DETAIL

A Barrel-Vault Ceiling

by Lou duPont

Curved plywood plates and simple framing form the backing for this rounded plaster ceiling

On a recent remodel, I had the chance to build a barrel-vault ceiling that transformed a small, plain-jane space into one that reminded us why it is we like to build. The finished room brought smiles of appreciation from all who entered it — including the architect and, most importantly, the owner.

The vaulted ceiling was nonloadbearing. Since roof loads were carried by a shed roof above, our structure had to be only strong enough to carry the weight of a 12-foot-long plaster ceiling. This particular vault did not form a full semicircle, but the construction details we worked out would also work for a full, 180-degree vault.

Our first tasks were to locate the radius point for the arced ceiling, then check to see that the vault as drawn would fit the dimensions of the room. Using a length of 1x lumber as a trammel, we struck the 10-foot 3-inch radius across the studs at each end of the room. (To get an accurate arc, use a wood trammel; a string will stretch as you pull it.)

Fortunately, the architect had done his work well; the line of the finish ceiling fit almost exactly as it was supposed to, starting at the top of the rear wall and landing just above the upper course of windows on the front wall. We measured up another 3/4 inch to allow for metal lath and three-coat plaster and 3/4 inch for plywood strapping; this gave us the radius for the plywood "plates" that would hold the 2x8 ceiling joists.

Next, working on the floor, we drew the radius for the plates on 3/4-inch BC plywood. We made the plates 7 1/2 inches wide to accommodate the 2x8 ceiling joist. We doubled the plates to make sure they were stout enough to span the studs and carry the ceiling load. We lapped the joints as you would for double top plates and made sure that each joint landed on a stud. As you can imagine, it took a bit of trial and error and cutting and fitting to match the plates to the arcs drawn on the studs. After the plates were up, we marked the joist layout at 16-inches on-center.

We used joist hangers to attach the joists so the weight of three coats of plaster over the 12-foot span wouldn't move the joists. We also blocked the ceiling to give it added strength. The only trick to cutting the ceiling joists was ripping the few that met the plane of the roof rafters near the exterior bearing wall. But with the layout marked on the plates, it was easy to figure the rip angle and joist width.

Once the joists were all up, we ripped three sheets of 3/8-inch CDX plywood into 2 1/2-inch strips for strapping. We decided to use two layers of 3/8-inch ply to conform to the radius. In retrospect, a better grade of plywood might have worked better as the CDX did not yield a very uniform bend. We laid out the strapping on one-foot centers, fastening them with 8-penny sinkers, and lapping the joints. With the strapping up, the ceiling really took on the look of a barrel. It also looked and felt satisfyingly rugged.

We next stapled #30 felt paper to the nailers. Specified by the architect, this barrier would keep moisture from the plaster from wicking into the framing lumber. We fastened expanded metal lath over the paper, using screws on 5-inch centers, making sure to lap all edges at least 2 inches.

With the prep work done, we got out of the way so the plasterer and painter could finish the job. The plasterer added fine white sand to the finish coat to give a slightly textured surface. The painter, after waiting 30 days for the plaster to cure, rolled on an evening blue color. The combination of texture and color gives the finished vault an expansive quality beyond its modest dimensions. ■

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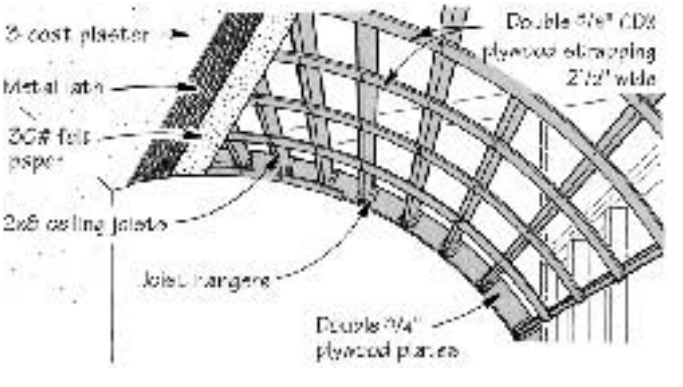
The vaulted ceiling gives a spacious feeling to a formerly dull rectangular room (inset).

The author, at left, and carpenter John Crosswaithe install a double layer of 3/8-inch plywood strapping to the bottom of the barrel vault's 2x8 joists.

Vaulted Ceiling Construction



Radiused plywood plates at each end of the room define the curve of the vaulted ceiling. Two-by-eight joists and plywood strapping provide the backing for the finished plaster ceiling.