Equipment
1. Low-power microscope (x5-x40)
2. Staining blocks
3. Petri dishes
4. Sieve stacks with lid, base, 500micron, 1mm, 2mm, 4mm (mesh sizes optional)
5. Soft tweezers
6. Large plastic tray
7. Weigh boats
8. Riffle box (for large samples)

Consumables
1. Plastic bags
2. Fine pen marker
3. Biocide
4. Glass vials

Personal Protective Equipment
Lab coat
Mask
Gloves (optional)

Protocol
This should all be carried out in the Penn Paleoecology Lab

NB- Before starting check with the field archaeologist that no hazardous chemical or biological contamination is present in sediment samples.

Charred plant macrofossils:
1. Use a large plastic tray as a working space (easy to clean afterwards).
2. Put the flot through the sieve stack, to make sorting easier.
3. Start with the larger fraction, tipping all or part of it into a Petri dish.
4. Set the microscope to its lowest magnification
5. Use the soft tweezers to move fragments across the microscope view, working systematically from one side of the petri dish.
6. Collect any grain, chaff or seeds into the staining blocks – subdividing as desired. If this is just an assessment (rather than full analysis), you may instead want to just note the presence and relative abundance of different classes of plant material.
7. Once the largest fraction is sorted, return it to the flot bag (now labelled 'sorted', with your initials and the date – if nothing has been removed, then label it as 'scanned' instead).
8. Repeat stages 5 to 7 for all of the size fractions, increasing the magnification as required.
9. Work through the identifications separately for each staining block; tipping them into a petri dish to subdivide and quantify.
10. Quantification of items must be linked to your research objectives – why are you analysing these samples? Students should discuss methodology with their supervisor before commencing full sorting and quantification.
11. Sorted items can be stored securely in vials. Labelling depends on whether C14 dating is ever likely on the material – if so, then do not put a card or paper label inside the tube! Instead, use 3M Scotch tape to wrap a paper label around the outside of the tube. The label should include site code, sample number, context number, sample volume.
12. It is usually best to store the tubes of sorted items with the remainder of the flot. An alternative system is to collect all the sorted items together, and keep the flots separately.
13. Clear away any debris with biocide.
14. The entire process should be recorded, either on a data sheet or in a lab book.

Using the riffle box:
If a flot is very large and rich, you may want to subdivide it before commencing sorting; a riffle box is the only reliable way of subdividing flots.

1. First, choose the riffle box that is the appropriate size for the entire flot – large or small.
2. The small riffle box cannot handle material >4mm, so sieve your sample down to that size.
3. Place the entire flot in one of the three metal containers that comes with the riffle box.
4. Place the other two metal containers underneath the riffle box itself.
5. Shake the container with the flot, so that its contents are evenly distributed.
6. Gently tip the container sideways into the riffle box, so that the flot falls evenly into it.
7. Shake the entire box gently, to ensure all the flot has fallen through into the other two containers.
8. Either – bag up both halves of the flot, labelling each clearly with '1/2 flot'
9. Or – bag up only one half of the flot, labelling clearly with '1/2 flot', and repeat stages 4 to 8 with the other half, resulting in two containers of '1/4 flot'.
10. Stage 10 can be repeated as much as desired – down to fractions of 1/8, 1/16, 1/32 etc.
11. Always stick with the above fractioning system, so that the amount of flot sorted can be linked to the original volume of sediment sieved.