brick manufacturers will do custom color matching but the cost may be prohibitive.

Contact the brick manufacturer 6 to 10 months ahead of construction, to give them time for several test runs if necessary. Make two separate counts of the percentages of light and dark range units in a typical blend area close to the location of the repair or the planned addition. Request at least 48 loose sample bricks in the selected colors. These samples should be numbered on the back, and the manufacturer should retain duplicates at the plant. Compare the samples to the existing walls and view them at distances of 20 ft and 60 ft. Do not be influenced by slight size, finish, or texture variations that are noticeable only at close range—color is the most important factor. When comparing the units, be sure that both the samples and the existing walls are surface dry. If you are not satisfied with the samples, order more.

Deliberately choose a color range that has slightly *less* contrast than the existing wall. That is, make sure the darkest sample you choose is a little lighter than the darkest brick in the wall, and the lightest sample slightly darker than the lightest brick in the wall. When you are satisfied with the color range and blend of the units, return 10 approved samples to the plant, packaged so that they do not become separated in transit.

The mortar must also match the existing to achieve good results. If you can identify the original mortar, specify the same type, proportion, and materials (i.e., masonry cement or portland and lime mix). If a colored mortar is needed, the manufacturer can help in selecting or custom blending the pigments. Specify controls on job-site mortar mixing to ensure consistent color. Each batch of mortar must be mixed in exactly the same way, using exactly the same ingredients. The type and amount of each ingredient affect mortar color. Use only one brand of cement, one brand of lime, and one source and color of sand throughout the entire job. Mix only full batches of mortar, maintain a consistent water content, and mix each batch the same length of time. When you cannot exactly match the existing brick color, construct several sample panels with varying mortar colors to find the one that minimizes the difference.

To achieve consistency in color pattern on the wall, units with a pronounced range of colors, or mixes that contain more than one color, must be properly blended. Blending problems are rare in historic buildings because careful hand blending at the job site was necessary after the shipment was dumped from the back of a wagon or cart. Manufacturers today routinely perform hand blending operations at the plant and ship the brick on pallets that hold the equivalent of 500 standard modular units. Since the units typically go to the scaffold in batches of only about 100, however, the masonry contractor must unstack the bricks according to instructions on each pallet and distribute them to the bricklayers uniformly. Narrow color ranges present fewer potential problems than wider ranges or blends of more than one color (*refer to Fig. 15-6*). Always specify that units be laid in the wall in a blend that will result in even color without patchy areas.

Establish a standard of acceptable workmanship for color blending by specifying a sample panel for approval. This panel should be constructed in addition to any that were used in the selection process, because it must be built with brick from the actual production run used in the building. The sample panel can also be used to set standards for joint tooling. The joint size and shape, of course, must match the existing, but tooling should also be consistent to avoid the patchy effect of light and dark joints. Wetter mortar tools to a lighter color than drier mortar because more cement paste is drawn to the surface. Tooling therefore, must occur at the same moisture content

throughout the job rather than after a set number of courses or bricks, or elapsed time.

Brick moisture content at the time of laying affects mortar curing time. An *inconsistent* moisture content therefore affects the color of the finished joint. If an unprotected pallet of brick, for instance, becomes partially wet during an overnight rain, the wet units will cause patches of lighter-colored joints because their higher moisture content keeps the mortar moist for a longer period of time than adjacent areas (refer to Chapter 15). Always specify weather protection, not only for unfinished walls, but also for units and mortar ingredients.

Visual separation elements can also help minimize the effect of any contrast between new and existing walls. An entry, a decorative panel with a different joint type, or even a small projecting pilaster will help isolate the different sections instead of abutting them for critical comparison.