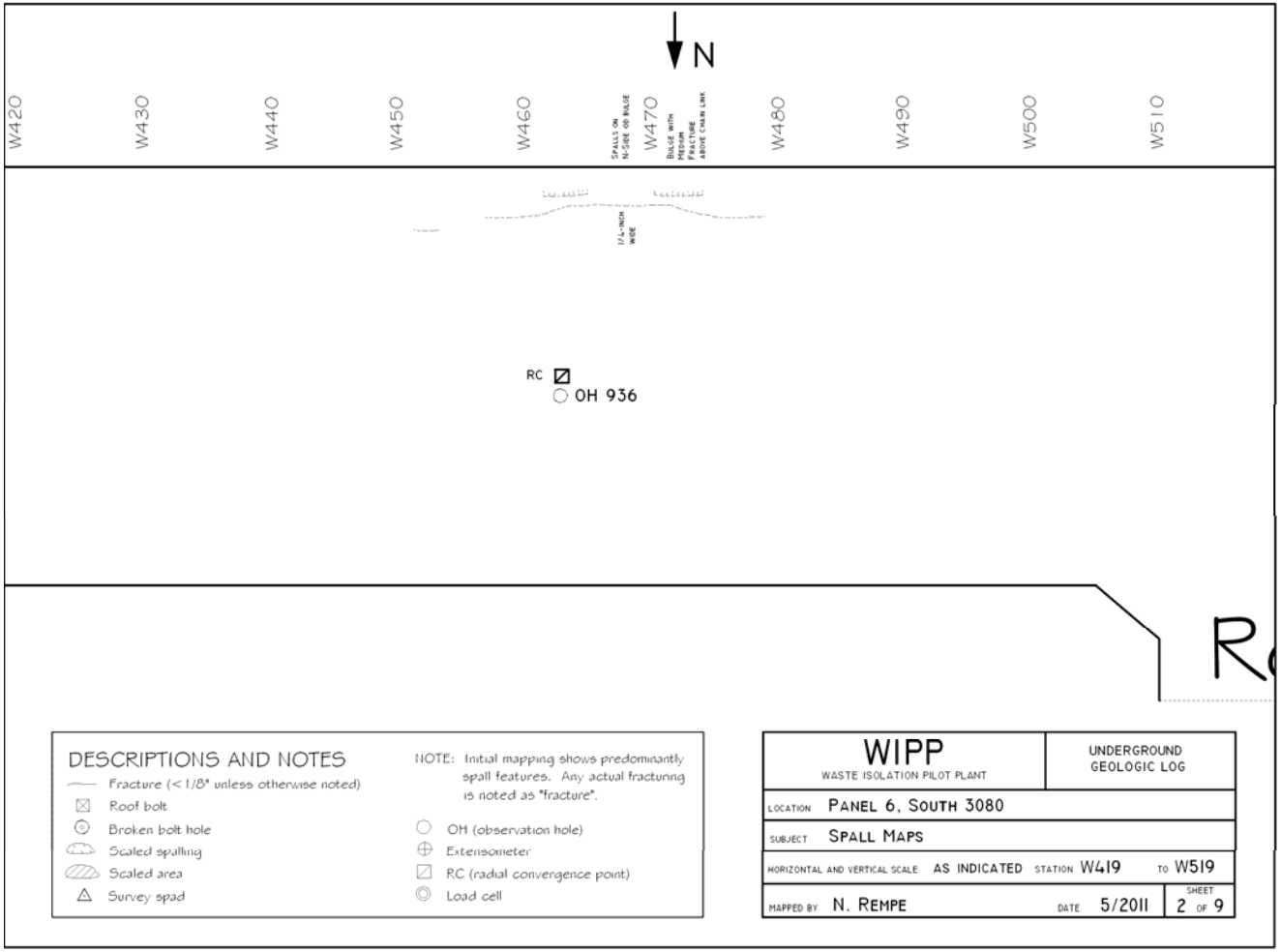

Figure 6-32 Panel 6 S3080, W390-W1210 Roof Fractures (Sheet 2 of 9)

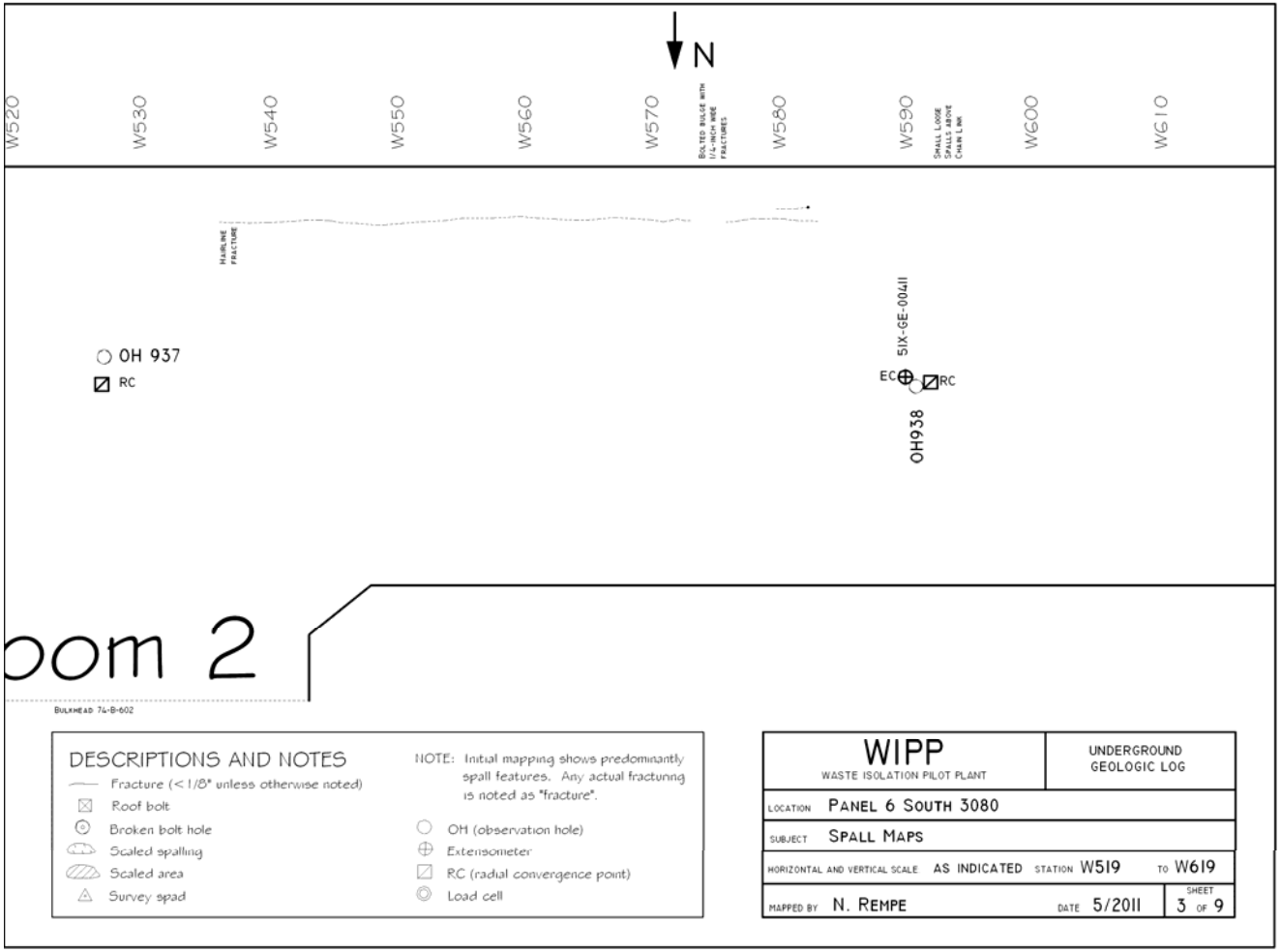

Figure 6-33 Panel 6 S3080, W390-W1210 Roof Fractures (Sheet 3 of 9)

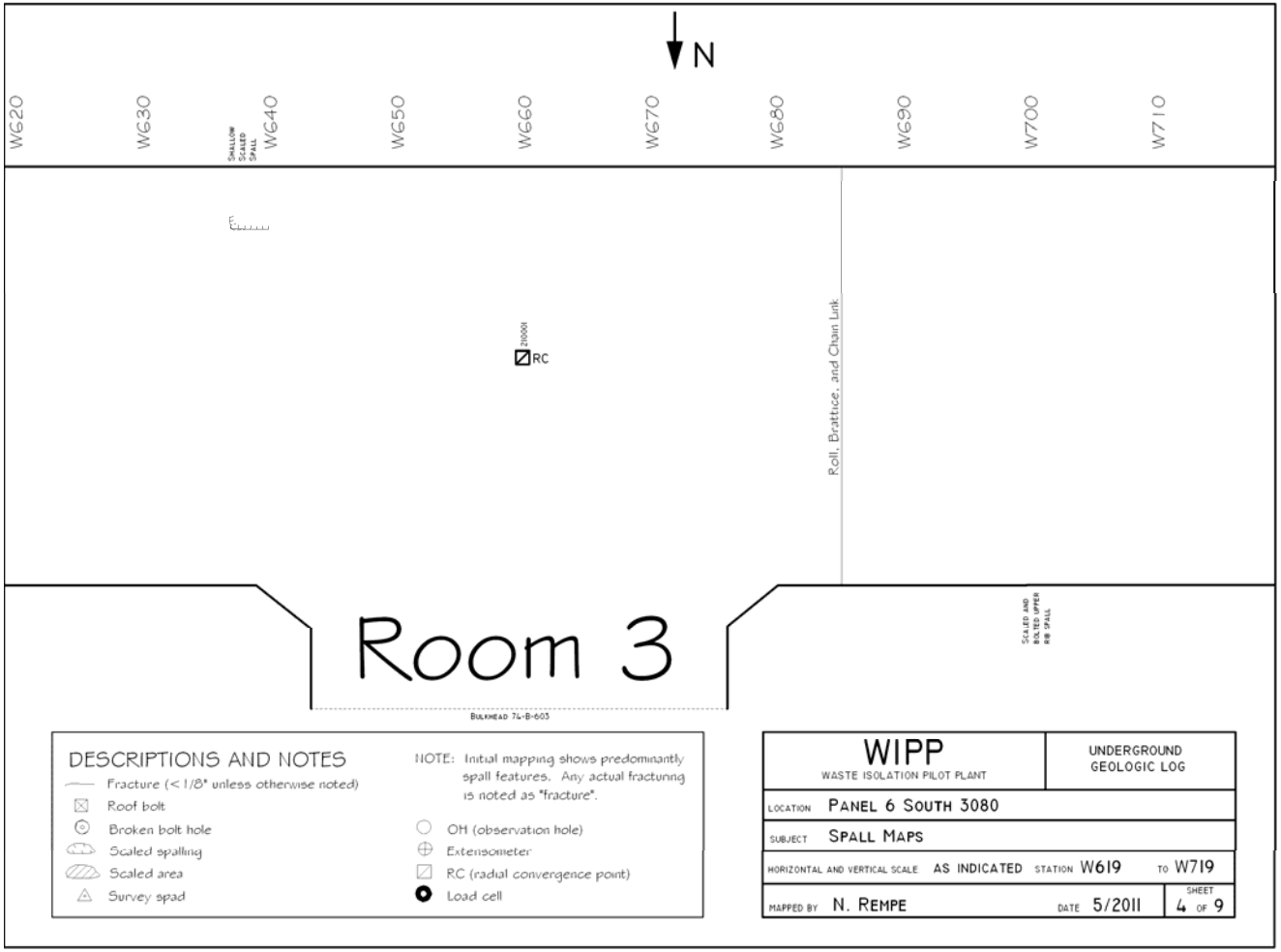

Figure 6-34 Panel 6 S3080, W390-W1210 Roof Fractures (Sheet 4 of 9)

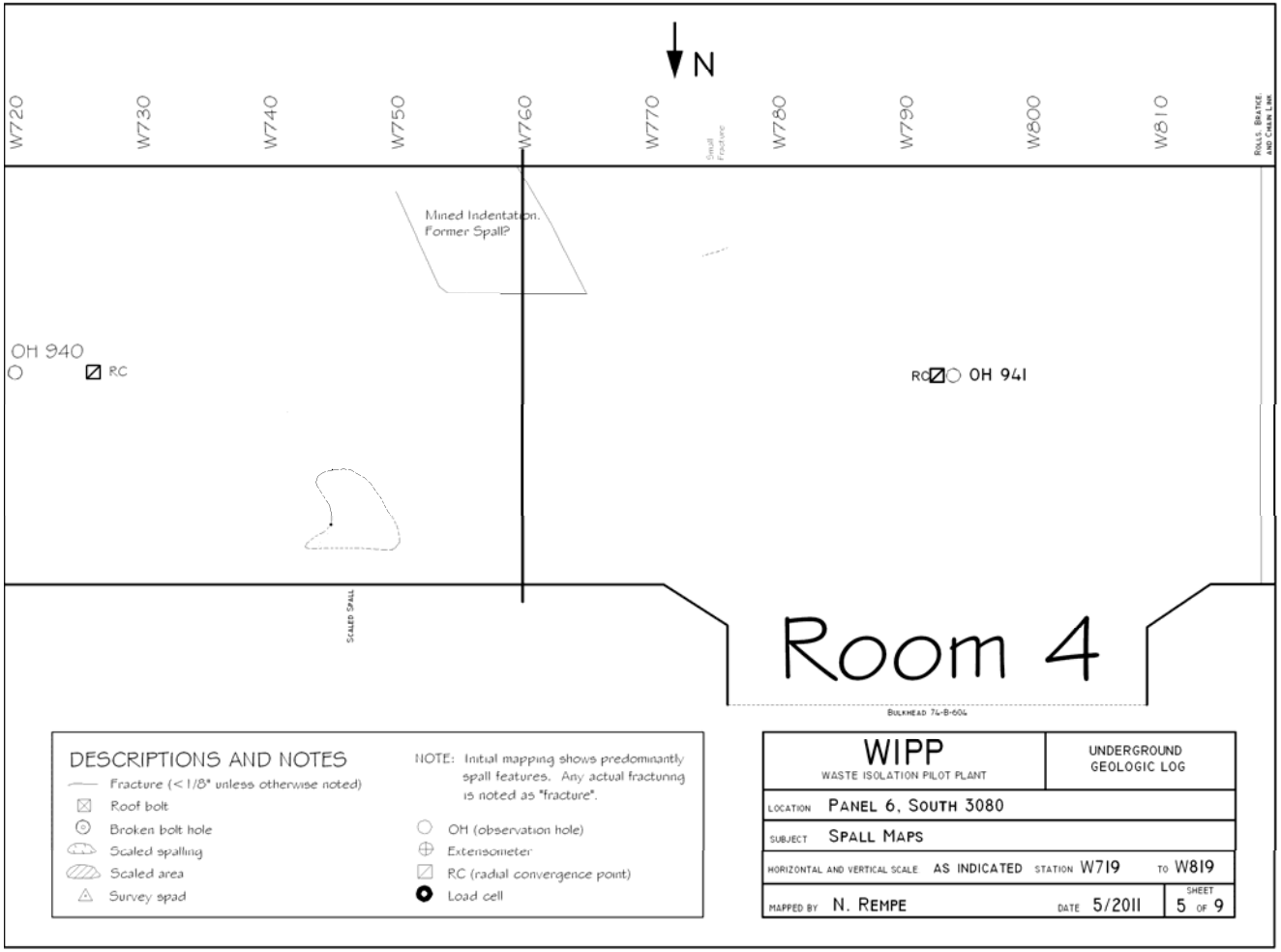

Figure 6-35 Panel 6 S3080, W390-W1210 Roof Fractures (Sheet 5 of 9)

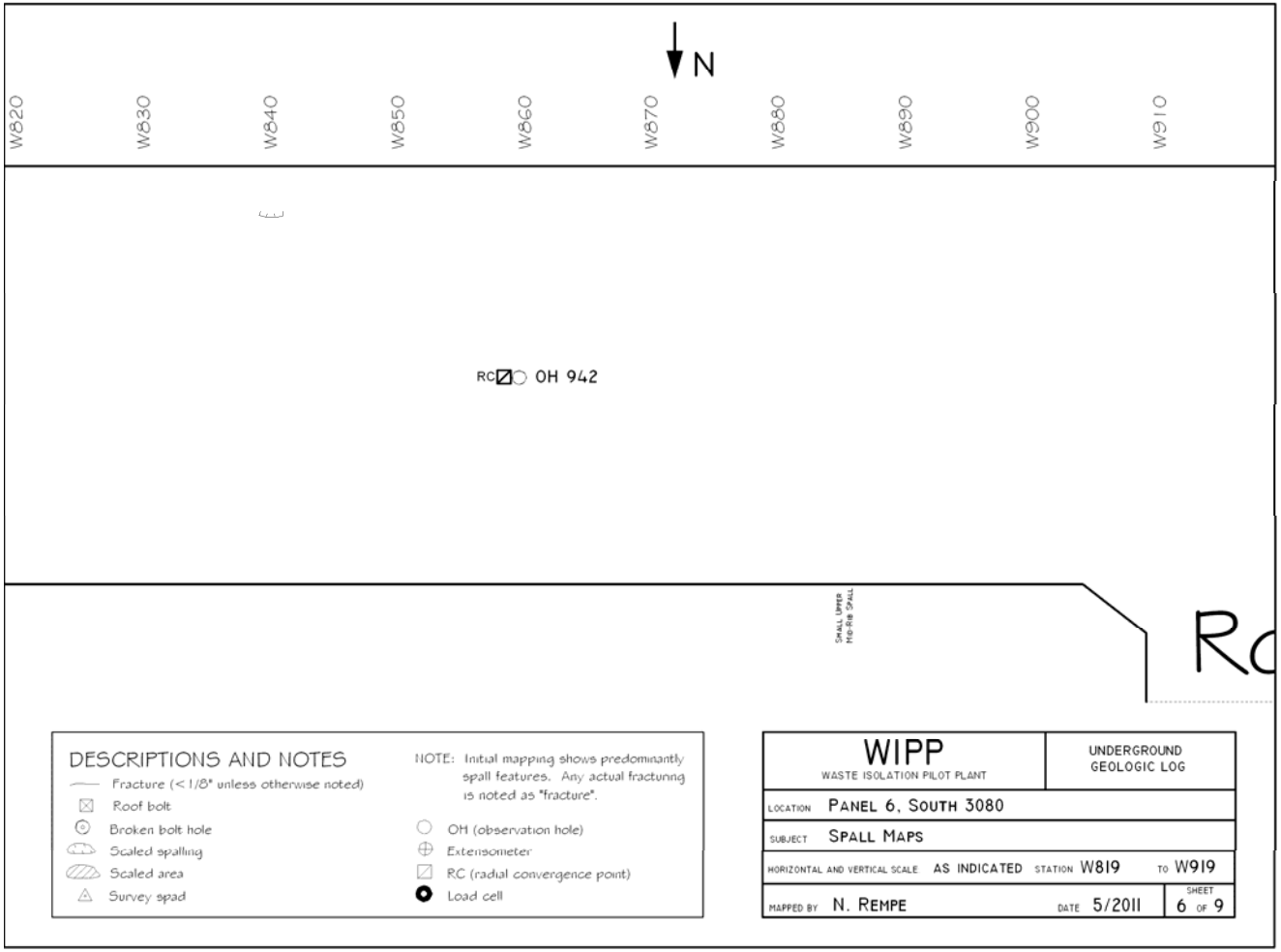

Figure 6-36 Panel 6 S3080, W390-W1210 Roof Fractures (Sheet 6 of 9)

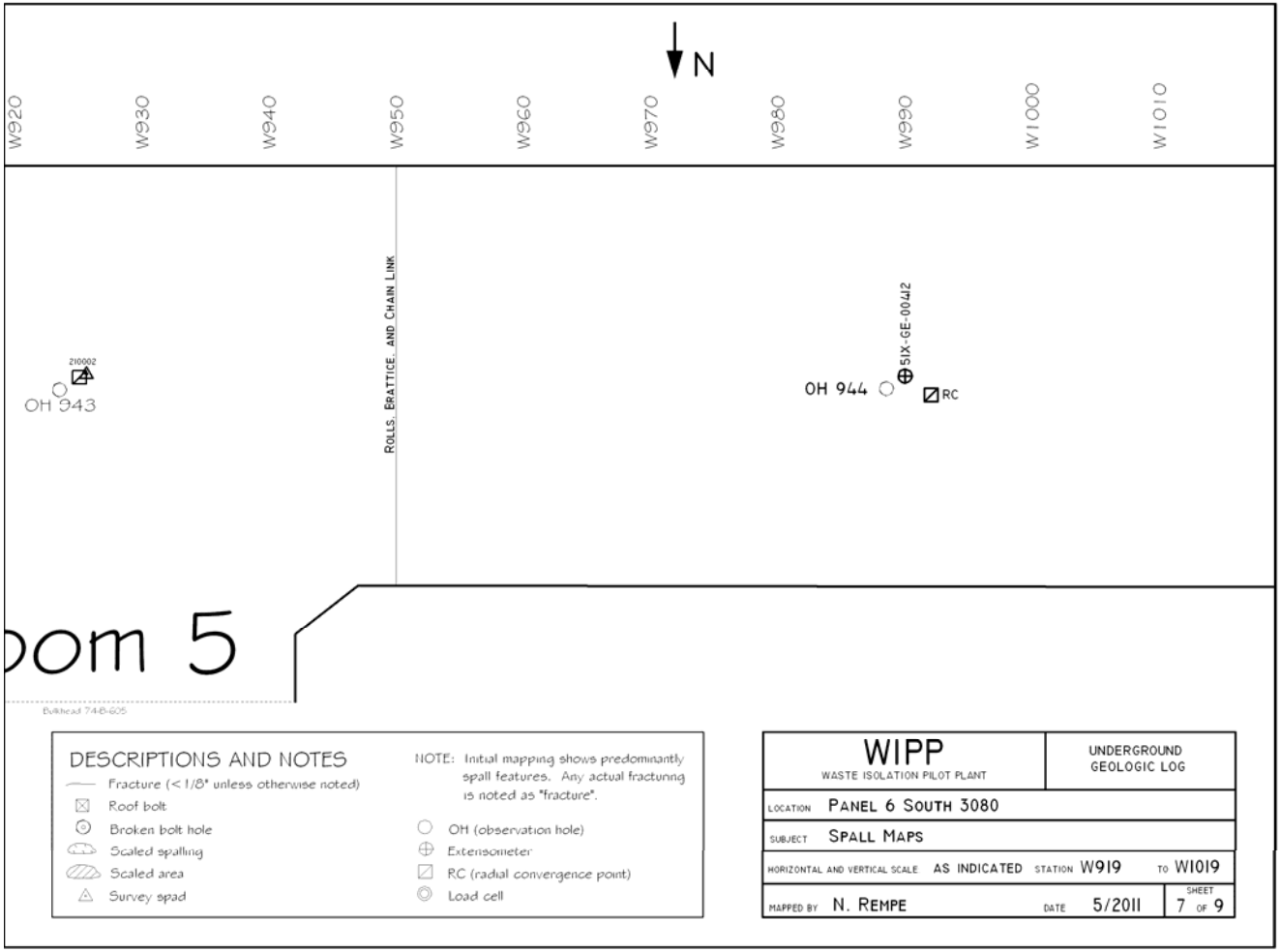

Figure 6-37 Panel 6 S3080, W390-W1210 Roof Fractures (Sheet 7 of 9)

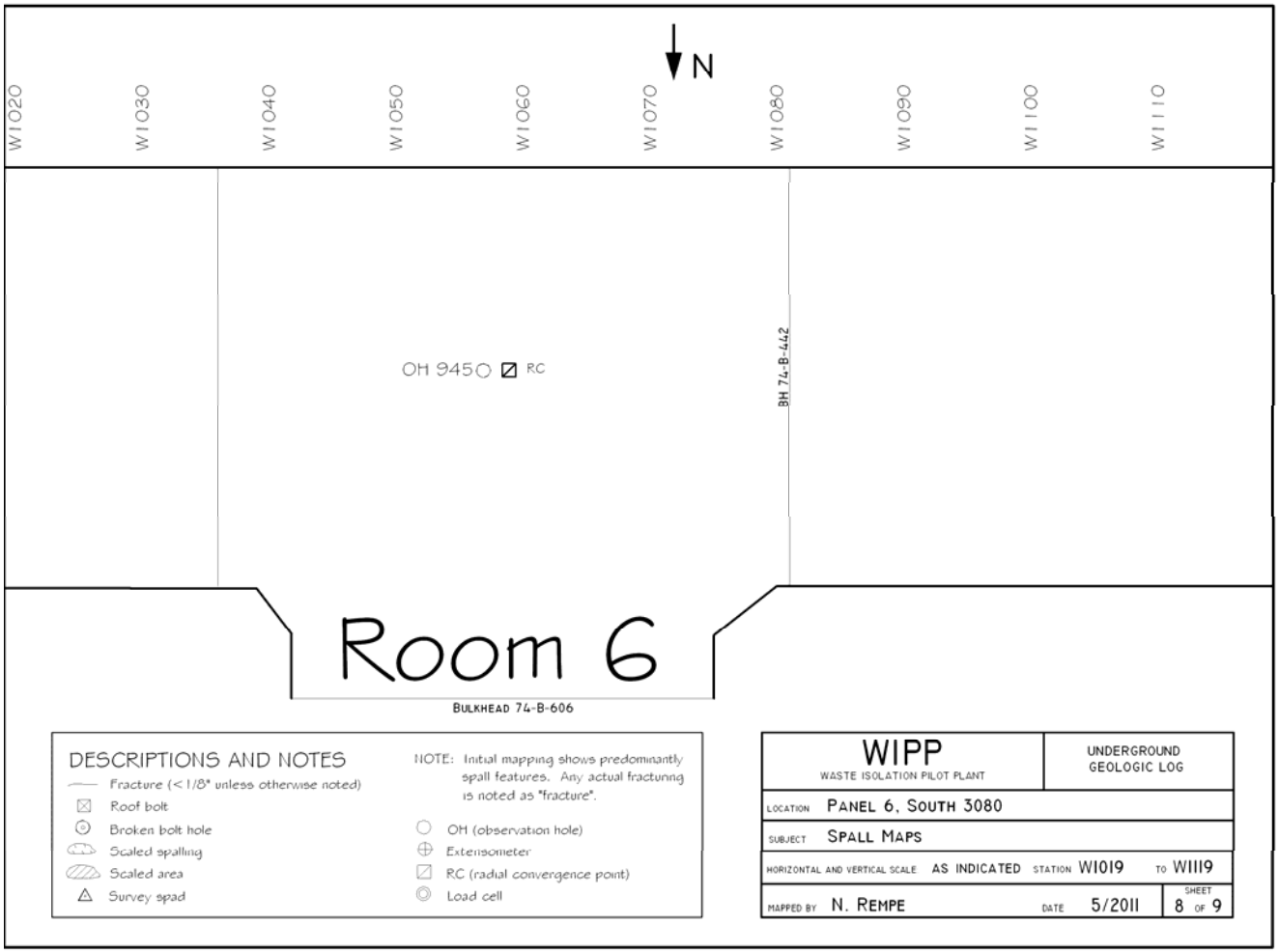

Figure 6-38 Panel 6 S3080, W390-W1210 Roof Fractures (Sheet 8 of 9)

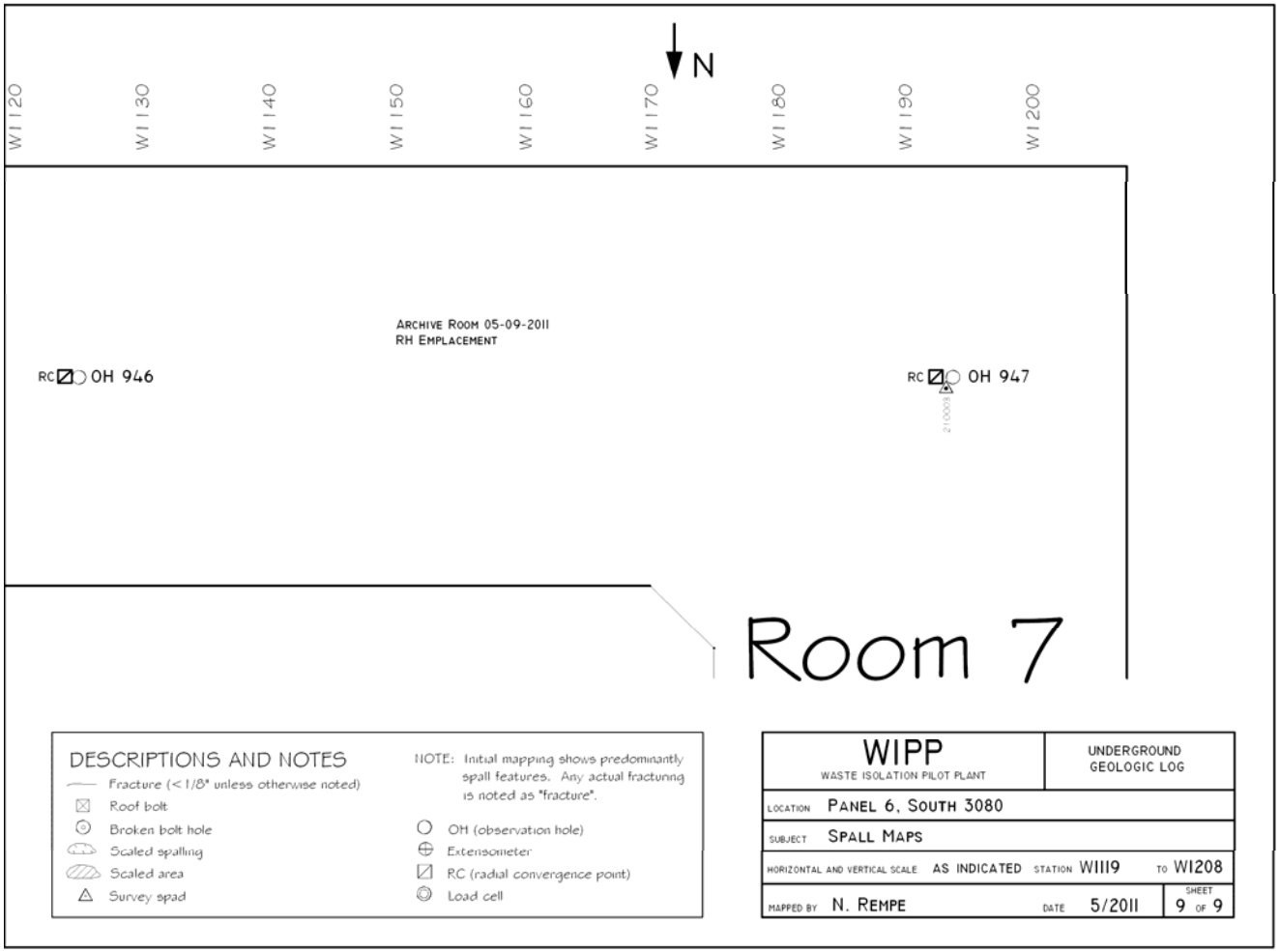

Figure 6-39 Panel 6 S3080, W390-W1210 Roof Fractures (Sheet 9 of 9)

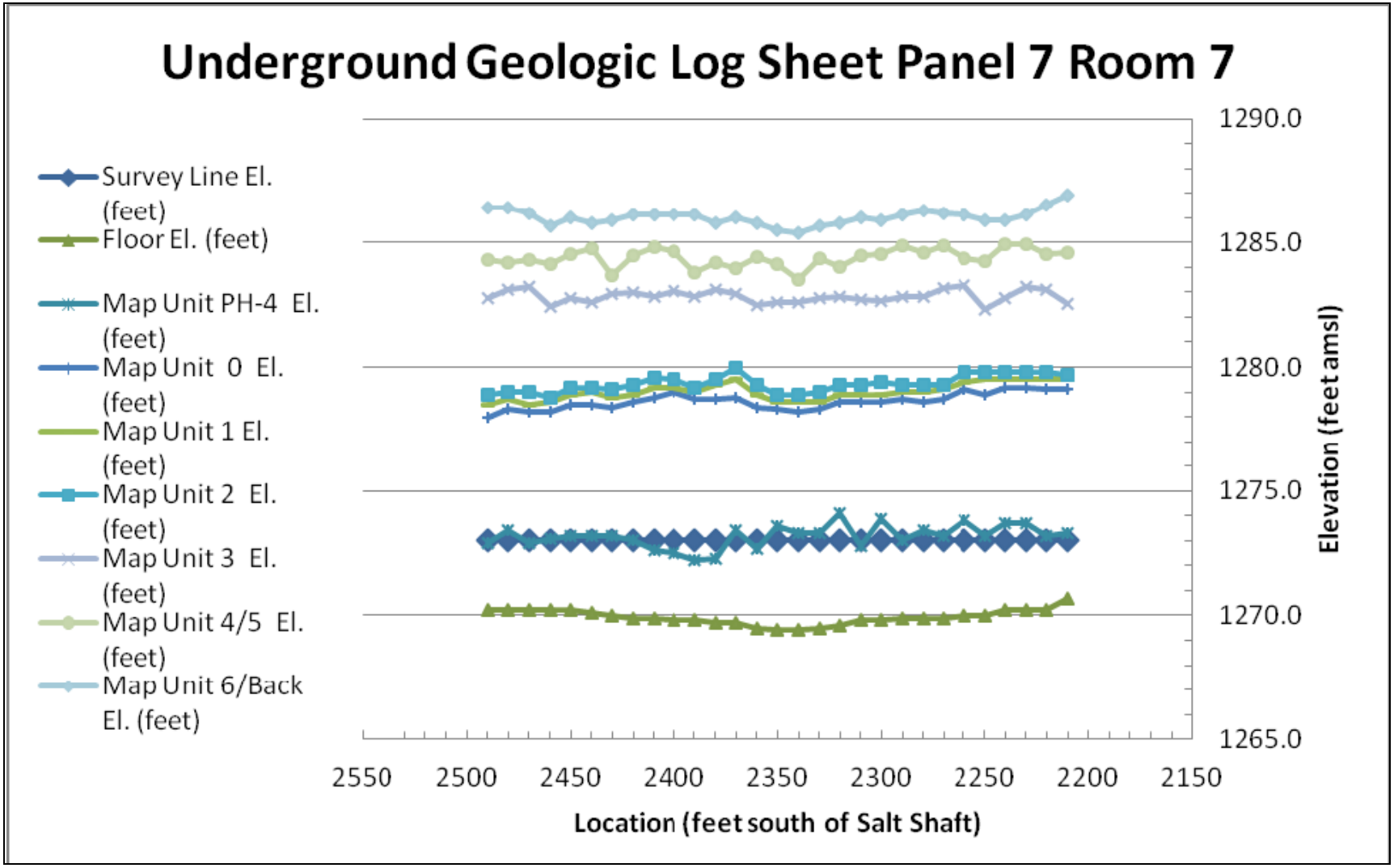

Figure 6-40 Panel 7 Room 7 W1190, S2210-S2490 Stratigraphic Map