

The Great Pyramid's solar system map and the original surveying grid of the Giza Plateau.

Second edition

Abstract

In this paper I analyse the wall markings on the northern wall of the lower chamber in the Great Pyramid of Giza and from that analysis identify the original surveying grid of the Giza plateau.

I show that the astronomical data that was uncovered on these walls in my earlier work allows two maps of the solar system that have been drawn onto this wall to be discovered. From the design on the chamber's wall I determine that the feature known as the 'Wall of the Crow', a 7m wide massive outdoor wall located on the Giza Plateau to the south of the Sphinx, has its design plan hidden in the lower chamber's wall structure in the Great Pyramid.

Using the Wall of the Crow as the start point, I show that the first astronomical line on the wall map of solar system in the lower chamber has been replicated at a scale of 1:87500 on the Earth and that the end point of this line, which can be found in Sicily some 1740 km away, is marked out by clearly identifiable features on the ground at that point. I show that the mapping system in use uses both geocentric and geodesic calculations and from this establish the original surveyor's baseline and base grid to which the Giza Plateau's monuments are all aligned.

I identify that the series of trenches to the west of the second pyramid on the Giza Plateau are an alignment mechanism for forming the surveying grid and I show that the markings in Sicily conform to the grid system in Giza and are an essential requirement for the Giza system to be solved.

I prove that this surveying grid stretches around the globe and that the pyramids of Abusir provide the alignment mechanism required for adjusting the grid to a longitude accuracy of 1mm.

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The Great Pyramid papers

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The north wall of the lower chamber.

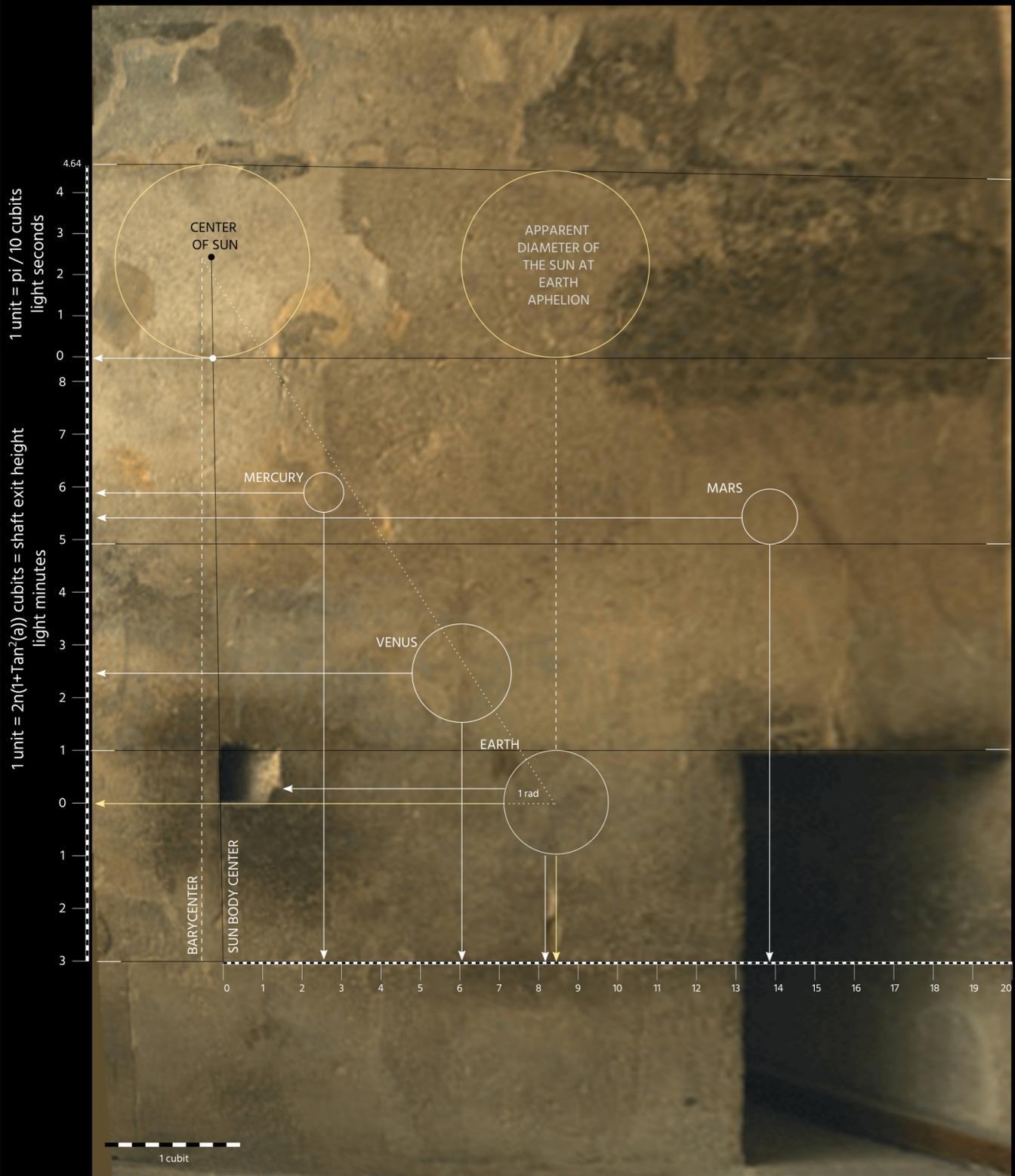
At the end of the previous paper in this series¹ it was shown that the unit of measure being used on the north wall of the lower chamber of the Great Pyramid was representative of the light second, and that by comparing the length of this unit to the semi-major axis of the earth's orbit that was specified explicitly in the architecture and documented in that paper, then the Astronomical Unit could be precisely defined.

Although these definitions are essential to being able to put together any meaningful astronomical data from the pyramid's architecture, there is a secondary purpose to showing the light minute unit on the wall, and that is to draw attention to the fact that the north wall contains significantly more information than was extracted at the end of the last paper. The wall is covered with subtle lines, seemingly random patches of discoloured stone and faintly drawn circles, and after significant time comparing the wall markings to the known astronomy data from NASA's DE-441 ephemeris using the light minute scale discovered, it was possible to fully resolve the design of the lower chamber north wall. Diagram J-0 shows the architect's initial map of the inner solar system that is drawn onto the north wall of the lower chamber of the Great Pyramid of Giza .

The drawing has a horizontal scale of the light minute unit as defined in the previous paper, and a differing vertical scale which is based on the height of the shaft exit hole on the wall. The horizontal axis shows the positions of the planets of the inner solar system relative to the Sun, which is located at the zero position on the horizontal axis with the axis scale aligned vertically to the top of the first row of wall stones and horizontally to the right side of the narrow wall triangle which makes up the piece of stone that partially blocks the shaft entrance. Mercury and Venus are shown at the average perihelion distance from the Sun, Earth is shown in both its aphelion and perihelion position by the wall indentation, and Mars is shown at its average aphelion distance from the Sun. The vertical scale shows the planets' distances, at the orbital events just described, from the Earth at aphelion. Each of the planet's locations and the Sun's position is clearly marked out in the architecture by either distinct vertical discoloured line on the wall in the case of the Sun, Mercury and Venus, by a wall indentation that shows both aphelion and perihelion for the Earth, and by an angled line for Mars. The unique sloping joint between the upper layer of stonework and the one below allows the apparent magnitude of the Sun at Earth's average aphelion to be drawn into the wall level with accuracy where the size of the Sun is 96.69% of its size shown on the left of the same level of the wall. The unit length used for drawing the Sun on the wall is $\pi/10$ cubits per light second and is designed to show that the size of the Sun is purely representative and does not conform to the scale of the rest of the drawing.

The angled 'line' at the right side of Mars is not set at an arbitrary angle but is a line that has been rotated by 1 radian from the horizontal in a clockwise direction, and this has been drawn on the wall to draw attention to the line that connects the center of the Earth to the center of the Sun which is also at precisely 1 radian to the horizontal and therefore parallel to this line. The whole map is a combined geocentric and heliocentric model of the solar system mapped out to light minutes and with the orbital plane of the Earth, the ecliptic, set at an angle of 1 radian to the horizontal.

The drawing is perfect in most details apart from one deliberate error and one misalignment. On the vertical scale the position of the Sun at 8.46 light minutes from the Earth's average aphelion is incorrectly set at the joint between the wall stones at the bottom of the drawing of the Sun, rather than at the center of the Sun. This can be determined as being a deliberate feature because of the angled non-horizontal wall joint that allows the apparent Sun diameter drawing to be correctly positioned above the Earth, showing the the Sun must be drawn in the correct location. The misalignment is with the center of the sun and the line running at one radian clockwise from the horizontal starting in the center of the Earth, suggesting that the origin of the vertical scale may not be in the correct position.



THE INNER SOLAR SYSTEM

**HORIZONTAL SCALE
HELIOCENTRIC (LIGHT MINUTES)**

MERCURY PERIHELION	2.5573
VENUS PERIHELION	5.9752
EARTH PERI/APH	8.1776 / 8.4559
MARS APHELION	13.8574

**VERTICAL SCALE
GEOCENTRIC (LIGHT MINUTES)**

EARTH APHELION	0
EARTH PERIHELION	0.2782
VENUS PERIHELION	2.4806
MARS APHELION	5.4016
MERCURY PERIHELION	5.8985
SUN	8.4558

PLANET SCALE - LIGHT SECONDS / 60

MERCURY	0.976
VENUS	2.422
EARTH	2.5530
MARS	1.3593

Diagram J-0 - The inner solar system on the north wall of the lower chamber, initial drawing.

The architect's are showing that whilst the drawing of the solar system is correctly identified it has been deliberately drawn to require a further refinement to the system on display. In previous papers in this series it was shown that the principal methods of concealment of data in the architecture is the use of opposites, and the same method is required to refine the solar system map that has just been uncovered on the lower chamber's north wall. By listing out all of the drawing's features and then 'inverting' them the correct template for the final solar system map can be determined. Calling the map in diagram J-0 the 'initial drawing', and the map that needs to be produced the 'final drawing' the table of opposites is as follows

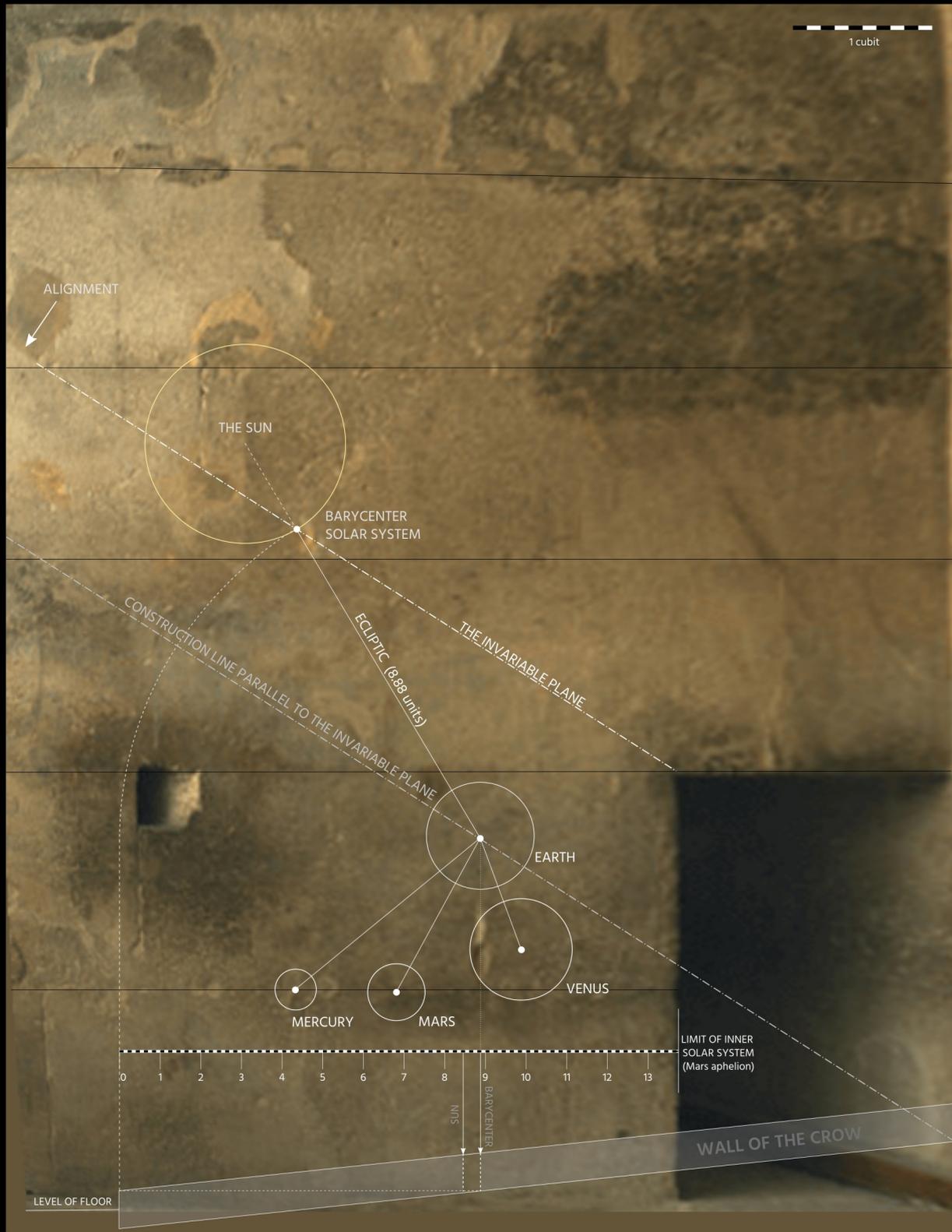
<u>Item</u>	<u>Initial drawing</u>	<u>Final drawing</u>
Center of system	The sun body center	The barycenter of solar system
Principal line	Ecliptic - angled at 1 radian clockwise to the horizontal	Invariable plane of the solar system - angled at 1 radian anti-clockwise to the vertical.
Mercury	At perihelion and located linearly relative to both the Sun and Earth	At aphelion and located angularly relative to the line of the ecliptic
Venus	At perihelion and located linearly relative to both the Sun and Earth	At aphelion and located angularly relative to the line of the ecliptic
Earth	At both aphelion and perihelion and located linearly relative to both the Sun and Earth	At winter solstice, with the ecliptic located angularly relative to the line of the invariable plane
Mars	At aphelion and located linearly relative to both the Sun and Earth	At perihelion and located angularly relative to the line of the ecliptic

Table J-0 - The table of opposites for the solar system drawing.

By applying this table of opposites to the solar system drawing it is possible to re-map the system and determine the final drawing configuration which is shown in diagram J-1. The drawing is constructed in the following manner. Because it is a geocentric map of the inner solar system, the Earth is positioned as it was in the initial drawing, with the only change being that it is moved to its position 8.2637 light minutes along the horizontal scale of *the initial drawing*, which places it at its winter solstice distance from the Sun and between its perihelion and aphelion distance. A construction line representing the invariable plane of the solar system is then drawn by using a vertical line and rotating it by 1 radian in an anti-clockwise direction and then aligning it with the center of the Earth (the opposite of how the one radian line was formed in the initial drawing). This line is not a drawing of the invariable plane of the solar system because it passes through the center of the Earth, it is just a parallel to the invariable plane - a construction line.

The planets are then placed onto the drawing by taking their known average distances at aphelion or perihelion from Earth at the winter solstice of 2729 BCE by drawing a horizontal line of this scaled length from the center of the Earth to the right, and then rotating this line around the center of the Earth by the known angles of each planet's orbit to the invariable plane, this angle being scaled up by a factor of 17. To draw the Sun, the same procedure is used but with the distance from the Sun to the Earth at the winter solstice measured on the vertical scale of diagram J-0 being used as the length of the ecliptic between the two bodies. This places the sun perfectly onto the vertical wall line that the architects have drawn onto the level 3 stonework. The diameter of the Sun is the same as it was on the initial drawing.

The line of the invariable plane can be deduced from the proceeding system by realising that *in the geometry*, the ecliptic must pass through the barycenter of the solar system *and* the center of the sun, and



THE INNER SOLAR SYSTEM

GEOCENTRIC DISTANCE (LIGHT MINUTES)		ANGLE TO INVARIABLE PLANE (DEGREES)		ANGLE TO INVARIABLE PLANE (DEGREES x 17)	
BARYCENTER	8.8355	MERCURY	6.34	MERCURY	107.78
SUN	8.2637	VENUS	2.19	VENUS	37.23
MERCURY APHELION	4.3822	EARTH	1.57	EARTH	27.20
VENUS APHELION	2.2072	MARS	1.67	MARS	28.39 + 1 rad = 85.6858
EARTH WINTER SOLSTICE	0				
MARS PERIHELION	3.2248				

Diagram J-1 - The final drawing of the inner solar system with the planets positioned angularly relative to the invatiable plane.

the barycenter must also be on the invariable plane line by definition. Looking at the architecture, a line drawn from the top left corner of the door passes through the sun/ecliptic intersection point and runs up to a quite distinct patch on the wall, the bottom of which is set at 1 radian to the vertical. If the vertical scale from diagram J-0 is now disregarded and only the horizontal scale is used for measuring distances, the fixed point of reference of the barycenter on the ecliptic is 8.8 light minutes from the center of the Earth and it would appear that the map is a geocentric map modeled to the solar system barycenter.

Having established that the barycenter is a fixed point that defines the top of the ecliptic line, it is logical that there must be an equivalent fixed point on the invariable plane line at the bottom of that line, because the architecture always uses opposites in its design. This is clearly the case where the invariable plane line terminates at the top corner of the door, but there is also the invariable plane construction line to take into account. In the initial drawing shown in diagram J-0 the east wall of the chamber is located exactly 20 units horizontally from the origin of the measurements and therefore the east wall must play some part in the design because its position relative to the origin as an integer has been built in to the system. It can be reasonably deduced that the the intersect point of the invariable plane construction line with the east wall is the significant fixed end point on that line.

Further investigation into the design of the wall map in comparison to features outside the pyramid allows the design of the "Wall of the Crow" to be determined. This wall is a major feature on the Giza plateau and an illustration of its shape, taken from the mapping work of the Giza Plateau mapping project² is shown in diagram J-3 and compared against the design from the chamber wall.

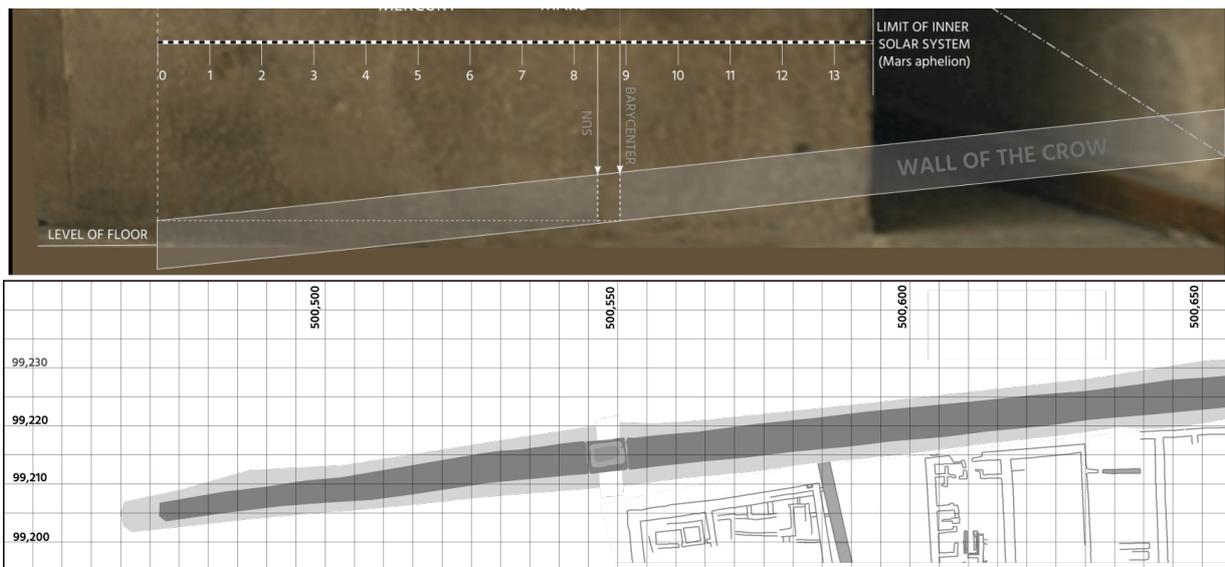


Diagram J-2 - The design of the 'Wall of the Crow' on the lower chamber wall, and the wall.

In the lower part of diagram J-3 the wall is shown within a grid square of units, which is the Giza Plateau Mapping Project's (GPMP) base grid onto which all of their archaeological excavations are plotted. The reference point of the grid is the center of the Great pyramid at coordinates 500000,100000 with the units being meters, so it can be seen that the Wall of the Crow passage (the gap in the wall) is located 550 meters to the east of the center of the pyramid and 790m to the south. The lighter grey area of the wall shows the foundation section of the wall below ground level which was excavated during an archaeological dig³, and the darker part of the wall shows the portion of the wall that is above ground level. As can be clearly seen when comparing the archaeological map with the wall's design, the angle of the wall, the length, the width and the location of the passage through the wall are all perfectly defined from the lower chamber map.

From the design of the solar system map when looked at in conjunction with the Wall of the Crow it can be concluded that the east wall of the passage through the Wall of the Crow is the starting point of the architect's design of the Giza Plateau, because it is defined from the barycenter definition of the aphelion position of the Earth in the solar system map.

The latitude of the Wall of the Crow

It has already been established⁴ that the Great pyramid of Giza contains a perfectly accurate 1:87500 scale model of the Earth and, from the design of the lower southern shaft¹, a scaled perfect definition of the Earth's average orbit containing the measurement of the Astronomical Unit (AU) and the eccentricity of the Earth's orbit around the Sun. These scale models are the foundations of a 1:87500 scale model of the whole solar system, built around the planet with absolute precision, and to uncover it requires following the architectural and logical design that has been used up to this point in the specific order in which it was presented on the north wall of the lower chamber.

What is required as a fundamental starting point is the precise location in the Wall of the Crow passage that has been used by the architects as the base reference point of their surveying, in the same manner that the GPMP has the center of their surveying grid location at the center of the Great Pyramid. To establish this point, and thereby the original surveying grid to which the monuments align, the first step is to plot out the invariable plane line from the wall map at a real world scale of 1:87500 scale, starting from a semi-arbitrary start point in the Wall of the Crow passage, and then refine that start point from the information obtained until it is specified with absolute accuracy.

By looking at the work of the GPMP team it can be seen that the passage through the Wall of the Crow has a specific shape at the foundation level of the wall, which can only be discovered after all of the drift sand has been excavated from the area. Diagram J-3 shows the foundation level design of the passage.

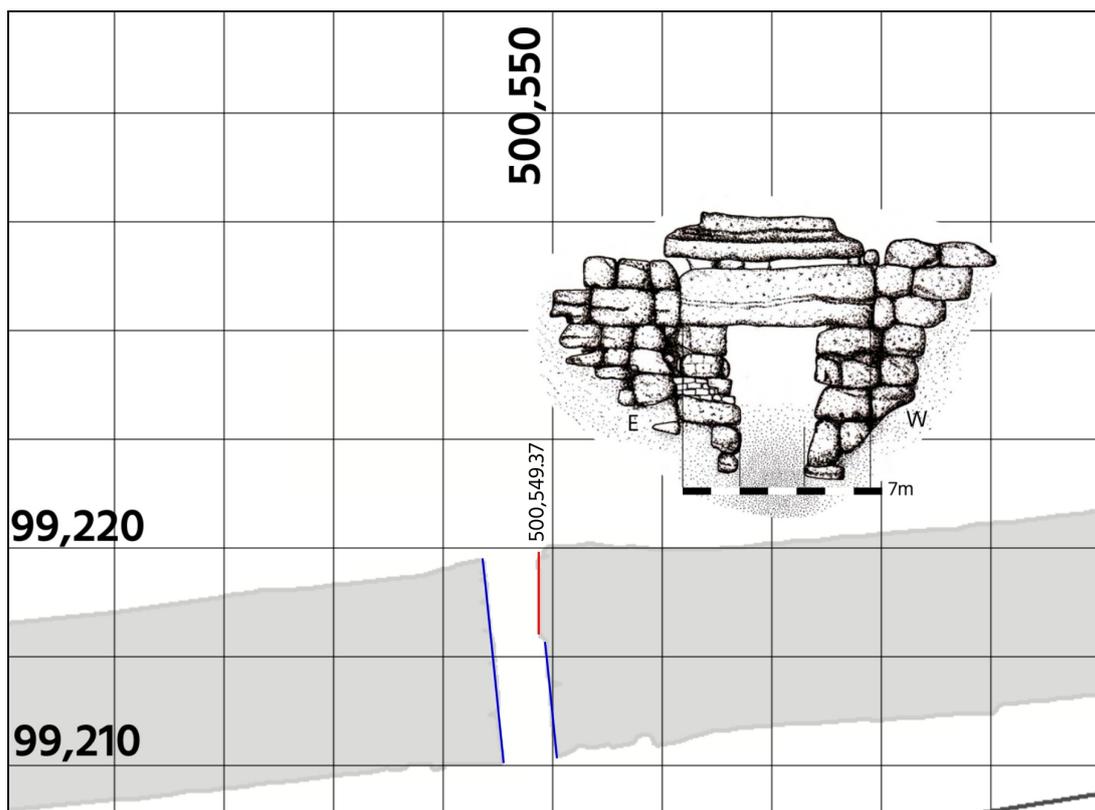


Diagram J-3 - The design of the 'Wall of the Crow' on the plateau.

The inset drawing shows the passage viewed from the north, and the plan view shows how the side walls of the passage marked in blue are perpendicular to the wall sides whereas the section shown in red, as predicted on the east side of the wall, is built along a north-south direction and therefore conforms to the wall map of the lower chamber. So a provisional start point for the architect's surveying grid can be taken as being the southern end of this red line at an approximate surveyed latitude of 29.972106° and a longitude of 31.139892° , the approximations being due to the limitations of the mapping programmes, Google Earth or NASA Worldwind, and the fact that the start point has yet to be determined so cannot be taken from the GPMP surveying grid square measurements.

The architect's system is specifically designed to remove these errors and to do so it is necessary to refer back to the model of the Earth that is contained within the Great Pyramid. Because of the manner in which the reference ellipsoid of the Earth is defined in this model, the precise latitude of the Great Pyramid at its time of construction is included in the definition of the cubit, and is 0.52322373 radians, as was shown⁴ in paper G in this series of papers.

The current latitude of the Great Pyramid is known to a high degree of accuracy from the work of Glen Dash and the GPMP team, and the surveying data is available online⁶. The latitude of the center of the Great Pyramid is specified by the survey point "Center of Base (GDFS 2015)" as 29.979177 degrees or 0.52323535 radians and by comparing this to the original latitude it can be deduced that the building has moved 0.000011616 radians north since it was built due to the tectonic plate movement of the African plate (equivalent to 0.000665548 degrees).

It is therefore possible to calculate the architect's original latitude of the start point of the surveying on the east wall of the Wall of the Crow passage by converting the starting estimate of the latitude into radians and removing the northerly portion of the tectonic plate shift. The current surveyed latitude is 0.5231119 radians, and therefore the original latitude must have been 0.5231003 radians which can correctly be read as 0.5231 radians exactly, and is the defining latitude line of the Wall of the Crow's central reference point. Adding the tectonic plate shift back on to this value gives 0.523111616 radians or 29.97208781 degrees as the current latitude of the start point in the Wall of the Crow.

The aphelion line of the map

The first step in creating the wall map of the solar system in diagram J-2 was to create the invariable plane *construction* line, a line which serves only a temporary purpose, and so that same step can be performed from the surveying start point in the Wall of the Crow passage. The invariable plane line is set at exactly 1 radian from north and the distance along that line that requires mapping is given by the aphelion distance of Earth taken from the orbit characteristics determined in the previous paper where the aphelion was given as 152,379,146.34 km which, when scaled down by the model scale of 1:87500 gives a distance of 1741.476 km. The reason that aphelion distance needs to be used is that the passage through the Wall of the Crow is defined on both its west and east sides by the aphelion distance of Earth to the Sun and to the solar system barycenter respectively, unambiguously defining this value.

Because the architecture up to this point has defined a reference ellipsoid of the Earth, you would assume that it is necessary to use ellipsoidal mapping mathematics to determine where the invariable plane line terminates, using a bearing of 1 radian west of north and a distance of 1,741,476 meters to get a precise location. (There are one or two geodesic mapping programmes available on online platforms^{7,8}, and I have also written one that is available on the giza-pyramids.com website⁹ and has been cross checked for accuracy against the other available systems.) However, when you perform these calculations and then check out the position of the resulting location at latitude 37.420934° and longitude 14.559436° you are presented with nothing more than a farmers field in the middle of Sicily in the south of Italy. Rather than there being anything incorrect in the calculations, this is deliberately wrong and another part of the architect's puzzle system, forcing you to think your way through to the next stage.

If you perform exactly the same method using either "Google Earth"¹⁰ or "NASA Worldwind"¹¹ online graphical mapping platforms, that is to take a 1741km line from the Wall of the Crow along the same bearing, you end up with a completely different end location which is 3.3km kilometers SSW of that determined from the ellipsoidal mapping. This end location on the mapping platforms is also in a field in Sicily, but the field in questions contains some quite distinctive under soil markings which can be seen to be geometric in nature. The stones that mark out the lines are massive measuring several meters across and

are therefore effectively un-movable and two of the lines that they form are at right angles to each other, and the eastern line is aligned at exactly 1 radian from vertical, indicating that there can be little doubt that this is the end point of the line from Giza. This location is shown in diagram J-4.



Diagram J-4 - The western end of the aphelion line from Giza's Wall of the Crow.

In the diagram, which is a screen shot from Google Earth, the purple line is created by the software and originates from Giza at a 1 radian bearing west of north and terminates at the angle shown, the difference being due to mapping the line across a 3D curved shape. Line one on the diagram is set at 1 radian west of north, and lines two and three are perpendicular to each other and offset from the 1 radian line by approximately 1.57 degrees, which is the angle of the Earth's ecliptic to the invariable plane of the solar system. To the left of this, and accentuated by the farmer's tractor lines, is a quite distinct 'eye of Horus' symbol in the field which is created from stones around which the farmer is having to drive.

The reason for the the mapping software showing the end point of the aphelion line correctly and the geodesic calculation across the ellipsoid being off by 3.3km is essential to solving the architect's puzzle. Both Google Earth and NASA Worldwind software applications use spherical mapping systems in order to speed up the software by making the mathematics much quicker to calculate. They keep the screen output showing the correct GPS coordinates from the WGS84 ellipsoid by mapping the satellite imagery that they purchase onto a sphere and then interpreting the cursor location on that sphere back down to the ellipsoid to determine the correct GPS coordinates.

From this it can be immediately deduced that the mapping line coming from the Wall of the Crow must also be being mapped on a sphere and not an ellipsoid.

The surveying base point and base line

Before exploring more of the Sicily construction it is necessary to return to Giza and the line start point, because at present it is being mapped from the latitude of the Wall of the Crow passage location, and this latitude is by definition on the ellipsoid. For the mapping over to Sicily to make sense, the start point of the surveying needs to be transferred onto a sphere and there are two logical choice of sphere available. The first is one which has a radius equal to that of the reference ellipsoid's equatorial radius and the second is a sphere with a radius equal to that of the polar radius. Through investigation of these two possible scenarios

it is possible to determine that the architect's have used the larger equatorial radius and have mapped the survey start point onto that sphere in the manner shown in diagram J-5.

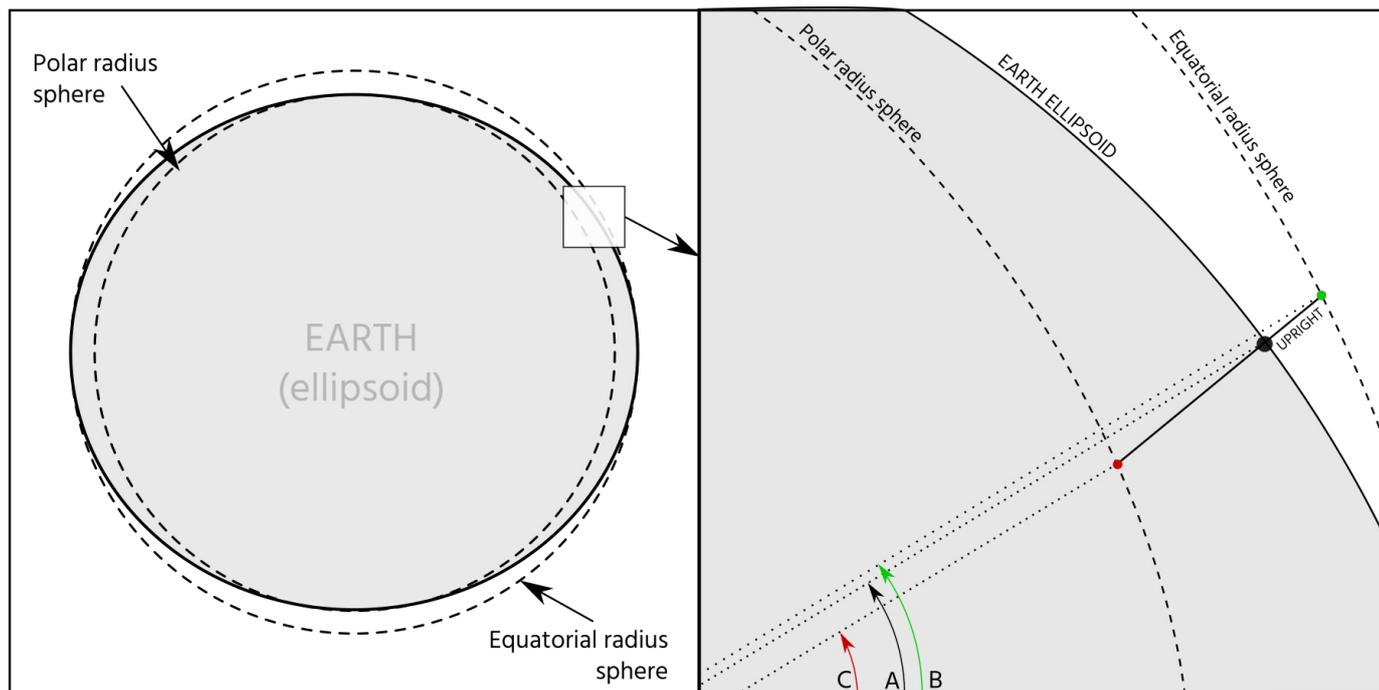


Diagram J-5 - Transferring ellipsoidal points onto spheres

The left image in diagram J-5 shows an exaggerated polar cross section of the Earth's reference ellipsoid as an ellipse, and two circles showing the polar and equatorial sphere cross sections. The image on the right shows a close up of the geometry at approximately the latitude of Giza. Angle A is a geodesic latitude measured from the focal point of the ellipse, angle B is a geocentric latitude measured from the center of the equatorial sphere, and angle C is the geocentric latitude measured from the center of the polar radius sphere. The drawing is illustrative and angles and lengths are arbitrarily assigned. If the black dot on the ellipsoid marks the point on the Wall of the Crow, then the 'upright' line shows this point being mapped up to the equatorial sphere, and down to the polar sphere. It is clear from the diagram that when performing this transition from the ellipsoid, the latitude of the point in question will move north when modeled onto the equatorial sphere and move south by a greater distance if modeled onto the polar sphere.

Using available mathematics functions¹² for translating points from one reference ellipsoid to another, an application was written that allows points to be transferred off the WGS84 ellipsoid and on to either of the two spheres. Plugging in the location of the Wall of the Crow start point into this mathematics and translating onto the equatorial sphere results in the following translation

Spherical Latitude	29.97215782	deg.
Ellipsoidal Latitude	29.97208781	deg.
Distance between points	7.76034	m

with the longitude remaining constant during the shift and still an unknown quantity. Returning to the Wall of the Crow, this means that survey start point is now located north of the passage start point and incorrectly outside of the passage limits. This can be rectified by distributing the 7.7603 m shift either side of the original latitude point in the passage, with the north reference point 3.88m north of the start point, and at a latitude of 29.97212397 degrees, specified to this precision because it is still purely mathematical. Overlaying a satellite image of this translation onto the archaeological map of the area reveals that the straight section of the Wall of the Crow passage corresponds to the ellipsoid to Sphere translation just performed, as shown in diagram J-6. On the semi-transparent satellite image which has been overlaid onto the earlier diagram, the points on the passage east wall are the blue 'pins' in the mapping software that are

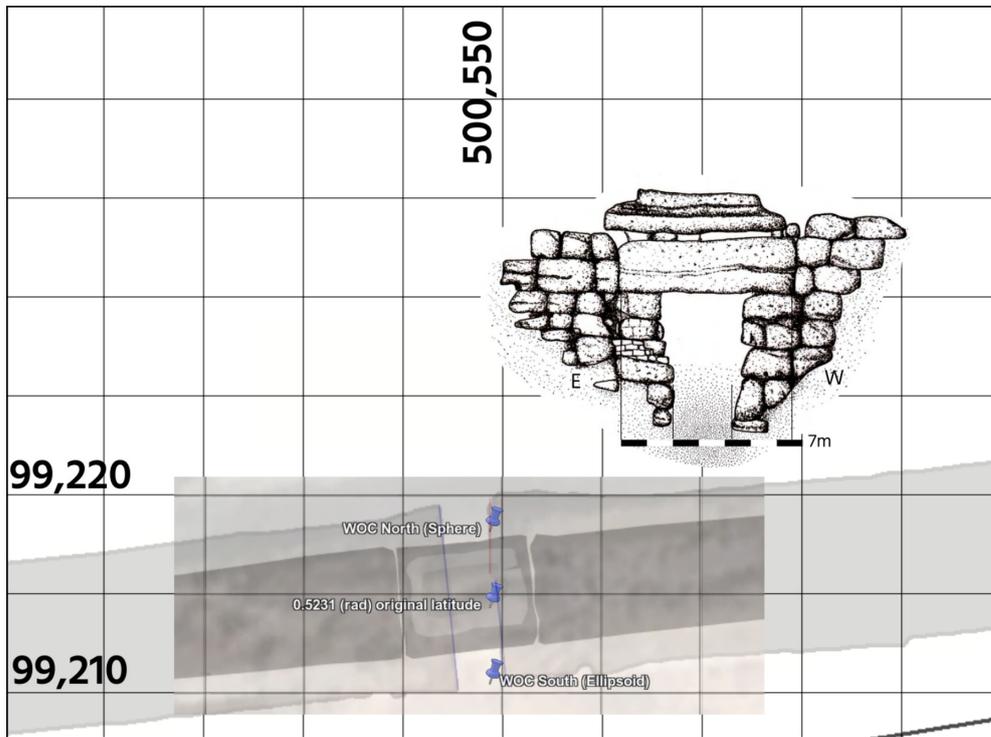


Diagram J-6 - The wall of the crow start latitude mapped onto the equatorial radius sphere.

placed at the original latitude, the southern end of the passage on the ellipsoid, and north end of the passage translated onto the equatorial sphere 7.76m to the north of the south point. The red line shows the north-south section of the passage that was determined from the GPMP survey data which is the same length as the distance between adjacent 'pins'. The length of the red line and the distance between the adjacent 'pins' is the same but the red line is situated 1.9m to the north of its calculated location, for two reasons. The first is to conceal the architecture and the second and principal reason is to indicate that a movement will be required to make the system work. The "WOC North" point on the diagram is the architect's provisional base point for the surveying of the Giza Plateau with a correct latitude and estimated longitude and, as would be expected, this can be verified in the plateau's architecture.

The Giza Plateau survey baseline

Through investigation, the baseline of the Giza Plateau starts at the latitude of the point just determined and runs for exactly 1800 cubits at a bearing of 315 degrees from this point (45 degrees west of north), and needs to be mapped *geodesically on the reference ellipsoid* rather than spherically, as was the case with the initial line to Sicily. The end point of this line is the south west corner of the south west socket of the Great Pyramid of Giza.

At this stage the 'WOC North' point is known as a starting point and only the latitude of this point is known with complete precision. To determine the baseline the start coordinates, distance and bearing need to be placed into a professional geodesic bearing calculator such as those described earlier or the one available on the website, and from the provisional start point the calculation data is as follows :

Start point latitude	29.9721227	degrees	
Start point longitude	31.139892	degrees	(estimation)
Bearing	315	degrees	
Distance	1800	cubits	
End point latitude	29.97813127	degrees	
End point longitude	31.1329901	degrees	

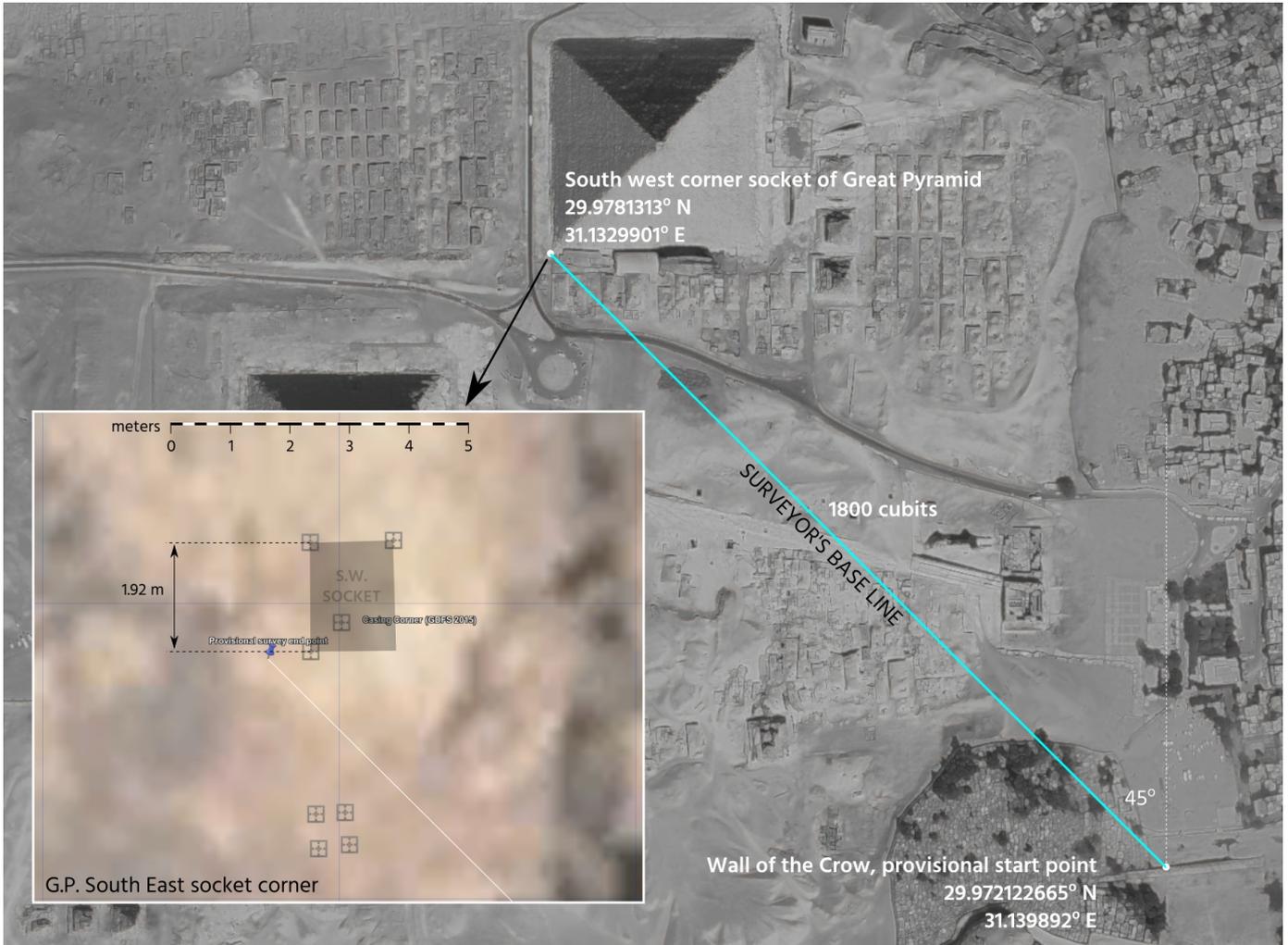


Diagram J-7 - The provisional architect's base line of the Giza Plateau.

Diagram J-7 shows the provisional survey baseline drawn across a satellite image of the Giza plateau, and the inset drawing shows a detailed close up aerial view of the south west corner of the Great Pyramid. The marker points on this inset drawing are the Glen Dash survey marker points, the blue 'pin' is the end point of the baseline and the grey shape is the S.W. socket profile on the ground, with the south east corner point estimated. The latitude of the end point of the survey line is 29.97813127 degrees and surveyed latitude of the socket's SW corner is 29.97813257 degrees and they are therefore at the same latitude within five decimal places. The north-south length of the socket is 1.92m and this is the same distance that the start points are offset from the red line wall section on the Wall of the Crow, this being so that you know that it is the socket to which it aligns and not the corner of the pyramid's casing stones.

With the latitude of the provisional start point established, it is now possible to return to the Wall of the Crow and adjust the *longitude* of the start point so that the longitude of the end of the baseline matches that of the socket corner. This is accomplished by adjusting the starting longitude in the geodesic bearing calculator until the end point matches the surveyed socket longitude. The resulting location of the start point is

Survey baseline start point latitude	29.972122813	degrees
Survey baseline start point longitude	31.139905534	degrees

and the resulting end point of the S.W. socket corner is

Survey baseline end point latitude	29.97813127	degrees
Survey baseline end point longitude	31.133036206	degrees

Comparing the baseline end point on the SW corner socket of the Great pyramid to the surveyed S.W. corner socket shows that the baseline end point is 0.118 m south of the surveyed point, and this 'error' is in the modern surveying measurements that were used earlier. If you follow the flow of the logic of how the surveyors baseline is created the calculations start with the surveyed location of the center of the *base* of the pyramid from the Glen Dash survey in order to calculate the tectonic plate shift that needs to be applied to the Giza plateau to determine the location of the latitude line at 0.5231 radians that runs through Wall of the Crow passage. There is nothing wrong with the numerical value of the surveyed location of the base of the pyramid. The problem is that the 3D center of the pyramid, half way up its vertical height, is 0.118cm north of the center of the base because the pyramid is a dynamic model of the Earth positioned at its correct astronomical angle at the winter solstice of 2729 BCE and with its base point pinned to the ground at the location of the Glen Dash survey point.

From this information it is possible to run through all of the calculations again, adjusting the vertical center of the pyramid until the architect's survey baseline terminates correctly at our surveyed location of the Great pyramid's S.W. corner socket. This is accomplished by taking the Glen Dash center of the base of the pyramid and placing the latitude and longitude of this point into the geodesic calculator and applying a bearing of zero degrees and a distance of 0.118m and then making fine adjustments, resulting in the following values and locations

Base center of Great Pyramid (Glen Dash)	29.979177	N, 31.134201 E	degrees
Vertical center of Great Pyramid	29.979178064	N, 31.134201 E	degrees
Tectonic plate shift north since construction	0.0006668486		degrees
Reference location in Wall of the Crow	29.972089112	N, 31.139892 E	degrees
Wall of the Crow north point	29.972123966	N, 31.139892 E	degrees
Wall of the Crow south point	29.972054258	N, 31.139892 E	degrees
Start point of survey baseline	29.972123966	31.139905534 E	degrees
End point of survey baseline	29.978132570	31.133003620 E	degrees

Diagram J-8 shows the Wall of the Crow final configuration with the corrected plateau baseline start point shown 1.3 meters to the east of the point labeled "WOC North", and the corresponding point at the south of the Wall of the Crow passage also added to the mapping software, both points being shown by the blue pins. The design of the east wall of the passage is now clear to see, with the northern part comprising of a north-south running wall, and the southern part angled so that it terminates half way between the two southern marker points.

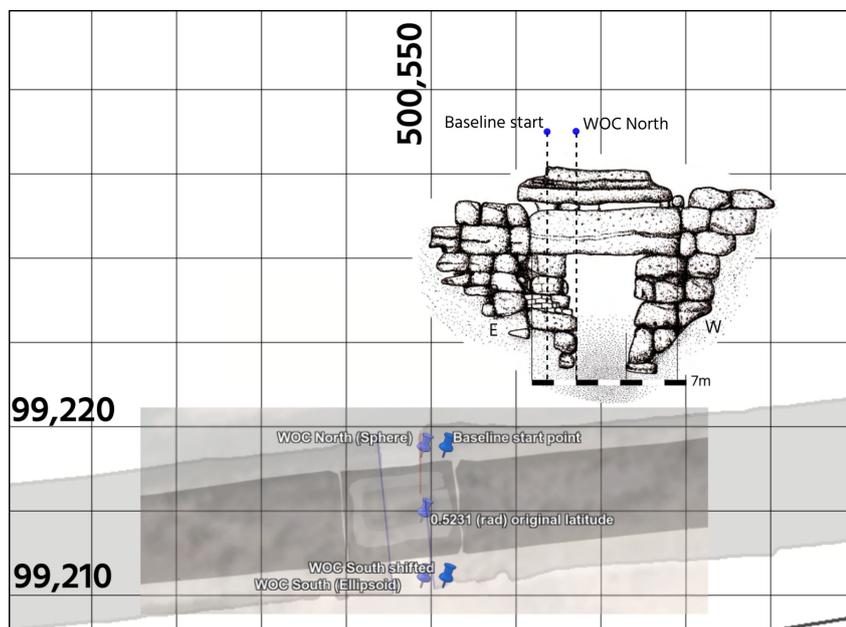


Diagram J-8 - The baseline start point on the Wall of the Crow.

This method of alignment for the southern end of the passage, constructed half way between two known points, is used again in various points of the Giza plateau architecture and is important to note and look at in more detail. Diagram J-9 shows the southern end of the Wall of the Crow passage in detail.

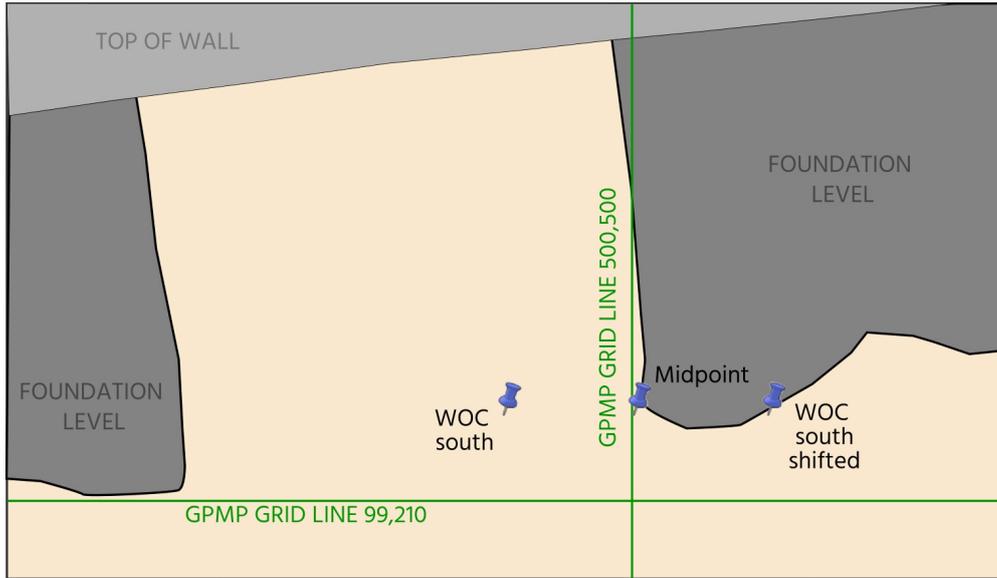


Diagram J-9 - the southern end of the Wall of the Crow passage

The midpoint is located almost exactly on the GPMP grid line that is 500m east of the base center of the Great Pyramid. This is the deliberate longitude alignment of the design, the marker point of the southern end of the Wall of the Crow passage is exactly 500 pM (perfect meters) or 500.098 m east of the center of the Great Pyramid and provides the starting *longitude* of all the plateau's architecture and is located at

WOC south end midpoint 29.972054258 N, 31.139898770 E

It is interesting to look at William Petrie's drawing of the layout of the socket corners of the Great Pyramid, shown in diagram J-10, where it can be seen that the south west socket corner is out of place in relation to the other 3 corners of the building, showing the architectural design that has just been explained.

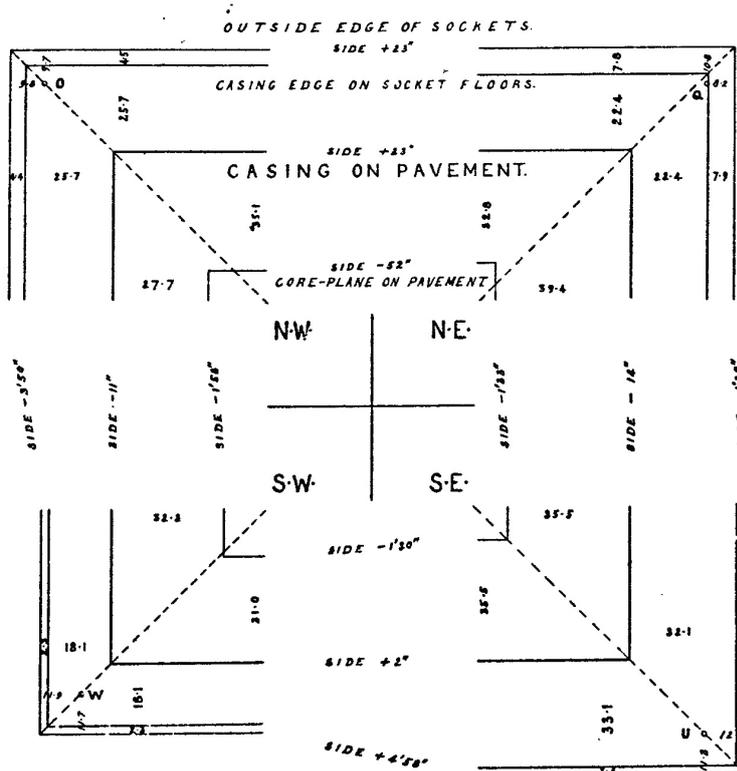


Diagram J-10 - Petrie's surveying of the corner positions of the Great Pyramid.

The architect's construction grid on the Giza Plateau

The is now sufficient information available to be able to start to reconstruct the architect's original surveying grid on the plateau, starting with the latitude alignments.

At the time of the pyramid's reference date of 2729 BCE, the start point in the middle of the Wall of the Crow passage was at the specific latitude of 0.5231 radians. On diagram J-11 the lower red latitude line passes through this location and above it the other red latitude lines are spaced every 0.0001 radians. The blue latitude lines are spaced in the middle of the red lines, according to the system just seen at the south end of the Wall of the Crow, and therefore are placed at 0.00005 radian absolute locations at the reference date. None of these lines align with any of the major monuments on the plateau, even though the lower red line appears to pass along the southern face edge of the third pyramid it is actually out of line by several meters.

What is significant on the diagram is the features to the west of the second pyramid, which were classified by William Petrie¹³ as "workman's barracks", but which are actually the alignment mechanism for the surveying grid on the plateau. A detailed survey diagram of these pits is shown overlaid on diagram J-11 and the southern end of these latitude aligned 'calibration pits' are located 100 cubits to the south of the blue grid line on their west side. Similarly the blue latitude line north of the Great Pyramid is around 100 cubits from the face line of the Great Pyramid and therefore if an adjustment mechanism can be found it will be possible to align the latitude lines to the architectural features of the plateau.

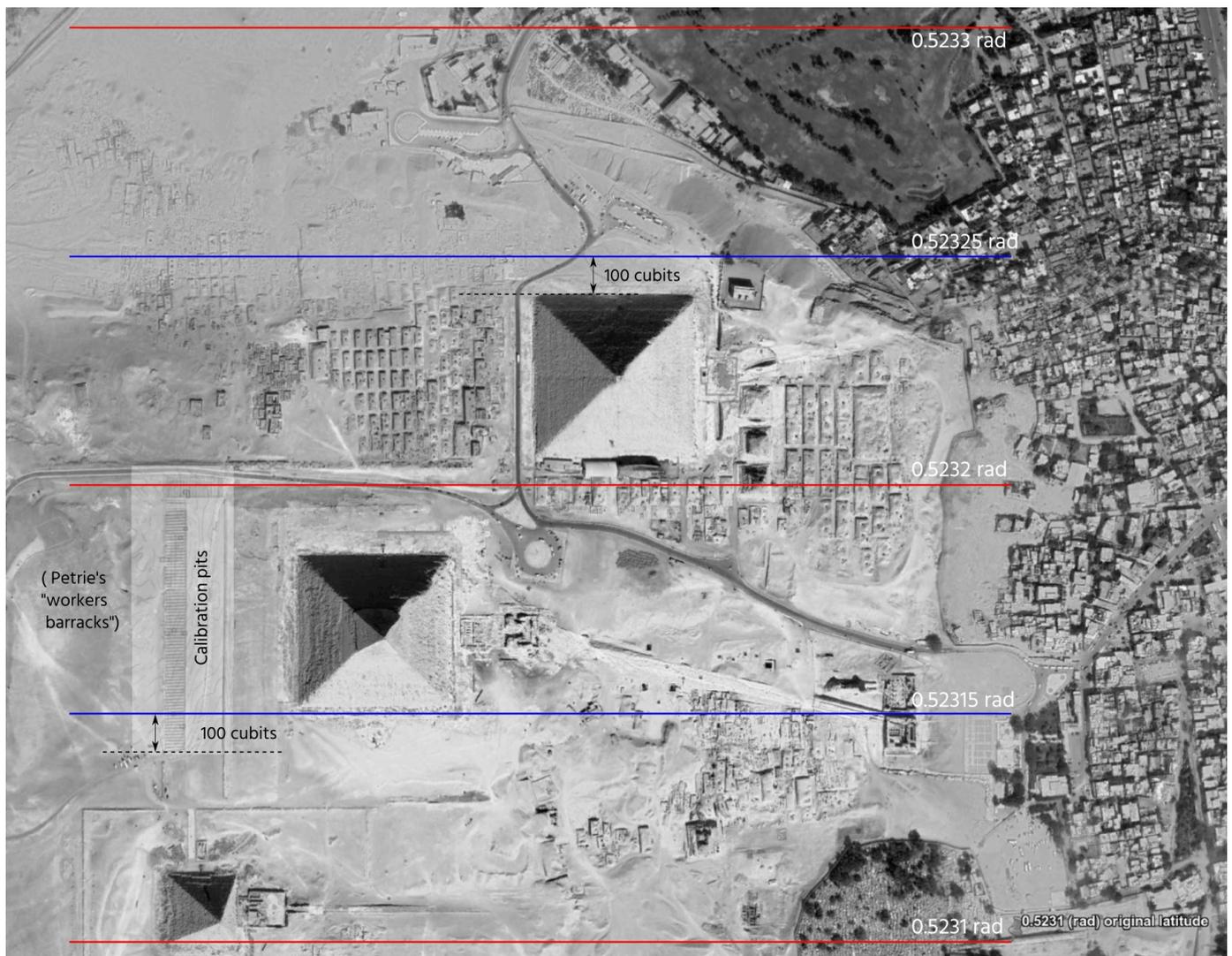


Diagram J-11 - The alignments of the regular radian level latitude lines which start from the Wall of the Crow.

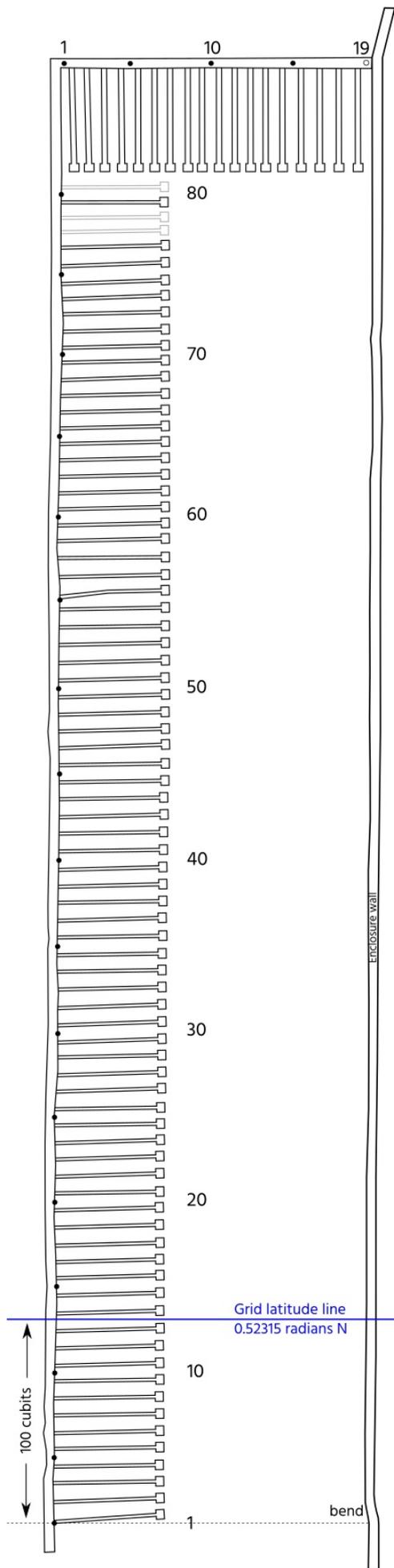


Diagram J-12 - The calibration pits

The features of note on these calibration pits are as follows.

There are three missing wall constructions at the top of the calibration pits, the final constructed pit wall being number 76 with wall 79 also having been built. The purpose of these missing pit walls is to allow the total number of pits to be correctly deduced as 80 and to show that the pit system starts at the southern end. The 76th row is later used as an adjustment value in the baseline calculation.

The fact that wall number one is the first wall is shown by the bend in the eastern enclosure wall which occurs at the start of the calibration pits. This alignment shows how the counting system should be used, where it is the west end of the first pit wall that is the start point of the *counting* system and the spaces between the pit walls that are being counted, and not the walls themselves.

The west end of wall one is significantly to the south of the east end of this wall, and that is so that the west end is exactly 100 cubits from the latitude grid line of the previous illustration, and shows that the east end of the wall therefore cannot be. The 100 cubit measure is designed to catch your eye, and is not the amount that you need to shift the latitude lines to make them conform to the pits.

There are 19 longitude calibration pits at the northern end of the structure. The 55th pit wall has a distinct bend in it and is therefore significant.

The blue latitude grid line that was originally at a latitude of 0.52315 radians north when built is positioned exactly at the latitude center of the 13th of the 80 calibration pits.

Using this information it is possible to determine the manner in which the latitude grid lines can be moved so that they conform to the calibration pits and the north face of the Great Pyramid. The latitude lines are 0.00005 radians apart and need to be moved south by $\frac{1}{10} + \frac{1}{16}$ of this amount. The reason being that the lowest common denominator of these two fractions is $\frac{1}{80}$ and expressing the addition of the two fractions results in $\frac{13}{80}$ of a latitude space. This is the reason that the calibration pits are built as they are, so that the original latitude line passes directly through the center of the $\frac{13}{80}$ calibration pit. Converting this translation into decimal degrees it corresponds to a movement of 0.000465528 degrees, and therefore the southern end of the calibration pits are located at

Original latitude 0.52315 rad.	29.97428705 degrees
Tectonic plate shift	+0.000666849 degrees
Latitude shift south $\frac{13}{80}$	-0.000465528 degrees
South of calibration pits	29.97448837 degrees

The same calculation can now be performed on the latitude line to the north of the Great Pyramid :

Original latitude of grid line 0.52325 radians	29.98001663	degrees
Tectonic plate shift minus latitude shift	+0.00020132039	degrees
North face of Great Pyramid	29.298021795	degrees

This latitude value can be accurately compared to the Glen Dash published survey points on the north face of the Great Pyramid, and diagram J-13 shows the measurements superimposed on the Glen Dash image of the surveying of point #32220 at the center of the north face of the building.



Diagram J-13 - The translated latitude grid line at the north face of the Great Pyramid.

On the diagram the last three digits of the latitudes have been extracted and placed on the two surveying lines and on the grid line for ease of comparison of the numbers. The grid line conforms to the same system that was seen at the south end of the Wall of the Crow passage, where the point of significance is situated half way between two measured values.

With the latitude grid lines adjusted to millimeter precision, the longitude lines can now be considered and the start point for these lines is the southern end of the Wall of the Crow passage at the mid point between the two fixed points. (Note that the survey grid is being solved in a linear fashion and the last point solved leads on to the next point that requires solving and without this systematic approach, the grid would be near impossible to determine.)

We now know implicitly that it is the longitude midpoint in the Wall of the Crow that is significant at the original latitude of 0.5231 radians at a longitude 500 pM east of the Great Pyramid center, and so a second baseline can be constructed from this point as follows

<u>Original</u> latitude WOC center point	29.97142226	degrees
<u>Current</u> longitude of WOC south midpoint	31.13989877	degrees
<i>Provisional</i> end point of baseline 2, original latitude	29.978097716	degrees
<i>Provisional</i> end point of baseline 2, original longitude	0.0069019117	degrees

Note, importantly, that in the calculation just performed the center of the WOC passage point is designated as a zero longitude and the architect's measure of longitude is from east to west as the positive direction. These start and end points of this second baseline can be mapped onto the software mapping system (Google Earth) and the longitude grid lines formed in the same manner that the latitude lines were formed earlier, by taking the primary division from the calculation and adding in a subdivision between each line. The result of this is shown in diagram J-14.

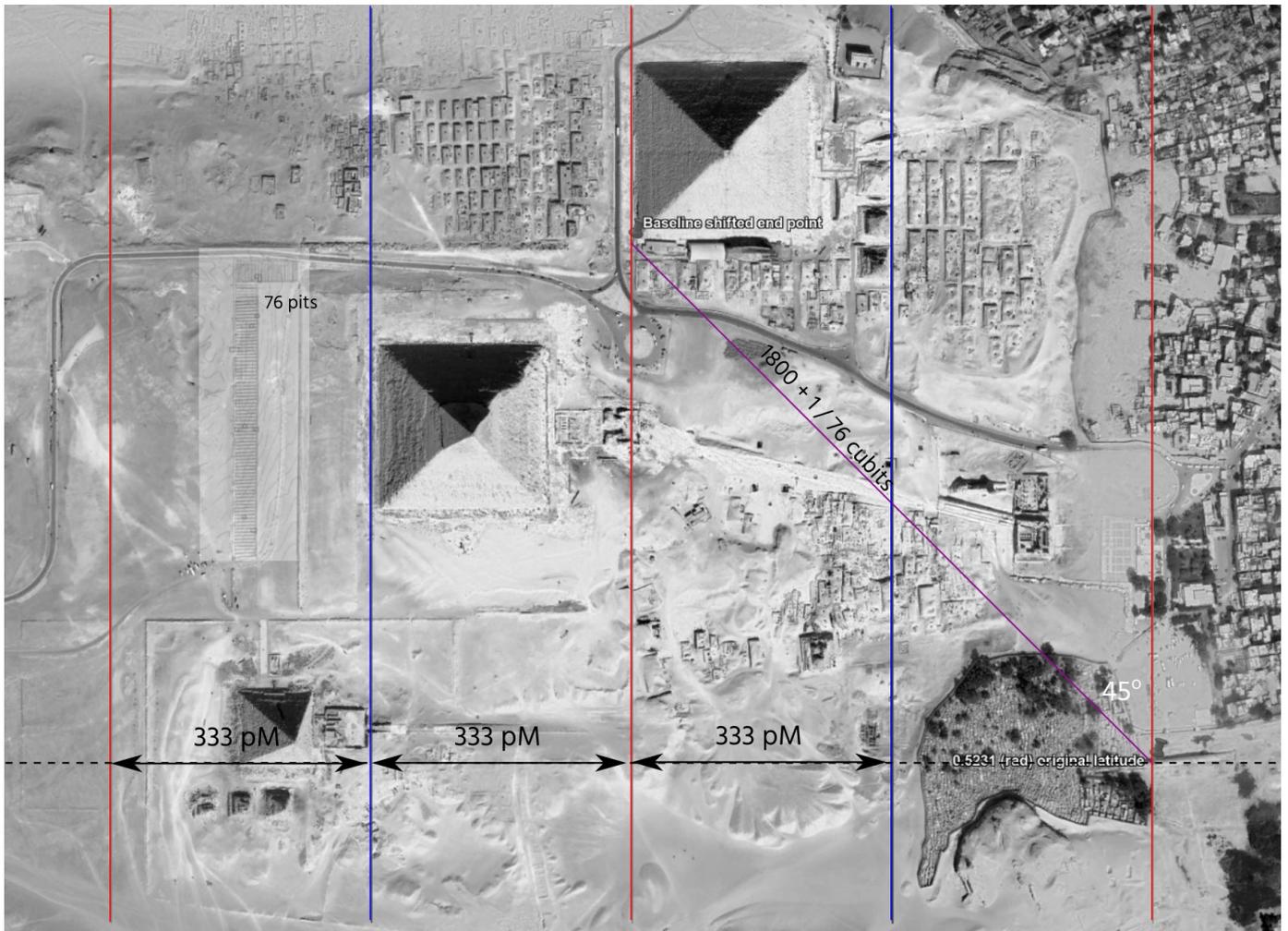


Diagram J-14 - The initial longitude grid lines of the Giza plateau

This relatively simple construction of five longitude lines is actually highly sophisticated. Because longitude lines become closer together the further you move away from the equator, and because the tectonic plate shift since the pyramids were built has resulted in a northerly movement in the plateau of around 65m, the calculations *have* to be performed using original latitudes from 2729 BCE.

At the original latitude of the Wall of the Crow center point the longitude lines are spaced almost exactly 333 pM apart. Specifically a 665.995 pM line length at a bearing of 270 degrees from the center point of the Wall of the Crow terminates at the same longitude as the end point of the 1800 cubit long second baseline, and therefore there is a 5mm error in the calculation to produce a perfect 333pM longitude grid.

The missing five millimeters is found by referring back to the 76 continuous calibration pits and realising through calculation that 1/76 of a cubit needs to be added to the second baseline length for the longitude grids to be spaced 333.00000 pM apart. The second baseline of the plateau is therefore 1800 + 1/76 cubits long at a bearing of 315 degrees starting at the Wall of the Crow passage center point, resulting in the end point of this baseline at **29.97809776 N, 31.13299681 E**. Because this defines the longitude portion of the grid, this baseline must be the primary baseline of the plateau, and the one that was first encountered that runs to the SW corner socket of the Great Pyramid only a construction line.

Diagram J-15 shows the central red longitude line in diagram J-14 passes directly through the north west corner socket point of the Great Pyramid as surveyed by the Glen Dash team. The longitude of the grid-line is 31.13299681 degrees and the survey point #35214 has a longitude of 31.13299754 with the discrepancy between the two showing the small rotation of the African tectonic plate since the pyramid was constructed.



Diagram J-15 The GP north west corner socket alignment

Although it is the linear distance on the plateau of 666 pM that is the crucial factor in determining the longitude grid, it is the difference in longitude that is the determining factor in defining this distance and therefore the most important piece of information to note. The difference between the longitude of the start point and end point of the principal baseline is 0.00690191 degrees, and therefore each grid column half this amount, but the calculation performed to obtain this datum is being carried out over a short distance across the Giza plateau. The more accurate method for determining this value is to determine the *Cartesian coordinates* of the start point on the ellipsoid of the Earth, giving the X coordinate at the Wall of the Crow center point as 5529.83989 km, calculate the circumference of the cross section of the Earth at this latitude as 34745.009 km, convert to perfect kilometers by dividing by 1.1000196573 and then divide through by the 333 pM grid width, giving the longitude width of the grid divisions as **0.003454412383** degrees.

With this information it is now possible to combine the latitude and longitude lines into a initial grid system, and diagram J-16 shows this grid, which has been calculated externally to the mapping software and then imported in as a "Google Earth kml" file so that the independence of the calculations is retained and they can therefore be checked and verified.

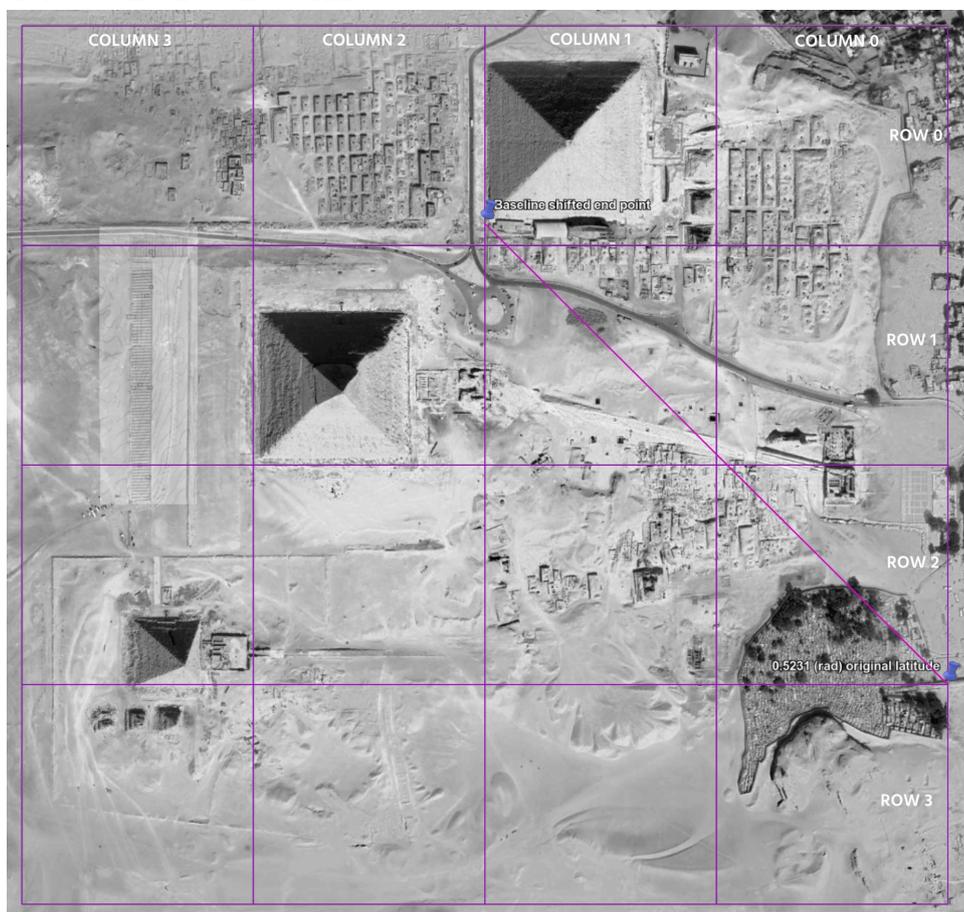


Diagram J-16 The 333 pM starting grid on the Giza Plateau

The grid in diagram J-16 has not been translated so that it aligns with the north edge of the Great Pyramid and the south end of the calibration pits, and is simply fixed to the Wall of the Crow passage center point longitude and latitude. The grid is drawn according to the architect's system of measurement, the top right corner of the grid is the start of the *drawing* system and runs from east to west and from north to south allowing the rows and columns to be numbered so that the north east grid 'square' is (0,0), the north west is (3,0), and the south east is (3,3). The plateau baseline is shown on the drawing running from the Wall of the Crow reference point to the Great Pyramid west socket line, defining the grid longitude lines.

The translation of the latitude shown earlier that is required to align the grid to the north face of the Great Pyramid and the south of the calibration pits is only required in column 1. A similar translation of column 2 would result in the second latitude grid line being positioned remarkably close to the north edge of the second pyramid and by analysing the distances involved it is possible to discover that all of the columns can be translated by latitude in the following manner.

Column 0	0 x	1/9 + 1/15 of a grid
Column 1	1 x	1/10 + 1/16 of a grid
Column 2	2 x	1/11 + 1/17 of a grid
Column 3	3 x	1/12 + 1/18 of a grid

This results in the final latitude translated grid shown in diagram J-17.

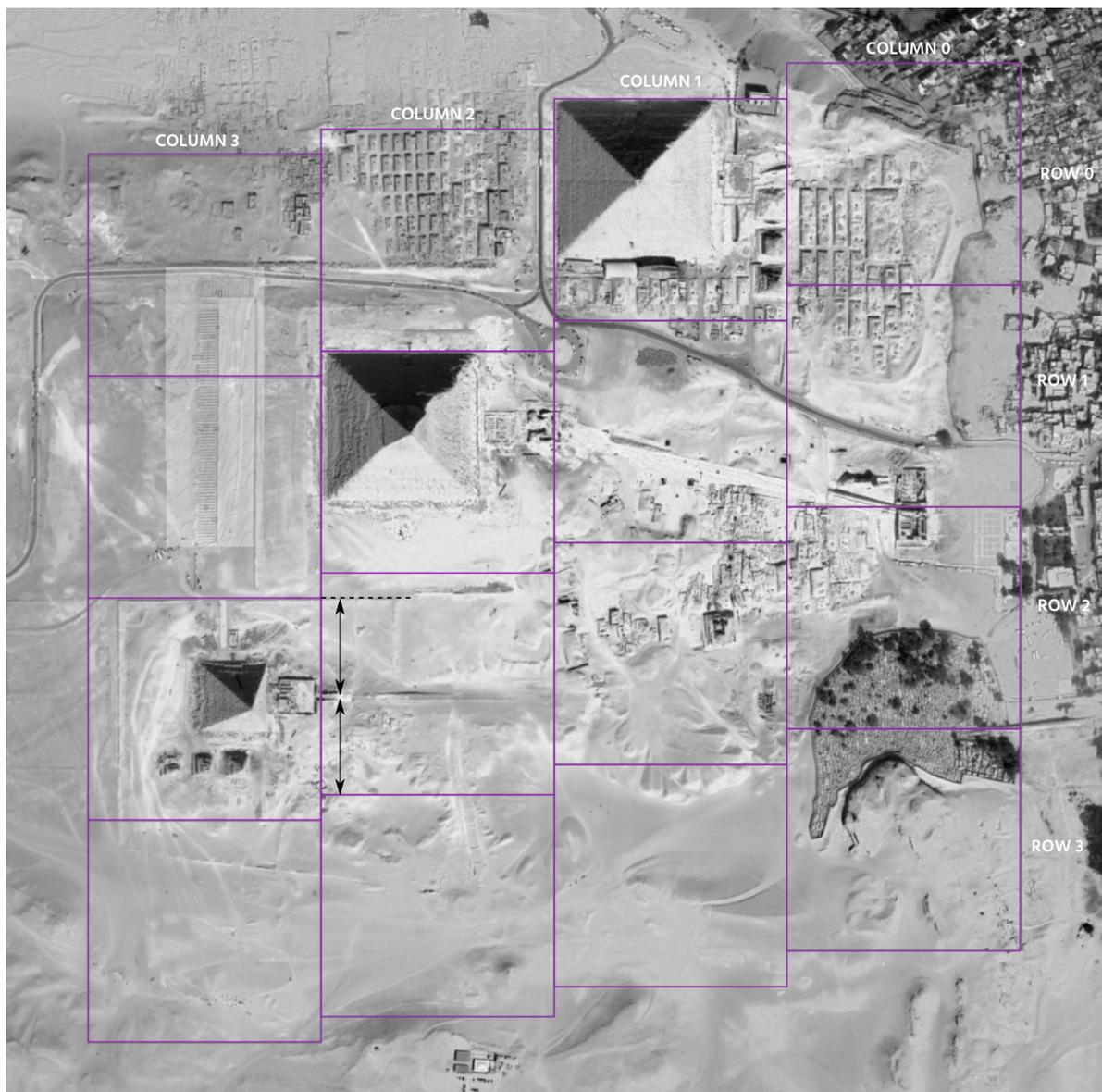


Diagram J-17 The latitude translated grid with alignments to all three major pyramids

All three of the major pyramids are aligned to this grid. The Great Pyramid's alignment has already been explained. The third pyramid is perfectly centered as shown by the black arrows that are of equal length and align to the grids of columns 2 and 3, leaving no doubt at all that the method of formation of the translated grids is correct. The second pyramid's northern face line where the casing stones meet the foundation of the building is exactly 1 pM (1.0002 m) south of the grid line when checked against the Glen Dash survey point number #35620 which has a latitude of 29.97695110 degrees.

Having found the latitude offset system, and knowing that the Great Pyramid's western socket line longitude has already been established by the longitude grid, it is logical that the longitude grid must also be displaced in a similar manner to the latitude grid, where the first row is static and each subsequent row to the south is displaced east. The answer of how to do this must be contained in the calibration pits that were used earlier, and inspection of the translated latitude grid in this area reveals that the recently shifted latitude lines of column 3 now pass directly through the 54th pit wall, below the bent wall that was identified when first looking at these pits. Diagram J-18 shows a close up of this area of the pits.

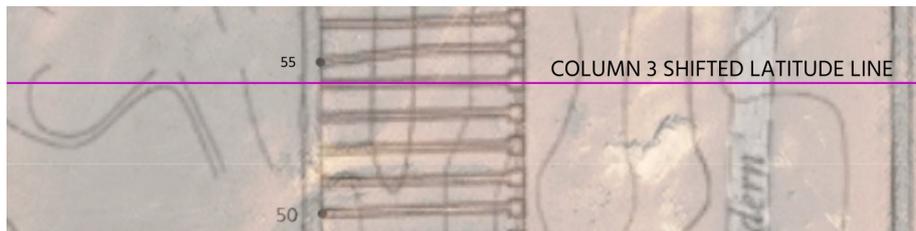


Diagram J-18 The latitude tgrid in column 3 and its alignment with the calibration pits

The longitude grid lines can now be displaced using this information. Each row of the grid needs to be displaced to the east by 1/55th of a grid - a value which is unobtainable without first having solved the latitude displacement. The completed base-grid is shown in diagram J-19.

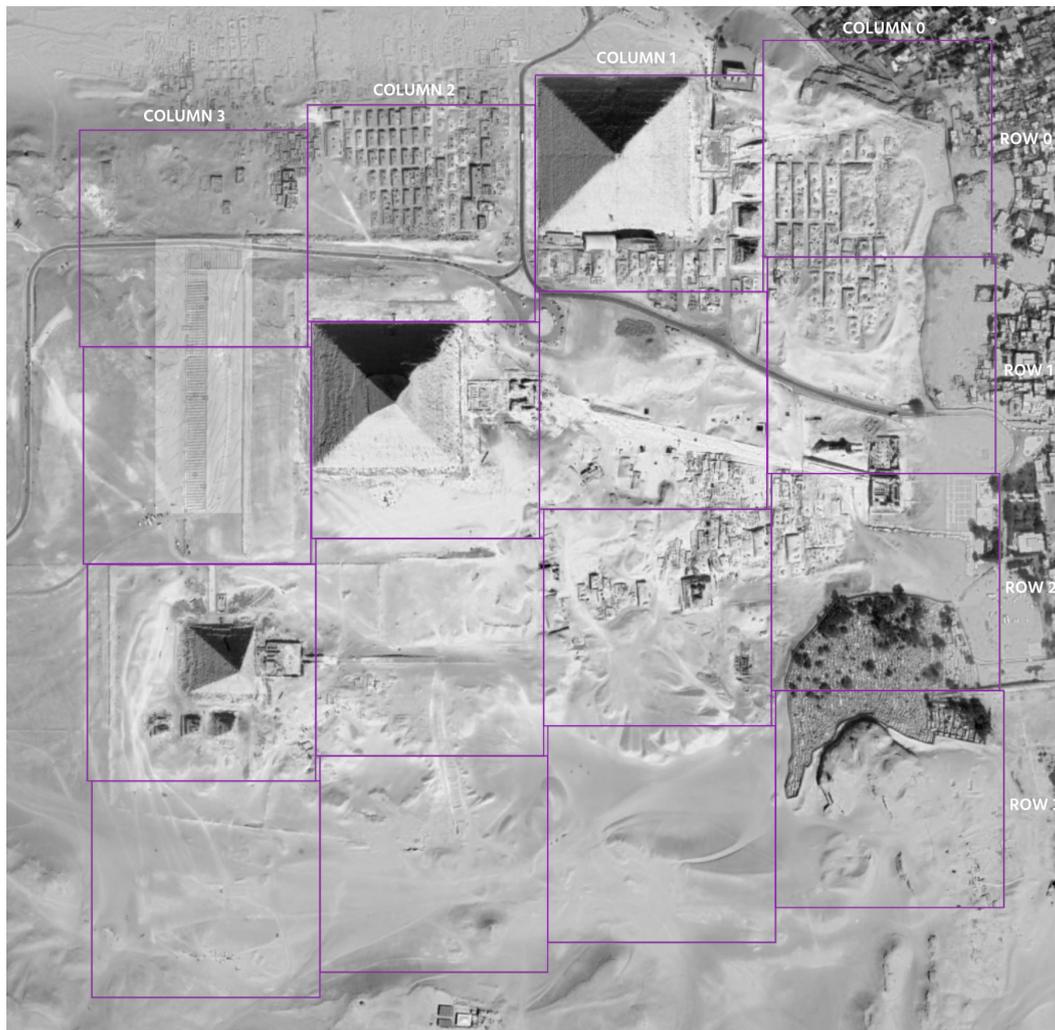


Diagram J-19 The fully translated architect's base grid

There are now numerous alignment points with the buildings on the plateau in addition to the three major pyramid, such as the east side of one of the satellite pyramid of the Great pyramid, the Sphinx valley temple north-south center, the east side of the pyramid two temple and many more. This is because all of the buildings on the plateau are aligned to this grid, and not the other way around where the grid is being aligned to the buildings. Any doubt about this can be dismissed by looking at each of the individual grids, in particular the grid of column 3 row 2 grid that surrounds the third pyramid. (It would be sensible at this stage to letter each of the grid squares to make identification easier, but until further detail is revealed there is no guarantee that the complete grid is a 4x4 pattern, and therefore the lettering system would need to be adjusted in the future if the grid was discovered to be larger.)

The grid of column 3 row 2 is shown in diagram J-20 in which the left side image shows a close up of the grid in which it can be identified that the perimeter wall's eastern side is 33.3 meters from the west side of the grid, and therefore 1/10 of the grid's width. The right side image shows the same major grid with a 10 x 10 sub-grid placed inside it and an arrow showing the wall alignment.

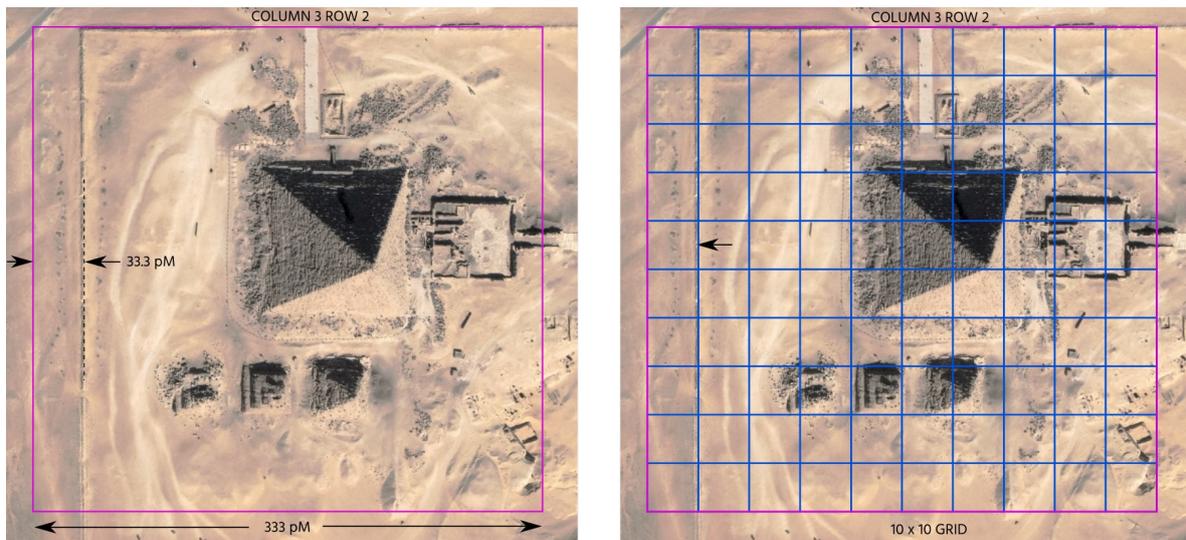


Diagram J-20 Column 3 row 2 grid and its 10x10 sub division

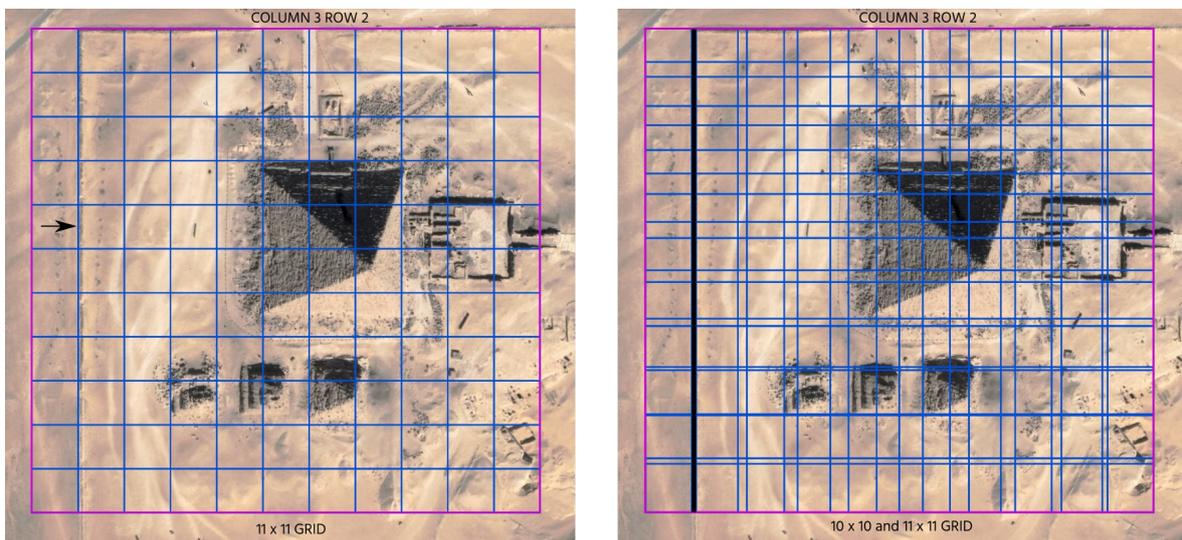


Diagram J-21 Column 3 row 2 grid with an 11x11 sub division and a composite of both the grid divisions.

Diagram J-21 (left) shows an 11x11 grid sub grid which aligns to the west side of the perimeter wall as shown by the small black arrow. On the right side image of diagram J-21 both the 10x10 and the 11x11 grids have been drawn and the perimeter wall is drawn as an elongated black rectangle running from north to south between the grid lines of the two sub-grid structures. If you know how the overall grid across the plateau has been formed, you will now know the latitude and longitude of either side of this perimeter wall which can then be used to perfectly geo-align the satellite image.

As well as permitting geo-alignment of overhead images, another purpose of these clear grid alignments is to teach the system that has been used throughout the plateau in every one of the major grids which all contain subdivision grids that have been adjusted by moving them using simple fractions. In some cases, as an example to the west of the Great Pyramid, the translation of the grid lines is asymmetrical causing the buildings and features to be no longer aligned to the cardinal axis, as shown in Diagram J-22.

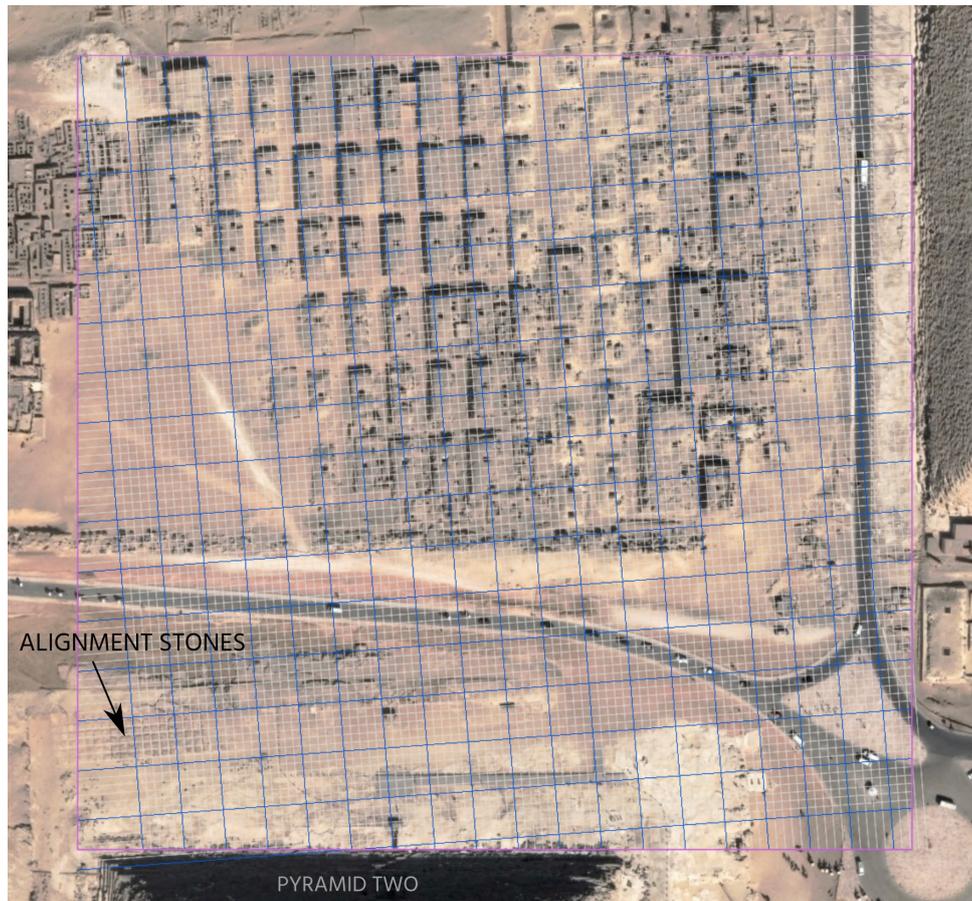


Diagram J-22 The 16 x 20 sub grid to the north of pyramid 2 on the Giza plateau.

The sub grid system in this diagram was discovered after extensive analysis of the major grid and is a 16 (latitude) x 20 (longitude) grid with the latitude lines shifted north by one sub grid at the east side of the major grid and shifted south by 1/4 of a sub grid on the west side. The longitude lines are shifted west by 1 sub grid at the north of the major grid and east by 1/2 of a sub grid at the south. Each of the sub grids is further divided by a 6 x 5 grid, shown in white on diagram J-21. What is of importance in this system is the quarry style cut alignment stones to the north west of pyramid two which are perfectly defined by the minor white sub-grid and are shown in detail in diagram J-23.



Diagram J-23 The defining quarry cuts next to the calibration pits north of pyramid 2.

The purpose of these alignment stones is two fold. The first is that, just as with the previous alignments to the perimeter walls, they allow satellite photography or, in the case of diagram J-23, overhead images from a drone to be correctly positioned within the grid system because it is not possible to carry out an analysis of the whole of the plateau's grid system before this has been done. The second and primary purpose is to define the size of the major grid system being used because the quarry cut stones are distributed among the sub grids in a 5x5 pattern with the southern most line of quarry cut stones 'missing' in the construction. If you correctly form the architect's grid the 5x5 pattern is obvious, and if you were to look at the quarry cut stones without the grid you would deduce that there are 6 rows of stones and 19 columns, some of which are incomplete. (The 19 columns relate to the 19 calibration pits which is how it is possible to know that these stone are related to the grid calibration.) It is now possible to draw out the full set of major grids on the plateau in their 5x5 format as shown in diagram J-24, which has identifying letters now marked on each major grid unit.

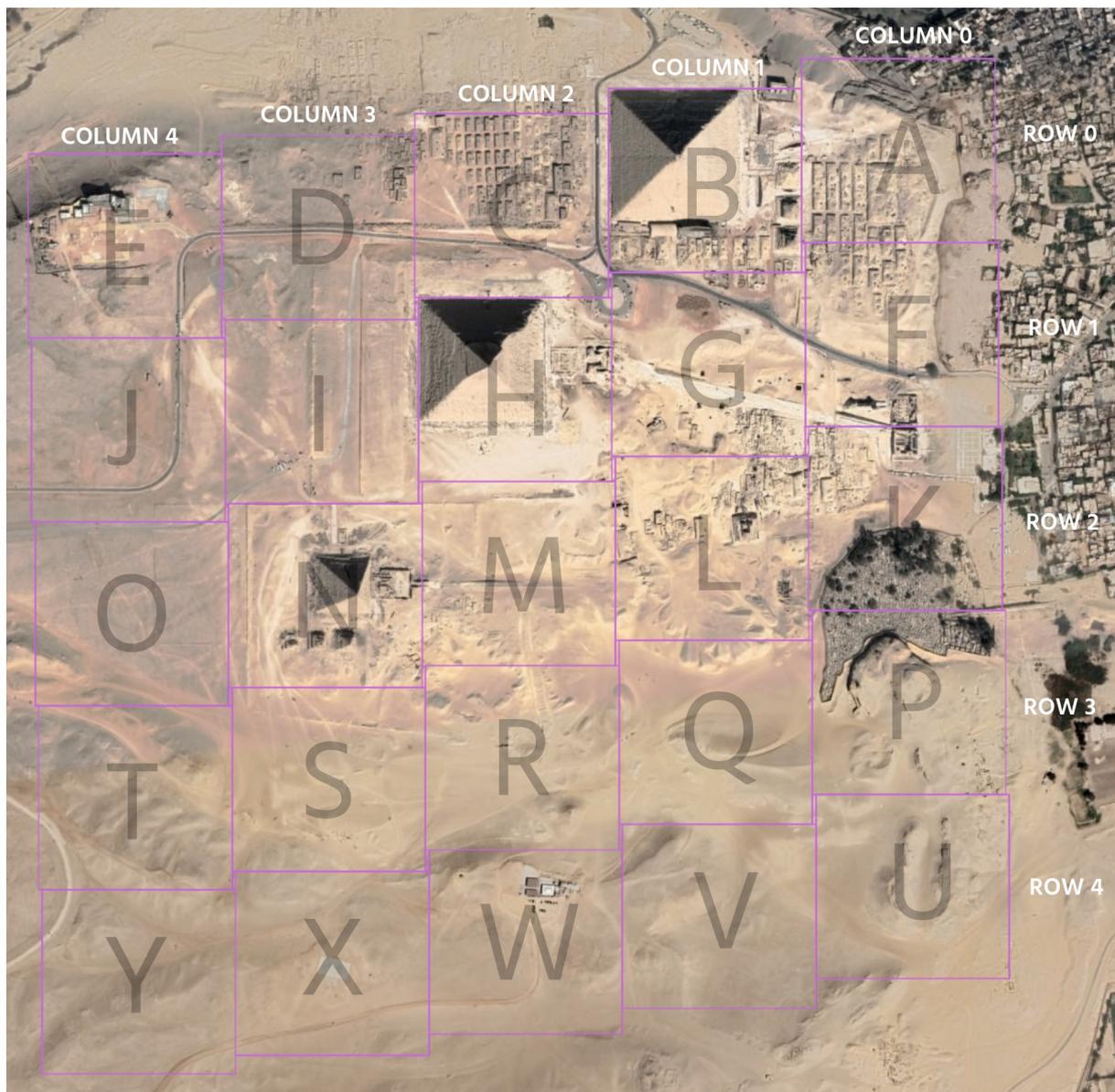


Diagram J-24 The 5x5 master architect's grid of the Giza Plateau.

This 5 x 5 grid pattern is nominally 5 x 333 pM wide on each row, or 1665 pM (1665.33m), and 0.00005 radians from north to south on each column with the rows and columns offset as described earlier. It is possible (and essential) to determine how many of these grids would fit around the globe because the X value of the Cartesian coordinate of the Wall of the Crow at its original latitude of 0.5231 radians can be calculated as being 5528753.0939 pM (5529839.8971 m) and therefore the cross section circumference is this value multiplied by 2 x pi. Dividing the circumference through by the grid size of 1665 pM gives 20863.772 of these grids that can be tessellated around the globe, meaning that it is impossible to move to

the east from Giza on this system because the last grid is only partial and therefore longitude has to always be measured from Giza to the west. This is the reason in the calibration quarry cuts that there is a 'blank' row below the 5x5 grid showing that the system is deliberately discontinuous.

Between each of the shifted rows and columns in this grid system are rectangular space that were formed when the rows and columns were translated. Because the column translations are not identical on each of the 5 columns, these small rectangular 'spaces' are a different north-south length throughout the grid construction and this can be clearly seen when comparing the rectangle at the joint between grids A,B,F and G and the rectangle between the grids S,T,X and Y.

It is now possible to return to the end of the line that was drawn up to Sicily and construct the architect's grid at that location. The grid will not have the same distances between longitude lines as in Giza because the grid's definition is angular in longitude, and therefore the closer to the globe's poles that the grid is drawn the narrower the longitude lines become.



Diagram J-25 The grid system drawn in Sicily.

Diagram J-25 shows the architect's grid system drawn in the farmer's field in Sicily. The grid reference number at the bottom of the diagram refers to latitude and longitude grid number of this 5 x 5 grid where the latitude is given first and the longitude second. The grid at Giza currently has reference number (2092,0) where the latitude reference number shows how far from the equator the grid system is placed and the longitude number how many grids west of Giza the grid is located.

In the diagram the cyan line is the aphelion line from Giza plotted on the equatorial sphere as before, and the grid has had the northerly part of the tectonic plate shift of the African plate that was calculated at Giza applied to it, so that the grid at this location is on the same reference system as the Giza plateau. (The more 'correct' system would be to move the satellite photography in both Giza and Sicily to their original locations, but this ideal system requires significant effort for no reward at this stage of the analysis.)

The inset drawing shows the detail of where the aphelion line terminates and which is about 42 meters to the east of the alignment rectangle's center point and at the approximate same latitude. Because both the grid and the line are pure calculations based on the shape of the Earth's reference ellipsoid and the Earth's average orbit, and the data that makes up these two elements is known to be correct, then there must be something incorrect in the calculation of the grid location.

The number of grid squares that tessellate around the globe is determined from the X coordinate on the reference ellipsoid of the position of the Wall of the Crow starting point at its original latitude of 0.5231 radians North, at the pyramid's reference date of 2729 BCE - a position which is the bottom of row 2 of the 5x5 grid, in column 0. If the original latitude of row 4 of the 5x5 grid, at 0.5230 radians, is used to create the grid system instead of the Wall of the Crow latitude and the grid in Sicily is redrawn then the center of the alignment rectangle becomes 42m to the east of the fixed end point of the aphelion line rather than the 42m west as was shown on diagram J-25. The reference latitude on the Giza plateau for determining how many 5x333 pM grids tessellate around the globe must therefore be at the bottom of row 3 and diagram J-26 shows a close up of the alignment rectangle area of the Sicily grid redrawn using this datum.



Diagram J-26 The grid system in Sicily redrawn using row 3 base as the reference datum.

The aphelion line terminates in the center of the alignment rectangle with no discernible error margin when viewed in close up of the mapping application. It is worth reviewing that the line is 1741.476 km long and formed from the aphelion distance in the Earth's average orbit as specified in the lower northern shaft of the Great Pyramid, and the grid is simply defined as being 333 pM in width at a latitude of 0.52305 radians at Giza, both measured on a reference ellipsoid specified in the architecture of the Great Pyramid. Without doubt, all of the calculations to this point are correct.

To the north of the 5 x 5 grid in diagram J-25 are a further set of ancient lines that can be seen to be angled to north-south, and therefore to finish the grid alignment it is necessary to rotate the grid to lock into position with these markings. The problem with rotating the grid is that there is no defined rotation point, and experience in the past analysis of making an assumption about where it could be, such as in the center of the 5x5 grid for example, does not work. The only place that the rotation point details can be obtained is back on the Giza Plateau.

After analysis of the grid system on the plateau the rotation point can be defined with precision, and diagram J-27 shows the detail of an area to the south east of the Great Pyramid in which the rotation point architecture has been built.



Diagram J-27 The grid rotation point on the Giza plateau.

Diagram J-27 shows the alignment pit on the plateau to which the alignment rectangle formed from the joint between grids A,B,F and G aligns. To distinguish between the two possible rotation points on the north corners of this rectangle, the SW corner of grid A or the NW corner of grid F, there are two small alignment walls built. The northerly of these walls shows the space rectangle width at its north-south mid point, and a meter or so south of this is another wall of the same length angled to align with the pit and placed on the east side dotted line showing that it is the NW corner of grid F that is the rotation point.

The inset drawing on the right of diagram J-26 shows how the alignment pit is designed. It uses the four spacing rectangles from the top row of the Giza 5x5 grid where the north end of the pit is spaced from the small angled wall using the space rectangle from below grid A, and the southern end of the pit is defined by the addition of the B C and D space rectangles. The angle of rotation used on the diagram to align to the satellite image is 5.94 degrees and the same as the angle of the Wall of the Crow offset from east-west.

It is now possible to return to the Sicily location for the final time and rotate the 5x5 grid around the grid point just identified and check that it aligns with the ancient markings in the field. The rotation has to be carried out carefully because the normal way of rotating non-centered objects on a Cartesian grid by translating them to the origin, performing the rotation, and then translating them back into position does not work on longitude and latitude based grids. This is because the longitude lines are closer together nearer the poles and at their maximum distance apart at the equator. To compensate for this it is necessary to take the longitude at the grid's location relative to the maximum equator longitude into account during the rotation process by reducing the longitude points proportionally when translated to the origin and then re-applying the distortion when translating back to the location after rotation around the origin.

Diagram J-28 shows a 5x5 grid at the Sicily location, one position up from the previous grid, which has been rotated around the identified rotation point by 0.542 radians to align with the lines in the field with the same grid identifying letters then were used on the Giza grid added to it.

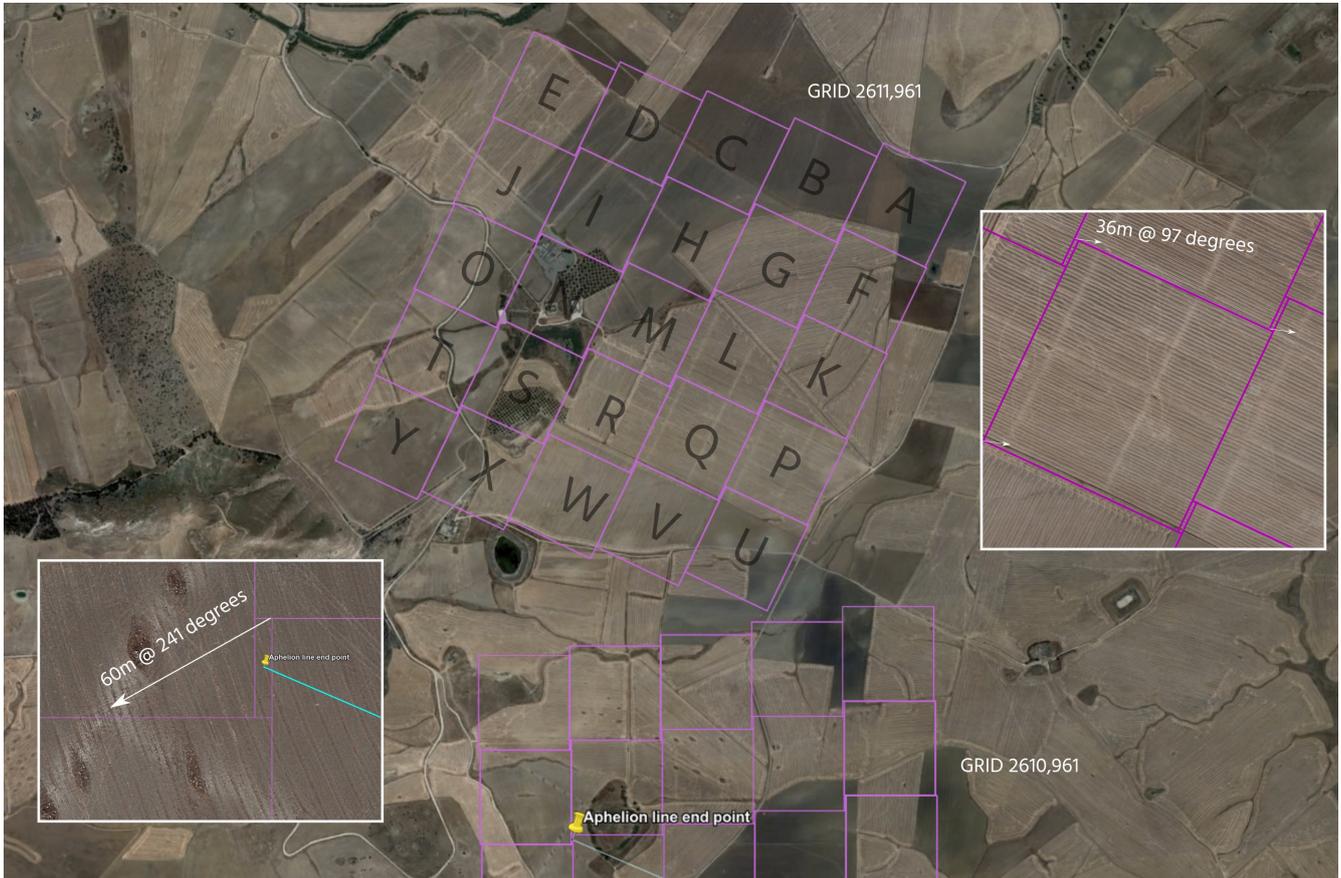


Diagram J-28 The rotated grid in Sicily.

There are two inset drawings in diagram J-28. The right one shows the rotated grid and its alignment to the marks in the field, which have exactly the same dimensions as the grid itself, and the left inset drawing shows a close up of the end of the aphelion line and the corresponding ground markings.

The white arrow on the left inset drawing is 60m in length at a bearing of 241 degrees from north and shows the movement of the tectonic plate in Sicily relative to the tectonic plate movement in Giza, and therefore the displacement of the grid that is required to align to the current position of the lines in the field. The four white arrows on the right inset drawing show the movement that is required to the grid for it to align to the markings in the field, and the small white arrows are 35.75 m in length at a bearing from north of 97 degrees. It is clearly not possible for both of these movements to be carried out simultaneously and therefore the rotation point of the grid must be incorrect. To solve this problem the unrotated grid needs to be drawn, upon which there must be a grid node that is out of position by 60m at a bearing of 241 degrees from the marks in the field . Diagram J-29 shows the solution to this where the grid node in the north west corner of grid M is exactly this distance and bearing from a corner of the the field markings and therefore is the rotation point of this grid.



Diagram J-29 The rotation point of the grid in the field in Sicily

With the tectonic plate shift in Sicily resolved the grid alignments at this location are correct and it is possible to show the full working system in a series of four diagrams. Diagram J-30 shows the complete set of line features in the fields, drawn with white lines to emphasise them. Diagram J-31 shows the two unrotated grids with their respective pivot points marked. On diagram J-32 the grids have been rotated by their respective angular rotations to fit the alignments of the field features, and diagram J-33 shows the alignment of the upper grid to the final check system in the northern most field.

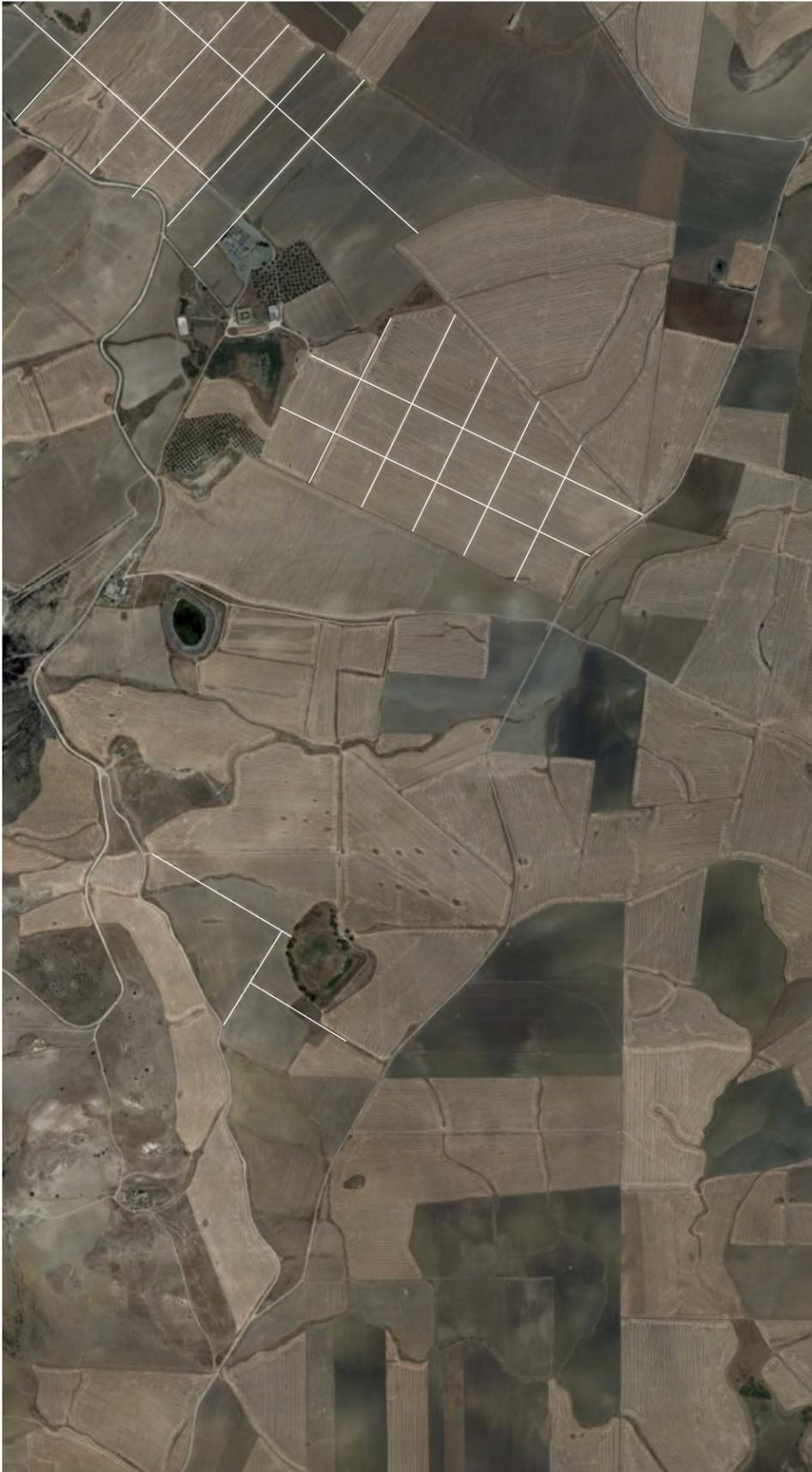


Diagram J-30 The lines in the fields in Sicily.

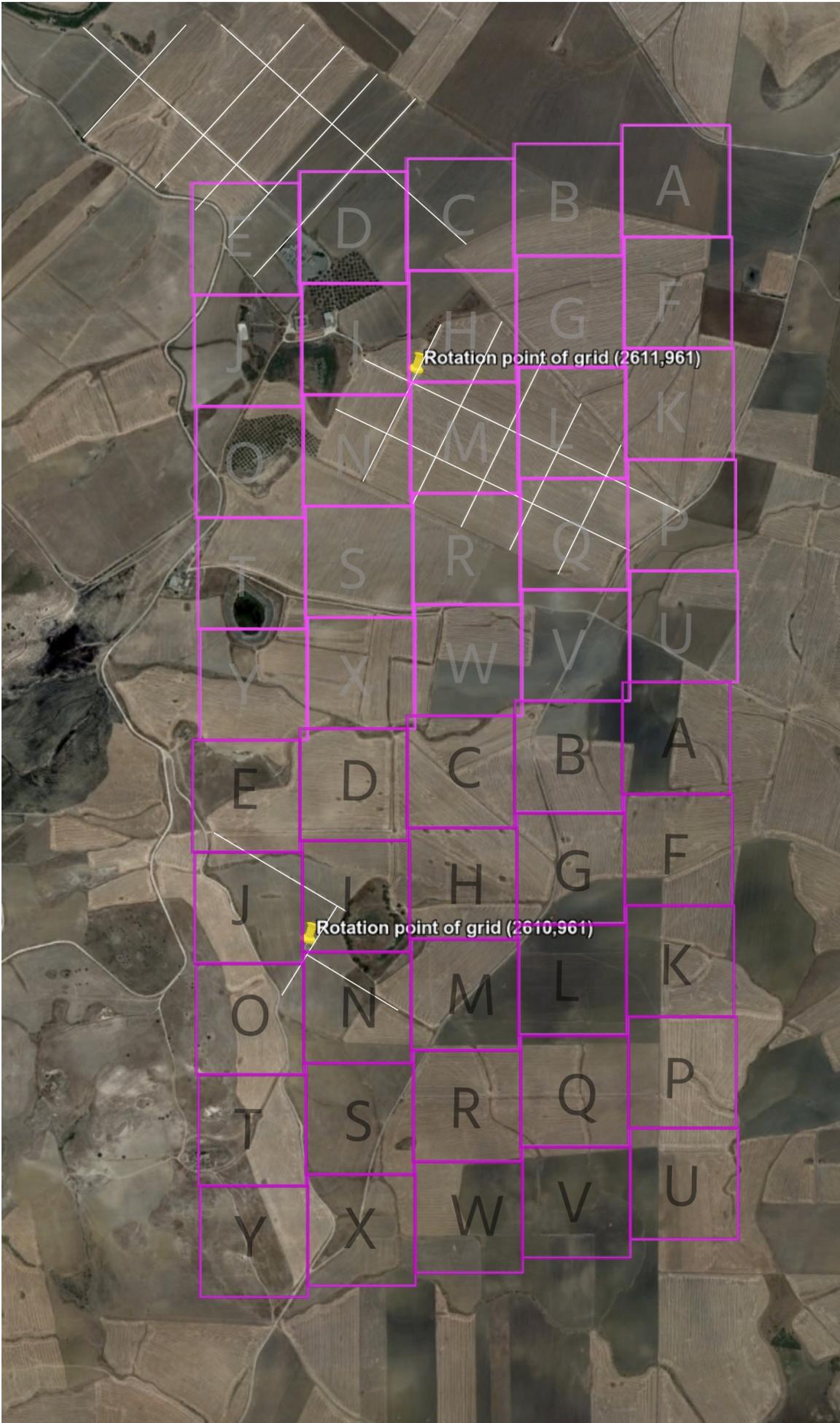


Diagram J-31 The unrotated grid superimposed upon the field lines in Sicily, adjusted for relative tectonic plate movement.

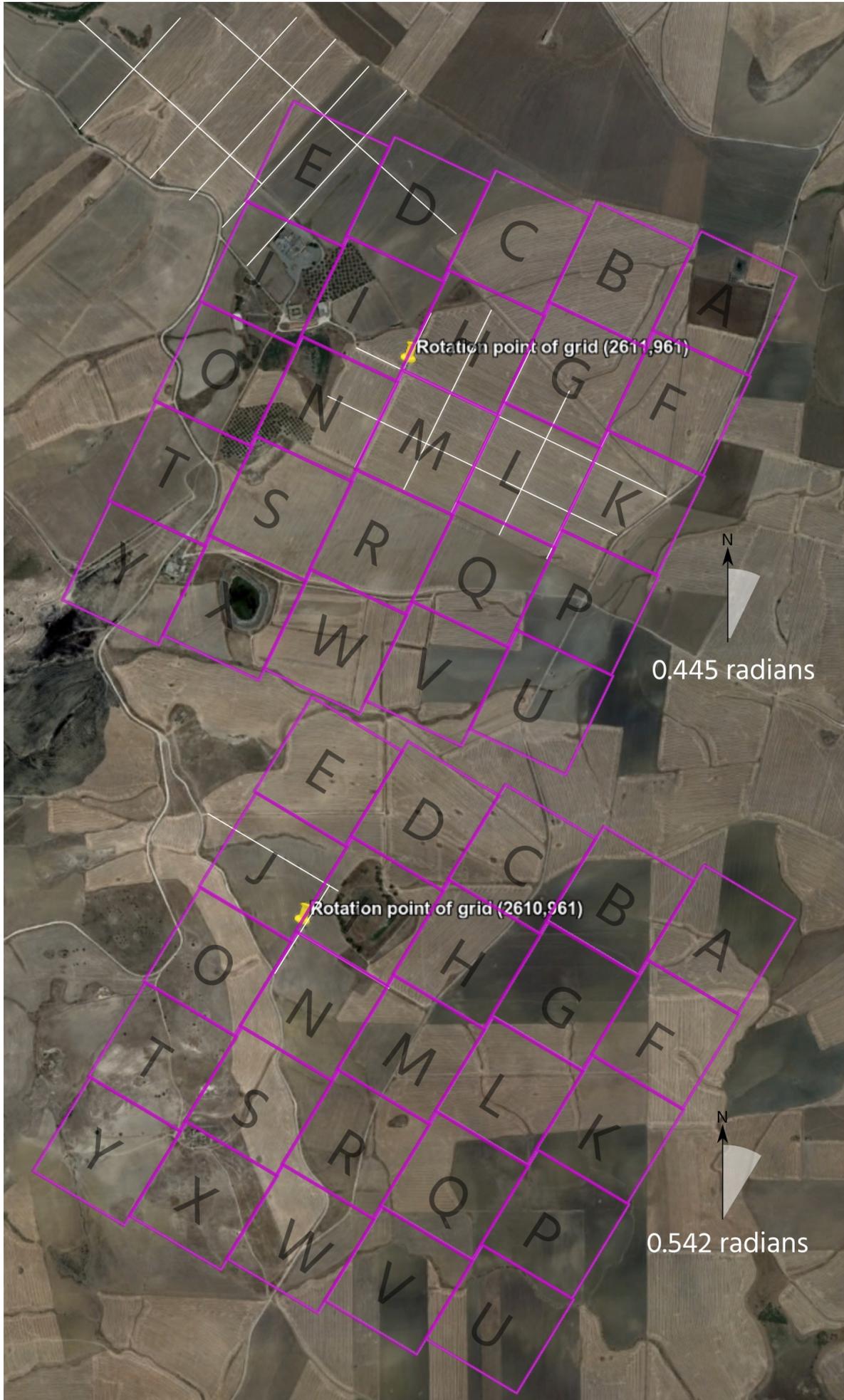


Diagram J-32 The rotated grid superimposed upon the field lines in Sicily.

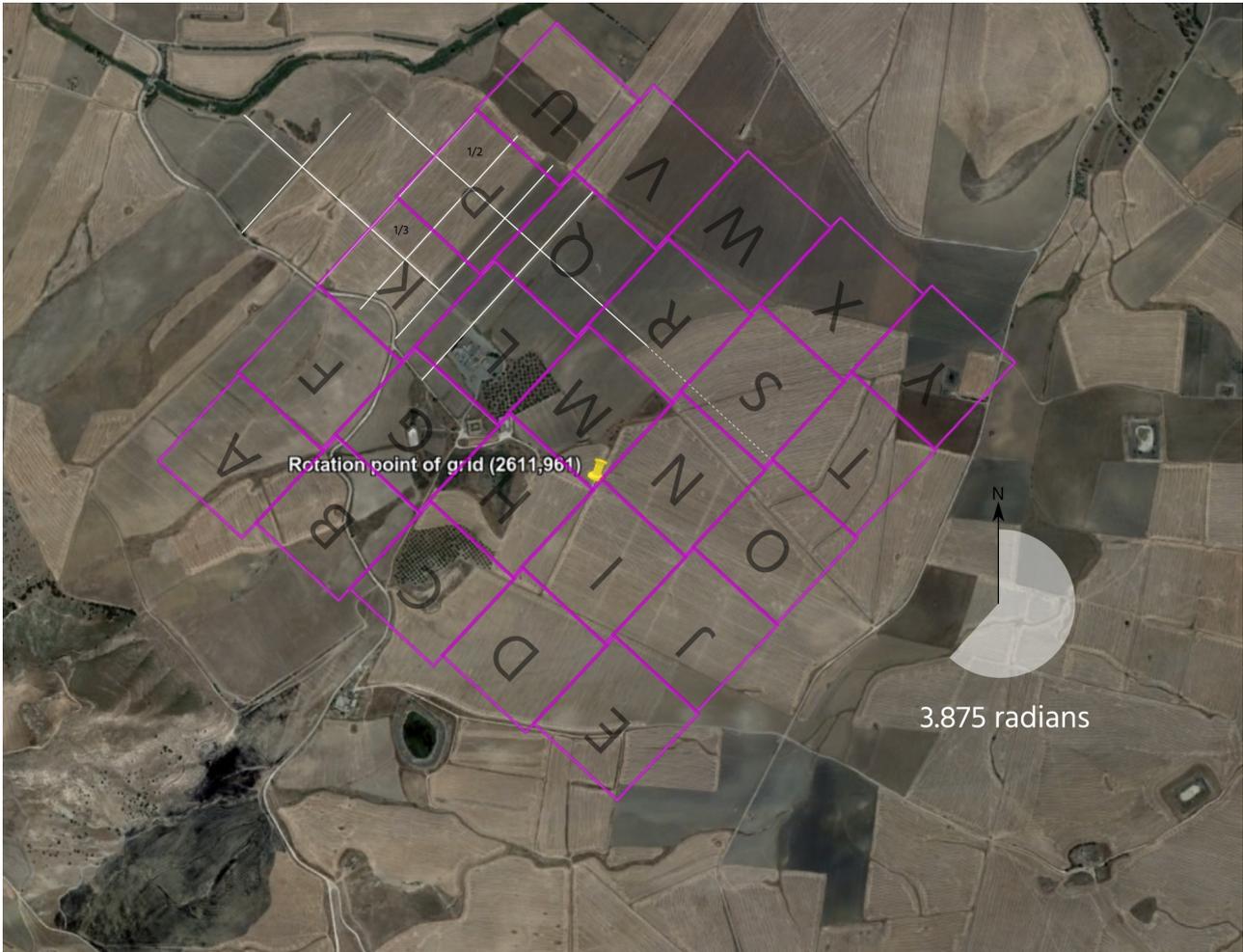


Diagram J-33 The secondary alignment of the upper grid

In diagram J-33 the rotation angle of 3.875 radians is not arbitrary. The grid system started with a 333 pM longitude width grid on the Giza Plateau, and the final rotation angle in Sicily is 222 degrees (3.875 radians), showing that the grid construction and rotation system and the tectonic plate shift in Sicily has been solved.

Checking the grid construction

In all previous parts of the puzzle that is contained within the Great Pyramid and its surrounding area the architecture has always contained a final checksum which is created from the knowledge gleaned whilst analysing the system and which confirms that the solution to the puzzle has been correctly determined. The grid square system that has been shown in the preceding pages is no exception to this rule and the checking device is as follows.

Because the longitude of the grid system is determined from the surveying base line on the Giza plateau and the subsequent 333 pM sized sub-grids which are in a 5x5 format, each of the major grid units is 1665 pM in width at the reference point on the plateau, which is currently at southern end of sub-grid 'P'. The circumference of the Earth at this latitude is not exactly divisible by 1665 pM, which is of no great surprise, and therefore the grid system contains an incomplete section which is found between the grid that covers the Giza plateau and the final major grid when the grids are tessellated starting in Giza and working westwards around the globe. Diagram J-34 shows the grid systems around the Giza plateau area with the 'no man's land' section illustrated between the start and ends of the longitudinal alignment of grids. This space between the start and end is not a remanent of some sloppy mathematics, it is specifically designed so that the grid system can have a checksum added to it at the end.

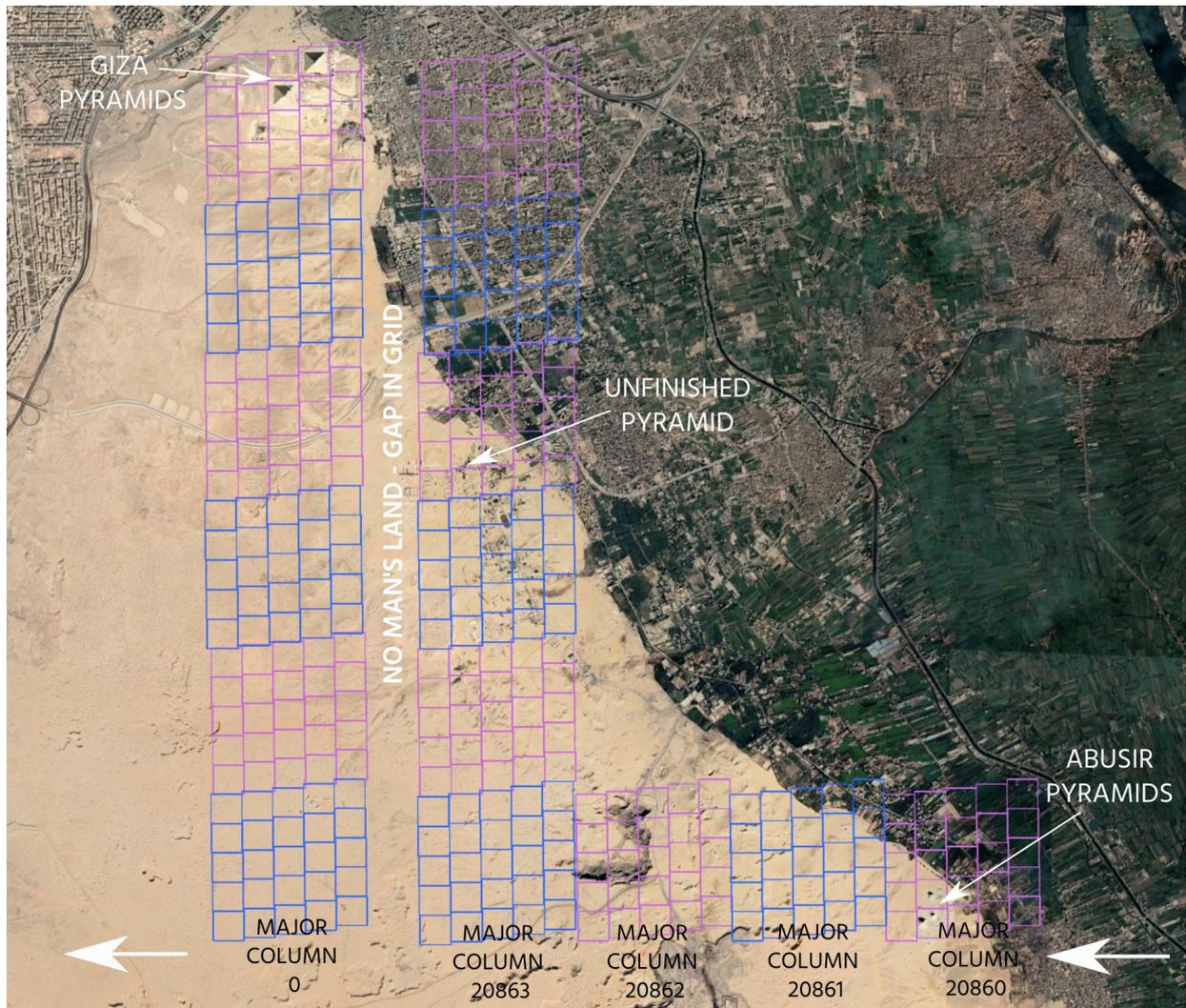


Diagram J-34 The non-continuous grid system that wraps around the globe.

This arrangement means that the next group of pyramids to the south of Giza, which can be found at Abusir some 11km away from Giza in a straight line, but 9 km south and 7 km east can only be reached by traveling west from Giza around the whole globe. The same is true of the great pit, known as the 'Unfinished Pyramid' that can be found in Zawiyet el-Arayan between Abusir and Giza. These grid traversals are shown on diagram J-34 which includes the column numbers of the major grids. Diagram J-35 shows a close up of the Abusir pyramids with the current grid configuration placed over it.



Diagram J-35 The unfinished grid alignment at Abusir.

It can be seen on diagram J-35 that the lower incomplete pyramid and the upper building marked with the white arrows would align to both the longitude and latitude lines of the grid if the grid were to be displaced to the south east by about 41m west and 10 m south.

Dealing with the longitude first, it is necessary to add the architect's smallest unit of measure, one perfect-millimeter, as a margin to the east and west sides of every major grid making the grid at the Giza reference point 1665.002 pM wide, that is 5 x 333 pM grids plus two 1pmm margins. By doing so the grid at Abusir now aligns perfectly with the west edge of the lower pyramid, the difference in the position of the longitude line being 2pmm multiplied by the column number of the grid at this point, 20860, 41.72 pM.

Because the longitude lines of the original grid were created from a fixed linear distance, and the latitude lines were created from a fixed angular measure, it is clear that the grid's margins must conform to the same principal, and that the north and south margins must be based on the smallest unit of *angular* measure that is being used by the architects, and which must also be based on the value of Pi if it is to make any sense. Investigation of the alignments in Abusir shows that the margin on the major grid's north and south sides needs to be $\pi/2 \times 10^{-7}$ radians when the start of the latitude grid system is on the Giza Plateau, rather than at the equator. This radian value is exactly 1/40,000,000 of the polar circumference of the Earth, which by definition is 40 million perfect meters, and the north and south margins are therefore exactly both 1 perfect meter in length. The reason that this final calibration of the grids is able to work to perfection is because the satellite photograph of Giza and Abusir is the same image and therefore there are no distortions between the images nor are there any relative tectonic plate shifts to take into account.

In order to create the grid system with the latitude margins in place, the Giza plateau grid needs to be at the origin of the system, and therefore the reference point that is currently being used, at the south end of sub-grid 'P', needs to be at the southern extremity of the major grid. This involves shifting the major grid north by one sub-grid at Giza, and as a consequence in order to keep the longitude alignments in place along the western side of the Great Pyramid, the longitudes need to be adjusted by 1/55th of a sub-grid to the west.

Diagram J-36 shows the Abusir grid alignment, grid number (-6,20860) in magenta and (-5,20860) in blue, with the margins in place, the monuments aligned, and the distinct 2m gap between the grids forming the temple walls in the upper right area of the image.



Diagram J-36 The completed grid alignment at Abusir with margins in place.

The temple in the top right of Diagram J-36 is known as the mastaba of Ptahshepses and the distinct square roof that can be seen in the satellite image is a modern construction. An archaeological map of the temple is shown in diagram J-37 in which it can be seen that the principal feature of the building, housed under the modern roof, is a 5x5 grid made up from the columns of the building, leaving no doubt that both the alignment and the characteristics of the surveying grid are correct.

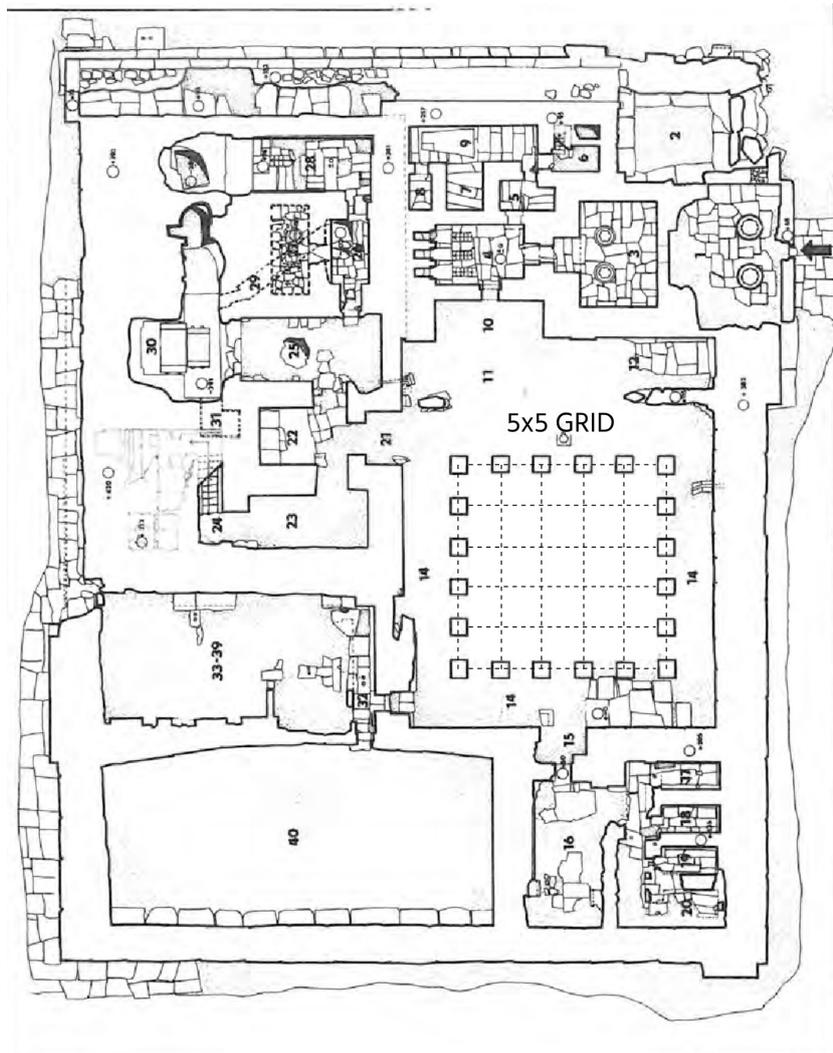


Diagram J-37 The 5x5 grid in the mastaba of Ptahshepses in Abusir.

Diagram J-39 shows the master grid at the origin (0,0) at Giza with the lettering of the grids not shown, but which are the same as in diagram J-19. The longitude lines of the grid at Giza are displaced from the original Giza grid shown in diagram J-19 by one perfect millimeter to the west because the margin line *is* the alignment line at the east side of the grid, and the latitude lines are at the same latitude as they were previously, because the opposite system is in place for the north and south margins and the latitude margin is *outside* the uppermost and lowest of the grid lines.

The reference latitude, at which the sub grids are exactly 333pM in width, is at the south east corner of the major grid as shown on the diagram. The reference longitude is the midpoint location in the Wall of the Crow passage to which the north east corner of the major grid has been aligned.

The website www.giza-plateau.com contains the software that can be used to recreate the architect's grid system at any location on the planet which is in the form of an HTML webpage with embedded javascript, and therefore the source code of the calculations for forming the grids is available to inspection.

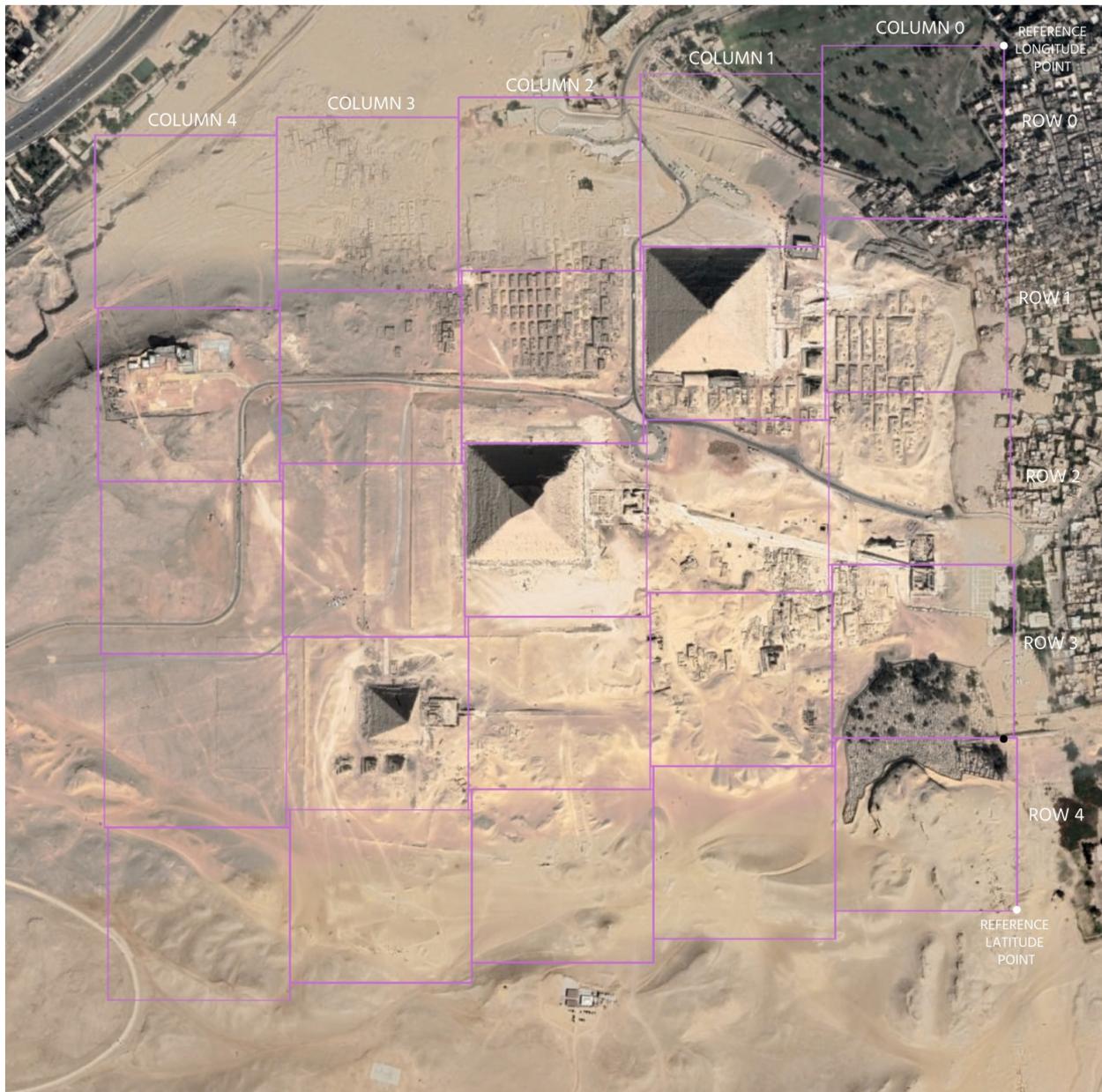


Diagram J-39 The final grid alignment at Giza with major grid margins in place.

Author's Note

Looking at the complexity of the creation of this surveying grid in this paper I have little doubt that there will be more detail to come out of this system. At present the starting grid on the Giza plateau is defined and the ending grid in Abusir is defined, however the number of grids that appear between these two static points is as yet undefined. Additionally, the rotation point of the Giza plateau grid and the alignment pit that specifies the rotation point indicates that there is no reason why the grid system is aligned to the Cardinal axis and may well tessellate around the world at a specific angle. Because there is no readily available information at present to allow the investigation of this hypothesis, I can do no more than make this note to alert the reader to that possibility. Previous experience has taught me not to pursue anything which has not yet been explicitly shown in the architecture. The next stage in the work needs to follow the solar system map instructions on the north wall of the lower chamber of the Great Pyramid.

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Errata

The year of the winter solstice was mistakenly shown as 2728 BCE in the first edition of this paper and has been corrected to 2729 BCE (in the astronomical year -2728).