Handbuilding: General Guidelines and Suggestions

Vince Pitelka, 2021

The following simple guidelines apply to all clay working methods, but especially to handbuilding. Thorough familiarity with these guidelines will greatly accelerate the learning curve.

Commanding Approach—Clay appreciates a vigorous commanding approach with an economy of motion. Whatever you do, know why you're doing it, but at the same time, be adventurous. Push the capability of the clay, and take chances in order to really explore its capability. You will make mistakes but will learn far more and faster than with a hesitant, tentative approach.

Clay Consistency—Always start with well-wedged, plastic clay of appropriate softness for the desired project. Use clay containing grog or sand for large work.

Mobilize and Homogenize the Clay—If you are using a claybody that has not been pugged in a deairing pugmill, wedge the clay thoroughly before proceeding. If you are using clay that you have pugged and deaired or commercial deaired moist clay, drop each bag of clay on a concrete floor a few times on different surfaces of the bag to mobilize the slabs. This gets the particles moving and restores the water layers between particles. When clay sits for a matter of months, it becomes more plastic due to thorough wetting of the particles and development of organic activity, but the particles settle together, increasing friction, and initially the clay can seem very stiff. Wedging or dropping the clay remobilizes it.

Forming Method—Use the method appropriate for the forms you wish to make—pinch, coil, or soft slab for rounded and organic shapes, coil or stiff slab for geometric shapes. For larger sculptural forms, especially figurative, consider working solid and hollowing the form.

Awareness of Surface Effects—With an appropriate forming method and sensitivity to the surface during initial construction, subsequent surface finishing may not be necessary. The forming or assembly process often creates interesting surface marks or patterns.

Concentration of Pressure Points—All stages of manipulating clay depend on concentration of pressure points, giving far greater control than with broad application of pressure over a large area. Every part of your hand is useful. For every action there is a reaction—keep in mind the consequences of every type of pressure you apply.

Wall Thickness—Make pieces with a wall thickness appropriate to their size and intended use. Unnecessary thickness does not translate to greater structural integrity, and in fact the added weight may cause structural failure. In tall work it is appropriate to make the lower walls slightly thicker, but otherwise maintain uniform thickness. Even a massive sculpture or vessel should not exceed ¾ inch to 1 inch in thickness anywhere. If special circumstances require thicker areas in walls or joints, perforate

thoroughly with a needle tool to allow moisture to escape during drying and firing. Internal bracing in sculptural forms will greatly improve structural integrity.

Base Support and Bottom—Always construct large forms on a sturdy moveable board with several layers of newspaper beneath the clay to prevent sticking and allow for shrinkage during drying. With all coil-construction and when possible with slab construction, build up from a bottom slab of clay, and create breather holes through the slab unless there is a reason not to.

Whenever possible, incorporate a single continuous base supporting all parts of a piece. For example, a sculptural form supported on multiple delicate appendages can be built with an integral base supporting all parts of the piece since the base shrinks along with the piece in drying and firing. If there is a compelling reason to build such a form without an attached base, construct the form on a thick waster slab made from the same claybody and dry and fire it on that slab. The slab will accommodate shrinkage at all stages.

Avoid Closed Spaces—Get in the habit of monitoring every connection and addition to avoid any completely closed air spaces, even very small ones, as they tend to gather and focus steam pressure and may cause separation during drying or firing, or even an explosion in the kiln. Always incorporate breather holes (tiny pinholes are adequate) in any closed space. Make several in case one gets clogged. Whenever possible leave larger breather holes. When applying additions or appliqués be careful to avoid trapping air in the joint. Ventilate thick areas with a needle tool.

Joining—Successful joining depends on intermixing and interlocking the platelets across the joint. Always join clay firmly in a way that is appropriate for the consistency of the clay and the type of attachment. Never press clay straight together without proper surface preparation, as this just aligns the particles in a perfect fracture plane. Soft plastic clay may be joined without scoring or slurry as long as the pieces can be aggressively smeared together, as in the coil construction method described in *Clay: A Studio Handbook*. Blend the seams inside and out to insure interlocking of the platelets. In all other circumstances, when joining parts or adding soft clay or appliqués, score thoroughly in a crosshatch pattern with a serrated metal rib. Avoid scoring with any sort of sharply pointed tool like a needle tool or wire brush that makes deep cuts, or use such a tool with a very light touch. The slurry cannot penetrate deep, thin cuts, and they will leave a network of tiny air pockets across the joint that can cause it to pop apart in the firing. Apply plenty of slurry and press the parts firmly in place to eject excess slurry and any air bubbles, and clean up all excess slurry from the seams. Don't use slurry to fill a gap, corner, or exposed seam, because the slurry will shrink in drying far more than the surrounding clay, building up stresses, which can become a crack later on.

Ideally, pieces to be joined should be the same consistency and stiffness. This is not always possible, and if you must join pieces of slightly dissimilar moisture content, cover the assembled form with plastic or place in a damp box and allow moisture content to equalize before slow drying. Joining fresh plastic clay to stiffer clay, as in adding freshly made handles to a thrown or handbuilt form, should be done at the soft leatherhard stage. You risk cracking around the joint if the form is any stiffer. In

pieces of equal moisture content, do all joining by the medium leatherhard stage, and don't attempt joinery of stiffer pieces except when using paper clay techniques.

Some clays, such as porcelaneous bodies offer special challenges in forming and attaching. Slurry of the claybody with a little vinegar works better than plain slurry, and if the clay is quite damp this slurry can be mixed very thinly. With moist, fresh porcelain it is often possible to join parts immediately without scoring or slurry just by wetting the surface and pressing the parts together with a wiggling motion, but the success depends on wetness of the clay and the nature of the particular clay body. Some people use a brush coat of Lana Wilson's magic water applied to the surface immediately before joining freshly made parts, again with a slight wiggling motion to encourage interlocking of platelets. Magic water is composed of 9 grams of sodium silicate and 3 grams of soda ash added to 1 gallon of water. It may seem counterintuitive to use a deflocculant as a joining medium, but the theory is that repulsion between particles loosens up the surface giving ideal conditions for interlocking platelets.

Stages of Leatherhard—The following are generalizations, and it's difficult to clearly define stages of leatherhard. The drying cycle is a continuum from wet plastic clay to bone dry, and every stage along the way is ideal for some forming or decorating process. Every claybody behaves differently. As you get to know a claybody you'll adjust depending on your experience and intent.

Soft leatherhard is where you can carefully pick up a small or medium size piece without distorting it, but the clay is still quite flexible and the surface is still a bit tacky. Slight adjustments of shape can still be made with earthenware and stoneware bodies, but would be risky with true porcelain. When attempting to trim the surface with a trimming tool or Surform, the trimmings ball up and stick under the tool, and the form is easily distorted or damaged if mishandled. This stage is ideal for joining parts or adding appendages as long as the forms can be handled without damage.

Medium leatherhard is when all surface tackiness is gone and plastic clay doesn't seem to stick easily when pressed against the surface. At this stage, most forms can easily be handled without distortion. Adjustments of shape will likely create internal stresses that result in cracking or warpage. When the surface is incised with a modeling tool, the displaced clay rises in attached ridges along the groove. When trimmed, the trimmings fall freely away and will not stick to the surface of the Surform or trimming tool. This stage is ideal for joining parts of the same moisture content, but risky joining wet plastic clay to medium leatherhard.

Hard leatherhard is where the color is still "damp," but the clay is too stiff for easy trimming or any joinery except with paper clay. When incised with a wooden or metal tool, the surface feels scratchy and most displaced material falls away freely as small particles. This stage is ideal for sgraffito and carved decoration on porcelain and other gritless claybodies. For stoneware and earthenware containing sand or grog most people prefer carving at a point between medium and hard leatherhard. Generally, the clay can still be shaved with a Surform at this stage, but the cutting edges will dull more quickly.

Once the clay has begun to bleach (lighten in color from drying) it has passed beyond leatherhard and can be damaged by rewetting. Unless using paper clay processes, if an unfinished or damaged piece has begun to bleach, you are better off recycling it and starting anew.

Multi-Piece Assembly—Regardless of forming method it is often advantageous to build pieces in sections to be joined when soft or medium leatherhard. Very large sculptural forms can be fired in separate sections to be loose stacked, assembled on an armature, or glued together with epoxy or silicone adhesive.

Avoid Using Water—Do not use water to smooth or finish a handbuilt piece while you are working. It just softens the clay, decreases structural integrity, slows you down, and makes the clay less cooperative. It also diminishes or erases working marks that you may wish to preserve. Do not use water in place of slurry when joining pieces except in the cases described above. Water can be sparingly applied with spritz bottle to slow down the drying process whenever needed, but don't overdo it.

Structure—Think about and plan the structural integrity of a form and the clay's ability to support upper portions of the piece in the wet and dry stages. With large vessels, increase the wall-thickness accordingly. With sculptural forms, always also cross brace the interior. Support horizontal protrusions or extensions with temporary props until they are firm enough to support themselves. Do not overlook the possibility of using wadded newspaper as an interior support to maintain the shape of partially closed forms or to support raised relief forms from below. In situations where there is no other option, newspaper may be left in place to burn away in the firing. For some sculptural forms, especially when modeling solid, dowels or wood sticks may be forced directly through the clay to support precarious sections or additions and then pulled free after the clay has stiffened a bit. This can be especially effective with figurative work.

Controlled Drying—Always carefully monitor and control the rate of drying. When timing demands it, pieces may be stiffened in stages with carefully applied heat from a hair dryer, heat gun, or propane torch before continuing with construction. Move the heat source constantly to avoid uneven stresses on the clay. The objective is to warm the clay and accelerate evaporation.

CAUTION—Be very careful when using a heat gun. It blows hot air at 1500°F and will cause very serious burns if aimed at your skin. A propane torch is far safer for the simple reason that you see the flame.

Large pieces to be left covered with plastic should first be draped with a large cloth (old towels or bed sheet) to absorb and dissipate moisture. Otherwise, condensation beneath the plastic can flow back onto the piece and concentrate in areas where the plastic touches, possibly causing structural failure. Large complicated pieces should be kept covered and allowed to dry very slowly.

Small parts that protrude from a form must be protected from quick drying, especially if attached in two or more separate places as in a mug handle, where quick drying would cause them to crack. An

easy solution is to coat those areas with wax resist. As the piece dries, moisture from the wax coated areas wicks into the main body through the connections. In general, complete each part of the process at the appropriate stage of dryness. Do not attempt to bring a piece that is too dry back to workable moisture content.

Rapid drying should be avoided except in very simple small forms. Many people keep work-in-progress in plastic storage boxes, and for the final stages of drying, leave the lid off and cover the box with fabric. On occasions when extenuating circumstances require the quickest safe drying, it is best accomplished under a raised fabric tent that eliminates all drafts. Elevate the work on a few slats or small blocks of wood and completely enclose in a fabric tent (old bed sheets work well) draped over an improvised frame or a stretched rope. Make the tent no bigger than it needs to be to accommodate the piece plus a reasonable margin of space around it, ensuring that the fabric does not touch the clay anywhere. Moisture evaporating from the piece humidifies the space inside the tent. The moisture slowly dissipates through the fabric, gradually lowering the humidity inside and allowing even drying. Using this method, I have successfully taken complex slab-built forms from leatherhard to bone dry in 24 hours, although that depends on the humidity of the surrounding space. If necessary, use a dehumidifier in the studio.

Finish the Bottom—This is one of the most frequently neglected areas in studio clay. A carelessly finished bottom or lower edge can ruin the appearance and feel of otherwise good work, especially something that will be picked up and handled in use. When potential customers pick up work in galleries or art fairs, one hand frequently goes straight to the bottom, and any roughness or sharpness is off-putting. Except for certain cases in sculpture where a sharp edge is needed visually, such an edge is rarely appropriate and invites chipping. In a utilitarian vessel, it creates the illusion that the form is growing out of the surface it sits on. Our logical mind knows better, but it still comes across as a design flaw. For most pieces, a slight bevel or undercut at the base gives a line of shadow that sets the piece off from the surface beneath and gives a bit of buoyancy.

For finishing the bottom of handbuilt vessels that rise fairly vertically from the base, consider a rolled or paddled edge that creates a bevel and slight outward flare that are aesthetically pleasing and very functional. For round or oval vessel forms like cups or mugs at the stiff side of medium-leatherhard, the piece may be placed vertically on a hard, smooth table surface, tilted slightly to one side, and then rolled around so as to bevel the outer edge. Don't try this on soft-leatherhard forms, because it will distort the whole form. The degree to which you tilt the form determines the angle of bevel. For best results, roll the form around a few times against the lower edge, rotate it 90° on its vertical axis, roll it around a few times, rotate it, etc. This will give a far more even rolled edge. If the result leaves a sharp protruding edge, round it over a bit with moistened fingertips or a damp chamois.