CTRL Section 1 Post-excavation
Database editing and additional data capture

Background

This document discusses the databases, originally defined to the client's (RLE) specifications, and proposes a methodology for ordering and retrieving the data from the fieldwork, assessment and post-excavation analysis carried out as part of CTRL Section 1.
The base-line material from which the proposals must work are approximately 77 spreadsheets (Excel format) which will be imported into Microsoft Access 97. The following worksheets will be imported: EVENT, CONTEXT, SUB_GROUP, GROUP.
A precise system of outputting data for various identified user-requirements is defined, so that project officers analysing the site stratigraphy can undertake periodic checks, or organise periodic checks to identify potential problems at an early stage.

Aims

1. Enable the distribution of the site stratigraphy to the archaeological specialists at the level of feature (here taken to mean a combination of sub-group and group) to allow individual context numbers to be viewed from a wider perspective.
2. Enable the distribution of shape files summarising the site plans at a phase and monument level
3. Enable the detailed intra-site analysis of particular sites, mainly cemeteries, via a geographic information system
4. Maintain the existing site archive at the level of contexts, sub-groups and groups.
5. Allow the specialist data to be summarised by either site or group, for analysis at a inter-site level.

New data capture

This section defines the extent of new data capture to be undertaken in post-excavation. The main requirement dictating how this done is point 4 (above): maintain the existing site archive at the level of contexts, sub-groups, and groups.
Two points will be made here. The new types of data are listed below

1. Dating decisions based on the archaeologist's resolution of the site stratigraphy, the typological date of features mapped in the excavation and the dating of objects within deposits, either on typological grounds or on the basis of scientific dating.
2. Re-interpretation of the features and deposits in the face of new evidence, usually provided by the specialists, or through a new perspective on the excavation record resulting from either a better overview of the individual deposits and features or from a different and presumably better personal perspective on the archaeological record.

On the basis of the above requirements the following new fields will be added to the assessment databases. On table tlkpPeriods will be added to provide validation for values entered in the PX_Period fields.

Table: Contexts

Field Name	*Field Type*	*Description*	*Restrictions*
PX_Period	Text (50)	Post-excavation interpretation of the date/phase of the context	Restricted to values in tlkpPeriods. Indexed (non-unique)
PX_Sub-group	Number(10.0)	Post-excavation assignment of the context to a sub-group	Optional participation with Sub-Group table on Sub-group field. Indexed (non-unique)
PX_Rank	Number(5,0)	An integer indicating the count of matrix steps up the Harris matrix within an archaeological intervention. This enables the sorting of deposits within an intervention from the top of the intervention to the bottom of the	Required for deposits (layers should been assigned a value of 1. A primary fill will receive the value 1, the secondary fill above the primary fill will receive the value 2. Contexts on the same step will receive the same

		intervention.	value. Cuts receive a value of 0

Table: Sub_Group

Field Name	Field Type	Description	Restrictions
PX_Period	Text (50)	Post-excavation interpretation of the date/phase of the context	Restricted to values in tlkpPeriods. Indexed (non-unique)
PX_Group	Number(10.0)	Post-excavation assignment of the sub-group to the Post-excavation group	Optional participation with Group table on Group field Indexed (non-unique)
PX_Interpretation	Text(50)	Post-excavation keyword summarising the sub-group	Indexed (non-unique). Required field
PX_Comment	Memo	Free text description of the sub-group	Not indexed. Optional. Individual text files for each mapped record will be submitted to Kent County Council SMR for hotlinking in ArcView 3.2 due to .dbf file restrictions

Table: Group

Field name	**Field Type**	**Description**	**Restrictions**
PX_Period	Text (50)	Post-excavation interpretation of the date/phase of the context	Restricted to values in tlkpPeriods. Indexed (non-unique)
PX_Interpretation	Text(50)	Post-excavation keyword summarising the sub-group	Indexed (non-unique). Required field
PX_Comment	Memo	Free text description of the sub-group	Not indexed. Optional. Individual text files for each mapped record will be submitted to Kent County Council SMR for hotlinking in ArcView 3.2 due to .dbf file restrictions

These fields will be pre-filled with the existing data in the Assessment fields. This data can then be edited as required (see below for details of proposed edits)

Data Changes Required to Assessment data sets

Edits to be made to table CONTEXTS

The following changes may be required to Table CONTEXTS

Field *Type*: if Deposit and is actually a layer edit to read layer. This is required should layers need to be mapped . If the value in this field is 'Other' and has been used to refer to finds or artefacts, the value should be edited to read 'Finds Reference'

Field *PX_Period*: all contexts that are not assigned to sub-groups or groups should be dated unless the date is unknown, in which case the field should be left blank.

Field *Fill of*: Where the fill of field has a missing value or incorrect value this needs to be corrected. If the context does not fill another archaeological context, this field should be left blank.

Edits, Deletes and Additions to table SUB_GROUP
The following possibilities are considered. All **new** numbers assigned **must** be unique across the Context and Sub-group tables for each Event_Code. You can use the query 'UsedNumbers' to see which numbers have already been assigned.

Remove contexts from an existing sub-group: edit the field PX_Sub-group in CONTEXT table to read 0
Add contexts to an existing sub-group: edit the field PX_sub-group in CONTEXT table to the number of the sub-group.
To change the dating, interpretation or description of the sub-group: edit the fields for the sub-group in table Sub-group to the required values
Create a new sub-group: add a new sub-group number to the field Sub_Group in the SUB_GROUP table. The correct event_code should be assigned to the new sub-group at this stage. Edit the blank fields, PX_Interpretation, PX_Comment, PX_Period as required. To assign contexts to the new sub-group enter, the new SUB_GROUP number into the field PX_SUB-GROUP in table CONTEXT. All contexts within an intervention should be assigned to the sub-group, unless the intention is to assign the deposits to another sub-group.
Delete an existing sub-group: Only new sub-group numbers assigned in post-excavation analysis may be deleted. Assessment and excavation assigned sub-group records MUST NOT be deleted as this will invalidate the existing archaeological archive. Edit all Context records in table CONTEXT, which are assigned to the deleted sub-group, so that the value in field PX_Sub-group reads 0, then delete the sub-group record in table SUB-GROUP.

Edits, Deletes and Additions to table GROUP
The following possibilities are considered. All Group numbers must be unique across the entire project. This is required since in some circumstances it will be necessary to link together contexts from more than one event code in order to define the blocks of data that will be analysed at a route-wide level. On the receipt of the database, you will have been assigned a block of group numbers which you may choose to use as required. Group numbers will typically be in the range 40000 to 49999. Should you require further Group numbers, these should be applied for at Oxford Archaeology.

Remove sub-groups from an existing group: edit the field PX_Group so that the value reads 0.
Add sub-groups to an existing group: edit the field PX_Group in table SUB_GROUP to the number of the Group. Assign the post-excavation event code 'CTRL 1 PX' as the event code.
To change the dating, interpretation or description of the sub-group: edit the fields for the group
Create a new Group: add a new group number to the field Group in the table Group. Edit the fields PX_Interpretation, PX_Comment and PX_Phasing as required.
Delete an existing group: only new group numbers assigned in post-excavation analysis may be deleted. Assessment and excavation assigned sub-group numbers MUST NOT be deleted as this will invalidate the existing archaeological archive. Edit all sub-group records in table SUB_GROUP, which are assigned to the sub-group to be deleted, so that the value in field PX_Group reads 0. Then delete the Group record in table GROUP.

Where new sub-groups or groups are defined it will be necessary to correlate these with the object data tags on the CAD drawings.

Difficulties

Differing Sub-Grouping and Grouping Methodologies
Within the data structure, two main approaches to sub-grouping have been detected. The first approach assigns both deposits and cuts for a feature explicitly to a sub-group. The second approach assigns just the cut (intervention) number. The following section (Retrieving the data) has been designed to minimise the effects of these different approaches.

Retrieving the data

Due to the structure of the databases defined by the client, the methodology for outputting information from the database is complex and is described here in some detail. The following description of the methodology assumes the existence of a database engine which allows the use of stacked SQL statements. All SQL quoted in the following section is in the Microsoft Jet database engine dialect and for brevity, the examples given below work only with the post-excavation fields. To work with the assessment data fields remove every instance of the letters PX or PX_ from the examples.
The SQL statements can be tested by pasting directly into Microsoft Access using the SQL view in the query designer, provided that each statement is saved with the correct name and that the new fields have been designed.

Basic data formatting tasks
Since the CTRL project envisages the use of a geographical information system to analyse at least some sites (mostly cemeteries) and envisages the construction of CAD drawings with object tagging to define these, it is necessary to be able to define the subset of numbers that makes up the object tags. In order to display archaeological deposits correctly on any such site plan, it is necessary to match up the numbers that refer to these deposits with the numbers that are actually mapped on the CAD drawings (and the resultant shape files actually used by the GIS).

Some definitions:
A *deposit* is any archaeological context which may contain finds or samples.
An *intervention* is any slot excavated through an *archaeological feature* which should appear on the site plan.
An *archaeological feature* is any series of deposits defined by one or more interventions which are considered to have formed a discrete event or series of events in the past. *Archaeological features* should appear on the site plan. Using the terminology of the CTRL project, at assessment level, both sub-groups and groups were used to define *archaeological features*. In post-excavation, only sub-groups should be used to define *archaeological features.*

The SQL for retrieving interventions (called qryInterventions) is:

```
SELECT DISTINCT CONTEXT.EVENT_CODE, CONTEXT.[FILL OF] AS isIntervention
FROM CONTEXT
WHERE (((CONTEXT.[FILL OF]) Is Not Null));

UNION SELECT CONTEXT.EVENT_CODE,CONTEXT.CONTEXT
FROM CONTEXT
WHERE (((CONTEXT.TYPE) In ('Skeleton', 'Coffin', 'Layer', 'Masonry')));

UNION SELECT CONTEXT.EVENT_CODE, CONTEXT.CONTEXT
FROM CONTEXT
WHERE (((CONTEXT.TYPE) In ('Finds Reference')) AND ((CONTEXT.[FILL OF]) Is
Null));
```

Two union statements are required. The first union statement includes in the IN clause a list of context types which should always appear on the site plan. Skeletons and coffins are included in this list because of the stated strategy for dealing with the cemetery excavations on the project. The second union statement includes types of context which may or may be included on the site plan depending on the situation described by the Fill of field: typically Finds references may be mapped by themselves if the fill of has a Null value or may be mapped by their containing context (intervention) if the Fill of field contains a value.

The SQL for retrieving deposits (called qryDeposits) is:

```
SELECT CONTEXT.EVENT_CODE, CONTEXT.CONTEXT AS Deposit,
CONTEXT.TYPE, CONTEXT.INTERPRETATION, CONTEXT.[FILL OF] AS
InterventionNo, CONTEXT.[FILL OF], CONTEXT.PX_MinDate, CONTEXT.PX_MaxDate,
CONTEXT.COMMENTS, CONTEXT.PX_RANK
FROM CONTEXT
```

```
WHERE (((CONTEXT.TYPE) In ('Deposit')));

UNION SELECT CONTEXT.EVENT_CODE, CONTEXT.CONTEXT AS Deposit,
CONTEXT.TYPE, CONTEXT.INTERPRETATION, CONTEXT.CONTEXT AS
InterventionNo, CONTEXT.[FILL OF], CONTEXT.PX_MinDate, CONTEXT.PX_MaxDate,
CONTEXT.COMMENTS, CONTEXT.PX_RANK
FROM CONTEXT
WHERE (((CONTEXT.TYPE) In ('Skeleton', 'Coffin', 'Masonry',  'layer')));

Union SELECT CONTEXT.EVENT_CODE, CONTEXT.CONTEXT AS Deposit,
CONTEXT.TYPE, CONTEXT.INTERPRETATION, CONTEXT.CONTEXT AS
InterventionNo, CONTEXT.[FILL OF], CONTEXT.PX_MinDate, CONTEXT.PX_MaxDate,
CONTEXT.COMMENTS, CONTEXT.PX_Rank
FROM CONTEXT
WHERE (((CONTEXT.TYPE) In ('Finds Reference')) AND ((CONTEXT.[FILL OF]) Is
Null));

UNION SELECT CONTEXT.EVENT_CODE, CONTEXT.CONTEXT AS Deposit,
CONTEXT.TYPE, CONTEXT.INTERPRETATION, CONTEXT.[Fill of] AS
InterventionNo, CONTEXT.[FILL OF], CONTEXT.PX_MinDate, CONTEXT.PX_MaxDate,
CONTEXT.COMMENTS, CONTEXT.PX_Rank
FROM CONTEXT
WHERE (((CONTEXT.TYPE) In ('Finds Reference')) AND ((CONTEXT.[FILL OF]) Is Not
Null));
```

The aim of this query to create a list of all contexts that might contain finds and samples in a single column.
It should be noted that multiple Union statements are required since is it necessary to construct a join correctly with the SQL that defines interventions for those instances. This is carried out by passing either the context number of the deposit itself or the fill of number of the deposit depending on the values in the Type and Fill of fields.

Retrieving the data to fulfil Aim 1: Enable the distribution of the site stratigraphy to the archaeological specialists at the level of feature.

The original data structure allows either sub-groups or groups to define higher order groupings of contexts. Depending on your definition of an archaeological feature, either sub-groups alone or both sub-groups and groups have been used to define these higher groupings. Additionally, since both sub-grouping and grouping are optional, some features, usually those considered unimportant, are only definable at the level of intervention.
The approach taken to this problem requires the use of both qryInterventions and qryFeatures described above. A further stage of data formatting is also required and the SQL for this (called ReconFeaturesPX) is shown below:

```
SELECT GROUP.GROUP AS GroupNo, GROUP.PX_Interpretation AS GroupInterpretation,
GROUP.PX_Period AS GroupPeriod, GROUP.PX_Comment AS GroupComments,
SUB_GROUP.SUB_GROUP AS SubGroupNo, SUB_GROUP.PX_Period AS
SubGroupPeriod, SUB_GROUP.PX_Comment AS SubgroupComments,
SUB_GROUP.PX_Interpretation AS SubgroupInterpretation,
qryInterventions.EVENT_CODE AS InterventionEvent, CONTEXT.CONTEXT AS
InterventionNo, CONTEXT.TYPE AS InterventionType, CONTEXT.INTERPRETATION
AS InterventionInterpretation, CONTEXT.COMMENTS AS InterventionComments,
CONTEXT.PX_Period AS InterventionPeriod
FROM ((qryInterventions INNER JOIN CONTEXT ON (qryInterventions.EVENT_CODE =
CONTEXT.EVENT_CODE) AND (qryInterventions.isIntervention =
CONTEXT.CONTEXT)) LEFT JOIN SUB_GROUP ON (CONTEXT.[PX_Sub-group] =
SUB_GROUP.SUB_GROUP) AND (CONTEXT.EVENT_CODE =
SUB_GROUP.EVENT_CODE)) LEFT JOIN [GROUP] ON SUB_GROUP.PX_Group =
GROUP.GROUP
ORDER BY GROUP.GROUP, SUB_GROUP.SUB_GROUP, CONTEXT.CONTEXT;
```

With the construction of this query we are able to finally output the data using the query qryReconstructFeaturesPX:

```
SELECT qryDeposits.EVENT_CODE, ReconFeaturesPX.GroupNo,
ReconFeaturesPX.GroupInterpretation, ReconFeaturesPX.GroupPeriod,
ReconFeaturesPX.GroupComments, ReconFeaturesPX.SubGroupNo,
ReconFeaturesPX.SubGroupPeriod, ReconFeaturesPX.SubgroupComments,
ReconFeaturesPX.SubgroupInterpretation, ReconFeaturesPX.InterventionNo,
ReconFeaturesPX.InterventionType, ReconFeaturesPX.InterventionInterpretation,
ReconFeaturesPX.InterventionComments, ReconFeaturesPX.InterventionPeriod,
qryDeposits.[FILL OF], qryDeposits.Deposit, qryDeposits.PX_RANK, qryDeposits.TYPE AS
DepositType, qryDeposits.INTERPRETATION AS DepositInterpretation,
qryDeposits.COMMENTS AS DepositComments, qryDeposits.PX_PERIOD AS
DepositPeriod
FROM qryDeposits LEFT JOIN ReconFeaturesPX ON (qryDeposits.EVENT_CODE =
ReconFeaturesPX.InterventionEvent) AND (qryDeposits.InterventionNo =
ReconFeaturesPX.InterventionNo)
ORDER BY ReconFeaturesPX.GroupNo, ReconFeaturesPX.SubGroupNo,
ReconFeaturesPX.InterventionNo, qryDeposits.PX_RANK DESC;
```

The main aspects of the result set that are outputted using this SQL are as follows:

1. The left side of the screen displays the higher level groupings (Groups) and data about them. As the eye moves to the right, the next level of grouping (sub-groups) and data about them becomes apparent. Moving further right, there are the interventions and data about them and finally at the extreme right the deposits within each intervention. This allows aggregation at several levels: by group, by sub-group and by intervention. Filtering (as at least implemented in Microsoft Access allows concentration on each of
2. A single record for each deposit (any context which may contain finds or samples). It is therefore possible to attach specialist datasets without multiplying the counts of artefacts or eco-facts recovered.
3. Because of the structure of the queries behind the result set from the query, it is not a requirement that deposits belonging to interventions are assigned to sub-groups. An example of this situation can be found in ARC PIL 98.xls. This situation, along with the optional nature of sub-grouping and grouping, causes the apparently more straightforward approaches of linking the CONTEXT, SUB_GROUP AND GROUP tables to fail. Such an approach would be based on the query or more detailed version thereof (to account for fills of interventions):

   ```
   SELECT GROUP.GROUP, GROUP.INTERPRETATION AS GroupInterpretation,
   GROUP.COMMENTS AS GroupComments, SUB_GROUP.SUB_GROUP,
   SUB_GROUP.INTERPRETATION AS SubGroupInterpretation,
   SUB_GROUP.COMMENTS AS SubGroupComments, CONTEXT.CONTEXT,
   CONTEXT.TYPE, CONTEXT.INTERPRETATION, CONTEXT.COMMENTS,
   CONTEXT.[FILL OF]
   FROM [GROUP] RIGHT JOIN (SUB_GROUP RIGHT JOIN CONTEXT ON
   SUB_GROUP.SUB_GROUP = CONTEXT.[SUB-GROUP]) ON GROUP.GROUP =
   SUB_GROUP.[PART OF GROUP]
   ORDER BY GROUP.GROUP, SUB_GROUP.SUB_GROUP, CONTEXT.CONTEXT;
   ```

4. Deposits within interventions are ranked from top to bottom using the PX_Rank field providing some indication of the location of finds within individual interventions.
5. However, there are some anomalies that result from approach: the majority of these derive from situations where walls or timbers themselves belong in cuts (water-logged pits or foundation trenches being the obvious examples). In these situations and should absolute accuracy be required, it may prove necessary to produce separate correspondence lists of deposits, interventions, sub-groups and groups.
6. Where it is necessary to provide phasing data in a single field, reference should be made to the logic of the query described in the section below.

Retrieving the data to fulfil Aim 2 (Enable the distribution of shape files summarising the site plans at a phase and monument level)

The essential driving factor behind the output methodology for aim 2 is the recognition that definition of sub-groups and groups is essentially optional. The methodology applied therefore works on the basis that a group definition will take priority over a sub-group and a sub-group will take priority over a context. This is demonstrated in the following SQL which requires the SQL defined above:

```
SELECT qryReconstructFeaturesPX.Event_Code,qryReconstructFeaturesPX.SubGroupNo As
SourceNo, qryReconstructFeaturesPX.SubGroupInterpretation,
qryReconstructFeaturesPX.SUBGROUPPERIOD, 'Sub-group' As ILevel
FROM qryReconstructFeaturesPX
WHERE ((qryReconstructFeaturesPX.SUBGROUPNo) <>0 );
UNION SELECT
qryReconstructFeaturesPX.Event_Code,qryReconstructFeaturesPX.InterventionNo,
qryReconstructFeaturesPX.InterventionInterpretation,
qryReconstructFeaturesPX.Interventionperiod, 'Context' As ILevel
FROM qryReconstructFeaturesPX
WHERE ((qryReconstructFeaturesPX.SUBGROUPNo) = 0);
```

Depending the exact structure of the CAD drawings it may be necessary to additionally define the intervention number in the query and use ArcView's geo-processing wizard to create polygons with the relevant Source Number attached.

Retrieving the data to fulfil Aim 3 (Enable the detailed intra-site analysis of particular sites, mainly cemeteries, via a geographic information system)

For this section reference should be made to the detailed cemeteries CAD/GIS methodology. Spatial analysis of grave goods will be carried out on a direct mapping basis using the small find number as the object data tag. This will not therefore be addressed here.
What will be addressed is the method for providing the subset of object data tags from within the database. The correct identification of these will ensure that specialist data, usually, but not necessarily exclusively defined by deposit, can be attached to the interventions mapped on the cemetery GIS systems. In order to do this effectively, each intervention must occur in a single column of a result set from a query of the data in the database.
It is proposed that the query, qryReconstructFeaturesPX described above, fits that criterion.
Consideration should be given to the question of whether defining all body shadows and skeletal remains as skeletons is sufficient. If it is considered not to be the case, then it will be necessary to edit the data to distinguish body shadows from surviving skeletal remains and edit the above queries appropriately to reflect the chosen classification terms.

Retrieving the data to fulfil Aim 5 (Allow the specialist data to be summarised by either site or group, for analysis at a inter-site level.)

It is proposed that the existing qryReconstructFeaturesPX will be used to define the overall framework for the proposed inter-site analyses as stated in the project mission statement. For this to be successful, careful consideration by and coordination of project officers needs to be carried out. The highest level of aggregation of contexts, the group should be used to define those elements, such as settlements, cemeteries or other interesting and discernible landscape blocks, that are likely to be analysed at a route-wide level. Sub-groups should be used to separate out the individual elements of each of the elements as required. That statement is not intended to be prescriptive since for particularly extensive landscape elements (for example a Roman villa), it may be necessary to use more than one group to properly define the archaeological sequence. In these situations, it would be helpful, if the PX_Interpretation field is filled in a consistent manner for those groups: for example: Group 1 - Roman Villa: main occupation and Group 2- Roman Villa: abandonment.
Diagnostic specialist data will then be aggregated by these landscape elements, preparatory to the route-wide analysis. Where possible, residual and intrusive material will be removed from the summary data. For this to occur, it is necessary that the typological date of the material is available.

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