

TEST EXCAVATIONS AT AZ U:10:24 (ASU)

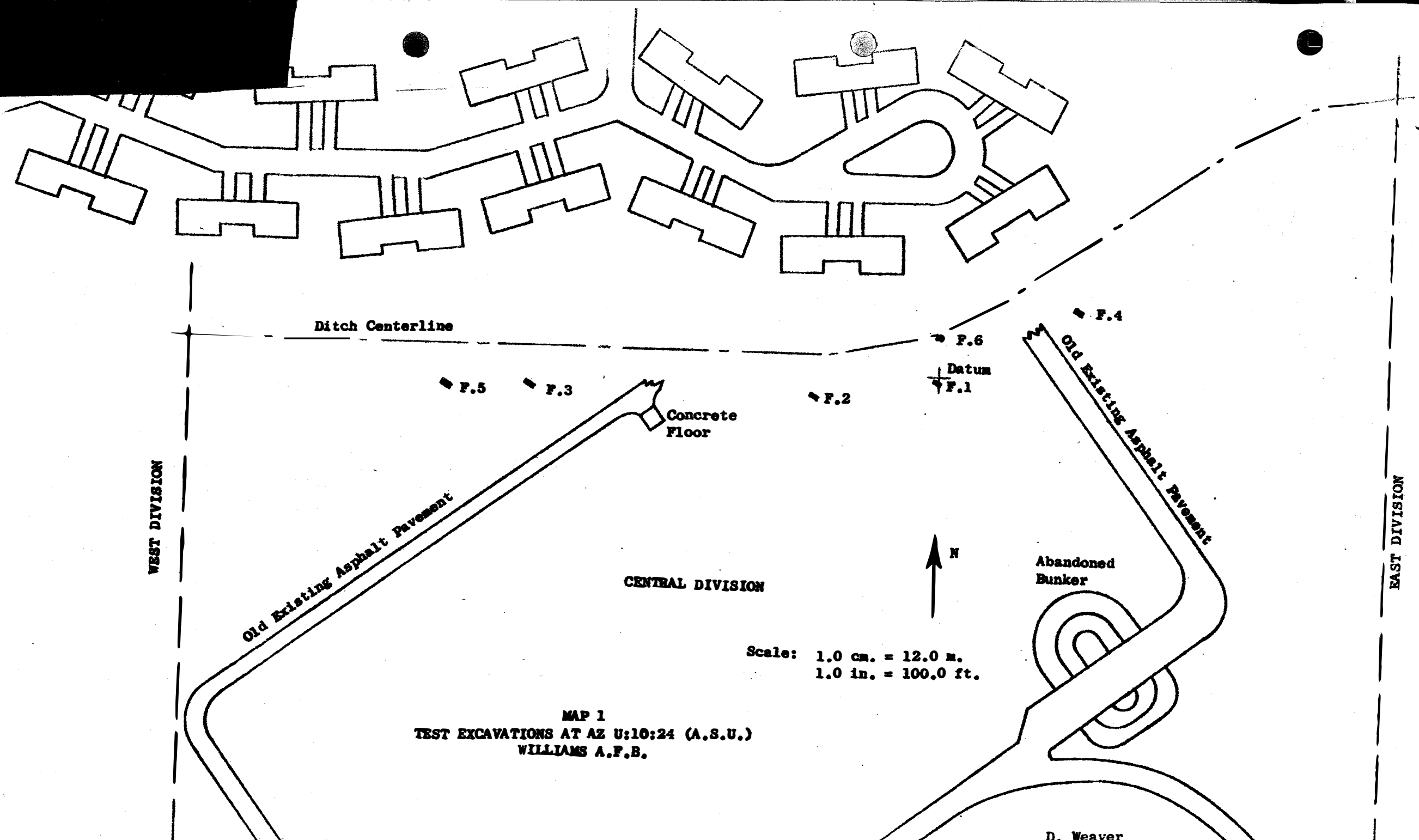
WILLIAMS A. F. B., ARIZONA

A Report to the

Arizona Archaeological Center

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Ditch Centerline

F.5

F.3

Concrete Floor

F.2

F.6

Datum

F.1

F.4

Old Existing Asphalt Pavement

WEST DIVISION

Old Existing Asphalt Pavement

CENTRAL DIVISION

N

Abandoned Bunker

EAST DIVISION

Scale: 1.0 cm. = 12.0 m.
1.0 in. = 100.0 ft.

MAP 1
TEST EXCAVATIONS AT AZ U:10:24 (A.S.U.)
WILLIAMS A.F.B.

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TEST EXCAVATIONS AT AZ U:10:24 (ASU)

WILLIAMS A.F.B., ARIZONA

Test excavations were undertaken at AZ U:10:24 (ASU), located on the lands of Williams Air Force Base in Maricopa County, Arizona, to provide very specific forms of information. It has been suggested that a drainage ditch which exists at the site might undergo further construction. If this should be authorized by the Advisory Council on Historic Site Preservation, a mitigation action would be called for which would involve controlled excavations. The purpose of our work was: (1) to obtain data which would serve as a basis for judgement of the advisability of such a mitigation action; (2) to obtain an appreciation of a meaningful research strategy should a mitigation action be approved; and (3) to obtain some basis for a cost estimate for implementation of such a strategy.

A drainage ditch approximately one kilometer in extent transects the known portion of AZ U:10:24 (ASU) from northeast to southwest (Figure 1). The watershed of the ditch involves a fairly extensive area subject to sheet flooding. In association with construction of housing facilities on the base, a portion of this ditch was filled and construction of a new segment, linked to the existing ditch on the east and west, was begun. During the course of grading operations on the new segment, archaeological materials were discovered. Ditch construction was halted at this juncture. The resultant ditch is not sufficiently deep to allow through drainage. To serve its proper

functions of drainage and protection of homesites from sheet flooding, the new ditch should be deepened and perhaps portions of it should be moved south of their present positions. Both actions would impact archaeological resources.

Within the existing ditch boundaries, where deepening is required to allow through drainage, archaeological remains have been exposed approximately 80 cm below the modern surface by grader action. (Surface is measured throughout this report from the base of a datum stake placed by WAFB engineers.) These consist of in situ vessel fragments, areas of charred and burned earth, trash deposits and debitage. Architectural features have not been exposed, but it is not unlikely that they occur within the confines of the existing ditch and would be encountered if controlled excavations were undertaken. Along the ditch banks, the occurrence of concentrations of artifactual debris and charcoal attest to areas where in situ materials have been disturbed.

Along its entire extent, the surface of the area immediately south of the ditch is littered with broken pottery, stone tools, lithic debitage, shell ornament and manufacturing breakage, burned and unburned bone fragments, etc. There tend to occur concentrations of debris, where one cannot walk without crushing archaeological material underfoot, and areas of some tens of linear meters where no debris is observed or where it is obscured (if it exists) by plant growth. We recognize three divisions of the area immediately south of the ditch, any or all of which might be impacted if portions of the ditch are moved southward. The eastern division involves land that shows

minimal human usage since the abandonment of a farm. Traces of disc furrows and irrigation berms are clear, but except for the occasional dumping of modern trash or the emplacement of narrow ditches and culverts this area has been essentially unaffected by the activities of Williams Air Force Base. Surface concentrations of archaeological materials are neither of wide extent nor of dense concentration, and they tend to be recovered at an average interval greater than 10-15 meters.

The western division shows substantially more human usage. The floors of abandoned buildings, asphalted and gravelled roadways, and dumping areas for construction debris are common. This is the lowest area topographically, and is the area of heaviest vegetation. Archaeological materials tend not to be found with as great frequency as in the eastern division, but this seems a function of the masking effect of the vegetation and the type of disturbance of the surface. It is our opinion that concentrations of archaeological remains are not actually to be found with less frequency in the western than the eastern division, and in fact may well occur in greater density in the western than the eastern division.

The central division is characterized by both frequent and dense concentrations of archaeological materials and by extensive human disturbance of the surface. The surface of the land over much if not all of this division has been graded to obtain earth for the construction of ammunition storage bunkers. This operation, as well as the construction of roads and a few buildings, destroyed a number of Hohokam trash mound accumulations. Much of the mound material was

incorporated into the bunkers; otherwise, construction work spread the materials of the mounds over wide areas and, by reducing the integrity of the mounds, allowed archaeological materials to be dispersed by sheet wash and eolian erosion. Pottery and lithic debris, for example, is superimposed on asphalted surfaces as a result of sheet washing.

Our testing strategy involved the excavation of five 1 x 2 meter test pits immediately south of the present ditch bank (shown in Figure 1) and an investigation of one of the in situ features exposed within the ditch by recent grading. All testing was undertaken in the central division, where ditch deepening and southward movement is most likely to be proposed. Two of the tests (Features 1 and 4) were placed where the surface concentration of artifactual material was high; one (Feature 2) was placed where surface concentration was moderate; and two (Features 3 and 5) were placed where surface evidence was masked by the occurrence of grassy and weedy growth. Our intention was to achieve a depth of 2.0 meters below the existing surface in at least three of the test pits, working in 10 cm levels and passing all sediment through 1/4-inch screening. Because of rain and the unexpected occurrence of indurated sediments, only one test reached below 1.5 meters.

The two westernmost tests (Features 3 and 5) were located in a topographic low spot. Artifact yield was low in the first 25 cm below datum, with evidence of modern asphalt at the 20-25 cm depth. The 15-30 cm level produced the majority of prehistoric materials in these tests. Essentially these are potsherds, but a large flake knife and a split bone fragment were recovered between 23 and 35 cm at

Feature 3. Charcoal was observed at the 35-45 cm level in both features, unassociated with artifactual material. Below this, no evidence of prehistoric occupation was observed. The stratigraphy of these tests is:

5-15 cm	Below Datum	:	Modern humus
15-25 cm	"	:	Fine silt superimposed upon asphalt or other modern construction material
25-80 cm	"	:	Buff-colored silt, non-indurated, containing charcoal and prehistoric artifacts in its upper portion
80-115 cm	"	:	Reddish-brown clay, non-indurated; blocky
115-145 cm	"	:	Clay, as above, but impregnated with white caliche nodules; partly indurated
145-185 cm	"	:	Clay, as above, but thoroughly calichified; indurated

The central test, Feature 2, was excavated to a depth of 90 cm over two days. Rain in the afternoon and night of the second day completely filled the test with water, halting further study. Artifact recovery was greatest in the first 20 cm below datum, with some sherds and lithic materials recovered to a depth of 40 cm. Charcoal was observed to a depth of 80 cm. Because excavation was halted by flooding, detailed observation of the stratigraphy was not obtained. Excavation notes indicated the existence of silt to a depth of 50 cm below datum, a blocky clay layer between 50 and 80 cm depth, and a silt layer between 80 and 90 cm. From the fact of flooding, we have presumed the existence of an impermeable layer shortly below the 90 cm depth.

The eastern tests, Features 1 and 4, reached depths of 130 and

40 cm, respectively. Artifacts were concentrated in the upper 10 cm of the deposits, but were found throughout the excavations. This was expected, as the surface density of artifactual material was great in the area of these tests, indicating the former existence of a trash mound near the test localities. Below the 90 cm level an undulating surface of obvious cultural character was exposed in Feature 1. A few pieces of pottery lay in situ upon this surface, which is characterized by high and low spots varying from 20 to 60 cm in diameter. In the center of the test a 50 x 110 cm rectangular depression was encountered, which may have been purposefully excavated into this surface in prehistoric time. Because of the lateness of the day, the depression could not be excavated to determine if it was a pit feature. The depression was filled with the same clay sediment which had been encountered at Feature 2 between 50 and 80 cm depth, though at Feature 1 it was observed below 120 cm depth.

The stratigraphy of these eastern tests is as follows:

0-65 cm	Below Datum:	Buff-colored silt, non-indurated
65-80 cm	"	: Reddish-brown, silty clay, non-indurated
80-130 cm	"	: Undulating surface of a light gray-buff silt, non-indurated; potsherds lie horizontal on this surface
110-130 cm	"	: Reddish-brown clay, non-indurated; blocky; forming fill of possible pit feature

Feature 6 is the label given to an in situ vessel fragment which had been uncovered within the ditch boundaries by grading operations. The base of the vessel had apparently been wholly or partly broken off in prehistoric times. Charred vegetal materials had been placed into

the pot and the whole discarded in an area of trash accumulation incorporating burned earth, charred sticks and matting, and sherds from other vessels. The rim area of the vessel had not survived the grading operation. The sherds remaining in situ were exposed for photography and a sample of the vessel contents salvaged for flotation analysis. At the base of the vessel a large utilized flake and a complete ceramic pipe of the cloud blower style were found. These had apparently been discarded with the vessel. The pot was badly burned, but appears to be a variety of the Sacaton Red-on-Buff type.

INTERPRETATIONS

It seems abundantly clear that in the central division of the site area, the density and distribution of archaeological materials on the surface is a poor index of probable density and distribution of archaeological materials below the surface. This seems due to two causes: (1) where archaeological material is densely concentrated on the surface, this may be due to the wide distribution of archaeological materials which results from erosion of trash mound accumulations; (2) where archaeological material is not evident on the surface, particularly where it is masked by vegetation, recent deposition may have covered archaeological records. This is the case at Features 3 and 5, where 20 cm of deposition have occurred since modern management of the site area has begun.

the central division of the site area is not unique in these regards, and that the density and distribution of archaeological materials on

the surface elsewhere on the site is a similarly poor index of probable sub-surface density and distributions.

Second, it seems likely that the sediment unit which pre-dates modern management of the site area, the buff non-indurated silt, post-dates the Hohokam occupational horizon. This sediment contains artifacts and charcoal, but these would appear to represent inclusions derived from the erosion of pre-existing trash mounds and middens. In the western tests, artifacts and even charcoal are limited to the upper portion of this sedimentary layer. In the central test, artifacts occur in all but the lower 10 cm of the deposit, and charcoal is found in that lower 10 cm. In the eastern tests, both artifacts and charcoal are found throughout the deposit. This pattern indicates the source of the artifacts and charcoal to have been near the eastern tests, with the material becoming more and more widely dispersed over time.

Third, it appears that the reddish-brown clay deposit caps and seals the surface upon which Hohokam occupation occurred. In its lower portions, where it directly overlies the cultural surface, this may be more blocky in texture. This was quite clearly observed at Feature 1. However, the texture and/or lithology of the deposit which served as an occupational surface is variable. The culturally managed deposit which is capped by the blocky clay at Feature 1 is a gray-buff silt. At Features 3 and 5 the blocky clay caps a partly indurated, partially calichified clay; at Feature 2 it caps a silt with no artifacts or indications of cultural management. Nor is the base of the blocky clay to be found at the same depth in all cases.

	Survey*			Feature 1		Feature 4		Total		
	1	2	3	Surface	0-10 cm 10-20 cm	Surface	0-10 cm			
Pottery Types										
Decorated Sherds	Gila Butte R/B		1					1		
	Santa Cruz R/B	15	3	1	5	1	2	27		
	Sacaton R/B	129	38	1	15	42	26	12	263	
	Casa Grande R/B	2							2	
	Gila Polychrome		4						4	
	Unidentified R/B		10						10	
	Other	1	1						2	
Sub-Total	147	56	3	20	43	28	0	12	309	
Undecorated Sherds	Sacaton Red	6	11		3	5	2	4	31	
	Salt Red	18	1	1					20	
	Wingfield Plain		3						3	
	Plain Buffware	66	32	9	28	46		18	11	210
	Plain Brownware	46	61	22	88	134	55	56	31	493
Sub-Total	136	108	32	119	185	57	74	46	757	
Total	283	164	35	139	228	85	74	58	1066	

- *1. Looter's spoil - unknown provenience
- 2. A. S. U. survey - Schoenwetter, Clark, Laughlin; south of drainage ditch
- 3. Williams A. F. B. cantonment area, locus of mound

Figure 2.--Preliminary ceramic analysis, AZ U:10:24 (ASU) and vicinity, Williams A. F. B., Arizona.

At Feature 1, the base of the blocky clay occurs at 80 cm below datum. At Feature 2, 36 meters west, it also occurs at 80 cm depth; at Feature 3, 118 meters west of Feature 1, it occurs at 115 cm depth. The surface of the in situ trash deposit recognized at Feature 6 must have been encountered between 70 and 80 cm below datum.

It would thus appear that the cultural horizon is represented by different forms of deposits which may or may not show evidence of cultural management and which may occur at different depths. Present evidence indicates that the cultural horizon may be represented at a minimal depth of 70 cm below datum (Feature 6) or a maximum depth of 115 cm below datum (Feature 3). Further, it would appear that the quantity of artifactual materials which occur on the prehistoric occupational horizon is quite low. The occupational horizon was probed in four out of the six tests, but artifactual materials were recovered from it in only two. Artifactual material is likely to be encountered in reasonable quantity on this surface only in the immediate area of architectural features and such non-architectural features as trash mounds.

Fourth, laboratory analysis of the material obtained from the test excavations indicates a Sedentary Period date (900 to 1100 A. D.) for the main occupation of the central division of the site. The predominant ceramic type recovered from samples where artifact density was high (Features 1 and 4) is a plain brownware, Gila Plain, with low quantities of Sacaton Red. The red-on-buff decorated pottery is dominated by Sacaton R/B with some smaller amounts of Santa Cruz R/B. Red-on-buff types indicative of the early Colonial Period and

Classic Period were not recovered. Other decorated sherds associated with the Classic Period, such as Gila Polychrome, were not found.

A collection of pottery from the eastern division, obtained as looter's spoil from an Air Force officer arrested for violating the site, points to similar conclusions with the possibility of occupation extending into the Classic Period (past 1100 A. D.) This collection contains a relatively high quantity of late redware, a variation of Salt Red, with the dominant decorated type being Sacaton R/B. Santa Cruz R/B and Casa Grande R/B occur in small quantities.

A comparison of the two collections indicates that the site is probably multi-component in nature, with its various components spatially segregate or partially so. The analysis of a collection obtained from the surface of all three divisions supports this conclusion, with ceramics from the late Colonial Period through the late Classic Period being represented. The actual results of the ceramic analysis are shown in Figure 2.

Fifth, the lithology of the deposits offers a basis for the establishment of hypotheses of paleoenvironmental conditions which may be tested by independent formats of paleoecological research. It would appear that the occupational horizon is at least in part underlain by a deposit which is impermeable to water. It is thought by us that this deposit was nearly reached in the excavations of Feature 2, and it was for this reason that the test filled with water and would not drain. Probably, this deposit is the calichified clay which occurs at the base of Feature 3. All deposits attributable to the occupational horizon which we have observed are silts in lithology,

and of a buff color. The deposits superimposed upon the cultural horizon are clays, of a reddish color. This would indicate that erosive forces were more active during the occupational period, allowing flushing from the site area of the finer clay particles.

The reddish color of the clay is indicative of greater oxidation of that deposit. Since the topography of the site area insures that the principle erosive force is sheet flooding, this would indicate the greater prevalence of rainstorm activity in the occupational than in the post-occupational period.

RECOMMENDATIONS

The housing drainage ditch seems needed to maintain the safety of the housing and the health of residents. The proportion of AZ U:10:24 (ASU) potentially impacted by ditch deepening, widening, or moving operations will be relatively small, so the quantity of archaeological resources removed from their in situ protected state would not be particularly great. Neither the natural nor cultural stratigraphy of the area is unduly complex, so available techniques of archaeological research should be adequate to the task of data accumulation. Controlled excavation has played a relatively limited role in our understanding of Hohokam prehistory, and would appreciably add to the scientific evaluation of available data. For all of these reasons, we recommend that a mitigation action be considered well advised at the present time.

It is our suggestion that excavation strategy be based on the

recognition of three factors: (1) the uppermost 50 cm constitutes a post-occupation deposit. Thus, though it contains artifacts and other archaeological materials, it is not of critical concern to scientific investigation of the site except as a source of non-artifactual samples of various sorts. (2) The occupational horizon is probably thin, involving no more than a few tens of centimeters of in situ deposit over most of its extent and no more than a meter of total thickness in any spot. However, the occupational horizon occurs at varying depths below the modern surface. (3) Artifactual material upon and within the occupational horizon is not frequent where it in fact occurs at all, and areas measured in tens of square meters no doubt exist wholly devoid of archaeological data.

In light of these factors, it would appear both unnecessarily costly and unnecessarily designed to recover all available archaeological evidence in situ. Such a strategy would require controlled excavation and screening of all deposits as was done in the testing operations. In the upper 50 cm this would not prove enlightening, and within the occupational horizon the yield of in situ data seems likely to be so low as to prove wholly unreasonable in terms of the labor costs involved. The controlled excavation and screening of our testing operations "cost" an average of four man-days for each cubic meter of deposit investigated.

We suggest that the excavation strategy have as its objective the recovery of architectural and non-architectural features with which artifacts may be directly associated, and that it be designed to reveal such features in both plan and profile views. Much of the

work of earth removal could be accomplished with power machinery. Such equipment would be used to strip the upper 50 cm of overburden from an area, leaving vertical profiles at the margins of the excavation. Features exposed in plan view would be mapped and hand excavated with appropriate control. The power equipment would then be called upon to remove the next 10 cm layer of overburden and the mapping and hand excavation of newly uncovered features would be initiated. This could be continued in 10 cm levels until the culturally sterile deposit was reached. Upon completion of this work the profiles of the excavation would be mapped. If warranted, a combination of backhoe and hand excavation of profiled features would be accomplished.

This excavation strategy can be adapted to ditch deepening, ditch widening, or ditch moving operations. Further, it is effective as a means of scientific investigation of such a large area as the entirety of the ditch line or as small as areas of 500 square meters.

Estimation of costs depends upon knowledge of the amount of area and cubic volume of deposits to be investigated. The more area exposed, the greater the probability that architectural features will be encountered, which involves more painstaking investigation, and the greater the probability large and/or deep. This would mean greater hand labor costs. Cost estimation would also depend upon whether power equipment rental and operator salary is to be provided by the contractor or the contracting investigator, and the extent of analytic opportunities offered by the types of recovered artifactual and non-artifactual

records. As a rule of thumb, we believe a minimum estimate of costs can be established on the basis of the cubic volume of sediments to be investigated. Considering the number of man-days required by supervisory, field, laboratory and analytic personnel, probable costs of expendable equipment and supplies, necessary fees for institutional overhead, etc., we estimate the minimum cost at \$15.00 per cubic meter (recognizing a minimum job as equal to 500 cubic meters.)

Cost per cubic meter is reduced as larger areas are investigated, but probably cannot be much less than \$12.00. Maximal costs, which would be encountered if a minimal size area was to be investigated and turned out to be so productive of features as to demand almost total excavation by hand, could approach \$150.00 per cubic meter.