AKROTIRI WALL

THE ANCIENT BREAKWATER AT AKROTIRI IN CYPRUS

By Frank Haggerty (Part 1 of 2 Parts)

ABSTRACT

The recent discovery of a large breakwater protecting a small headland may throw new light onto the importance of the peninsula of Akrotiri in Greco-Roman times.

LOCATION

The Akrotiri peninsular in Cyprus lies a few miles to the south west of the modern tourist town of Limassol. It is within the British Military Area known as the Western Sovereign Base Area (WSBA). The Chief Administrator of the Sovereign Bases is responsible for enforcing the Antiquities Ordinance of 1975 for the protection of archaeological sites within the areas. The peninsular lies between the two ancient cities of Kourion and Amathus, each with their own harbour, though the remains of the impressive harbour walls at Amathus overshadow the single breakwater wall at Kourion.

In recent times there had been reports of three building foundations, possibly Roman, in the area known locally as Dreamers Bay. In 1984 a pilot of 84 Squadron, Flt Lt Keith McGuire, mentioned to the author that there appeared to be a submerged construction near Dreamers. This report led the author to investigate the whole area of the Southern Cliffs with special attention to Dreamers Bay.

Perhaps the most notable feature of the peninsular is the huge necropolis which lies along the Southern Cliffs and extends for some four kilometres of cliff line. In the immediate area there are two known Roman settlements: Voupatis Khionas and Pano Katalymata. Further to the north west there is the Byzantine settlement of Katalymata Ton Plakoten. (Megaw, 1954). The original inspection report claimed that from the evidence of surface arteifacts the site appeared to have been densely populated from the Hellenistic period up to the end of the 7th century AD.

The Antiquities Ordinance was based upon a field survey carried out in 1954 by AHS Megaw, the Director of the Dept of Antiquities (1936-60), and Col J S Last, the Antiquities Advisor to the Military Authorities. The main site covered by the ordinance is the city of Kourion (Romanised - Curium) but other sites were located and many of these lay within the proposed new airfield of Akrotiri. Eighteen sites were originally identified around the station and one of these was de-restricted in 1976.

HISTORICAL RECORDS

Strabo, in 23 AD, described the south coast of Cyprus as follows: "Kition... Amathus... the promontory Curias, 700 stadia from Thronoi. Then Curion, a city with a harbour, built by the Argives." (Cobham, 1908, pp4-5). Medieval copies of both map and tabula of the Ptolemaeus Geographia of 160 AD still exists. In both documents the relevant section shows: "Kurion Polis... Lukos Potamos... Kurias Akra... Amathois ..." (BL Dep MS, Burney MS 111). Each of these cartographers name a headland between the two great cities of Kurion and Amathus.

It was Paracchi, who in 1567, cited oral tradition and wrote: "Curias, another royal capital, was near the sea-coast, where now stands Piscopia... Curias, an ancient city lay in the middle of C. del Gatta, 2 leagues and a half from Piscopia; there is a lake to the north of it full of salt water and quantities of fish." (Cobham, 1908, p164). It is this record that hints at something important in the Akrotiri area.

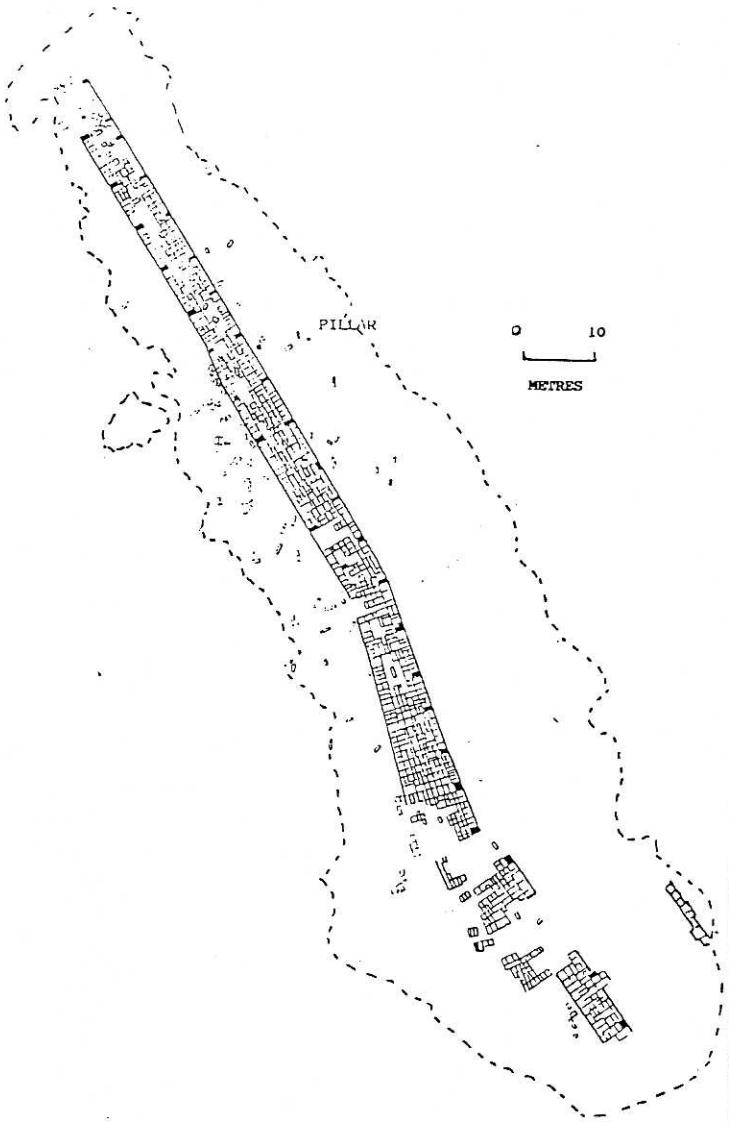
LAND SITES

Field walking of the whole area of Dreamers in order to substantiate the earlier reports of three building foundations yielded a total of ten separate footings. One of the structures appears to be a tower and may well be preserved to some considerable height under a covering sand dune. There is evidence of a large deep well which appears to be a Roman Bell cistern.

300 metres to the north-east of Dreamers is a small promontory with positive evidence of at least Roman occupation. On the surface there are five ashlar blocks which have been cut from a nearby quarry. There are also walls set in foundation trenches and rock-cut tombs. In the

vicinity of the blocks there is total cover of pottery sherds to a depth of at least 300 mm. The four 'finds' were literally picked from the surface scatter and reconstructed. The items appear to be 1st - 3rd century Roman. The pottery is mixed with fused glass fragments and burned animal bones.

As the Cypriot authorities confined the author to a non-disturbance survey it has proved impossible to identify the site. The close proximity of the tombs may indicate that the building blocks belong to an altar or small shrine.



ALIGNMENT OF THE WALL AND LIMIT OF SCATTER PATERN

Part 2 Next Month

AKROTIRI WALL
THE ANCIENT BREAKWATER AT AKROTIRI IN CYPRUS

By Frank Haggerty (Part 2)

UNDERWATER

Some 200 metres to the south-east of the promontory, out to sea, there is small rock which, until recently, had been used as a gunnery target. A few metres to the south of this rock there is a fine collection of broken Rhodean amphorae - possibly from a shipwreck tragedy. Fifty metres to the north-east of the rock there is a reef which runs north and curves to the north-west as it heads towards the coast. Both of these underwater obstructions cause very bad undercurrents in their immediate vicinity. It is only during the calmest of seas that there is no white water on them. It was this reef that had looked so odd from the air with its distinctive parallel lines and pale brown colouration. The lines proved to be the outer blocks of a large wall and the colouration was caused by a short brown algae, possibly 'Halopteris Scoparia' which appeared to be localized to the wall rubble.

The built construction on the reef is a large jetty or breakwater of uncertain date. The structure measures some 150 metres long and five metres wide though this is variable. At the northern end, closest to the cliffs, the blocks are 0.5 m below the surface with a water depth of 2 m; at the southern end the blocks are almost 3 m below the surface with a water depth of 6 m. The wall is constructed in continuous sections along what appears to be a natural reef. Each section is approximately 5 m long and there appears to be a vertical 'fault' between each section. The sections do not appear to have bonded into each other. The unrelenting pounding of the waves has removed layers of different sections from the wall producing a castellated effect and scattered the blocks down the slopes of the reef.

It is difficult to form a picture of the original structure but the southern end of the wall is substantially wider than the shallower end. The deeper blocks are also much larger than the shallower ones. Notwithstanding the sectional construction of the wall - this may be an incorrect interpretation, there is a very strong element of design technology in use. The Phoenicians of around 480 BC certainly had this advanced technology. (G Herm, 1973, pp 156-157).

It is very difficult to measure diagnostic blocks as the fallen blocks partly obscure the standing remains. One of the largest blocks was located near the deepest water and under the tallest standing wall section, it was located sitting directly on the bed rock and measured 1850 mm x 550 mm x 400 mm. The next adjacent block formed a corner and measured 1700 mm x 600 mm x 350 mm. At the shallow end of the wall most of the blocks measure 600 mm x 450 mm x 250 mm. There are very few blocks that are not rectangular, however, there are two short round pillars in the shallow section, one of which is wedged in a vertical position and makes an excellent datum for surveying. Another ashlar block measures 1150 mm x 580 mm x 380 mm the block is curved in two planes, there are two holes cut through the block, one circular and the other square.

IDENTIFICATION

The earliest type of harbour are rock-cut, natural features were adapted to give shelter to craft. Next came the vertical wall built on convenient shallows eg in protected bays; finally came the imposed harbour on unpromising coastlines - a Roman invention. (H Frost, 1963, pp 66-67). I feel that the Akrotiri Wall is of the second type. The building technique used shows traces of similarity with the walls of Vouni Palace which has rows of large blocks on top of horizontal slabs. According to VA Tatton Brown (Hunt, 1982, p 970), Vouni was built in the early 5th century by the Persians, rebuilt in the mid 5th century by the Greeks and totally destroyed in 380 BC, never to be rebuilt. This building technique was again seen by the author of Kition in the walls of a building found by S Hadjisavvas during a rescue excavation in 1987. The wall lay under an early Roman house. A very similar construction is found in the walls of a short canal which runs between the Nile and the Court of Amenhotep 111 in Luxor. Though obviously not contemporary with the Akrotiri Wall the building tradition may have survived into the Hellenistic period of Cypriot history (325-30 BC) and thus the wall might have been constructed

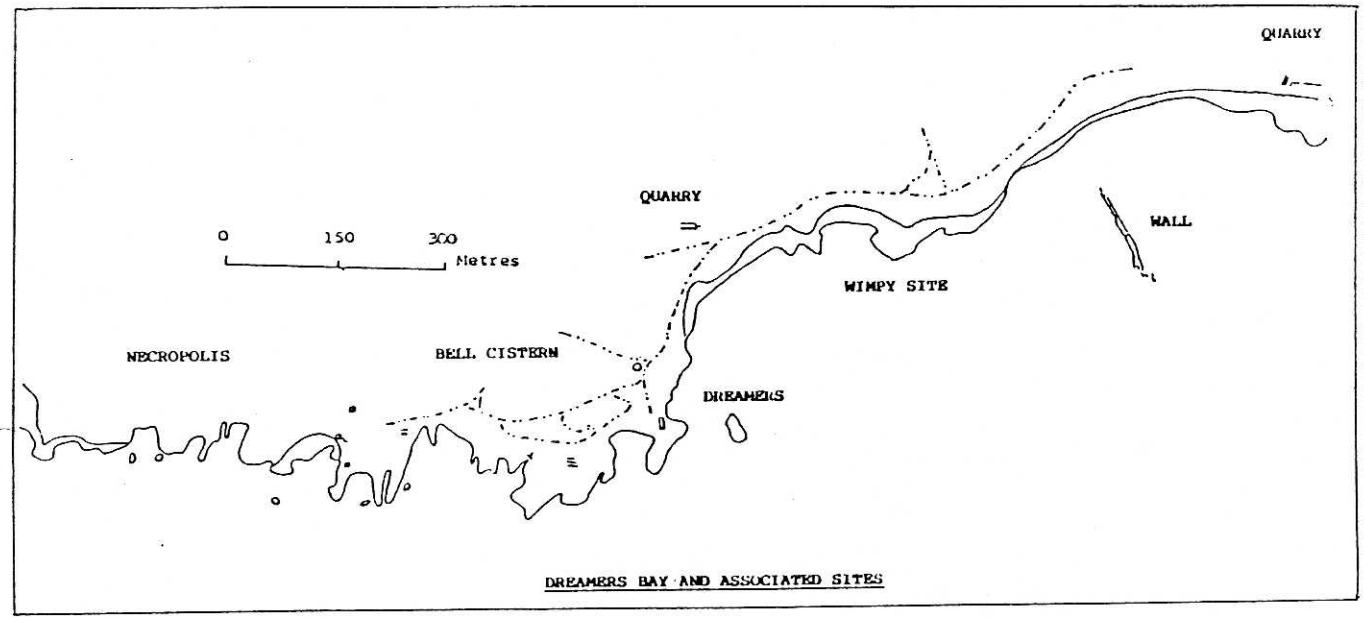
during the Ptolemaic rule of Cyprus (294-22 BC). The building style might therefore indicate a pre-Roman construction of earlier than 30 BC. S Swiny of CAARI, who has viewed the construction underwater (1985) expressed the opinion that it was a very early construction but would not commit himself to 'pre-Roman'.

WATER LEVELS

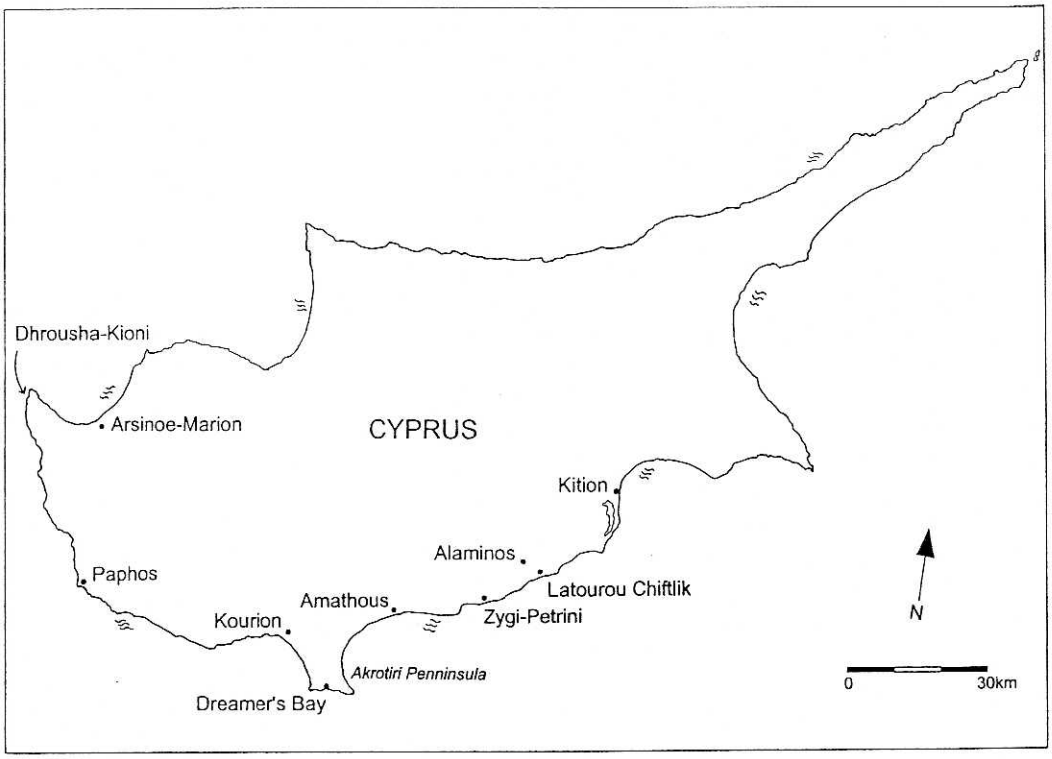
According to various studies (Jelgersma, 1961; Scholl and Stuiver, 1967; and Emery and Milliman, 1970) there is no established sea level curve which can be used as base line from which to calculate local earth movements. Statistical analysis from a large number of sites (Flemming, 1986; and Walcott, 1972) indicate that the hydro-isostatic adjustment for the Mediterranean is about 10% of the total eustatic change. It is probable that there has not been a net eustatic change of more than half a metre in the last 2000 years. Flemming (1973) analysed data from south west Turkey and concluded that the net eustatic change of the same period was only 300 mm. From the local evidence of adjacent marine constructions - berthing points and rock-cut steps from the sea, the water level does appear to have risen by less than 500 mm. This rise would also be sufficient to submerge the rock cuttings in the area of Cape Zevgari some one km to the west of Dreamers.

Geologically there is the Anatolian fault line which extends from the Sea of Marmara into Easter Turkey. A branch of this fault then runs through the Peloponese, Crete and Rhodes from here there is a south-eastern branch which runs through Cyprus. (Flemming, 1973, pp 1031-1032).

NB EUSTATIC: Uniform change of sea level throughout the world.



DREAMERS BAY AND ASSOCIATED SITES



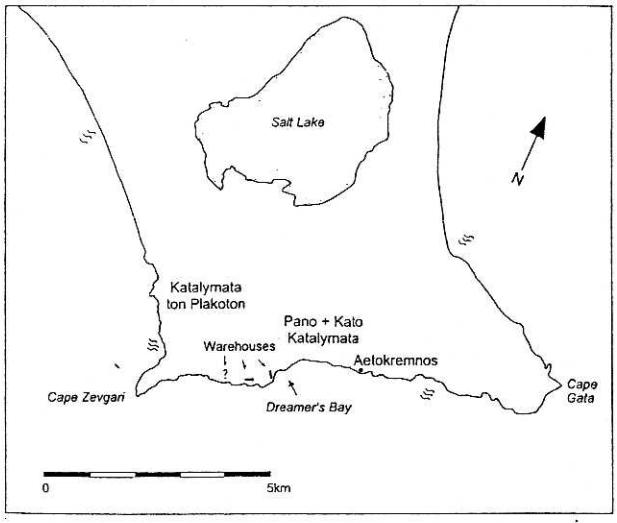


Fig. 2. Akrotiri Peninsula, Cyprus (A. Hooton).

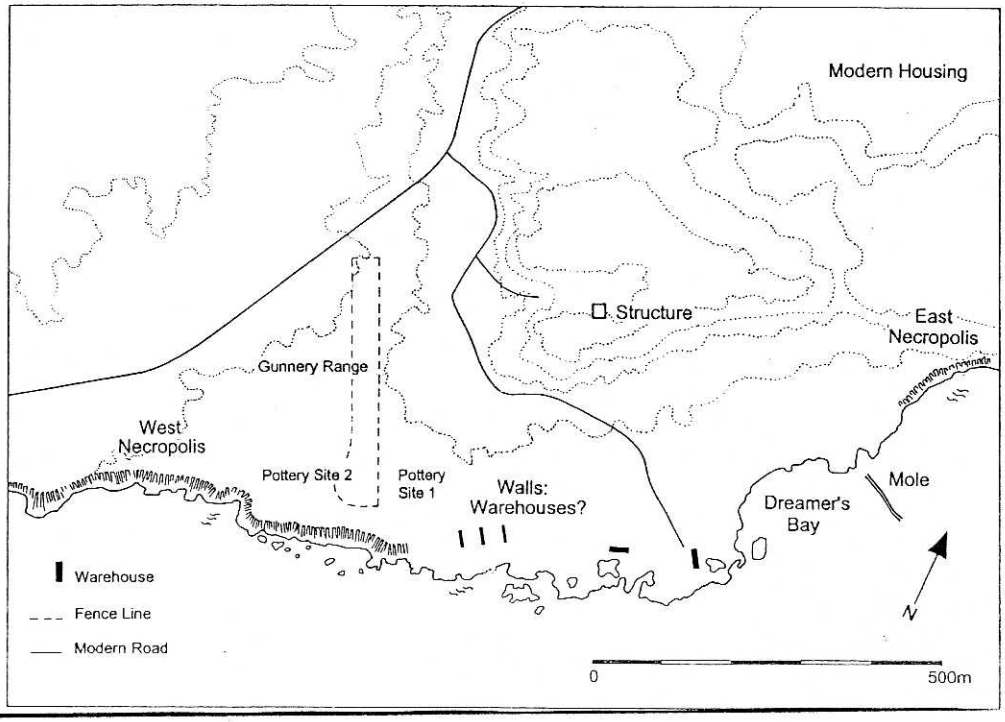


Fig. 4 Dreamer's Bay, site plan (A. Hooton).

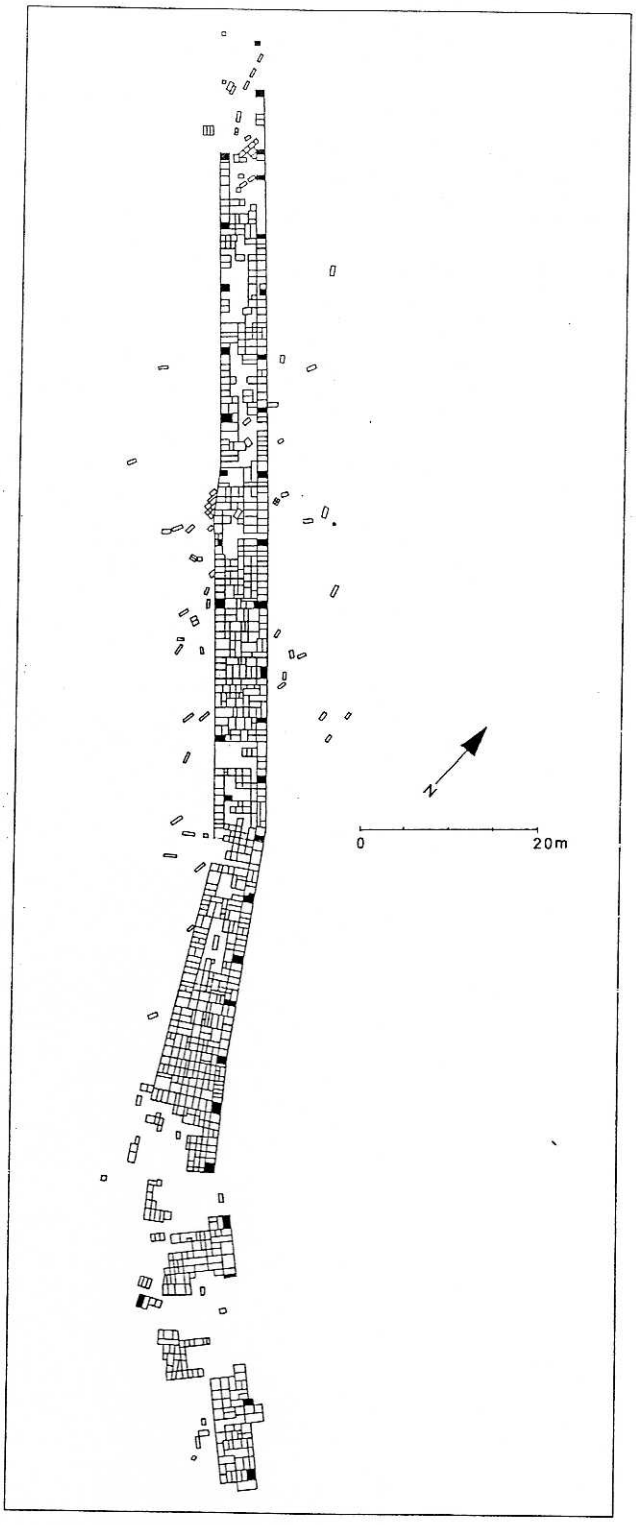


Fig. 4. Ancient breakwater, Dreamer's Bay, top plan (F. Haggerty, A. Hooton).

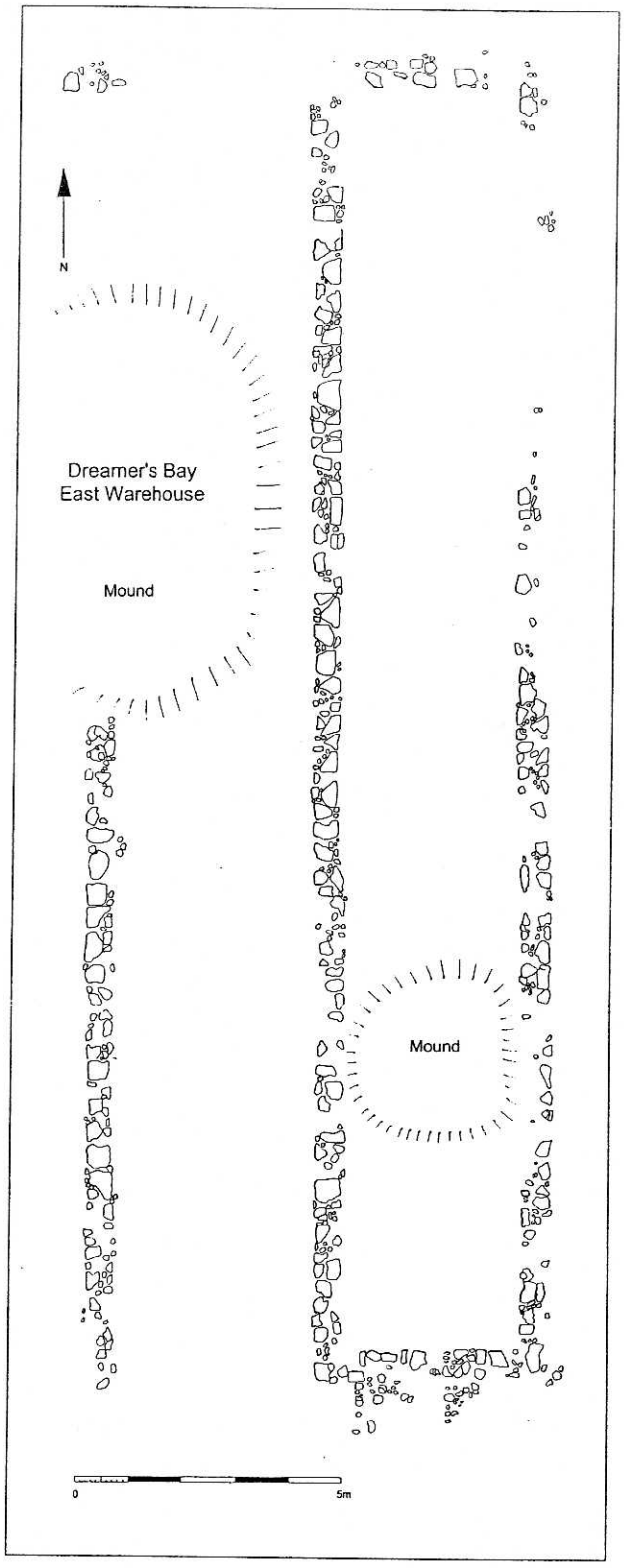
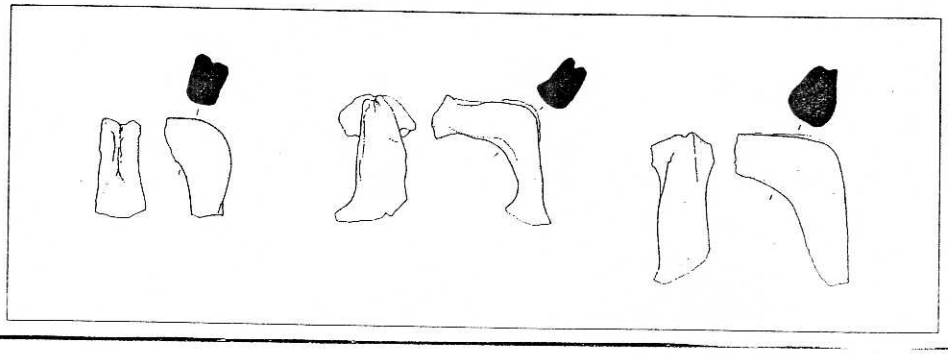


Fig. 5. East Warehouse, Dreamer's Bay, top plan (J.R. Leonard, A. Hooton).

Fig. 6. Pinched-handle amphorae (1st-4th centuries AD); Dreamer's Bay, Site 2. Left, Center: Fabric A. Right: Fabric B (A. Hooton).



ANNEX A TO AKROTIRI PENINSULA REPORT

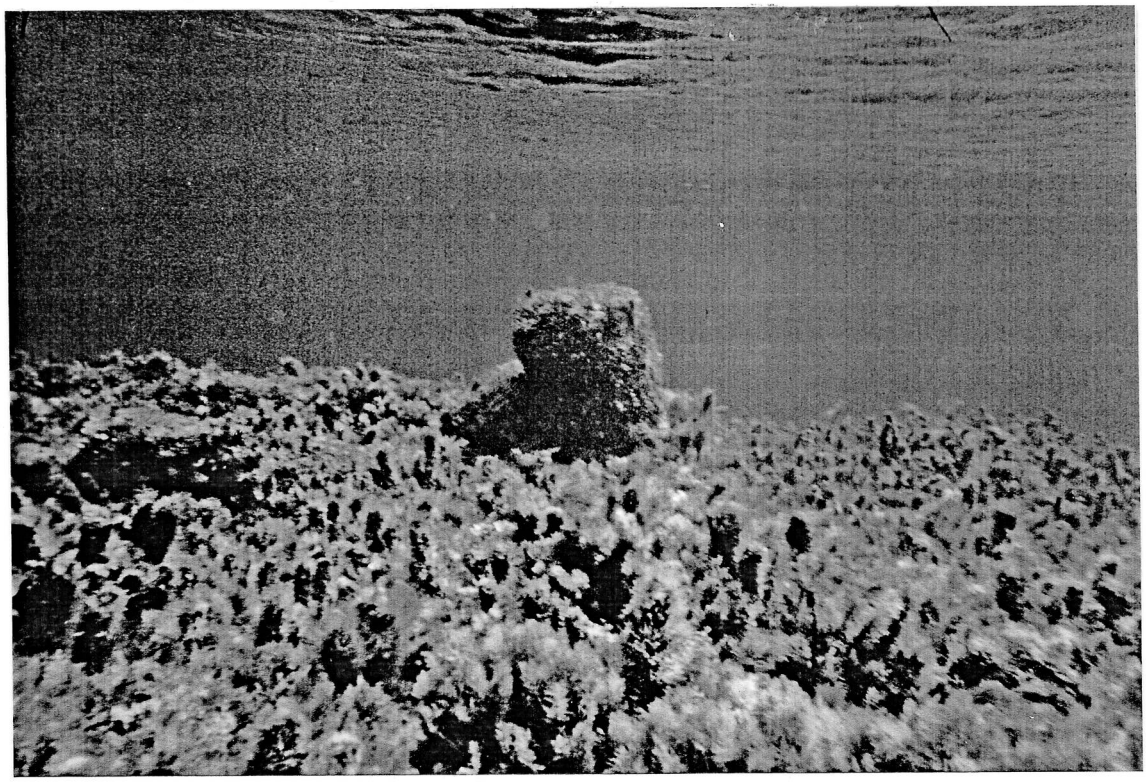
Text

Photographs

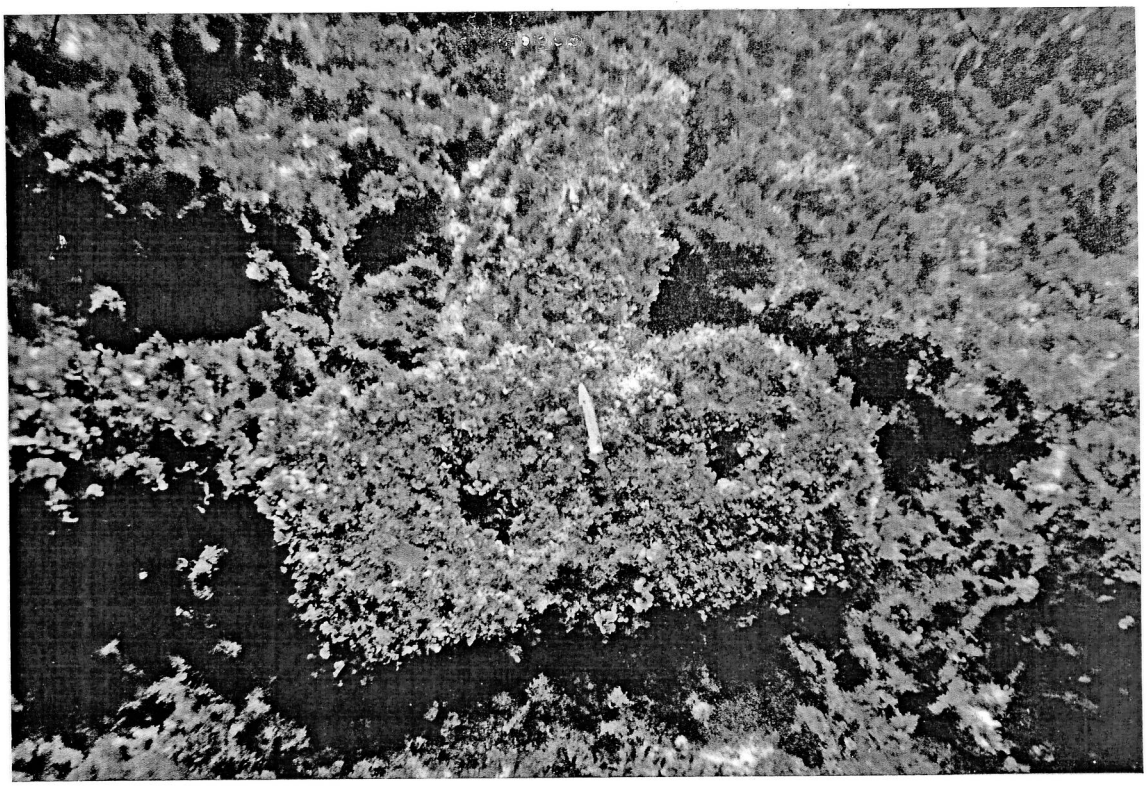
Maps

Diagrams

THE WALL AFTER ONE YEAR - LOOKING NORTH



THE DATUM PILLAR



ONE OF THE DISTINCTIVE FALLEN BLOCKS

UNDERWATER INVESTIGATION OF THE HARBOUR WALL

This part of the report describes my method of underwater survey and was used as part of my submission to the Nautical Archaeological Society for the Part 2 of the Certificate in Underwater Archaeology.

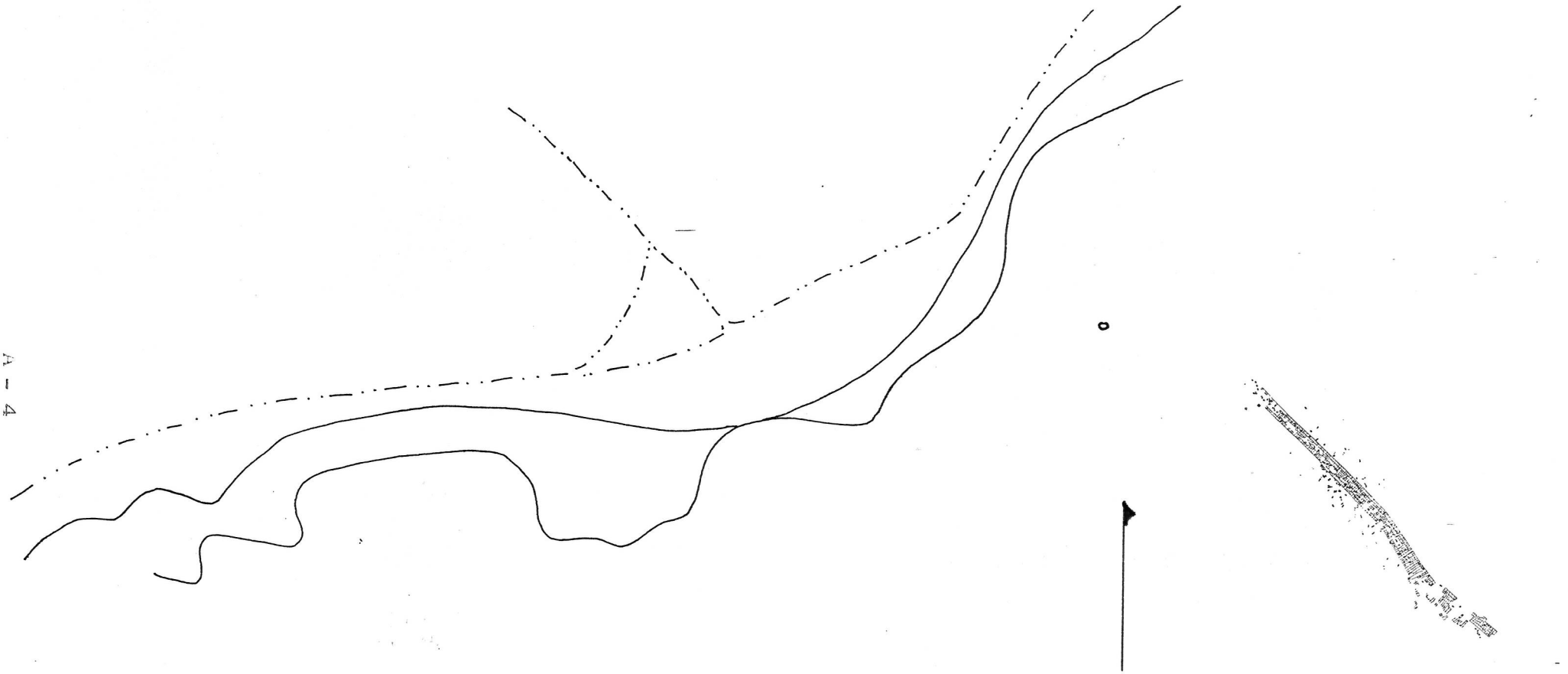
The two pillars lay lay adjacent to the wall may have formed part of a structure on the wall or they may have been part of the imported cargo of a wrecked ship. They lay next to each other, one horizontal and the second embedded among the building blocks but held erect. This pillar made an excellent datum point.

The wall blocks were covered with a short kelp which gives the area its distinctive pale brown colour. The gaps in between the blocks have been eroded away to form a space of around 25 cm and are the ideal home for the many Moray eel and octopus that inhabit the site.

The first task was to try and clear the kelp off the blocks in order to photograph them. The method employed to clear the kelp was to chop the plant off at its 'root' with a Cypriot tool which resembled a small adze. This proved very effective but was extremely laborious. Care had to be taken not to chop the blocks as the material had become very crumbly and the kelp was giving it great protection. After six months I had managed to clear a 100 metre strip 0·5 metres wide along the eastern edge of the wall and a 50 metre strip along the western edge. This effort was only sufficient to produce an aerial protograph that proved that there was a man made barrier on the site. A sketch of the photograph also shows the whole area which is covered by the misplaced building blocks. The aerial photograph indicated a line feature in deep water that I was never able to locate underwater.

The second years work involved clearing the kelp again as it had grown it its full size over the winter period. For this clearing attempt selected individual blocks were cleared and these were chosen at approximately every five metres along the wall. This method enabled me to clear the whole wall in a couple of months. These cleared blocks became my reference points along the wall. The blocks were numbered with plastic tags attached to brass brazing rods and these were wedged into the spaces near the blocks.

A length of heavy nylon rope was worked into a 5 metre square with a secure loop at each corner. Four food tins had lengths of brass rods fixed



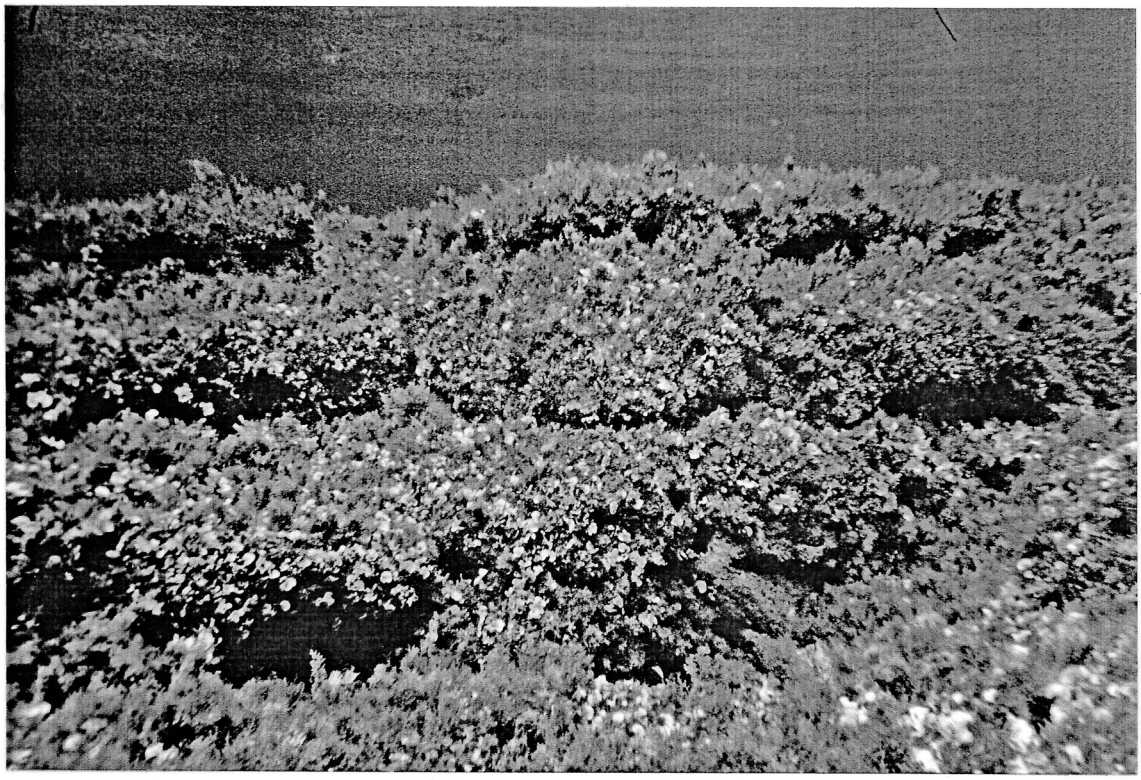
Scale 1 : 2500

0 50 100

Metres

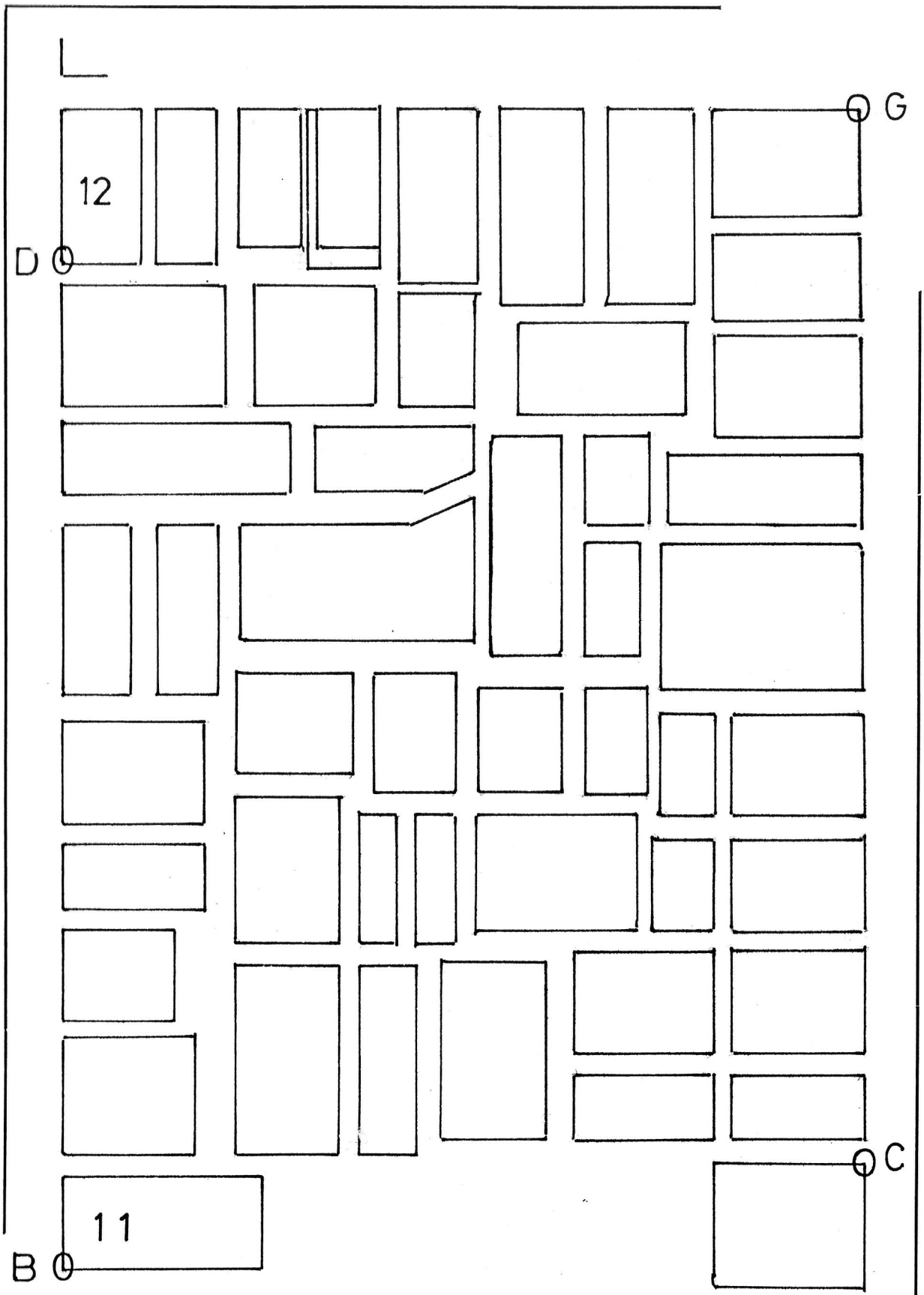
HAGGERTY

LOCATION OF THE WALL



WALL ELEVATION IN VICINITY OF BLOCK 17

WALL ELEVATION IN VICINITY OF BLOCK 24

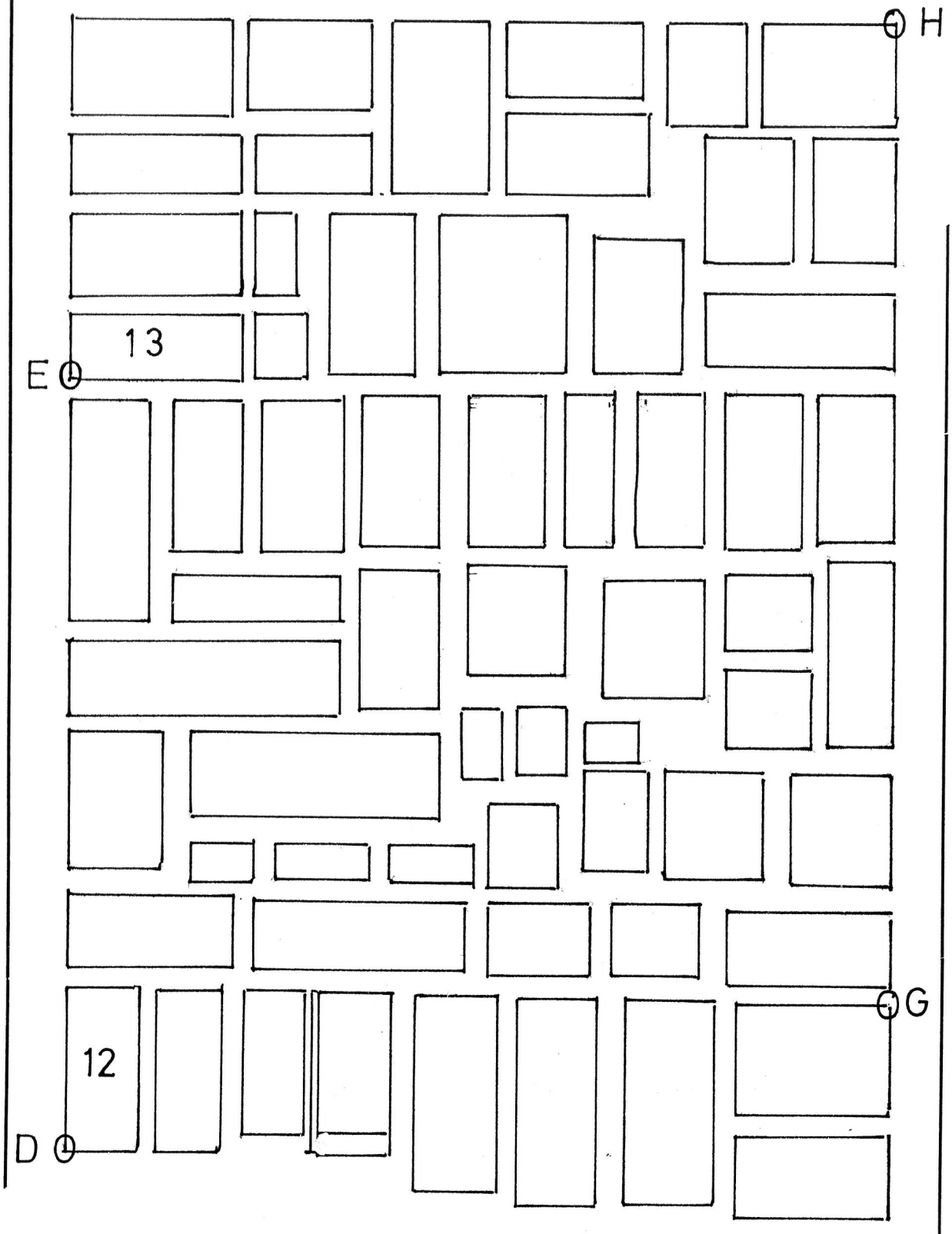


0 1 2

Metres

Scale 1 : 40

HAGGERTY



0 1 2

Metres

Scale 1::: 40

into their sides and then they were filled with molten lead. These provided four excellent anchors which were then attached to the rope to form an anchored grid.

The best section of the wall was chosen and the grid was positioned. It was very fortunate that the pillar was quite close to the chosen area. A plan of the section was made. The grid was then rotated to the south along the wall and the second area cleared and drawn. Only two areas were completed. The project had so far taken almost three years working three mornings a week for the whole of the Spring and Summer.

I now had to return to England and only continue the survey on an opportunistic basis as and when I could return to Cyprus for a holiday. In the UK I was able to complete the NAS Part 1 certificate and had started the Part 2 when Demos Christou invited me to bring an archaeological team out to Curium to assist with his continuing excavation of the city. Part of the project was to spend at least two mornings on the Akrotiri wall. With a bit of planning it was easy to obtain the required information.

A list of projects has been drawn up in order to ensure that time is not wasted on the few opportunities that are available to visit the wall.

Accurate geographical fixing of the wall
Accurate orientation of the wall
Depth of each numbered block
Underwater photographs of the blocks.
Elevation drawings of sections - ideally sections 11 to 13.
Photographs of the adjacent artifacts
Photographs of the Wimpy site.

After two visits to Cyprus only the elevation drawings are outstanding. This project might prove difficult as the piled blocks render the task almost impossible to view the elevation of the wall. There appears to be only two areas where the wall can be viewed and these are in deep water. Photographs have been obtained.

Method of Alignment. By using a sketch of the wall it was possible to work out the measurements that were required in order to roughly align the datum pillar and the main wall. A bracket was made to fit over the top of the pillar so that a tape could be attached and measurements taken from the centre of the upright post. Alignment of the whole wall has been

achieved by using aerial photographs. Triangulation from the land proved difficult as there are no easily identified reference points adjacent to the area of Dreamers Bay.

Underwater Trilateration. Measurements were taken to the north-east corner of the eastern blocks and to the south-western corner of the western blocks. 'X' marks the centre of the pillar. Distances are in centimetres.

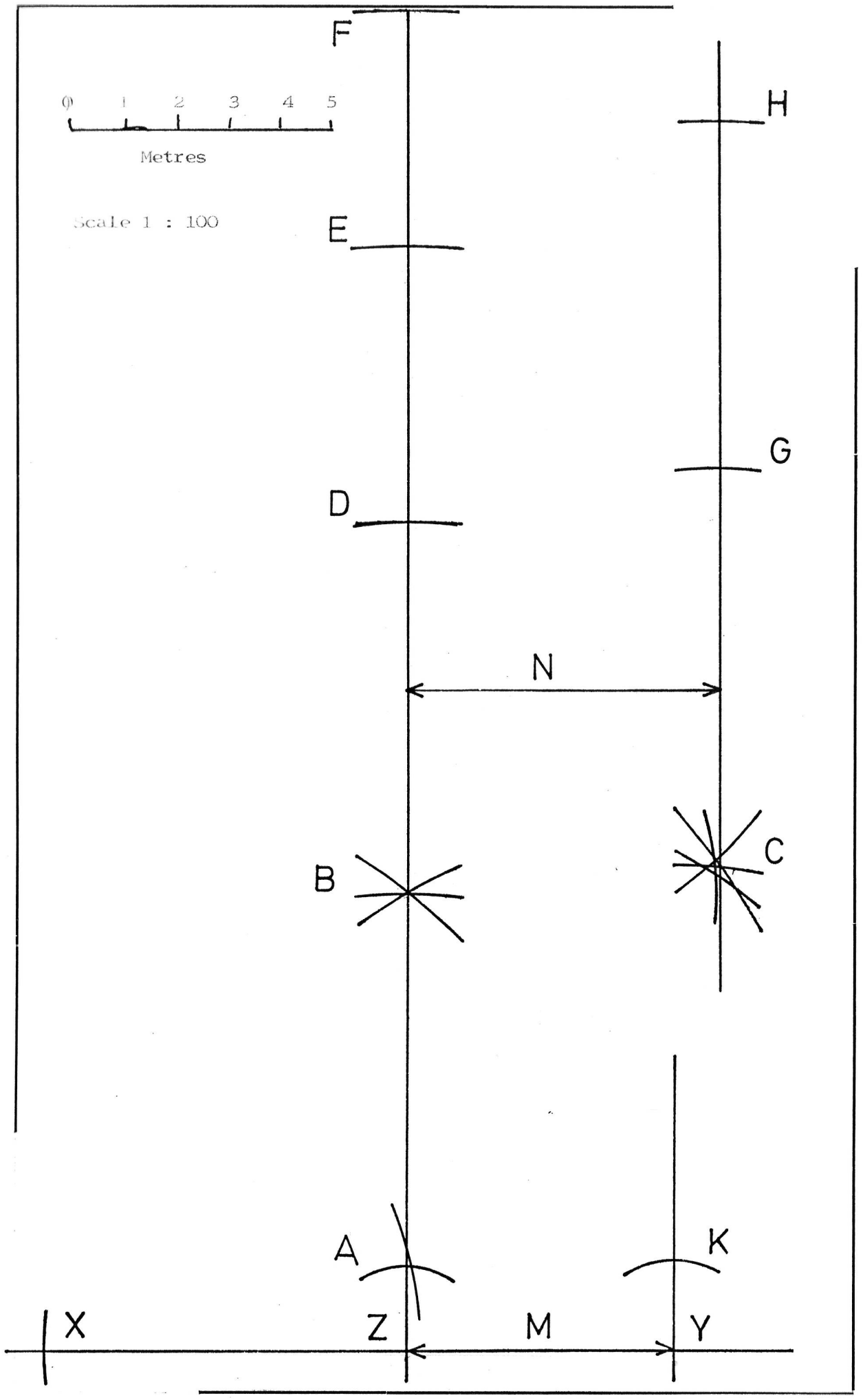
ZX	710	BC	600	BE	1250
ZA	160	BD	720	BF	1700
ZB	880	DC	870	CG	760
ZC	1100			CH	1440
		YK	190		
XA	720	KB	880	M	520
XB	1130	KC	770	N	580
XC	1600				

These measurements are plotted out on Sheets 1 and 2 and produce an alignment of blocks 10 to 13 and the upright pillar.

Water Depth. This was carried out using a plumb bob and tape measure. The slight swell during the measurement will produce an error of around ten centimetres.

1	110	Pillar	030	18	090
2	070	10	080	19	090
3	100	11	080	20	100
4	070	12	080	21	150
5	070	13	050	22	150
6	080	14	070	23	220
7	070	15	060	24	220
8	070	16	070	25	230
9	070	17	060		

These measurements are plotted on sheet 3 and show the level of destruction especially in the deeper water.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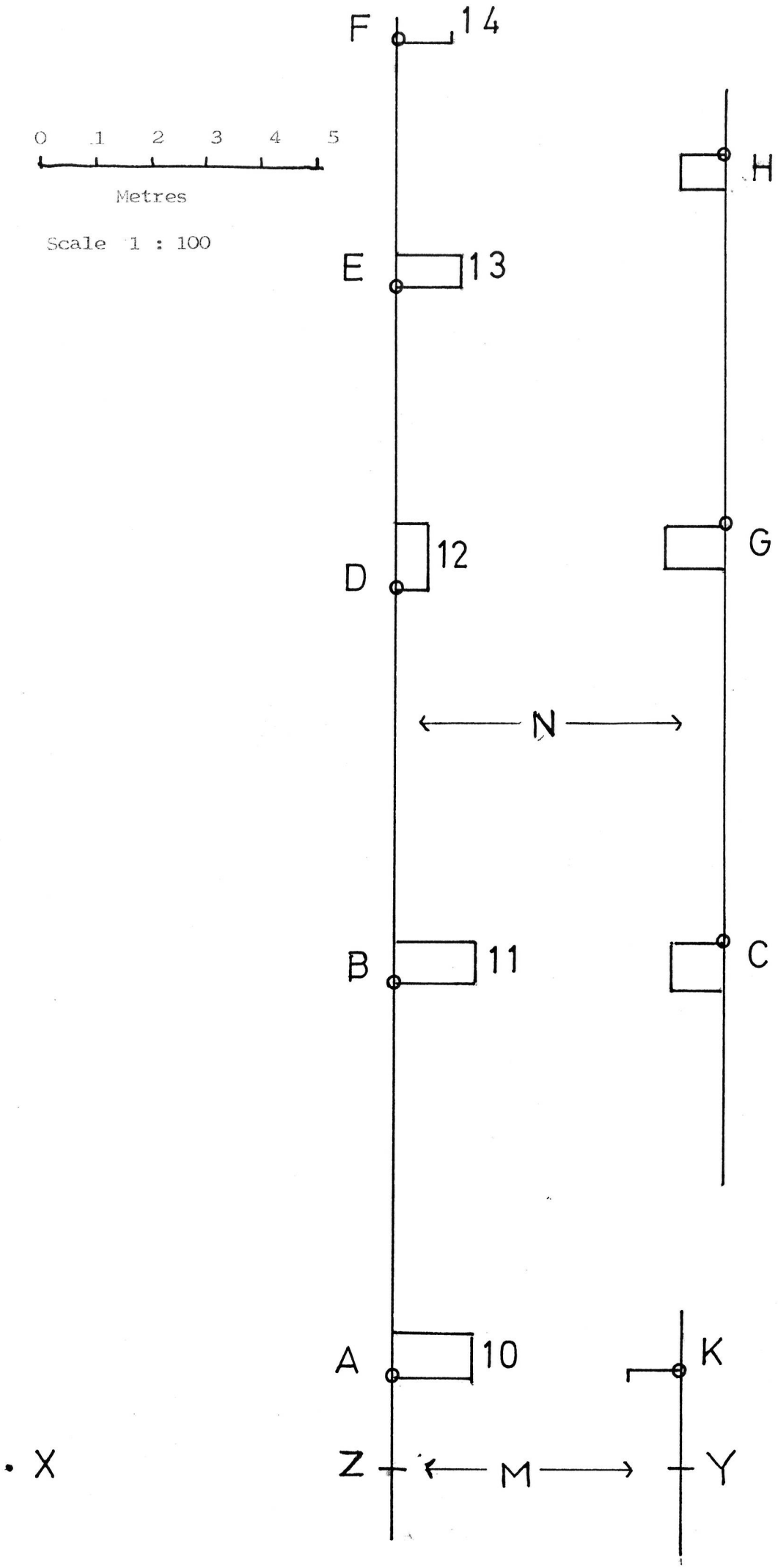
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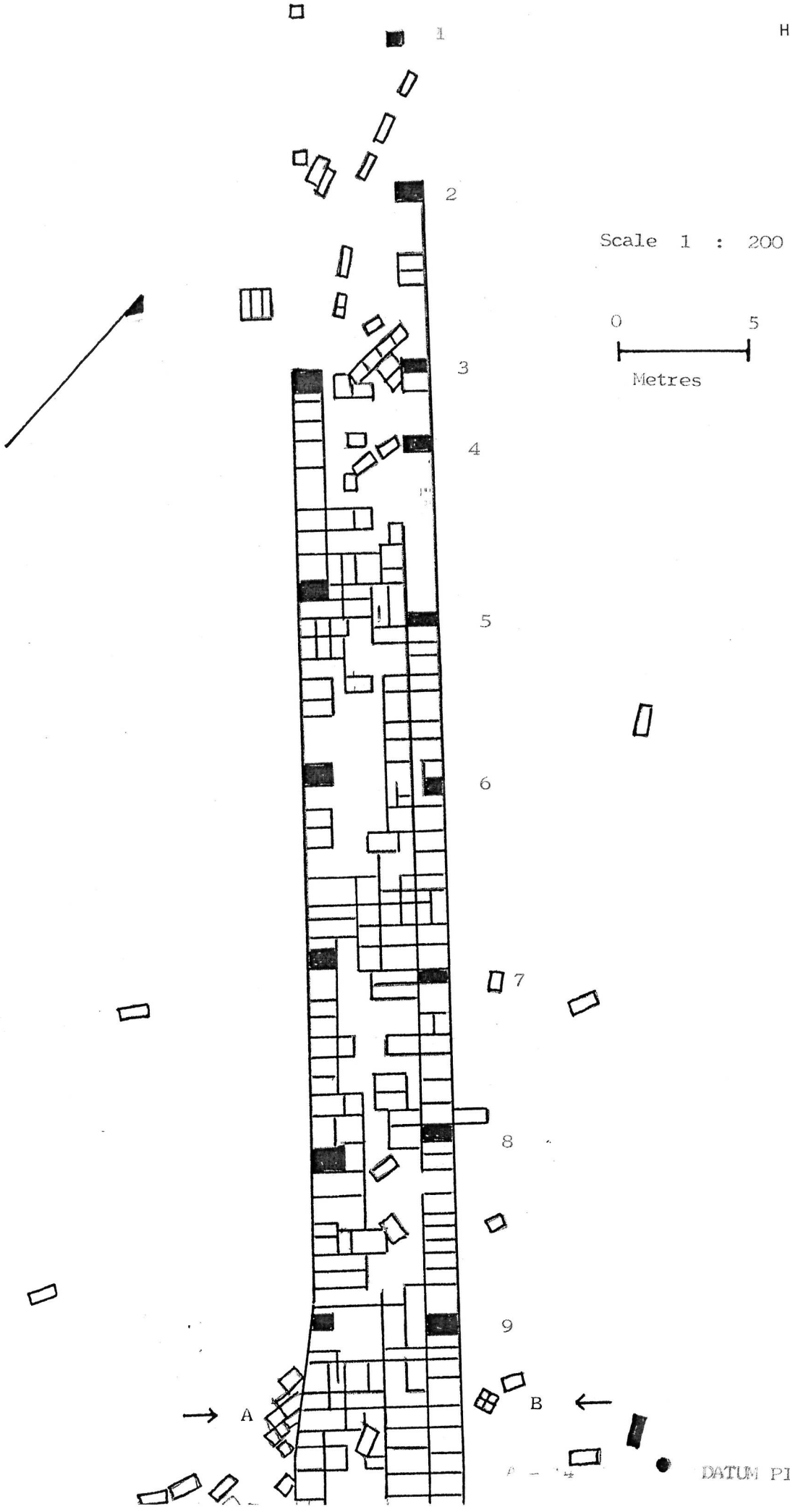
HAGGERTY



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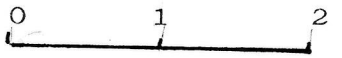
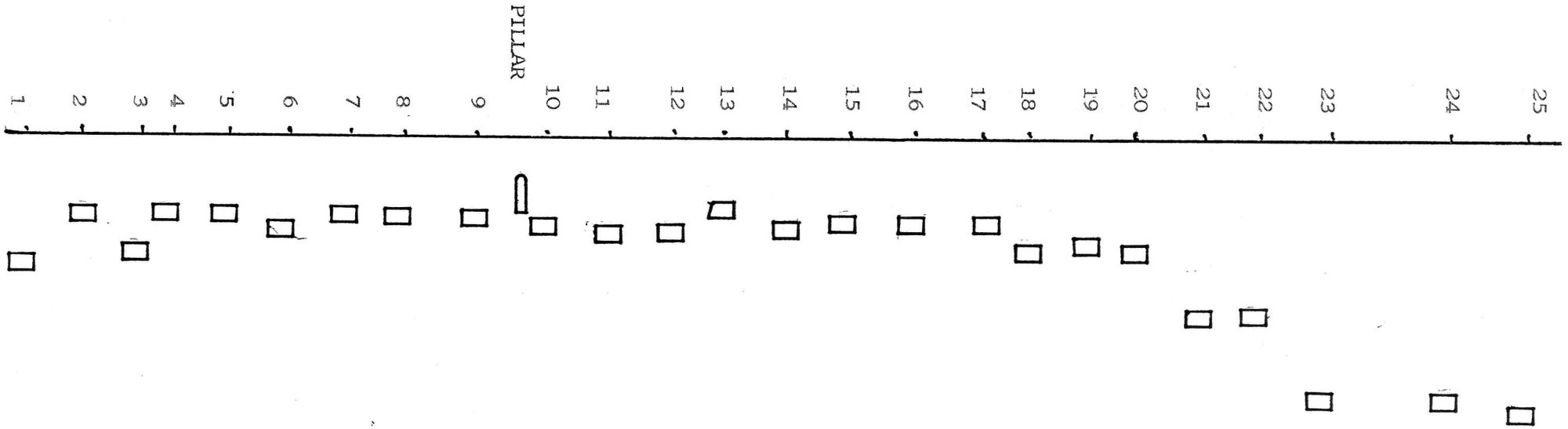
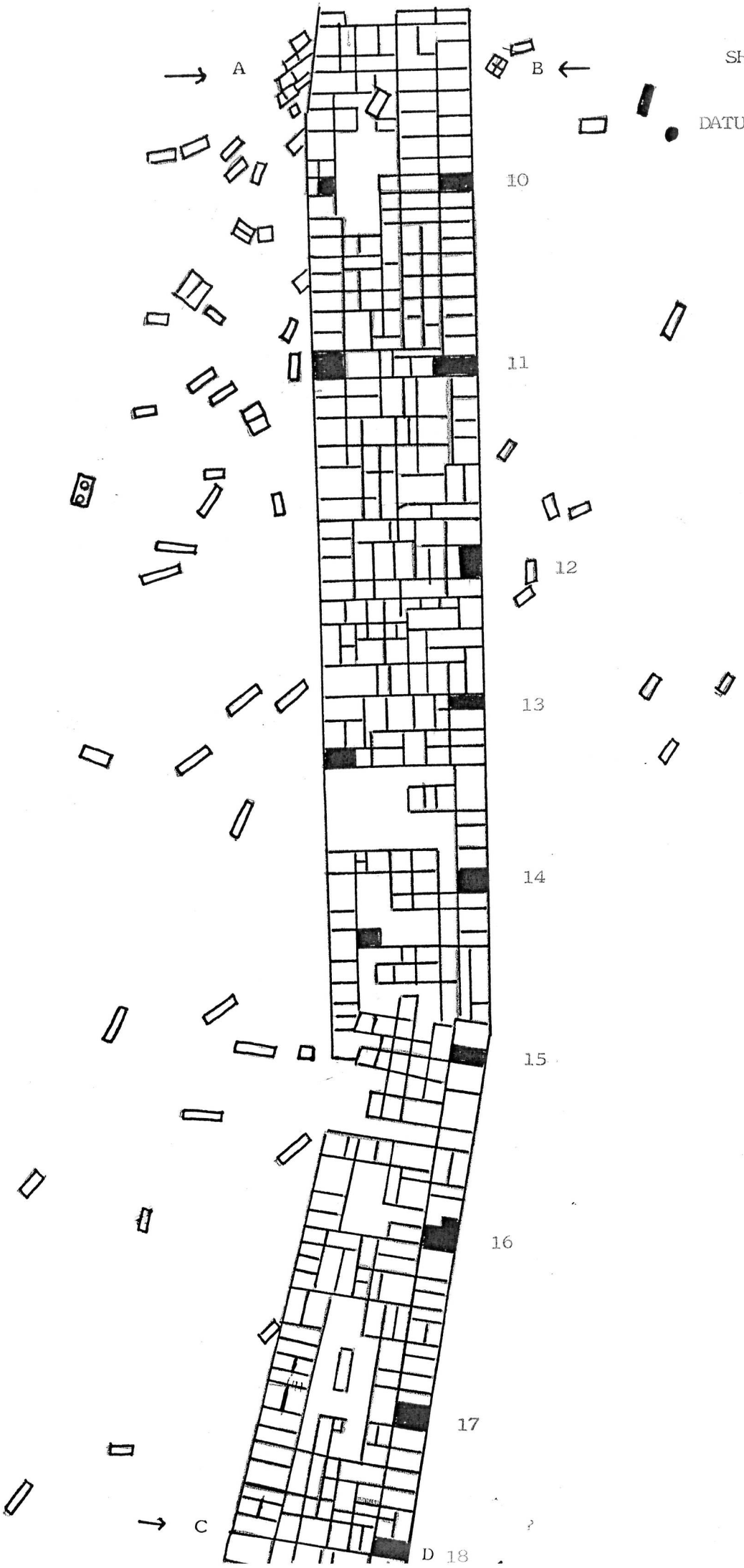


VERTICAL



WATER DEPTH OVER DATUM POINTS

HAGGERTY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DATUM PILLAR
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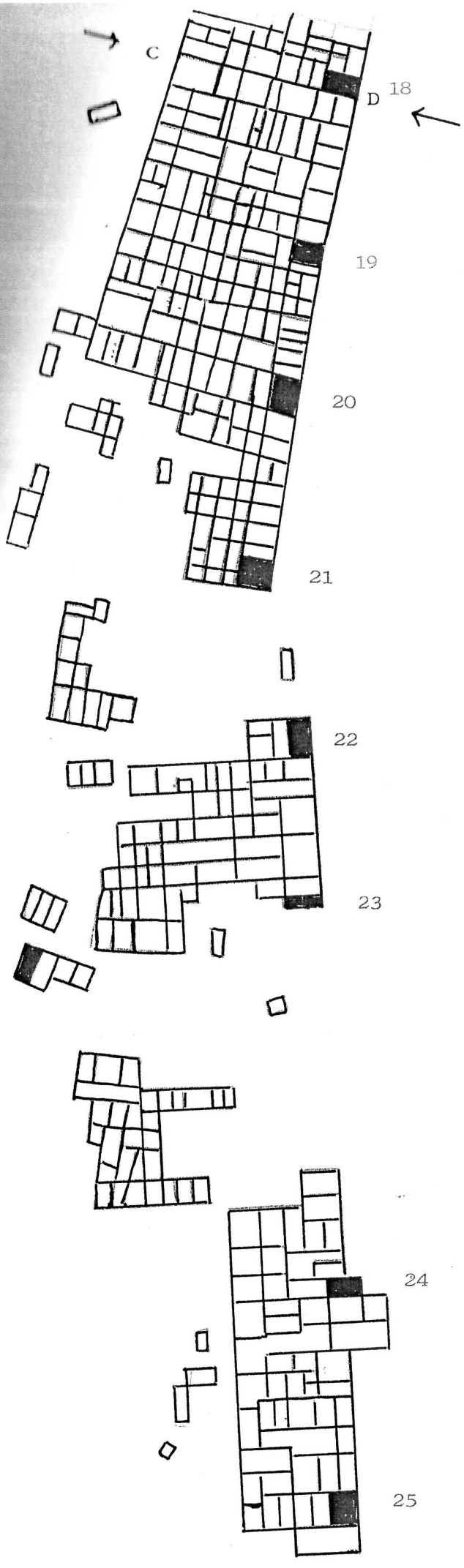
C
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SITE REPORT

by

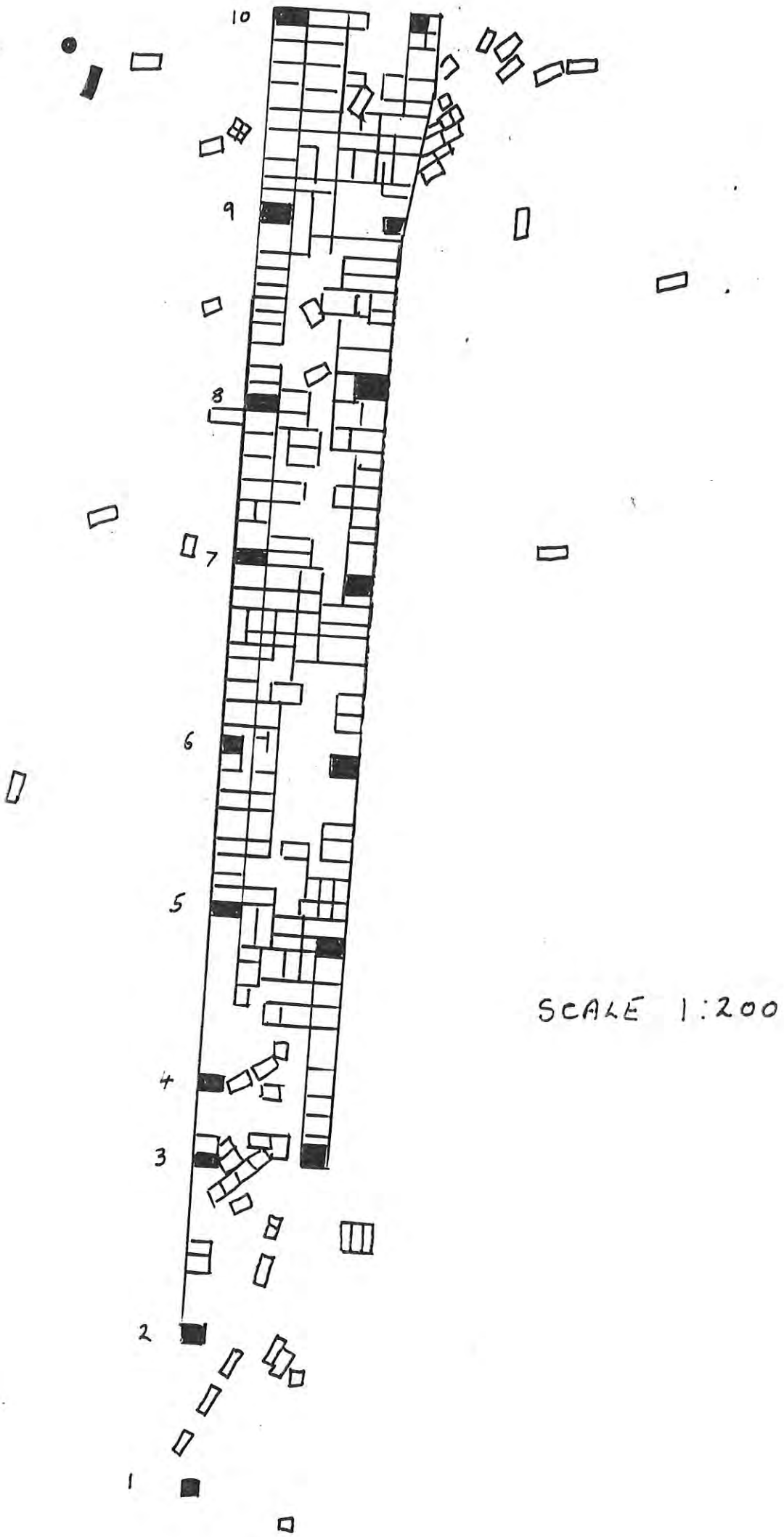
Francis Haggerty

THE AKROTIRI WALL

an Ancient Underwater Construction

Report and Survey

JUNE 1990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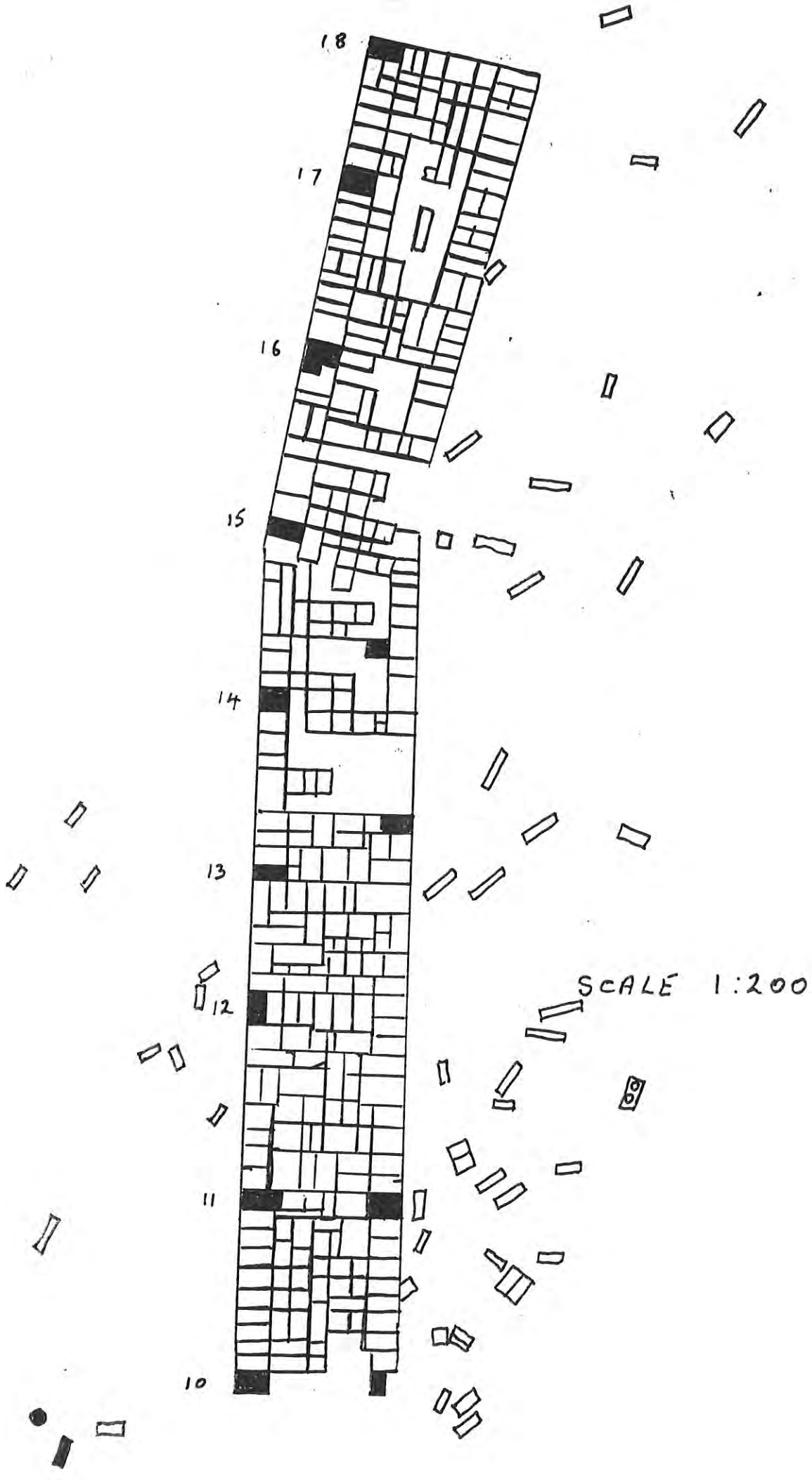
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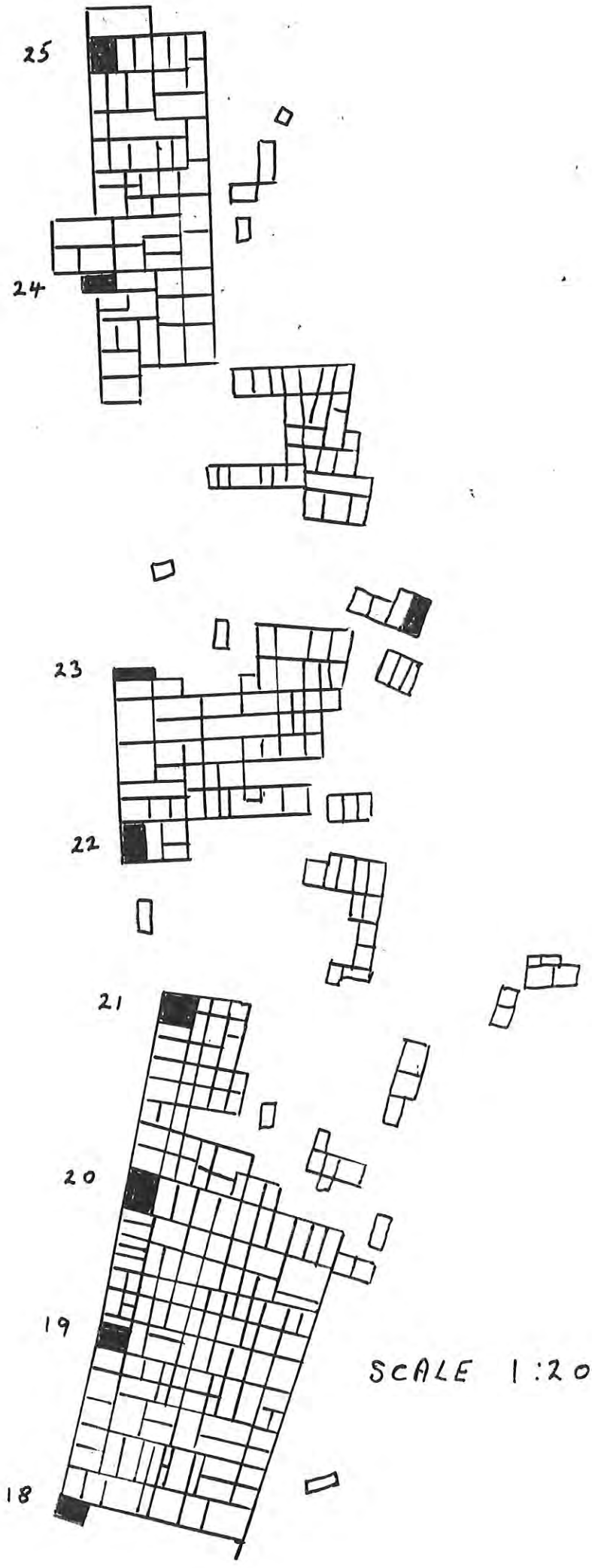
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THE AKROTIRI WALL

AN ANCIENT UNDERWATER CONSTRUCTION

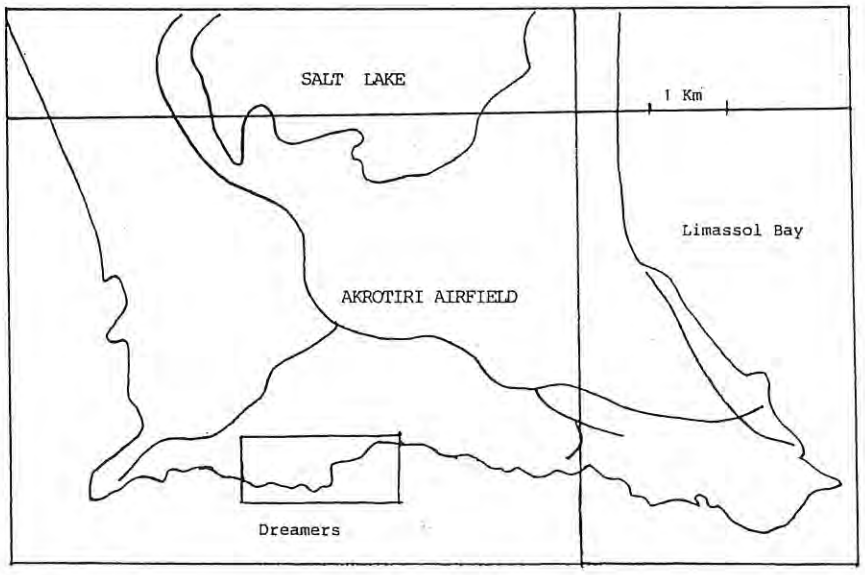
ABSTRACT

The recent discovery of a large underwater construction protecting a small headland on the south coast of Cyprus may throw new light onto the importance of the Akrotiri peninsula in Greco-Roman times. Dating the wall construction is proving difficult.

DESCRIPTION

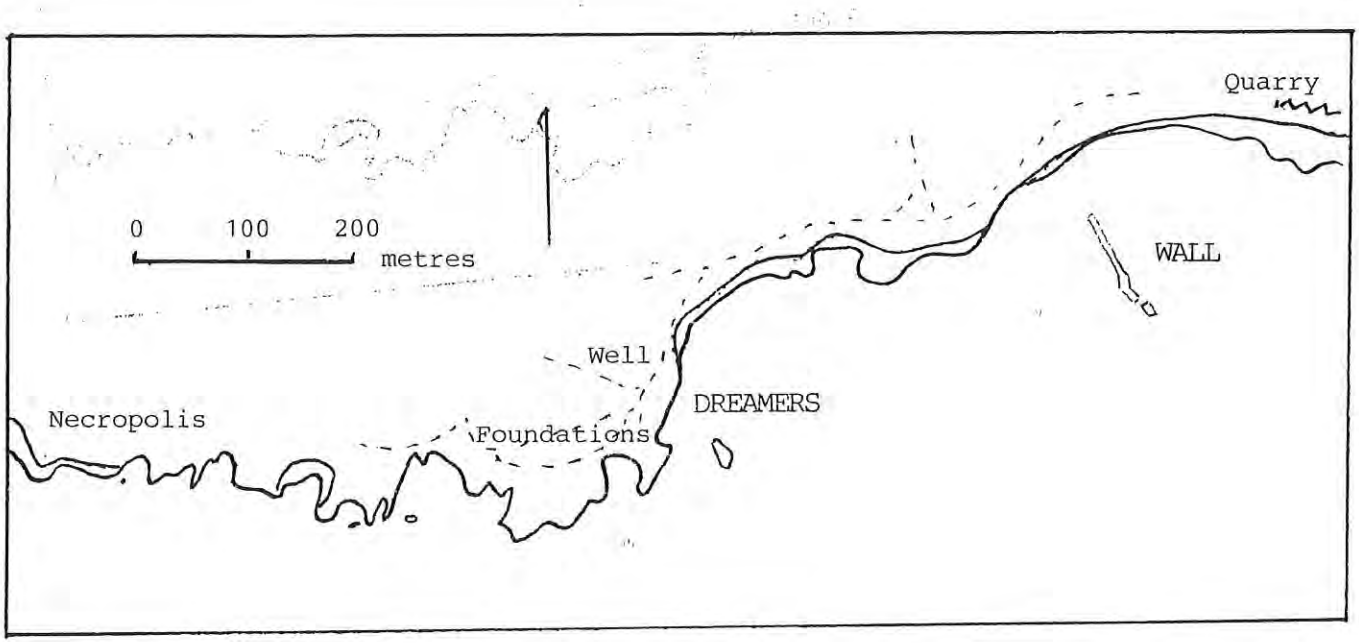
The Akrotiri peninsula in Cyprus lies a few miles to the south-west of the modern tourist town of Limassol. The peninsula lies between the ancient cities of Kourion and Amathus, each of which had its own harbour. The construction at Akrotiri bears no resemblance to the impressive harbour walls of Amathus but dwarf the single breakwater wall at Kourion.

To the south of the Salt Lake there are many known settlements. The main two Roman sites are Pano Katalymata and Kato Katalymata (also known as Voupatis Khionas) and there is a site identified as a Byzantine town, Katalymata ton Plakoton (also known as Palaeospitices);[Megaw, 1954]. The original inspection report claimed that from the evidence of surface finds the whole area appeared to have been densely populated from the Hellenistic period up to the end of the 7th century AD.



The Location of the Area of Dreamers Bay

In recent times there had been reports of building foundations, possibly associated with the vast amount of Roman pottery, in the area of Dreamers Bay. In 1984 a pilot of 84 Squadron, Keith McGuire, mentioned to the author that he had seen the remains of what looked like a small road, underwater near Dreamers Bay. This report led to the investigation the whole area of the Southern Cliffs with special attention made to Dreamers Bay.



The Area of Dreamers Bay at Akrotiri

OBSERVATIONS

Perhaps the most notable feature of the peninsula is the vast number of graves that lie along the cliff line. They extend for some four kilometres and are in three groups. In spite of the large number of tombs and graves the only site to be recorded in the report was site 8, the impressive surface remains of the small group of family graves at Vounaroudkhia ton Lamnion. A very basic tomb location map, Appendix A, was produced of the whole cemetry during the field survey.

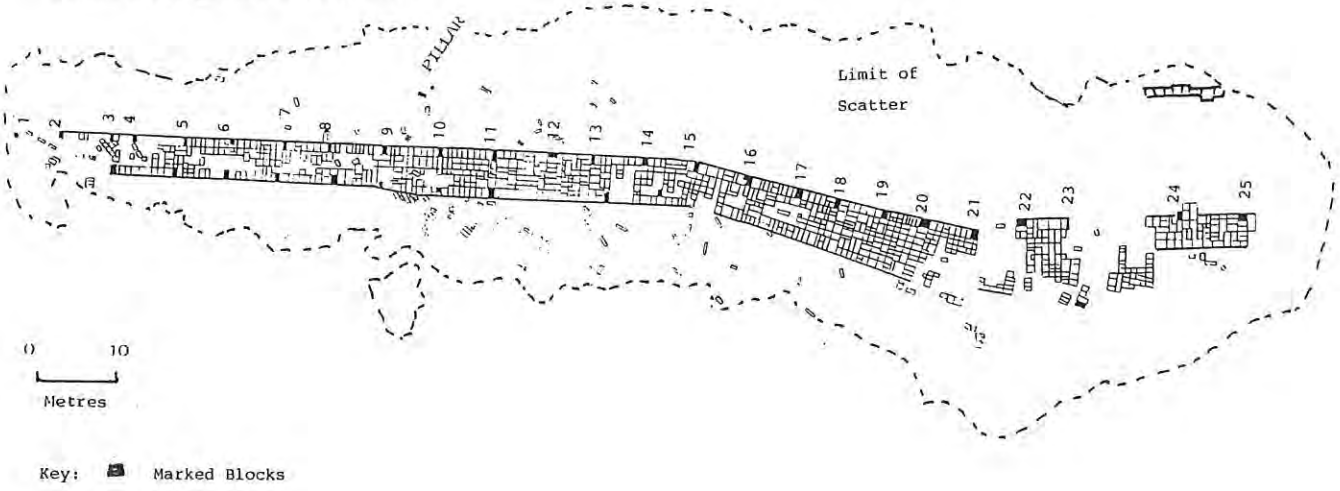
By field walking the whole area of Dreamers Bay the original reported foundations were found together with a further seven seperate footings. One of the buildings appears to be a tower and may be preserved to some considerable height under the protection of a sand dune. There is evidence of a large deep well which could be a Roman Bell Cistern.

Some 300 m to the north-east of Dreamers there is a small promontory with positive evidence of at least Roman occupation. On the surface there are five ashlar blocks which have been cut from a nearby quarry. There are also ashlar block walls that have been set in foundation trenches and there are the remains of rock cut tombs. In the vicinity of the blocks there is total cover of pottery sherds to a depth of at least 300 mm. The coarse ware can literally be pieced together. Drawings of four of the finds are enclosed with this report at Appendix B. The pottery appears to be 1st - 3rd Century Roman. The pottery sherds are mixed with fused glass fragments and burned animal bones. This might be very important when considering the use of the site.

As the Cypriot authorities confined the survey to a non-disturbance survey it has proved almost impossible to identify the site. The close proximity of the tombs may indicate that the building blocks belong to an altar or small funerary shrine.

UNDERWATER

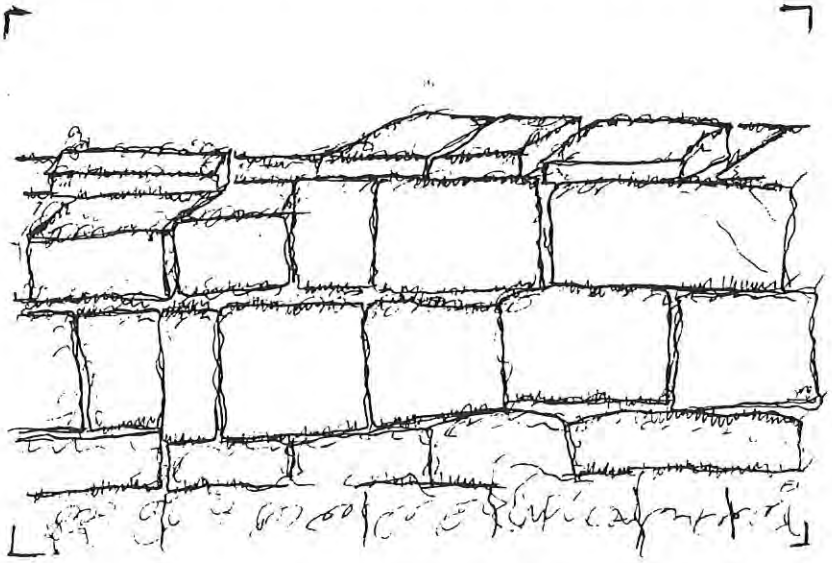
Some 200 m to the south-east of the promontory, out to sea, there is a small rock which, until recently, had been used as a gunnery target. A few metres to the south of the rock there is a fine collection of Rhodean amphorae - posible the cargo from a shipwreck tragedy. Fifty metres to the north-east of the rock there is a reef which runs north and curves north-west as it heads towards the coast. Both rock and reef cause very bad undercurents in their immediate vicinity. It is only on the calmest of days that there is no white water on them. It is was this reef that appeared odd from the air as it had its own distinctive brown colouration and there were straight parallel lines within the reef. The brown colouration was caused by a small brown algae, possibly Halopteris scoparia, which is localized and grows only on the building rubble. The straight lines caused the greatest exitement.



View of the Akrotiri Wall

NOTE: [In order to fully appreciate the underwater survey the reader must realise that the work was carried out single handedly by the author over a three year period. The work was all done using no diving equipment and necessitated a 20 minute swim to the site. Most of the work was carried out early in the morning before the bright sun obscured detail and the morning breeze made measuring difficult. The site was kept a 'secret' to prevent local divers from looting the site of the few identifiable artifacts.]

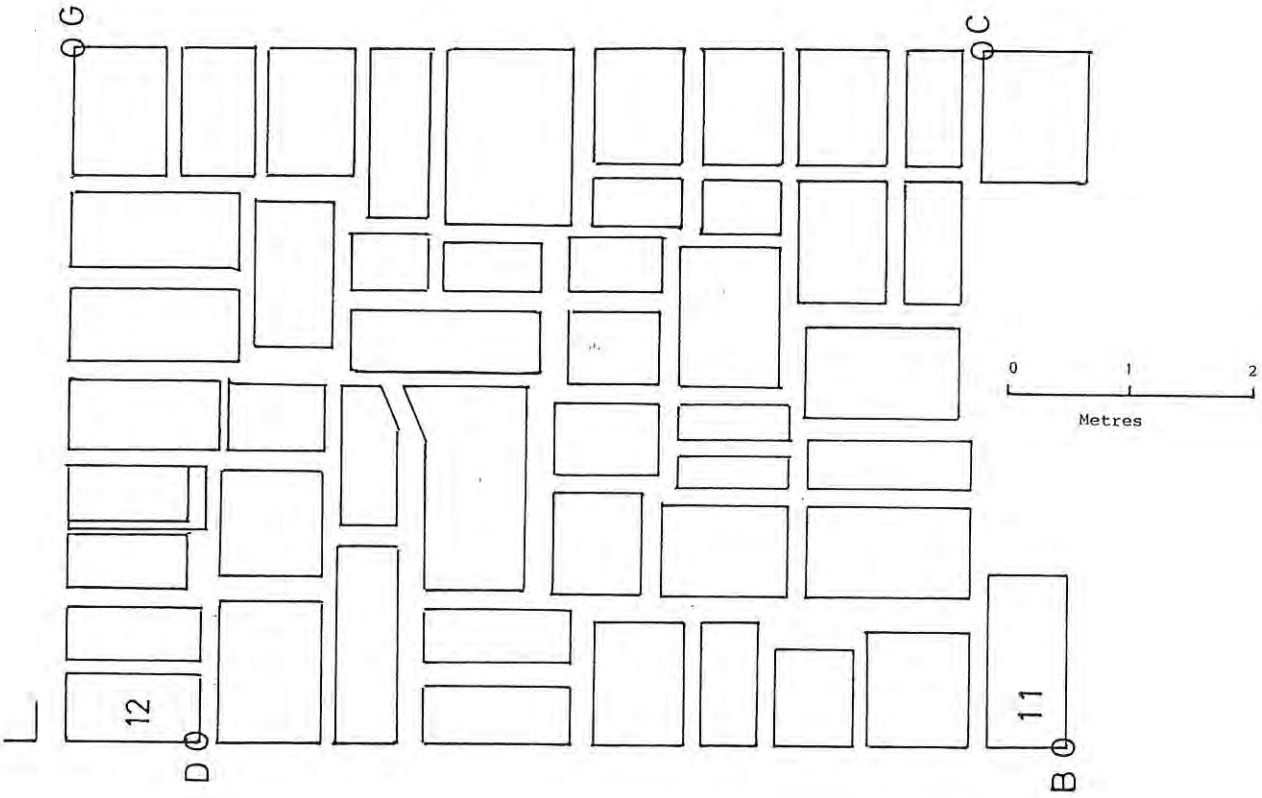
There is a built construction on the reef. It could be a large jetty or breakwater of uncertain date. The structure measures some 150 m in length and five metres in width - though this is variable. At the nortnern end, closest to the cliffs, the blocks are only 0.5 m below the surface with a water depth of 2 m; at the southern end the blocks are almost 3 m below the surface with a water depth of 6 m. The wall is constructed in continuous sections along what appears to be a natural reef. Each section is approximately 5 m long and there appears to be a vertical 'fault' between each section. The sections do not appear to be bonded into each other. The unrelenting pounding of the sea has removed layers from different sections of the construction thus producing a castellated effect and scattered the blocks down the the slope of the reef.



View of the Underwater Construction

It is difficult to form a picture of the original structure but the southern end of the wall is substantially wider than the shallower end. The deeper blocks are also much larger than those in shallow water. Notwithstanding the sectional construction of the wall (this might be an incorrect interpretation), there is a very strong element of design technology in the construction. The Phoenicians of around 480 BC certainly had this design technology (G Herm,1973, pp 156-157).

It is very difficult to measure diagnostic blocks as the fallen blocks partly obscure the standing remains. One of the largest block blocks (1850 mm x 550 mm x 400 mm) was located at the deepest end and was part of the standing wall section, it is located directly onto the bed rock. It is impossible to detect if the bed rock had been cut. The next adjacent block (1700 mm x 600 mm x 350 mm) formed a corner stone. At the shallow end of the reef most of the blocks measure 600 mm x 450 mm x 250 mm. There are very few blocks that are not ashlar, however there are two short round pillars in the shallow water, one of which is wedged into a vertical position and made an excellent datum for surveying. There are three other pierced blocks which may be anchors . One block (1150 mm x 580 mm x 380 mm) is curved in two planes with two pierced holes, one square the other circular.



Plan of Section of the Wall

IDENTIFICATION

The earliest type of harbour are rock cut. The natural features were adapted to give shelter to small craft. Next came the vertical wall built on convenient shallows eg in protected bays; finally came the imposed harbour on unpromising coastlines - a Roman invention, (H Frost, pp 66-67). I feel that the Akrotiri construction could be of either the second or third type.

The building technique used shows traces of similarity with the walls of Vouni Palace which has rows of large blocks on top of horizontal slabs. According to A Tatton Brown (Hunt, pp970) Vouni was built in the early 5th century BC by the Persians, but rebuilt in the mid 5th century by the Greeks. It was totally destroyed in 380 BC never to be rebuilt. The same building technique was again seen by the author at Kition, an early Phoenician town, during a rescue dig by S Hadjisavvas in 1987. This Greek wall lay under an early Roman villa. A very similar construction is found in the walls of a short canal which runs between the Nile and the Court of Amenhotep 111 in Luxor. Though not necessarily contemporary with the Akrotiri Wall the building tradition may have been exported and survived into the Hellenistic Period of Cypriot history (325 - 30 BC). Thus the wall may have been built during the Ptolemaic rule of Cyprus (294 - 22 BC).

The building style might therefore indicate a pre-Roman construction of earlier than 30 BC. S Swiny of CAARI, who has viewed the construction underwater (1985), has expressed the opinion that the wall was a very early construction but would not commit himself to 'Pre-Roman". The earliest pottery within the rubble must be our only source of direct evidence for the dating of the structure. This evidence is very rare.

It is difficult to find similar designs around the Mediterranean. (Bass, pp90-100) Thapsus has a single built mole which was constructed at right angles to the coast with a gap between the end of the mole and a built structure. The deepest part of the Akrotiri wall also has a gap with a tower like structure at its extremity. The Greeks from the 6th Century BC were very prolific with the construction of moles to break the force of the sea and wind in order to protect their ship sheds and ancillary harbour facilities. Again the area of Dreamers shows evidence of large construction activity, perhaps it was a small ship building harbour. Constructed breakwaters were highly developed by 522 BC. Herodotus spoke with admiration of the inner breakwater constructed by Polykrates, the Samian tyrant. This construction was 440 yards long and lay in 115 feet of water. It also had a tower built at the end of the breakwater.

It was customary around the 5th Century BC to have separate military and commercial harbours. On the island of Aegina there is a military harbour constructed of limestone ashlar blocks extending straight out into the sea. Even Themistocles, in 493 BC, moved the naval establishment from the undefended beaches of Phaleron to the rocky peninsula of Piraeus and built breakwater walls to extend the site. Was such a decision made with the defending naval force for Amathus and Kourion? This might explain the close proximity of the large buildings so close to the necropolis.

With the success of Alexander in 325 BC through to the rise of the Romans, there was a vast increase in maritime movement. The larger vessels required larger harbour facilities and paved platforms replace the older shore-side quays. It was the Romans that have left the best evidence of their underwater constructions. It is now generally agreed that because of the great difficulty in identifying early underwater constructions, mainy because of later improvements, that unidentified walls should be called Roman unless there is positive identification through underwater excavation. (BASS ,p95)

WATER LEVELS

According to various studies (Jelgersma, 1961; Scholl and Stuiver, 1967; and Emery and Milliman, 1970) there is no established sea level curve which can be used as a base line from which to calculate local earth movements. Statistical analysis from a large number of sites (Flemming, 1986; and Walcott, 1972) indicate that the hydro-isostatic adjustment for the Mediterranean is about 10% of the total eustatic change. t is probable that there has not been a net eustatic change of more than 500 mm in the last 2000 years. Flemming (1973) analysed data from south-west Turkey and concluded that the net eustatic change over the same period was only 300 mm. From the local evidence of adjacent marine constructions - berthing points and rock cut steps from the sea, the water level does not appear to have risen by more than 500 mm. This rise would also be sufficient to submerge the rock cut graves in the area of Cape Zevgari some 1 km to the west of Dreamers.

Geologically there is the Anatolian fault line which extends from the Sea of Marmara into Eastern Turkey. There is a branch of this fault which runs through the Peloponese, Crete and Rhodes; from here there is a south-eastern branch which runs through Cyprus (Flemming, 1973, pp1031-1032).

THE WEATHER

The prevailing surface wind from April and October , between late morning and early evening, is the west to south-west sea breeze (normally 10 - 15 kts, but occasionally 20 kts with gusts to 30 kts). An east to north-east surface wind is quite common in winter, and not infrequently, the mean speed reaches 20 -25 kts. In winter and spring there is the occasional south to south -westerly wind which brings the dust haze from North Africa. In summer there is an early morning easterly surface wind which becomes a westerly wind by late afternoon or evening. A strong north or north - westerly flow is rare. The infrequent north to north - easterly wind can cause turbulance and sudden fluctuations of wind speed of between 5 and 30 kts.

ENCLOSURES

Annex	A	Plan of the Wall
Annex	B	Plan of Section of Wall
Appendix	A	Site Map of Tombs
Appendix	B	Site Finds. 1 : 1

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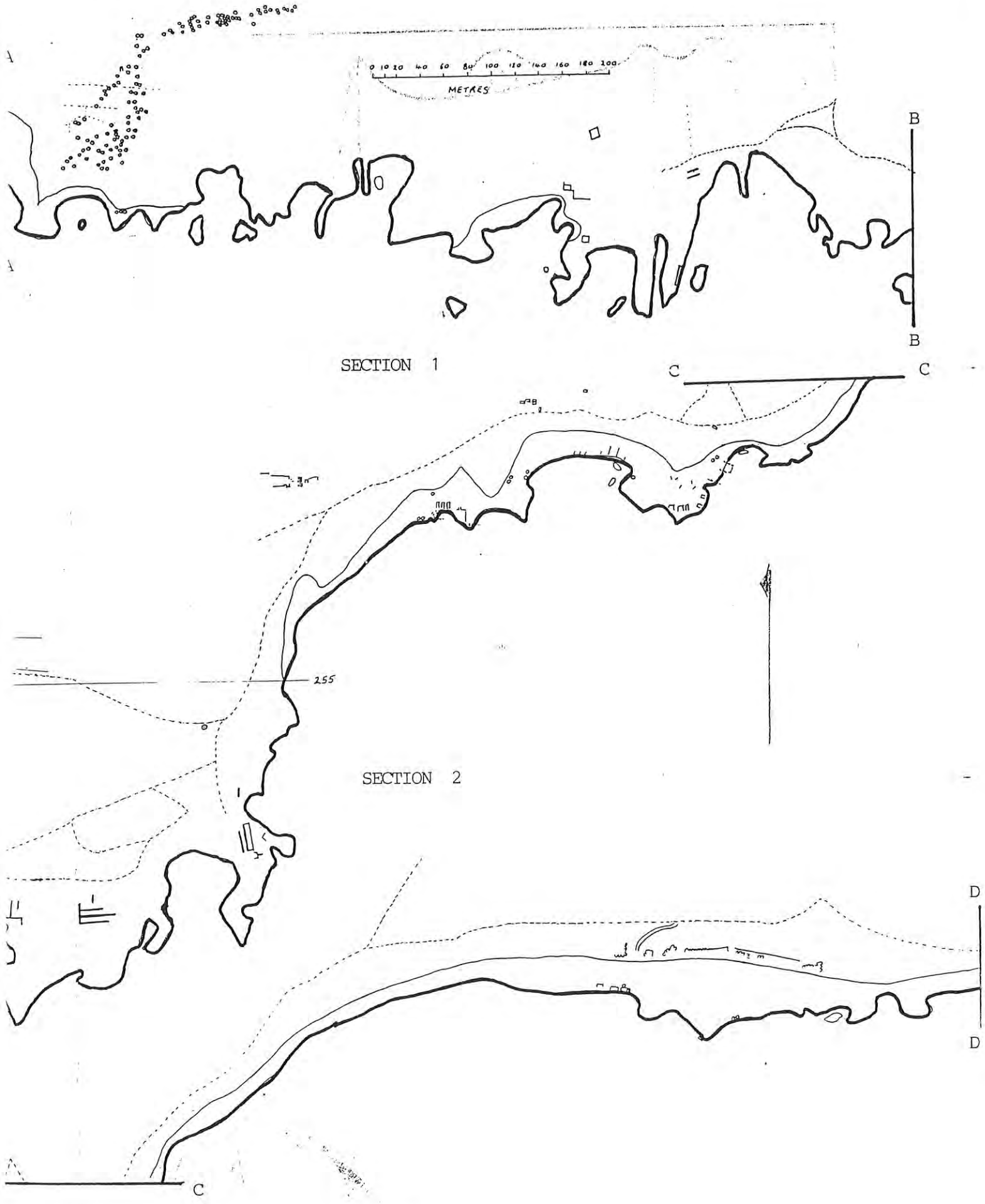
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SECTION 2
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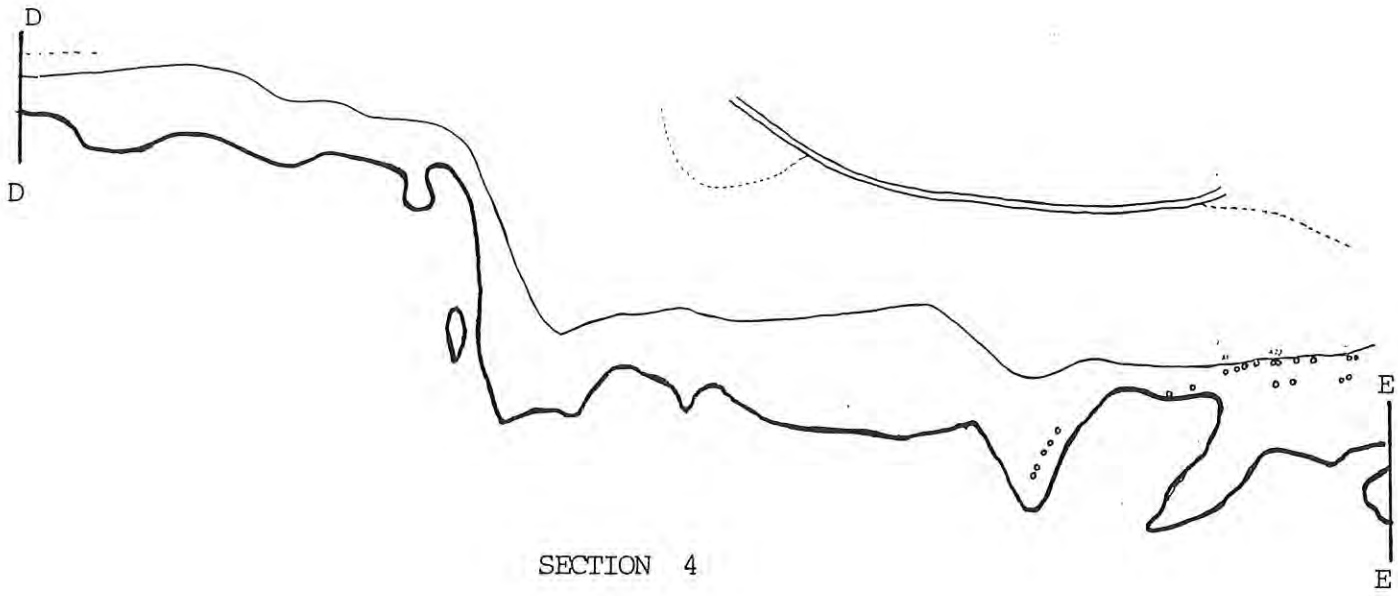
WALL
SECTION 3



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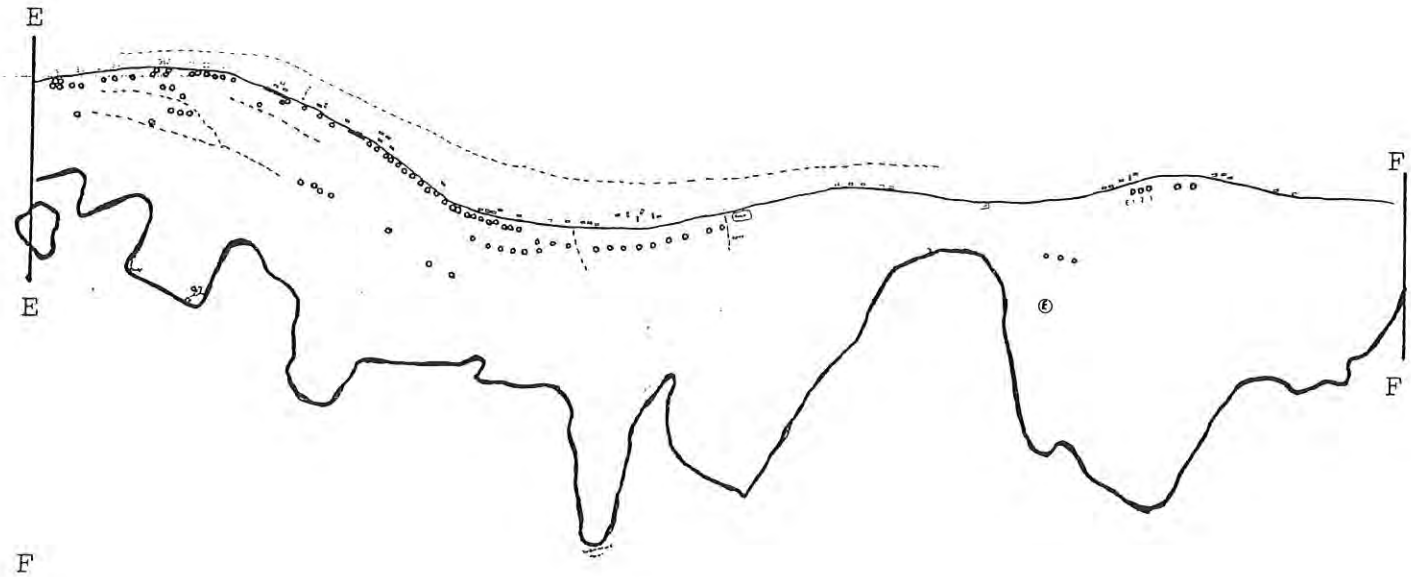

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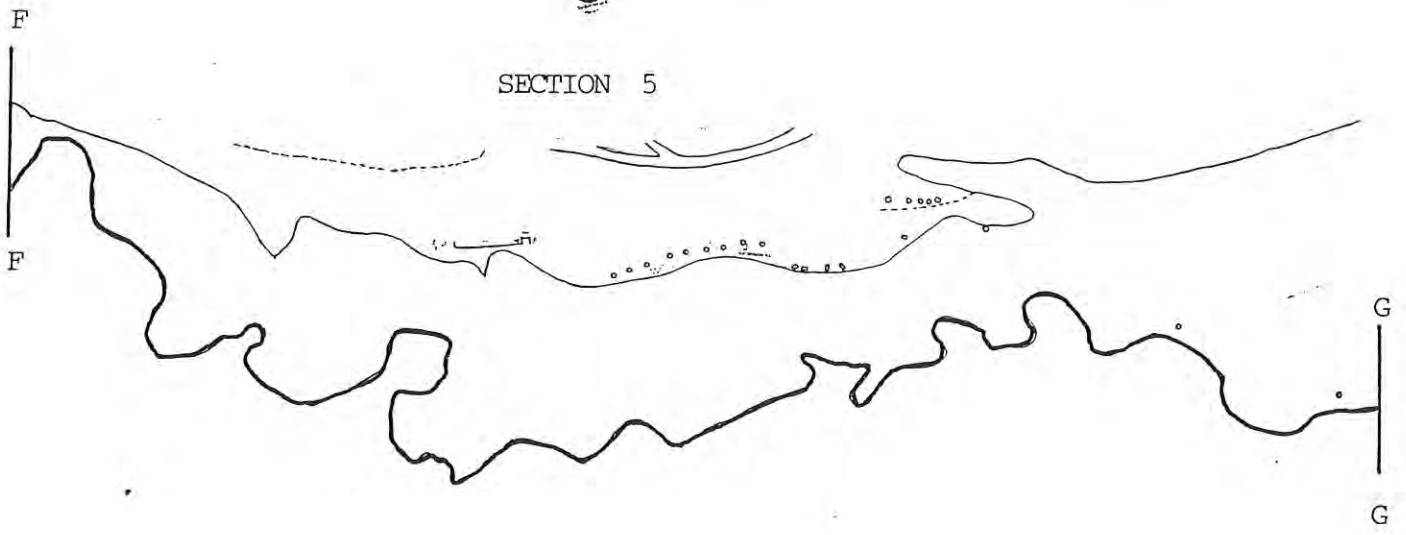
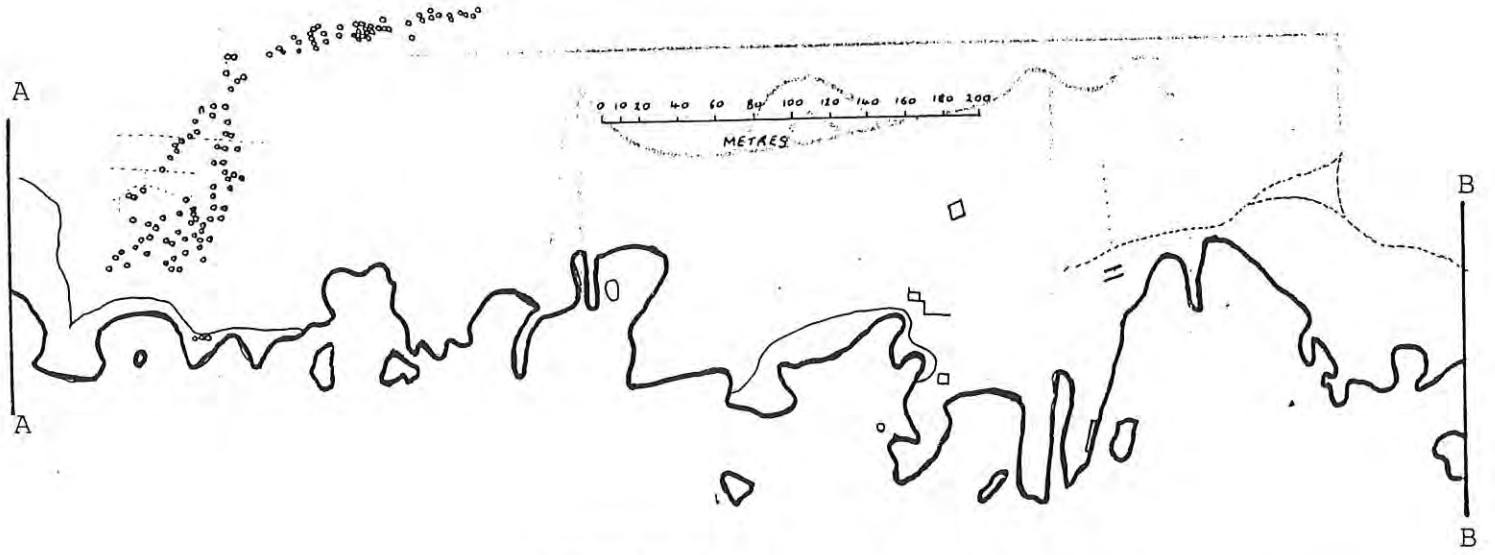


SECTION 6

THE TOMBS OF THE SOUTHERN CLIFFS - 6 Sections (A - G)

APPENDIX A



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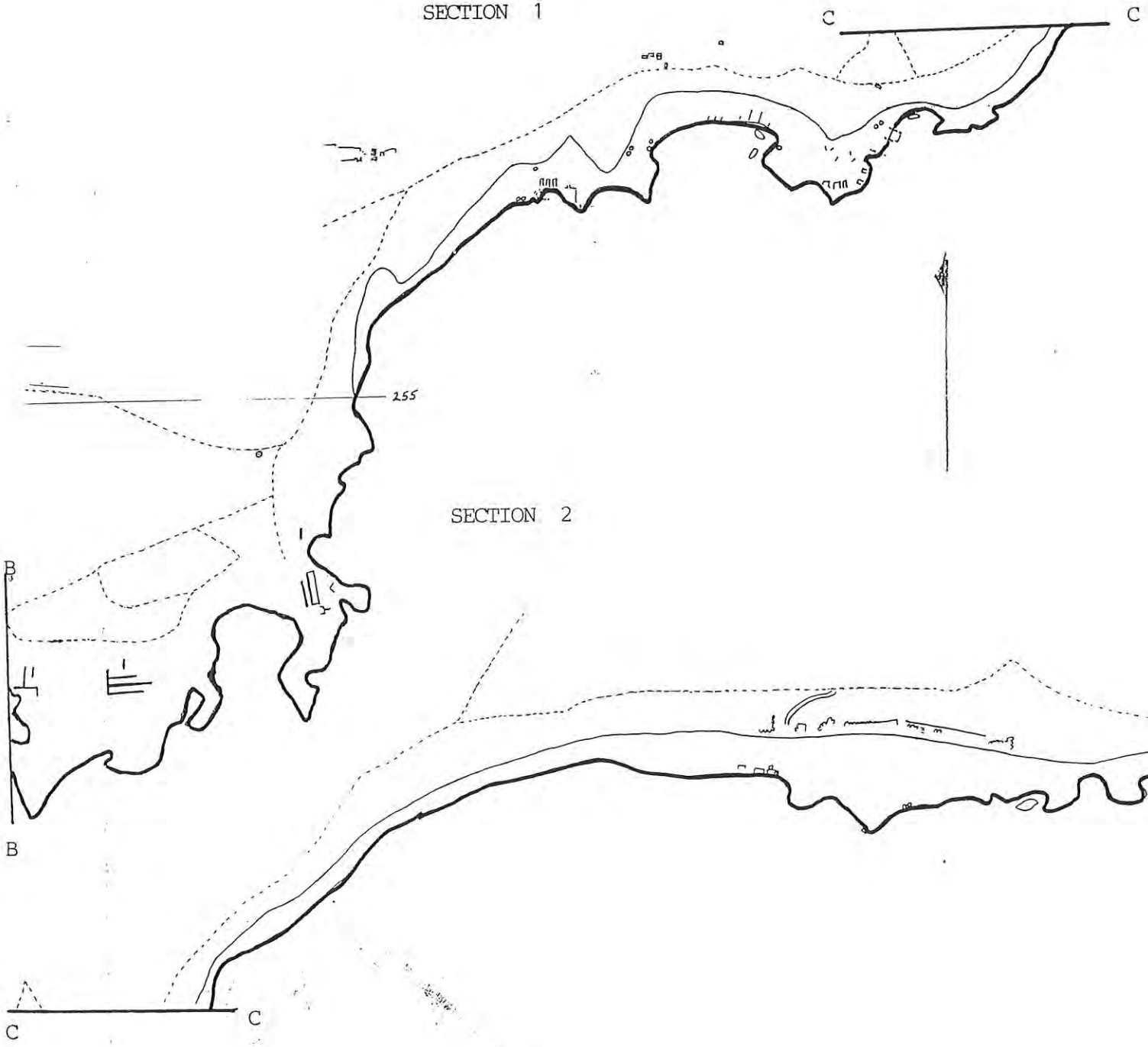
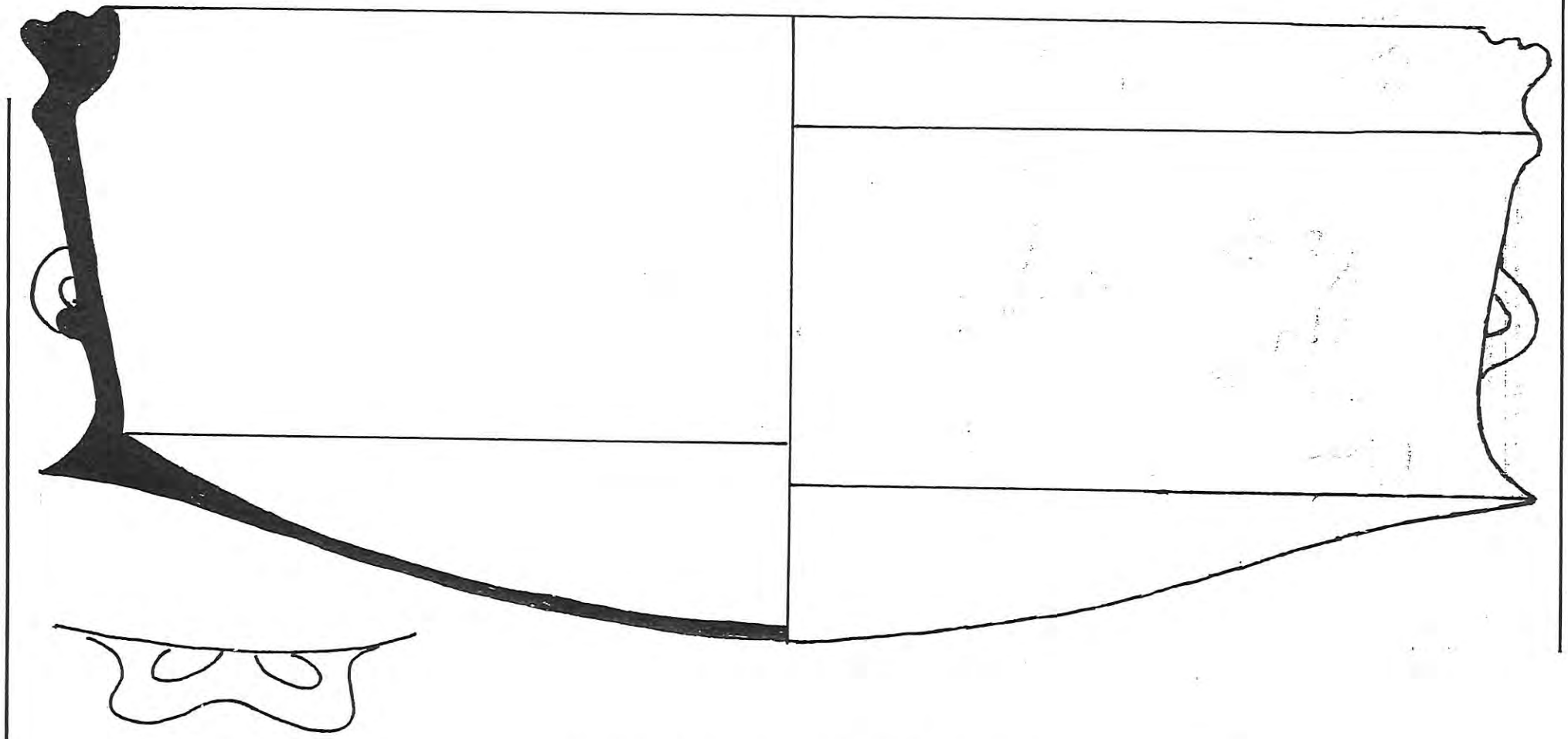


SECTION 2

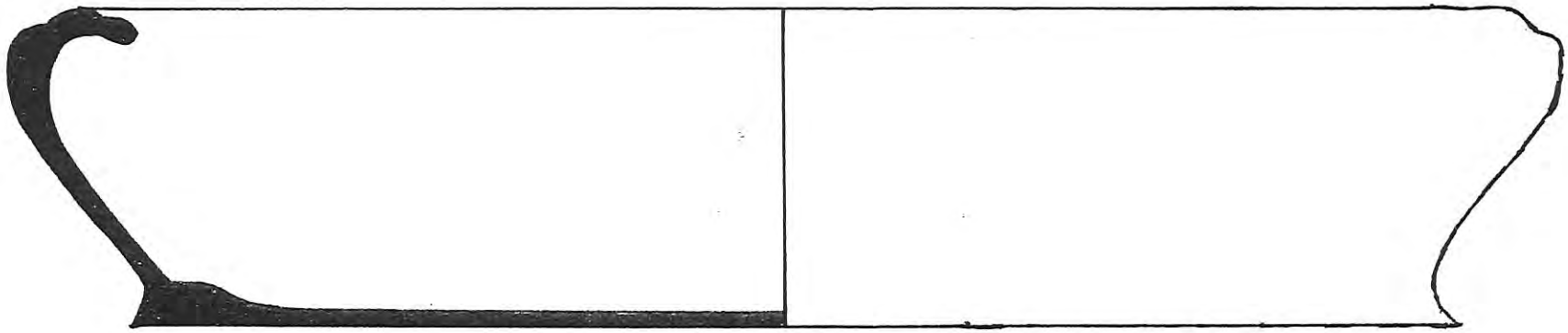
WALL

SECTION 3



LARGE COARSEWARE BOWL FROM DREAMERS Scale: 1:1

HAGGERTY



MEDIUM COARSEWARE BOWL FROM DREAMERS Scale: 1:1

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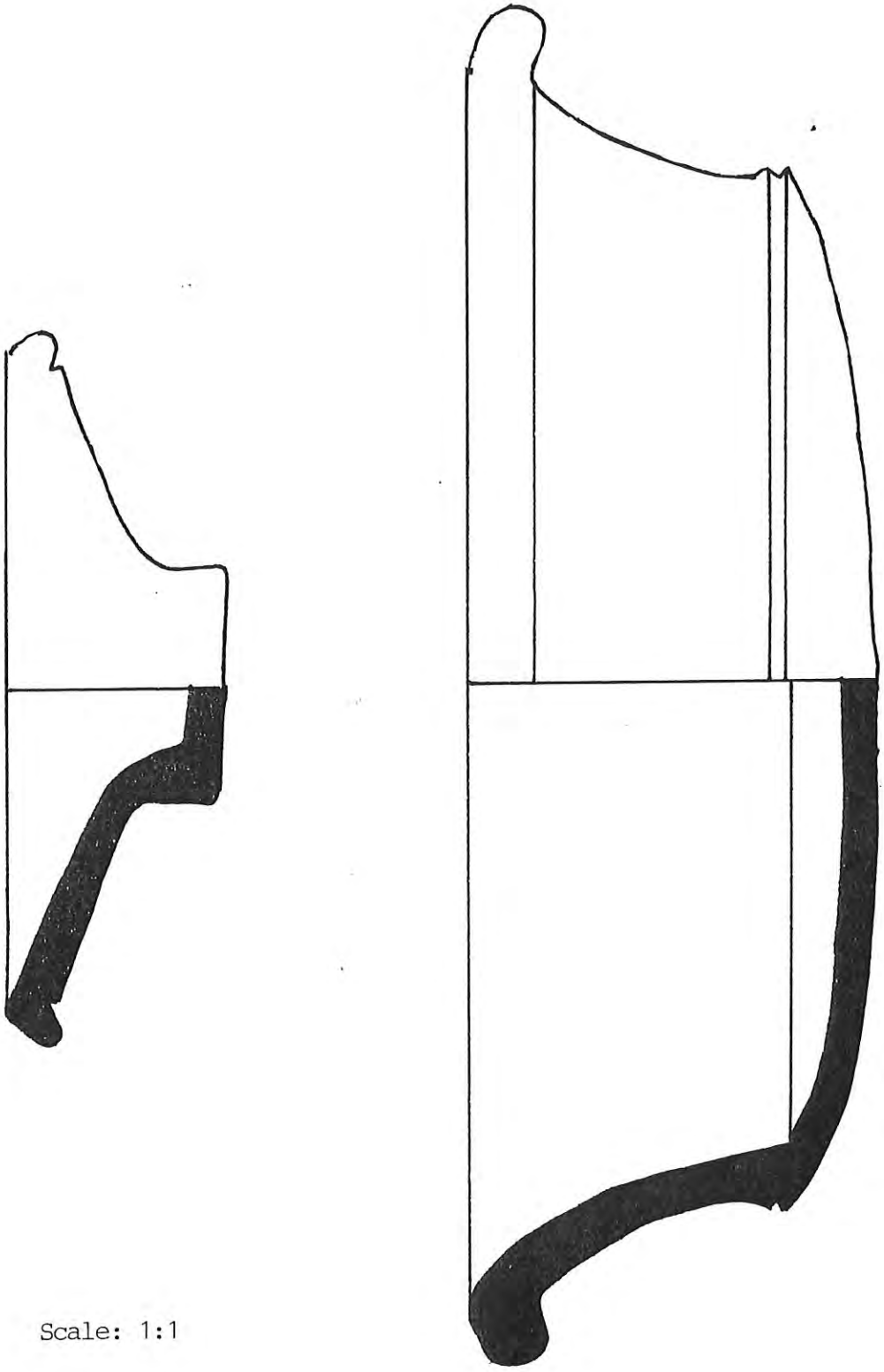

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TWO COARSEWARE BOWLS FROM DREAMERS

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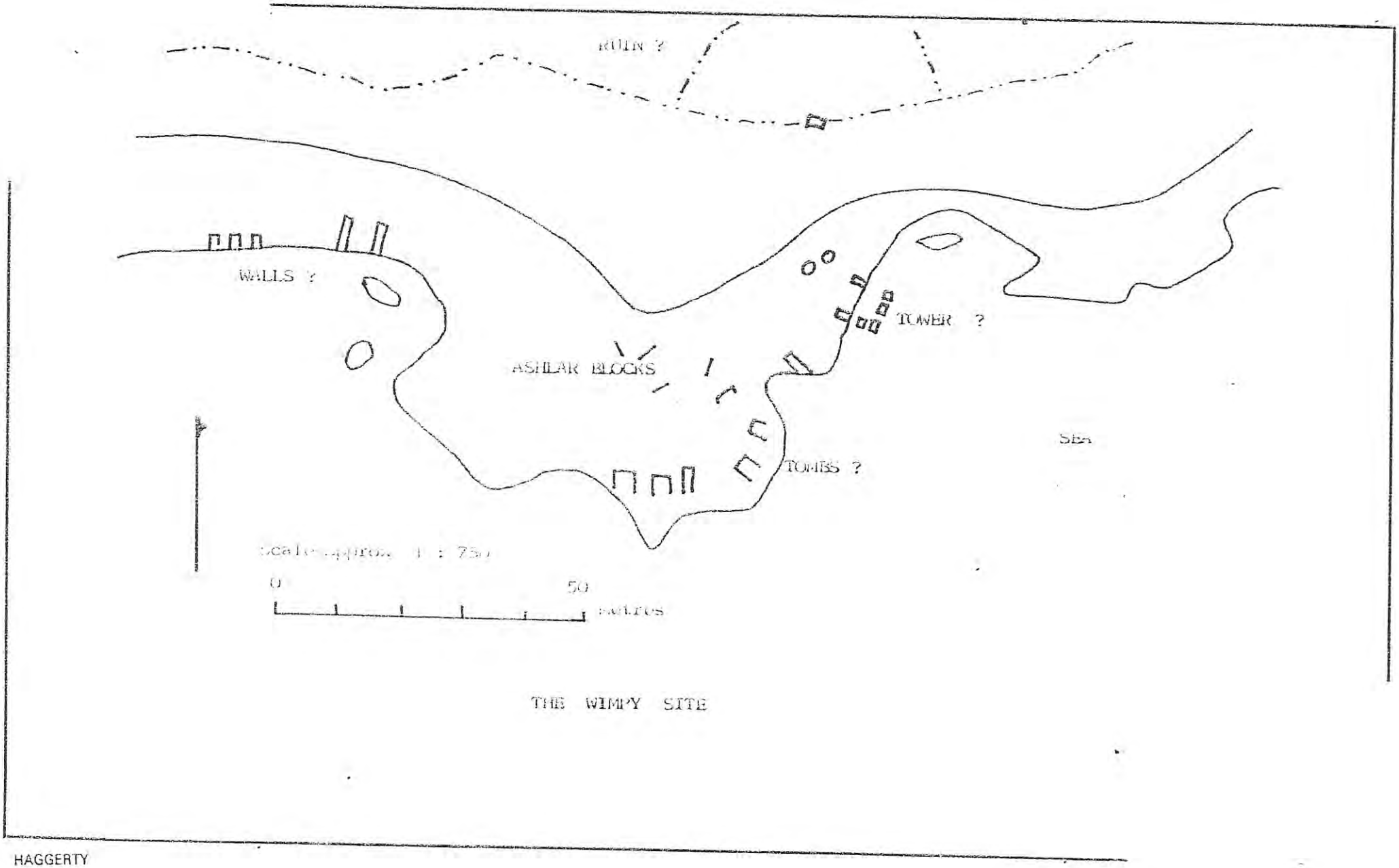

THE WIMPY SITE

HAGGERTY


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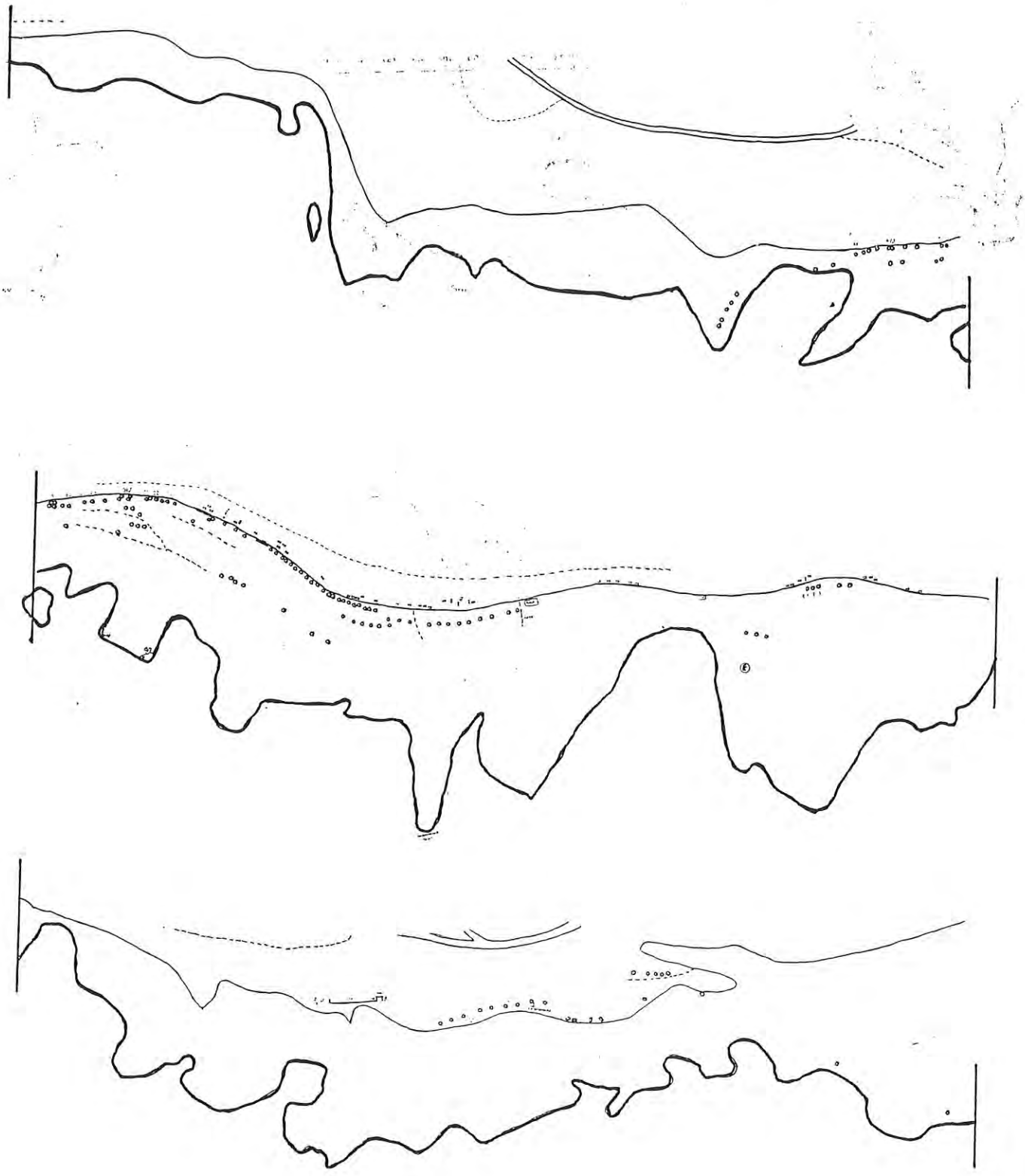


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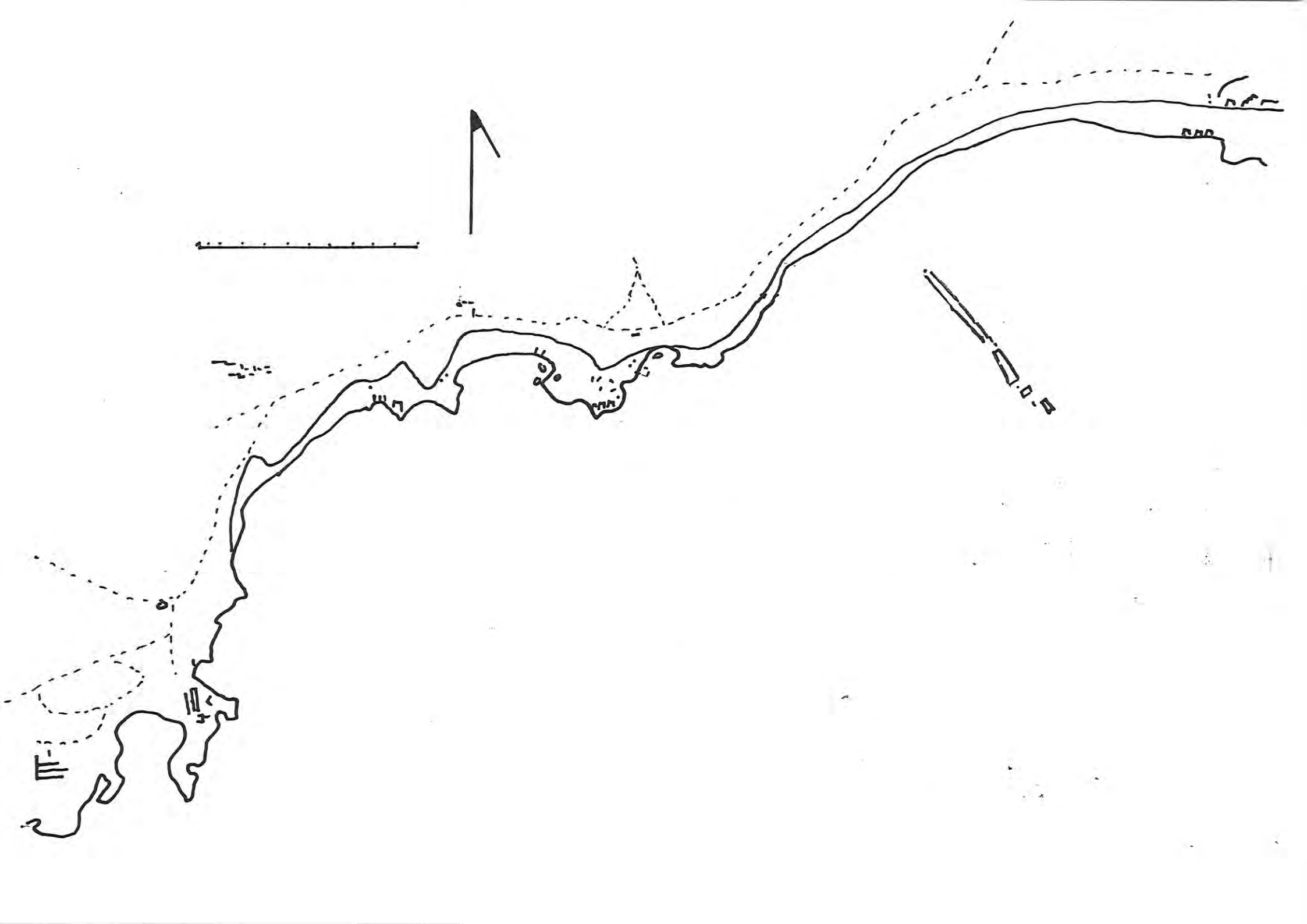

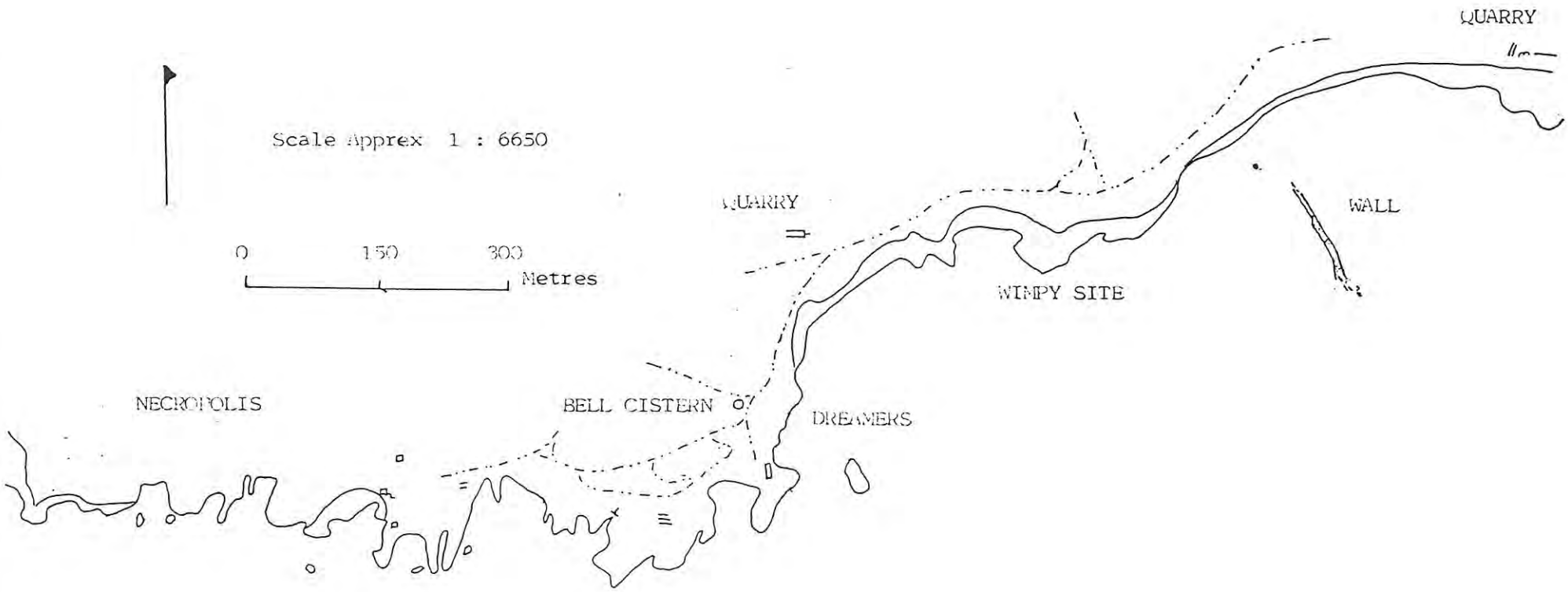

DREAMERS BAY AND ASSOCIATED SITES

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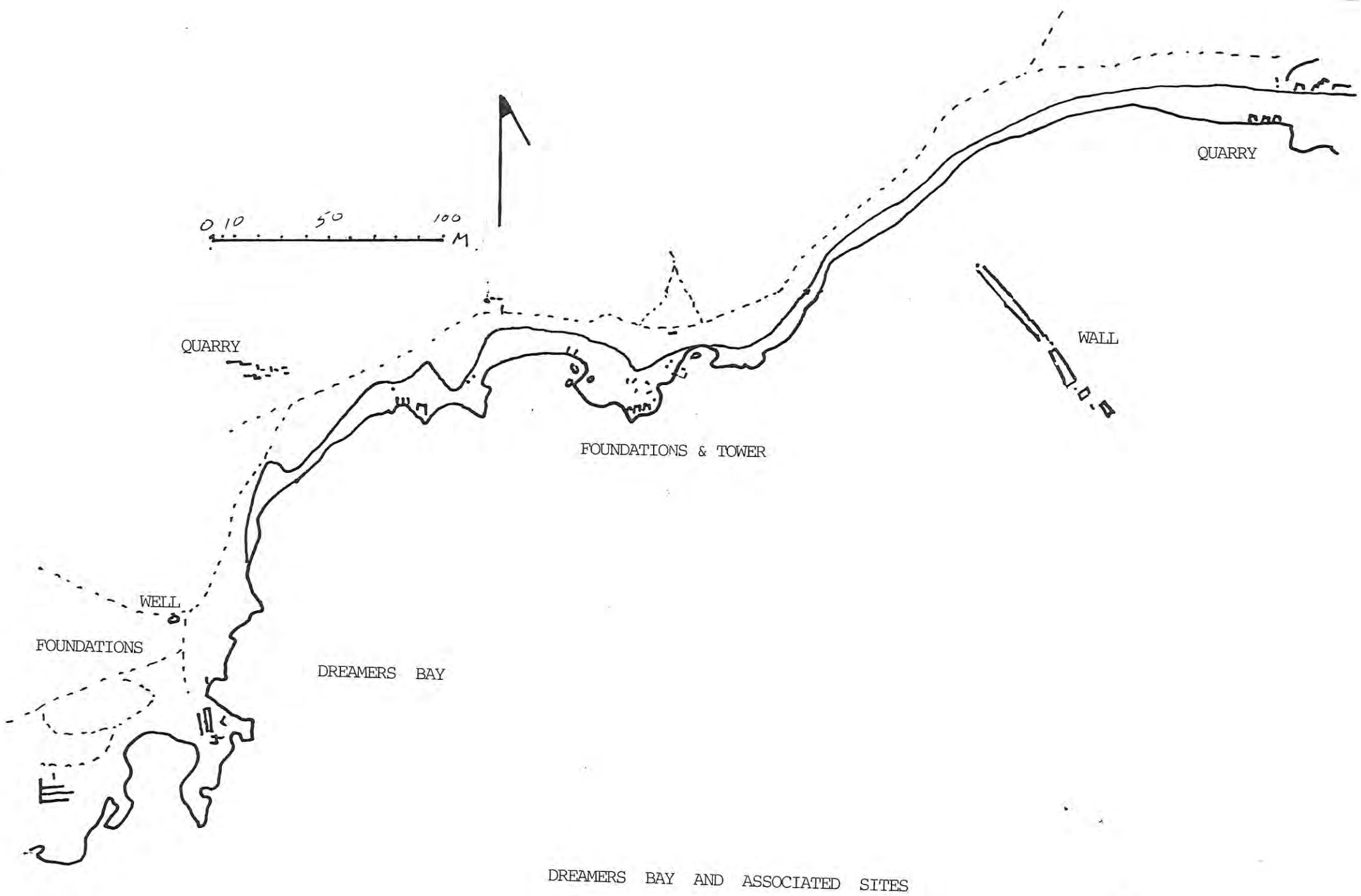

DREAMERS BAY AND ASSOCIATED SITES

SHEET 1

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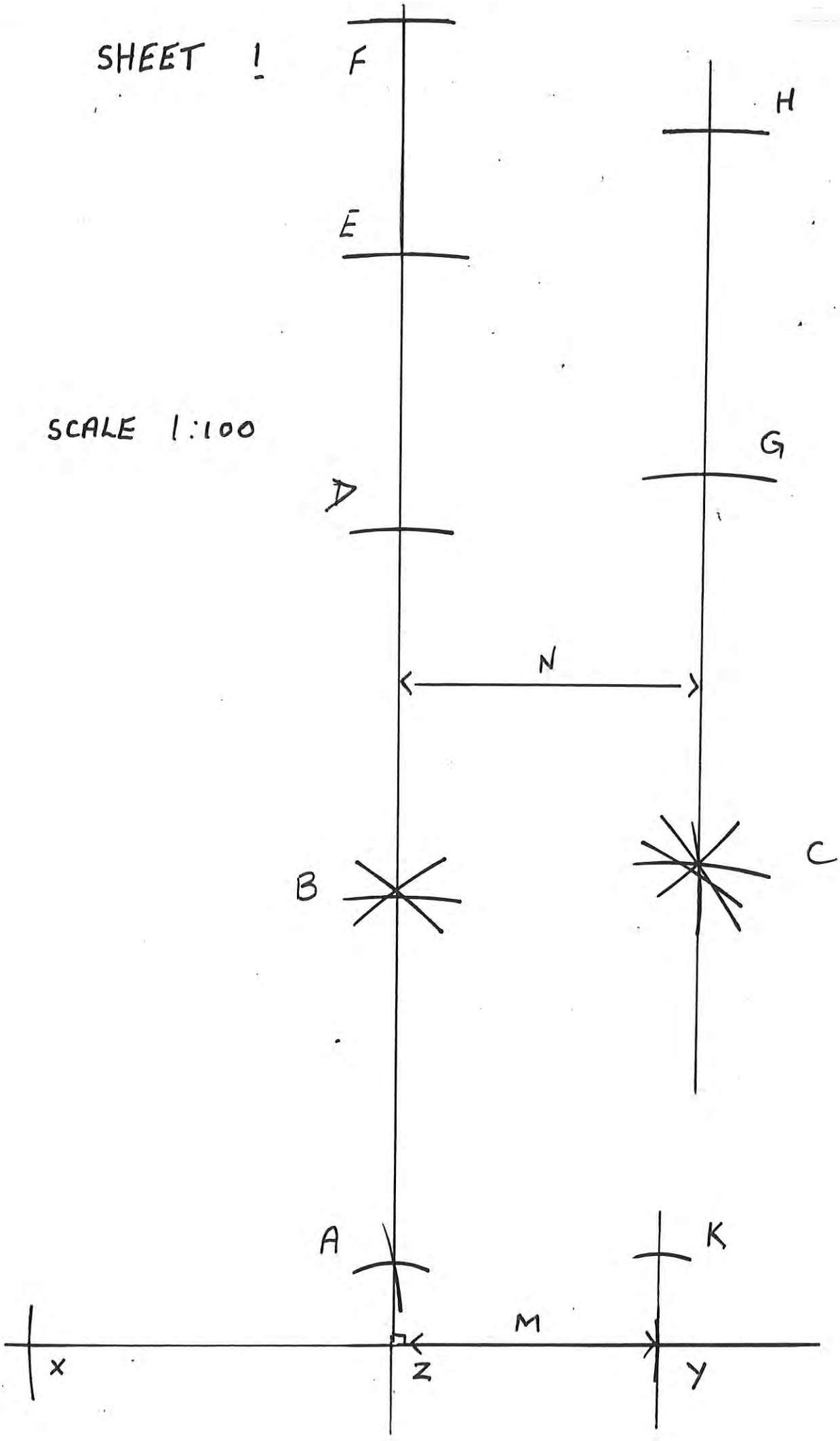

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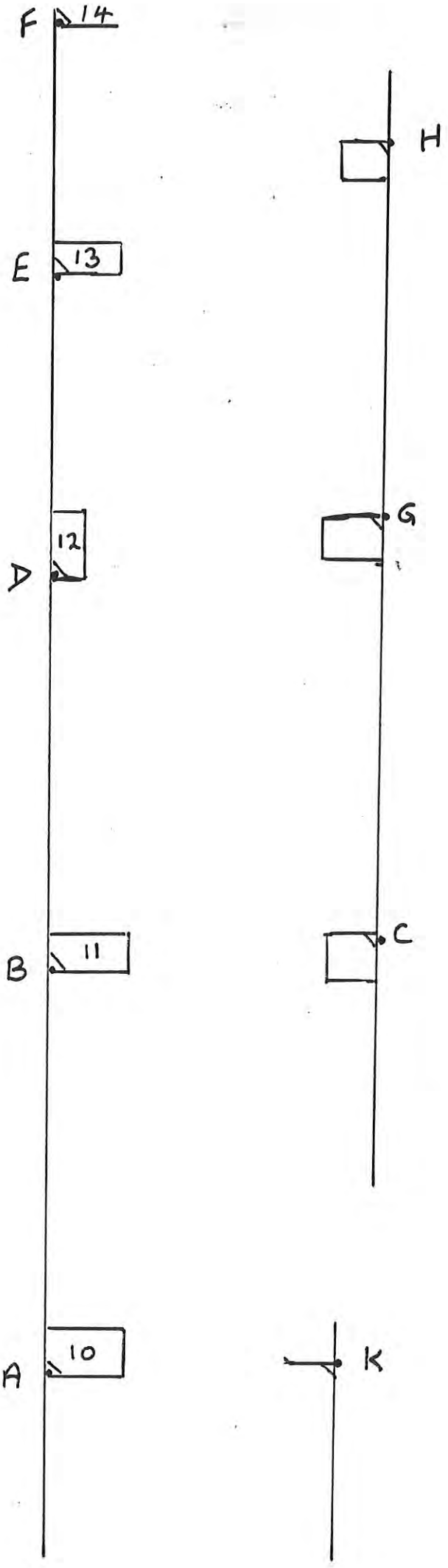

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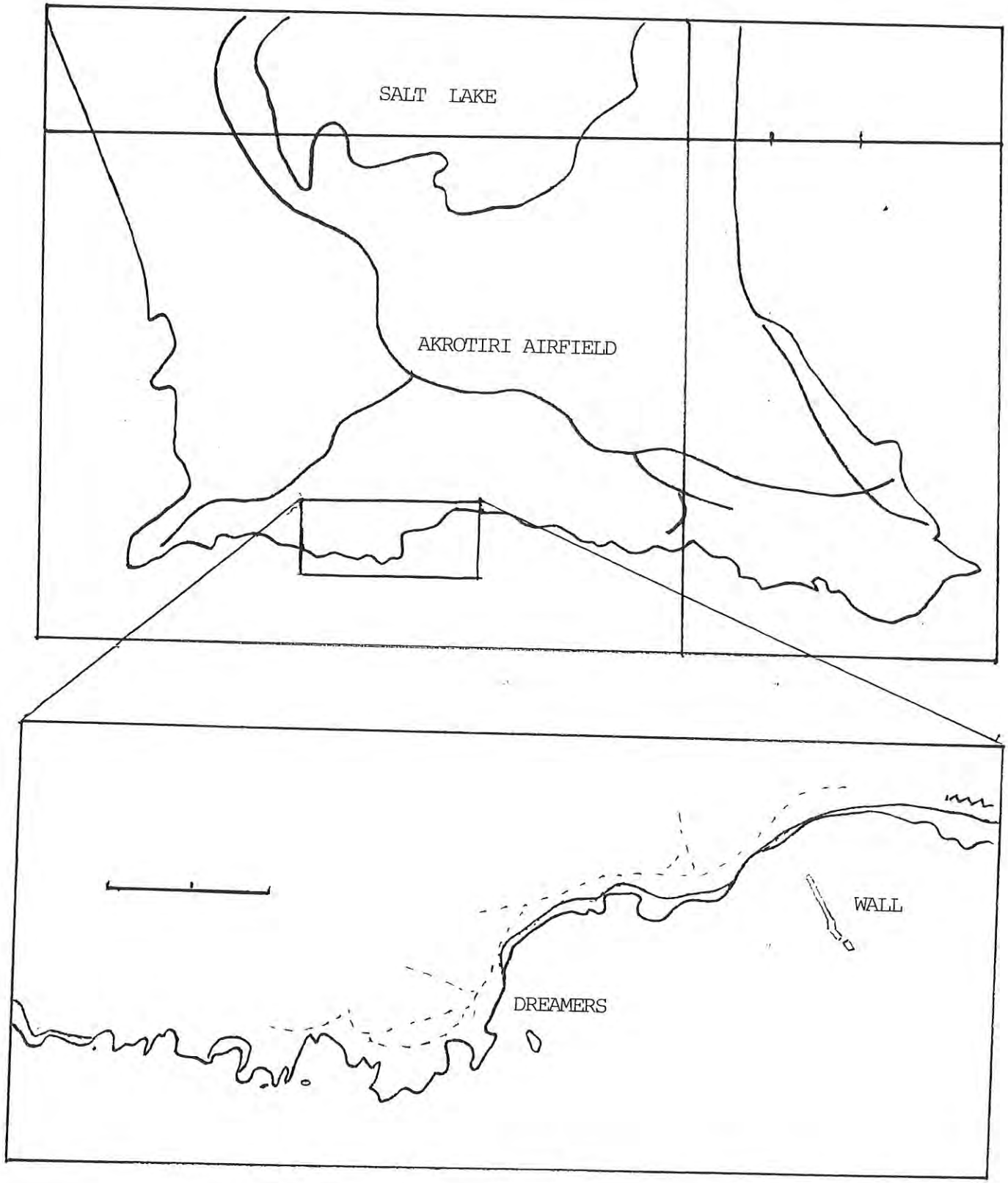
SCALE 1:100

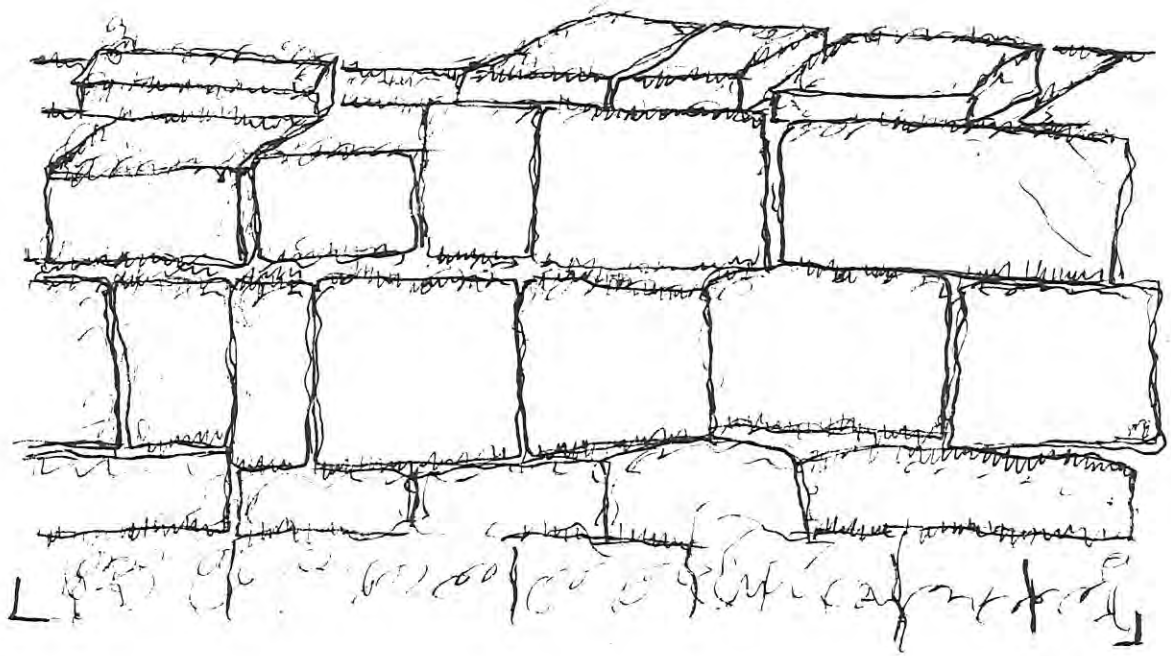
SHEET 4

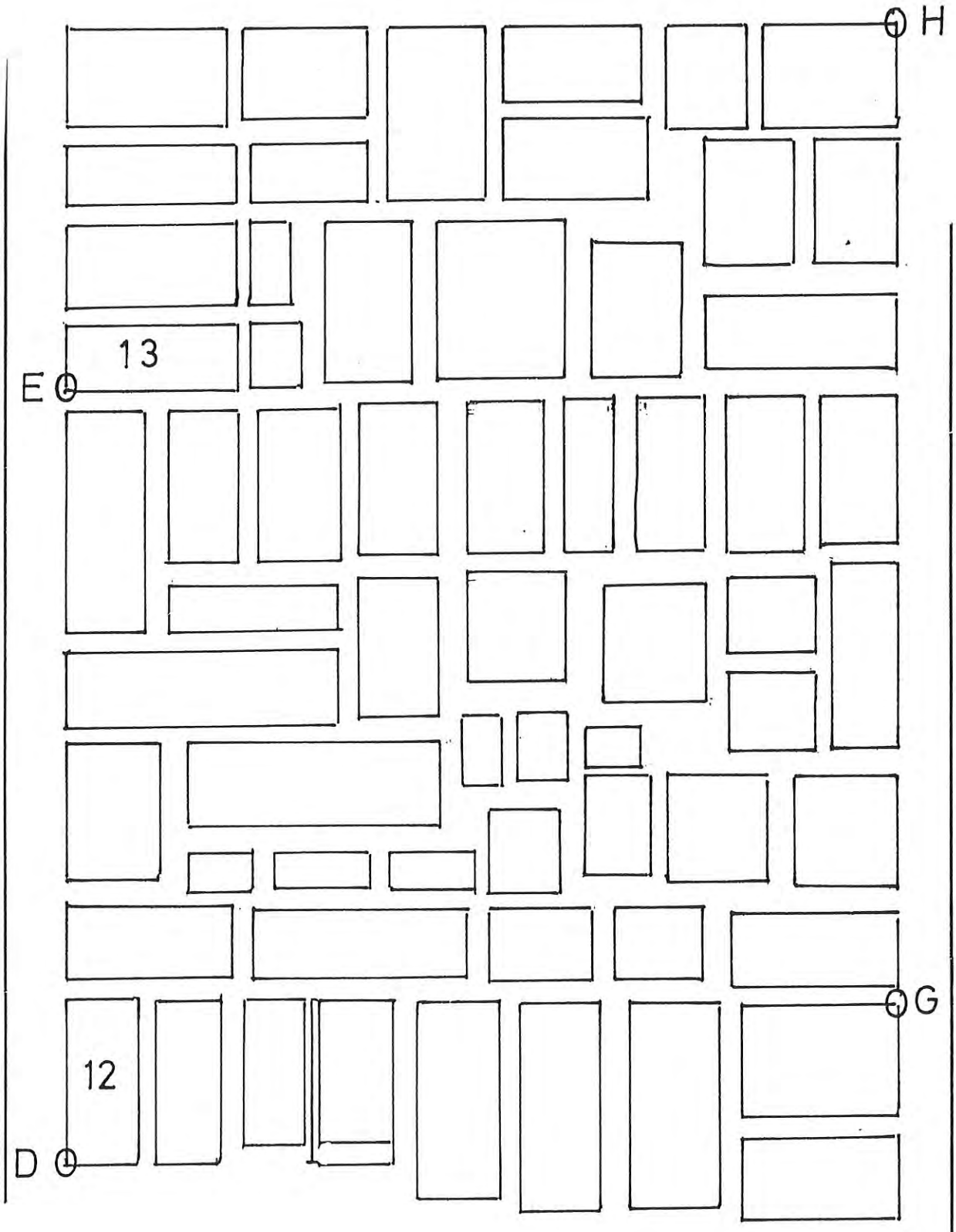
SHEET 3

SCALE 1:40



AKROTIRI WALL - LOCATION MAP





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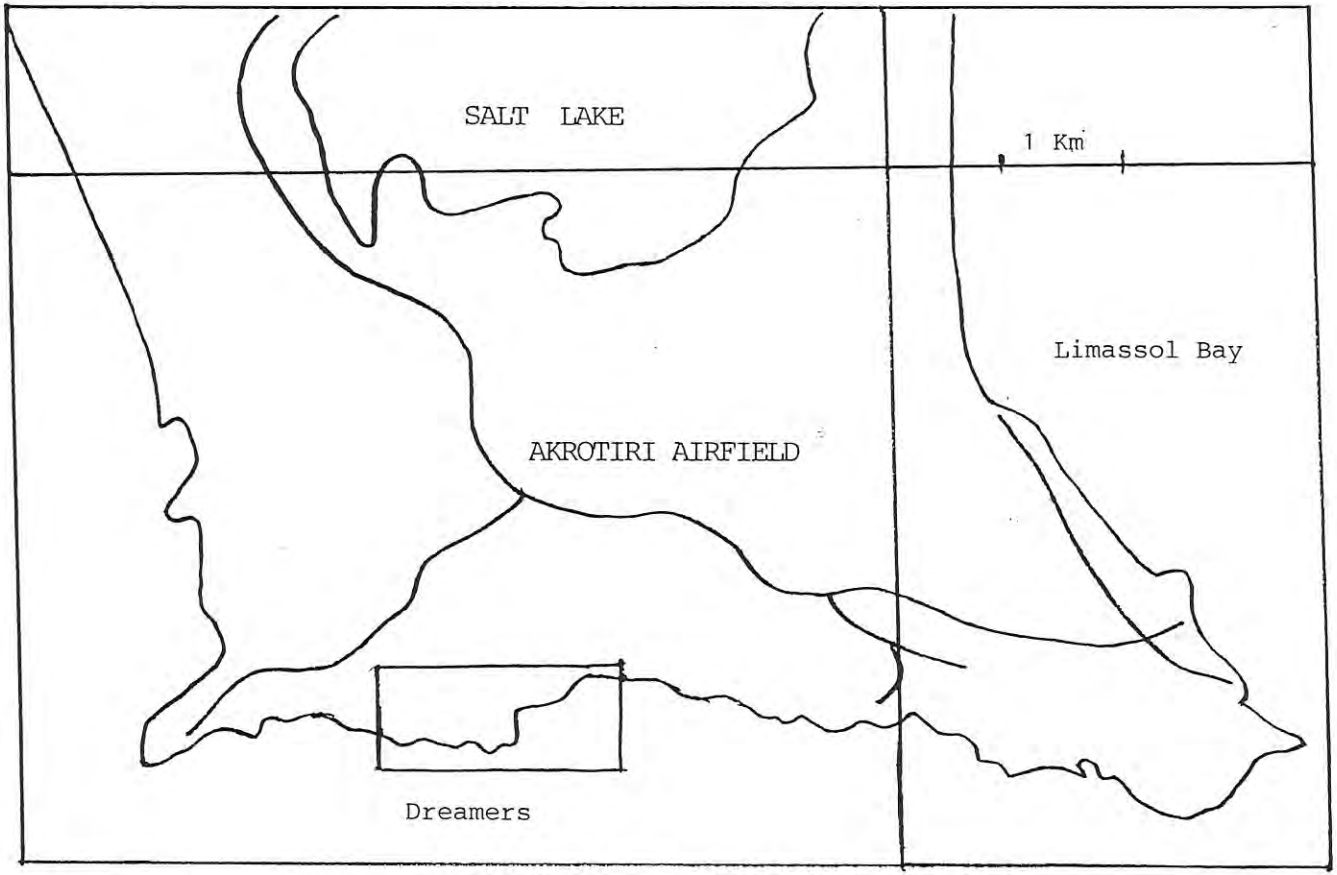
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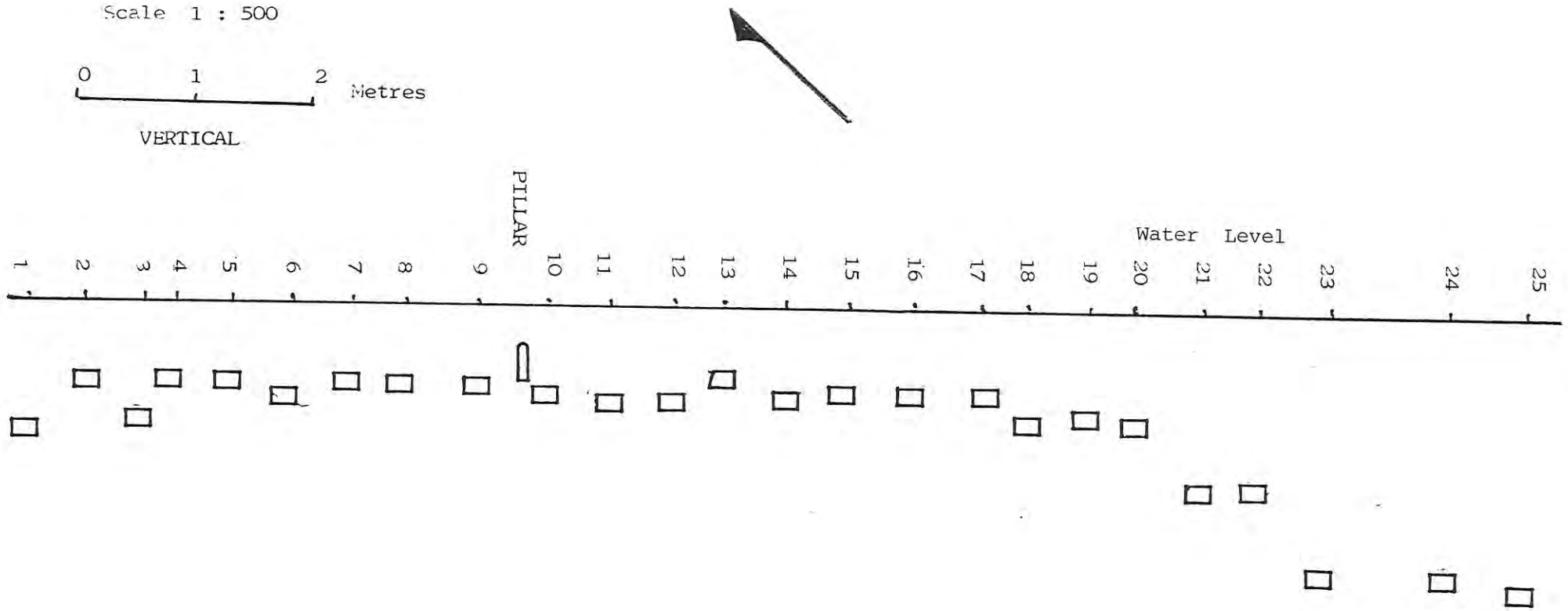
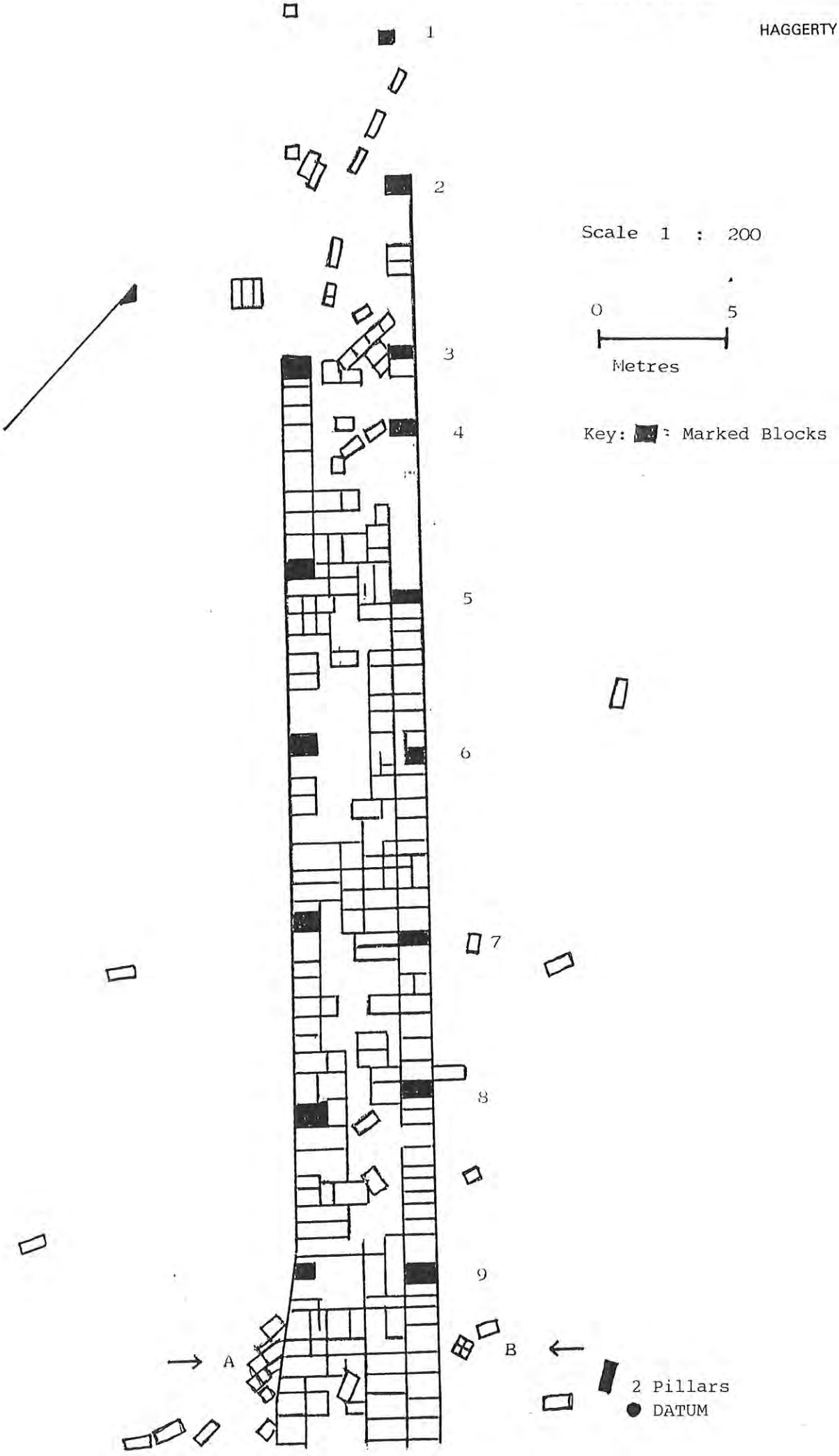
Limassol Bay
AKROTIRI AIRFIELD
Dreamers



WATER DEPTH OVER DATUM POINTS

HAGGERTY

HAGGERTY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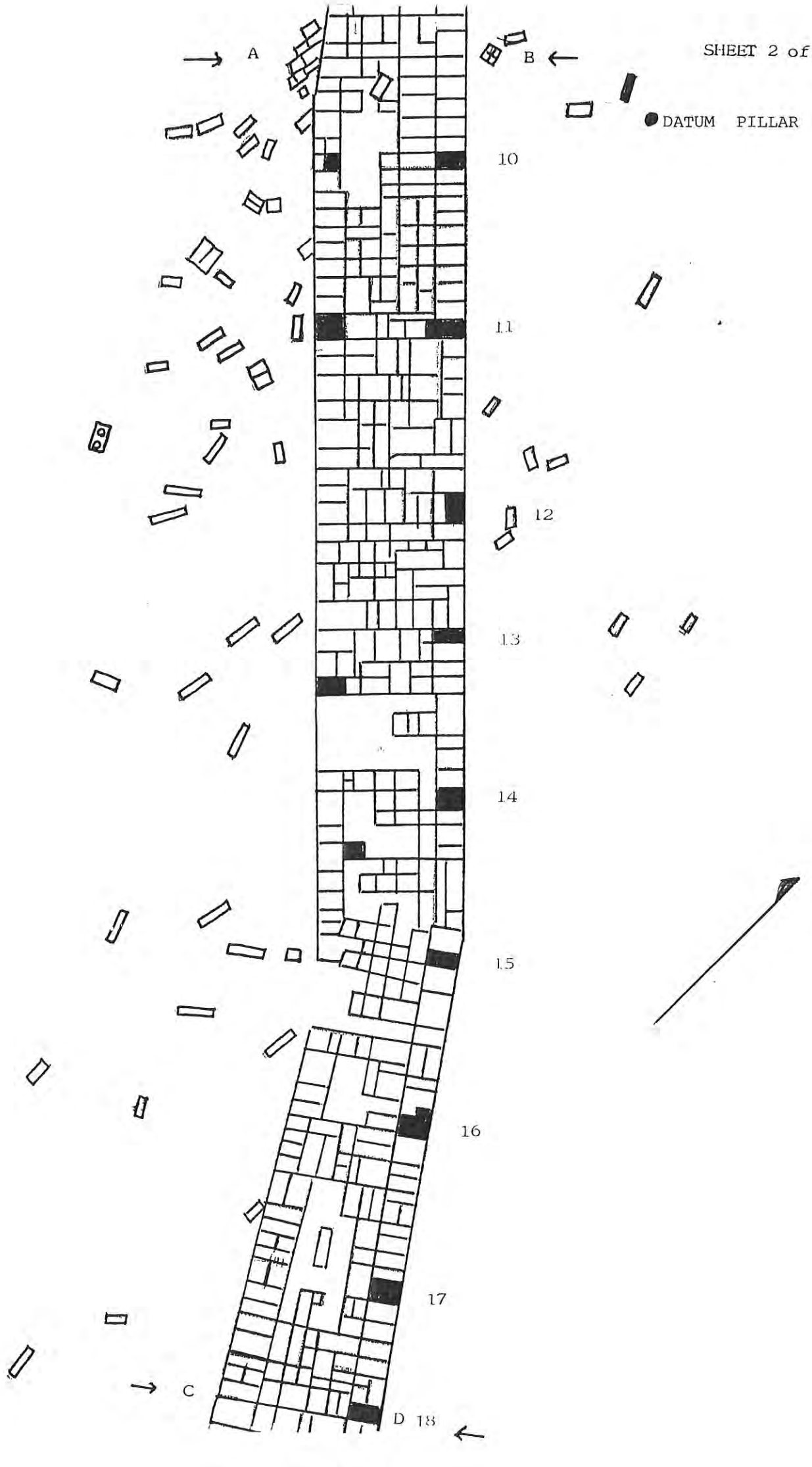
Key: : Marked Blocks
2 Pillars
DATUM


A
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DATUM PILLAR
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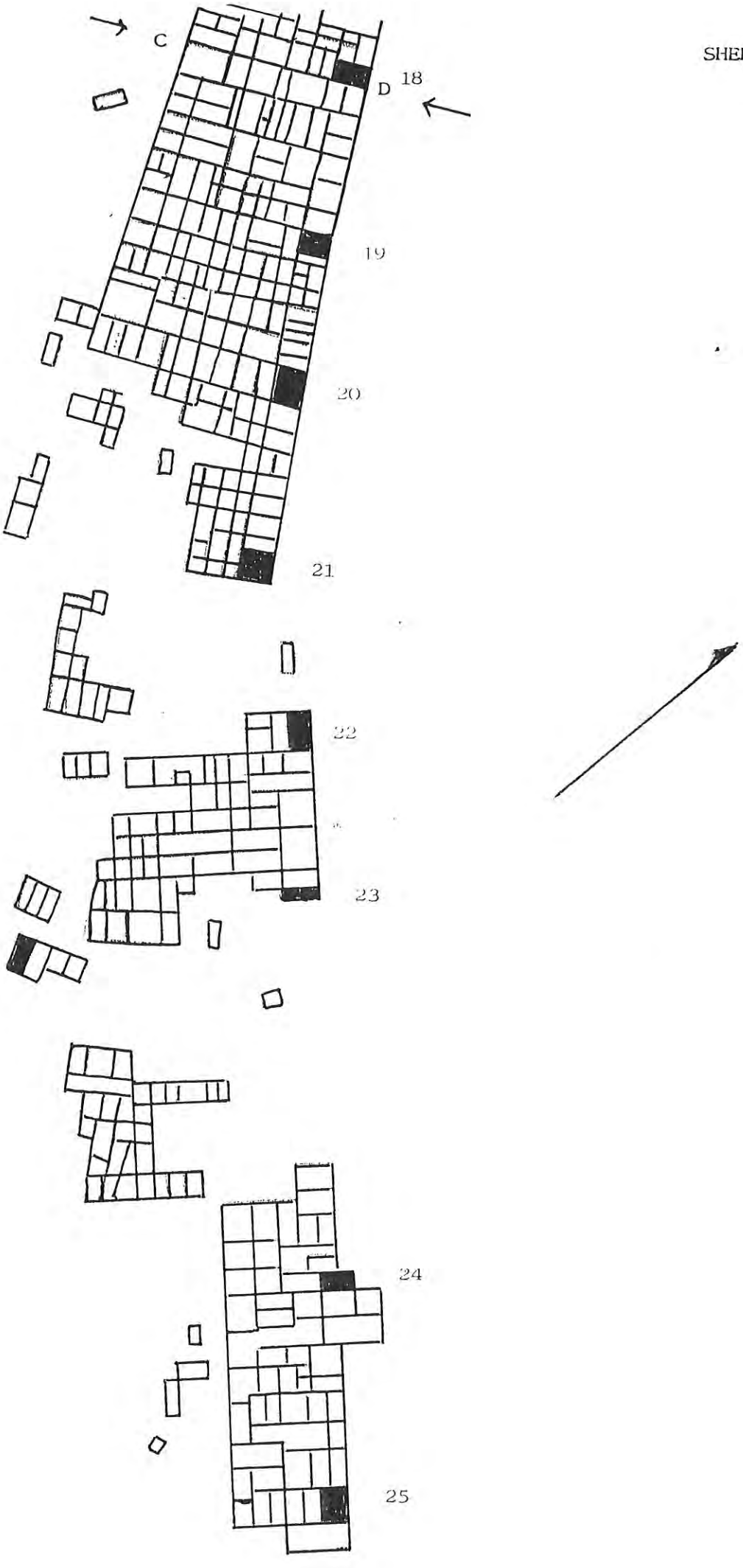
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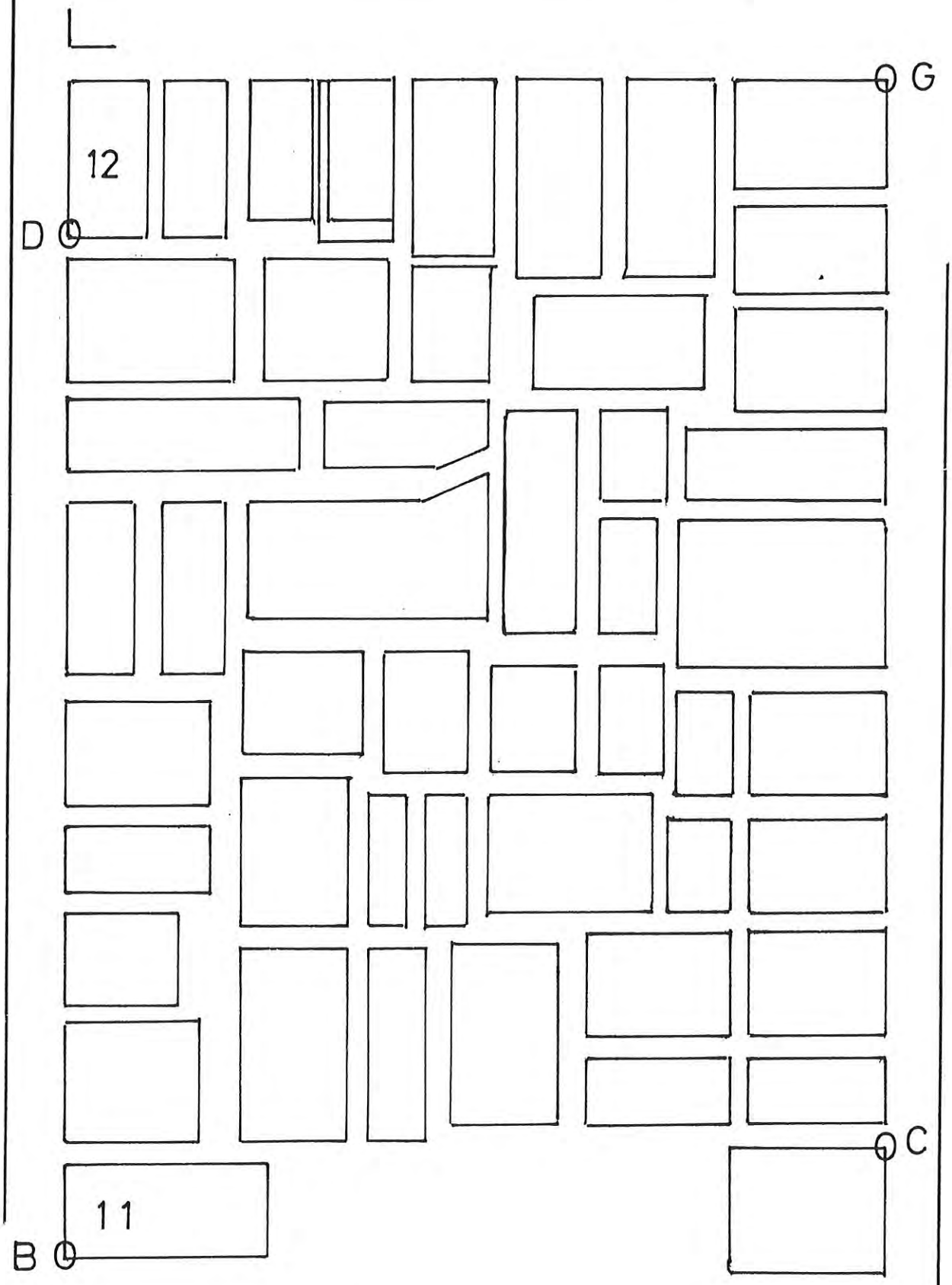

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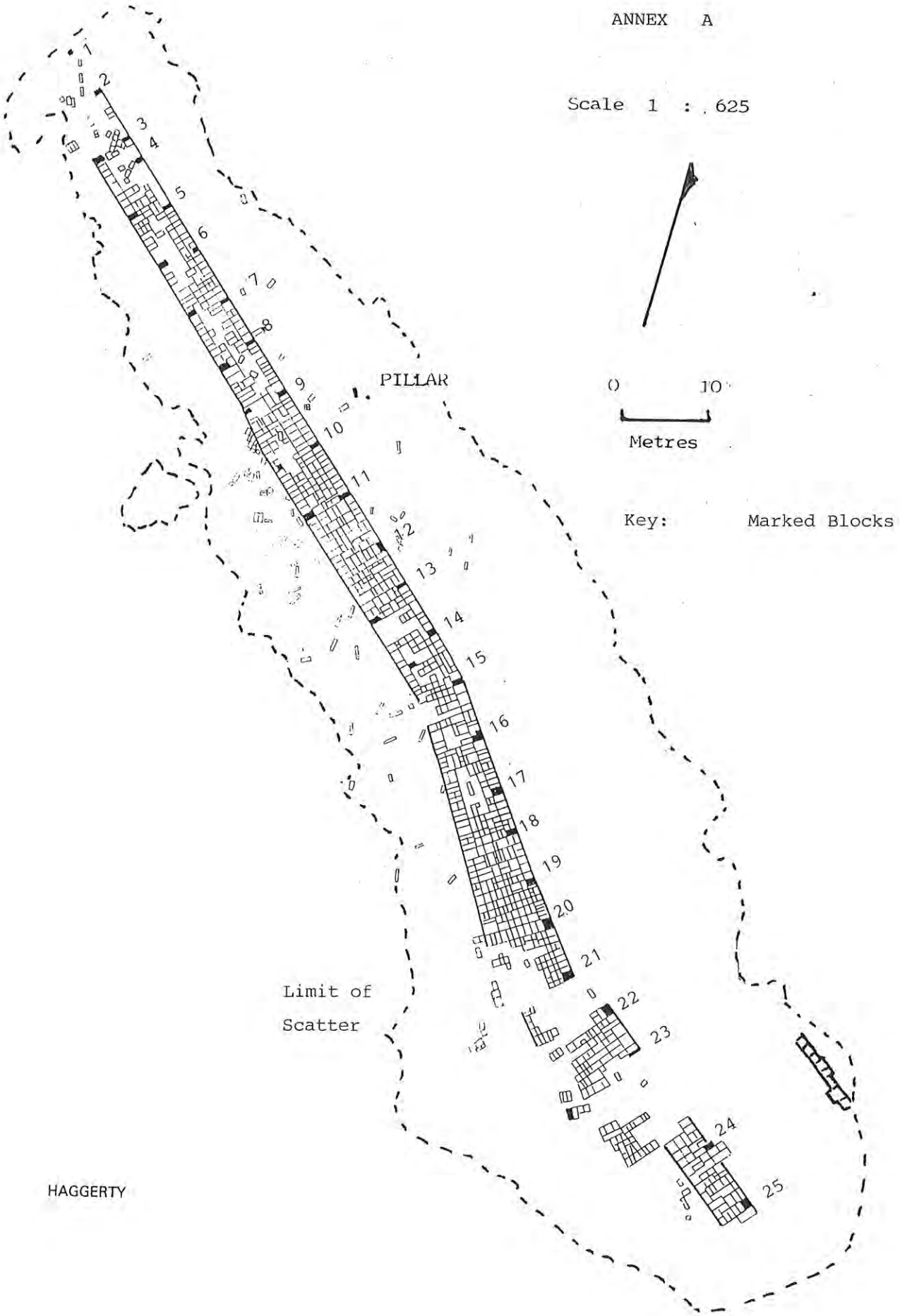
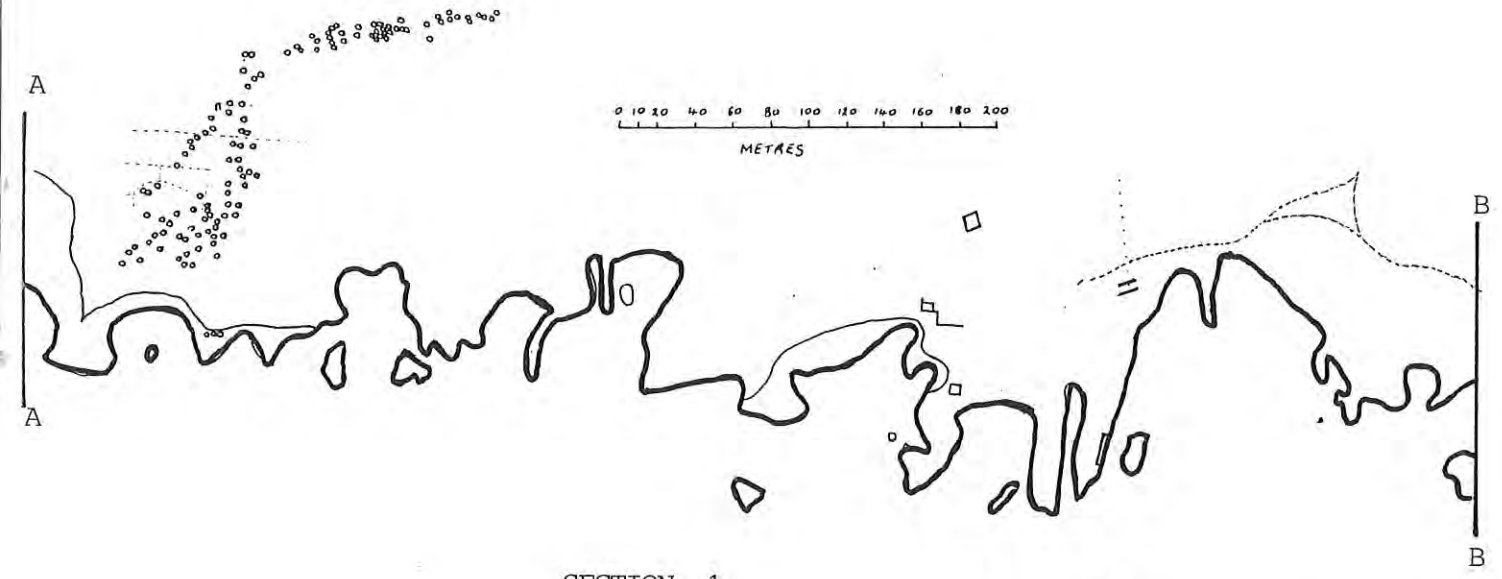
PLAN OF PART OF WALL 1 OF 2

HAGGERTY

ANNEX A



ALIGNMENT OF THE WALL AND LIMIT OF BLOCK SCATTER



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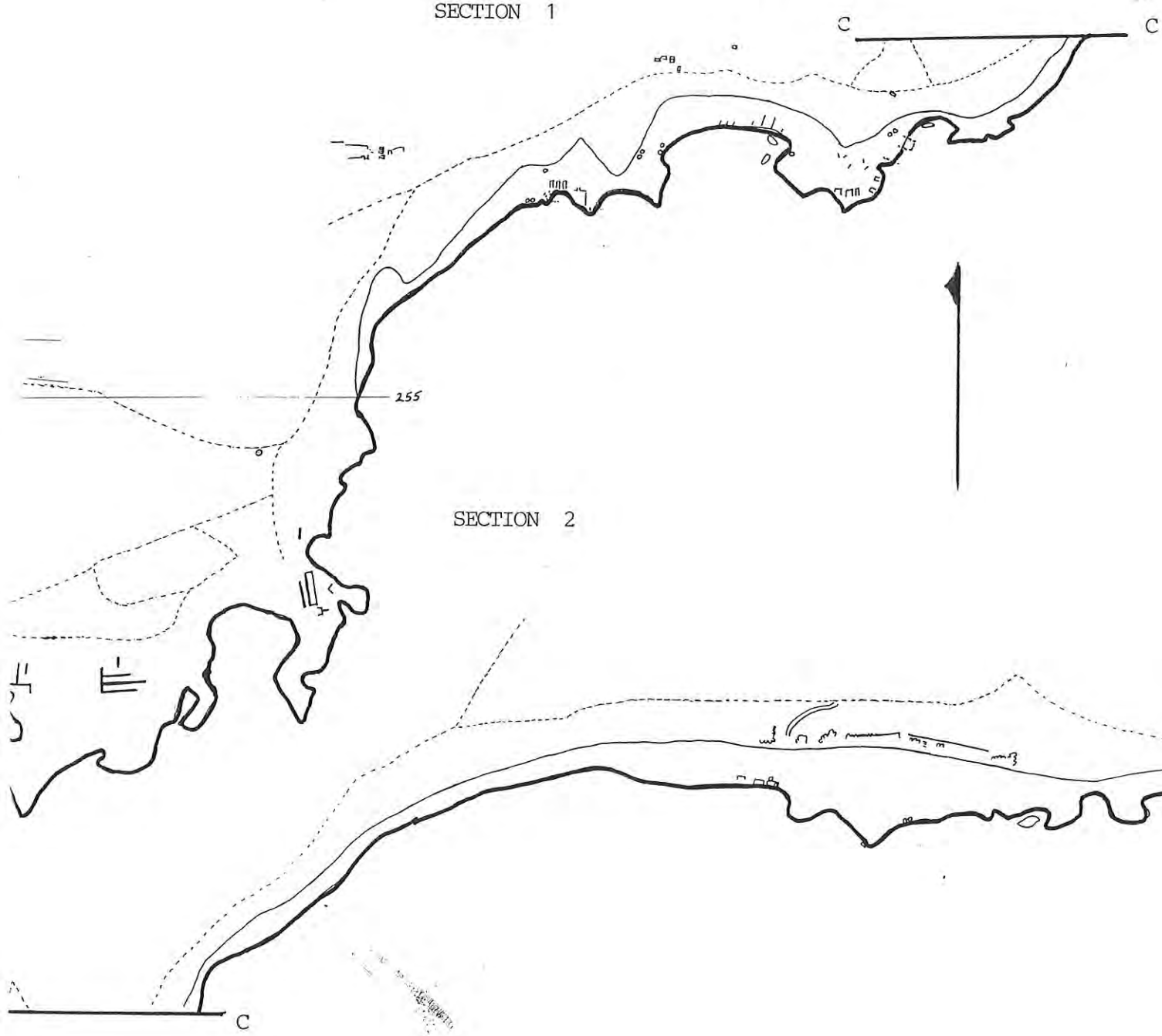
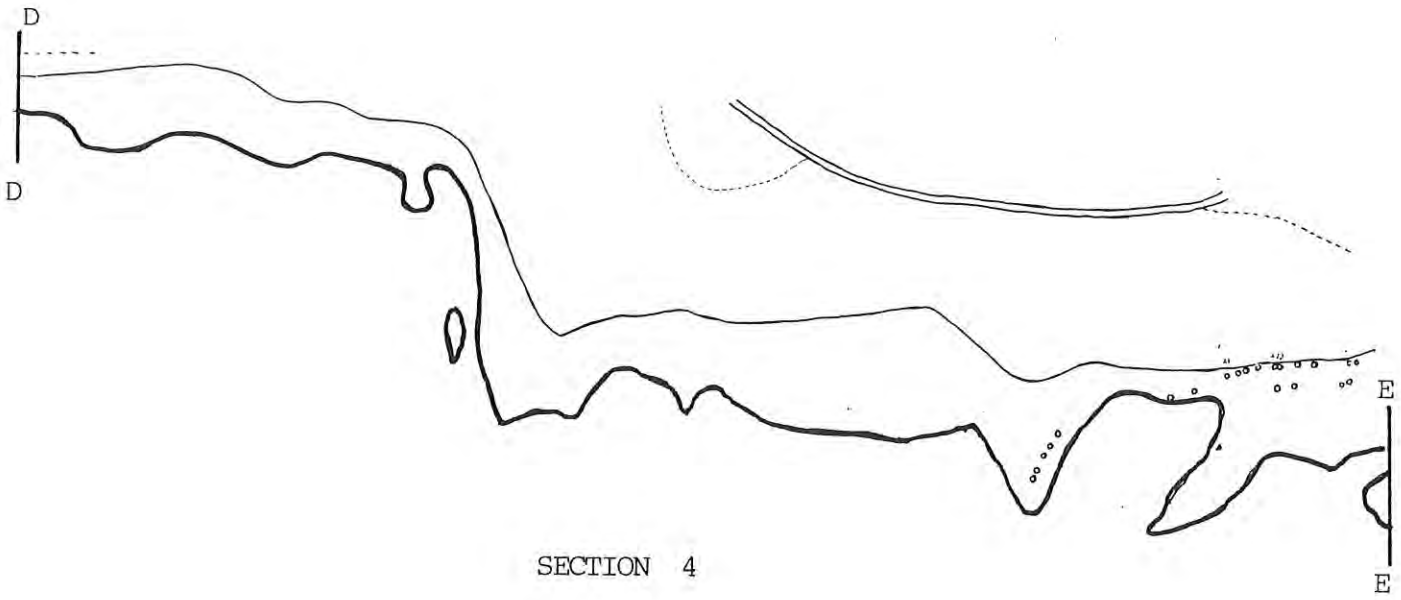


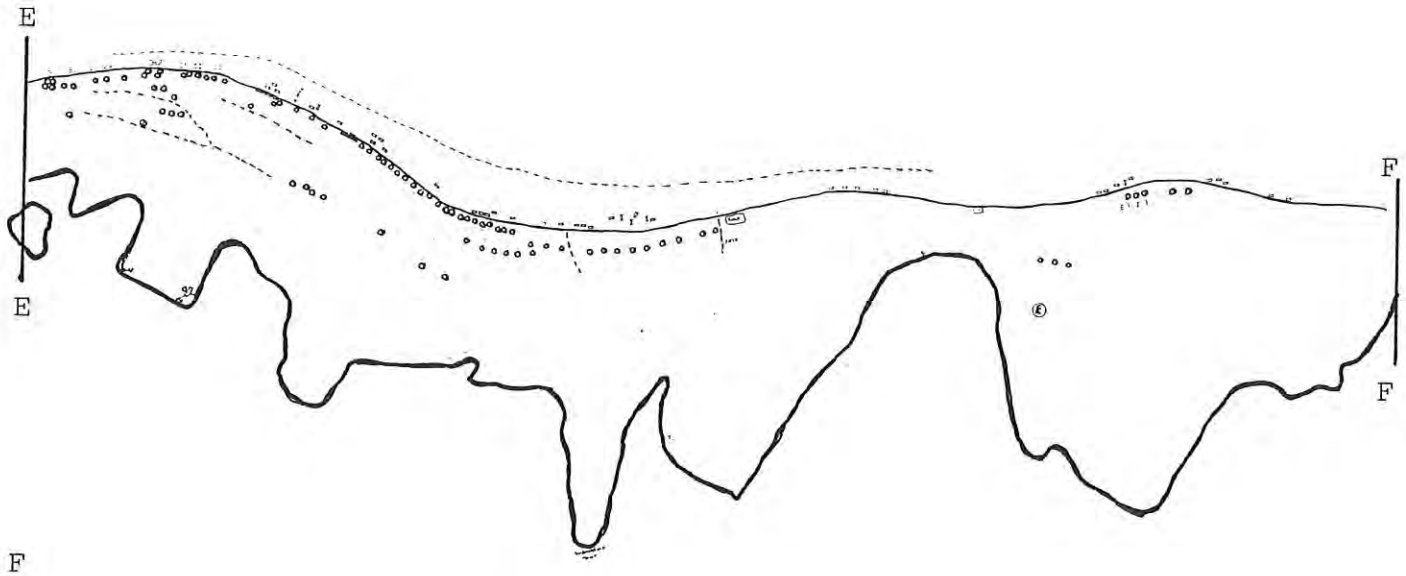
SECTION 2

WALL

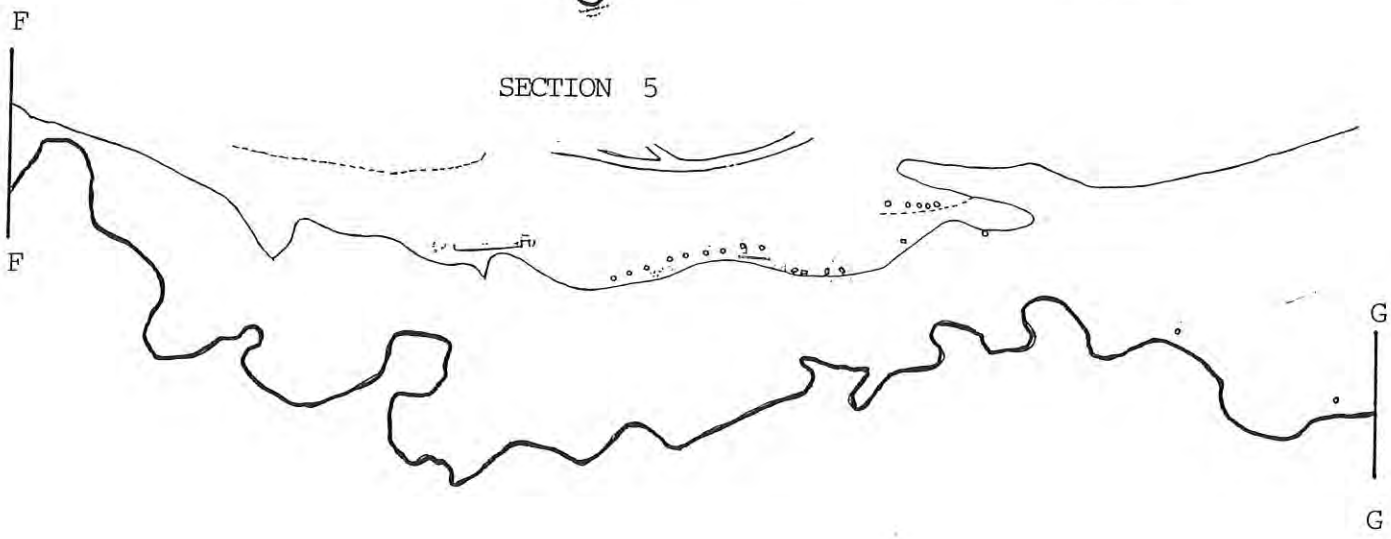
SECTION 3



SECTION 4



SECTION 5



SECTION 6

THE TOMBS OF THE SOUTHERN CLIFFS - 6 Sections (A - G)

APPENDIX A