

More Recent Surveys

John R Hoyle

David Hoyle

Robert Hoyle

Moel y Llyn Stone Ring



I had been aware since the nineteen seventies that there was a ring deep in the hills to the east of Tre Taliesin, but it was not on the maps at that time and I never took the opportunity to hunt it down. Last year – 2019 - my oldest son Robert wished to see this ring and set out to find it. As newer maps did have the ring marked this was not difficult. Later he and my youngest son David again set out, equipped with theodolite, tripod, measuring tape and note books, to make an accurate survey of the ring.

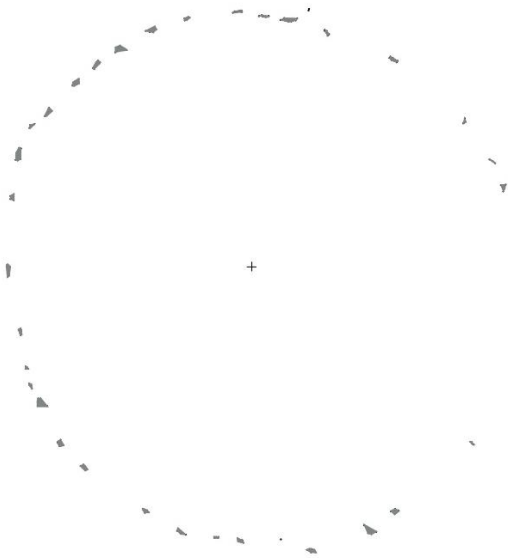
The Moel y Llyn stone ring is situated in a wild upland area. The ring diameter was found to be quite large, but the stones were small. It had thirty three visible stones and a diameter of about 22 metres. The small stones ranged in height from 10 cm to 40 cm. There were also two outliers at 23 metres and 43 metres distance from the assumed centre of the ring, which appeared to be approximately circular. Robert and David were of the opinion that there were perhaps more stones that were buried under the peaty soil. The views from the ring were limited in many places by the nearby surrounding hills, but part of the Llyn peninsula was visible through a gap.



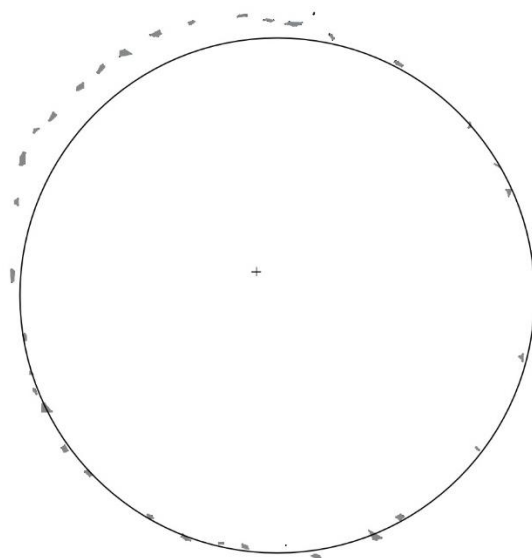
Two views of parts of the ring showing the smallness of the stones and the wildness of the country.

A plan is shown below together with an identical plan, but with a circle superimposed on it. The superimposed circle indicates that the ring is not a badly made circle, as it deviates in a symmetrical manner. The problem then becomes one of determining the intended design. The solution proved to be surprisingly elegant

The cross near the centre is where the theodolite was placed.



Plan of stones.



Plan with superimposed circle

Firstly it was impossible to find any satisfactory design using the Megalithic yard. When the old yard was tried the main part of the ring was found to have a diameter of 24 Old Yards (red arc in the following plan). The arc in the northwest had the same centre but its radius was 13 Old Yards and it was found that a pair of 5, 12, 13 triangles pinpointed the corners of that arc (mainly blue in the plan below). The difficulty lay in finding the centres of the arcs which linked up with the other arcs (green in the plan). There is evidence that the old yard, as with our modern yard, could be divided into

three old feet, so I tried using two 5,12,13 triangles, of one third the size of the other pair to locate the centres of the green arcs and found that these arcs were an extremely good fit, only falling short of points G and A by 1.28 inches or 3.26 cm. To have an error of less than one and a half inches in a distance of nearly 50 feet, when measured over rough ground, is exceptionally good and may have been regarded as perfect by the builders.

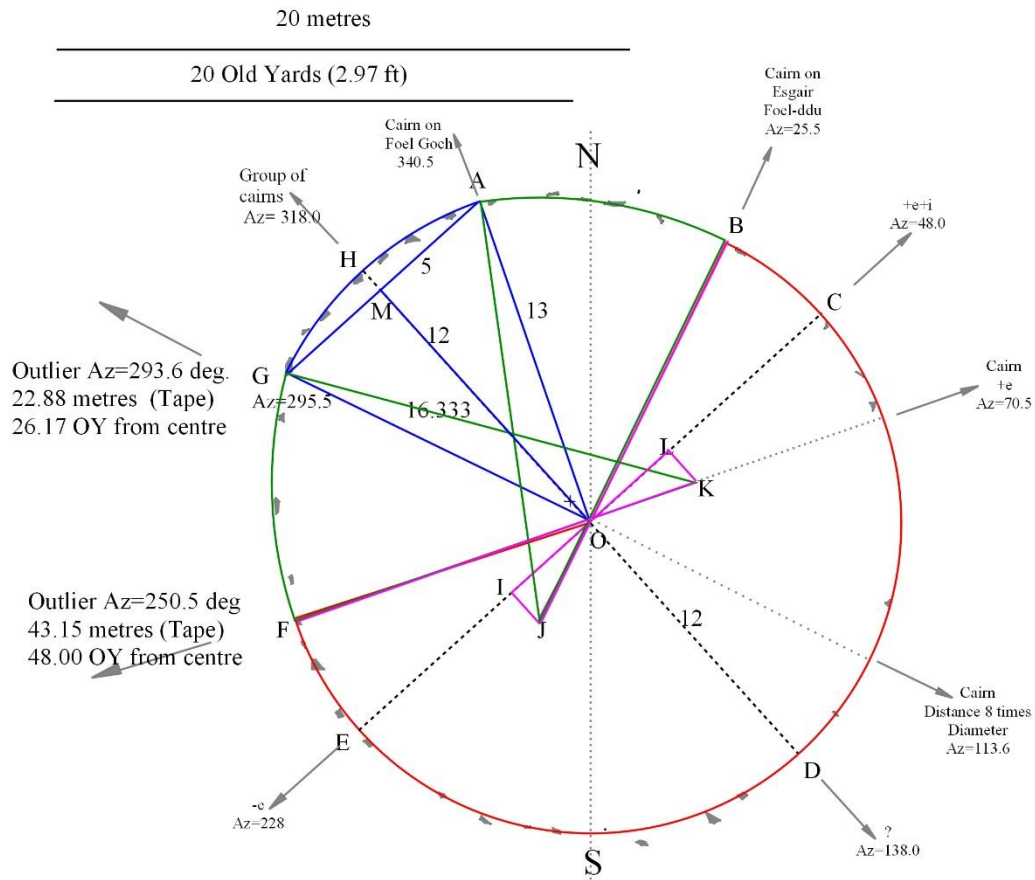
There are two outlying stones near this ring. The more northerly one in the direction of the radius OG, is 26.17 Old Yards from the centre of the ring (twice the length of the longer radius) and the more southerly one is 48.00 Old Yards from the centre in the direction of the radius OF and is four times the length of that radius.

The smallest angle in a 5, 12, 13 triangle is 22.62degrees which is very close to 22.5 degrees or one sixteenth of a complete circle. The angles around the centre O are all very close to multiples of 22.5 degrees and two of them, AOF and BOG are exact right angles.

An unusual property of this ring is that there are two “corners”, where the arcs do not merge smoothly. These are at the points G and A. In this respect it bears a resemblance to the great ring at Avebury, where several arcs do not merge, but meet at “corners”. Many researchers have explained this by claiming that the Avebury ring was simply badly made. My suggested construction for this ring, described in “Megalithic Matters”, throws doubt on this explanation and the geometry of Moel y Llyn, as described above, supports my ideas that corners were intentional in some rings.

The design of this ring is truly remarkable and gives us some insights into what the builders were capable of thinking. This ring has subtleties built into it that are not apparent to the casual visitor and what at first sight may be taken for a badly constructed ring, has a highly ingenious design which has been set out with great skill and accuracy. No less than five radial lines in this design point to nearby cairns, two to outlying stones and three to significant astronomical sightlines. The process of design must have taken months of trial and error to perfect. As the Old yard was in use before the Megalithic Yard, this ring and the surrounding cairns and stones must be older than most other rings in the area and it probably predates the coming of the Beaker People.

Moel y llyn



Basic triangles OIJ and OLK

$OI = OL = 4$ Old Yards or 12 Old Feet
 $IJ = LK = 1.667$ OLD Yards or 5 Old Feet
 $OJ = OK = 4.333$ Old Yards or 13 Old Feet

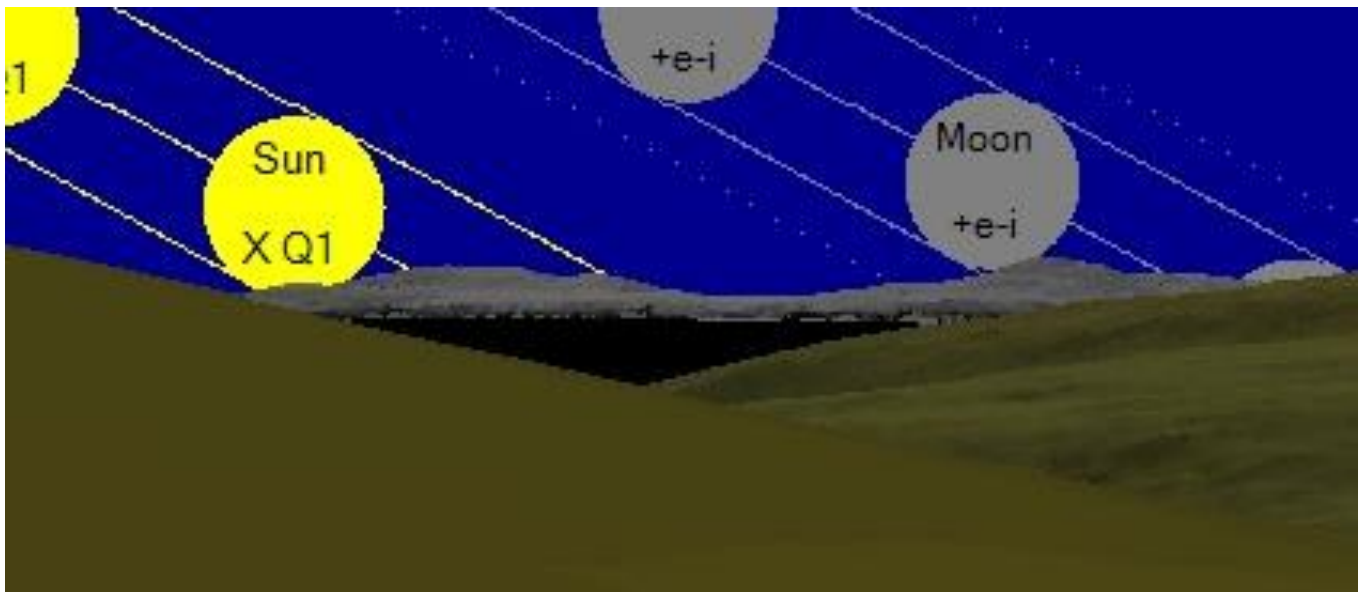
O is the centre for the red arc (Radius 12 Old Yards) and the blue arc (Radius 13 Old Yards)
 J and K are the centres for the green arcs (Radius 19 Old Yards)

A and G are the points where the green and blue arcs cross.

Angles AOF and GOB are right angles.

$AF = GB = 17.69$ Old Yards or 53.08 Old Feet, which is very close to 53.

Angle HOG = HOA = FOE = BOC = 22.62degrees (Very close to one eighth of a complete circle)

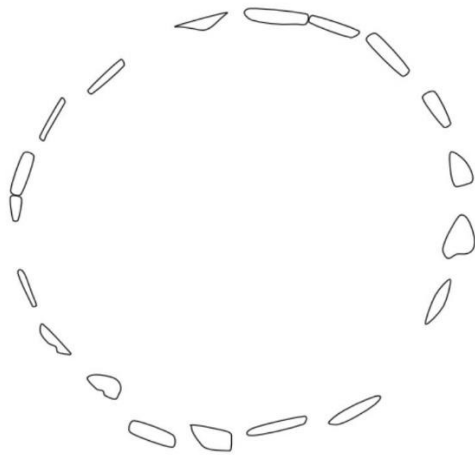


Distant view of the Llyn from Moel Y Llyn showing setting position of the moon

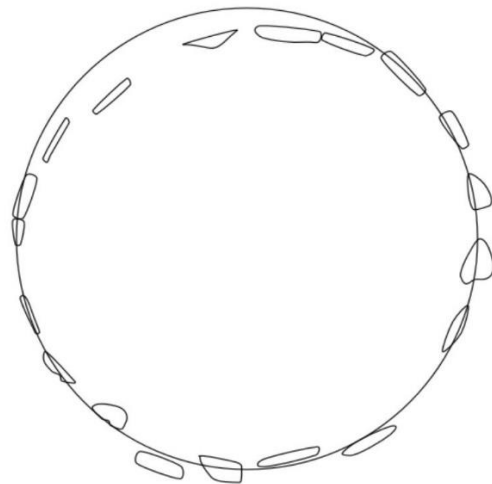
Lle'r Neuaddau

The following day I went with David and Robert to survey a small ring cairn Lle'r Neuaddau, which is about one and a half kilometres south of the Nant y Moch reservoir dam and about 10 Km SE of the previous ring. This ring had 19 small stones, none being more than 40 cm high, and a cursory examination of the survey measurements suggested that the ring was circular, though when the plan was drawn up, the ring was found to be flattened to a small extent.

Lle'r Neuaddau ring



Ring with circle superimposed



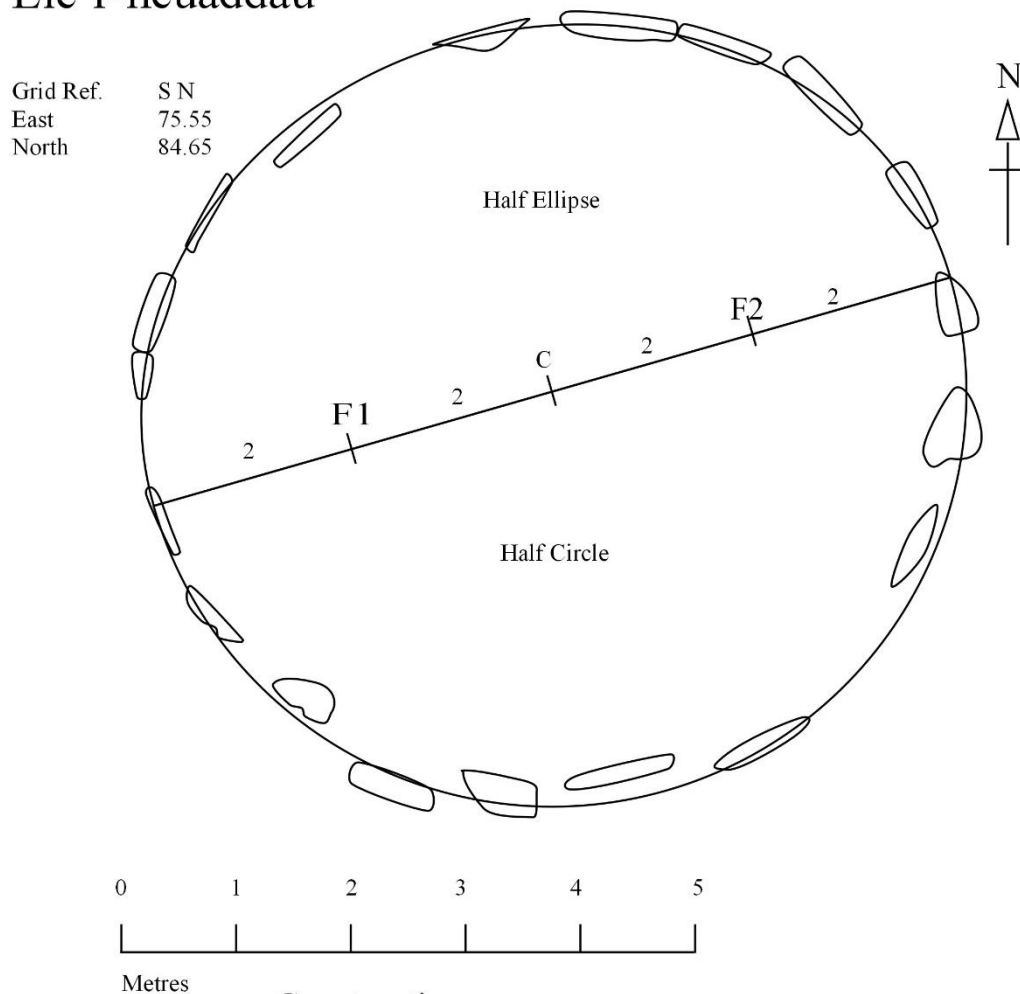
The question now arises: was the flattening of the NNW part of the ring a deliberate part of the plan of the original builders, or is it there because of sloppy building techniques? That is, were the builders simply incapable of making a truly circular ring? The answer depends, in part, on being able to find a credible geometrical construction that accurately fits the ring.

As with the previous ring, I was unable to find any satisfactory construction based on the megalithic yard of 2.72 feet, which had proved to be a satisfactory unit for all but one of the rings that I had previously surveyed. I again tried the Old Yard of 2.97 ft. and almost at once found a construction that worked in a very satisfactory manner. The construction consists of a half circle of diameter 8 Old Yards and a half ellipse whose major axis is 8 Old Yards and minor axis is 7 old yards. The two foci of the ellipse have to be 2 Old Yards from the centre of the circle. If this construction is correct then the implication is that this ring is similar in age to the previous ring and is older than others in the area.



Surveying the site. Note the small stones almost hidden by the rushes.

Lle'r-neuaddau



Construction

Based on suggestion by Robert

Main diameter 8.0 old yards

Ellipse short axis 7.0 old yards

Interfocal distance 4.0 old yards

A 4, 7, 8 triangle is an almost perfect Pythagorean triangle.

Rotation 16 degrees

Whilst there is a considerable number of elliptical stone rings, I know of only one other ring that uses a half ellipse and that is the Hirnant cairn circle, which is almost exactly one kilometre to the south of this ring. The Hirnant Cairn Circle uses a more complex design and the unit used is the Megalithic yard. Both rings are tilted in a similar manner and it seems likely that there is some connection in the ideas behind them.

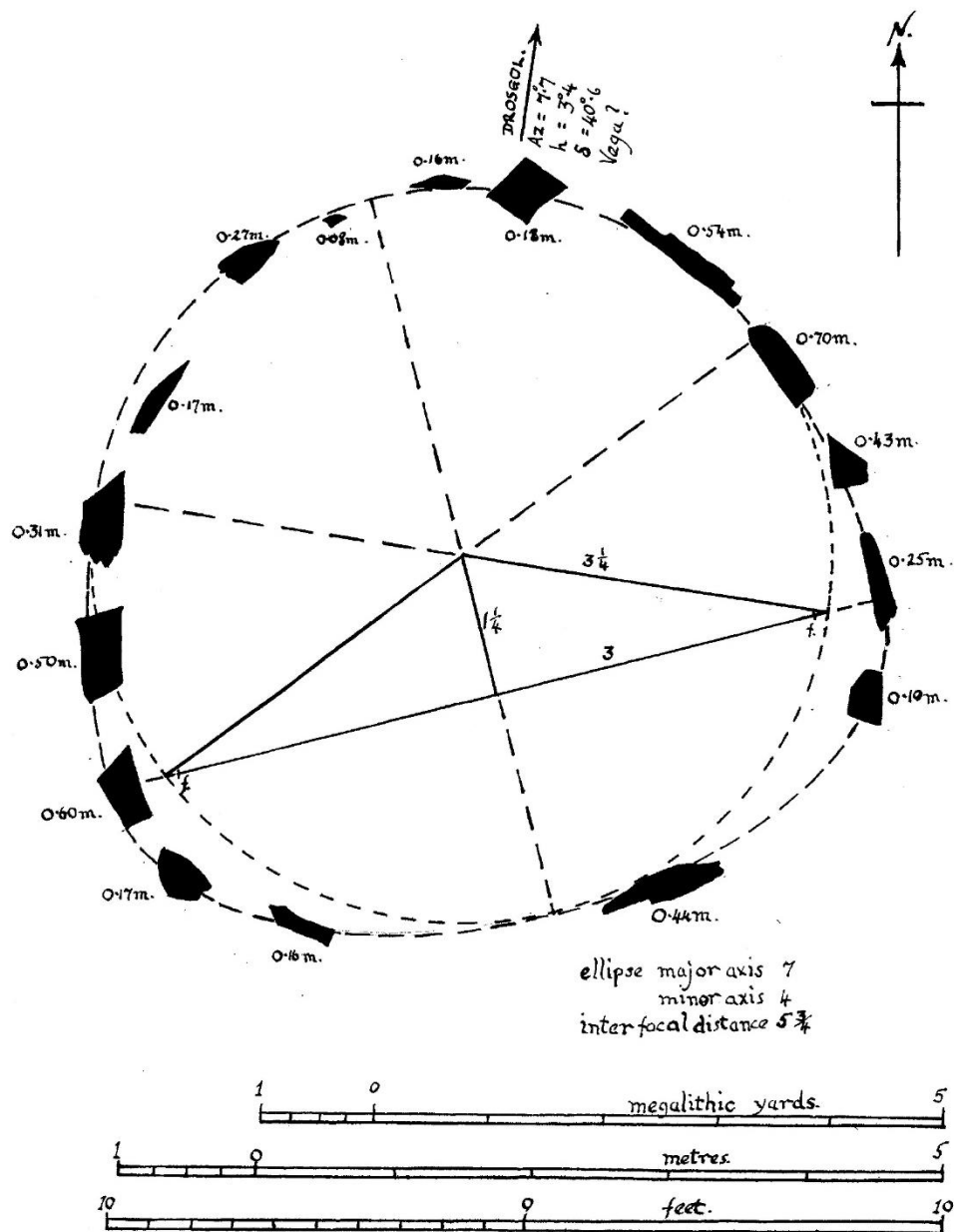
It was a surprise to find that Lle'r Neuaddau and Moel y Llyn use the old yard and not the Megalithic Yard. All the other rings that I had surveyed, with the possible exception of Cerrig Gaerau, have used the Megalithic yard. The above two rings are only about eight kilometres apart, have small stones and are, in what is now, wild upland country. It could be that they are considerably older than the other rings in the area and perhaps built when climate conditions were warmer and dryer than later. It may be significant that the Hirnant Cairn Circle, that is similar in both size and shape to Lle'r Neuaddau, was built about one kilometre lower down the valley, where conditions would have been a little better. The evidence discussed in *Megalithic Matters* indicated that the old yard went out of

use sometime in the middle of the third millennium B.C. first in England and then later in Scotland. This is discussed more fully in Chapter 4.

Hirnant Cairn Circle

The Hirnant Cairn Circle is a little smaller than the previous ring but has somewhat larger stones and the design is more complex. Both though use a half ellipse in the perimeter and both have an axis that is tilted in more or less the same direction. The centres of the two arcs with the longest radii are located by two 5,12,13 triangles, which are used in a similar manner to the small 5,12,13 triangles in the Moel y llyn ring. The units used are megalithic Yards. This suggests that it is more recent than the two previous rings.

Hirnant Cairn Circle. SN 753839



Appendices

Moel y Llyn Survey Data

Station 1: Approx Centre of Circle

Height: 1.5

Target	Description	Vertical	Horizontal	Distance	Height
Stone 1 Top	Stone 1 Top	96,46,20	5,21,0	10.315	
Stone 1 LB	Stone 1 LB	96,03,00	5,03,00	10.37	
Stone 1 LB	Stone 1 LB	96,03,00	5,03,00	10.33	
Stone 1 B	Stone 1 B	96,03,00	5,21,0	10.35	
Stone 1 F	Stone 1 F	96,03,00	5,36,40	10.22	
Stone 1 R	Stone 1 R	96,03,00	5,52,20	10.28	
Stone 2 Top	Stone 2 Top	96,26,00	21,31,00	10.57	
Stone 2 L	Stone 2 L	96,43,40	20,56,40	10.5	
Stone 2LB	Stone 2LB	96,43,40	20,56,40	10.57	
Stone 2 B	Stone 2 B	96,43,40	21,31,0	10.58	
Stone 2 F	Stone 2 F	96,43,40	21,31,0	10.48	
Stone 2 R	Stone 2 R	96,43,40	22,49,40	10.61	
Stone 2 R2	Stone 2 R2	96,43,40	22,49,40	10.54	
Stone 3 Top	Stone 3 Top	96,12,20	33,37,40	10.45	
Stone 3 L	Stone 3 L	96,43,40	32,26,20	10.55	
Stone 3 B	Stone 3 B	96,43,40	33,37,40	10.55	
Stone 3 RF	Stone 3 RF	96,43,40	34,05,40	10.37	
Stone 3 RB	Stone 3 RB	96,43,40	34,5,40	10.53	
Stone 4 Top	Stone 4 Top	95,19,00	43,19,20	10.79	0.4
Stone 4 L	Stone 4 L	96,43,40	42,58,00	10.84	
Stone 4 B	Stone 4 B	96,43,40	43,19,20	10.86	
Stone 4 F	Stone 4 F	96,43,40	43,19,20	10.74	
Stone 4 R	Stone 4 R	96,43,40	43,16,20	10.86	
Stone 4 R2	Stone 4 R2	96,43,40	43,16,20	10.77	
Stone 5 Top	Stone 5 Top	94,35,29	53,49,00	11.06	0.3
Stone 5 L	Stone 5 L	96,43,40	53,10,40	10.97	
Stone 5 R	Stone 5 R	96,43,40	54,25,40	11.12	
Stone 5 B	Stone 5 B	96,43,40	53,49,00	11.08	
Stone 5 F	Stone 5 F	96,43,40	53,49,00	11.03	
Stone 6 Top Triangular	Stone 6 Top Triangular	96,17,20	60,11,00	11.11	
Stone 6 L	Stone 6 L	96,43,40	59,18,00	11.02	
Stone 6 B	Stone 6 B	96,43,40	58,31,00	11.18	
Stone 6 R	Stone 6 R	96,43,40	60,43,20	11.04	
Stone 7 Top Triangular	Stone 7 Top Triangular	96,15,00	95,15,00	11.68	
Stone 7 L	Stone 7 L	96,24,00	94,37,00	11.71	0.1
Stone 7 B	Stone 7 B	96,24,00	95,15,00	11.78	
Stone 7 R	Stone 7 R	96,20,00	95,58,0	11.72	
Stone 7 F	Stone 7 F	96,20,00	95,18,20	11.57	

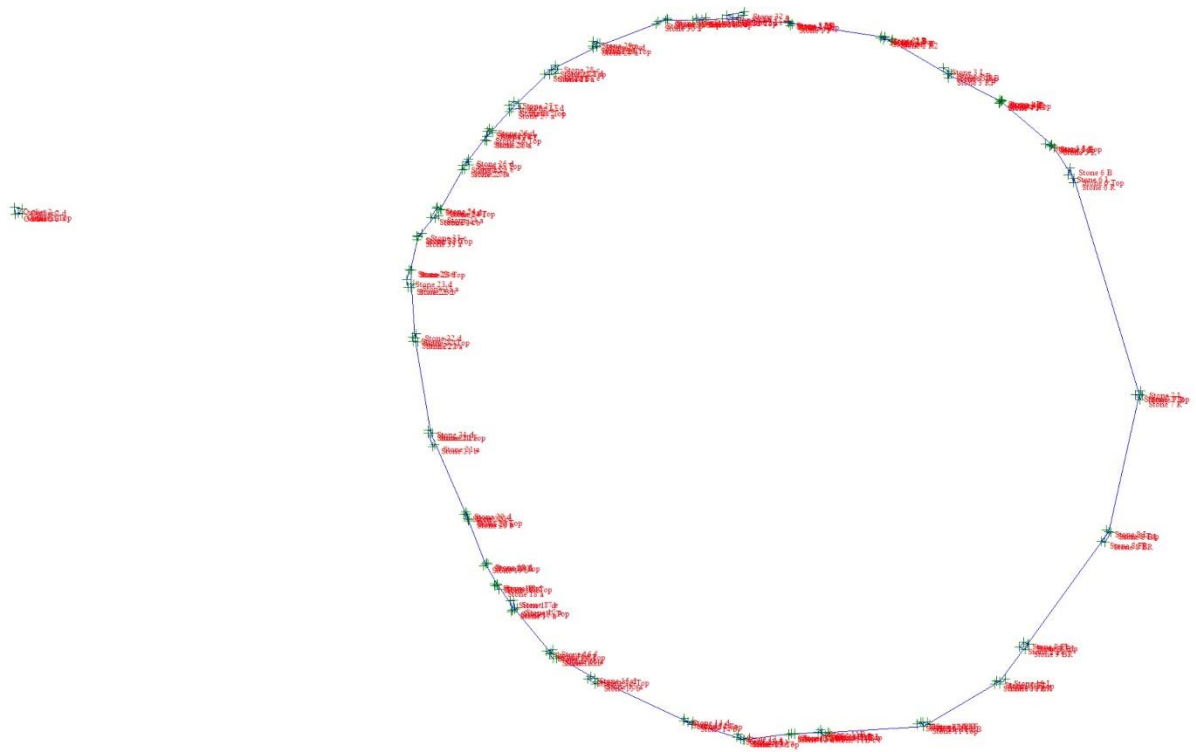
Stone 8 Top Rectangle	Stone 8 Top Rectangle	96,29,40	116,07,00	11.92	
Stone 8 L	Stone 8 L	96,15,00	115,59,40	11.81	
Stone 8 BL	Stone 8 BL	96,15,00	116,03,20	11.97	
Stone 8 BR	Stone 8 BR	96,15,00	117,45,00	11.96	
Stone 8 FR	Stone 8 FR	96,15,00	117,53,20	11.84	
Stone 9 Top Rhom	Stone 9 Top Rhom	95,51,00	136,28,40	11.93	
Stone 9 BL	Stone 9 BL	96,15,00	136,19,20	11.98	
Stone 9 BR	Stone 9 BR	96,15,00	137,19,40	12.01	
Stone 8 FR	Stone 8 FR	96,15,00	137,43,00	11.85	
Stone 9 FL	Stone 9 FL	96,15,00	136,41,40	11.83	
Stone 10 Top Diamond	Stone 10 Top Diamond	96,16,20	143,05,20	12.27	0.1
Stone 10 L	Stone 10 L	95,57,20	142,10,40	12.31	0.2
Stone 10 BR	Stone 10 BR	95,57,20	143,16,00	12.32	0.2
Stone 10 FR	Stone 10 FR	95,57,20	143,48,20	12.23	0.2
Stone 10 FL	Stone 10 FL	95,57,20	143,20,20	12.18	0.2
Stone 11 Top	Stone 11 Top	96,13,40	155,41,00	12.26	0.1
Stone 11 LF	Stone 11 LF	96,00,20	154,51,40	12.19	0.2
Stone 11 LB	Stone 11 LB	95,57,20	154,45,20	12.29	0.2
Stone 11 RB	Stone 11 RB	96,04,40	155,29,20	12.12	0.2
Stone 11 RF2	Stone 11 RF2	96,04,40	156,19,00	12.12	0.2
Stone 11 I	Stone 11 I	96,04,40	155,46,00	12.11	0.2
Stone 11B Top	Stone 11B Top	96,36,20	170,11,40	11.55	
Stone 11B L	Stone 11B L	96,26,40	169,16,00	11.55	0.1
Stone 11B b	Stone 11B b	96,26,40	169,04,40	11.61	0.1
Stone 11B c	Stone 11B c	96,26,40	169,42,40	11.63	0.1
Stone 11B d	Stone 11B d	96,26,40	170,44,40	11.5	0.1
Stone 11B e	Stone 11B e	96,26,40	170,20,40	11.44	0.1
Stone 12 Top Thin Rectangle	96,58,40	174,47,40	11.46	0.1	
Stone 12 a	Stone 12 a	96,40,20	174,22,00	11.45	0.1
Stone 12 b	Stone 12 b	96,40,20	174,22,00	11.48	0.1
Stone 12 c	Stone 12 c	96,50,20	175,12,00	11.47	0.1
Stone 12 d	Stone 12 d	96,50,20	175,12,00	11.5	0.1
Stone 13 Top	Stone 13 Top	96,26,20	181,59,00	11.59	
Stone 13 a	Stone 13 a	96,44,00	181,14,40	11.53	0.2
Stone 13 b	Stone 13 b	96,44,00	181,93,40	11.59	0.2
Stone 13 c	Stone 13 c	96,44,00	182,10,20	11.61	0.2
Stone 13 d	Stone 13 d	96,44,00	183,06,20	11.54	0.2
Stone 13 e	Stone 13 e	96,44,00	182,59,40	11.43	0.2
Stone 14 Top	Stone 14 Top	97,14,20	190,52,40	11.27	0.2
Stone 14 a	Stone 14 a	96,36,20	190,08,40	11.2	0.2
Stone 14 b	Stone 14 b	96,36,20	190,12,20	11.31	0.2
Stone 14 c	Stone 14 c	96,36,20	191,35,00	11.23	0.2

Stone 14 d	Stone 14 d	96,36,00	191,31,20	11.16	0.2
Stone 15 Top	Stone 15 Top	97,15,00	207,07,20	10.92	
Stone 15 a	Stone 15 a	96,30,40	206,23,40	10.96	0.2
Stone 15 b	Stone 15 b	96,30,40	206,34,00	11.05	0.2
Stone 15 c	Stone 15 c	96,30,40	208,00,20	11.03	0.2
Stone 15 d	Stone 15 d	96,30,40	207,43,00	10.91	0.2
Stone 16 Top	Stone 16 Top	96,26,40	215,13,00	10.93	
Stone 16 a	Stone 16 a	96,37,20	213,52,20	10.9	0.3
Stone 16 b	Stone 16 b	96,37,20	213,55,40	10.98	0.3
Stone 16 c	Stone 16 c	96,37,20	214,20,20	11.03	0.3
Stone 16 d	Stone 16 d	96,37,20	215,14,40	10.99	0.3
Stone 16 e	Stone 16 e	96,37,20	215,52,40	10.97	0.3
Stone 16 f	Stone 16 f	96,37,20	215,12,00	10.83	0.3
Stone 17 Top	Stone 17 Top	96,37,20	224,14,40	10.62	
Stone 17 a	Stone 17 a	96,44,40	224,07,40	10.53	0.3
Stone 17 b	Stone 17 b	96,44,40	224,17,40	10.73	0.3
Stone 17 c	Stone 17 c	96,44,40	224,23,00	10.7	0.3
Stone 17 d	Stone 17 d	96,44,40	225,41,40	10.54	0.3
Stone 17 e	Stone 17 e	96,44,40	225,25,20	10.45	0.3
Stone 18 Top	Stone 18 Top	97,46,20	229,03,40	10.51	0.3
Stone 18 a	Stone 18 a	97,13,00	228,24,20	10.55	0.2
Stone 18 b	Stone 18 b	97,13,00	229,18,20	10.57	0.2
Stone 18 c	Stone 18 c	97,13,00	229,39,00	10.55	0.2
Stone 18 d	Stone 18 d	97,13,00	229,19,00	10.495	0.2
Stone 19 Top	Stone 19 Top	97,38,00	233,02,40	10.39	0.2
Stone 19 a	Stone 19 a	97,34,00	232,48,20	10.34	0.1
Stone 19 b	Stone 19 b	87,12,00	233,02,40	10.4	0.2
Stone 19 c	Stone 19 c	87,12,00	233,30,40	10.36	0.2
Stone 19 d	Stone 19 d	97,08,20	233,08,20	10.33	0.1
Stone 20 Top	Stone 20 Top	98,04,40	241,18,40	10.11	
Stone 20 a	Stone 20 a	97,20,20	240,57,20	10.07	0.2
Stone 20 b	Stone 20 b	97,20,20	240,53,20	10.11	0.2
Stone 20 c	Stone 20 c	97,20,20	242,09,00	10.13	0.2
Stone 20 d	Stone 20 d	97,20,20	242,26,00	10.05	0.2
Stone 20 e	Stone 20 e	97,27,40	242,04,20	10.04	0.2
Stone 21 Top Flat	Stone 21 Top Flat	96,50,00	257,15,40	10.22	0.1
Stone 21 a	Stone 21 a	96,36,40	255,13,00	10.18	0.3
Stone 21 b	Stone 21 b	96,36,40	254,58,20	10.25	0.3
Stone 21 c	Stone 21 c	96,36,40	257,24,20	10.29	0.3
Stone 21 d	Stone 21 d	96,36,40	257,54,00	10.27	0.3
Stone 21 e	Stone 21 e	96,36,40	257,15,00	10.15	0.3
Stone 22 Top	Stone 22 Top	95,50,20	273,39,20	10.44	
Stone 22 a	Stone 22 a	96,14,20	272,58,20	10.37	0.2
Stone 22 b	Stone 22 b	96,14,20	273,04,40	10.51	0.2
Stone 22 c	Stone 22 c	96,14,20	273,44,40	10.54	0.2

Stone 22 d	Stone 22 d	96,14,20	274,22,20	10.43	0.2
Stone 23 Top	Stone 23 Top	96,17,00	284,25,20	10.91	0.2
Stone 23 a	Stone 23 a	95,52,40	282,23,20	10.71	0.2
Stone 23 b	Stone 23 b	95,52,40	281,48,20	10.79	0.2
Stone 23 c	Stone 23 c	95,52,40	281,44,20	10.87	0.2
Stone 23 d	Stone 23 d	95,52,40	282,51,00	10.95	0.2
Stone 23 e	Stone 23 e	95,52,40	284,28,20	10.95	0.2
Stone 23 f	Stone 23 f	95,52,40	284,34,00	10.87	0.2
Stone 33 Top	Stone 33 Top	95,32,00	289,56,00	10.98	0.3
Stone 33 a	Stone 33 a	95,38,20	289,24,20	10.99	0.3
Stone 33 b	Stone 33 b	95,38,20	289,59,20	11.03	0.3
Stone 33 c	Stone 33 c	95,38,20	290,36,00	10.91	0.3
Stone 24 Top	Stone 24 Top	95,30,20	295,21,40	10.68	
Stone 24 a	Stone 24 a	95,39,40	294,16,40	10.65	0.3
Stone 24 b	Stone 24 b	95,39,40	293,42,20	10.7	0.3
Stone 24 c	Stone 24 c	95,32,20	293,29,20	10.83	0.3
Stone 24 d	Stone 24 d	95,32,20	295,18,00	10.8	0.3
Stone 24 e	Stone 24 e	95,32,20	295,31,00	10.79	0.3
Stone 24 f	Stone 24 f	95,32,20	295,23,20	10.63	0.3
Stone 25 Top	Stone 25 Top	95,57,40	304,14,40	10.7	
Stone 25 a	Stone 25 a	96,05,20	303,03,20	10.64	0.2
Stone 25 b	Stone 25 b	96,05,20	302,42,00	10.7	0.2
Stone 25 c	Stone 25 c	96,05,20	303,22,00	10.76	0.2
Stone 25 d	Stone 25 d	96,01,40	304,47,40	10.71	0.2
Stone 25 e	Stone 25 e	96,01,40	304,00,00	10.6	0.2
Stone 26 Top	Stone 26 Top	96,36,20	309,28,20	10.7	
Stone 26 a	Stone 26 a	96,43,20	308,56,20	10.61	0.1
Stone 26 b	Stone 26 b	96,43,20	308,49,20	10.68	0.1
Stone 26 c	Stone 26 c	96,43,20	310,13,00	10.78	0.1
Stone 26 d	Stone 26 d	96,43,20	310,43,40	10.79	0.1
Stone 26 e	Stone 26 e	96,43,20	310,53,40	10.68	0.1
Stone 26 f	Stone 26 f	96,47,00	310,38,40	10.65	0.1
Stone 27 Top	Stone 27 Top	95,31,40	315,30,40	10.69	
Stone 27 a	Stone 27 a	95,27,00	314,59,20	10.67	0.3
Stone 27 b	Stone 27 b	95,13,00	315,38,00	10.82	0.3
Stone 27 c	Stone 27 c	95,13,00	316,41,00	10.79	0.3
Stone 27 d	Stone 27 d	95,18,00	317,00,40	10.65	0.3
Stone 27 e	Stone 27 e	95,18,00	316,38,20	10.51	0.3
Stone 28 Top	Stone 28 Top	95,55,00	324,37,40	10.84	
Stone 28 a	Stone 28 a	95,48,20	323,56,40	10.74	0.2
Stone 28 b	Stone 28 b	95,48,20	323,18,20	10.85	0.2
Stone 28 c	Stone 28 c	95,48,20	325,28,00	10.87	0.2
Stone 28 d	Stone 28 d	95,48,20	325,29,40	10.73	0.2
Stone 28 e	Stone 28 e	95,56,20	324,43,20	10.67	0.2
Stone 29 Top	Stone 29 Top	96,18,40	332,46,00	10.73	
Stone 29 a	Stone 29 a	95,51,40	332,17,00	10.72	0.2

Stone 29 b	Stone 29 b	95,51,40	332,14,20	10.79	0.2
Stone 29 c	Stone 29 c	95,51,40	333,12,40	10.81	0.2
Stone 29 d	Stone 29 d	95,51,40	333,28,20	10.77	0.2
Stone 29 e	Stone 29 e	95,49,40	332,44,40	10.91	0.2
Stone 30 Top	Stone 30 Top	96,21,20	344,55,40	10.72	
Stone 30 a	Stone 30 a	95,54,20	343,13,20	10.68	0.2
Stone 30 b	Stone 30 b	95,54,20	343,38,40	10.74	0.2
Stone 30 c	Stone 30 c	95,54,20	345,12,20	10.76	0.2
Stone 30 d	Stone 30 d	96,17,20	345,14,40	10.71	0.1
Stone 31 Top	Stone 31 Top	96,10,00	349,59,40	10.51	
Stone 31 a	Stone 31 a	95,59,20	349,12,00	10.52	0.2
Stone 31 b	Stone 31 b	95,59,20	349,50,40	10.57	0.2
Stone 31 c	Stone 31 c	95,59,20	351,22,20	10.54	0.2
Stone 31 d	Stone 31 d	96,06,20	350,42,40	10.49	0.2
Stone 32 Top	Stone 32 Top	96,22,20	354,05,40	10.44	
Stone 32 a	Stone 32 a	96,05,20	355,52,40	10.42	0.2
Stone 32 b	Stone 32 b	96,05,20	354,55,40	10.53	0.2
Stone 32 c	Stone 32 c	96,04,40	357,51,20	10.59	0.2
Stone 32 d	Stone 32 d	96,04,40	357,38,00	10.5	0.2
Stone 32 e	Stone 32 e	96,04,40	356,43,00	10.43	0.2
Outlier 1 Top	Outlier 1 Top	92,36,20	237,56,00	43.19	0.2
Outlier 1 a	Outlier 1 a	92,38,00	237,35,00	43.12	0.4
Outlier 1 b	Outlier 1 b	92,36,20	237,33,00	43.24	0.4
Outlier 1 c	Outlier 1 c	92,36,20	237,48,00	43.32	0.4
Outlier 1 d	Outlier 1 d	92,36,20	238,04,20	43.11	0.4
Outlier 1 e	Outlier 1 e	92,36,20	237,49,40	43.06	0.4
Outlier 2 Top	Outlier 2 Top	93,17,00	281,13,20	22.86	0.3
Outlier 2 a	Outlier 2 a	93,24,20	281,13,20	22.75	0.2
Outlier 2 b	Outlier 2 b	93,24,20	281,06,20	22.94	0.2
Outlier 2 c	Outlier 2 c	93,27,00	281,34,20	23.01	0.3
Outlier 2 d	Outlier 2 d	93,27,00	281,35,40	22.78	0.3

Moel y Llyn Survey Layout



Lle'r Neuaddau Survey Data

Station 1: Approx. Centre of Circle

Height: 1.5

Target	Description	Vertical	Horizontal	Distance
Stone 1 Top	Stone 1 Top	96,00,00	18,15,00	3.43
Stone 1 a	Stone 1 a	96,00,00	15,17,20	3.49
Stone 1 b	Stone 1 b	96,00,00	15,17,20	3.68
Stone 1 c	Stone 1 c	96,00,00	30,11,40	3.68
Stone 1 d	Stone 1 d	96,00,00	30,11,40	3.84
Stone 2 Top	Stone 2 Top	96,00,00	34,13,40	3.8
Stone 2 a	Stone 2 a	96,00,00	30,34,00	3.74
Stone 2 b	Stone 2 b	96,00,00	30,34,00	3.87
Stone 2 c	Stone 2 c	96,00,00	42,18,20	3.84
Stone 2 d	Stone 2 d	96,00,00	42,18,20	3.98
Stone 3 Top	Stone 3 Top	96,00,00	51,35,40	4.01
Stone 3 a	Stone 3 a	96,00,00	45,48,40	3.9
Stone 3 b	Stone 3 b	96,00,00	45,48,40	4.13
Stone 3 c	Stone 3 c	96,00,00	57,01,40	3.91
Stone 3 d	Stone 3 d	96,00,00	57,01,40	4.08
Stone 4 Top	Stone 4 Top	96,00,00	66,34,00	4.02
Stone 4 a	Stone 4 a	96,00,00	63,24,40	3.97
Stone 4 b	Stone 4 b	96,00,00	63,24,40	4.17
Stone 4 c	Stone 4 c	96,00,00	72,10,20	4.03
Stone 4 d	Stone 4 d	96,00,00	72,10,20	4.12
Stone 5 Top	Stone 5 Top	96,00,00	79,15,00	4.03
Stone 5 a	Stone 5 a	96,00,00	77,26,40	3.92
Stone 5 b	Stone 5 b	96,00,00	77,26,40	4.17
Stone 5 c	Stone 5 c	96,00,00	85,49,40	3.85
Stone 5 d	Stone 5 d	96,00,00	85,49,40	4.09
Stone 6 Top	Stone 6 Top	96,00,00	99,59,00	3.7
Stone 6 a	Stone 6 a	96,00,00	92,55,00	3.87
Stone 6 b	Stone 6 b	96,00,00	92,55,00	4.13
Stone 6 c	Stone 6 c	96,00,00	103,24,00	3.57
Stone 6 d	Stone 6 d	96,00,00	103,24,00	3.9
Stone 7 Top	Stone 7 Top	96,00,00	116,25,40	3.68
Stone 7 a	Stone 7 a	96,00,00	108,30,20	3.71
Stone 7 b	Stone 7 b	96,00,00	108,30,20	3.86
Stone 7 c	Stone 7 c	96,00,00	120,11,20	3.51
Stone 7 d	Stone 7 d	96,00,00	120,11,20	3.7
Stone 8 Top	Stone 8 Top	96,00,00	148,32,00	3.53
Stone 8 a	Stone 8 a	96,00,00	142,18,00	3.54
Stone 8 b	Stone 8 b	96,00,00	142,18,00	3.66
Stone 8 c	Stone 8 c	96,00,00	157,16,00	3.4
Stone 8 d	Stone 8 d	96,00,00	157,16,00	3.51
Stone 9 Top	Stone 9 Top	96,00,00	169,21,00	3.16

Stone 9 a	Stone 9 a	96,00,00	161,38,00	3.18
Stone 9 b	Stone 9 b	96,00,00	161,38,00	3.66
Stone 9 c	Stone 9 c	96,00,00	179,08,40	3.4
Stone 9 d	Stone 9 d	96,00,00	179,08,40	3.51
Stone 10 Top	Stone 10 Top	96,00,00	192,44,20	3.33
Stone 10 a	Stone 10 a	96,00,00	184,23,20	3.09
Stone 10 b	Stone 10 b	96,00,00	184,23,20	3.34
Stone 10 c	Stone 10 c	96,00,00	195,53,40	3.04
Stone 10 d	Stone 10 d	96,00,00	195,53,40	3.23
Stone 11 Top	Stone 11 Top	96,00,00	208,13,40	3.28
Stone 11 a	Stone 11 a	96,00,00	200,07,20	3.21
Stone 11 b	Stone 11 b	96,00,00	200,07,20	3.41
Stone 11 c	Stone 11 c	96,00,00	212,42,00	3.2
Stone 11 d	Stone 11 d	96,00,00	212,42,00	3.36
Stone 12 Top	Stone 12 Top	96,00,00	223,28,20	2.84
Stone 12 a	Stone 12 a	96,00,00	220,46,40	2.78
Stone 12 b	Stone 12 b	96,00,00	220,46,40	3.07
Stone 12 c	Stone 12 c	96,00,00	231,25,40	2.74
Stone 12 d	Stone 12 d	96,00,00	231,25,40	3.02
Stone 13 Top	Stone 13 Top	96,00,00	245,45,40	3.03
Stone 13 a	Stone 13 a	96,00,00	240,27,40	2.96
Stone 13 b	Stone 13 b	96,00,00	240,27,40	3.09
Stone 13 c	Stone 13 c	96,00,00	252,13,00	3.1
Stone 13 d	Stone 13 d	96,00,00	252,13,00	3.21
Stone 14 Top	Stone 14 Top	96,00,00	262,12,00	3.11
Stone 14 a	Stone 14 a	96,00,00	257,30,20	3.05
Stone 14 b	Stone 14 b	96,00,00	257,30,20	3.14
Stone 14 c	Stone 14 c	96,00,00	268,32,20	3.15
Stone 14 d	Stone 14 d	96,00,00	268,32,20	3.25
Stone 15 Top	Stone 15 Top	96,00,00	286,11,20	3.25
Stone 15 a	Stone 15 a	96,00,00	282,55,00	3.19
Stone 15 b	Stone 15 b	96,00,00	282,55,00	3.28
Stone 15 c	Stone 15 c	96,00,00	289,54,40	3.2
Stone 15 d	Stone 15 d	96,00,00	289,54,40	3.36
Stone 16 Top	Stone 16 Top	96,00,00	295,41,20	3.27
Stone 16 a	Stone 16 a	96,00,00	289,54,40	3.19
Stone 16 b	Stone 16 b	96,00,00	289,54,40	3.33
Stone 16 c	Stone 16 c	96,00,00	302,25,20	3.22
Stone 16 d	Stone 16 d	96,00,00	302,25,20	3.39
Stone 17 Top	Stone 17 Top	96,00,00	316,09,20	3.26
Stone 17 a	Stone 17 a	96,00,00	307,39,40	3.2
Stone 17 b	Stone 17 b	96,00,00	307,39,40	3.28
Stone 17 c	Stone 17 c	96,00,00	320,01,40	3.25
Stone 17 d	Stone 17 d	96,00,00	320,01,40	3.34
Stone 18 Top	Stone 18 Top	96,00,00	335,36,00	3.03
Stone 18 a	Stone 18 a	96,00,00	326,30,40	3.05

Stone 18 b	Stone 18 b	96,00,00	326,30,40	3.14
Stone 18 c	Stone 18 c	96,00,00	339,50,40	3.14
Stone 18 d	Stone 18 d	96,00,00	339,50,40	3.25
Stone 19 Top	Stone 19 Top	96,00,00	4,41,20	3.51
Stone 19 a	Stone 19 a	96,00,00	356,45,20	3.44
Stone 19 b	Stone 19 b	96,00,00	356,45,20	3.7
Stone 19 c	Stone 19 c	96,00,00	10,38,40	3.6
Stone 19 d	Stone 19 d	96,00,00	10,38,40	3.86

Lle'r Neuaddau Survey Layout

