

THE GREAT PYRAMID

DATA PACK

Introduction:

Brian Kutscher, in Michigan, has prepared in depth studies of the Great Pyramid of Egypt. These include precise measurements of the exterior and interior. His collection of notes, graphics, photos, astronomical data, calculations and formulas, historical data and resources. These are stored in his computer files called The Pyramid Data Pack. The following pages are a small extract of some of the sections.

These pages are very technical in nature and requires some knowledge of CAD (Computer Aided Design). This is a geometric design of the Pyramid and passages according to angles, positions and lengths.

Data gathered and plotted by Brian Kutscher.

September 2, 1993 edition.

Revised September 7, 1994

Updated September 1, 2024

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PREFACE

This data pack was pulled together at the request of several brethren. This data was gathered over a period of 20 years and has undergone several refining revisions. Generally speaking, if there are five or more decimal places in a coordinate value, I have reasonably good confidence in its accuracy. Lower numbers of decimals indicate that the value was probably scaled from a drawing.

Some of these values were obtained rigorously (longhand mathematics, no calculators); others, through the use of logarithms; while the majority of the higher-precision values were obtained using a hand calculator or Microsoft Windows 3.1's Calculator program (which can achieve 16 digits (combined total of integer places and decimal places)).

I am greatly indebted to Br. Rodney Hugelman, who went through the effort and expense to have his three volume edition of C. Piazzzi Smythe's "Life and Work at the Great Pyramid" copied for me. It contained valuable information, not obtainable through other sources. Br. Hugelman also reproduced D. Davidson's "The Great Pyramid - Its Divine Message" for me. This volume was at one time owned by Br. Morton Edgar, as evidenced by several notes (initialed or signed) that he made in its margins.

In this book, a letter to a Mr. Bell was found. It was in this letter that the key to Br. Edgar's angle calculations was found. The letter indicated the precise value of the Sine and Tangent for the Passage and Casing Stone Angles. Using Pythagorean's Theorem, I derived the Cosines for these angles. These values are given on the following page, along with some other pertinent data which, it is hoped, will assist the reader in making further computations.

As with any work compiled over several years, there may be inconsistencies in some of the values given beyond the sixth decimal place. Please check the values given before drawing conclusions, if your conclusions depend on highly accurate numerical values. I am making the assumption that the user of these notes will only use high-precision values if he/she knows how to prove them out for him/herself. The general reader should probably not depend on more than six decimal places for any calculations. Even then, to avoid round-off error, the final result should be given to no more than four decimal places, unless you prove the coordinates that you used to be accurate. ***Remember, in same instances, the data points were interpolated from scale drawings and may be accurate only to the 10's of inches (not 10th's). For example, the air shafts, Chambers of Construction (rough surfaces), the course of the Well is approximated, etc. These lower-precision areas are indicated in the :z.,y coordinate listing that follows in section 4.***

A future edition of this data pack will include a cross reference to the source materials (including page numbers in the books) used in computing the values. If data comes from not-readily available sources, the source pages will be photocopied and included in the data pack.

The following letter was sent from Br. Morton Edgar to Mr. Bell, who, it is believed, was Br. Richard Hill's grandfather.

This letter was found in a copy of David Davidson and H. Aldersmith's book entitled "The Great Pyramid - It's Divine Message", published in 1924 by Williams and Norgate, Ltd, London.

Br. Rodney Hugelman owns this book. He obtained it from a library that was willing to sell it. He was particularly interested in this book because it has several notes in the margins by Morton Edgar. Apparently, this book belonged to him and was sent to another (perhaps to Mr. Bell?) with these rather critical notes in the margins. Most of these marginal notes bear Br. Morton's initials or his name, to indicate their authorship.

27 JUL 1933
Morton Edgar
27 Aytoun Road, S.1.
Glasgow, Scotland

Dear Mr. Bell,

I have been going over some of Mr. Davidson's figures in his diagrams on his page 198, Plate XXXVIII, particularly Fig. B, the centre one of that Plate.

I do not question the proportions of that diagram, for it is merely one of many such proportionate agreements to be found in the Great Pyramid.

What I want to know is how he gets his figures for determining the angle of the passages in the Pyramid. He says that this angle is $26^{\circ} 18' 9''.63$, whereas to demonstrate the correct proportions of this diagram the angle should be $26^{\circ} 18' 9''.725+$

Can you determine which of these is correct?

Because Davidson takes a slightly greater day-value for the Solar Tropical Year than I do, and also a very slightly greater inch length for the "Pyramid Inch", his dimensions for the various parts of the Pyramid (which are largely related to these two factors) are necessarily greater than the dimensions that I understand to be correct, theoretically considered. But the proportions are the same, no matter what the actual dimensions.

I here forward you a diagram that demonstrates the same method of determining the passage-angle, using another proportion, namely, a Square and a Circle of the same area, - in this case 144,000 multiplied by 10. This is really the same method as used by Davidson in his diagram B, only instead of taking the hypotenuse (A-T) of his right-angled triangle as representing the diameter of a circle (the circle necessarily being of the same area as the square PQRS), he makes it the Radius of the Year-Circle.

In other words, the Square with a side-length equal to 10 times the solid cubic diagonal of the King's Chamber (P-R), has an area that is equal to the circle of which the vertical height of the whole Pyramid is the diameter.

The same thing is found by another proportion: If the side-length of the Square is the same number of inches as there are days in the year, and we find the area of this square, and draw a Circle of the same area, then the diameter of this circle is equal to the length of the King's Chamber.

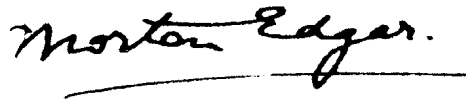
In all cases, if the diameter of the equal-area Circle is used as the hypotenuse of a right-angled triangle, and half the side length of the Square as the Perpendicular, the resultant angle from the base-line is the same as the Passage-angle, which I believe is correctly stated as $26^{\circ} 18' 9''.72515+$. Can you verify this?

The formula for the Sine of the Passage-angle is: The square-root of Pi, divided by 4. While the formula for the Sine of the Casing-stone angle (called the "Pi" angle) is: 4, divided by the square-root of (the square of Pi, plus 16). These two angles are thus directly connected (The Tangent of the Casing-stone angle is: 4 divided by Pi. While the Tangent of the Passage-angle is: The square-root of Pi, divided by the square-root of (16 minus Pi).

On page 308 of my Vol. II "Great Pyramid Passages" I have presented the trigonometrical values {of} the Passage-angle, $26^{\circ} 18' 9''.725+$.

With regards,

Yours sincerely,

A handwritten signature in cursive script that reads "Morton Edgar." The signature is written in black ink and is underlined with a single horizontal stroke.

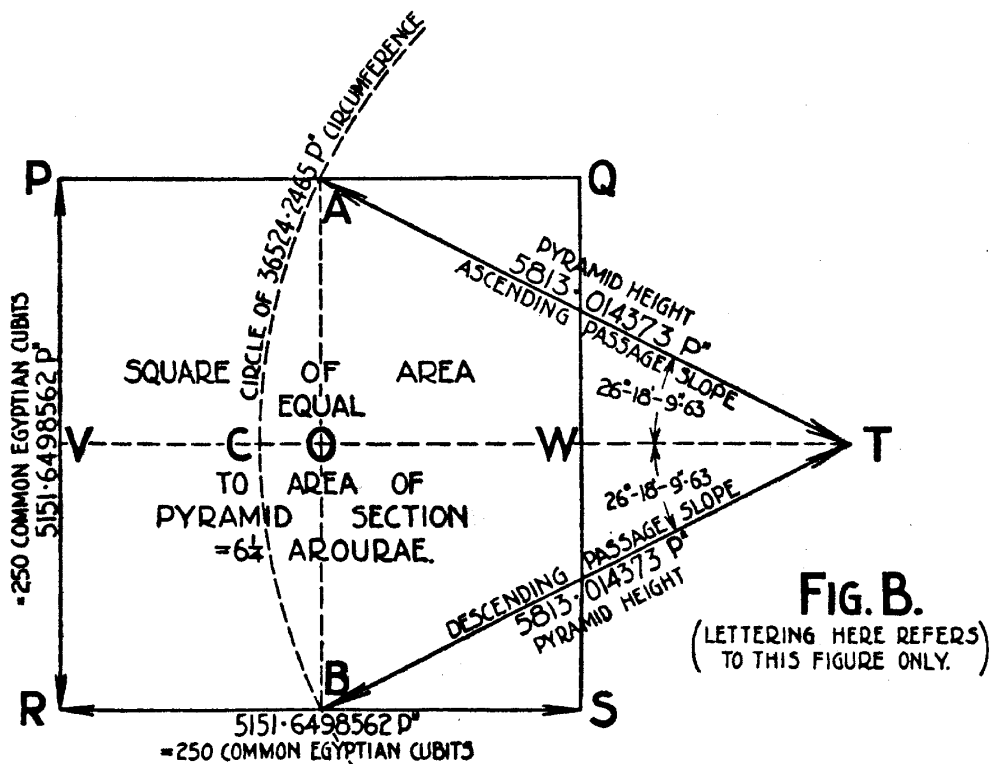
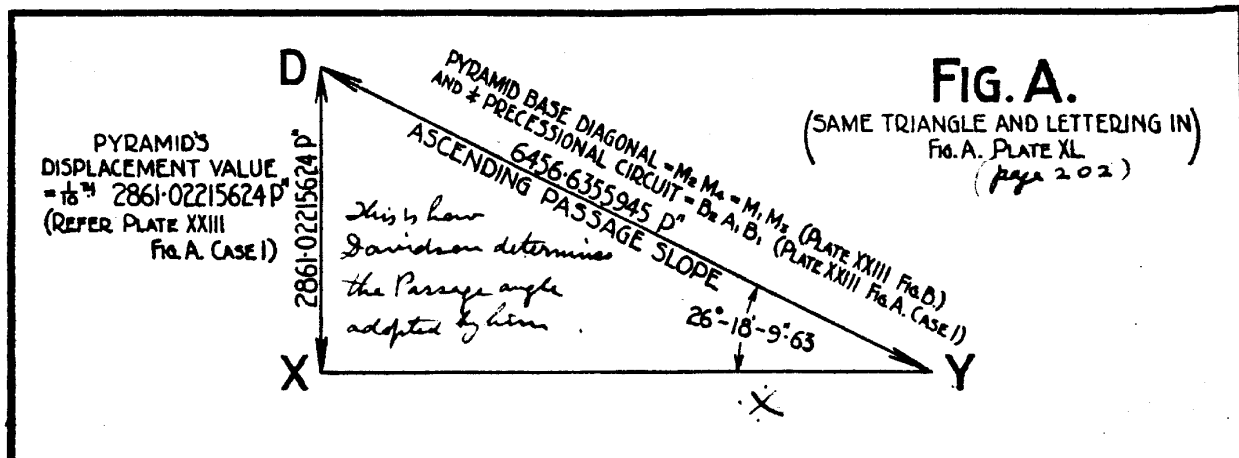
$6456.6355945 P'' = \frac{1}{4}$ Precessional Cycle in years (according to Davidson)
 $X_{44} = 25826.5423780 = \text{Precession - which, however, is too much.}$

X. The correct angle is $\rightarrow 26^{\circ}18'9''.72515+$ (See my Note-Book N^o XII, page 54)

PLATE XXXVIII.

GEOMETRY OF PASSAGE SLOPES.

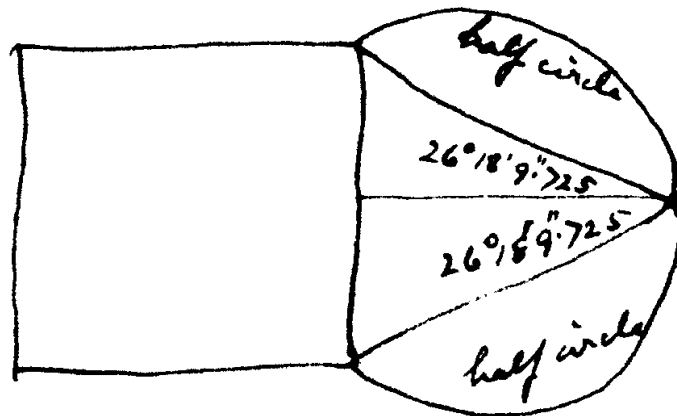
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(27 July 1933)

area square = $144\,000 \times 10$

" circle = $144\,000 \times 10$



Copy of a letter written to Brother Wittge, Bronx, N.Y., U.S.A. from Morton Edgar.

MEMORANDUM FROM MR. MORTON EDGAR, GLASGOW, SCOTLAND

Letterhead of
MENA HOUSE HOTEL
Pyramids, Cairo,
E G Y P T .

Cairo, 28 Feb. 1938

"I am starting to write this note in the Mena House Hotel, but have not time to finish it here - I go off for Port Said in a few minutes - coach waiting for me.

1 March 1938.

"Now on the good ship 'Orsende' of the Orient line, bound for London. We touch Naples, where this will be taken off, I believe, and forwarded on to the Bronx.

"Your very kind cable was delivered in due time, and I thought I would answer it right away, but found my time at the Pyramid limited. First of all, the clearing of the South side of the Great Pyramid is now an accomplished fact, and I have been able to measure this side from corner socket to corner socket right along the clear surface of the levelled rock--for the first time in history. Pervious measurements had always to be done by purely trigonometrical survey--a very accurate way too, to careful workers, but not as direct as by plain measuring right along the rock. The Antiquities Service Department of the Cairo Museum carried out this debris-clearing work for me, although I was there all the time personally directing operations. I also paid for this work.

"Regarding your cable, namely, that I should get into communication with Dr. Reisner in connection with the clearings of the Eastern side of the Great Pyramid--No doubt this seems the best way for the Boston authorities (Boston, Harvard, University); but unless they are prepared to pay for this themselves, the work would never be done. Of course I do not know what arrangements they may now have made with Dr. Reisner, or what definite instructions they may have forwarded to him (and I hope that some such definite instructions and arrangements have indeed been made, so that Professor Reisner will now carry out this necessary work)--but I know that for many years in the past I have personally approached him, enquiring when he intended to do this work, and so reveal the temple foundations at the Eastern base of the Great Pyramid--and he always gave me the impression that he was 'just about to begin'. However, all the times I have been at the Pyramid, this particular work was not begun--and the first of these pronouncements was made to me by Professor Reisner in 1909, or about 29 years ago! It was at my personal instigation and special request that the Northern side of the Great Pyramid was entirely cleared of debris (in 1925-1926). And it was at my special request that the Southern base-line and flank has been cleared (in 1925 and 1938). Also at my special request the four corner 'sockets' were cleared, and thus fully revealed for the first time (in 1925). And all the debris in the interior of the Great Pyramid was removed, either directly by me (in 1909, and 1912), or at my special request (in 1925). I personally cleared out the age-long debris from the Northern air-channel of the King's chamber, and also cleared the Southern Air-channel (in 1928)--and these two channels are still doing their good office of keeping the air in the interior of the building pure and cool. Also I personally probed the entire lengths of the two air-channels of the Queen's chamber (in 1928), and although I did not discover the outer ends of these two channels, I did establish the fact that they are not 'dummy' air-channels, as is supposed quite erroneously, by Prof. Reisner.

"I probed their lengths with specially prepared steel rods, coupled in lengths by screw-couplers (lengths of about 16 feet), to upwards of 208 feet (two hundred and eight feet). They may continue right out to the outer surface of the building, but this has still to be ascertained. When, in 1936, I visited Prof. Reisner at his 'Camp', I informed him that his theory regarding the air-channels of the Queen's chamber was not according to facts (and he claims always that it is facts he is desirous of), he nearly bit my head off!! And his lady assistant, typist, frantically laid hold of me to get me out of the place--the Professor had become so excited!! His theory is (or was, for he may now have seen better to alter his opinion). That, after constructing the Great Pyramid so far up as to include its Queen's chamber with its two air-channels, the builders suddenly decided to increase the size of their measurement--to add to its height greatly and construct another 'burial chamber' at a much higher level. Hence the Queen's chamber, the originally contemplated 'burial chamber' with its pair of air-channels, was abandoned--the upper

ends of its air-channels were thus covered over with the superimposed masonry and thus remained as 'dummies', of a few feet in length only.

"With this theory in mind, Mr. Borehardt, who was in cooperation with Prof. Reisner, wrote a book explaining all about the Great Pyramid from his view-point, and he shows a diagram in which the abandoned air-channels appear, ascending for a few feet only into the masonry. My previous investigations, however, had proved to me that these two air-channels, while not continued right out to the exterior surface of the building (as far as has been ascertained to date), nevertheless were by no means 'abandoned' by the builders, but were continued right on upward, well past the level of the topmost 'chamber of construction' above the King's Chamber--and these two pairs of channels run side by side for a considerable length. Therefore Prof. Reisner's theory about the method of building the Great Pyramid (the 'addition' idea) is not in accordance with the facts! And it must have been the sudden realisation of this which so excited Professor Reisner that he wanted to bite my head off!--and explains, I suppose, why I was laid hold upon by the arm and hurried out of his presence.

"While I was engaged superintending the clearing of the debris from the Southern base line to flank, Professor Reisner passed in his car a few times--and with some little difficulty sometimes, as the dislodged debris encroached somewhat upon the pathway that runs along the South side (but this pathway was definitely closed to motor traffic by the police a few years ago!) So Professor Reisner is well aware of the work; and as he sees how the clearing of the base-lines of the Great Pyramid is progressing, in spite of his own neglect during all these past years, he may now have suddenly awaked to his obligations, and his often-expressed promises, and now has decided to go ahead and clear away the debris from the Eastern base and temple-foundation. I can only say that I hope this is so; but if not, then this work will be done without his aid in any shape or form. Professor Selim Massan Bay, Sub-Director General of the Antiquities Service Department of the Cairo Museum, will carry it out at my request, whenever I can give him a start by donation to the Antiquities fund. He has written an official note to me to this effect. I would like if you could take time to copy this letter in type-writing, and send me a copy as a record, and send also a copy to the Boston Museum, as a record to them."

"I expect to reach Glasgow by 12th March."

"I was standing within 6 feet of Prof. Reisner when he gave his Radio Broadcast from the Northern base of the Great Pyramid. Some of the photos may include me!"

Morton Edgar
27 Aytoun Road
Glasgow, S.1,
Scotland

KEY TO DIAGRAMS OF THE GREAT PYRAMID

Diagram #	Central Subject of Diagram
1.	Extreme North side of the Great Pyramid, at the Mean Socket Level.
2.	Overview, showing relationship between previous diagram and Entrance Passage.
3.	Original Entrance to the Great Pyramid and start of Basement Sheet.
4.	Detail of Scored Line in Entrance Passage (Descending Passage).
5.	Overview, showing the relationship between the previous diagram and the Point of Intersection and the Granite Plug.
6.	Point of Intersection, Granite Plug and two, low-resolution values for the intersection of the floor and ceiling of the Descending Passage and the Mean Socket Level.
7.	Close-up of Point of Intersection and Granite Plug.
8.	Three of the "Girdle Stones" and their relationship to the Well, Grand Gallery., etc.
9.	Intersection of the Grand Gallery, Horizontal Passage, Well and First Ascending Passage.
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11.	Lower bend in the Well.
12.	Connection of the Well with the Descending Passage; Intersection of the Descending Passage and the Small Horizontal Passage.
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14.	The Pit, or Subterranean Chamber.
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31.	Overview of the fourth and fifth Chamber of Construction and the peak of the angled stones.
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35.	North, upper corner of the King's Chamber and the North end of the first Chamber of Construction.
36.	South end of the second and part of the third Chambers of Construction.
37.	North end of the second and part of the third Chambers of Construction.
38.	South end of the third and fourth Chambers of Construction.
39.	North end of the third and fourth Chambers of Construction.
40.	South end of the South Angled stone, South end of the fourth Chamber of Construction.
41.	North end of the fourth Chamber of Construction.
42.	South end of the South Angled stone, South end of the fifth Chamber of Construction.
43.	Central part of the fifth Chamber of Construction and peak of two Angled stones.
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46.	Communication of Northern Air Channels to their Casing Stone ends.
47.	Communication of Southern Air Channels to their Casing Stone ends.

“Extras” - Special interest drawings

- 48. Entire Drawing, all layers showing
- 49. Drawing, with Casing Stone layers removed. Equations of the Casing Stone and Passage Angles are given here, along with their intersections.
- 49a. Typical worksheet, showing how the values were worked out.
- 50. Produced floor line of the Descending Passage, intersecting with several vertical lines, drawn from the North and South Walls of the King's Chamber, Queen's Chamber, Pit, and Vertical Axis of the Great Pyramid.
- 51. Floor line of the Grand Gallery produced through the King's Chamber, also showing intersection with a vertical line drawn up from the South Wall of the Pit (-367.8368194, 1881.903325397).
- 52. Detail of the upper, Northern corner of the King's Chamber, showing where the produced Floor Line of the Grand Gallery intersects.
- 53. Approximate values of the intersection of the Grand Gallery's Floor-Line with the King's Chamber's Southern Air Channel and the Southern Casing Stone surface.
- 54. Overview, showing the Vertical lines, produced upwards from the North and South Walls of the Queen's Chamber and Pit.
- 55. Detail, showing the Intersections of the Grand Gallery's Floor-Line with several identified vertical lines.
- 56. Detail of 49, showing the intersection of principal slopes on the North side of the Great Pyramid.
- 56a. Worksheet for 56.
- 57-60. The Courses of Masonry, defined by C. Piazzzi Smythe (mostly). Some modifications made to bring values into line with the Edgar Brothers' data. The X-Coordinate was calculated, based on the slope of the Casing stone and the given height of the masonry course.
- 61. Overview of next two diagrams.
- 62-63. Measurements relating the various Chambers' walls to the Floor of the Grand Gallery, including its extension Southward beyond the lower edge of the "Great Step".
- 64. Intersects with the Grand Gallery Step.
- 65. Intersects with the Scored Line extensions from the Descending Passage.

Brian Kutscher
Revised October 16, 1993

	Defined Points in the Great Pyramid		
	Points defined 1980 - 1993 by Brian Kutscher using data from John and Morton Edgar and Prof. C. Piazza Smythe		
Point #	X Coordinate	Y Coordinate	Comments
1	4565.52748334663	0.	Intersection of Mean Socket Level with Casing Stone Angle
2	4558.54305844263	8.892845985	Intersection of Casing Stone Angle with Rock Level
3	4542.16279419859	29.7488461737321	Intersection of Casing Stone Angle with Platform Level
4	4017.60013212701	697.642771214773	Intersection of Casing Stone Angle with original floor at entrance point
5	3987.771202	735.6221446	Intersection of Casing Stone Angle with original ceiling at entrance.
6	4008.714871	693.2508801	Line dropped perpendicular to Desc. Passage angle from point 5 to Passage floor.
7	3987.771202	682.8964298	Line dropped vertically from point 5 to Desc. Passage floor
8	3906.081537	642.5203051	Beginning of "Basement Sheet"
9	3885.137868	684.8915694	Line drawn perpendicular to Passage angle from point 8
10	3885.137868	632.1680702	Line dropped vertically from point 9
11	3585.866065	484.2411737	Intersection of Scored Line with Desc. Passage floor
12	3564.922396	526.612438	Intersection of Scored Line with Desc. Passage ceiling
13	3022.8240154304	205.9354255552	"Point of Intersection" between Descending and Ascending Passages, measured along their floor lines.
14	2969.113167	232.4841313	Intersection of Asc. Passage Floor line with Desc. Passage ceiling
15	3022.428293	258.8372358	Intersection of Asc. and Desc. Passages' ceiling lines
16	3076.139141	232.2885298	Intersection of Asc. Passage ceiling line with Desc. Passage floor line.
17	3049.481578	219.1119775	Intersection of Desc. Passage floor line with line extending down the middle of the Ascending Passage
18	2956.191115	238.8713655	Lower limit of the Granite Plug, along the floor of the Asc. Passage
19	2796.45055	317.8294423	Upper limit of the Granite Plug, along the floor of the Asc. Passage
20	2817.1738735	359.64681152	Upper limit of the Granite Plug, along the ceiling of the Asc. Passage
21	2977.1279159	281.2287346	Lower Limit of the Granite Plug, along the ceiling of the Asc. Passage
22	2383.129744	522.1295586	Points 22-25 define the intersections of the first Girdle Stone with the Asc. Passage
23	2353.999096	536.5285305	
24	2353.999096	589.2347396	
25	2383.129744	574.8357676	
26	2198.848146	613.2180092	Points 26-29 define the intersections of the second Girdle Stone with the Asc. Passage
27	2169.344766	627.8012188	
28	2169.344766	680.5074279	
29	2198.848146	665.9242182	
30	2013.388181	704.8889147	Points 30-33 define the intersections of the third Girdle Stone with the Asc. Passage
31	1983.878678	719.4751464	
32	1983.290381	772.4721486	
33	2013.388181	757.5951237	
34	1669.1530496	875.0407104	This point is 33.5 inches down the Asc. Passage from the N. Wall of the Grand Gallery; Jesus' Birth as the Edgar's have it. It is in line with the Queen's Chamber floor level.
35	1639.1615114289	889.8652120788	Intersection of the N. Wall of the Grand Gallery with the Asc. Passage; Jesus' death, as the Edgar's have it.
36	1639.1615114289	942.5714207	
37	1616.740411	900.947725	Practical end of the Ascending Passage, at the mouth of the Well.
38	1616.740411	896.2006703	Intersection of the north end of the mouth of the Well with the Horizontal Passage floor.
39	1590.104011	896.2006703	Intersection of the south end of the mouth of the Well with the Horizontal Passage floor.
40	1438.75475	896.2006703	Point directly below the sheer cut off of the Grand Gallery floor, at the level of the Horizontal Passage.

41	1438.75475	942.5407	Intersection of the lower extremity of the sheer cut off of the Grand Gallery floor and the Ceiling of the Horizontal Passage.
42	1438.75475	981.0581605	Upper extremity of the sheer cut off of the Grand Gallery floor.
43	1402.25475	999.0997257	"Notch" in Grand Gallery floor, lower point
44	1402.25475	1006.965726	"Notch" in Grand Gallery floor, upper point
45	1639.1615114289	978.846023	45-58, 499, and 500 describe the North Wall of the Grand Gallery, with its six overlappings.
46	1639.1615114289	1015.120625	
47	1636.125811	1016.621147	
48	1636.125811	1051.395227	
49	1633.09011	1052.895749	
50	1633.09011	1057.895749	
51	1633.09011	1063.895749	
52	1633.09011	1087.669829	
53	1630.05441	1089.170351	
54	1630.05411	1123.944432	
55	1627.01871	1125.444953	
56	1627.01871	1160.219034	
57	1623.983009	1161.719555	
58	1620.947309	1232.768238	
59	13.33272211	1693.495239	Intersection of the Grand Gallery's floor with the N. edge of the Great Step.
60	-47.6267414153	1723.62686011329	"1914 A.D. Date Point" - Intersection of the extended Grand Gallery Floor Line with a vertical line dropped from the South Wall of the Grand Gallery's lowest extremity.
61	13.33272211	1729.478211988	Top of the Great Step at the Southern end of the actual floor of the Grand Gallery.
62	-47.6267414153	1729.478211988	Point directly above point 60, at the level of the top of the Great Step.
63	-47.6267414153	1773.153512	Lowest extremity of the South Wall of the Grand Gallery and Northern extremity of the ceiling of the passage that leads to the Ante-Chamber.
64	-26.37674176	1729.478211988	Point directly below point 81, the top of the Grand Gallery's South Wall, located at the level of the Great Step.
65	0.	1729.478211988	Intersection of the Vertical Axis of the Great Pyramid with the top of the Great Step.
66	-59.46464685	1729.478211988	Intersection of the line of the Grand Gallery's floor line (produced) with the top of the Step.
67	-47.6267414153	1808.899609	Points 67-81, 497, and 498 define the South Wall of the Grand Gallery with its seven overlappings (also the groove's southern extremity is shown as points 73 and 74.)
68	-44.59094274	1808.899609	
69	-44.59094274	1844.645821	
70	-41.55522846	1844.645821	
71	-41.55522846	1880.392032	
72	-38.51951417	1880.392032	
73	-38.51951417	1885.392032	
74	-38.51951417	1891.392032	
75	-38.51951417	1916.138246	
76	-35.48379989	1916.138246	
77	-35.48379989	1951.884459	
78	-32.4480856	1951.884459	
79	-32.4480856	1987.630671	
80	-29.41237132	1987.630671	
81	-26.37674176	2059.123208	
82	-17.12943	2045.8883	Points 82-151 define the 36 overlappings in the Grand Gallery ceiling mentioned by Prof. Smyth and Brs. Edgar.
83	-16.17794	2047.63232	Adjustments have been made based on Photo Analysis on January 16, 2006
84	17.0256	2029.56677	
85	17.98145	2031.32336	
86	48.11058	2014.93066	
87	49.06643	2016.6875	
88	80.77669	2000.20593	
89	81.25461	2001.08472	
90	121.83672	1978.26428	

91	122.31463	1979.1427	
92	164.74139	1957.70007	
93	165.2193	1958.57837	
94	203.42972	1939.13379	
95	203.90765	1940.01221	
96	241.32748	1919.65234	
97	242.28336	1921.40918	
98	284.44656	1898.46887	
99	285.4024	1900.22571	
100	331.25488	1875.27783	
101	332.21082	1877.03467	
102	371.38748	1855.71912	
103	372.34326	1857.47607	
104	413.62808	1838.01355	
105	414.58392	1836.77026	
106	452.97006	1815.88589	
107	453.9259	1817.64185	
108	496.00128	1794.74902	
109	496.95712	1796.5061	
110	548.69489	1768.35608	
111	549.65088	1770.11292	
112	593.04376	1746.5033	
113	593.99963	1748.26025	
114	669.01514	1707.44531	
115	669.97089	1709.20215	
116	751.83783	1664.65967	
117	752.79364	1666.41626	
118	790.12567	1646.10437	
119	791.08154	1647.86133	
120	821.29852	1631.42065	
121	822.25433	1633.17737	
122	905.79022	1587.72668	
123	906.74615	1589.4834	
124	954.00409	1563.771	
125	954.95996	1565.52795	
126	1001.25159	1540.34119	
127	1002.20752	1542.09802	
128	1047.00598	1517.72375	
129	1047.96167	1519.48059	
130	1086.61133	1498.4519	
131	1087.55726	1500.20874	
132	1134.73718	1474.54431	
133	1135.69312	1476.3009	
134	1182.77527	1450.68408	
135	1183.7312	1452.44092	
136	1228.70544	1427.97131	
137	1229.66101	1429.72791	
138	1267.95947	1408.89038	
139	1268.91516	1410.64734	
140	1315.90955	1385.07827	
141	1316.86548	1386.83508	
142	1361.92749	1362.31738	
143	1362.8833	1364.07422	
144	1406.62756	1340.27356	
145	1407.58362	1342.03027	
146	1446.23315	1321.00159	
147	1447.18884	1322.75842	
148	1535.38049	1274.77466	
149	1536.33618	1276.53137	
150	1583.14453	1253.3407	
151	1582.18884	1251.58362	
152	333.7517211	896.2006703	Southern extremity of the Horizontal Passage, leading to the Queen's Chamber, just where it steps down.
153	333.7517211	875.0407104	Northern extremity of the lower portion of the Horizontal Passage, leading to the Queen's Chamber, directly below point 152, at the level of the Queen's Chamber floor..
154	117.8500895	875.0407104	Intersection of the Queen's Chamber floor line with the North wall of the Queen's Chamber.

155	-87.7622577	875.0407104	Southern Wall of the Queen's Chamber, at the floor level.
156	-87.7622577	1059.325815	Intersection of the South Wall of the Queen's Chamber with its ceiling.
157	15.0439159	1120.05938	Top point in the Queen's Chamber Ceiling.
158	117.8500895	942.5407	Intersection of the North Wall of the Queen's Chamber with the ceiling of the Horizontal Passage that leads to it.
159	567.9083578	-1007.503499797	159-162 define the lower opening of the Well Shaft in the Descending Passage.
160	536.7183578	-1007.503499797	
161	536.7183578	-976.313499797	
162	567.9083578	-976.313499797	
163	302.49844	-1138.69312	Lower extremity of the Descending Passage, at the floor level.
164	301.9136897	-1137.475741	Northern extremity of the Small Horizontal Passage, at the floor level.
165	284.6215008	-1101.21594	Northern extremity of the Small Horizontal Passage, at the ceiling level.
166	282.0275	-1096.08203	Lower extremity of the Descending Passage, at the ceiling level.
167	-47.9047194	-1137.475741	Actual end of the floor line of the Small Horizontal Passage, floor level.
168	-47.6267414153	-1137.475741	This point is vertically below the South Wall of the Grand Gallery (and the 1914 A.D. Date Point), at the floor level of the Sm. Hor. Passage.
169	-42.9047194	-1137.475741	Intersection of the North Wall of the Pit with the Floor line of the Small Horizontal Passage.
170	-42.9047194	-1098.78198	Intersection of the North Wall of the Pit with the Ceiling line of the Small Horizontal Passage.
171	-47.6267414153	-1098.78198	Intersection of a line drawn vertically up from point 167 to the height of the Ceiling of the Sm. Hor. Passage.
172	12.0952806	-1098.78198	Southern extremity of the Recess, at the Sm. Hor. Passage's ceiling level.
173	83.02236	-1098.78198	Northern extremity of the Recess, at the Sm. Hor. Passage's ceiling level.
174	12.0952806	-1088.	Southern extremity of the Recess, at its highest point.
175	82.9983806	-1093.	Northern extremity of the Recess, at its highest point.
176	-42.9047194	-1015.767341	Northern ceiling corner of the Pit.
177	-367.8368194	-1015.767341	Southern ceiling corner of the Pit.
178	-367.8368194	-1146.834841	Intersection of the South wall of the Pit with the ceiling of the Blind Passage.
179	-1009.357419	-1146.834841	Extreme end of the Ceiling of the Blind Passage.
180	-1009.357419	-1175.834841	Extreme end of the Floor of the Blind Passage.
181	-367.8368194	-1175.834841	Intersection of the South wall of the Pit with the floor of the Blind Passage.
182	-367.8368194	-1184.834841	Southern, floor corner of the Pit.
183	-261.87	-1184.8	183-192 describe the hole in the floor of the Pit. The measures were scaled from a 3'x5' Pyramid Chart and are, at best, approximate.
184	-261.87	-1237.	
185	-237.87	-1237.	
186	-237.87	-1279.77	
187	-213.87	-1279.77	
188	-213.87	-1321.77	
189	-153.87	-1321.77	
190	-153.87	-1279.77	
191	-153.87	-1175.8	
192	-47.9047194	-1159.767341	
193	-99.60594176	1773.1535119	Intersection of the North Wall of the Ante-Chamber with the Ceiling of the passage that leads to it.
194	-99.60594176	1841.281611	Point on the North wall of the Ante-Chamber that is level with the Wainscoats on the walls.
195	-99.60594176	1878.918863	Northern, ceiling corner of the Ante-Chamber
196	-215.8661444	1878.918863	Southern, ceiling corner of the Ante-Chamber.
197	-215.8661444	1841.281611	Point on the South wall of the Ante-Chamber that is level with the Wainscoats on the walls.

198	-215.866144	1771.477983	Intersection of the South Wall of the Ante-Chamber with the Ceiling of the passage that leads out of it towards the King's Chamber.
199	-215.8661444	1729.4782119	Intersection of the South Wall of the Ante-Chamber with the floor of the passage that leads to the King's Chamber.
200	-120.6059	1773.1535119	Northern, bottom corner of the Granite Leaf.
201	-136.3023	1773.1535119	Southern, bottom corner of the Granite Leaf.
202	-136.3023	1800.978812	Southern joint between the two pieces of stone that make up the Granite Leaf.
203	-120.6059	1800.978812	Northern joint between the two pieces of stone that make up the Granite Leaf.
204	-120.6059	1805.978812	204-207 describe the Boss on the Granite Leaf.
205	-119.6059	1805.978812	
206	-119.6059	1810.978812	
207	-120.6059	1810.978812	
208	-120.6059	1818.808712	Northern, top corner of the Granite Leaf.
209	-136.3023	1818.808712	Southern, top corner of the Granite Leaf.
210	-140.1063444	1841.281611	210-220 describe the Wainscoating, along its top level. The 9" (radius) semicircular gouges are not defined explicitly in the data file.
211	-142.066311	1841.281611	
212	-160.066311	1841.281611	
213	-162.0262777	1841.281611	
214	-167.0262777	1841.281611	
215	-168.9862444	1841.281611	
216	-186.9862444	1841.281611	
217	-188.946211	1841.281611	
218	-193.946211	1841.281611	
219	-195.9061777	1841.281611	
220	-213.9061777	1841.281611	
221	-193.946211	1729.4782119	221-224, 227, and 228 describe the Wainscoating at their respective floor levels of the Ante-Chamber.
222	-188.946211	1729.4782119	
223	-167.0262777	1729.4782119	
224	-162.0262777	1729.4782119	
225	-160.1771735	1729.4752119	225-226 describe the small step height difference between the first and succeeding Granite Floor Stones.
226	-160.1771735	1729.928	
227	-140.1063444	1729.928	
228	-136.3023	1729.928	
229	-112.8332779	1729.928	229-230 describe the small increase of elevation of the first Granite Floor Stone in the Ante-Chamber.
230	-112.8332779	1729.4782119	230-231 describe the increased elevation of the first Floor stone in the King's Chamber.
231	-316.7095444	1729.4782119	230-231 describe the increased elevation of the first Floor stone in the King's Chamber.
232	-316.7095444	1730.244002	232 defines the North, floor corner of the King's Chamber.
233	-316.7095444	1771.477983	Intersection of the N. Wall of the King's Chamber with the ceiling of the passage leading to it.
234	-215.8661444	1806.75913	Intersection of the (Extended length of the) Grand Gallery's floor with the South Wall of the Ante-Chamber.
235	-316.7095444	1856.631694	Intersection of the (Extended length of the) Grand Gallery's floor with the North Wall of the King's Chamber.
236	-119.6059418	1841.281611	Point directly above the Northern extremity of the Boss on the Granite Leaf, in line with the top of the Wainscoating on the wall of the Ante-Chamber.
237	-119.6059418	1773.1535119	Northern, lower extremity of the ridge in the Ante-Chamber's wall that holds the Granite Leaf.
238	-215.8661444	1866.535321	Intersection of the South Wall of the Ante-Chamber and the level of the large Granite Blocks that form the second layer of the King's Chamber's North Wall.
239	-316.7095444	1866.535321	Intersection of the North Wall of the King's Chamber and the level of the large Granite Blocks that form the lower layer of the King's Chamber's North Wall.
240	-316.7095444	1913.58397	Intersection of the North Wall of the King's Chamber and the upper level of the second layer of masonry of the King's Chamber's North Wall.
241	-316.7095444	1960.632619	Northern, ceiling corner of the King's Chamber.

242	-522.7753884	1960.632619	Southern, ceiling corner of the King's Chamber.
243	-522.7753884	1913.58397	Intersection of South Wall of the King's Chamber with the upper level of the fourth course on Masonry in the South Wall of the King's Chamber.
244	-522.7753884	1866.535321	Intersection of South Wall of the King's Chamber with the upper level of the third course on Masonry in the South Wall of the King's Chamber.
245	-522.7753884	1819.486671	Intersection of South Wall of the King's Chamber with the upper level of the second course on Masonry in the South Wall of the King's Chamber.
246	-522.7753884	1772.438022	Intersection of South Wall of the King's Chamber with the upper level of the first course on Masonry in the South Wall of the King's Chamber.
247	-522.7753884	1730.244002	Intersection of the South Wall of the King's Chamber with the floor line of the King's Chamber
248	-522.7753884	1725.389372	Intersection of the South Wall of the King's Chamber with the lower limit of the first masonry course in the South Wall of the King's Chamber. (Lower extremity of the "Second Height" of the King's Chamber.)
249	-464.6344542	1771.457171	249-252 define the Coffin's location and size.
250	-374.8504786	1771.457171	
251	-464.6344542	1730.244002	
252	-374.8504786	1730.244002	
253	-527.11453134045	1960.632619	Intersection of the (produced) floor line of the Grand Gallery with the Ceiling level of the King's Chamber.
254	-522.7753884	1958.487868	Intersection of the line of the Grand Gallery's floor line (produced) with the South Wall of the King's Chamber.
255	-61.01385428	1730.24396884	Intersection of the line of the Grand Gallery's floor line (produced) with the level of the King's Chamber floor
256	-381.2133102	1871.80608	The significance of this point is not known.
257	1590.104011	875.04071040	257-260 define the upper opening of the Well Shaft.
258	1616.740411	875.04071040	
259	1617.422211	875.04071040	
260	1589.422211	875.04071040	
261	1589.422211	672.000725	261-262 define the bend in the Well shaft above the Grotto. All other Well and Grotto measurements are approximate as they were scaled off a 3' x 5' chart of the Great Pyramid.
262	1617.422211	672.000725	
263	1414.3	384.	263-288 define the Well Shaft and Grotto. Values are approximate only.
264	1443.2	384.	
265	1415.2	371.04	
266	1425.2	320.64	
267	1432.4	312.	
268	1441.76	312.	
269	1441.76	281.76	
270	1459.76	287.52	
271	1475.6	271.68	
272	1472.	260.16	
273	1441.76	260.16	
274	1441.76	237.12	
275	1432.4	237.12	
276	1399.34	312.	
277	1389.26	312.	
278	1399.34	266.64	
279	1389.26	266.64	
280	1367.66	276.432	
281	1343.18	270.672	
282	1343.18	234.672	
283	1367.66	232.512	
284	1399.34	232.512	
285	1399.34	173.472	
286	1432.4	163.68	
287	1318.7	100.032	
288	1318.7	85.63	
289	713.9	-608.45	289-290 define the bend in the Well shaft, above the entry into the Descending Passage.

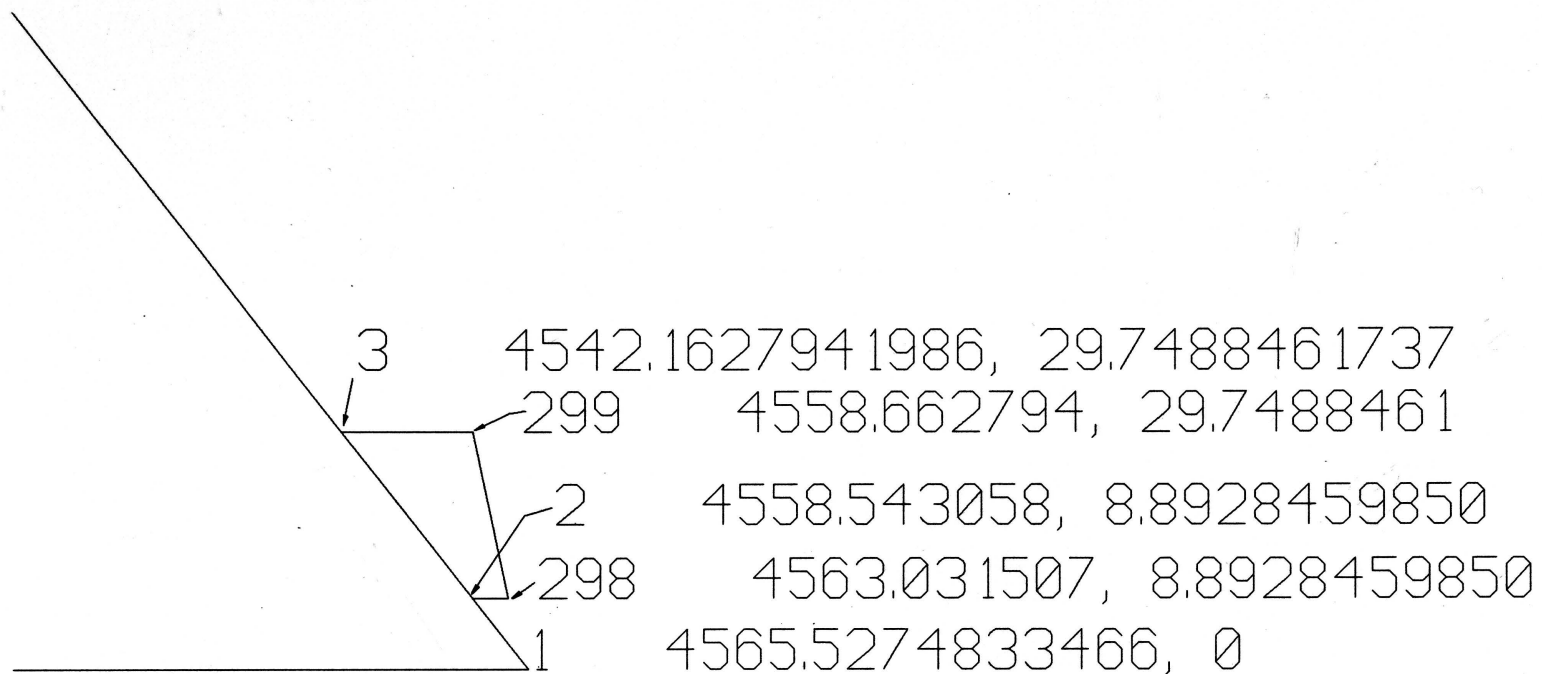
290	745.52	-624.	291-295 define the passage that communicates the Well to the Descending Passage.
291	614.0756194	-978.24	
292	566.94	-1007.503	
293	596.71	-1025.04	
294	567.91	-1025.04	
295	569.9	-975.83	Northern extremity of the West Ramp's upper surface, at the southern edge of the Well opening, in the Grand Gallery.
296	1590.104011	936.17596	
297	13.33272211	1716.92017	
298	4563.031507	8.892845985	
299	4558.662794	29.7488461	
300	-136.3023	1841.281611	A point in the Wainscoating, missed earlier (points 210-220).
301	117.8500895	1059.325815	Northern, ceiling corner of the Queen's Chamber.
302	0.	5813.01013437289	Top of the Great Pyramid
303	0.	0.	Origin of the coordinate system used for this data set. Located at the intersection of the Vertical Axis of the Great Pyramid and the Mean Socket Level.
304	0.	-1300.	End of an arbitrarily long vertical line.
305	-419.7424664	2662.63	Peak of the high angular stones above the King's Chamber. Y-Coordinate was scaled from a 3' x 5' Pyramid chart. X-Coordinate is assumed to be at one-half the distance between the North and South Walls of the King's Chamber.
306	-153.34	2493.43	306-311 define the angular stones above the Chambers of Construction. Values were scaled from a Pyramid Chart.
307	-189.34	2434.39	
308	-417.58	2574.07	
309	-424.062	2579.83	
310	-665.98	2490.55	
311	-631.42	2438.71	312-330 define the granite blocks that make up the floor of the fifth Chamber of Construction and the ceiling of the fourth Chamber of Construction.
312	-566.62	2473.27	
313	-543.58	2481.91	
314	-533.5	2493.43	
315	-506.14	2502.07	
316	-491.02	2499.19	
317	-427.66	2506.39	
318	-400.3	2509.27	
319	-344.86	2502.07	
320	-295.18	2489.11	
321	-278.62	2481.91	
322	-273.58	2461.03	
323	-275.02	2453.11	
324	-274.3	2414.23	
325	-318.94	2414.23	
326	-516.22	2414.23	
327	-574.54	2414.23	
328	-573.82	2428.63	
329	-575.26	2441.59	
330	-566.62	2458.87	
331	-551.5	2388.31	331-348 define the granite blocks that make up the floor of the fourth Chamber of Construction and the ceiling of the third Chamber of Construction.
332	-567.34	2353.03	
333	-565.18	2317.75	
334	-563.74	2307.67	
335	-574.54	2301.19	
336	-511.18	2301.19	
337	-318.94	2301.19	
338	-262.78	2301.19	
339	-265.66	2320.63	
340	-265.66	2363.83	

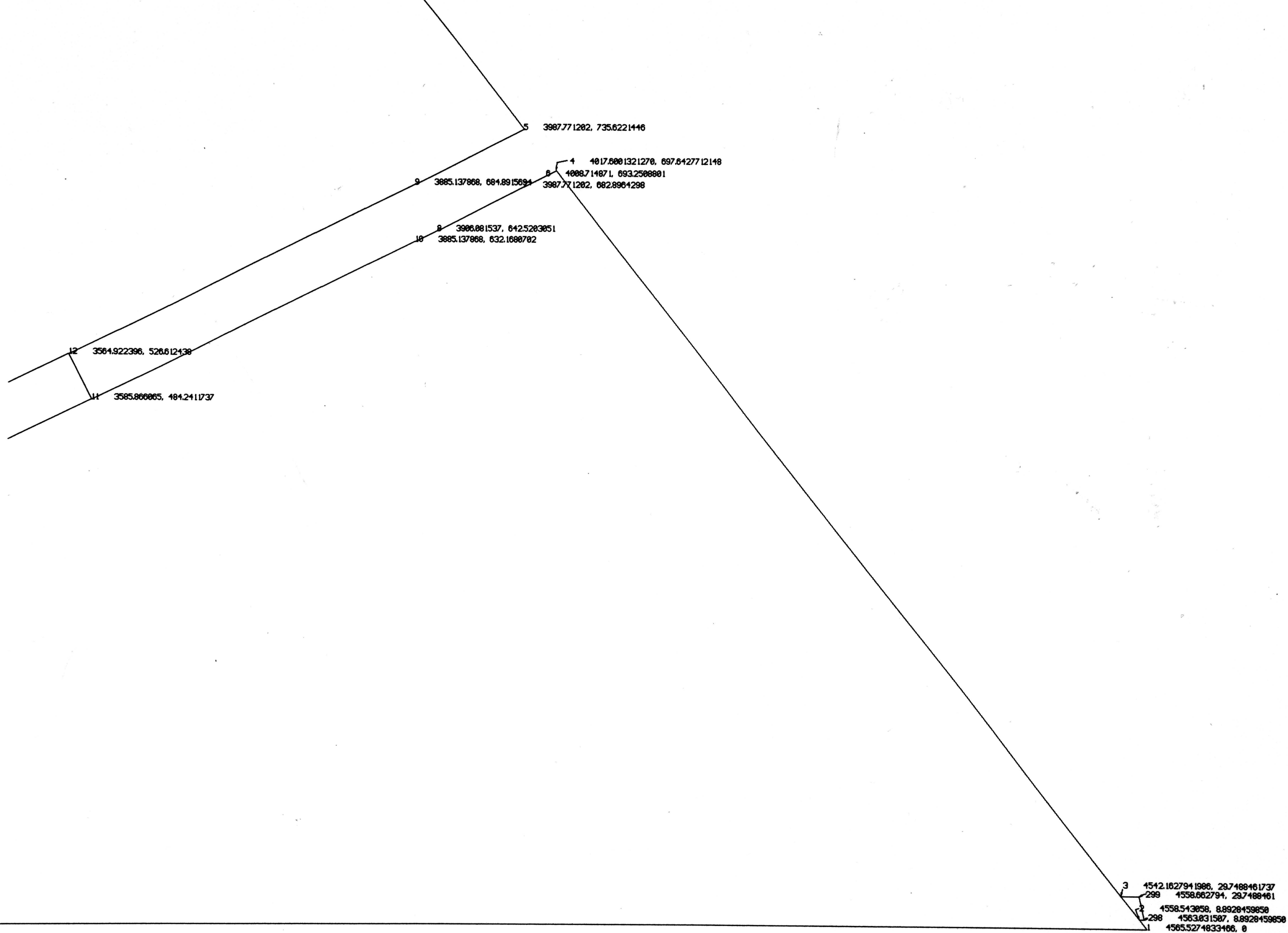
341	-308.14	2373.91	
342	-318.94	2383.99	
343	-350.62	2392.63	
344	-376.54	2392.63	
345	-389.5	2395.51	
346	-449.98	2395.51	
347	-516.22	2388.31	
348	-249.1	2301.19	349-372 and 384 define the granite blocks that make up the floor of the third Chamber of Construction and the ceiling of the second Chamber of Construction.
349	-249.1	2258.71	
350	-268.54	2257.27	
351	-267.1	2242.87	
352	-257.74	2193.91	
353	-262.78	2186.71	
354	-318.94	2186.71	
355	-353.5	2162.23	
356	-373.66	2167.99	
357	-432.7	2170.87	
358	-465.82	2167.99	
359	-519.1	2186.71	
360	-576.7	2186.71	
361	-568.06	2199.67	
362	-568.06	2212.63	
363	-569.5	2232.79	
364	-565.18	2251.51	
365	-566.62	2266.63	
366	-572.38	2273.11	
367	-511.18	2273.83	
368	-475.9	2283.19	
369	-429.82	2283.19	
370	-379.42	2270.23	
371	-365.74	2270.23	
372	-318.94	2257.27	
373	-258.46	2169.43	373-383, 385-389, 393, 401, and 412-414 define the granite blocks that make up the floor of the second Chamber of Construction and the ceiling of the first Chamber of Construction.
374	-251.26	2159.35	
375	-261.34	2159.35	
376	-318.94	2156.47	
377	-363.58	2162.23	
378	-408.22	2164.39	
379	-452.14	2167.99	
380	-495.34	2160.79	
381	-519.1	2160.79	
382	-572.38	2160.79	
383	-591.1	2160.79	
384	-588.94	2186.71	
385	-572.38	2143.51	
386	-582.46	2129.11	
387	-578.14	2113.27	
388	-581.74	2100.31	
389	-581.74	2088.79	
390	-583.9	2055.67	390-392, 394-400, 402-407, 415 and 418-424 define the granite blocks that make up the floor of the first Chamber of Construction and the ceiling blocks of the King's Chamber
391	-597.58	2057.83	
392	-519.1	2051.35	
393	-519.1	2088.79	
394	-471.58	2061.43	
395	-452.86	2061.43	
396	-435.58	2064.31	
397	-406.06	2061.43	
398	-373.66	2060.71	
399	-335.5	2050.63	
400	-317.5	2050.63	

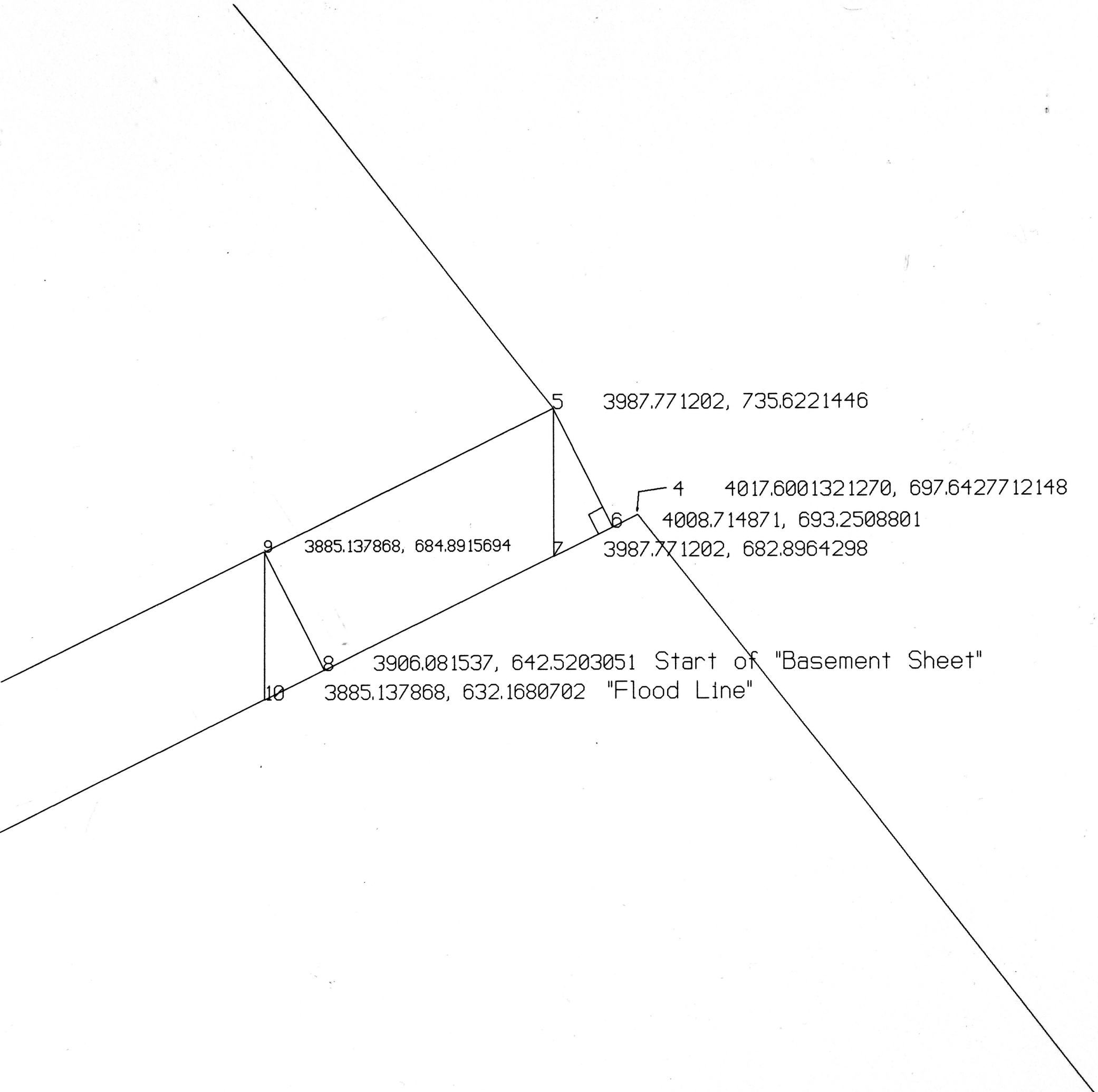
401	-317.5	2088.79	
402	-241.18	2048.47	
403	-235.42	2039.83	
404	-233.98	2001.67	
405	-231.1	1987.99	
406	-236.14	1975.75	
407	-232.54	1966.39	
408	-232.54	2049.19	
409	-232.54	2059.99	
410	-231.1	2065.75	
411	-231.1	2087.35	
412	-246.22	2088.79	
413	-241.9	2101.75	
414	-251.26	2136.31	
415	-244.71	1960.632619	415-417 define the Northern edges of the blocks that make up the North Wall of the King's Chamber, excepting the second level of masonry..
416	-244.71	1913.58397	
417	-244.71	1866.535321	
418	-601.18	2041.27	
419	-596.86	2023.27	
420	-600.46	2010.31	
421	-596.86	1995.91	
422	-604.06	1969.27	
423	-601.18	1960.632619	
424	-594.78	1960.632619	424-428 and 433-434 define the South edge of the blocks that make up the South Wall of the King's Chamber.
425	-594.78	1913.58397	
426	-594.78	1866.535321	
427	-594.78	1819.486671	
428	-594.78	1780.63	
429	-608.38	1776.31	429-432 define the lower end of the South Air Passage from the King's Chamber.
430	-671.74	1816.63	
431	-689.02	1813.75	
432	-616.3	1766.23	
433	-594.78	1767.67	
434	-594.78	1725.389372	
435	-561.58	1787.83	Marks the bulge in the height of the South Air Passage from the King's Chamber.
436	-529.9	1725.389372	Intersection of the bottom of the Lowest Masonry Course in the King's Chamber's South wall with the Southern extremity of the southern-most floor block in the King's Chamber.
437	-529.9	1697.11	437-445 define the bottoms of the floor blocks in the Floor of the King's Chamber - Thickness of these blocks is only approximate. Scaled from a Pyramid Chart.
438	-479.5	1697.11	
439	-419.74	1697.11	
440	-362.14	1697.11	
441	-316.7095444	1697.11	
442	-262.78	1697.11	
443	-203.74	1697.11	
444	-160.1771735	1697.11	
445	-112.8332779	1697.11	
446	-203.74	1729.4782119	Joint at the last floor-stone in the Ante-Chamber; missed earlier (see 221-229).
447	-262.78	1729.4782119	Joint in floor stones in passage leading from the Ante-Chamber into the King's Chamber.
448	-362.14	1730.244002	448-450 define the joints in the floor stones in the King's Chamber. X Coordinates are uncertain.
449	-419.74	1730.244002	
450	-479.5	1730.244002	
451	-316.7095444	1762.48	451-452 Lower opening of the North Air Channel from the King's Chamber.
452	-215.8661444	1762.48	
453	2108.802028	3128.	Opening of King's Chamber's North Air Channel at the Casing Stones.

454	2103.243019	3135.07795	Opening of King's Chamber's North Air Channel at the Casing Stones.
455	-2128.375759	3103.077952	Opening of King's Chamber's South Air Channel at the Casing Stones.
456	-2133.934769	3096.	Opening of King's Chamber's South Air Channel at the Casing Stones.
457	-2414.260691	2739.077952	Opening of Queen's Chamber's South Air Channel at the Casing Stones.
458	-2419.819701	2732.	Opening of Queen's Chamber's South Air Channel at the Casing Stones.
459	2386.613067	2774.28	Opening of Queen's Chamber's North Air Channel at the Casing Stones.
460	2381.054018	2781.358	Opening of Queen's Chamber's North Air Channel at the Casing Stones.
461	15.0439159	1223.739	Upper Peak of Ceiling stones in Queen's Chamber
462	270.72	1072.29	462-488 and 493 define the masonry of the Queen's Chamber
463	226.08	998.85	
464	-204.48	993.09	
465	-240.48	1072.29	
466	-201.6	995.97	
467	-190.08	979.41	
468	-149.76	984.45	
469	-149.76	959.97	
470	-149.76	935.286	
471	-149.76	926.286	
472	-149.76	908.846	
473	-149.76	875.0407104	
474	-87.7622577	908.846	
475	-87.7622577	926.286	
476	-87.7622577	965.526	
477	-87.7622577	992.886	
478	-87.7622577	1028.886	
479	117.8500895	1028.886	
480	117.8500895	992.886	
481	117.8500895	965.526	
482	117.8500895	933.5407	Opening of the North Air Channel from the Queen's Chamber.
483	182.16	959.97	
484	182.16	984.45	
485	182.16	1001.73	
486	230.4	981.57	
487	237.6	993.09	
488	182.16	942.5407	
489	190.08	942.5407	489-490 define the bend upward of the North Air Channel of the Queen's Chamber.
490	192.96	933.5407	
491	-165.6	935.286	491-492 define the bend upward of the South Air Channel of the Queen's Chamber.
492	-169.92	926.286	
493	-149.76	998.9068368	
494	-87.7622577	935.286	Upper, inner opening of the South Air Passage in the Queen's Chamber.
495	-522.7753884	1766.31	495-496 define the inner mouth opening of the South Air Passages of the King's Chamber.
496	-522.775388	1776.31	
497	-29.41237132	2018.14453	497-498 define the upper (seventh) overlapping of the South Wall of the Grand Gallery. (These points were missed earlier).
498	-26.37674176	2018.14453	
499	1623.983009	1196.493636	499-500 define the upper (seventh) overlapping of the North Wall of the Grand Gallery. (These points were missed earlier).
500	1620.747309	1197.994157	
501	-42.9047194	-1309.42225979375	Intersection of vertical line from North Wall of the Pit and the extension of the Descending Passage's Floor line.

502	-47.6267414153	-1311.75630548737	Intersection of the Vertical Line for the South Wall of the Grand Gallery and the extension of the Descending Passage's Floor line (Lower A.D. 1914 Date Point)
503	2568.40637806461	2542.66998623436	Point where the slope of the Scored Lines crosses the outer surface of the casing stones.
504	7750.28689406461	2542.66998623436	Point where the slope of the descending passage crosses the y value of point 503
505	2568.40637806461	-18.678421258767	Point on Descending passage directly below point 503
506	1668.03246767866	875.59460228408	BC/AD point (1.25 inches up the 1st Ascending Passage from Point 34)
507	2568.40637806461	430.549272355607000	Point on Ascending passage directly below point 503
	Points defined 1980 - 2024 by Brian Kutscher using data from John and Morton Edgar and Prof. C. Piazzzi Smyth.		
	c:\winword\studies\gppoints.xls		
	Brian Kutscher		
	September 02, 1993		
	Revised September 10, 1993		
	Font sizes/type modified for use with pythag1.xls on Jan. 19, 1994		
	Revised September 07, 1994 to include offset columns.		
	Revised October 15, 2010 to add points #501 and #502		
	Revised August 15, 2024 to include points 503, 504 and 505.		
	Revised August 16, 2024 to include Point 506 - BC/AD Point		







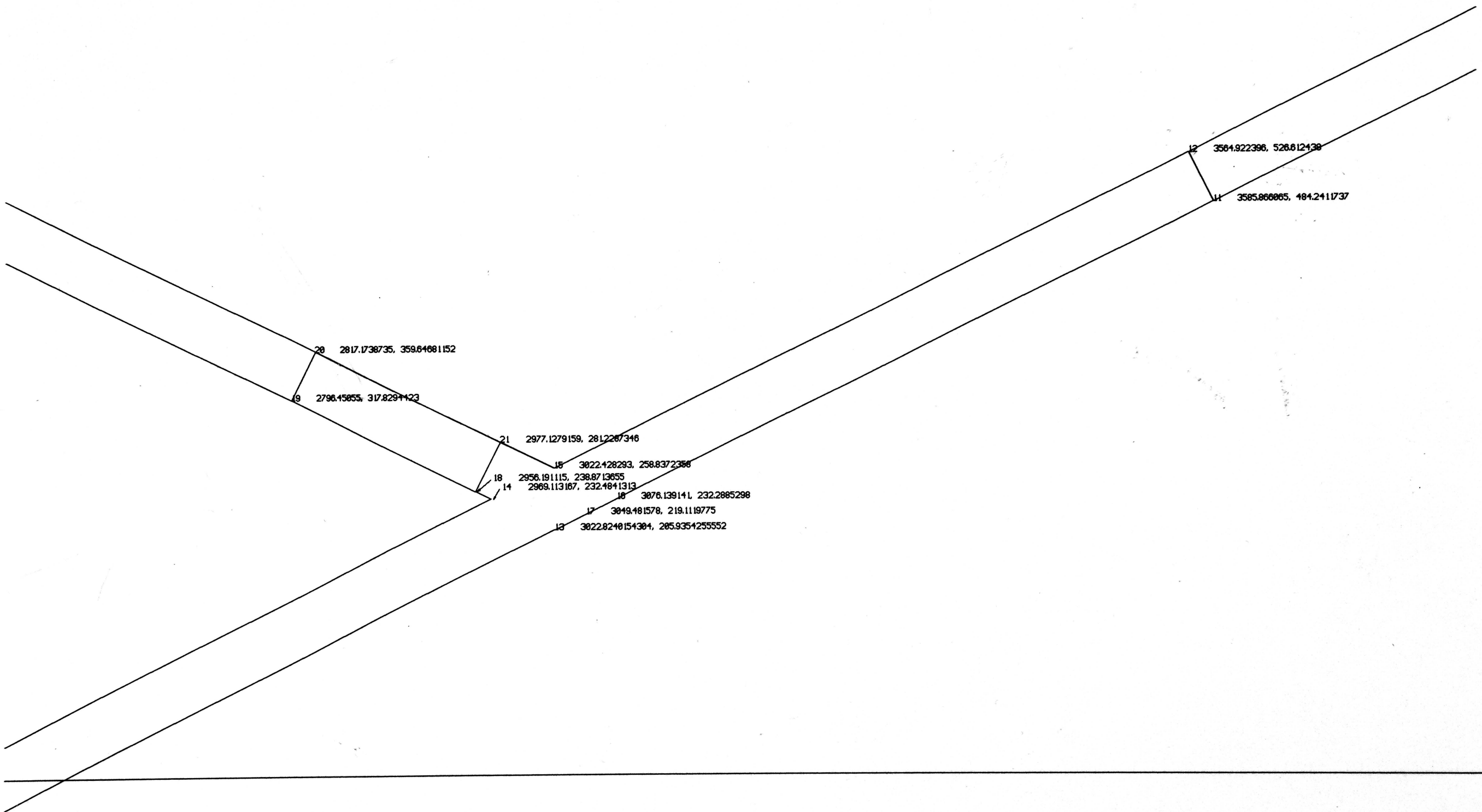
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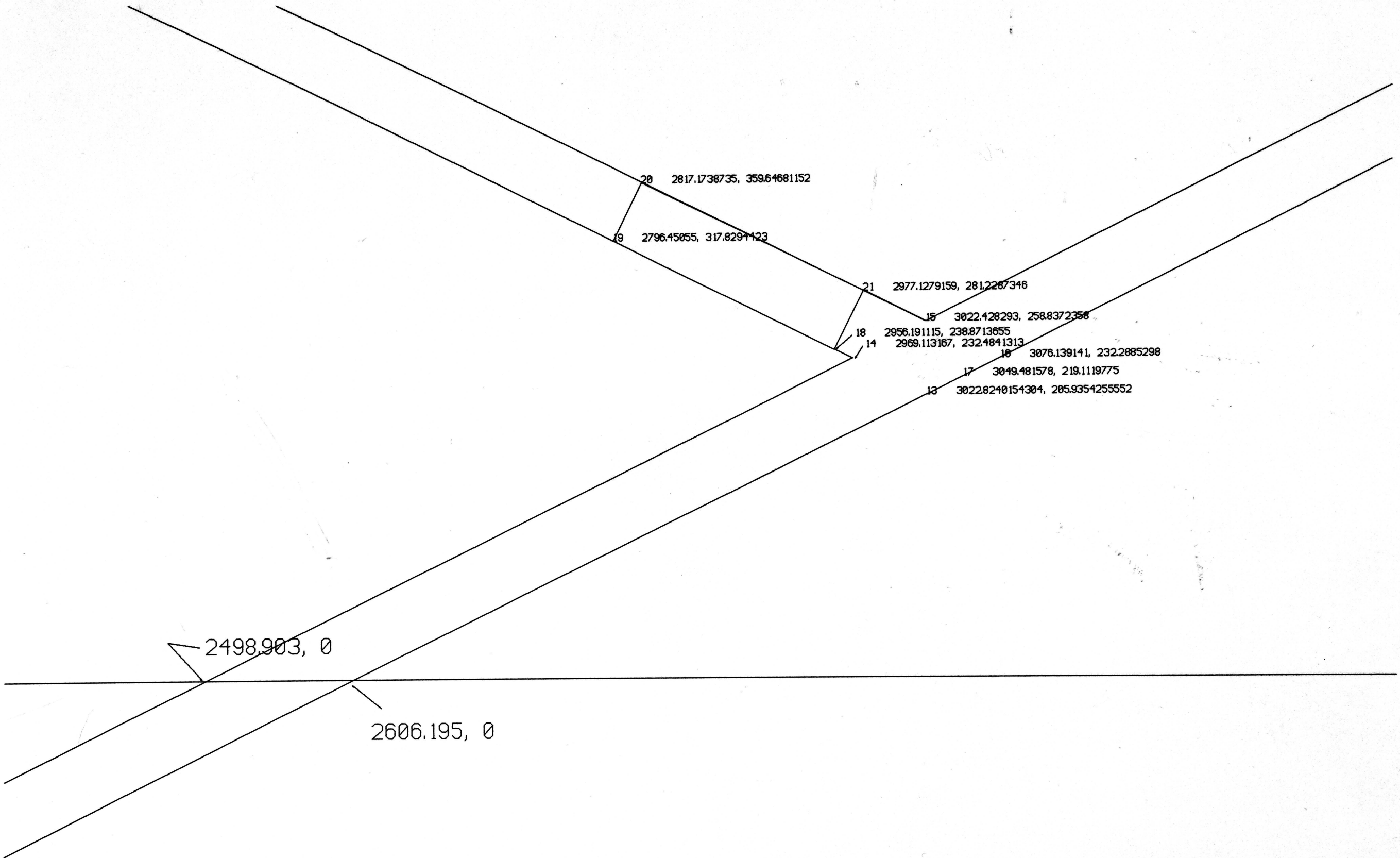
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"Scored Line"

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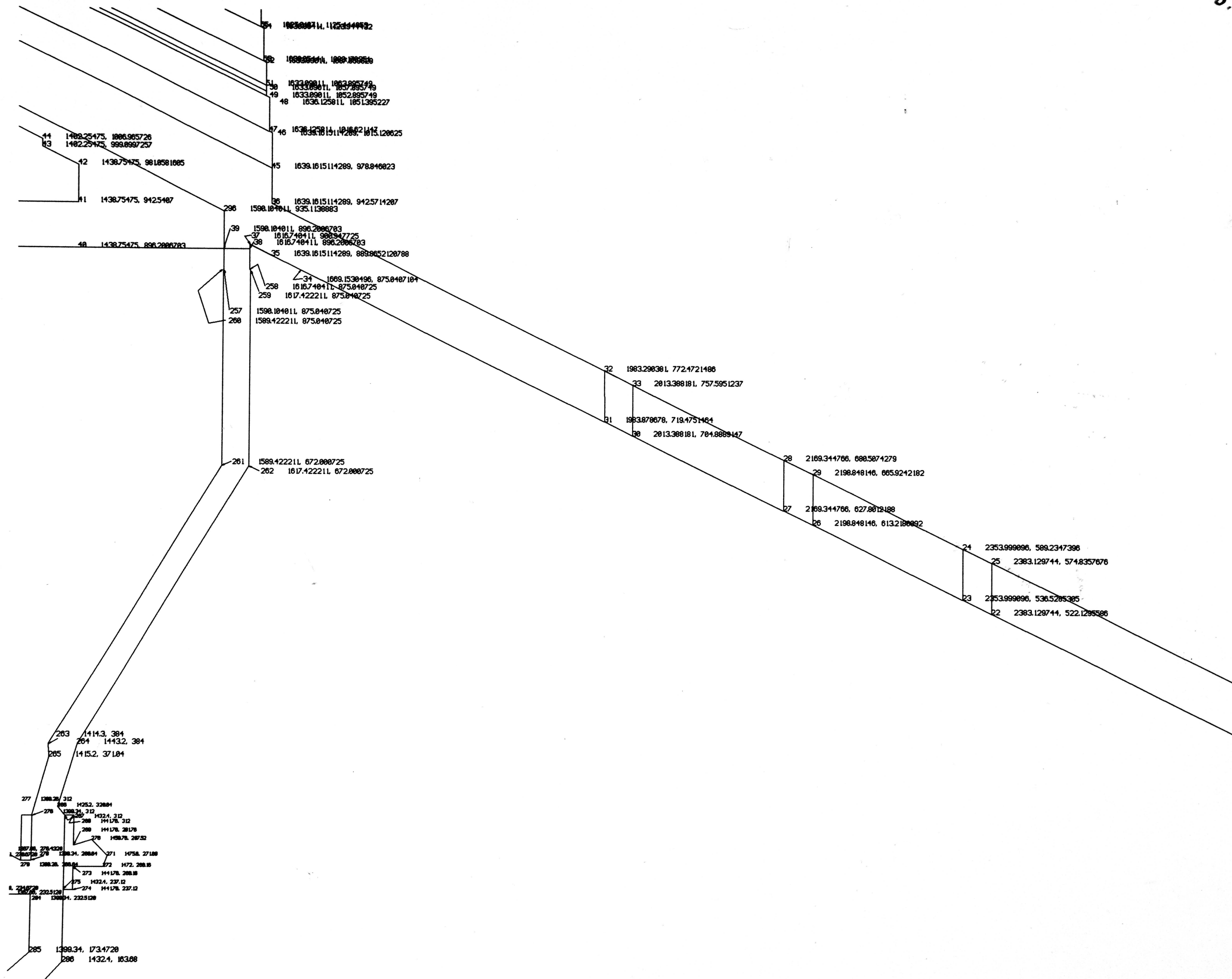
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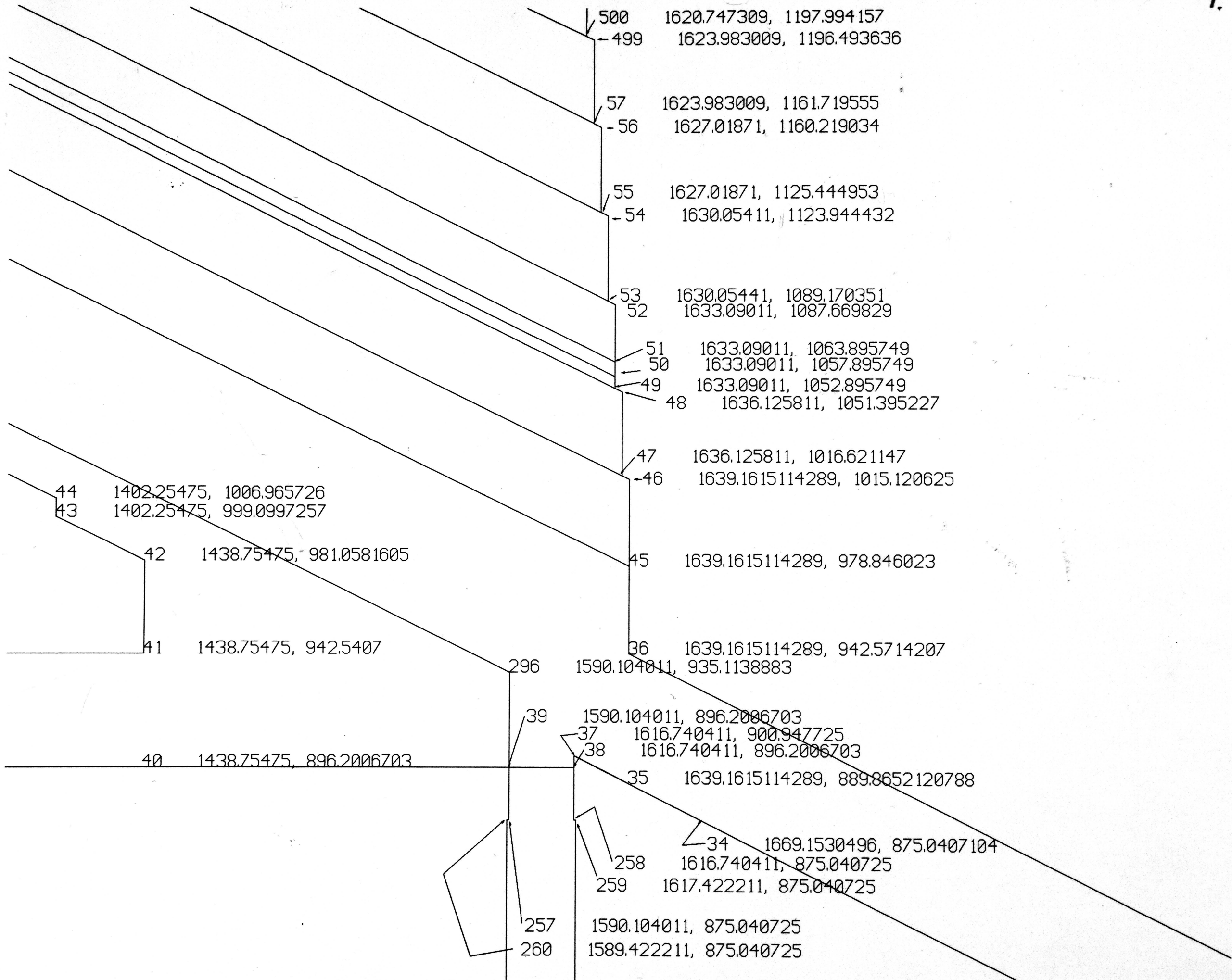
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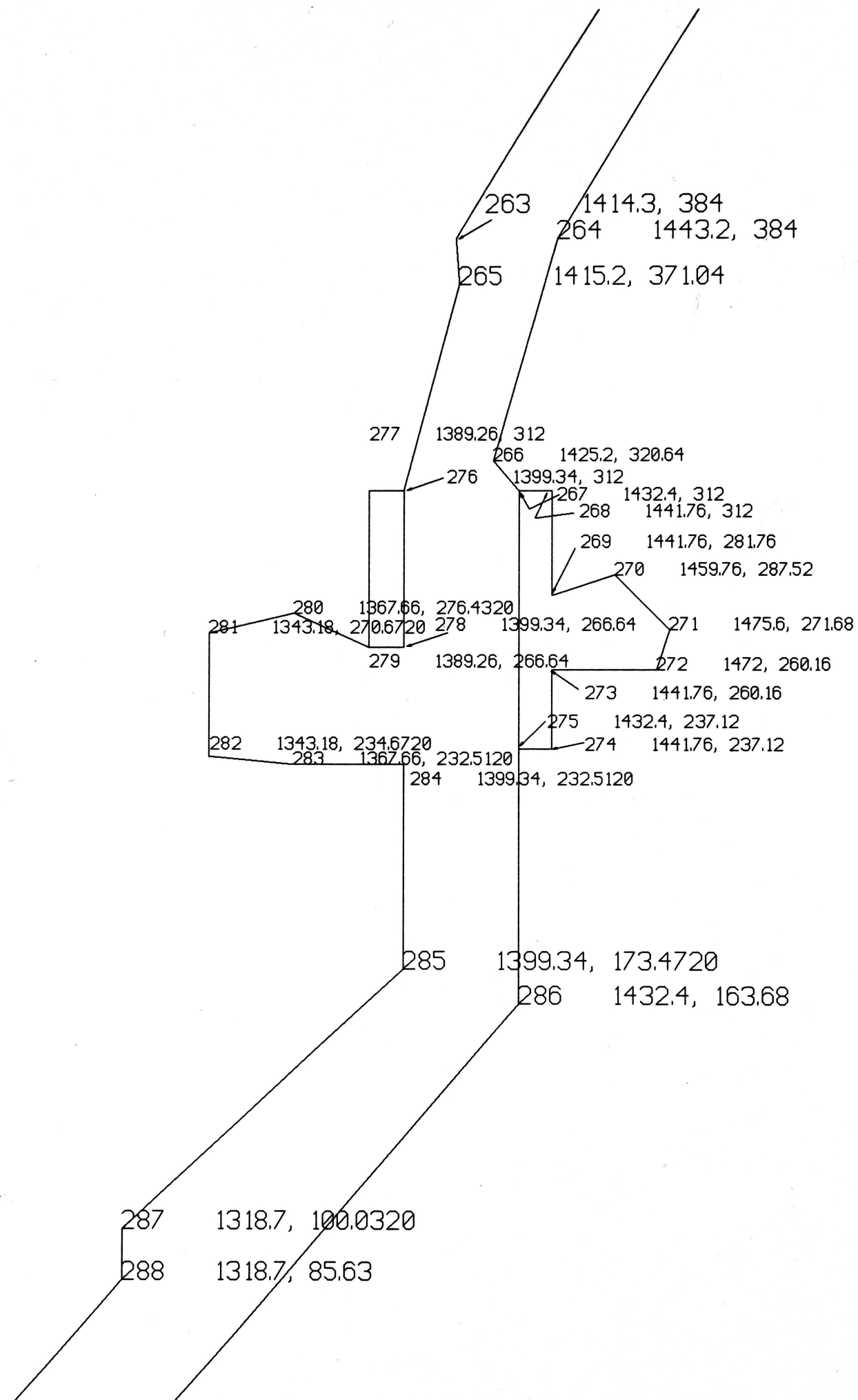
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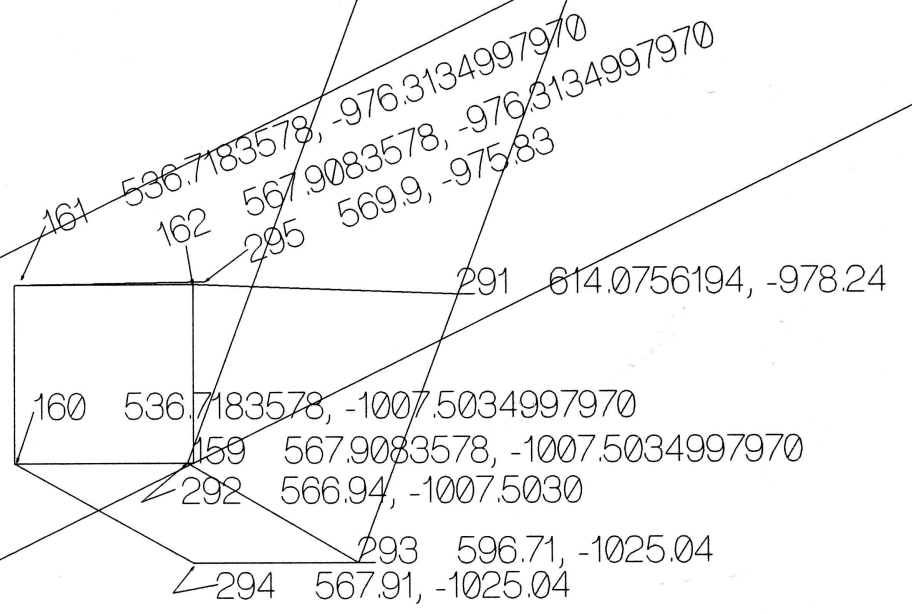


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2/27/06

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290 745.52, -624

12.
2/23/06



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165 284.6215008, -1101.21594

164 301.9136897, -1137.475741
163 302.4984053, -1138.692841

13.
2/27/06

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175 82.9983806, -1093

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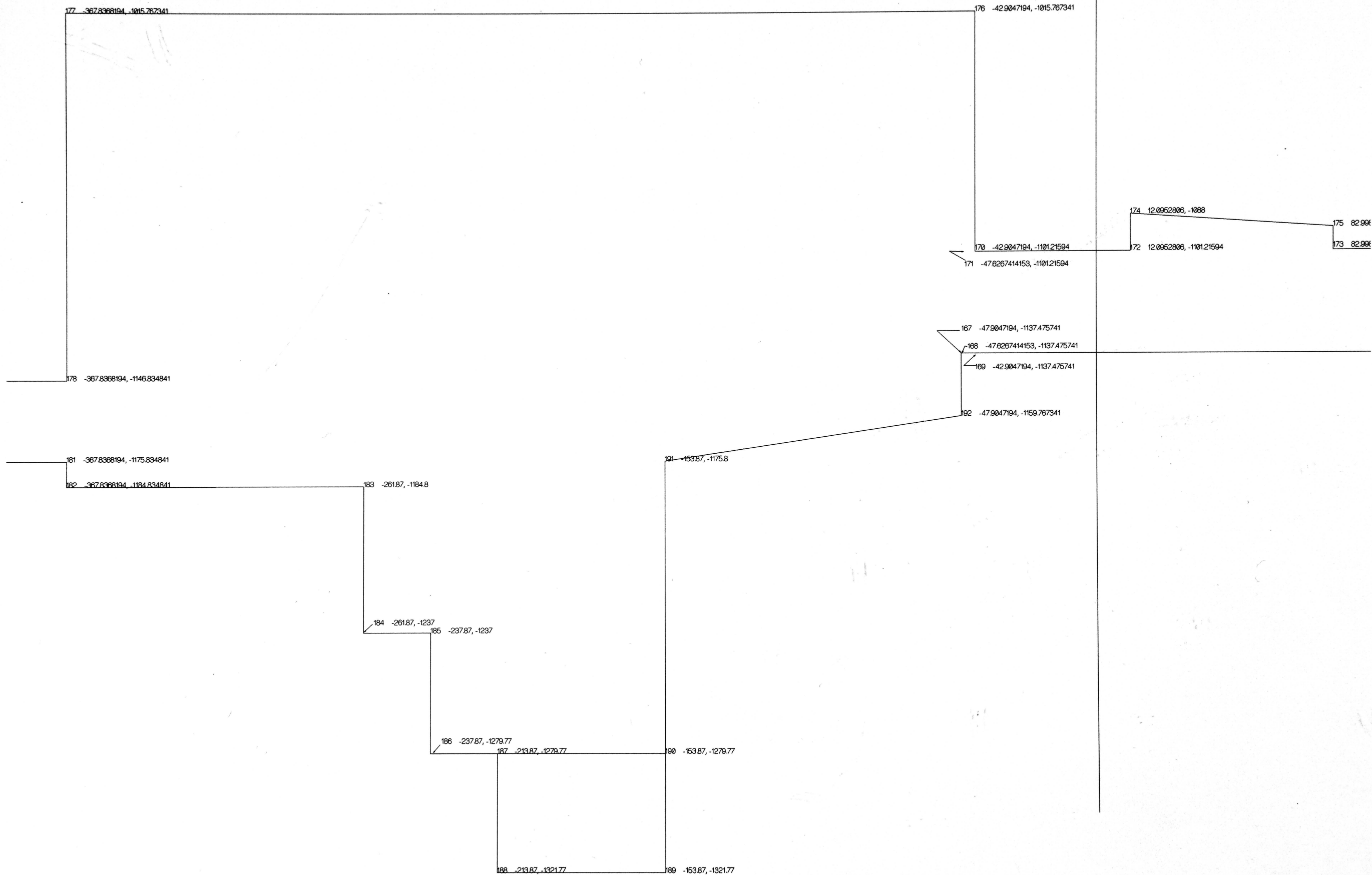
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14.
2/27/06



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180 -1009.357419, -1175.834841

18, 998.85

237.6, 993.09

30.4, 981.57

152 333.7517211, 896.2006703

153 333.7517211, 875.0407104

479 117.8500895, 1028.8860

480 117.8500895, 992.8860

481 117.8500895, 965.5260

482 117.8500895, 942.5407

483 117.8500895, 933.5407

154 117.8500895, 875.0407104

485 182.16, 1001.73

484 182.16, 984.45

483 182.16, 959.97

488 182.16, 942.5407

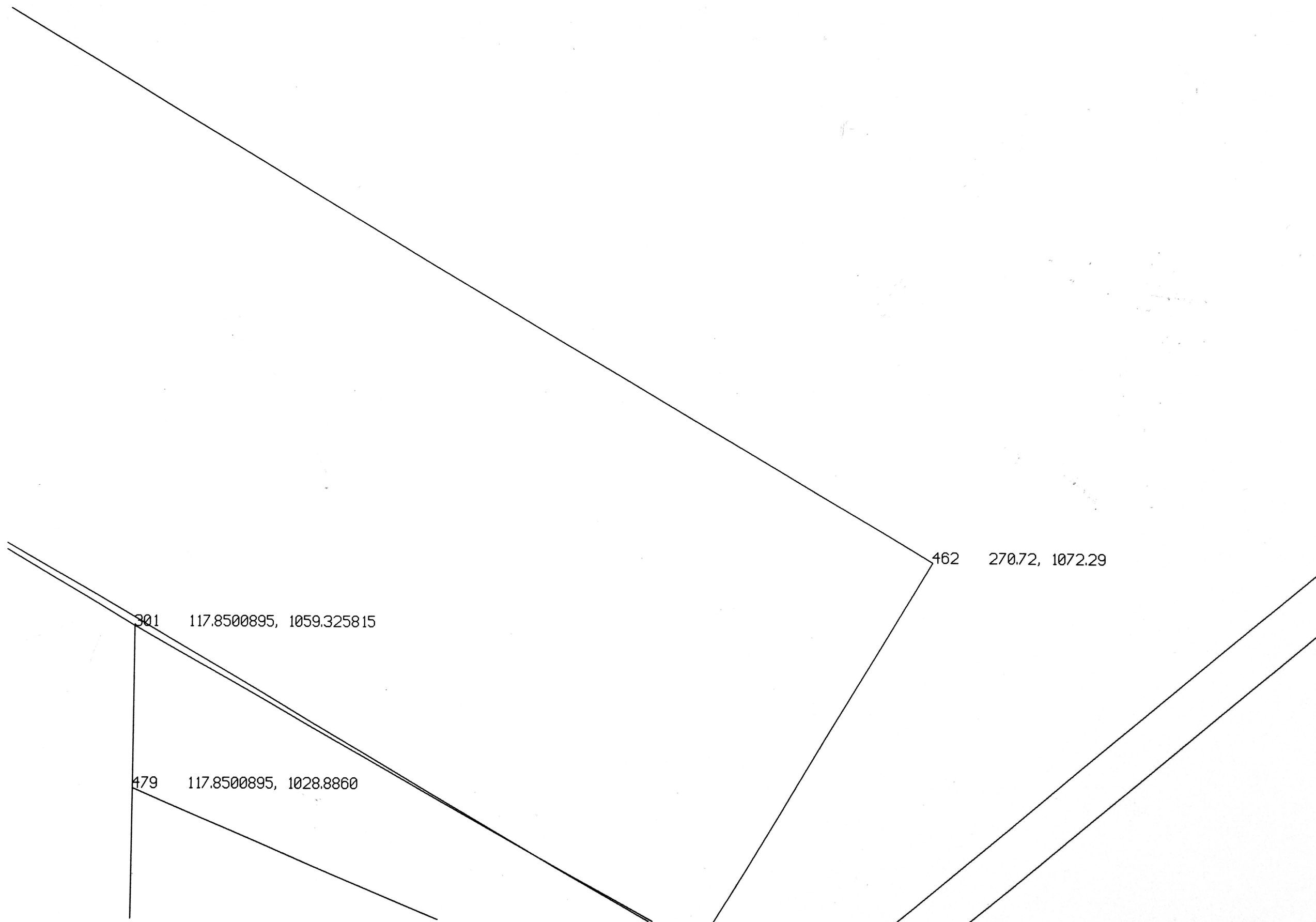
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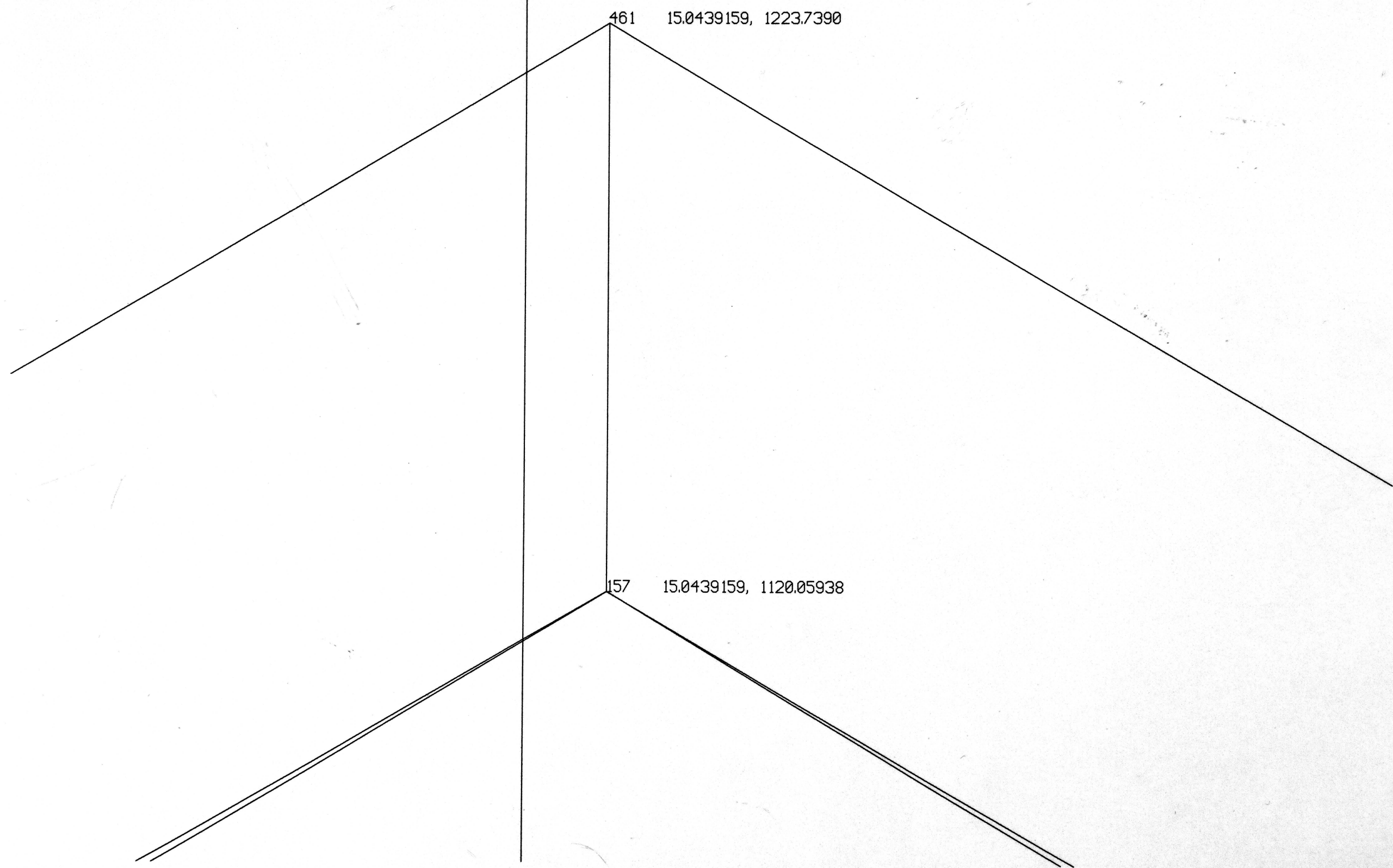
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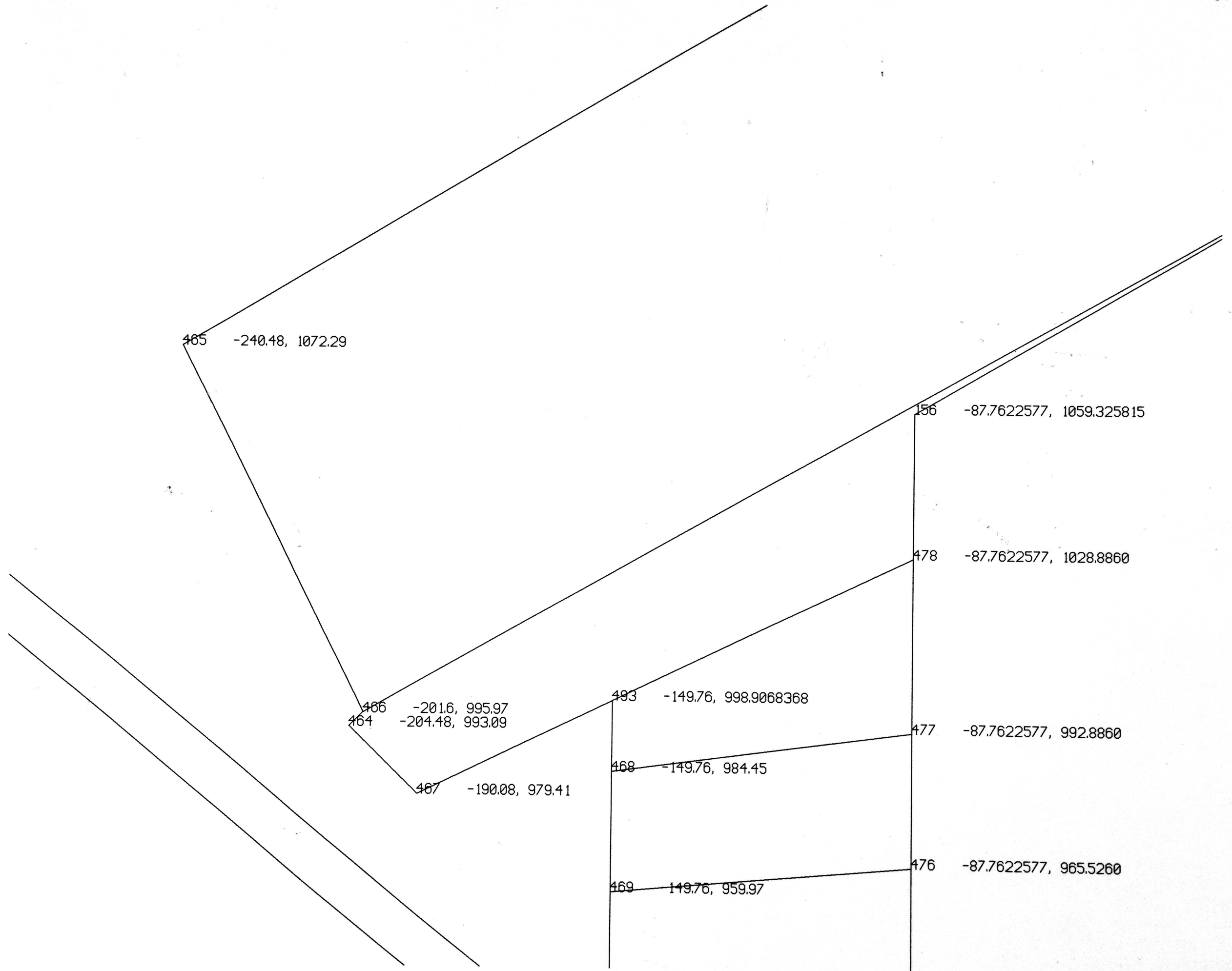
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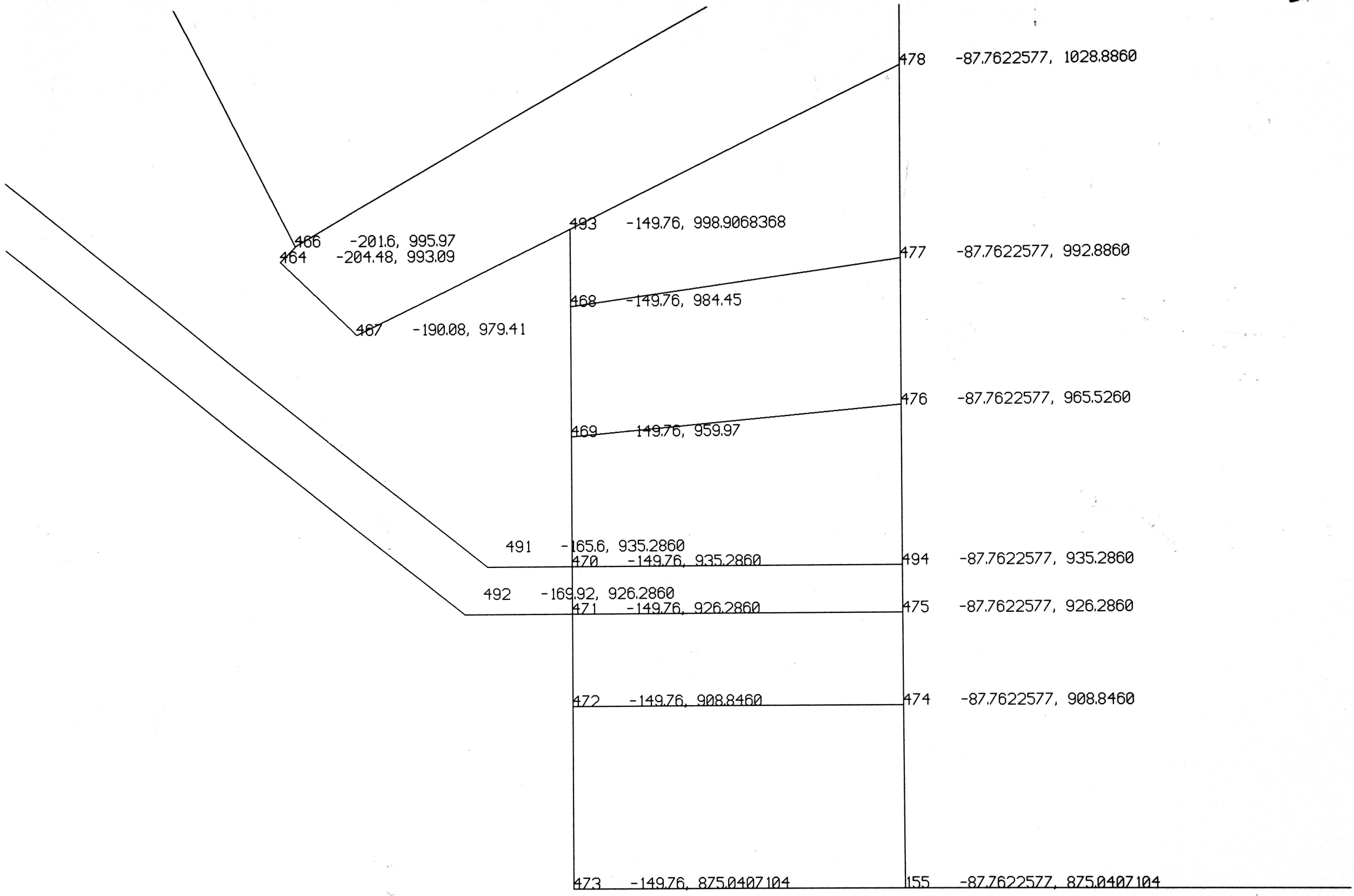
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1/26/06

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115 669.97089, 1709.20215
114 669.01514, 1707.44531

117 752.79364, 1666.41626
116 751.83783, 1664.65967
119 791.08154, 1647.86133
118 700.12567, 1646.10437
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120 821.29852, 1631.42065

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124 954.00409, 1563.77100

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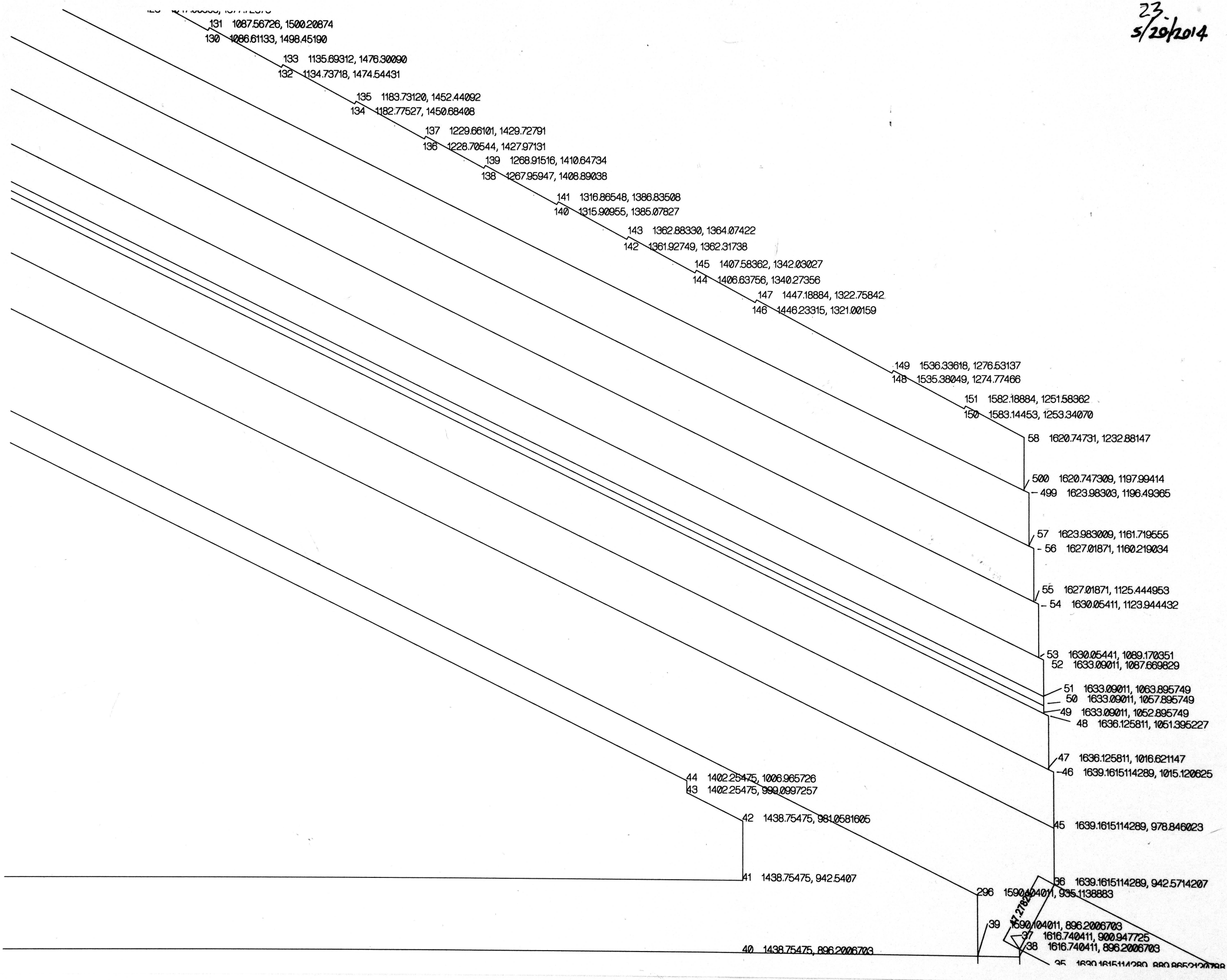
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23
5/29/2014



24.
5/20/2014

104 413.62808, 1838.01355

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110 548.69489, 1768.35608

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115 669.97089, 1709.20215

114 669.01514, 1707.44531

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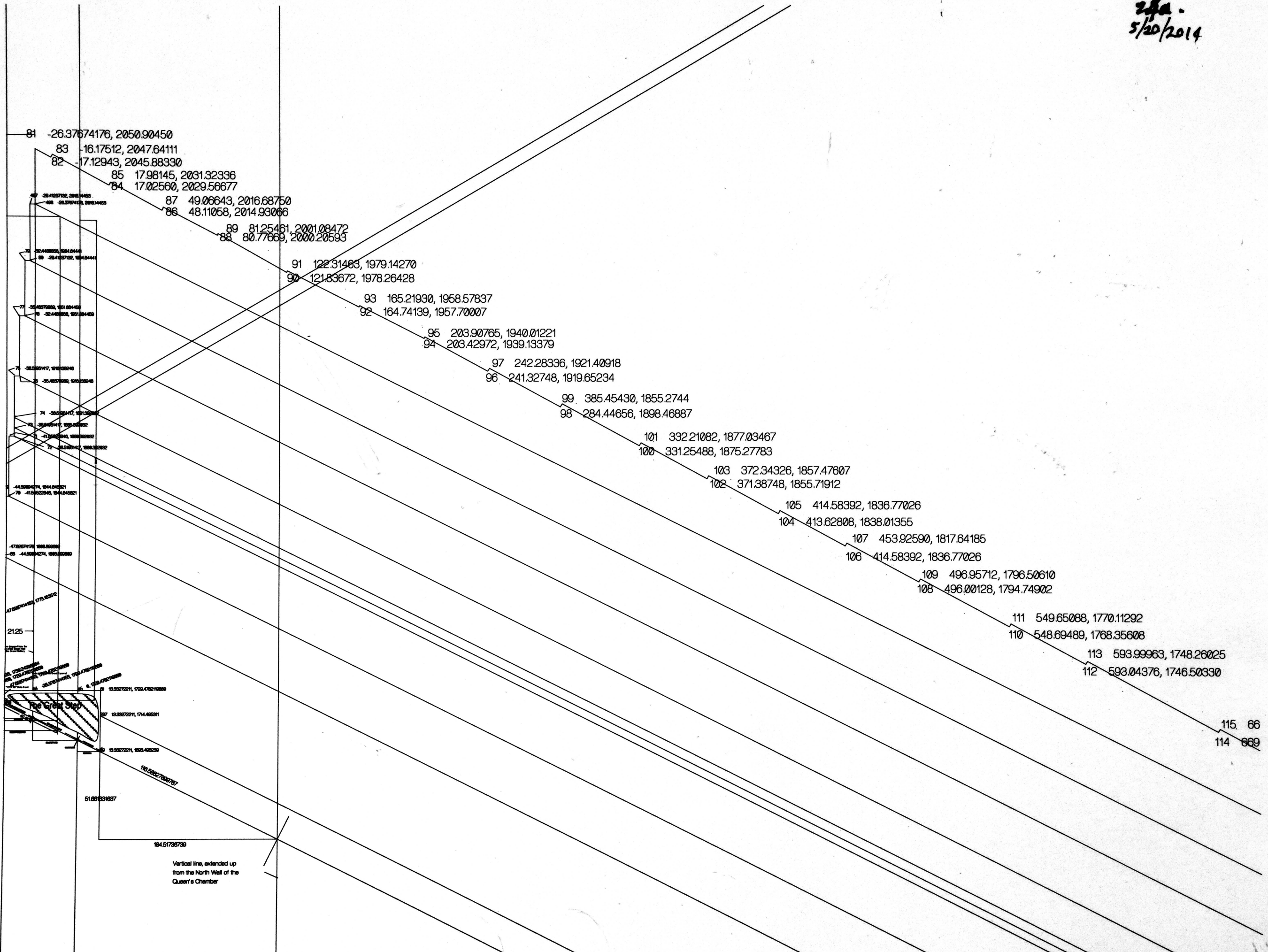
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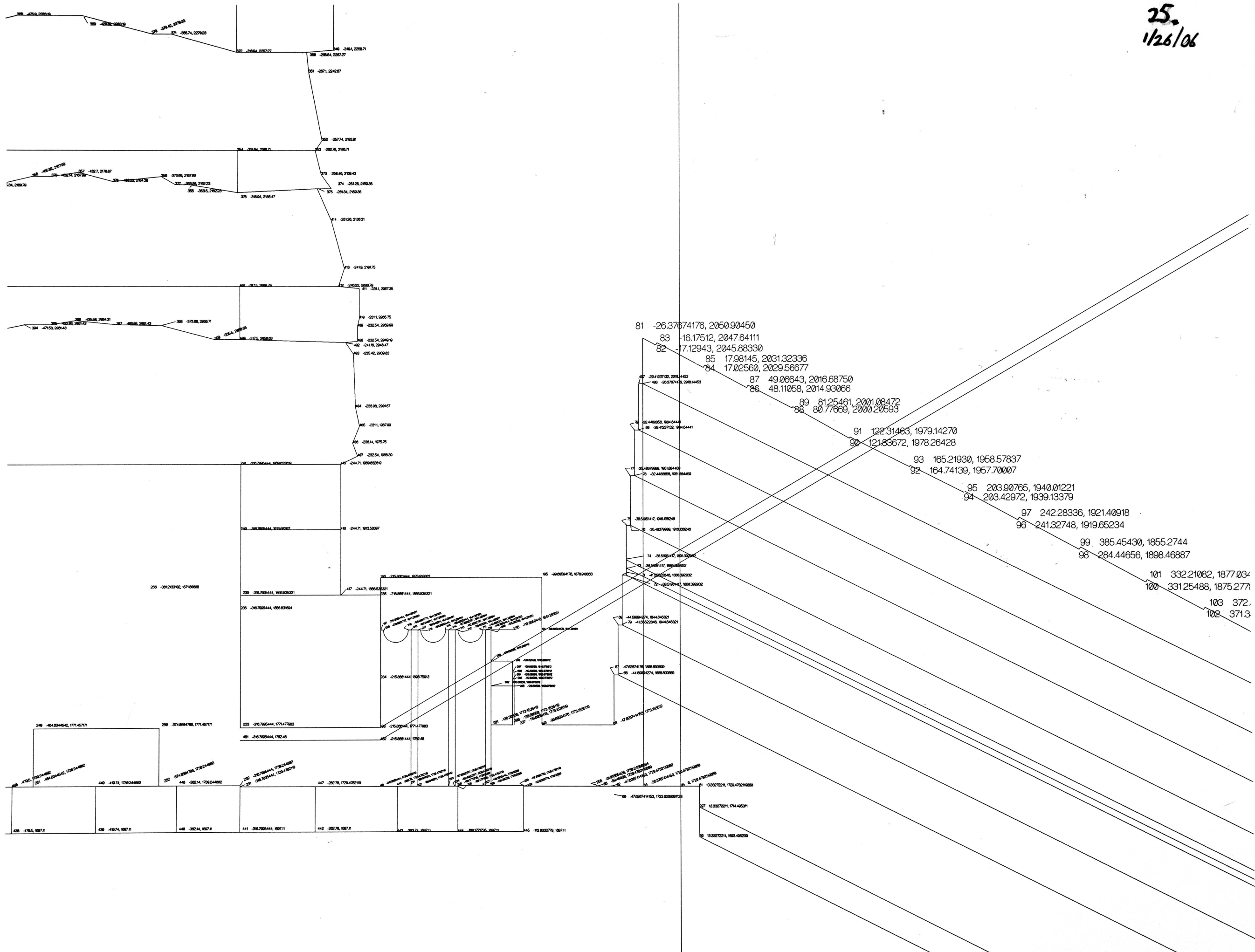


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- 84 17.02560, 2029.56677
- 87 49.06643, 2016.68750
- 86 48.11058, 2014.93066
- 89 81.25461, 2001.08472
- 88 80.77669, 2000.20593
- 91 122.31463, 1979.14270
- 90 121.83672, 1978.26428
- 93 165.21930, 1958.57837
- 92 164.74139, 1957.70007
- 95 203.90765, 1940.01221
- 94 203.42972, 1939.13379
- 97 242.28336, 1921.40918
- 96 241.32748, 1919.65234
- 99 385.45430, 1855.2744
- 98 284.44656, 1898.46887
- 101 332.21082, 1877.03467
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- 111 549.65088, 1770.11292
- 110 548.69489, 1768.35608
- 113 593.99963, 1748.26025
- 112 593.04376, 1746.50330
- 115 66
- 114 669

Vertical line, extended up
from the North Wall of the
Queen's Chamber

The Great Step

25.
1/26/06



81 -26.37674176, 2050.90450

83 -16.17512, 2047.64111

82 -17.12943, 2045.88330

85 17.98145, 2031.32336

84 17.02560, 2029.56677

497 -29.41237132, 2018.14453

498 -26.37674176, 2018.14453

87 49.06643, 2016.68750

86 48.11058, 2014.93066

89 81.25461, 2001.08472

88 80.77669, 2000.20593

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80 -29.41237132, 1984.64441

91 122.31463, 1979.14270

90 121.83672, 1978.26428

93 165.21930, 1958.57837

92 164.74139, 1957.70007

95 203.90765, 1940.0122

94 203.42972, 1939.13379

97 242.283

96 241.32748

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76 -35.48379989, 1916.138246

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73 -38.51951417, 1885.392032

71 -41.55522846, 1880.392032

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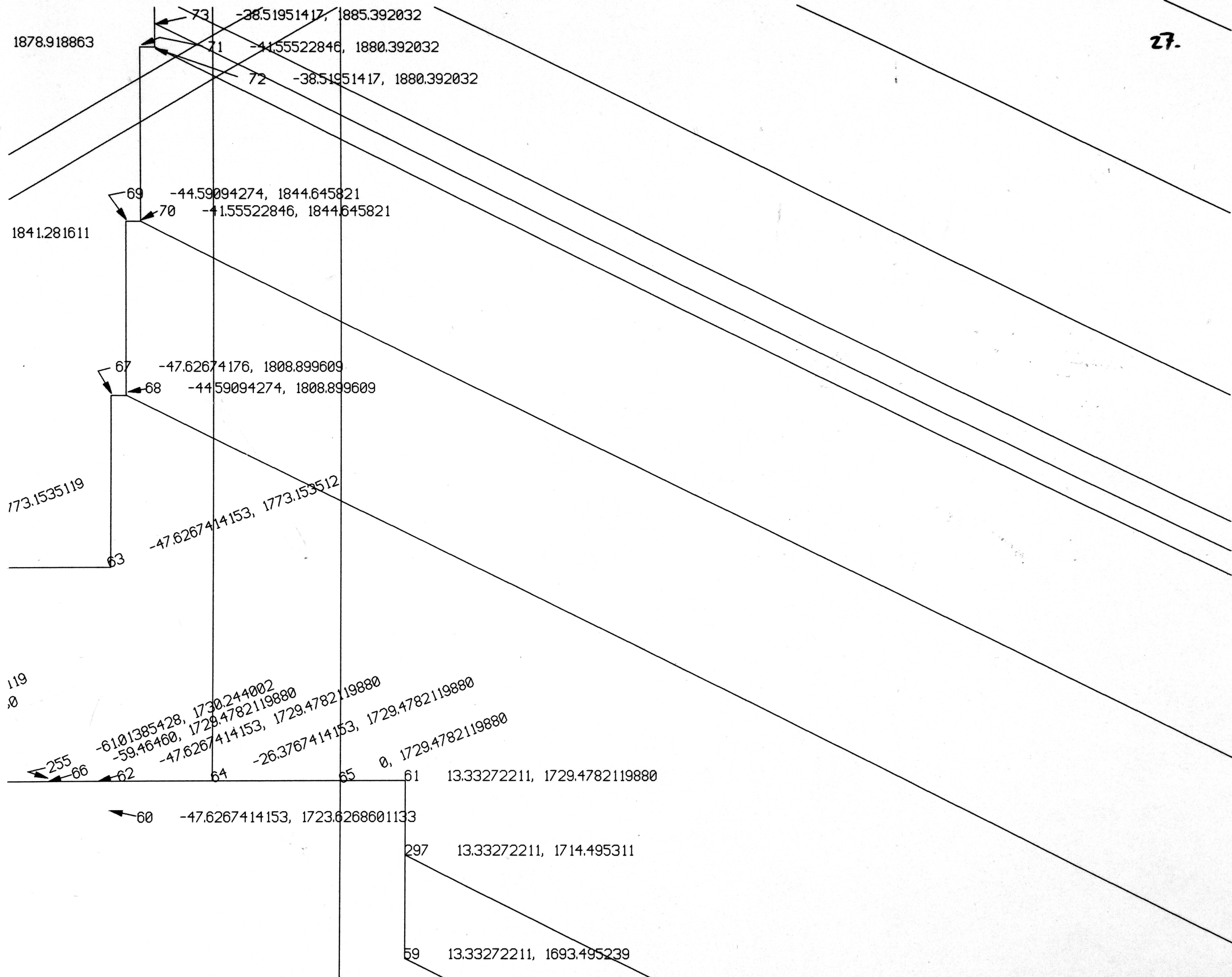
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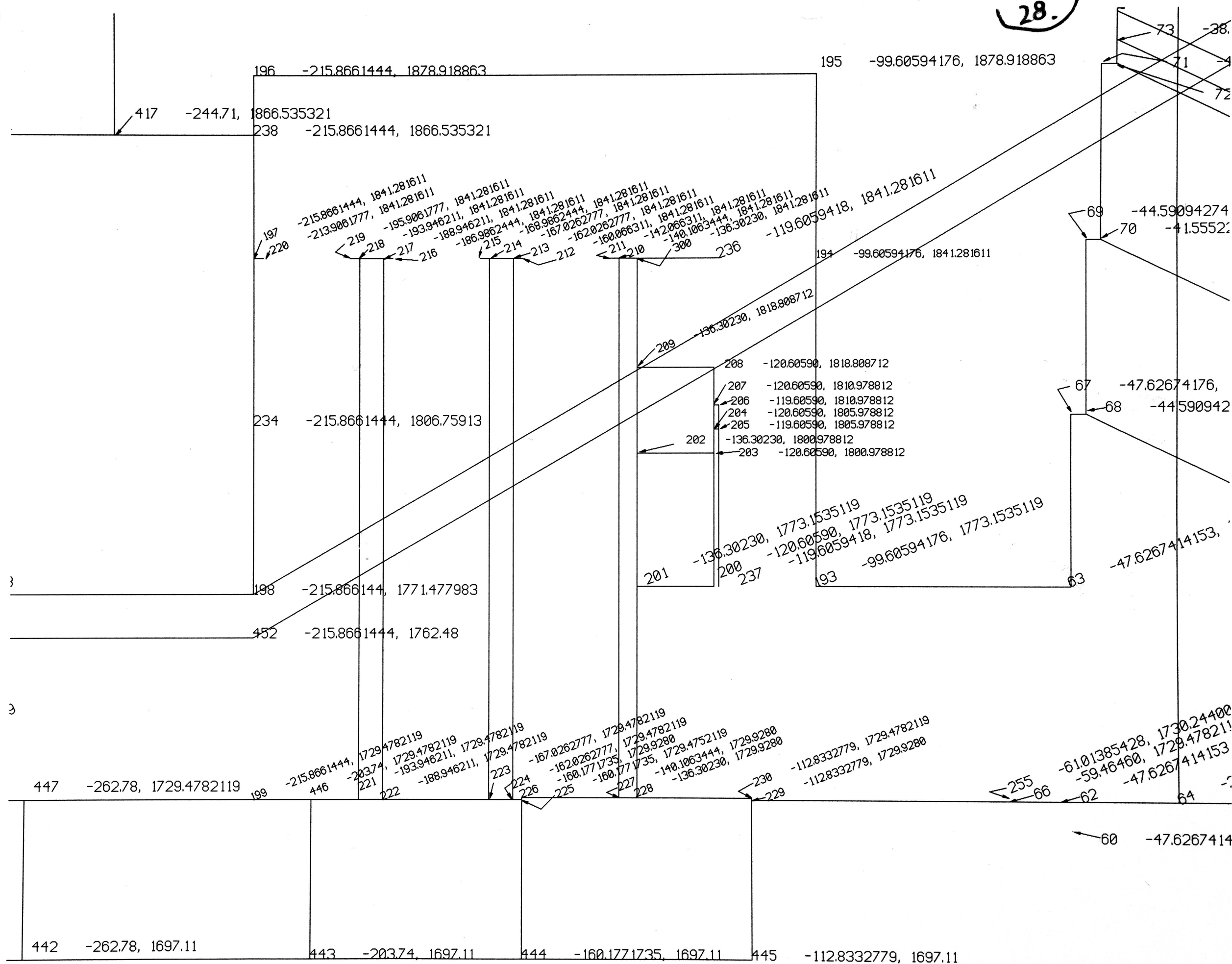
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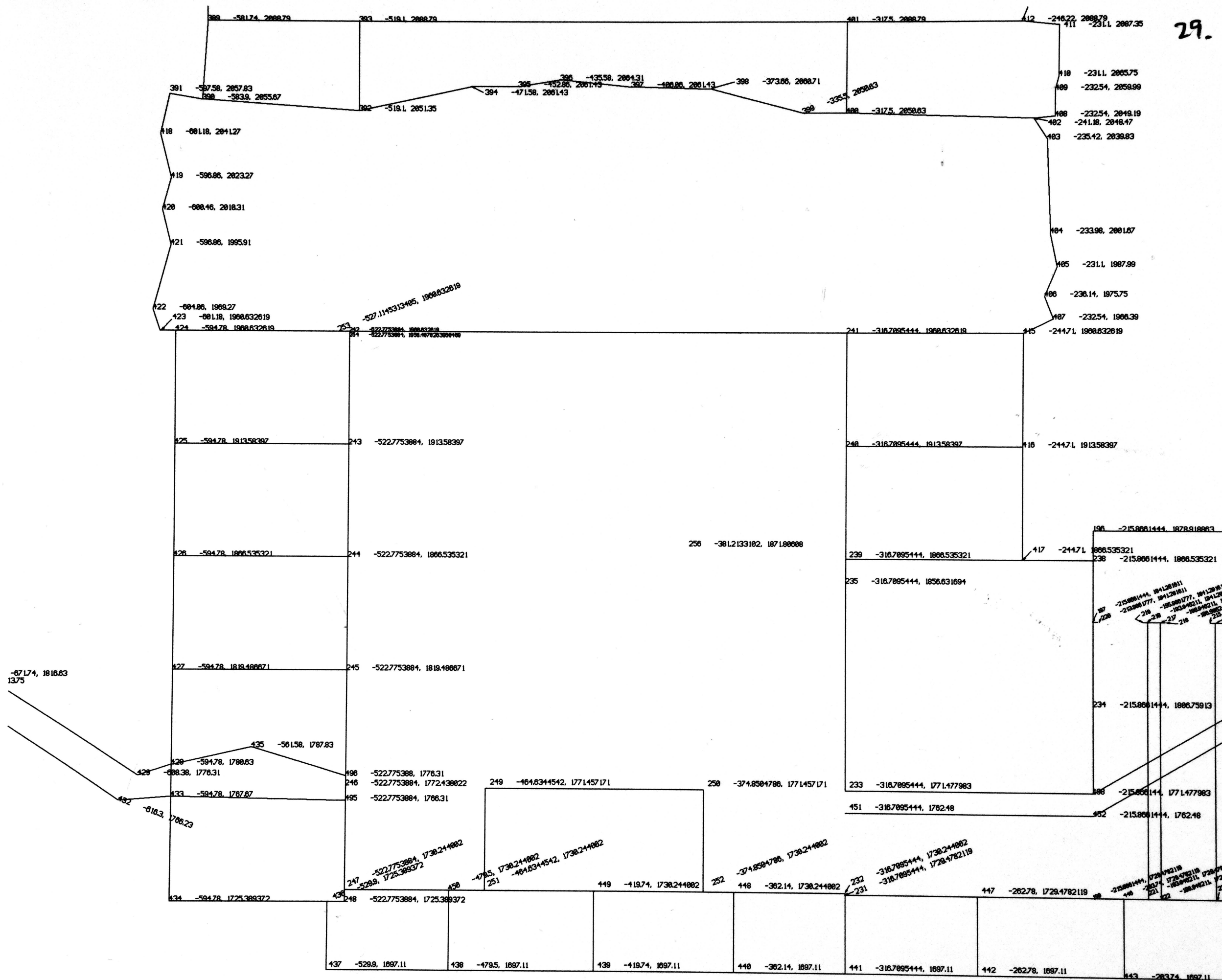
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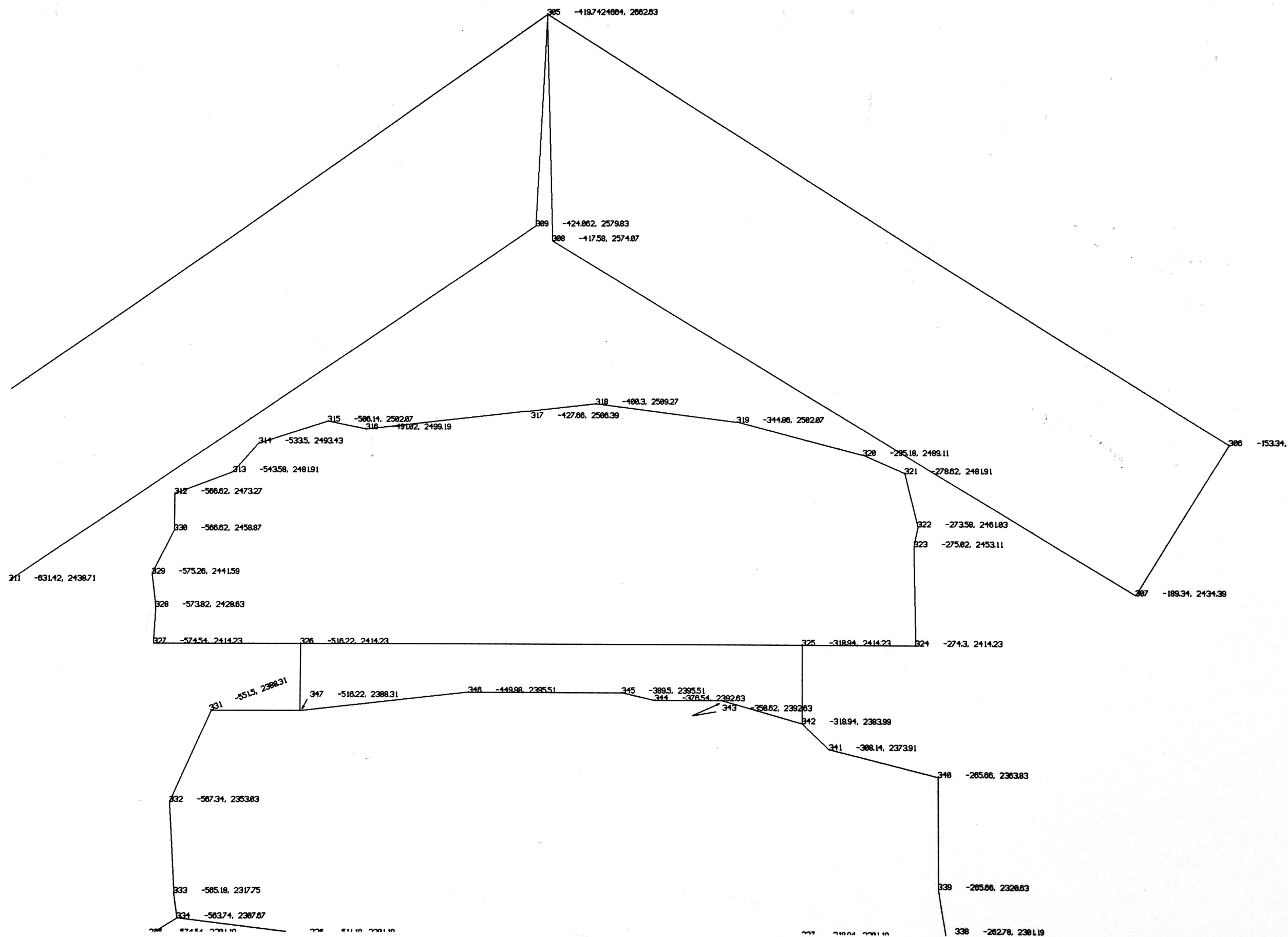
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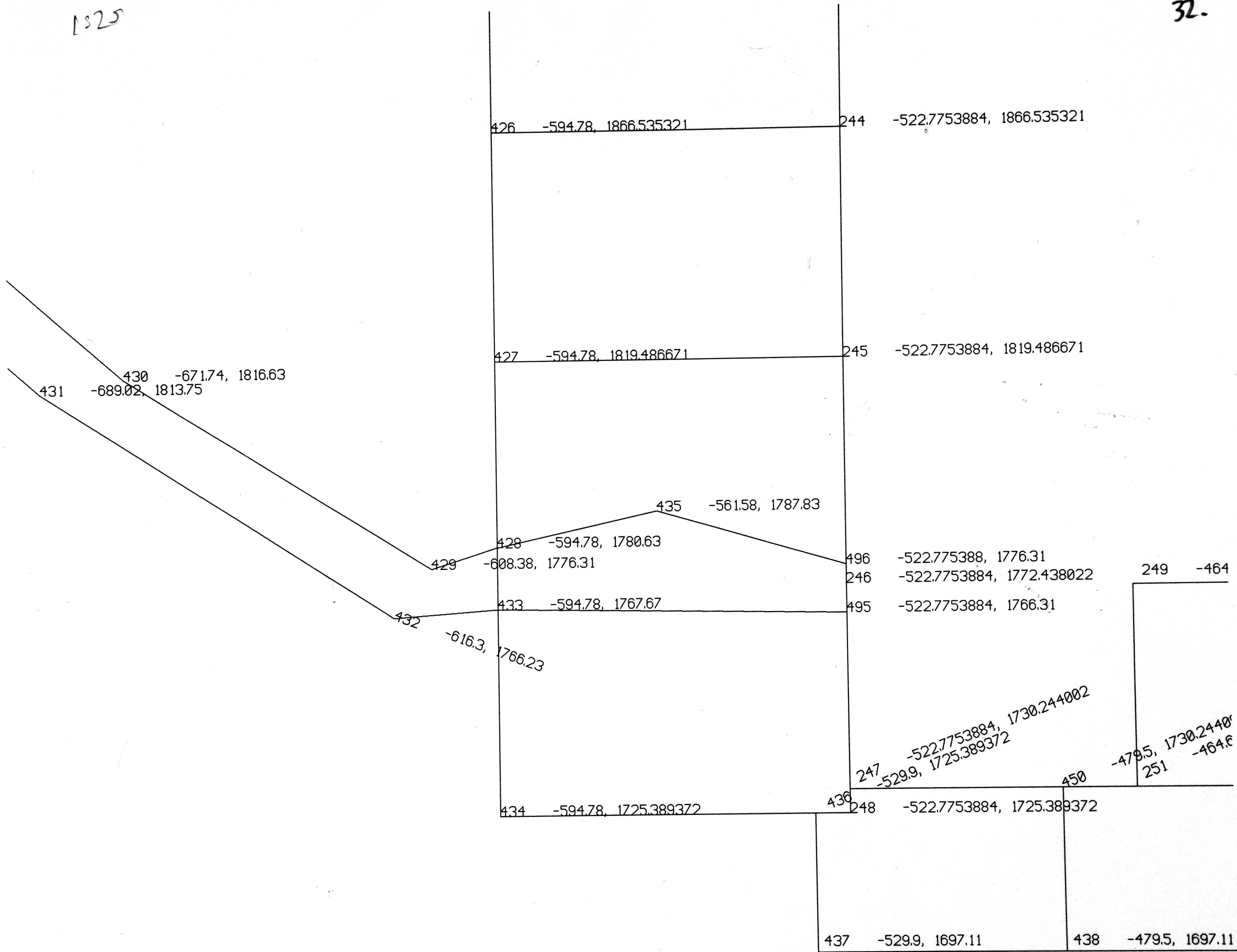
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1825

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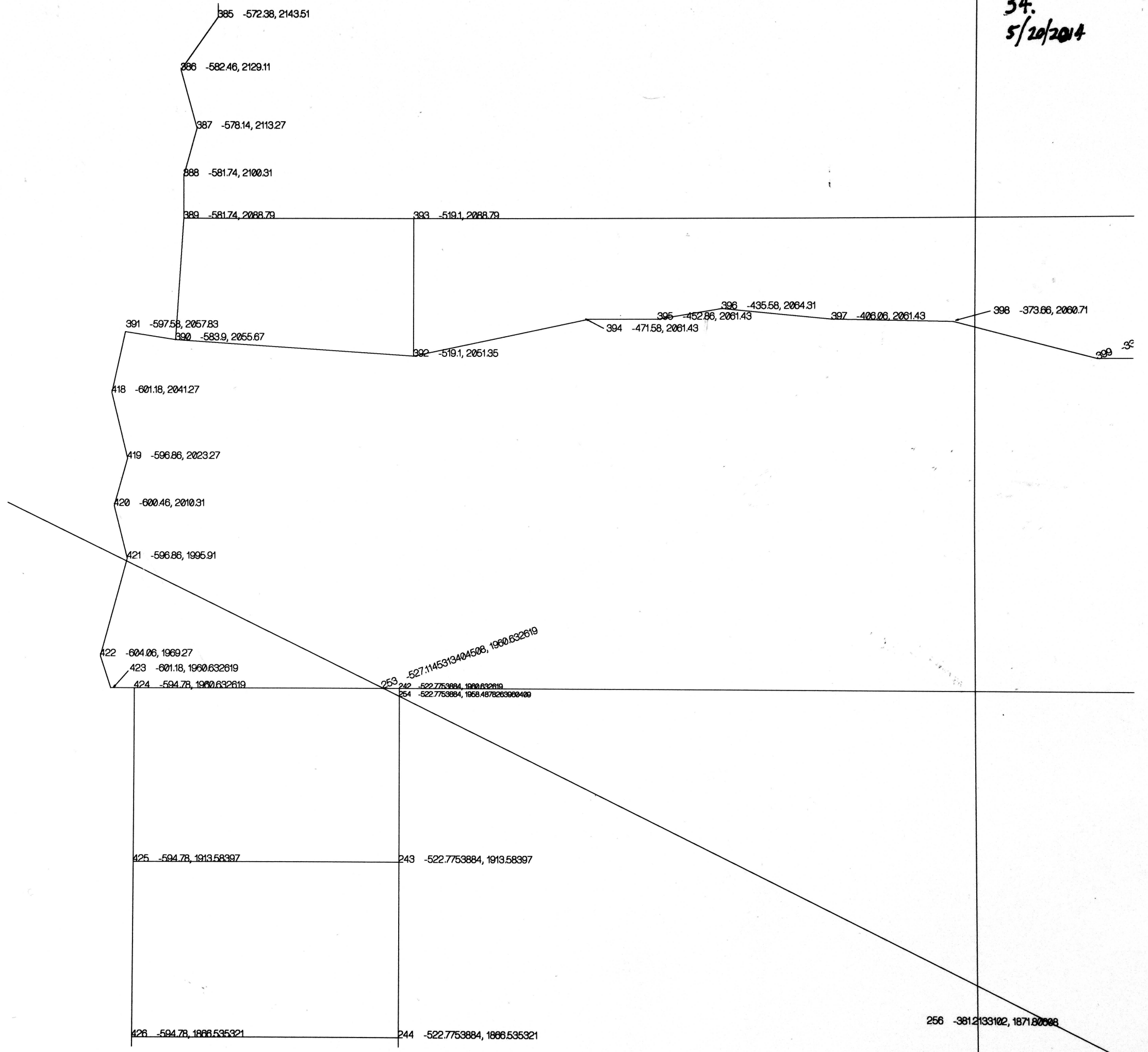
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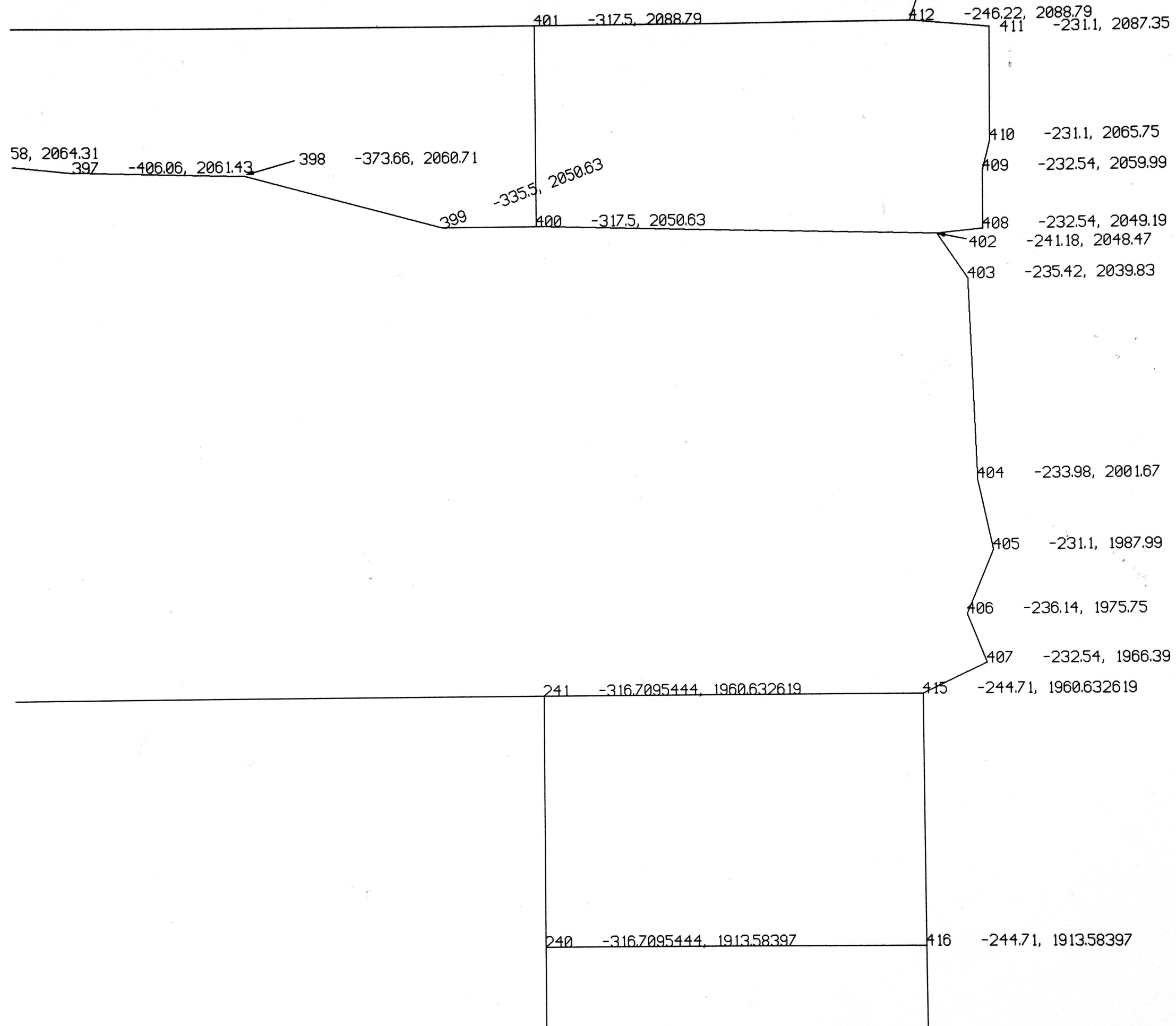
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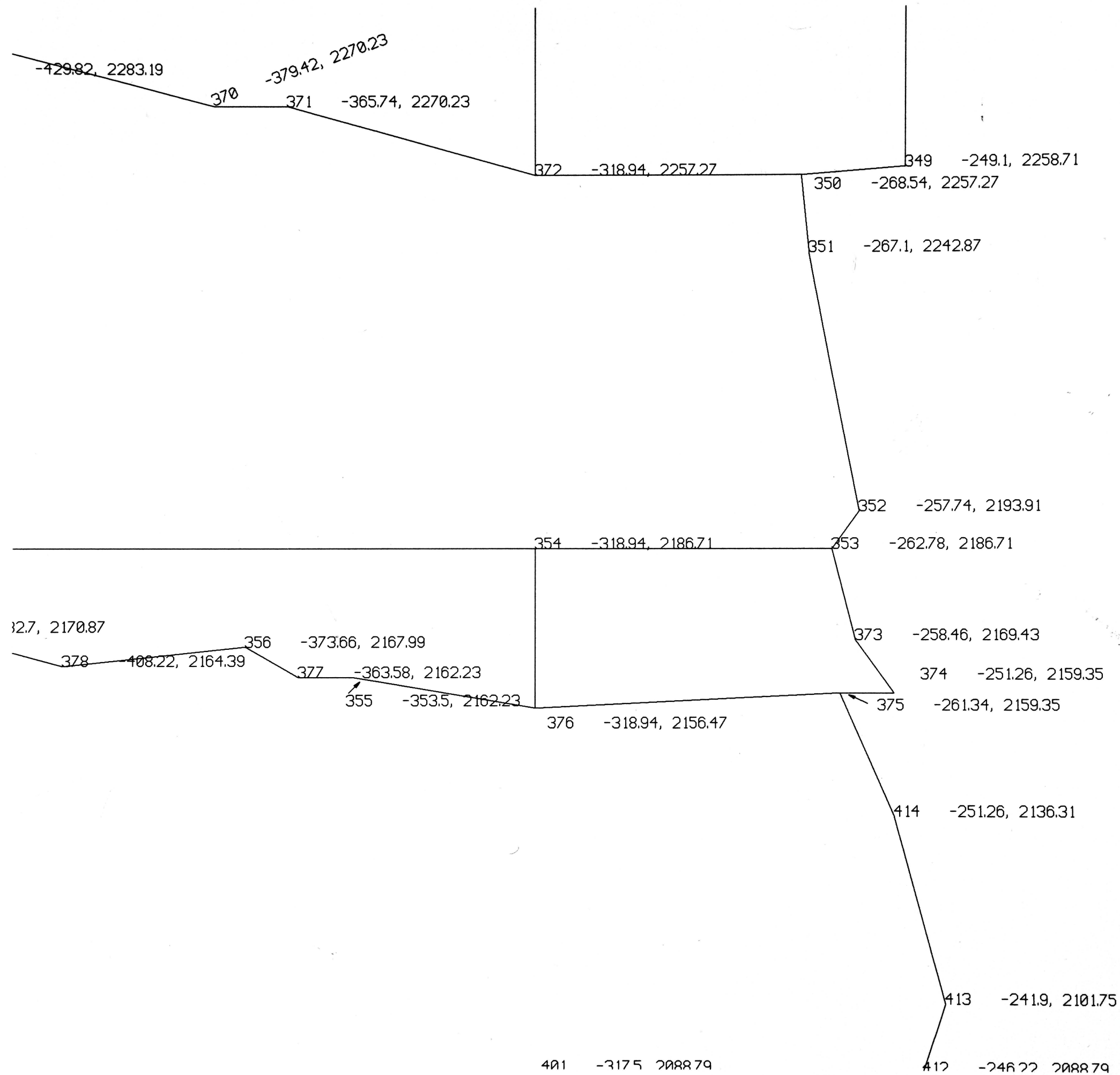
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5/20/2014







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345 -389
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341 -308.14, 2373.91

340 -265.66, 2363.83

339 -265.66, 2320.63

337 -318.94, 2301.19

338 -262.78, 2301.19

348 -249.1, 2301.19

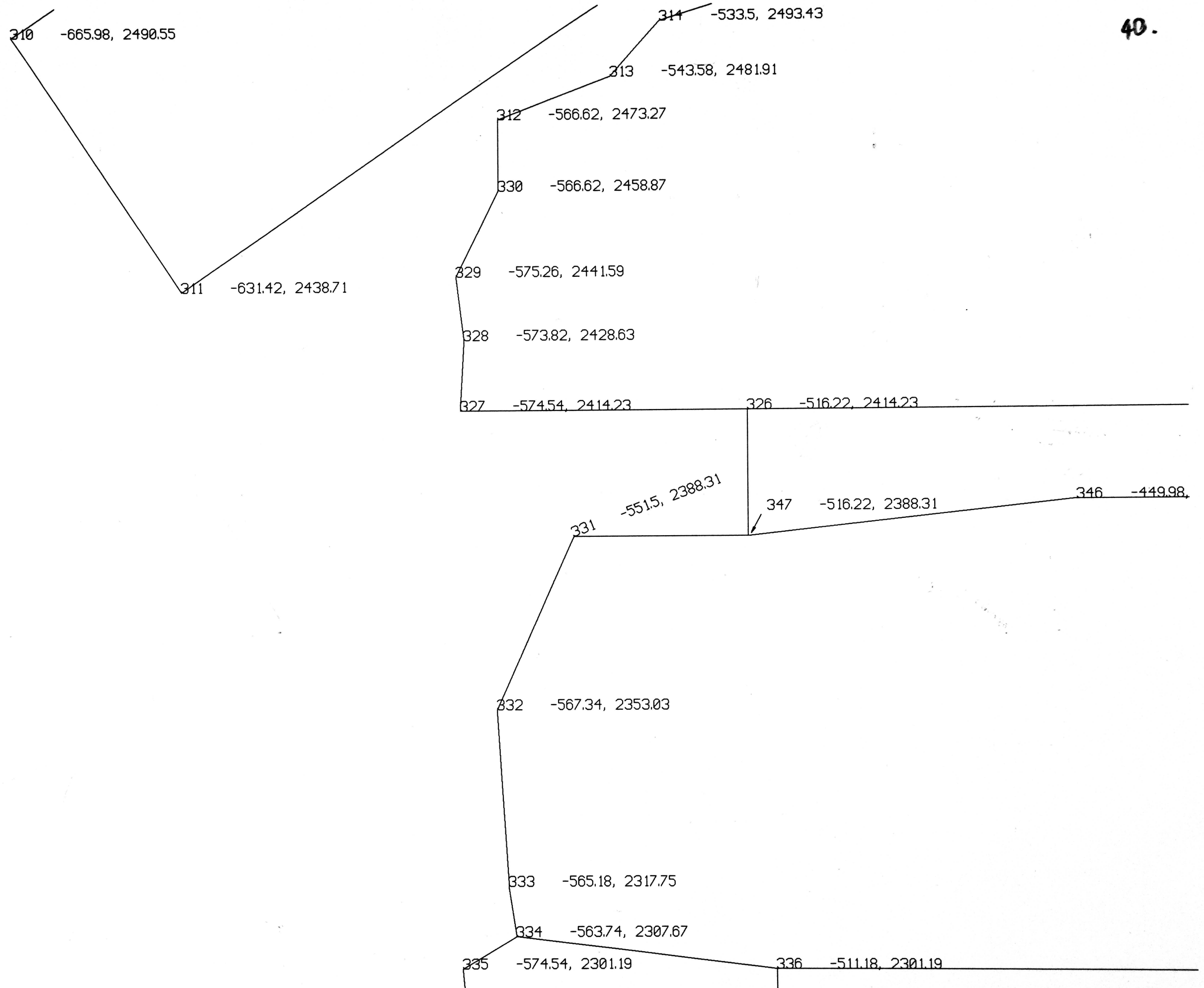
369 -429.82, 2283.19

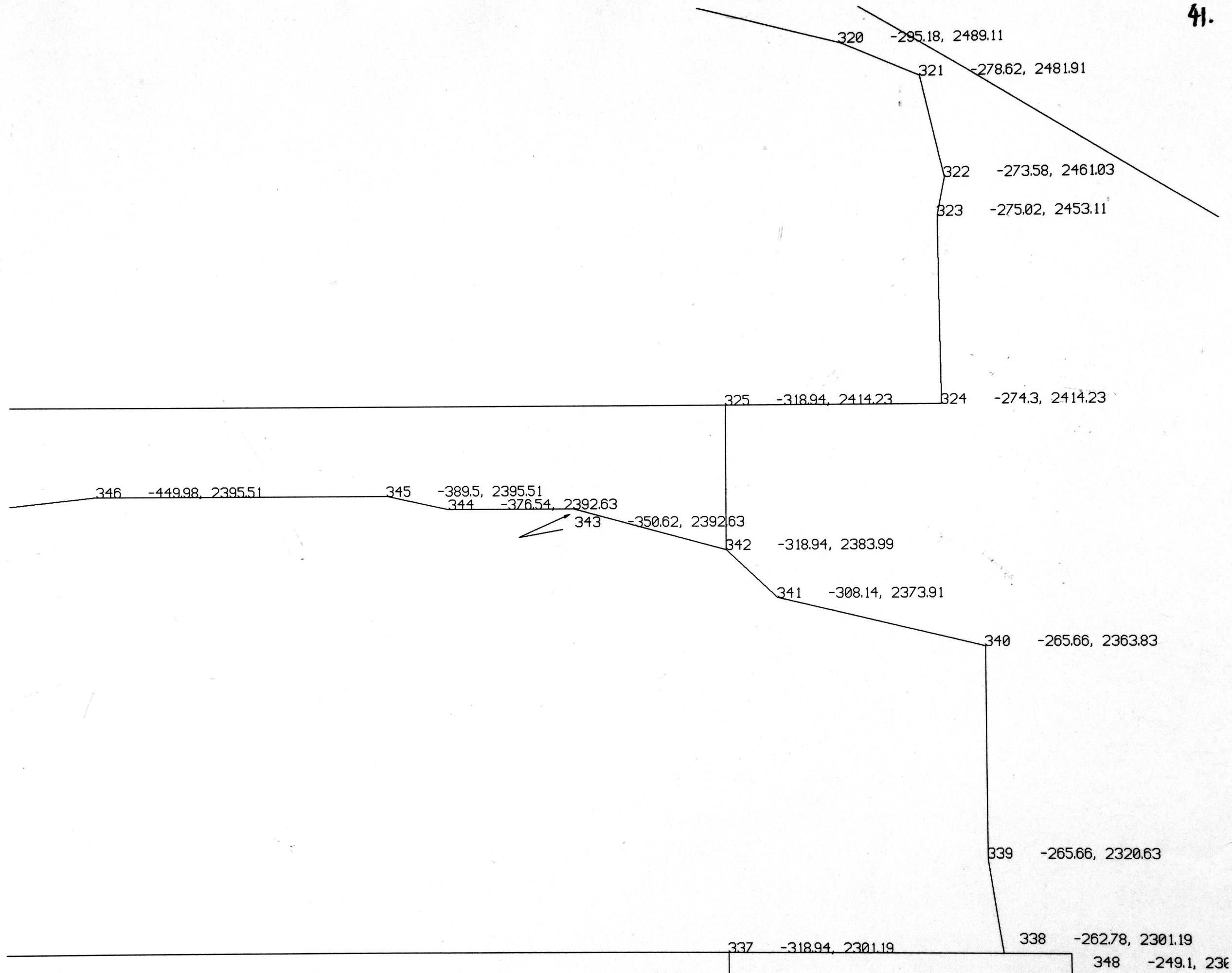
370 -379.42, 2270.23

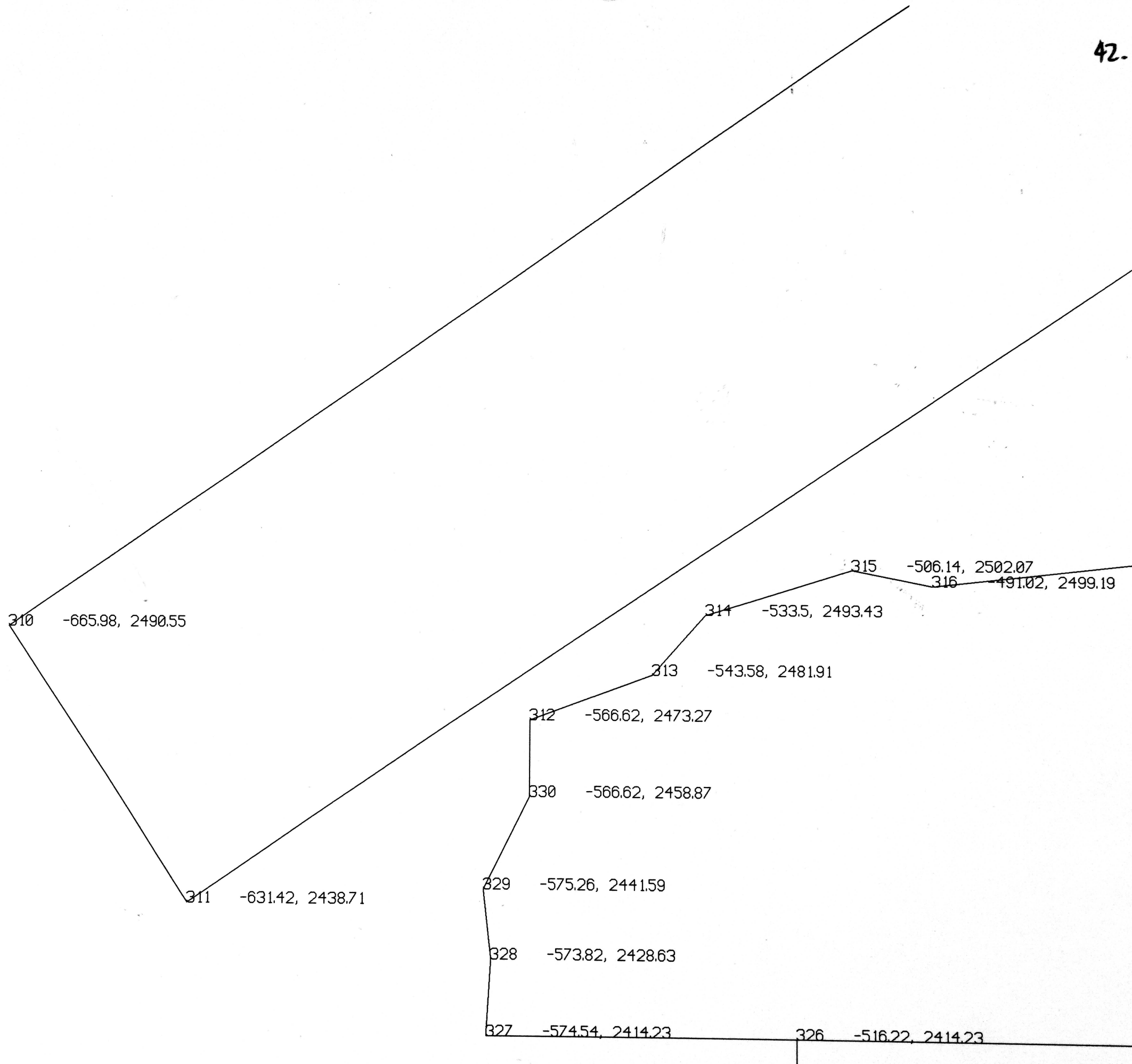
371 -365.74, 2270.23

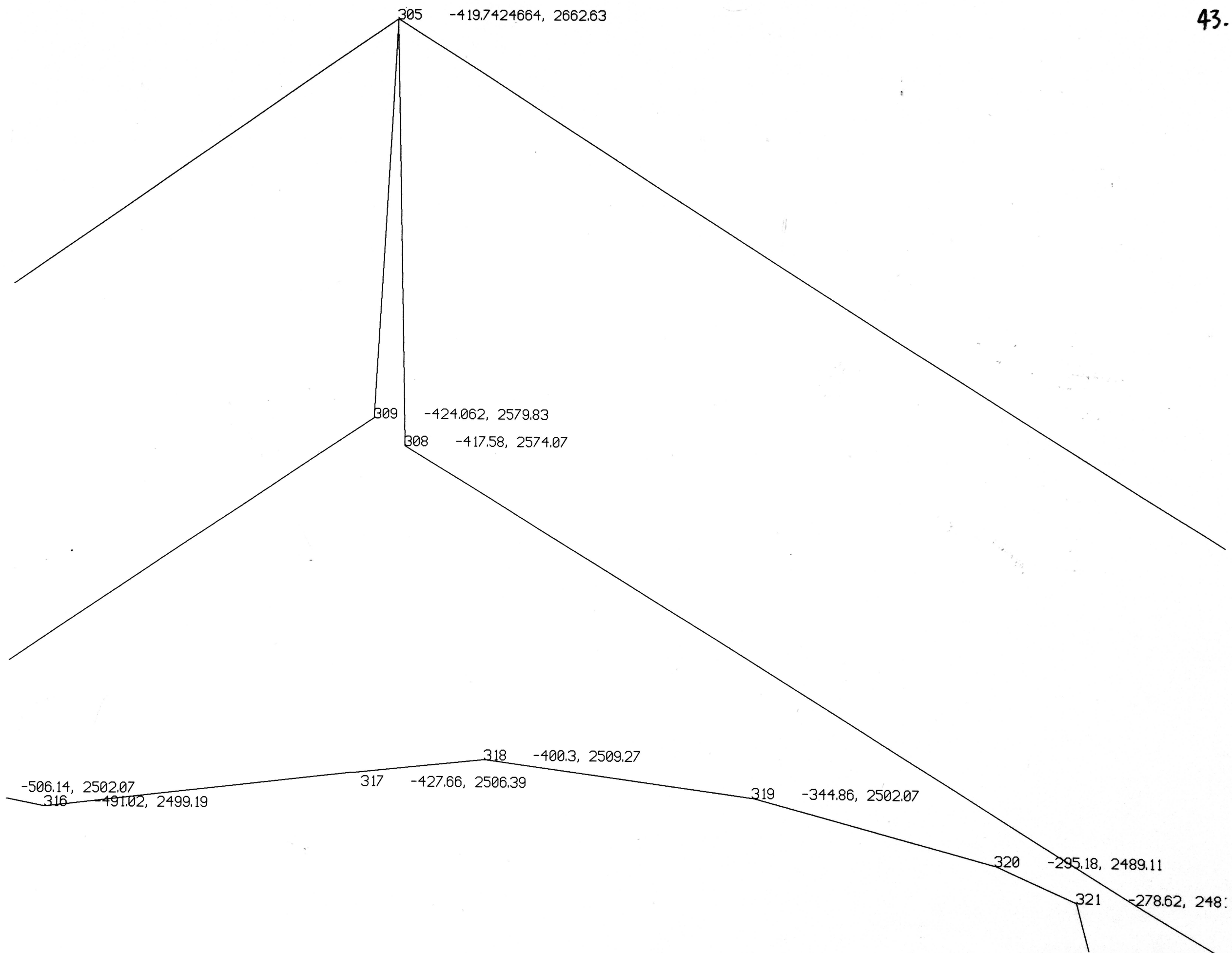
372 -318.94, 2257.27

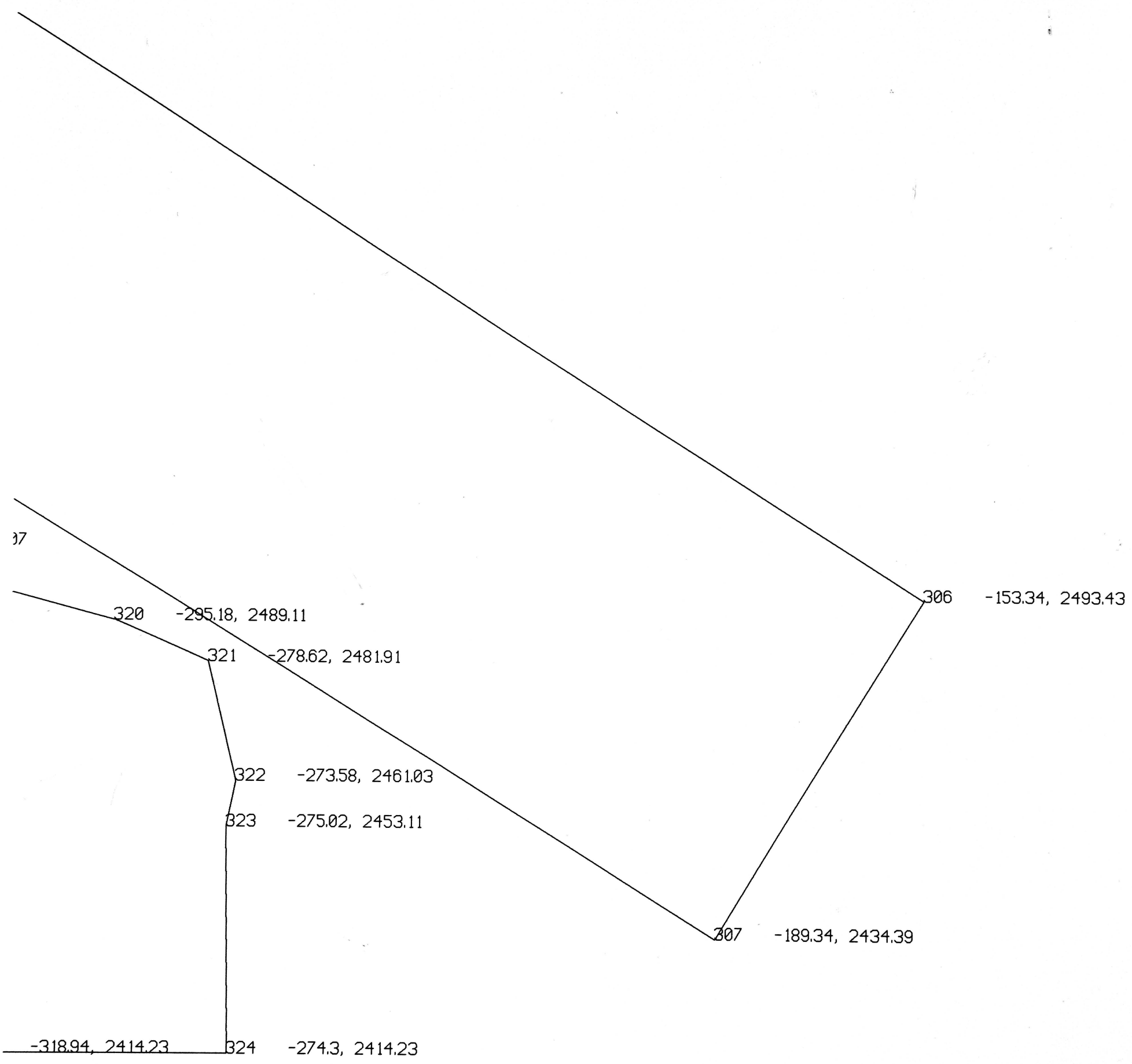
349 -249.1, 2258.71





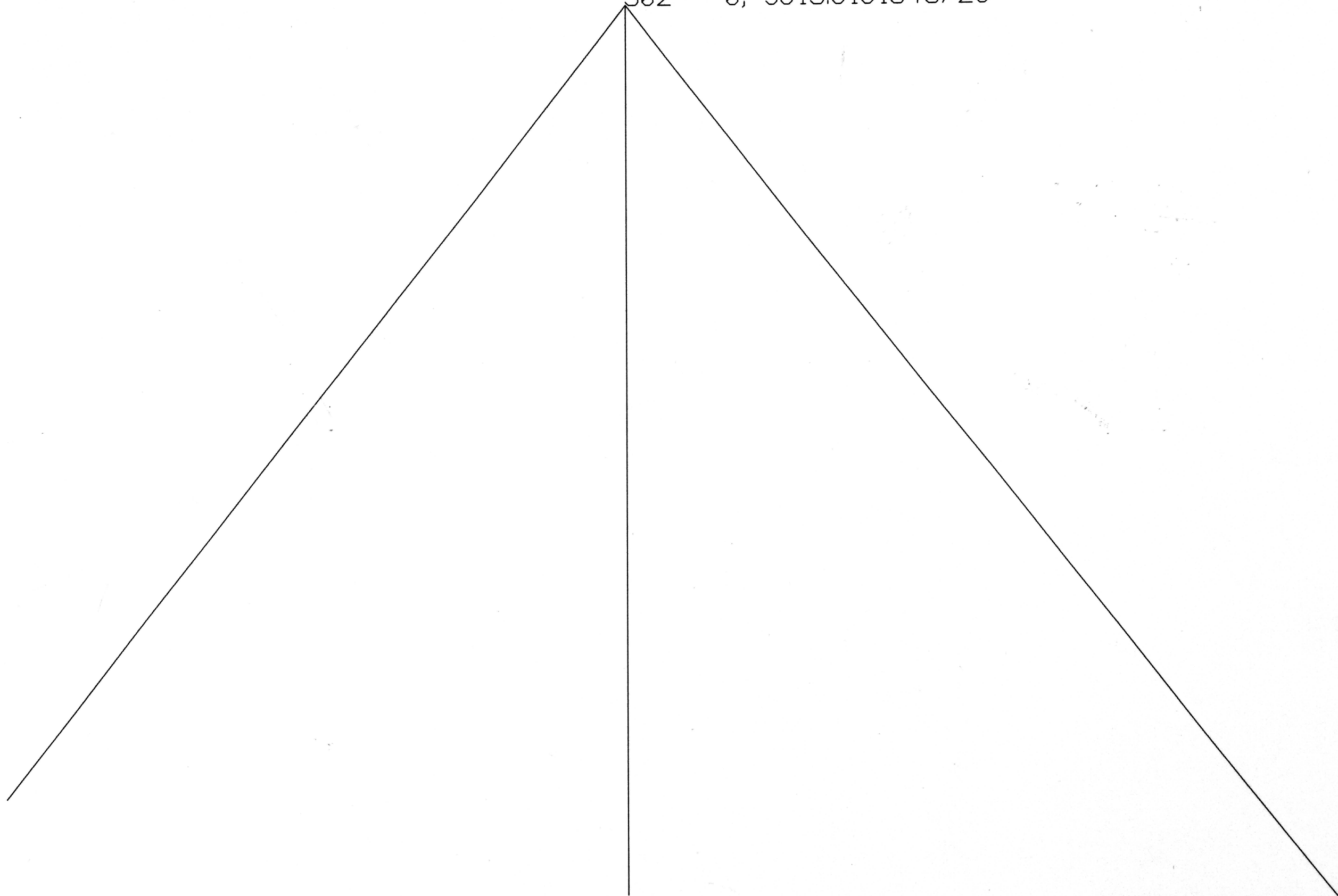


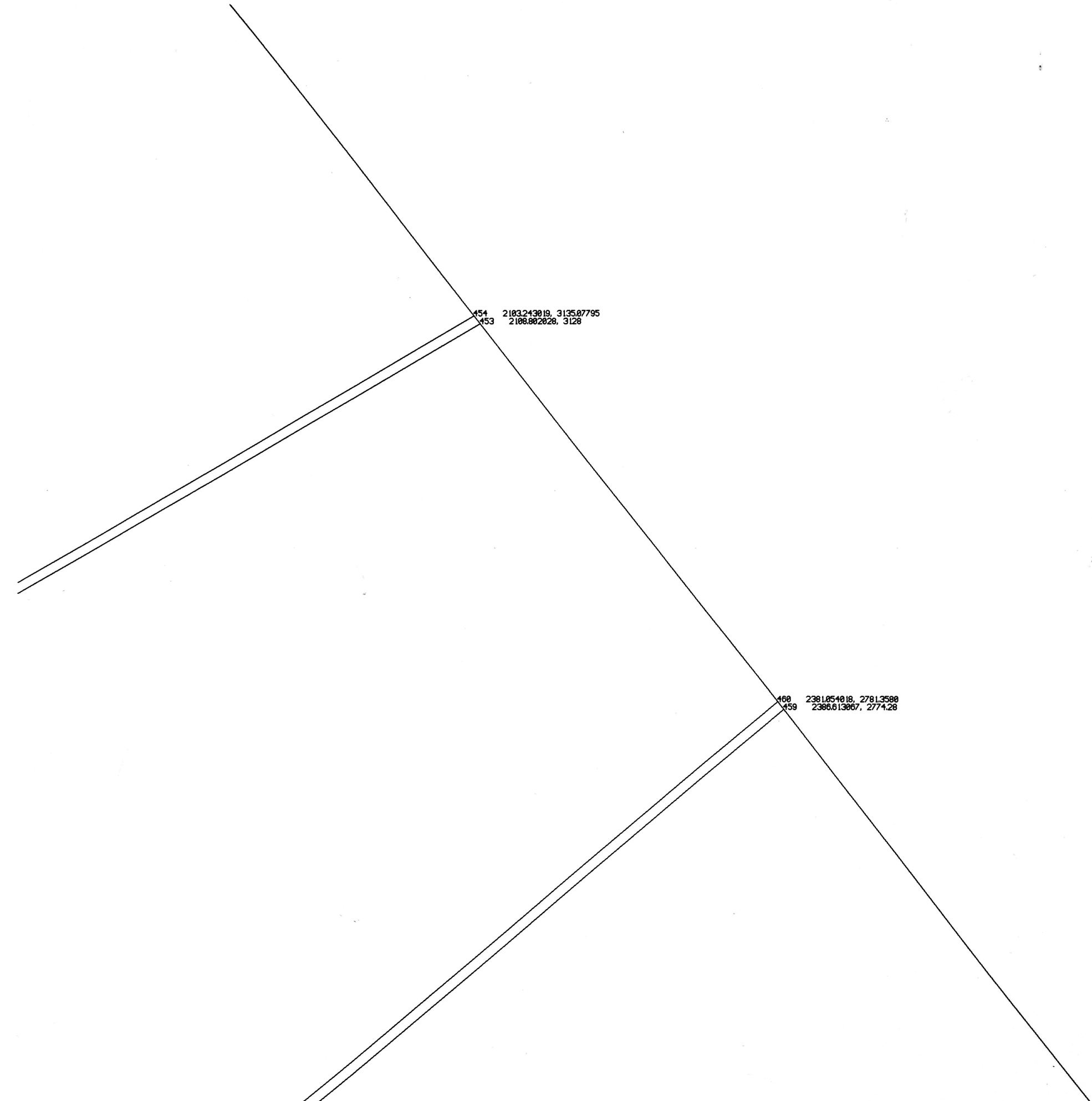




302

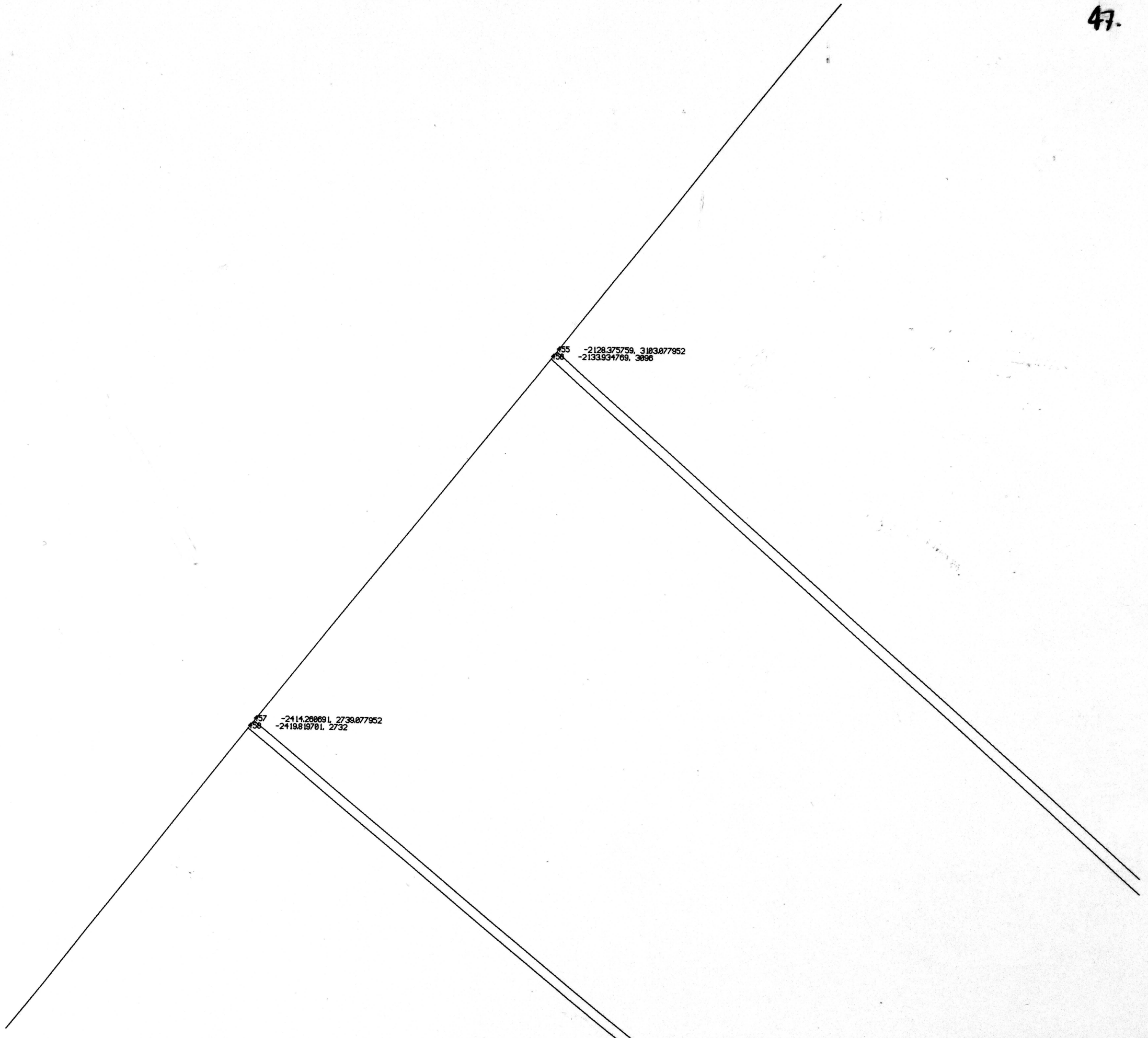
0, 5813.0101343729





454 2103.243019, 3135.07795
453 2106.002028, 3128

468 2381.054018, 2781.3588
459 2386.613007, 2774.28



Equation of Casing Stone Angle (South side)
 $Y = 1.273295447351627 * X + 5813.01013437289657$

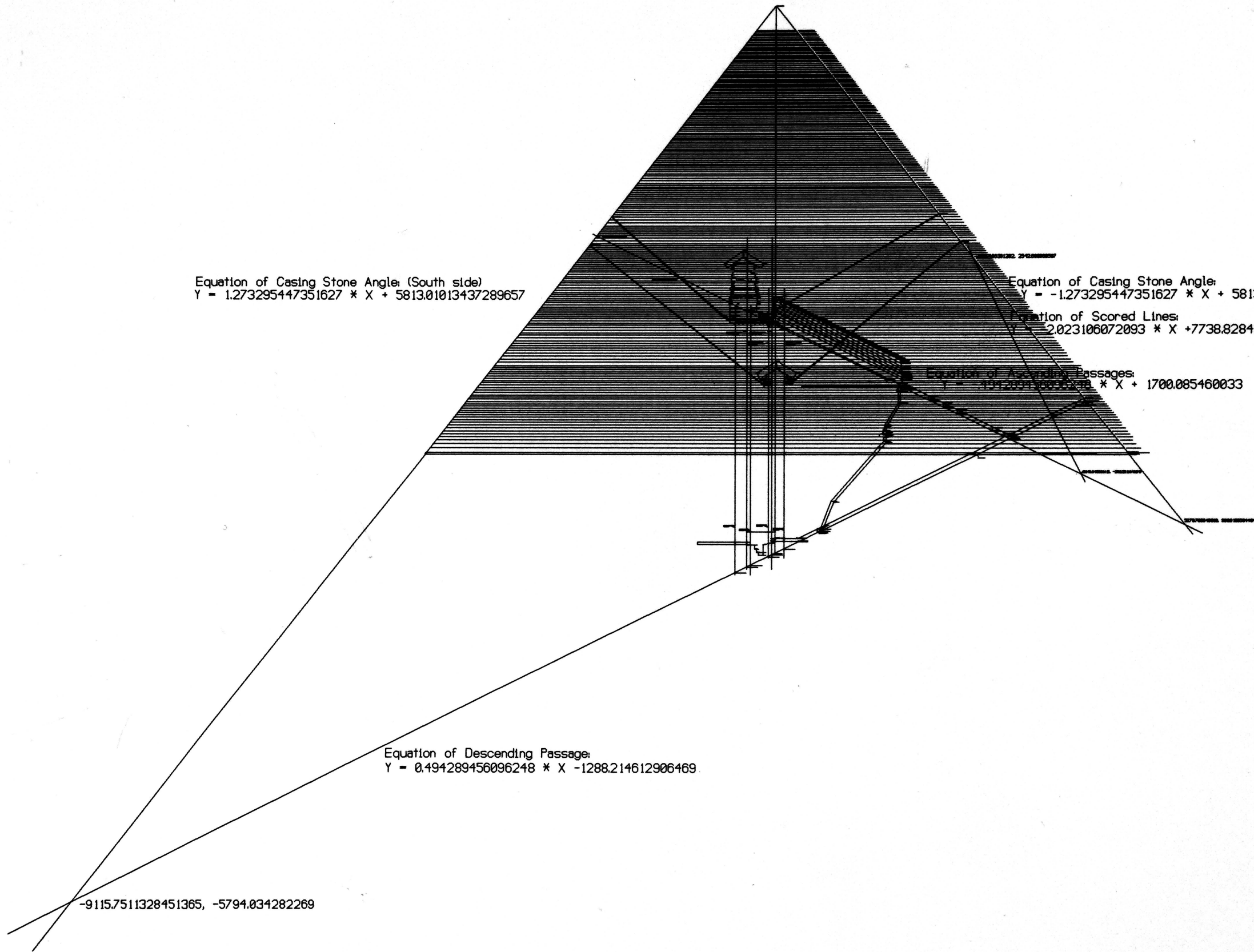
Equation of Casing Stone Angle:
 $Y = -1.273295447351627 * X + 5813.01013437289657$

Equation of Scored Lines:
 $Y = 2.023106072093 * X + 7738.82842415$

Equation of Ascending Passages:
 $Y = 1.9128910096248 * X + 1700.085460033$

Equation of Descending Passage:
 $Y = 0.494289456096248 * X - 1288.214612906469$

-9115.7511328451365, -5794.034282269



Equation of Casing Stone Angle: (South side)
 $Y = 1.273295447351627 * X + 5813.01013437289657$

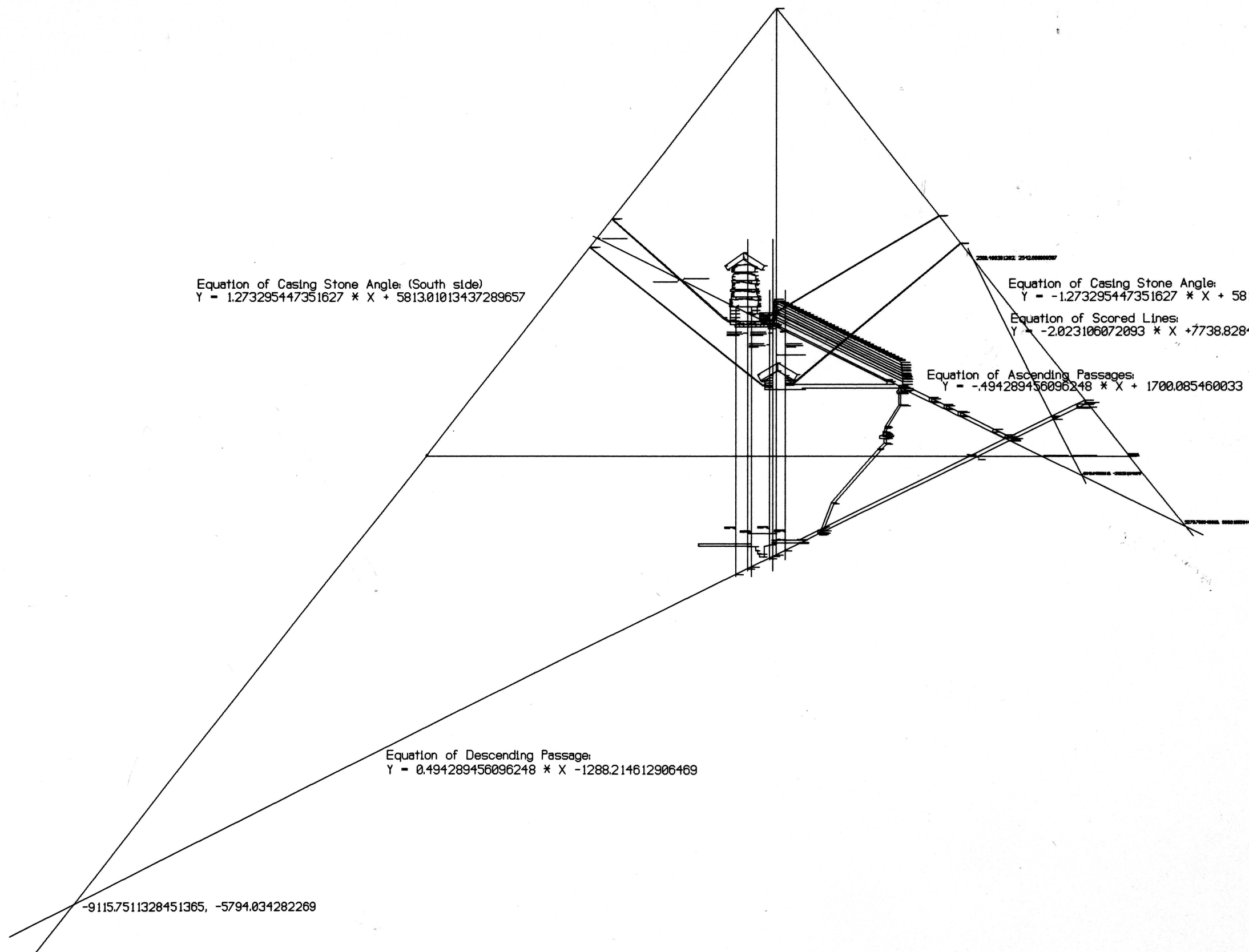
Equation of Casing Stone Angle:
 $Y = -1.273295447351627 * X + 5813.01013437289657$

Equation of Scored Lines:
 $Y = -2.023106072093 * X + 7738.82842415$

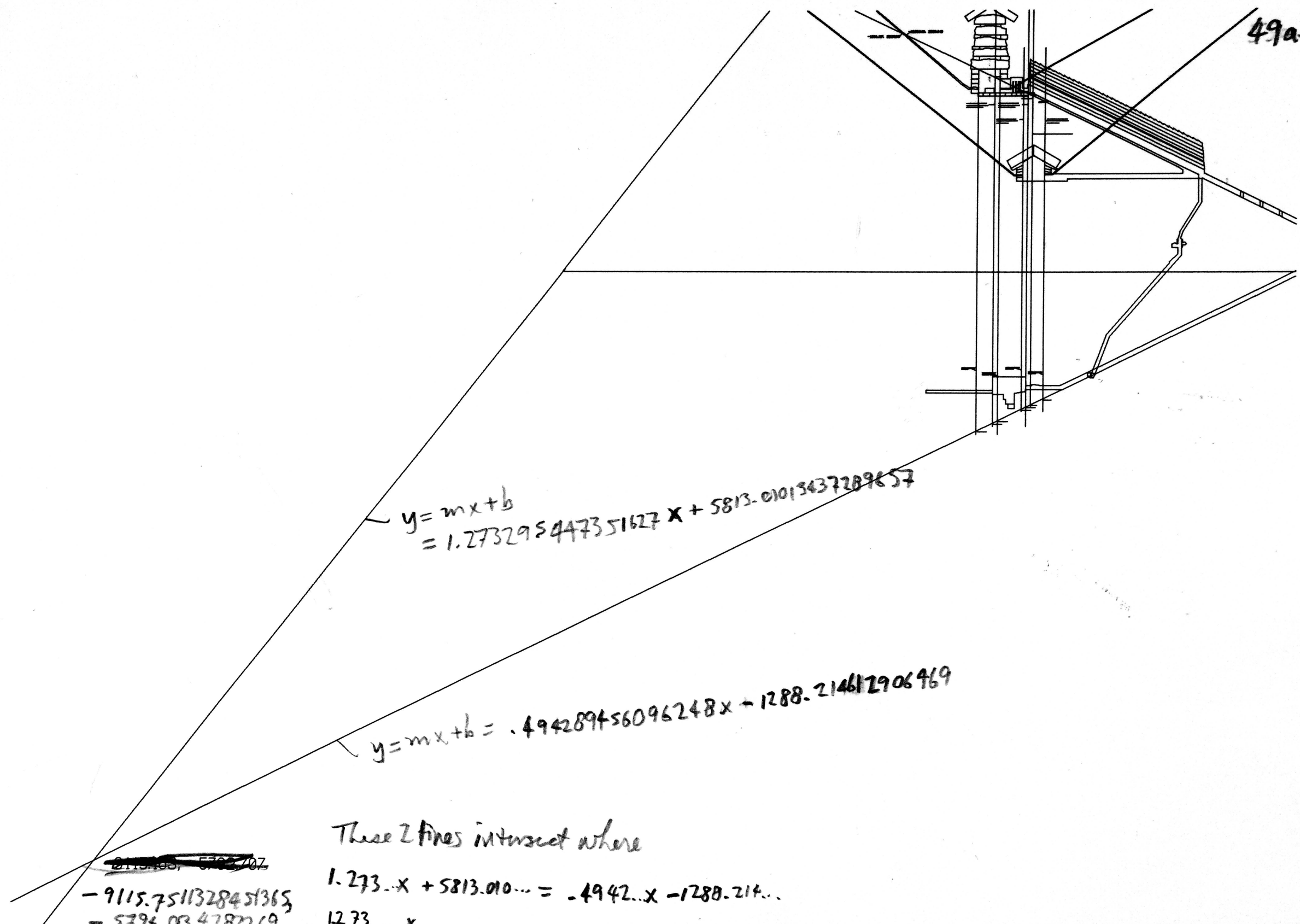
Equation of Ascending Passages:
 $Y = -.494289456096248 * X + 1700.085460033$

Equation of Descending Passage:
 $Y = 0.494289456096248 * X - 1288.214612906469$

-9115.7511328451365, -5794.034282269



49a.



$$y = mx + b$$

$$= 1.273295447351627x + 5813.01013437289657$$

$$y = mx + b = .494289456096248x - 1288.214612906469$$

These 2 lines intersect where

~~2115.400, 5794.707~~
 -9115.7511328451365
 -5794.034282269

$$1.273...x + 5813.010... = .4942...x - 1288.214...$$

$$\begin{array}{r} 1.273...x \\ - .4942...x \\ \hline \end{array} =$$

$$.7790059912554x = -7101.224747279$$

$$x = -9115.7511328451365$$

plug x into either equation to get the y value
 $y = .4942...x - 9115.75... + (-1288.21...)$
 $= -5794.034282269$

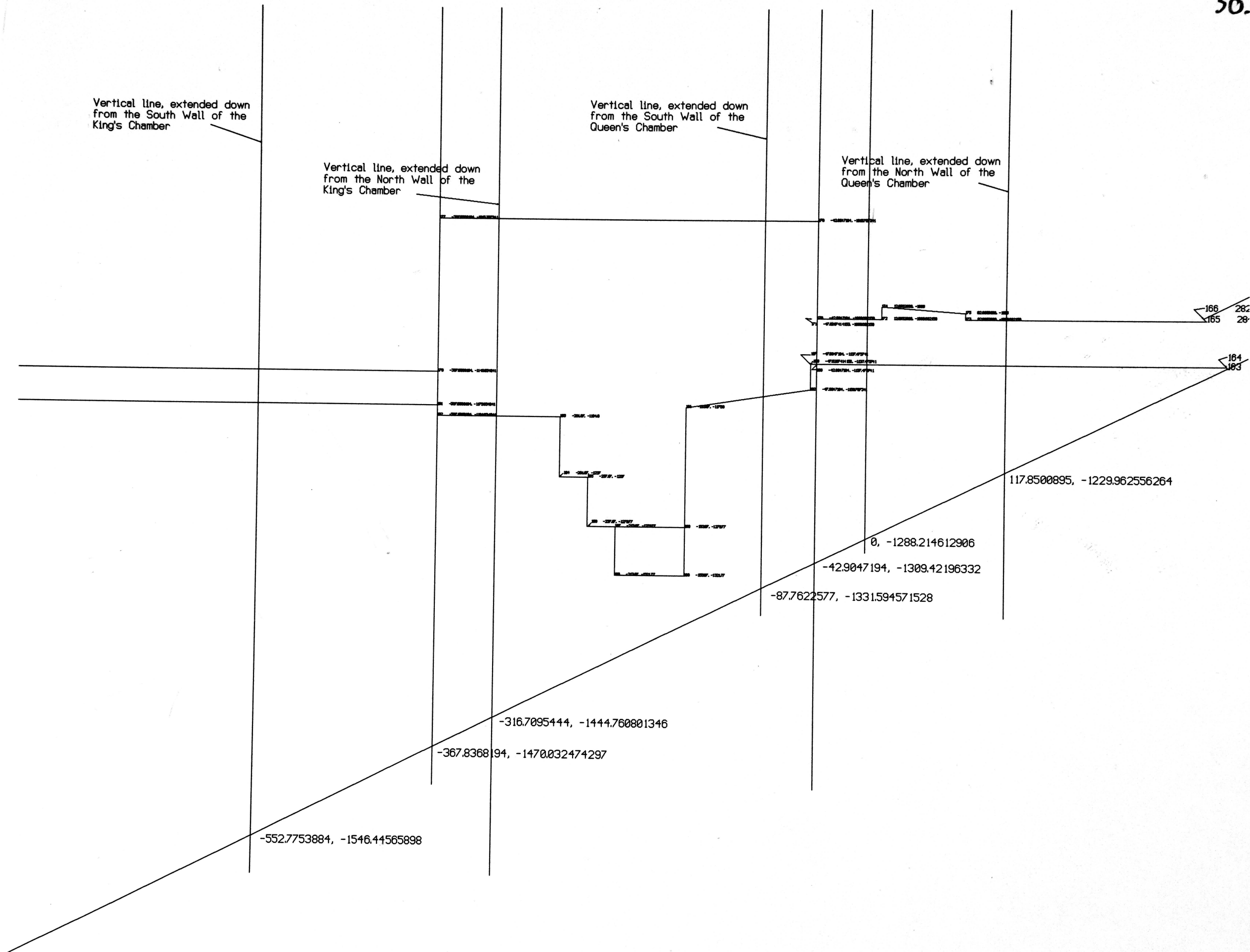
BR 9/2/95

Vertical line, extended down
from the South Wall of the
King's Chamber

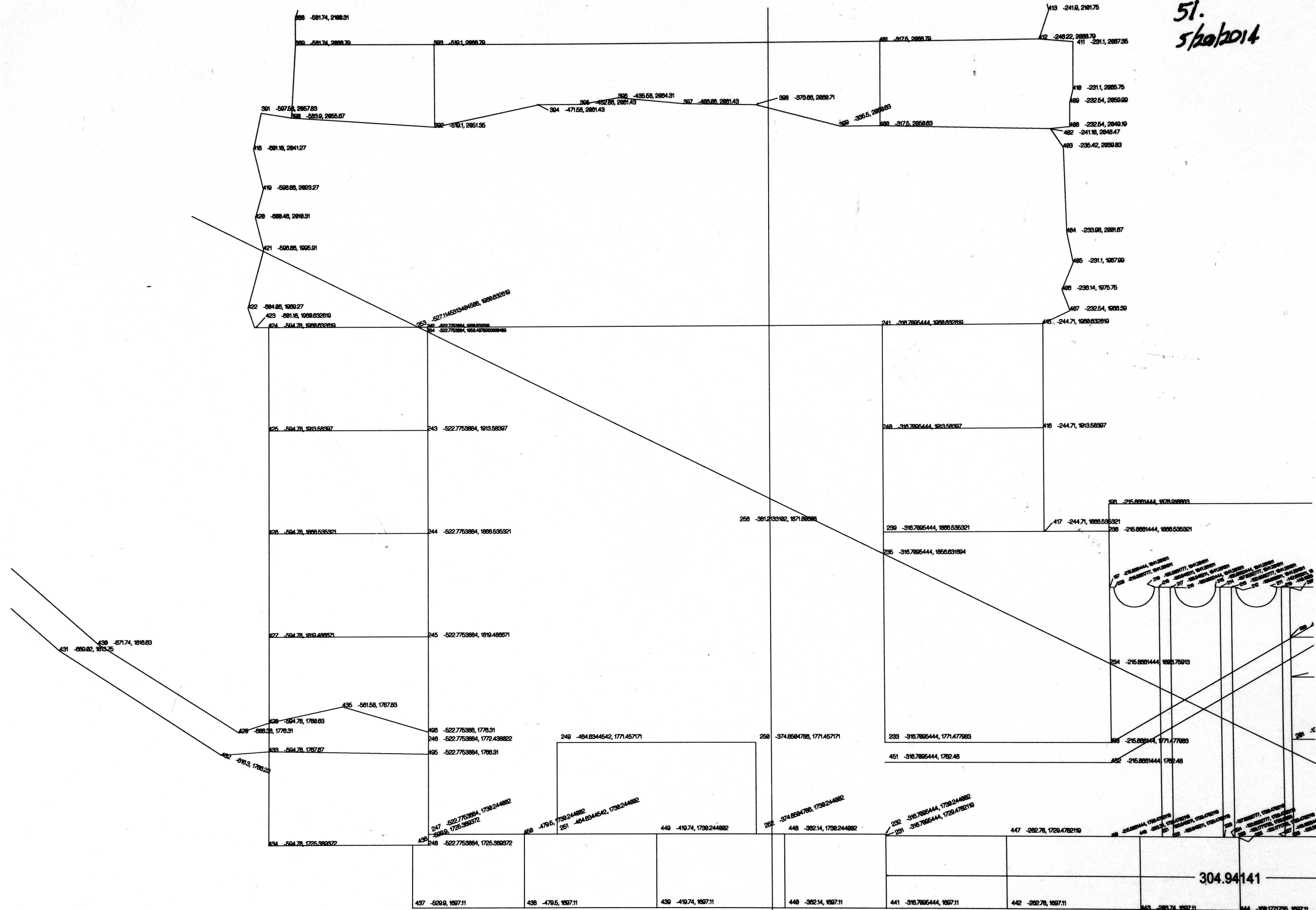
Vertical line, extended down
from the North Wall of the
King's Chamber

Vertical line, extended down
from the South Wall of the
Queen's Chamber

Vertical line, extended down
from the North Wall of the
Queen's Chamber



51.
5/20/2014



-527.1145313405, 1960.632619

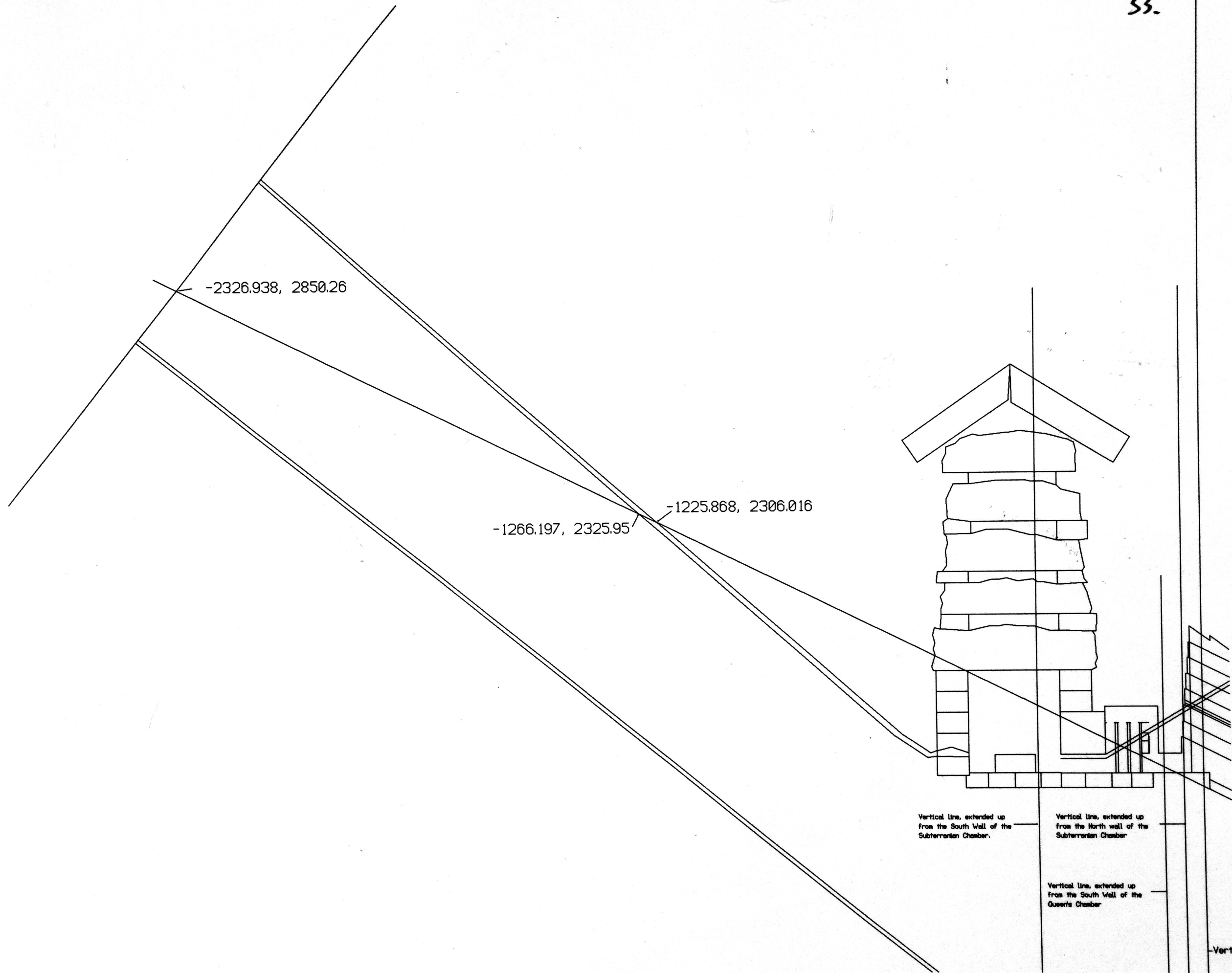
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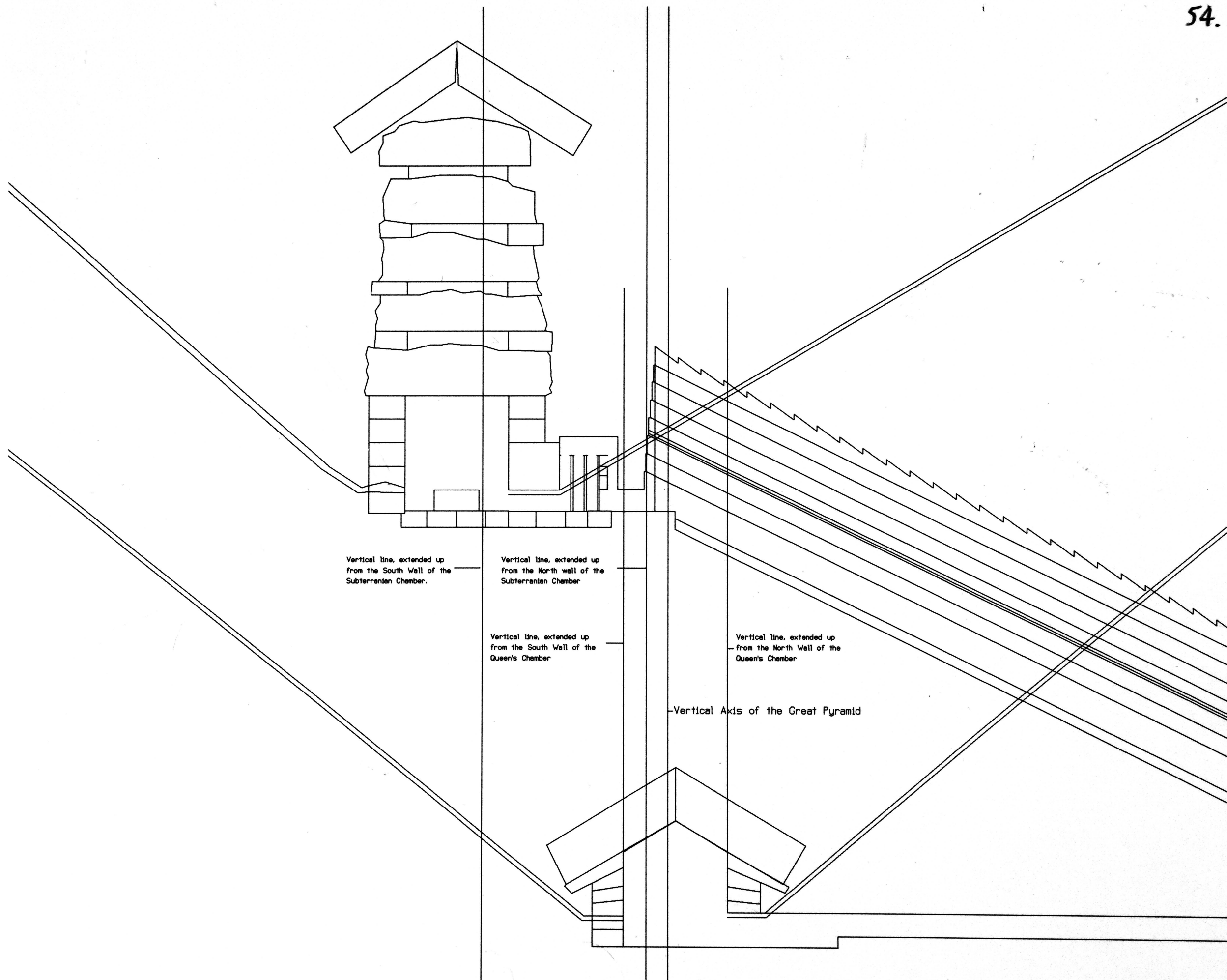
242

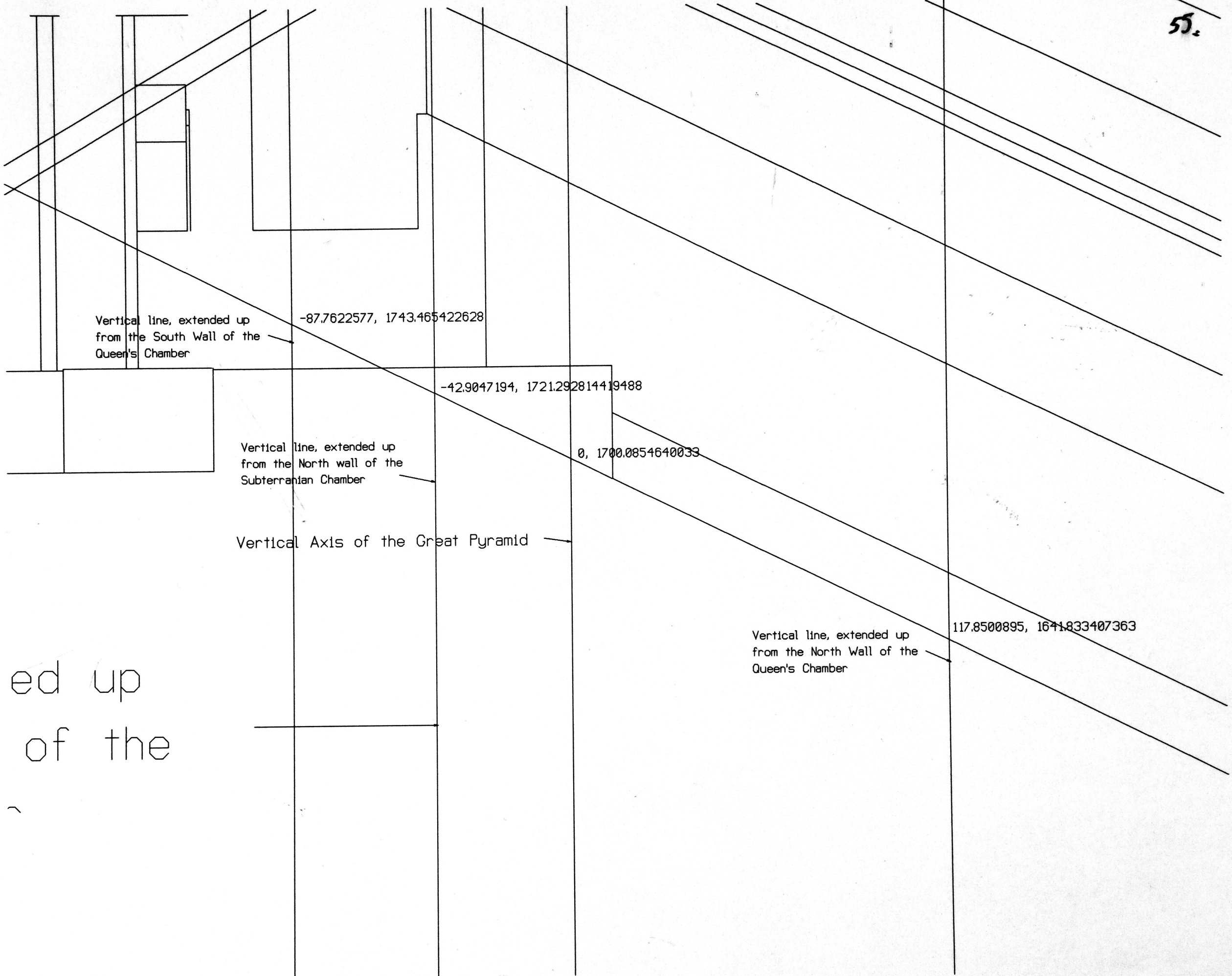
-522.7753884, 1960.632619

254

-522.7753884, 1958.4878263960409







ed up
of the

2568.406391202, 2542.669969507

Equation of Casing Stone Angle:

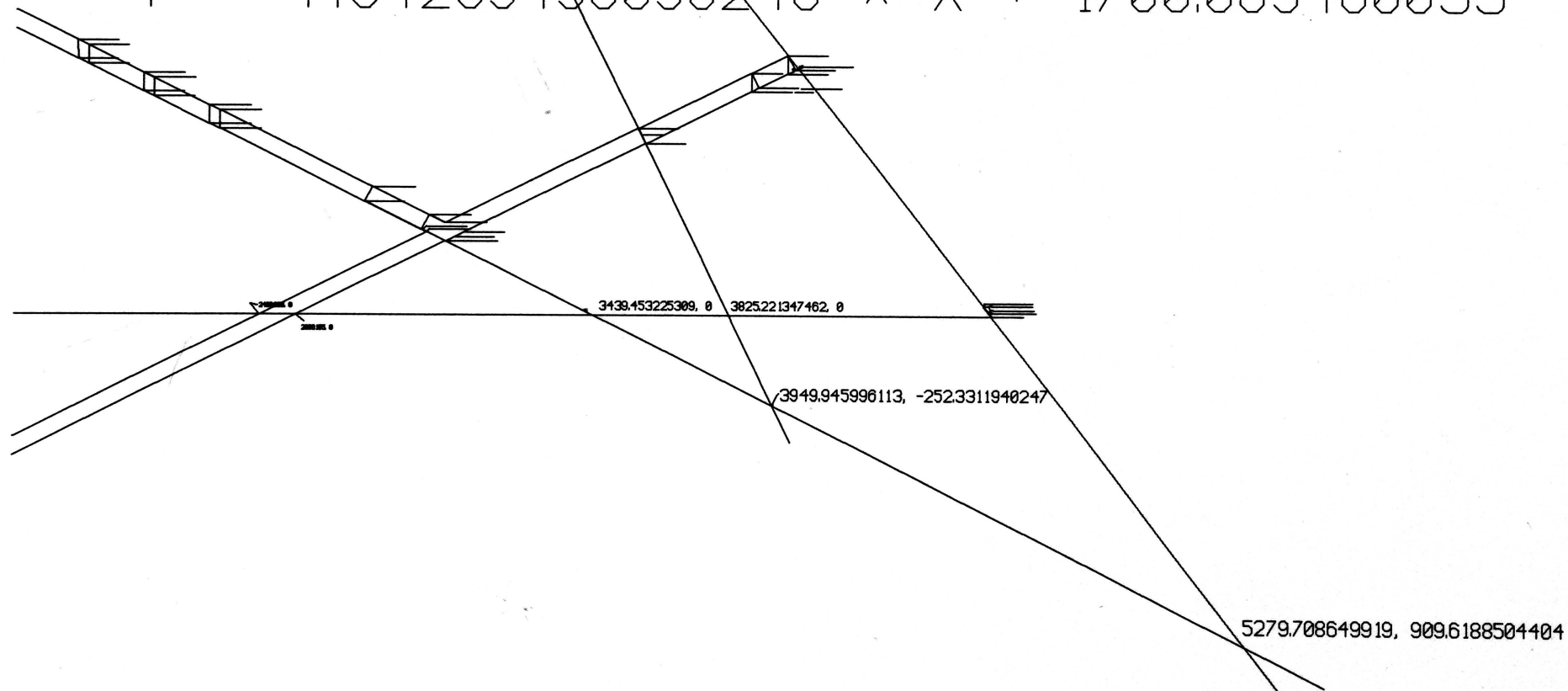
$$Y = -1.273295447351627 * X + 5813.01013437289657$$

Equation of Scored Lines:

$$Y = -2.023106072093 * X + 7738.82842415$$

Equation of Ascending Passages:

$$Y = -.494289456096248 * X + 1700.085460033$$



56a.

$$\begin{array}{r}
 -2.023106x + 7738.82853515 = -1.27x + 5813.010... \\
 -2.023...x \\
 + 1.27...x \\
 \hline
 -.7498106247414x = \frac{5813.0101... - 7738.828...}{-1925.818400777} \\
 x = 2568.406391202 \\
 y = 2542.669969507
 \end{array}$$

$y = mx + b$ $y = -1.273295447351627x + 5813.01013437289657$ (m) (b)

$y = mx + b$ $m = \tan^{-1}(-90 + 2(18'9''72608)) = -2.023106072093$ (slope is negative here)
 $b = 7738.82853515$

$484.2411737 = -2.023106072093(3585.866065) + b$
 $b = 7738.82853515$

$3439.453225309, 0$
 $y = 0 = -4942...x + 1700.085...; x = \frac{-1700.085...}{-4942...} = 3439.453225303$

$y = 0 = -2.023...x + 7738.828...; x = 3825.21347462$

$3825.21347462, 0$
 $3949.945996113, -252.3311940247$
~~3949.945996113, -252.3311940247~~

Intersect where:

$y = -2.023106072093x + 7738.82853515 = -4942.89456096248x + 1700.0854640033$

$$\begin{array}{r}
 -2.023106072093x \\
 + 4942.89456096248x \\
 \hline
 -1.528816615997x = \frac{1700.0854640033 - 7738.82853515}{-6038.743071147} \\
 x = 3949.945996113
 \end{array}$$

$y = -4942... \times 3949.9459... + 1700.085...$
 $y = -252.3311940247$

$5279.708647717, -909.6188504404$
~~5279.708647717, -909.6188504404~~

9/2/93
 P.K.

60 3024.5761718750, 1962
59 3048.1379394531, 1932
58 3069.34375, 1905
57 3089.7641601563, 1879
56 3107.04296875, 1857
55 3127.4631347656, 1831
54 3146.3127441406, 1807
53 3167.5185546875, 1780
52 3187.9389648438, 1754
51 3211.7866210938, 1723.63626
50 3233.4919433594, 1696
49 3257.0539550781, 1666
48 3285.3283691406, 1630
47 3312.8171386719, 1595
46 3334.8083496094, 1567
45 3363.8681640625, 1530
44 3396.8547363281, 1488
43 3421.9875488281, 1456
42 3443.9787597656, 1428
41 3469.1115722656, 1396
40 3494.2441406250, 1364
39 3520.9477539063, 1330
38 3550.79296875, 1292
37 3581.4233398438, 1253
36 3613.6247558594, 1212
35 3652.421875, 1162.6020268740
34 3671.7441406250, 1138
33 3690.59375, 1114
32 3712.5849609375, 1086
31 3734.5761718750, 1058
30 3754.9963378906, 1032
29 3778.5583496094, 1002
28 3802.9057617188, 971
27 3824.8967285156, 943
26 3845.3171386719, 917
25 3875.1623535156, 879
24 3899.5097656250, 848
23 3925.4277343750, 815
22 3952.9167480469, 780
21 3970.9809570313, 757
20 3989.8305664063, 733
19 4019.6755371094, 695
18 4044.8083496094, 663
17 4065.2287597656, 637
16 4087.2197265625, 609
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14 4132.7729492188, 551
13 4156.3349609375, 521
12 4179.8969726563, 491
11 4205.8149414063, 458
10 4232.5185546875, 424
9 4260.79296875, 388
8 4290.6381835938, 350
7 4321.2685546875, 311
6 4351.1137695313, 273
5 4382.5297851563, 233
4 4413.9453125, 193
3 4451.64453125, 145
2 4495.6269531250, 89
1 4542.1625976563, 29.74E

122 1695.3261/18/50, 365/

121 1715.3172607422, 3629

120 1738.0938720703, 3600

119 1762.4411621094, 3569

118 1789.9301757813, 3534

117 1807.9942626953, 3511

116 1827.6292724609, 3486

115 1845.6933593750, 3463

114 1863.7575683594, 3440

113 1881.8216552734, 3417

112 1900.6712646484, 3393

111 1919.5208740234, 3369

110 1938.3703613281, 3345

109 1958.0053710938, 3320

108 1980.7818603516, 3291

107 2000.4168701172, 3266

106 2020.8371582031, 3240

105 2042.04296875, 3213

104 2063.2487792969, 3186

103 2085.2397460938, 3158

102 2108.8017578125, 3128

101 2133.9345703125, 3096

100 2160.6381835938, 3062

99 2189.6977539063, 3025

98 2221.8991699219, 2984

97 2240.7487792969, 2960

96 2259.5981445313, 2936

95 2279.2331542969, 2911

94 2299.6535644531, 2885

93 2321.6447753906, 2857

92 2345.9919433594, 2826

91 2371.91015625, 2793

90 2400.1845703125, 2757

89 2419.8195800781, 2732

88 2438.6689453125, 2708

87 2457.5185546875, 2684

86 2477.1535644531, 2659

85 2496.7885742188, 2634

84 2517.2087402344, 2608

83 2537.6291503906, 2582

82 2556.4787597656, 2558

81 2575.3283691406, 2534

80 2592.6071777344, 2512

79 2611.4565429688, 2488

78 2630.3061523438, 2464

77 2649.1557617188, 2440

76 2669.5761718750, 2414

75 2691.5671386719, 2386

74 2715.9145507813, 2355

73 2736.3349609375, 2329

72 2757.5407714844, 2302

71 2779.5317382813, 2274

70 2801.5229492188, 2246

69 2825.8703613281, 2215

68 2851.7885742188, 2182

67 2878.4919433594, 2148

66 2898.9123535156, 2122

65 2919.3327636719, 2096

64 2941.3239746094, 2068

63 2961.7441406250, 2042

62 2982.1645507813, 2016

61 3002.5849609375, 1990

60 3024.5761718750, 1962

59 3048.1379394531, 1932

58 3069.34375, 1905

57 3089.7641601563, 1879

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55 3127.4631347656, 1831

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53 3167.5185546875, 1776

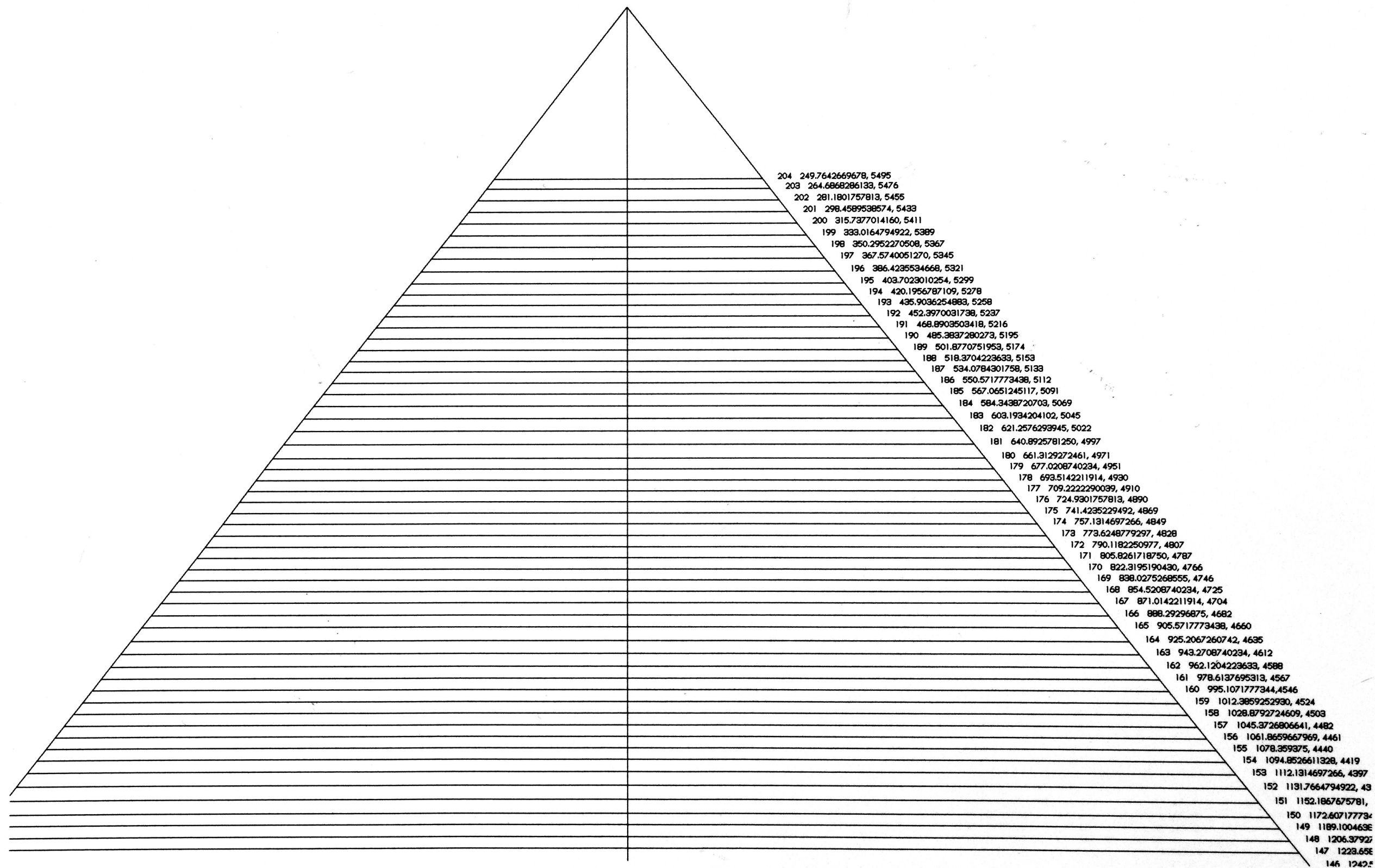
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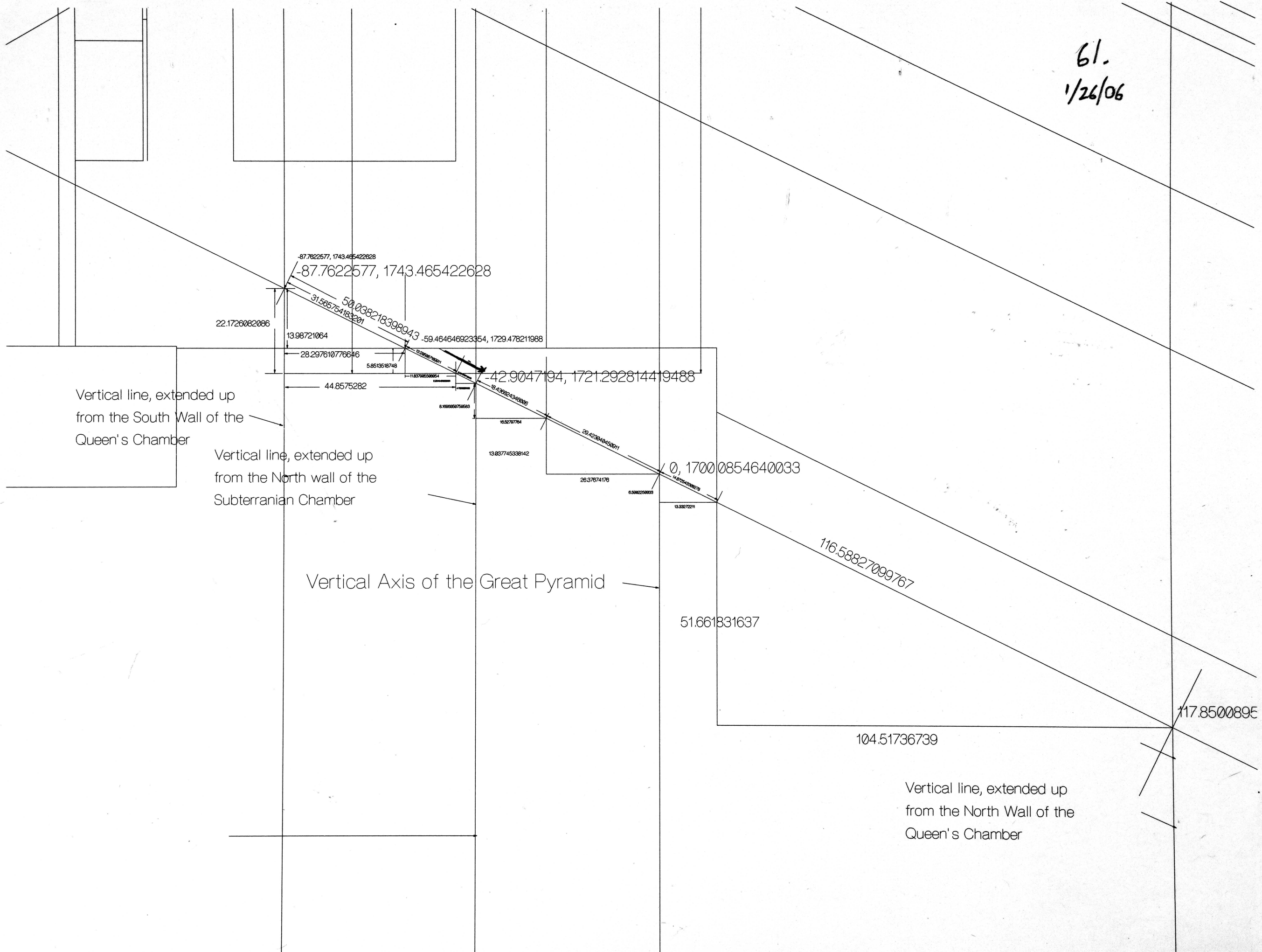
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49 3257.053, 1662

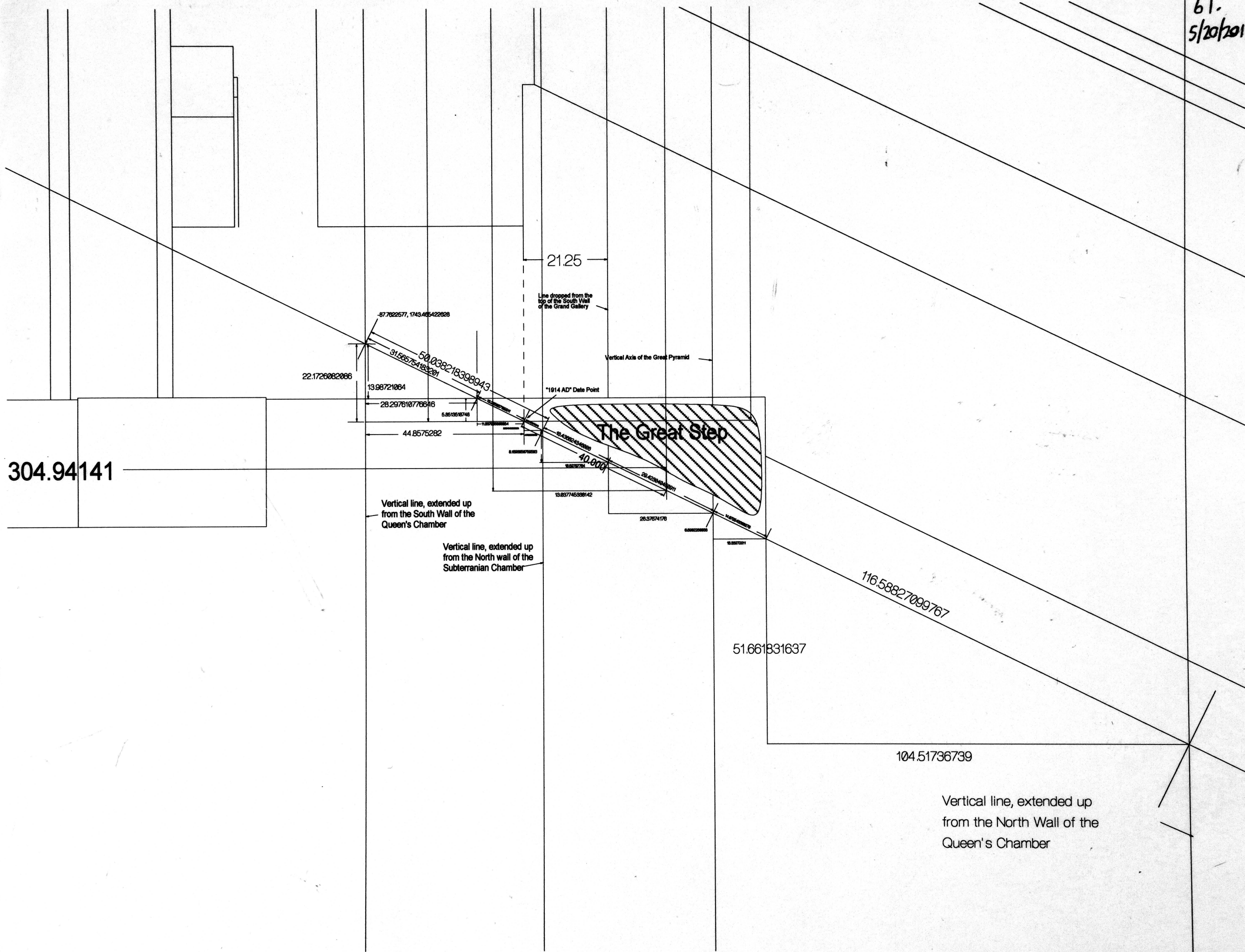
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200 315.7377014160, 5411
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198 350.2952270508, 5367
197 367.5740051270, 5345
196 386.4235534668, 5321
195 403.7023010254, 5299
194 420.1956787109, 5278
193 435.9036254888, 5258
192 452.3970031738, 5237
191 468.8903503418, 5216
190 485.3837280273, 5195
189 501.8770751953, 5174
188 518.3704223633, 5153
187 534.0784301758, 5133
186 550.5717773438, 5112
185 567.0651245117, 5091
184 584.3438720703, 5069
183 603.1934204102, 5045
182 621.2576293945, 5022
181 640.8925781250, 4997
180 661.3129272461, 4971
179 677.0208740234, 4951
178 693.5142211914, 4930
177 709.2222290039, 4910
176 724.9301757813, 4890
175 741.4235229492, 4869
174 757.1314697266, 4849
173 773.6248779297, 4828
172 790.1182250977, 4807
171 805.8261718750, 4787
170 822.3195190430, 4766
169 838.0275268555, 4746
168 854.5208740234, 4725
167 871.0142211914, 4704
166 888.29296875, 4682
165 905.5717773438, 4660
164 925.2067260742, 4635
163 943.2708740234, 4612
162 962.1204223633, 4588
161 978.6137695313, 4567
160 995.1071777344, 4546
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158 1028.8792724609, 4503
157 1045.3726806641, 4482
156 1061.8659667969, 4461
155 1078.359375, 4440
154 1094.8526611328, 4419
153 1112.1314697266, 4397
152 1131.7664794922, 4372
151 1152.1867675781, 4346
150 1172.6071777344, 4320
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148 1206.3792724609, 4277
147 1223.6580810547, 4255
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145 1263.7133789063, 4204
144 1285.7044677734, 4176
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124 1652.4854736328, 3709
123 1672.9057617188, 3683
122 1693.3261718750, 3657
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118 1789.930175
117 1807.9942
116 1827.62



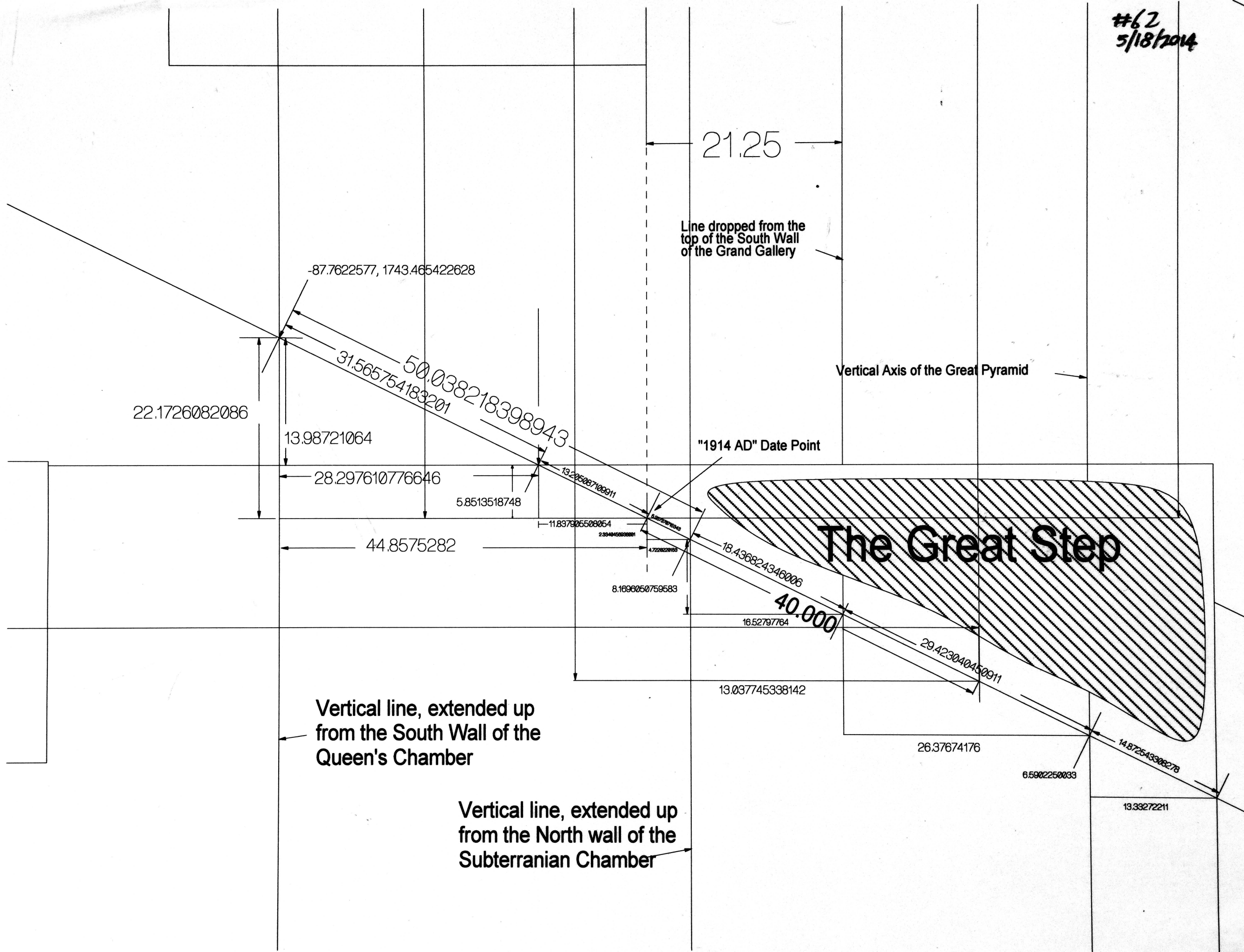
61.
1/26/06

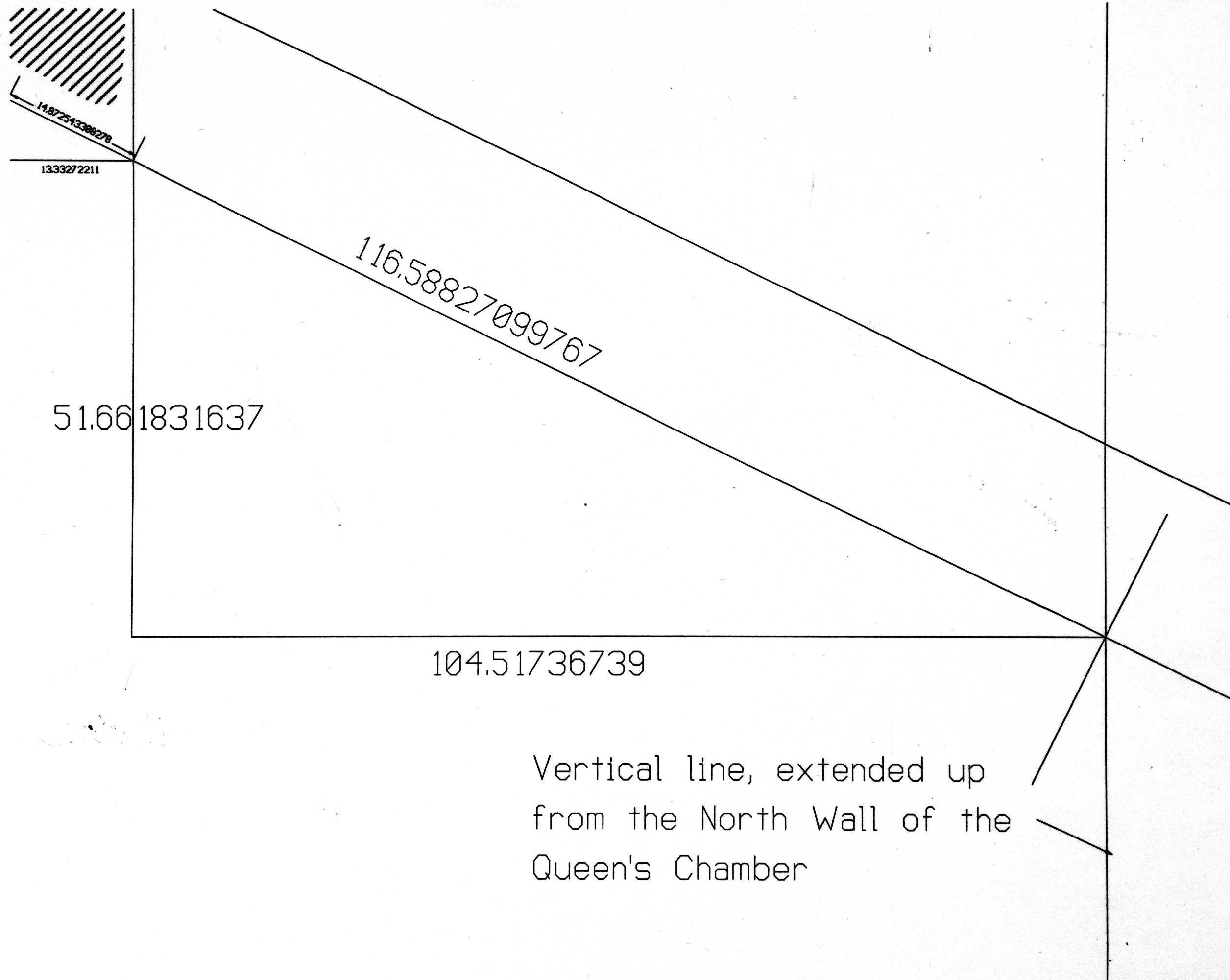


61.
5/20/2014



#62
5/18/2014





#64
5/18/2014

-367.8368194, 1881.903325397

304.94141

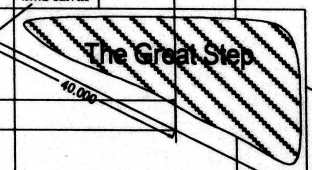
304.94141

2125

Line dropped from the
top of the South Wall
of the Great Gallery

Vertical Axis of the Great Pyramid

"1814 AD" Date Point



Vertical line, extended up
from the South Wall of the
Queen's Chamber

Vertical line, extended up
from the North wall of the
Subterranean Chamber

Vertical Axis of the Great Pyramid

#503 2568.40637806461, 2542.66998623436

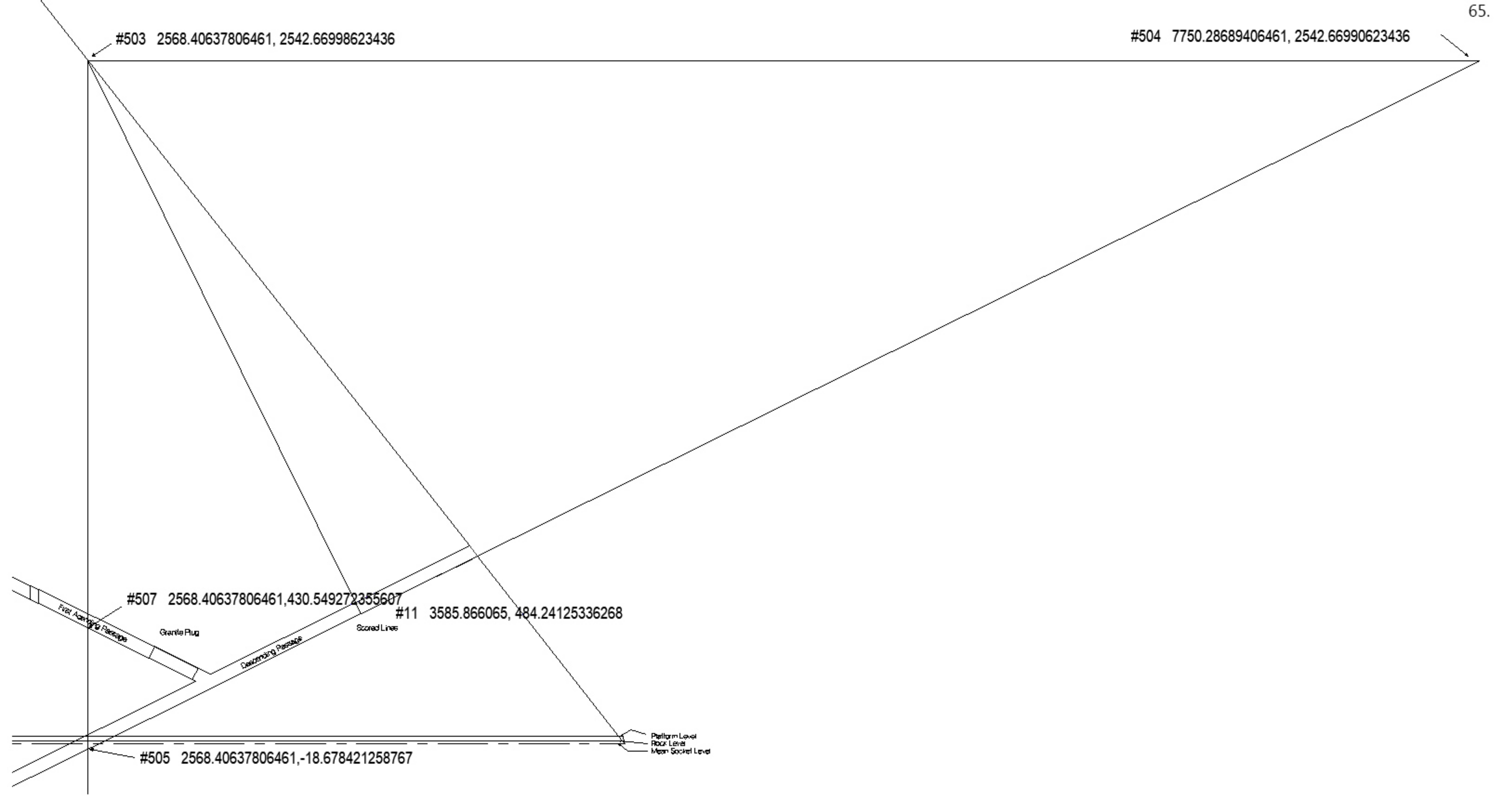
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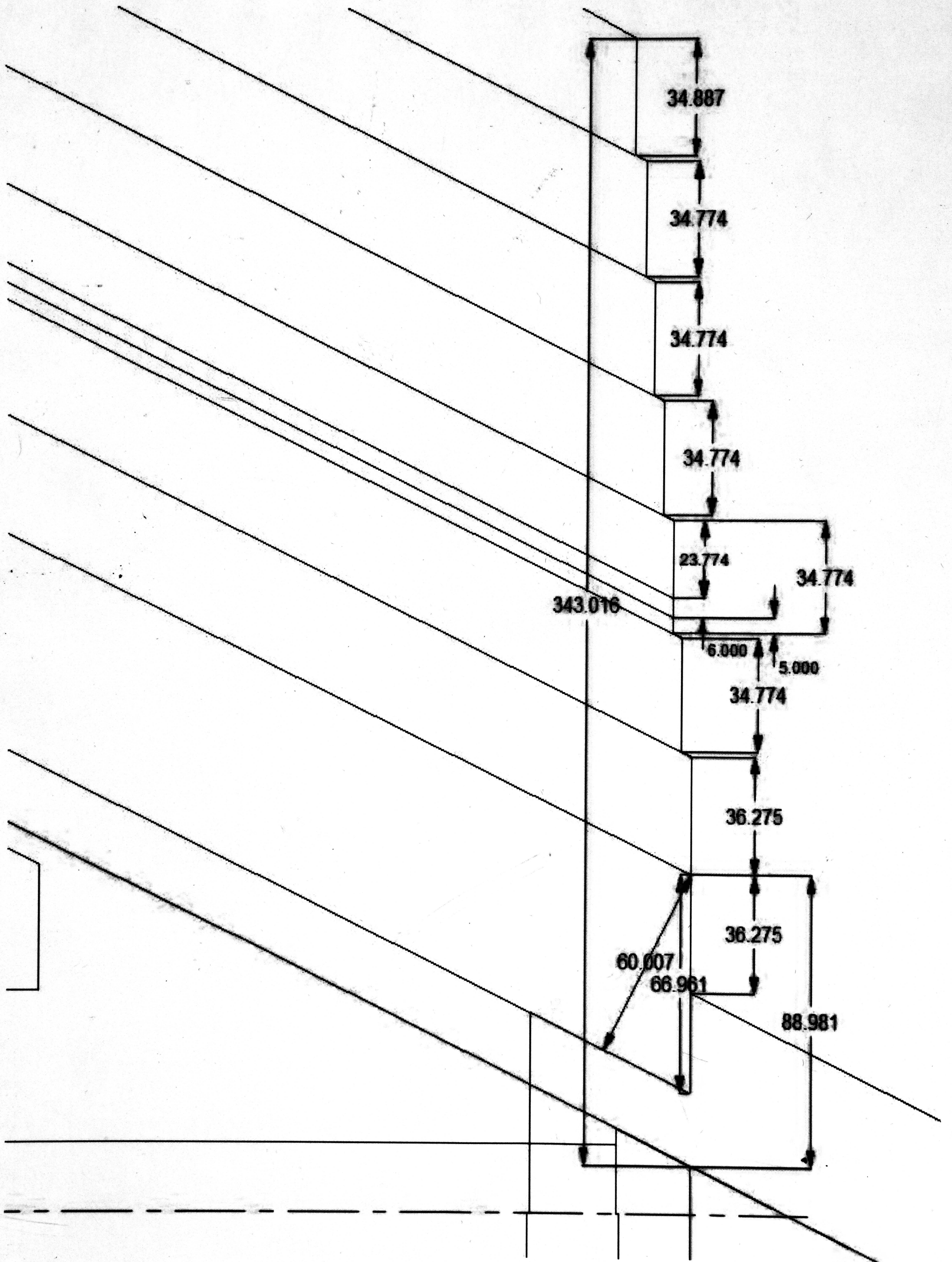
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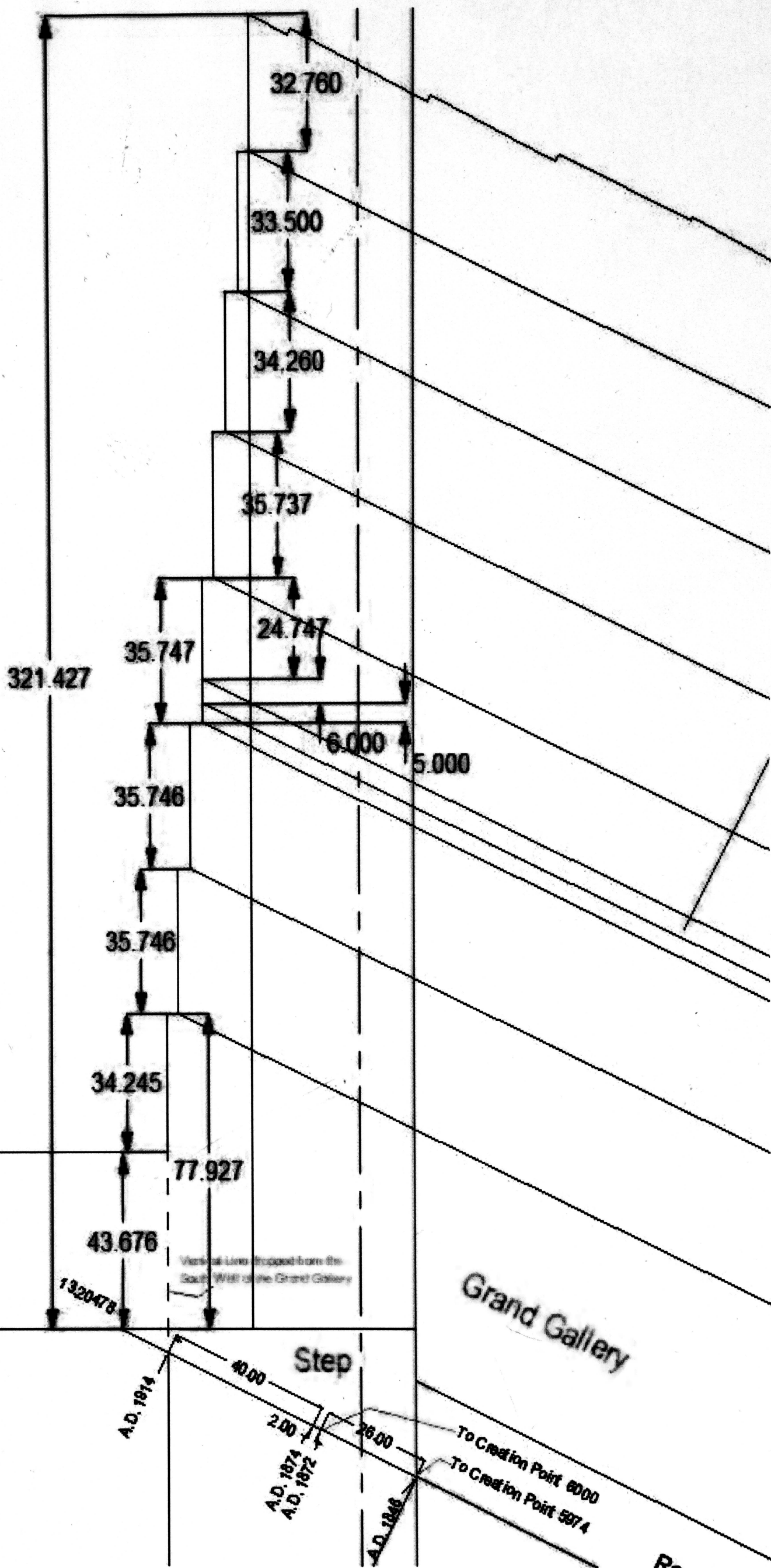
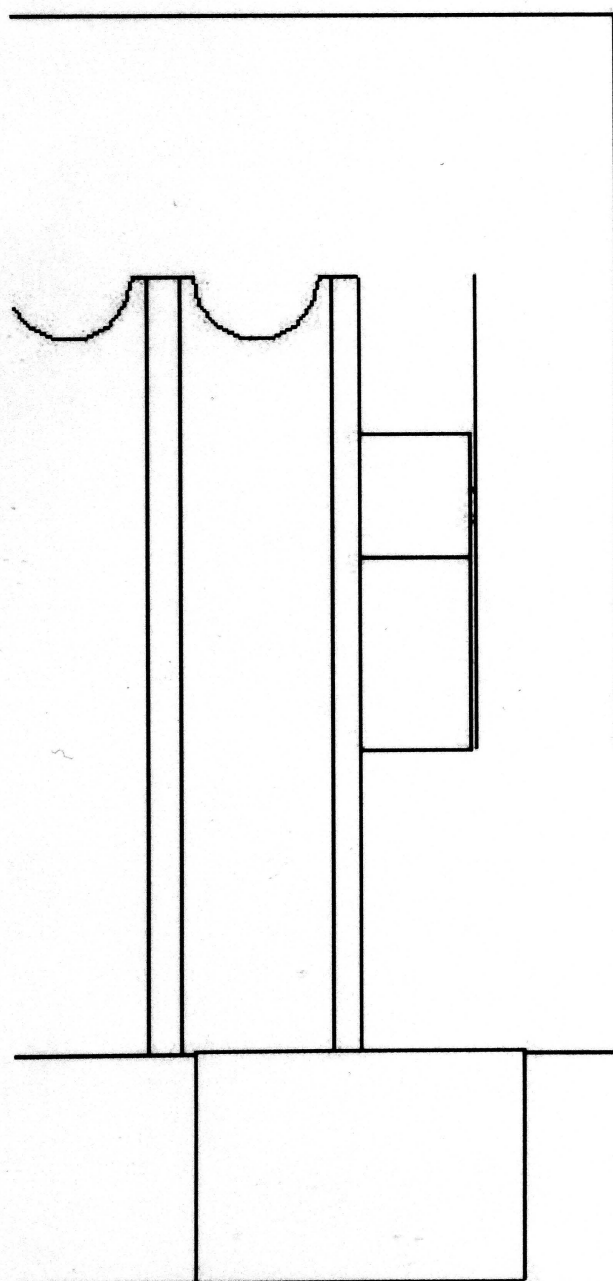
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Platform Level
Rock Level
Mean Socket Level



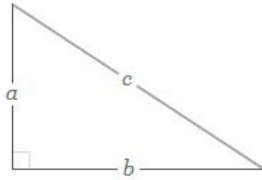


Ante-
rumber

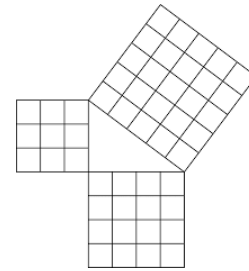


CALCULATING DISTANCES AND ANGLES

Pythagoras theorem states that “In a right-angled triangle, the square of the hypotenuse side is equal to the sum of squares of the other two sides.”



$$c = \sqrt{a^2 + b^2} \quad \text{or} \quad c^2 = a^2 + b^2$$



Using the X (horizontal) and Y (vertical) coordinate points in the “Defined Points” list and in the corresponding diagrams, you can determine the distance between points on the same plane simply by the difference between two X points of Y points.

Otherwise the hypotenuse length on the passage angle can be determined by entering both the X and Y coordinates for both points into the following Excel formula:

[GreatPyramidCalculations.xlsx](#)

Download and enter the respective values.

Here are 4 sections for finding distances:

1. For working with passage measurements.
2. For working with exterior (Casing Stone angle) measurements.
3. To determine unknown distances; given either the vertical or horizontal distance.
4. To compute the distance and angle between any two points.

[GreatPyramidPointsOffsetsDistances.xlsx](#)

Download and enter the respective values.

The purpose of this spreadsheet is to make it possible to find the straight line distance and angle, as well as the horizontal and vertical differences between all of the points in the CAD drawing with respect to the one point that is shown near the top of the spreadsheet. In this way, one can find out how far, say the first point on the entrance passage is from all other points in the pyramid, as well as the horizontal distance and vertical distance and the angle that all the other points make with that reference point.

Think of it as a means to place a tape measure at any point in the Pyramid and make a straight measure to any other point in the Pyramid. The point that you enter into **B2** and **C2** is the “Zero” end of the tape measure and all of the values under it in column H are the direct line of sight measurements from that reference (zero) point.

The numbers in columns **F** and **G** below the reference point tell you how far above or below (column **F**), left or right (column **G**) you are from the reference point at each row in the table, while Column **H** is the result of applying the Pythagorean Theorem to those distances and finding the hypotenuse length (Column **H**) to each point. Columns **I** and **J** are the projected angles to the horizontal and vertical.

[GreatPyramidMeasurements.xlsx](#)

Download to view measurements and formulas

This spreadsheet compiles a number of measurements with the underlying formulas that determine various distances, volumes and areas.

Some of these are summarized in the following section #7 for Dimensions and Angles.

Passage Angle information

Passage angle = $26^{\circ}18'9''.7260895701=26.30270169154727$

$\sin = (\sqrt{\pi})/4 = 0.4431134627263789$

$\log(\text{same}) = -0.353485054980895$

$\cos = (\sqrt{16-\pi})/4 = 0.896465537068011$

$\log(\text{same}) = -0.04746640141566282$

$\tan = \sqrt{\pi}/(\sqrt{16-\pi}) = 0.494289456096248$

$\log(\text{same}) = -0.3060186535652327$

Casing Stone Angle information

Casing Stone Angle = $51^{\circ}51'14''.3064459988 =$

$51^{\circ}.85397401277745$

$\sin = 4/(\sqrt{(\pi^2)+16}) = 0.7864391000953833$

$\log(\text{same}) = -0.10433490243236631$

$\cos = (\pi)/(\sqrt{(\pi^2)+16}) = 0.6176678248388559$

$\log(\text{same}) = -0.2092450210661949$

$\tan = 4/\pi = 1.2732395447351627$

$\log(\text{same}) = 0.104910118633828$

from Math Tables books:

$\log(2) = 0.3010299956639811952137389$

$\pi = 3.141592653589793238462643$

$\log(\pi) = 0.4971498726941338543512683$

$\log(2*\pi) = \log(2) + \log(\pi) = 0.7981798683581150495650072$

$e^1 = 2.718281828459045235360287$

Astronomical Values (given by Br. Morton Edgar):

(GPP, V2, Pg. 41) Year length = 365.2421986677311

$\log(\text{same}) = 2.56258094846194235$

(GPP, V2, Pg. 42) Month Length = 29.5305887150085

$\log(\text{same}) = 1.4702721050460486$

Exterior Measurements:

$\frac{1}{2}$ side length (at mean socket level) = 4565.5274833466392

$\log(\text{same}) = 3.6594909614699987264$

Height (Apex to Mean Socket Level) =

5813.01013437214757621284

$\log(\text{same}) = 3.764401080103824808$

Exterior Measurements (See GPP, V.3, Pg. 44.)

[And Great Pyramid Passages, Volume II, 1913 edition, page 131 where this is elaborated.]

Given Value

849.2633

Computed by:

(K.Ch Length x 2) + 25 inches

Theoretical value

849.26337584166

Dimensions of the Coffin related to the Ark of the Covenant

see: <https://www.biblestudentarchives.com/documents/CoffinArk.pdf>

King's Chamber Dimensions (GPP, V3, Pgs. 29-30)

Start with Chamber width (obtained below via equation); one half of this value times square root of 4, 5, 9, etc. (pg. 29) yields the other values.

Length = 412.1316879208283

$\log(\text{same}) = 2.6150360077785694$

Width = (Year length/ $\sqrt{\pi}$) = 206.0658439604141

$\log(\text{same}) = 2.314006012115$

(See GPP, V3, Pg. 29 for equation)

Height = 230.3886174681753

$\log(\text{same}) = 2.3624610186189039$

Floor Diagonal = 460.7772349363505

$\log(\text{same}) = 2.66349101428288501$

Side Diagonal = 472.1561640467782

$\log(\text{same}) = 2.67408566381785391$

End Diagonal = 309.09876594062121

$\log(\text{same}) = 2.49009727117055721$

Cubic Diagonal = 515.1646099010353

$\log(\text{same}) = 2.7119460207869133$

(See GPP, VI, Pgs. 314-315 for the following:)

2nd Ht. of Kg's Ch. (Granite ht.) = 235.2432470689922

$\log(\text{same}) = 2.371517165350019$

Equation of Ascending Passages:

$y = m * X + b$

$Y = -.494289456096248 * X + 1700.0854640033$

Equation of Descending Passages:

$y = m * X + b$

$Y = .494289456096248 * X - 1288.214612906469$

Equation of Scored Lines in Descending Passage:

$y = m * X + b$

$Y = -2.023106072093 * X + 7738.82853515$

Equation of Casing Stone Angle (North Side):

$y = m * X + b$

$Y = -1.273295447351627 * X + 5813.01013437289657$

Equation of Casing Stone Angle (South Side):

$y = m * X + b$

$Y = 1.273295447351627 * X + 5813.01013437289657$

Great Pyramid Grand Gallery Ceiling

The following pages represent a project to photograph the ceiling of the Grand Gallery, in order to count the overlapping selves of stone layers.

This was done in the 1980s during travels to Egypt. It was during one of the rare times when given permission to do the work without interruption of other tourists or guides.

Brian Kutscher had drawn schematics of the Gallery with proposed positioning of the camera for the images. These instructions are on the following 4 pages. Nearly 100 photos were taken.

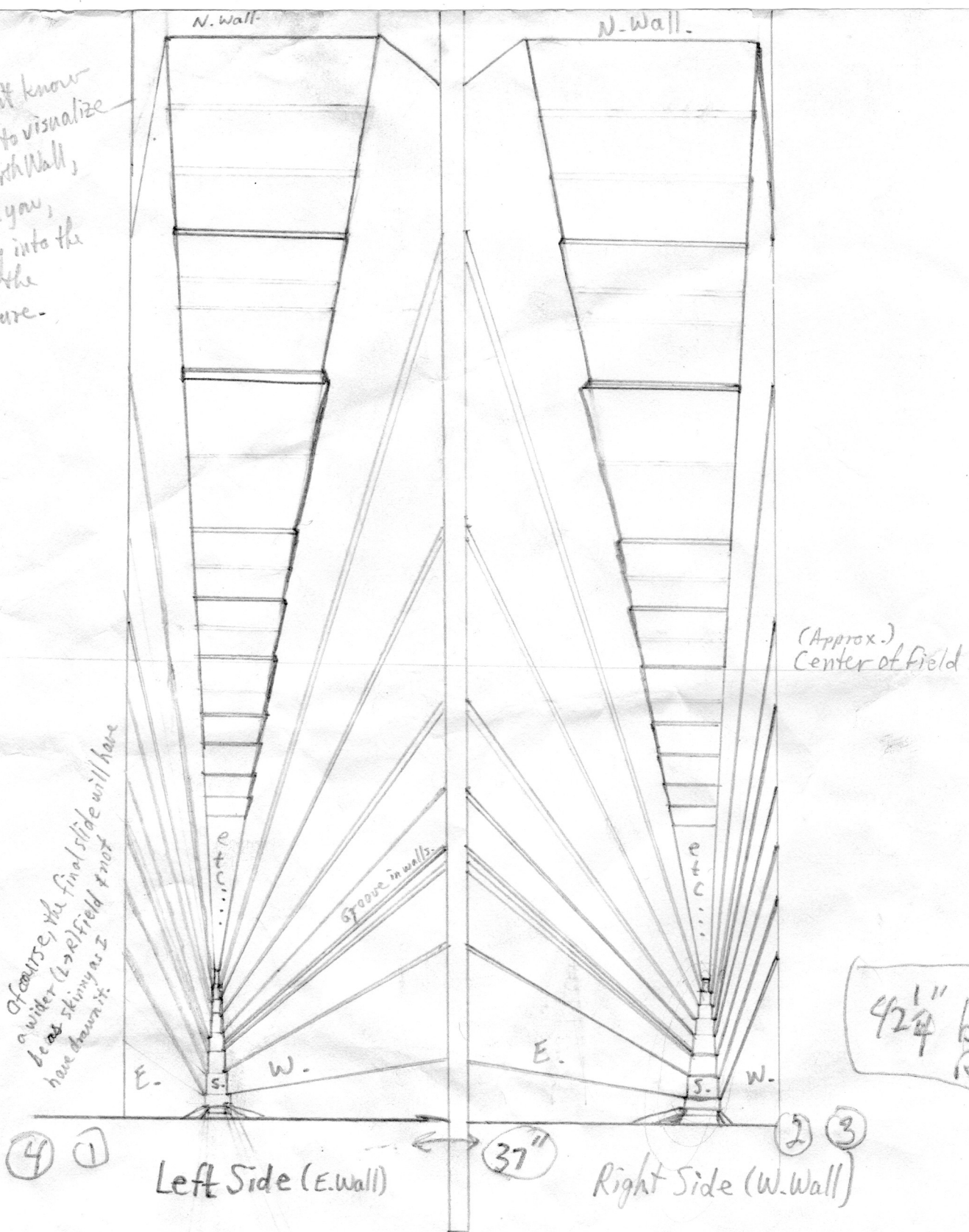
It should be noted that due to the angle of the ceiling and floor and camera positions, the length of each section does not always appear proportional to the others. However, visually they appear to be about equally spaced. Furthermore, due to stone marring, deteriorations and surface blackening from ancient use of torches, each overlap is not easily discernable. Morton Edgar indicated 36 overlappings in GPPI:71, 384.

Following the diagrams is a list of computed dimensions of each stone located on the film frames.

Following the list, are the film frames of the ceiling as referenced in the previous stones list.

I don't know how to visualize the North Wall, behind you, coming into the top of the picture.

Of course, the final slide will have a wider (L-R) field & not be as skinny as I have drawn it.

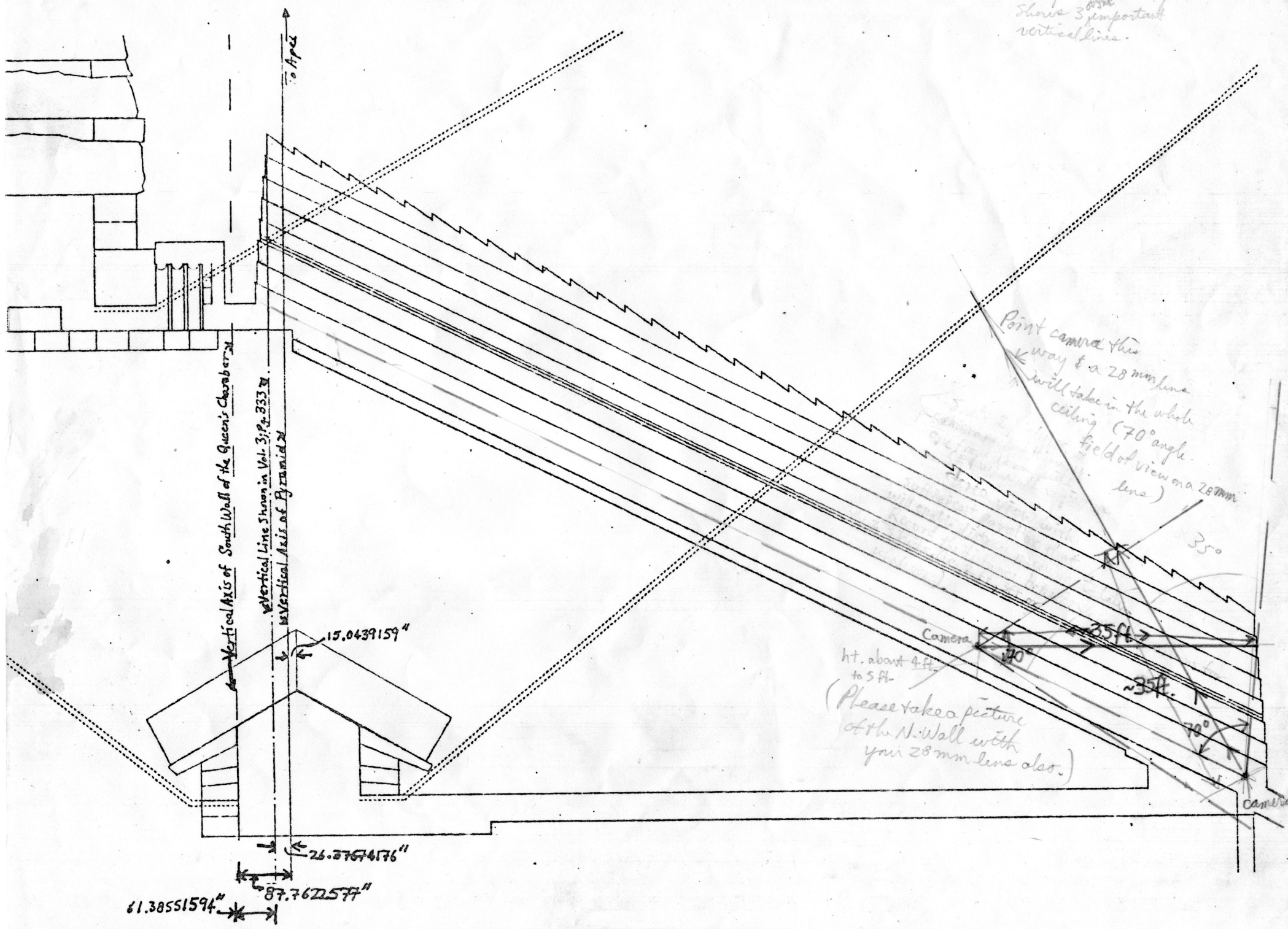


(Approx.) Center of field

42 $\frac{1}{4}$ " between Ramps.

Highly stylized visualizations of what a widely separated stereo pair of photographs would show. IF you do take a pair such as these, would you please be sure to get an accurate measurement of the distance between the 2 camera positions? This is important for any future measurements that may be made from the photographs. Thank you,
Br. Brian Kutscher

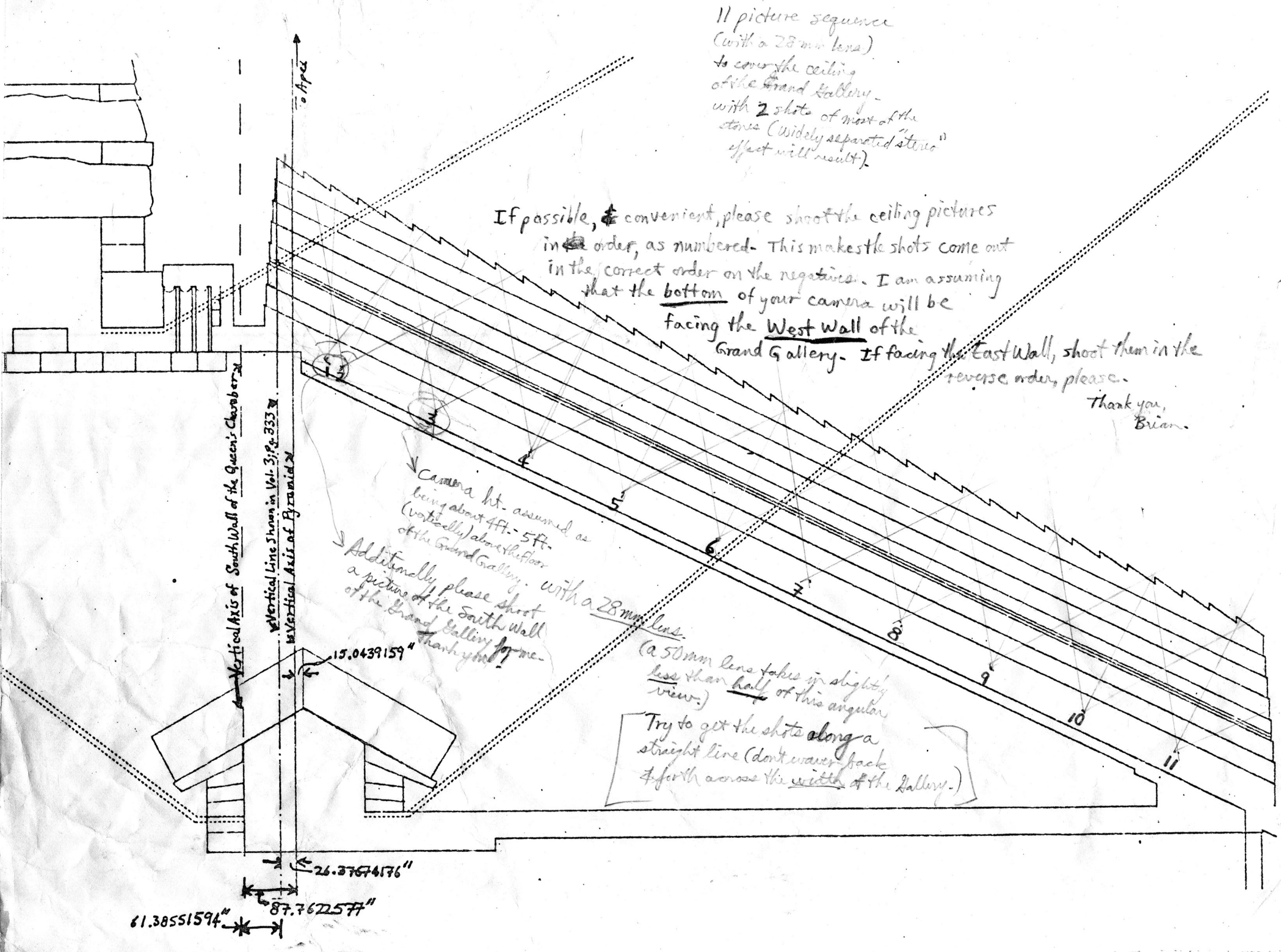
Computer generated plot
 Shows 3 ^{or 4} important
 vertical lines.



11 picture sequence
(with a 28 mm lens)
to cover the ceiling
of the Grand Gallery -
with 2 shots of most of the
stones (widely separated "stone"
effect will result).

If possible, & convenient, please shoot the ceiling pictures
in the order, as numbered. This makes the shots come out
in the correct order on the negatives. I am assuming
that the bottom of your camera will be
facing the West Wall of the
Grand Gallery. If facing the East Wall, shoot them in the
reverse order, please.

Thank you,
Brian.

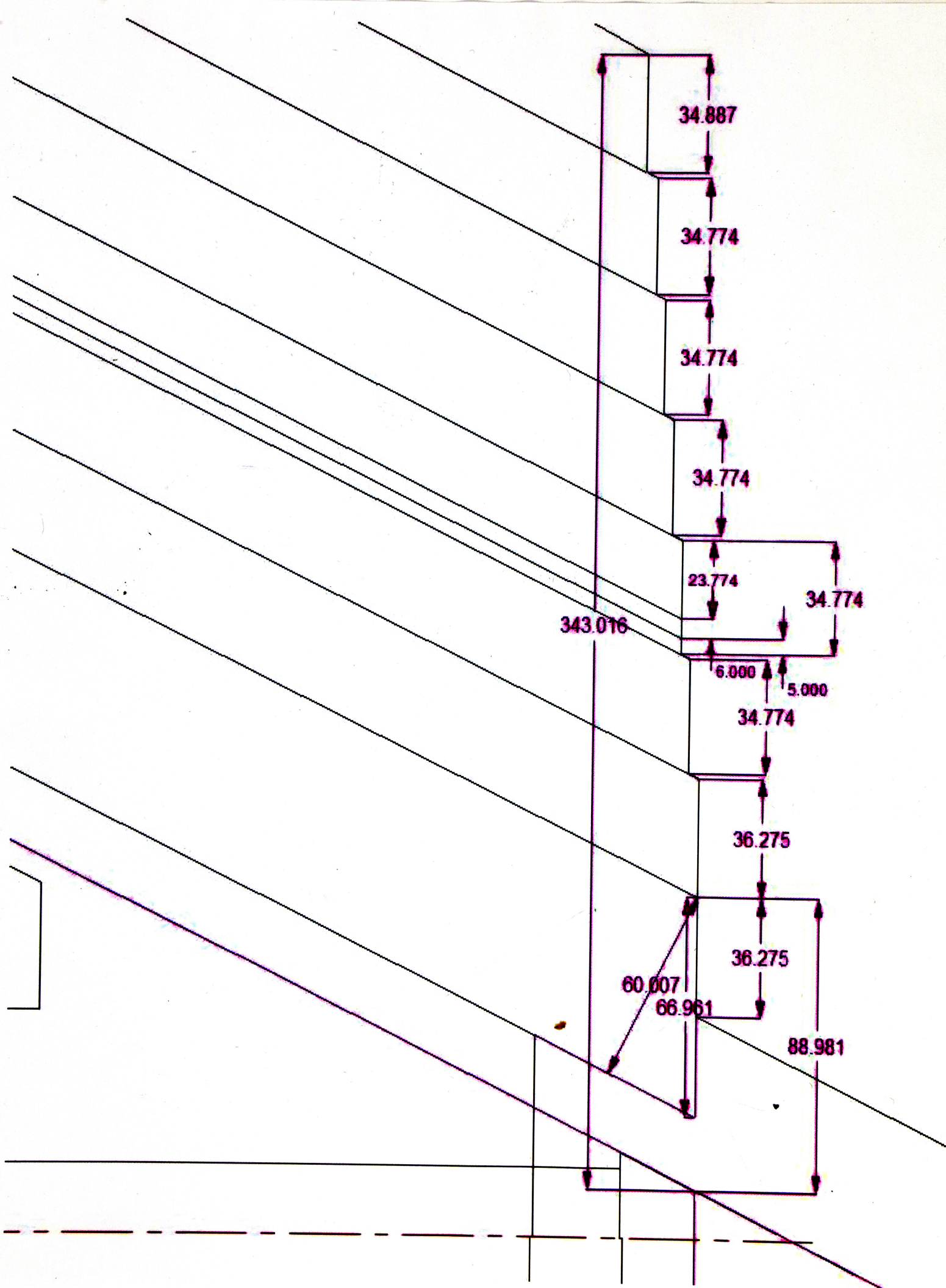


Camera ht. assumed as
being about 4ft. - 5ft.
(vertically) above the floor
of the Grand Gallery. with a 28 mm lens.
Additionally please shoot
a picture of the South Wall
of the Grand Gallery. Thank you!

(a 50mm lens takes in slightly
less than half of this angular
view.)

Try to get the shots along a
straight line (don't waver back
& forth across the width of the Gallery.)

26.27674176"
87.7622577"
61.38551594"



Frame	Stone	Width	Length	Scale Factor	Length	Average of two measures	Average of all measures	Weighted averages for each stone			
1	1	1.46	0.4	28.76712329	11.50685					Stone	Length
	1	1.47	0.38	28.57142857	10.85714	11.18199609	11.06925891			1	10.95652
	2	1.47	1.385	28.57142857	39.57143					2	35.96897
	2	1.5	1.42		28	39.66571429	37.8173399			3	33.80394
	3	1.5	1.28		28					4	37.09290
	3	1.52	1.225	27.63157895	33.84868	34.84434211	34.3241415			5	46.24019
	4	1.52	1.47	27.63157895	40.61842					6	48.27000
	4	1.67	1.47	25.1497006	36.97006	38.79424047	36.09969609			7	43.50000
	5	1.665	1.935	25.22522523	48.81081					8	42.64417
	5	1.74	1.9	24.13793103	45.86207	47.33643989	44.4165867			9	48.02172
	6	1.72	2.08	24.41860465	50.7907					10	52.24089
	6	1.75	2.08		24	50.35534884	46.92609908			11	44.64797
	7	1.77	1.98	23.72881356	46.98305					12	46.99542
	7	1.92	1.94		21.875	44.71027542	42.32221897			13	43.70471
2	1	1.38	0.36	30.43478261	10.95652					14	47.92836
	1	1.38	0.36	30.43478261	10.95652	10.95652174		10.95652		15	58.89850
	2	1.4	1.22		30					16	49.38279
	2	1.45	1.22	28.96551724	35.33793	35.96896552		35.96897		17	85.36982
	3	1.45	1.18	28.96551724	34.17931					18	93.16765
	3	1.47	1.17	28.57142857	33.42857	33.80394089		33.80394		19	42.50089
	4	1.47	1.37	28.57142857	39.14286					20	34.40123
	4	1.63	1.36	25.76687117	35.04294	37.09290096		37.0929		21	95.11410
	5	1.62	1.88	25.92592593	48.74074					22	53.76779
	5	1.69	1.76	24.85207101	43.73964	46.24019286		46.24019		23	52.65575
	6	1.68	1.98		25					24	51.04111
	6	1.75	1.96		24	47.04	48.27	48.27		25	43.99096
	7	1.75	1.875		24					26	53.74827
	7	1.88	1.88	22.34042553	42	43.5		43.5		27	53.59071
3	4	1.31	1.06	32.0610687	33.98473					28	51.17776
	4	1.43	1.05	29.37062937	30.83916	32.41194683				29	43.64505
	5	1.41	1.36	29.78723404	40.51064					30	53.52475
	5	1.46	1.35	28.76712329	38.83562	39.67312737				31	51.34479
	6	1.48	1.51	28.37837838	42.85135					32	49.76625
	6	1.54	1.52	27.27272727	41.45455	42.1529484				33	43.98018
	7	1.55	1.455	27.09677419	39.42581					34	100.40000
	7	1.61	1.46	26.08695652	38.08696	38.75638149				35	52.24981
	8	1.63	1.68	25.76687117	43.28834					36	46.27236
	8	1.71	1.71	24.56140351	42	42.64417178	40.65660359	42.64417			1842.00628
	9	1.7	2.01	24.70588235	49.65882						
	9	1.82	2.01	23.07692308	46.38462	48.02171946	45.54932127	48.02172			
	10	1.84	2.24	22.82608696	51.13043						
	10	1.85	2.35	22.7027027	53.35135	52.24089307	47.82676008	52.24089			
4	7	1.425	1.12	29.47368421	33.01053						
	7	1.49	1.11	28.18791946	31.28859	32.14955846					
	8	1.49	1.39	28.18791946	39.18121						
	8	1.53	1.39	27.45098039	38.15686	38.6690354					
	9	1.56	1.64	26.92307692	44.15385						
	9	1.64	1.64	25.6097561	42	43.07692308					
	10	1.59	1.83	26.41509434	48.33962						
	10	1.66	1.88	25.30120482	47.56627	47.95294385					
	11	1.65	1.97	25.45454545	50.14545						
	11	1.82	1.995	23.07692308	46.03846	48.09195804	46.36996566				
	12	1.79	2.15	23.46368715	50.44693						
	12	1.79	2.12	23.46368715	49.74302	50.09497207	46.80939553				
5	10	1.555	1.57	27.0096463	42.40514						
	10	1.55	1.63	27.09677419	44.16774	43.28644332					
	11	1.56	1.71	26.92307692	46.03846						
	11	1.67	1.72	25.1497006	43.25749	44.64797328		44.64797			
	12	1.64	1.87	25.6097561	47.89024						
	12	1.69	1.855	24.85207101	46.10059	46.99541781		46.99542			
	13	1.7	1.77	24.70588235	43.72941						
	13	1.75	1.82		24	43.68	43.70470588	41.31311267	43.70471		
	14	1.76	2.01	23.86363636	47.96591						
	14	1.78	2.15	23.59550562	50.73034	49.34812308	48.63824162				
	15	1.75	2.44		24	58.56					
	15	1.73	2.44	24.27745665	59.23699	58.89849711	55.77431027	58.8985			
6	12	1.55	1.6	27.09677419	43.35484						
	12	1.59	1.64	26.41509434	43.32075	43.33779671					
	13	1.6	1.49		26.25						

	13	1.67	1.54	25.1497006	38.73054	38.92151946					
	14	1.66	1.9	25.30120482	48.07229						
	14	1.67	1.9	25.1497006	47.78443	47.92836015		47.92836			
	15	1.67	2.225	25.1497006	55.95808						
	15	1.7	2.25	24.70588235	55.58824	55.77315956					
	16	1.72	2.02	24.41860465	49.32558						
	16	1.75	2.06	24	49.44	49.3827907	45.21151646	49.38279			
7	15	1.52	1.935	27.63157895	53.46711						
	15	1.58	1.95	26.58227848	51.83544	52.65127415					
	16	1.57	1.78	26.75159236	47.61783						
	16	1.69	1.78	24.85207101	44.23669	45.92726039					
	17	1.68	3.4	25	85						
	17	1.69	3.45	24.85207101	85.73964	85.36982249	80.25399019	85.36982			
	18	1.69	3.93	24.85207101	97.66864						
	18	1.8	3.8	23.33333333	88.66667	93.16765286	90.19142981	93.16765			
8	16	1.33	1.31	31.57894737	41.36842						
	16	1.39	1.3	30.21582734	39.28058	40.3244983					
	17	1.4	2.55	30	76.5						
	17	1.52	2.67	27.63157895	73.77632	75.13815789					
	18	1.56	3.44	26.92307692	92.61538						
	18	1.73	3.37	24.27745665	81.81503	87.21520676					
	19	1.71	1.77	24.56140351	43.47368						
	19	1.78	1.76	23.59550562	41.52809	42.50088705	40.19851279	42.50089			
	20	1.78	1.49	23.59550562	35.1573						
	20	1.86	1.49	22.58064516	33.64516	34.40123233	32.71203471	34.40123			
9	19	1.57	1.43	26.75159236	38.25478						
	19	1.6	1.43	26.25	37.5375	37.89613854					
	20	1.59	1.2	26.41509434	31.69811						
	20	1.64	1.185	25.6097561	30.34756	31.02283709					
	21	1.66	3.895	25.30120482	98.54819						
	21	1.75	3.82	24	91.68	95.11409639	91.26510919	95.1141			
	22	1.765	2.285	23.79603399	54.37394						
	22	1.825	2.31	23.01369863	53.16164	53.76779076	51.81641072	53.76779			
10	21	1.53	3.29	27.45098039	90.31373						
	21	1.62	3.26	25.92592593	84.51852	87.416122					
	22	1.63	1.93	25.76687117	49.73006						
	22	1.68	2	25	50	49.86503067					
	23	1.683	2.12	24.95543672	52.90553						
	23	1.675	2.09	25.07462687	52.40597	52.655748	52.655748	52.65575			
	24	1.69	2.06	24.85207101	51.19527						
	24	1.725	2.09	24.34782609	50.88696	51.04111114	49.62968452	51.04111			
	25	1.73	1.86	24.27745665	45.15607						
	25	1.78	1.815	23.59550562	42.82584	43.99095603	42.47519103	43.99096			
11	24	1.69	1.885	24.85207101	46.84615						
	24	1.66	1.96	25.30120482	49.59036	48.21825765					
	25	1.645	1.64	25.53191489	41.87234						
	25	1.72	1.64	24.41860465	40.04651	40.95942603					
	26	1.695	2.17	24.77876106	53.76991						
	26	1.712	2.19	24.53271028	53.72664	53.74827351	53.74827351	53.74827			
	27	1.715	2.19	24.48979592	53.63265						
	27	1.702	2.17	24.67685076	53.54877	53.59070961	52.29783637	53.59071			
	28	1.73	2.115	24.27745665	51.34682						
	28	1.725	2.095	24.34782609	51.0087	51.17775823	51.28429837	51.17776			
	29	1.65	1.73	25.45454545	44.03636						
	29	1.675	1.725	25.07462687	43.25373	43.64504749	43.33471887	43.64505			
12	27	1.66	2.02	25.30120482	51.10843						
	27	1.675	2.03	25.07462687	50.90149	51.00496314					
	28	1.685	2.045	24.92581602	50.97329						
	28	1.67	2.06	25.1497006	51.80838	51.3908385					
	29	1.64	1.72	25.6097561	44.04878						
	29	1.69	1.69	24.85207101	42	43.02439024					
	30	1.71	2.2	24.56140351	54.03509						
	30	1.735	2.19	24.2074928	53.01441	53.52474847	52.88432545	53.52475			
	31	1.725	2.08	24.34782609	50.64348						
	31	1.735	2.15	24.2074928	52.04611	51.34479389	51.15174328	51.34479			
	32	1.74	2.08	24.13793103	50.2069						
	32	1.72	2.02	24.41860465	49.32558	49.76623897	46.63730669	49.76624			
13	30	1.64	2.06	25.6097561	52.7561						
	30	1.64	2.02	25.6097561	51.73171	52.24390244					
	31	1.65	1.99	25.45454545	50.65455						
	31	1.655	2.02	25.3776435	51.26284	50.95869267					
	32	1.675	2.05	25.07462687	51.40299						
	32	1.71	2	24.56140351	49.12281	50.26289605					

	33	1.705	1.8	24.63343109	44.34018						
	33	1.685	1.75	24.92581602	43.62018	43.980177	40.4872395	43.98018			
	34	1.68	4	25	100						
	34	1.675	4.02	25.07462687	100.8	100.4	96.51688609	100.4			
14	32	1.515	1.46	27.72277228	40.47525						
	32	1.55	1.45	27.09677419	39.29032	39.88278505					
	33	1.56	1.4	26.92307692	37.69231						
	33	1.62	1.4	25.92592593	36.2963	36.99430199					
	34	1.645	3.78	25.53191489	96.51064						
	34	1.81	3.825	23.20441989	88.75691	92.63377219					
	35	1.81	2.35	23.20441989	54.53039						
	35	1.95	2.32	21.53846154	49.96923	52.24980875	52.24980875	52.24981			
	36	1.93	2.12	21.76165803	46.13472						
	36	2	2.21	21	46.41	46.27235751	45.22974237	46.27236			
16	31	0.96	0.575	43.75	25.15625						
	31	1.02	0.59	41.17647059	24.29412	24.72518382					
	32	1.03	0.73	40.77669903	29.76699						
	32	1.165	0.725	36.05150215	26.13734	27.95216467					
	33	1.16	0.77	36.20689655	27.87931						
	33	1.24	0.77	33.87096774	26.08065	26.97997775					
	34	1.27	2.31	33.07086614	76.3937						
	34	1.575	2.32	26.66666667	61.86667	69.13018373					
	35	1.575	1.72	26.66666667	45.86667						
	35	1.855	1.72	22.64150943	38.9434	42.40503145					
	36	1.825	2.05	23.01369863	47.17808						
	36	2.09	2.05	20.09569378	41.19617	44.18712722					
						Sum of each column	1788.144859	1842.006			
January 15, 2006				Ideal length	1842.134	Error	53.98885577	0.127452			

Frame 1 *Frame 1*

| 1 |

2 |

3 |

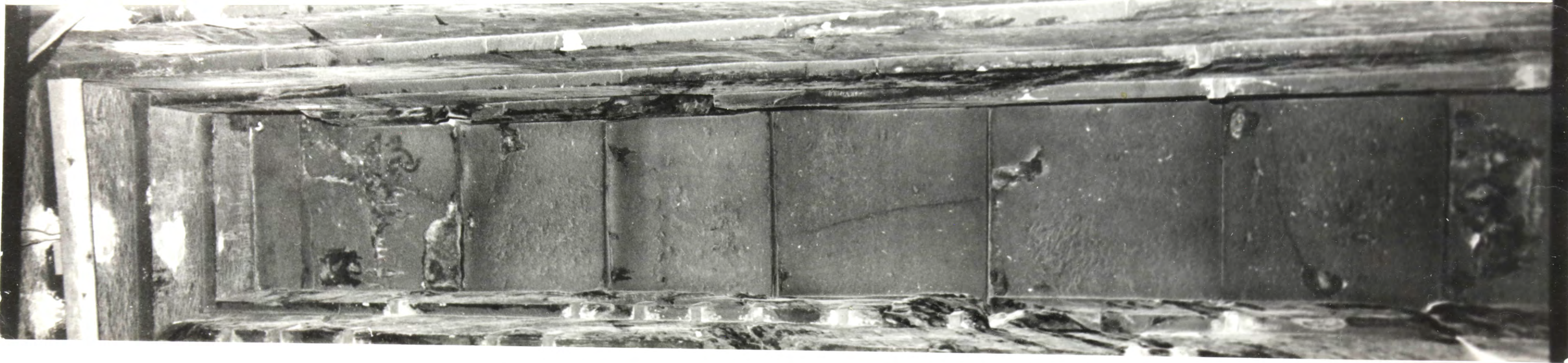
4 |

5 |

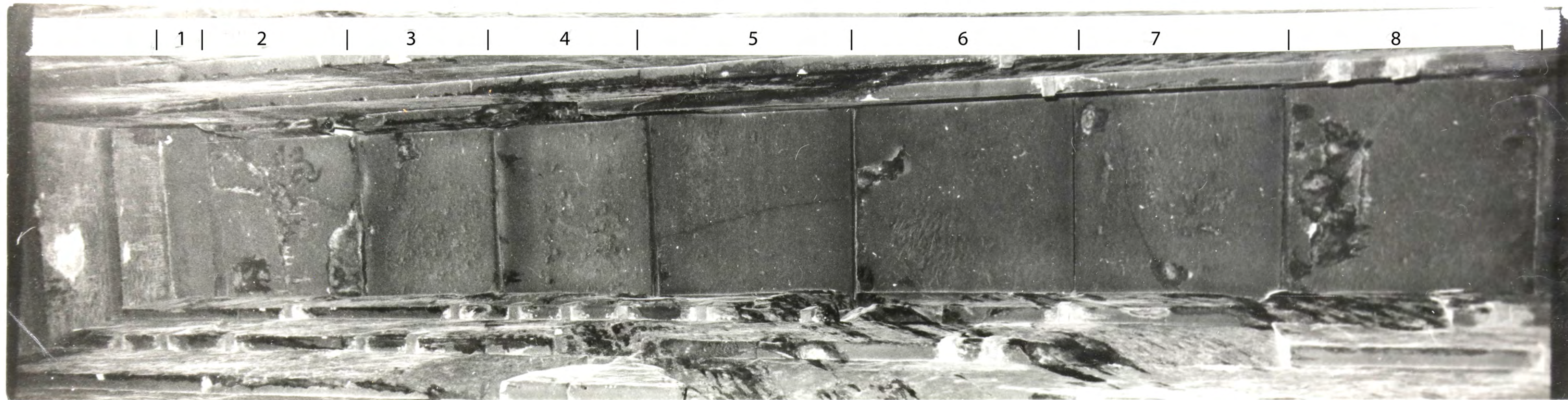
6 |

7 |

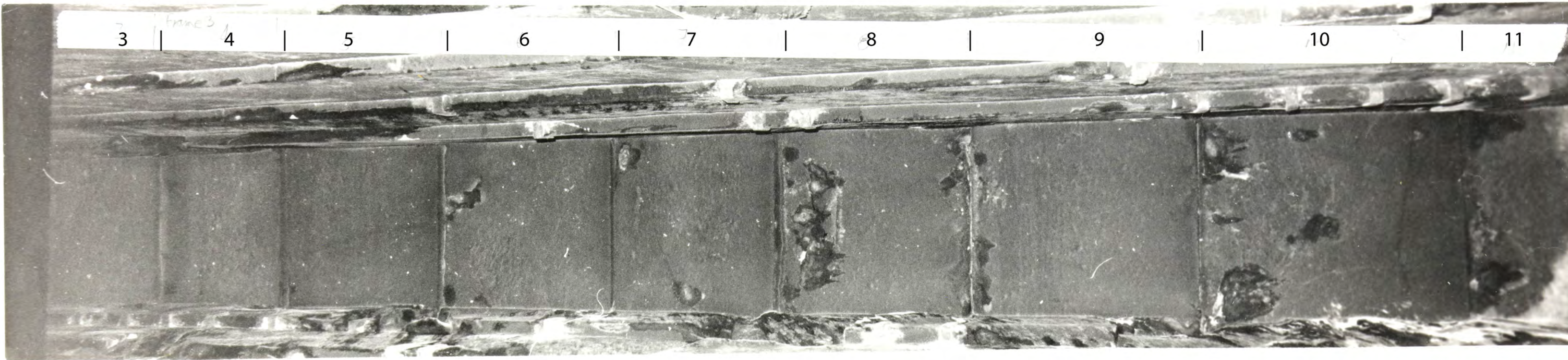
8



Frame 2



Frame 3



Frame 4

6

7

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9

10

11

12

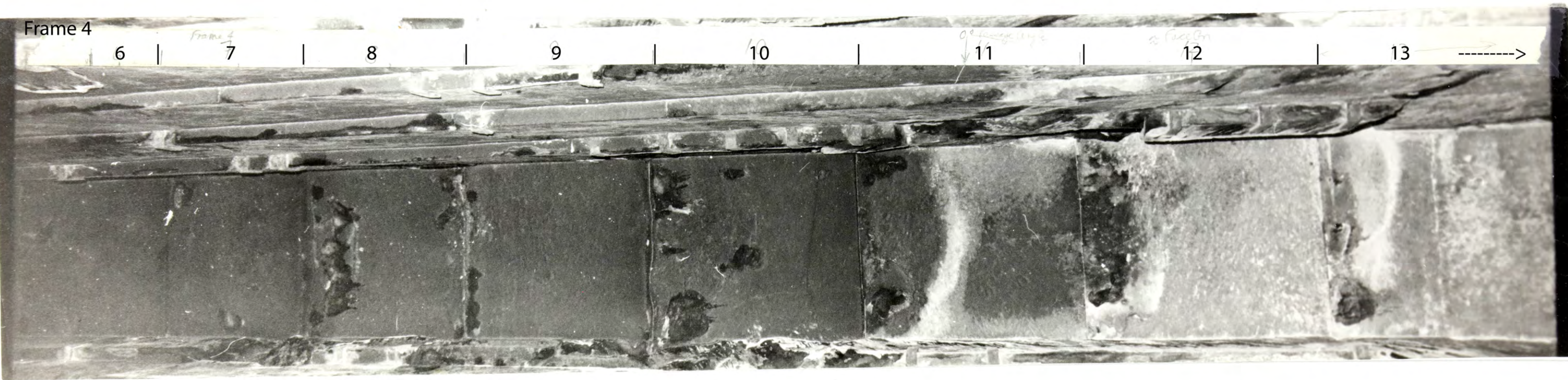
13

----->

Frame 4

0° to 180°

Face Bn



Frame 5

9

10

11

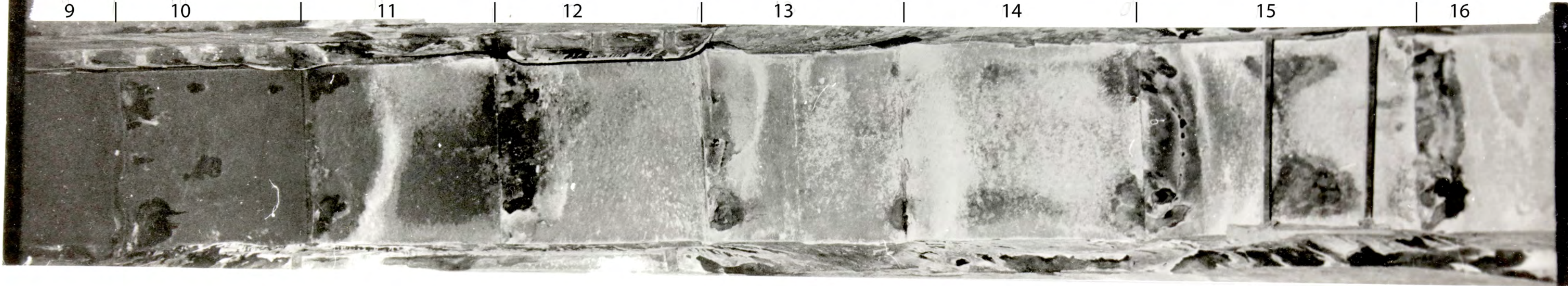
12

13

14

15

16



Frame 6

11 |

12

Frame 6

13 |

14 |

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17a

18



Frame 7

14

Frame 7

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17

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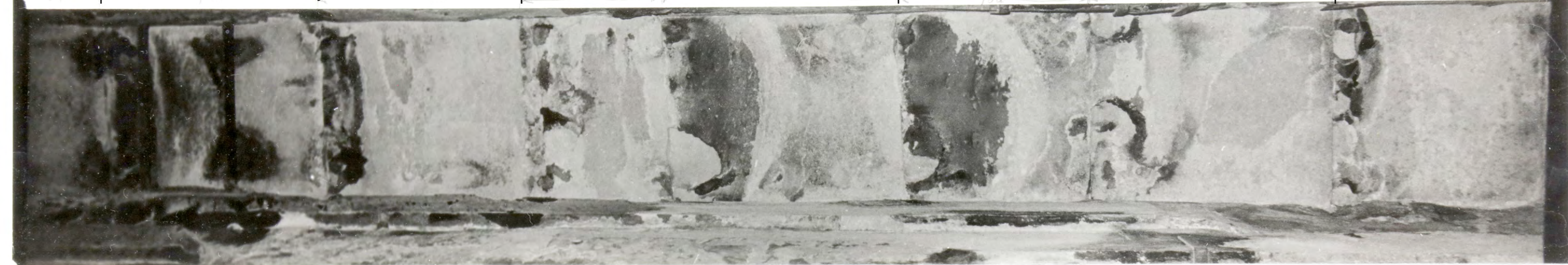
|

18

18a

18b

19



Frame 8

15

frame 816

17

18

19

20

21



Frame 9

18 frame 9

18.5 for new (9/10/82 am)

19

20

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22

23



Frame 10

20

21

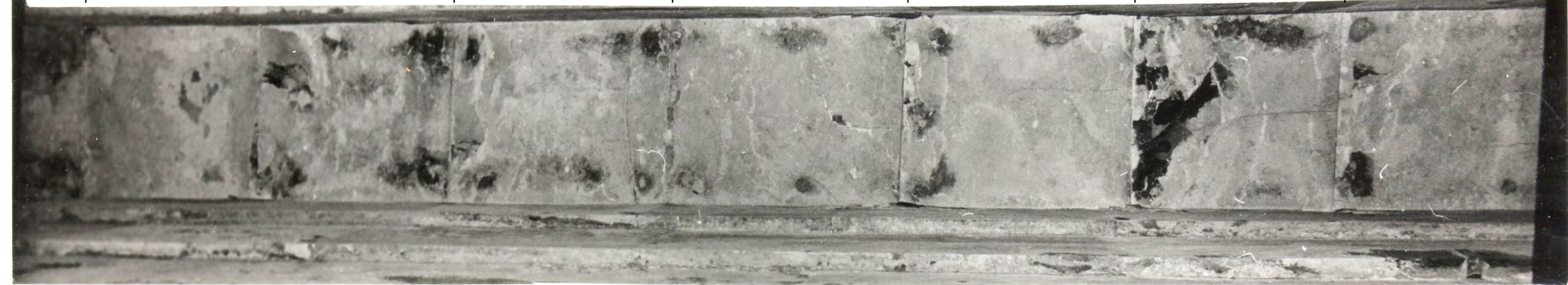
22

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26



Frame 11

23

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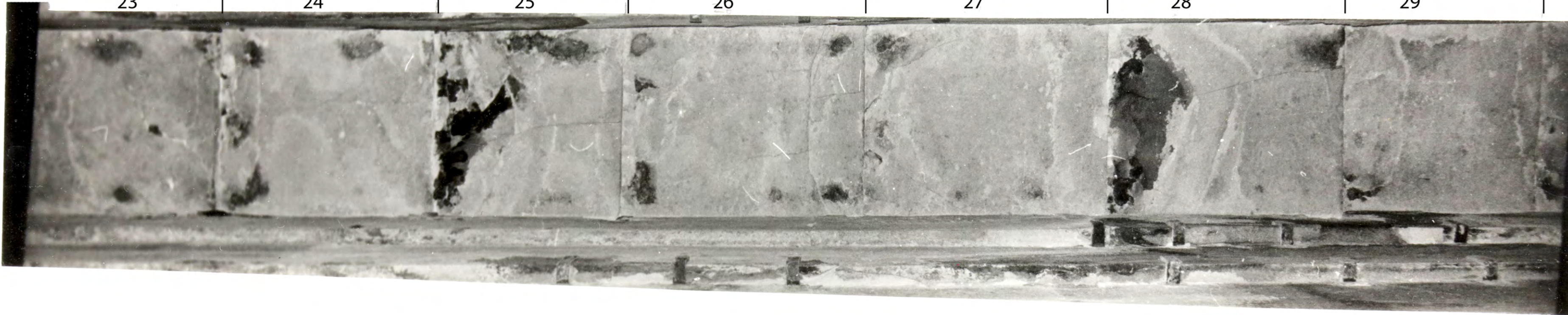
25

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Frame 12
26

Frame 12
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228

229

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Frame 14

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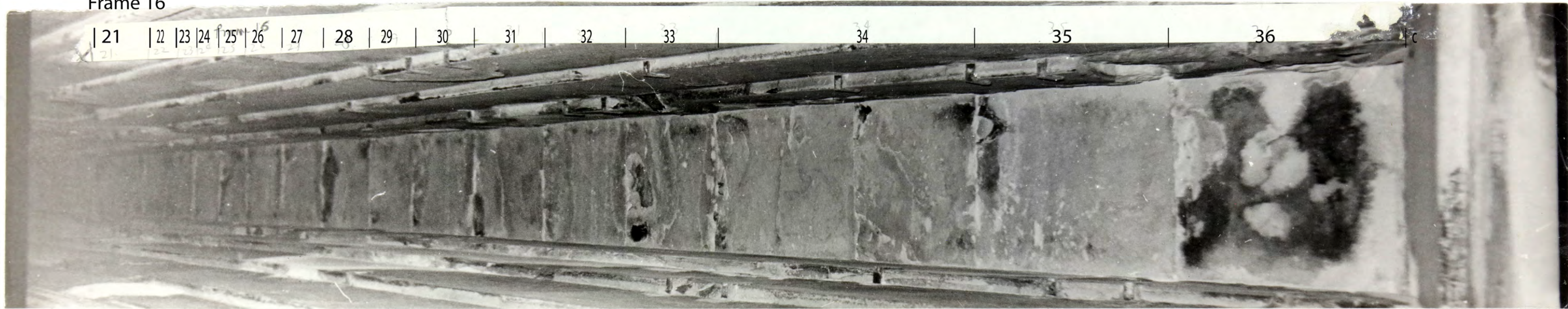
35

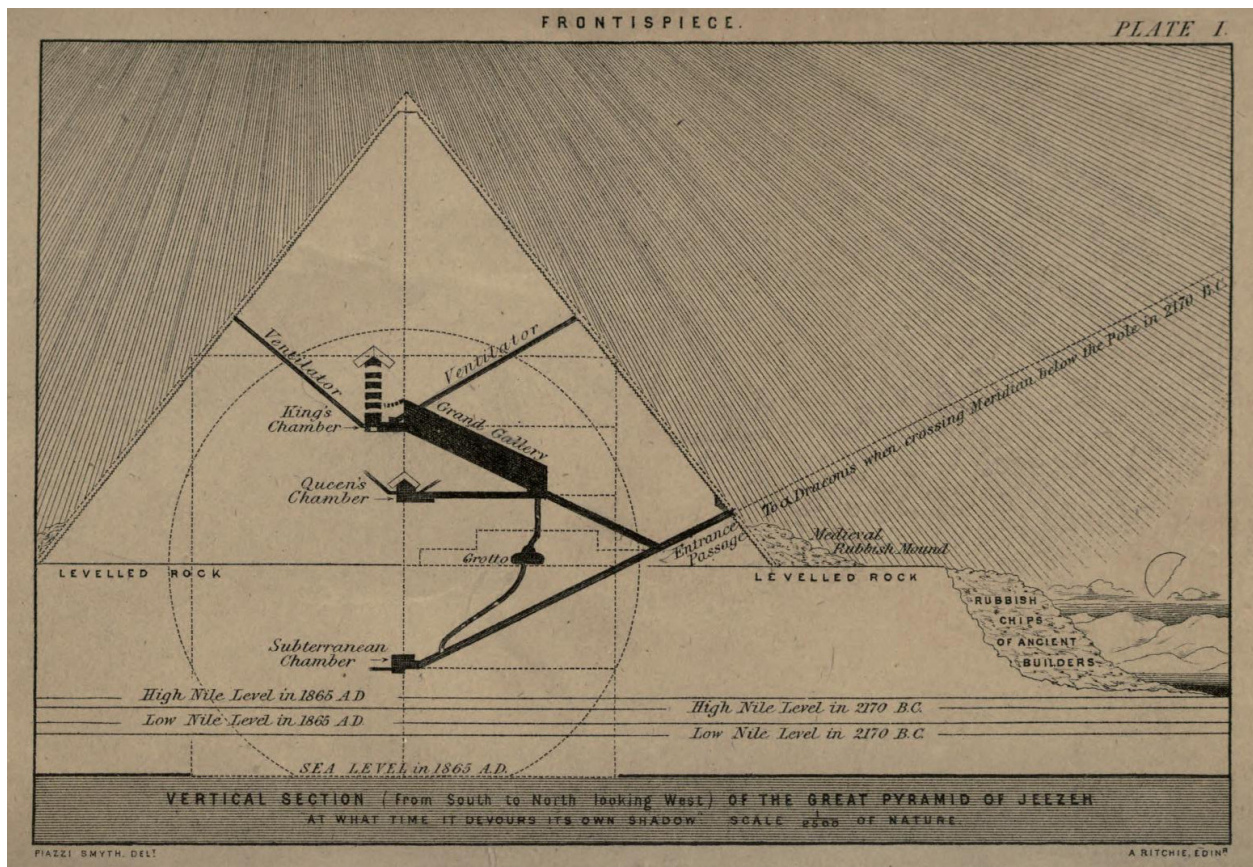
36

| N. Wall of G.G.



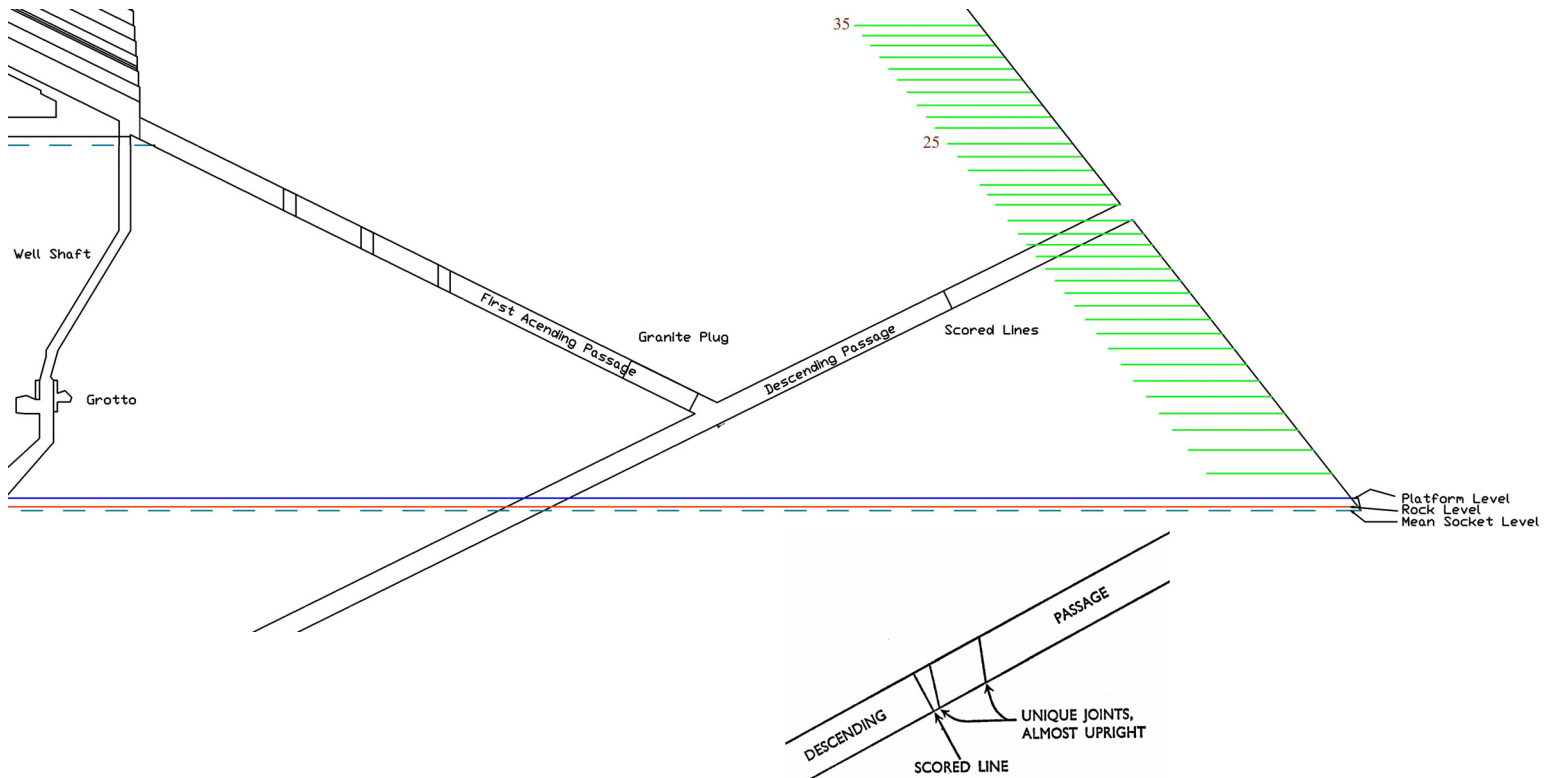
Frame 16





The above image was published by Pizzi Smyth between 1865 - 1880 in "Our Inheritance in the Great Pyramid." It projects the angle of the Descending Passage pointing toward the Pole Star in 2170 B.C., later to be determined as in 2140 B.C.

Furthermore there are "Scored Lines" in the Descending Passage exactly on opposite walls and parallel to each other. Their preciseness and angle has engaged additional research. The point in the passage is seen in the following graphic of a segment of the passageway.



In "Great Pyramid Passages" Volume II, 1924, pages 159-161, Morton Edgar writes:

Later, in the 3rd Edition of his *Our inheritance in the Great Pyramid*, page 444, when reviewing the matter of the building date, Professor Smyth wrote : "though I did, no doubt, years ago mentally conclude and publish 2170 B.C. to be most probably the year intended to be memorialised as the foundation year, by the architect of the Great Pyramid, it was no ridged deduction of scientific exactitude." Still later, in his 4th Edition of the same publication, page 388, he refers to a certain astronomical table prepared by Dr. Brunnnow, Astronomer-Royal for Ireland, in which the date 2248 B.C. instead of 2170 B.C. is given as the year when the particular stars, and the equinoctial point, were in the necessary positions on the meridian of the Pyramid.

This table was re-calculated by R. A. Proctor of Cambridge University, who had his own theories regarding the purpose of the Great Pyramid. Although Professor Smyth did not agree with these theories, he nevertheless recognised R. A. Proctor's ability as an astronomer. Referring to the latter's publication on the Pyramid, Professor Smyth wrote : "I am happy to point out that its author does one good thing toward the end of his essay, on his own sound knowledge of modern practical astronomy and its methods of calculation. This good thing is, that he computes the date for the Pleiades stars being in the [desired] position described in No. 4 of Dr. Brunnnow's list, and 'says that he finds it, not 2248 B.C. but more nearly 2140 B.C. To which I can only say for the reasons pointed out . . . very probably."

This year 2140 B.C. pronounced by Professor C. Piazzi Smyth, after further careful consideration, to be very probably the correct date of the Great Pyramid's erection, because of the astronomical coincidence of the notable stars, Alpha Draconis and Alcyone of the Pleiades, with the angle of the Descending Passage, and with the meridian of the building, is corroborated by the Pyramid itself, by means of its characteristic use of an inch-year measurement along its time-passages.

Professor C. Piazzi Smyth, when measuring in the upper built part of the Descending Passage during the year 1865, carefully noted on each side wall two vertical joints in the masonry, the two joints on the east wall being opposite the corresponding two on the west wall. Although these joints are conspicuous because running in a different direction to the other joints, all of which are at right-angles to the incline of the passage, they do not appear to have any special significance in themselves. Their purpose seems to be to direct attention to a very peculiar feature in the passage: immediately below them there is, on each side wall, and opposite to one another, a *scored line*, drawn from roof to floor exactly at right-angles to the incline of the passage. These scored lines, which may still be seen by all who visit the Pyramid, because of the firmness and truth with which they were drawn by the ancient workman, reminded Professor Smyth of a similar scored line on the floor of one of the corner socket foundations of the Pyramid.

Writing later about the scored lines in the Descending Passage, Professor Smyth said : " I looked at them with still more interest afterwards, when there appeared good reason to consider them the work of the very same hand that laid out in forethought, *Promethean* manner, the entire proportions of the whole Great Pyramid. For when Messrs. Aiton and Inglis excavated and (with my assistance in finding its site) laid bare the south-west socket of the Great Pyramid in April, 1865,—there, upon the fair white flattened face of the said socket-rock, while three sides were formed by raised edges of rock, the fourth and outer side was defined simply by a line; but a line ruled apparently by the very same hand and selfsame tool which had also drawn these other truthful lines in the entrance passage" (*Our Inheritance in the Great Pyramid*, 3rd Edition, page 435).

The scored lines on the walls of the Descending Passage, therefore, suggest a connection with the foundation of the building, because of the similarity in their appearance to the line drawn on the foundation corner socket-floor. Their existence appears to be for chronological purposes, in order to furnish an additional proof of the great monument's erection. And so we find, when we apply the usual Pyramid inch to a year, that the scored lines indicate the date 2140 B.C., already independently computed by the latest and most modern method of astronomical calculations as being the probable year of the completion in the erecting of the structure.

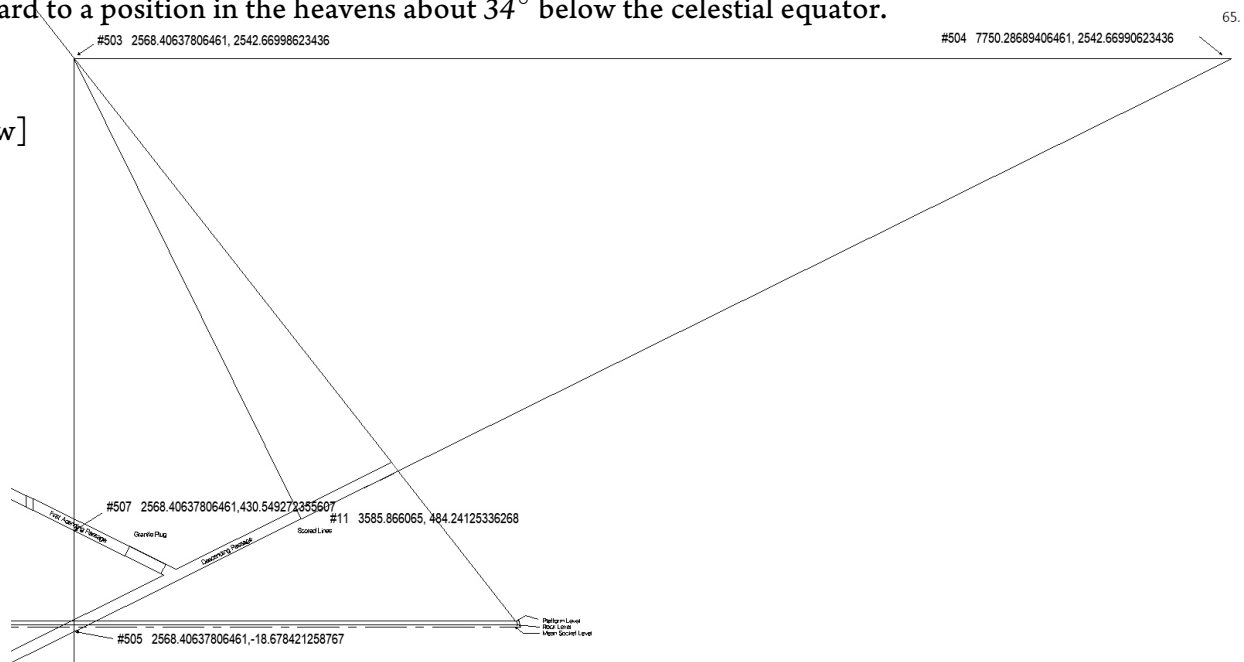
When we measure from the north wall of the Grand Gallery as indicating the date 33 A.D., backward down the floor-line of the First Ascending Passage to the "Point of Intersection," and from thence up the floor-line of the Descending Passage to the scored lines, we find that the total number of Pyramid inches equals the period of years from Spring 33 A.D., back to Autumn 2140 B.C. (This period is 2171.5 years, and the measurement referred to is $2171.5330 + \text{Pyramid inches}$, as will be seen in the diagram.)

That we have correctly interpreted the ancient architect's purpose when he caused these strange lines to be drawn on the walls of the Descending Passage, namely, to mark the year when his mighty building was erected, is further supported by the fact that the lines themselves at that very date pointed directly upward to the Pleiades, just as the Descending Passage in the same manner pointed to Alpha Draconis. R. A. Proctor calculated that in the year 2140 B.C., the Pleiades, when on the meridian of the Great Pyramid, were at an altitude of $63\frac{2}{3}^\circ$ above the southern horizon (See his publication, *The Great Pyramid*, page 146). The scored lines are drawn at right-angles to the incline of the passage; and as the passage descends southward at the inclination of, practically, $26\frac{1}{3}^\circ$, it follows that the lines on the walls point upward at an angle of $63\frac{2}{3}^\circ$ above the southern horizon, and therefore directly toward the Pleiades, for 90° minus $26\frac{1}{3}^\circ = 63\frac{2}{3}^\circ$.

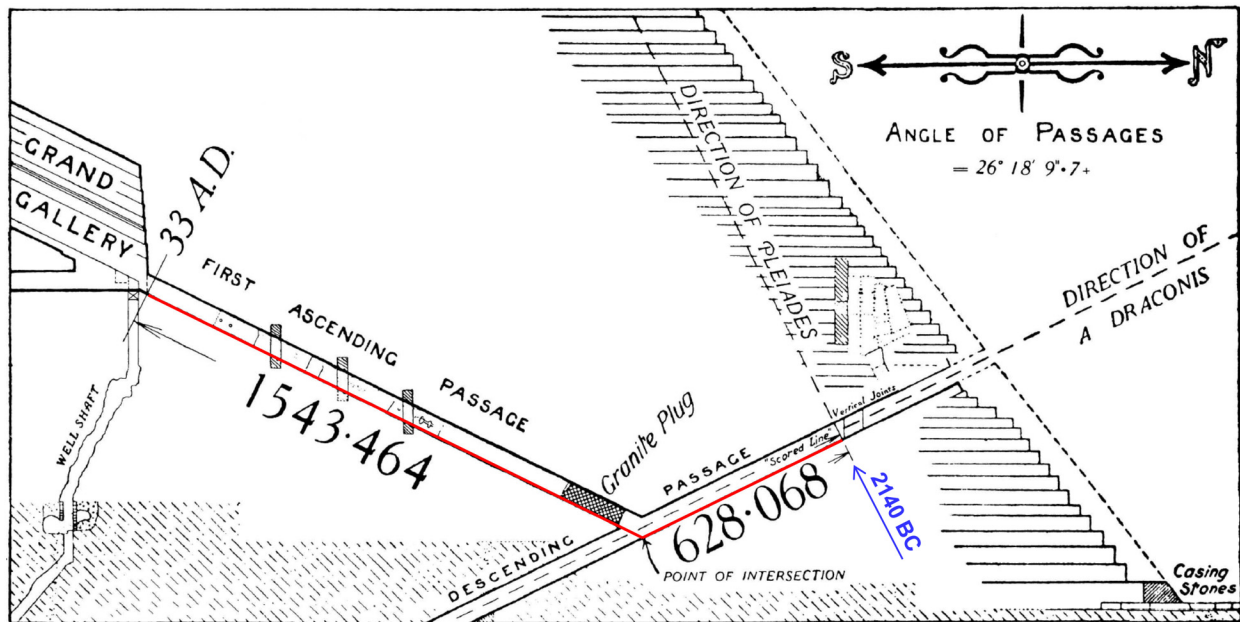
When drawing attention to the wonderful celestial coincidences with the meridional line of the Great Pyramid, Professor C. Piazzi Smyth is very careful that his readers shall not make the mistake of supposing that the Grand Gallery pointed directly to the Pleiades, in the same way that the Descending Passage pointed to Alpha Draconis. We are to understand, rather, that the vertical plane of the Grand Gallery was, during the period in question, in the direction of the meridian of the Pleiades. Alcyone was at that date, 2140 B.C., very nearly an equatorial star, and had the Grand Gallery been constructed to point directly to it, the angle of the passage's inclination would require to have been nearly $63\frac{2}{3}^\circ$ instead of $26^\circ 18' 9''.7$. As it is, the direction of the Grand Gallery points upward to a position in the heavens about 34° below the celestial equator.

[Illustrations follow]

CAD
Offsets
Points



The dating and directions are shown with the following diagram:



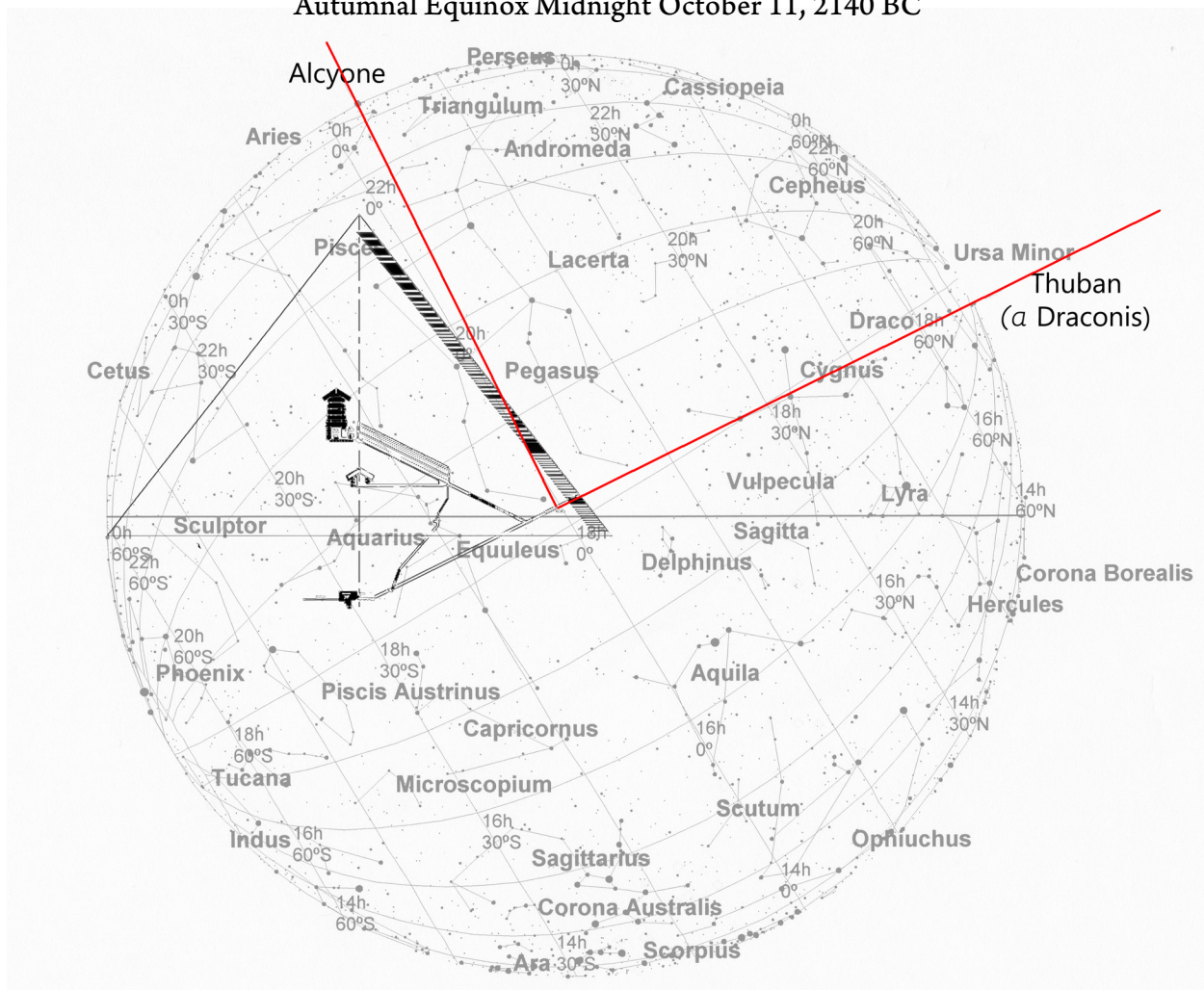
GPPv2 pg. 159-161:

$1543.464 + 628.068 = 2171.532$ in.

April 33 AD = 32.25 years

$2171.532 - 32.25 = 2139.28$ in → Autumn 2140 BC

The date and directions are confirmed with the following time-line sky map for
Autumnal Equinox Midnight October 11, 2140 BC



The Descending Passage and Alpha Draconis

I .

$29^{\circ} 58' 51''$	N	Latitude of the Great Pyramid
$-26^{\circ} 18' 9''$	.726	<u>Angle of (North Facing) Descending Passage</u>
$3^{\circ} 40' 41''$	.274	Actual Angle between the Earth's Polar Axis and the angle of descent.

II .

in astronomical language:

$90^{\circ} 00' 00''$	"Due North"
$-3^{\circ} 40' 41''$	.726 <u>Difference angle'</u>
$86^{\circ} 19' 18''$	.726 Expected declination of a pole star which would shine down the Descending Passage at some time during its 24 hour circuit about the Polar Axis of the Earth.

III .

$+86^{\circ} 20' 47''$	.5	Declination of Alpha Draconis in 2140 B.C.
$-86^{\circ} 19' 18''$	.726	<u>Expected Declination (given above)</u>
$0^{\circ} 01' 28''$	.774	Difference

Right Ascension of Alpha Draconis in 2140 B.C. = $184^{\circ}.841313732$
= 12h 19m 21.9s

Alpha Draconis passed Lower Culmination at 19m 21.9s after midnight on the Autumnal Equinox of 2140 B. C.

The Scored Lines in the Descending Passage and Eta Tauri (Alcyone)

1. The Great Pyramid's Descending Passage is displaced $3^{\circ} 40' 41''.3$ from the Earth's Polar Axis.
2. The Scored Lines (scribed in the walls of the Descending Passage) are at right angles to the angle of the passage's descent.

Therefore, by the laws of geometry, the scored lines must be displaced $3^{\circ} 40' 41''.3$ from the Equator. Since the course of the Descending Passage is smaller (in angle) than the Great Pyramid's Latitude North of the Equator, the scored lines must have a positive declination; i.e., $+3^{\circ} 40' 41''.3$.

$+4^{\circ} 22' 38''$	.2	Declination of Alcyone in 2140 B.C.
$- +3^{\circ} 40' 41''$	.3	<u>Declination indicated by the Scored Lines.</u>
$0^{\circ} 41' 56''$	.9	Difference

Right Ascension of Alcyone in 2140 B. C. = $1^{\circ}.029285961$
= 0h 4m 7.0s

Alcyone crossed the Meridian at 4m 7s after Midnight on the Autumnal Equinox of 2140 B. C.

Star Pointings of the Great Pyramid

Some controversy exists over the validity of the claim that the Great Pyramid's Descending Passage pointed in the direction of Alpha Draconis at midnight on the Autumnal Equinox in the year 2140 B.C. and that the Scored Lines, scribed within the same passage, pointed in the direction of Eta Taurus (Alcyone, in the Pleiades) at the same time.

Precession of the Earth's axis is known to cause the poles of the Earth to point toward different stars in different eras. This slow shifting of Earth's axis describes a generally circular path on the sky. (Actually, this path never closes on itself, but gyrates). Precession is caused by the forces which the Sun and Moon exert on the Earth. The Moon's inclination to the Ecliptic (the Sun's path in the sky) of about 5° is the principle factor in the precession-causing forces.

The *rate* of precessional motion is constantly changing also. There is no *fixed* period for the duration of the precessional cycle. In 1979, the rate of precession was 50".273938 of arc per year. In 1980, the rate of precession was 50".27416 of arc per year. That is, the *rate* of precession is accelerating at a rate of 0".00222 of arc per year. It is also possible to project backward in time to determine the rate of precession for any era.

Note: *The American Ephemeris and Nautical Almanac (1979 Edition), page 532, gives the rate of general precession as $50''.2564 + 0.0222 \times T$ where T is the number of Tropical Centuries from the year 1900.0. Actually, in this analysis, the precessional equations for Right Ascension and Declination were used separately in order to be able to analyze any star whose coordinates do not lie exactly on the Ecliptic.*

By starting with 1979 star positions, the rate of precession in Right Ascension (Astronomer's version of Longitude) and Declination (Astronomer's Latitude) is calculated for the year 1978. The corrections are applied to the star's 1979 coordinates, then the precessional elements are calculated for 1977. The corrections are applied to the star's 1978 coordinates. This process is repeated until the year 2140 B.C. is reached. By applying this iterative process, any star's position can be found for the year 2140 B.C. In our analysis, Alpha Draconis (Thuban) and Eta Taurus (Alcyone) were "precessed" back to 2140 B.C. The results show a remarkably close agreement with those predicted by using the Descending Passage as a pointer for Alpha Draconis and the scored lines as a pointer for Eta Taurus.

Note: *The iterative process could have been broken down into 1/2 year or even daily precession increments, but the absolute accuracy would be even more questionable due to the nature of the equations for precession which are given in the American Ephemeris and Nautical Almanac.*

Note: *The Following Equations were used in the iterative process:*

*(RA new) = (RA previous) - m - ((n * sine (RA previous)) * tan (Dec previous))*

*(Dec new) = (Dec previous) - (n * cosine (RA previous))*

where m is defined as $0''.012807539 - (7.75 \times 10^{-6} T)$

and n is defined as $0''.0055666902 + (2.361111 \times 10^{-6} T)$

where T is the number of Tropical Centuries from 1979 AD.

All elements are expressed in decimal degrees to minimize multiple conversion errors.

(m is the precessional element for Right Ascension and n is the element which governs Declination.)

Using this analysis method, the Declination of Alpha Draconis computes as 86° 20' 47".5 for the year 2140 BC. The Declination of the Great Pyramid's Descending Passage can be computed as 86° 19' 18".726. The difference between the two values amounts to only 0° 01' 28".774

At this point, it would be fitting to consider just how big of an angular "window" one would have if one were at the lowest reach of the Descending Passage, looking back up toward the entrance. Using trigonometry, the angle computes to 0° 39' 12".38, or just a little larger than the angular diameter of the Sun or the Moon. (Of course, neither the Sun nor the Moon ever shine down the Descending Passage because it faces to the North, and the Sun and Moon are always South of the Great Pyramid.)

Note: *This is computed by taking the height of the Passage at the entrance (47.2748 inches and dividing this by the length of the Descending Passage from the entrance, down to the start of the Small Horizontal Passage (4144.1656964 inches), and taking the arctangent of the resulting quotient. The result is 39' 12".38.*

The same precessional analysis was run for Eta Taurus (Alcyone). The results show that in 2140 BC., Alcyone was at Declination +4° 22' 38".2 N, while the scored lines point toward 3° 40' 41.3" N. The difference amounts to 0° 41' 56".9, which is about 2/3 of a degree off. It is important to note that this analysis does not include the proper motion of the stars themselves, although this would change the results very little for the Pleiades. Also, the assumption is made that the scored

lines are absolutely perpendicular to the course of the Descending Passage. This point is difficult to know for certain because the scored lines are only slightly over 47 inches long and walls upon which they are scored are not smooth at present.

The claim has been made that Alcyone passed the meridian (transited) at midnight and that Alpha Draconis shown down the Descending Passage at the time of its lower culmination (its lowest point below the true direction of the earth's polar axis) at the same time. By the same computer program, the results show that the actual transit took place at four minutes past midnight, and the lower culmination took place at 19 minutes past midnight. Owing to the fact that the precessional equation for Right Ascension involves the multiplication of a sine times a tangent of two angles, there is greater room for error than for the calculation of the Declination, which only involves the cosine of an angle. In the case of these two stars, it would be expected that the Right Ascension of Alcyone and the Declination of Alpha Draconis would be the two more accurate terms while the Right Ascension of Alpha Draconis and the Declination of Alcyone would be the least accurate. If we compare the results obtained against the ideal values, as pictured by the Great Pyramid, we see that our expectations are borne out in the results obtained.

Star Pointings for the Ascending Passage and the Grand Gallery

Since the Great Pyramid was built at 29° 58' 51" N. Latitude, its Southward pointing passages (the First Ascending Passage and the Grand Gallery) would be inclined to the South Polar Axis by the Latitude of the Great Pyramid plus their own upward angle of inclination (26° 18' 9".7), namely 56° 17' 00".726.

Conversely, the declination of these passages (measured from the Earth's Equator) would be:

-90° 00' 00"	(South Polar Axis)
+57° 17' 00".726	(Inclination from the Pole)
-33° 42' 59".174	South Declination of the Ascending Passages

Four interesting bright stars transited the Meridian at about the ideal declination. They were:

Star	R.A.	Dec.	Dec. Error
Gamma Crux	9h 24m 39.4s	-35° 27' 46".99	-1° 44' 47".72
Alpha Sag.	14h 43m 06.0s	-34° 56' 25".82	-1° 13' 26".65
Alpha Ara	12h 57m 25.4s	-34° 45' 37".31	-1° 02' 38".14
Delta Cor Aust	14h 30m 40.0s	-33° 29' 07".92	+0° 13' 51".25

Crux is the Southern Cross. Gamma Crux is the head of the Cross. When viewed from the floor at the 33.5 AD point, Gamma Crux lies on the slightly lower portion of the floor of the Grand Gallery.

Sagittarius is a centaur. Half man-half horse. In ancient literature, an excellent horseman was pictured as a centaur. A man who was so good that he became as the horse's head. A picture of Christ; a Perfect Man who is at-one with Doctrine (horses). The star Alpha Sagittarius is on the riser that appears just before the full floor length of the Grand Gallery. This riser was measured by Leonard Marzewski in the 1880s to be about 15 cm (7.576 inches) tall. The Edgars make no report about this riser.

Ara - Our Altar - upon which our incense-prayers are placed and carried up to the Father. The lowest star in the constellation falls on the vertical riser of the Grand Gallery's floor, just above Alpha Sagittarius

Corona Australis - The Southern Crown - The prize of the overcomers - the Crown of Life. The entire constellation of Ara is above the floor line of the Grand Gallery and goes from the floor to the third overlapping of the East Wall of the Grand Gallery.

These constellations crossed the opening of the Grand Gallery as it was being built, so the stars would have been visible at night, but the constellations crossed the Meridian at different times and at different months of the year. They would have made excellent "guideposts" for the builders of the Great Pyramid as the work progressed and the floor of the Grand Gallery was laid at its incline of 26° 18' 9.726+".

Brian Kutscher

Originally written: 4/26/81

Revised and entered into

D:\wordfilz\studies\GPSTARS.DOC: 1/11/95

Renamed Great Pyramid Southern Stars.doc on 9/2/2024

Theoretical Values for Passage and Casing Stone Angles

$$\sin^{-1}((\pi^{1/2})/4) = 26.30270169154726923946656615756^\circ$$

$$\cos^{-1}((16-\pi)^{1/2}/4) = 26.30270169154726923946656615756^\circ$$

$$\tan^{-1}((\pi^{1/2})/(16-\pi)^{1/2}) = 26.30270169154726923946656615756^\circ$$

$$26.30270169154726923946656615756 = 26^\circ 18' 9.726089570169262079638167216$$

$$^\circ = \text{ALT}(0176)$$

$$\sin^{-1}(4/(\pi^2+16)^{1/2}) = 51.853974012777452454524489216986^\circ$$

$$\cos^{-1}(\pi/(\pi^2+16)^{1/2}) = 51.853974012777452454524489216986^\circ$$

$$\tan^{-1}(4/\pi) = 51.853974012777452454524489216986^\circ$$

$$51.853974012777452454524489216986 = 51^\circ 51' 14''.306445998828836288161181148402$$

$$\pi = 3.1415926535897932384626433832795$$

$$(16-\pi) = 12.85840734641020676153735661672$$

$$(16-\pi)^{1/2} = 3.5858621482720451563582176011779$$

$$(\pi^2+16) = 25.869604401089358618834490999876$$

$$(\pi^2+16)^{1/2} = 5.0862171012540703991245083142357$$

Polar Diameter of Earth (GPP 1; 242)

Brian Kutscher – June 17, 2007

1992 Standard Equatorial Radius = 6378136.3 Meters

Multiply this by 39.37 inches per meter and divide by 12 inches per foot. Then multiply by 2 to get the equatorial diameter in British Feet = 41,851,204.3551666666666666666666667 Feet

Polar Diameter = Equatorial Diameter (1-f), where f = flattening factor of Earth = 0.00335281 = 1/298.257

Polar Diameter = 41,710,885.218692620315 Feet

Multiply this by 12 to get polar diameter in British Inches = 500,530,622.62431144378 British Inches

Divide this by 500,000,000 to obtain the number of British Inches per 1 Pyramid Inch = 1.00106124524862288756

The inverse of this is 0.99893987979890349524574522999362 (Pyramid Inches/1 British Inch)