

Wall Options for Perma-Columns

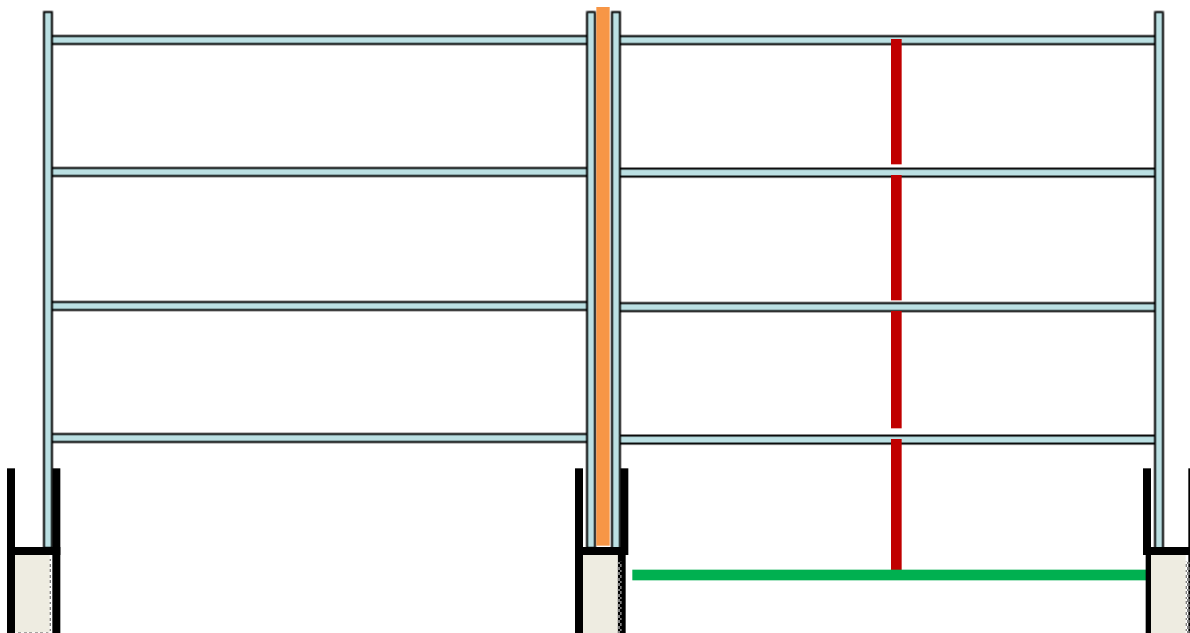
Right: Illustration for a pre-fabricated wall section that can be placed in between Perma-Columns, similar to a stud-frame wall turned 90.

The 2-by members on the left and right of the frame have 2-bys of the same dimension (6" or 8" or 10" or 12") attached to them with ring-shank nails or screws through the left and right members. Ideally the members in between, which will be bookshelf girts, will be between 8' and 16' in length (8' o.c. columns being most common, but up to 16' with proper engineering) spaced 2' to 4' o.c. Based on the size and specifications of a particular structure, additional or larger members or diagonal bracing may be required.

If steel or another finish is screwed to the girts on both sides, this will greatly increase the diaphragm and shear of the entire building to allow the longer spans between posts and girts, and many structures will not need diagonal bracing.

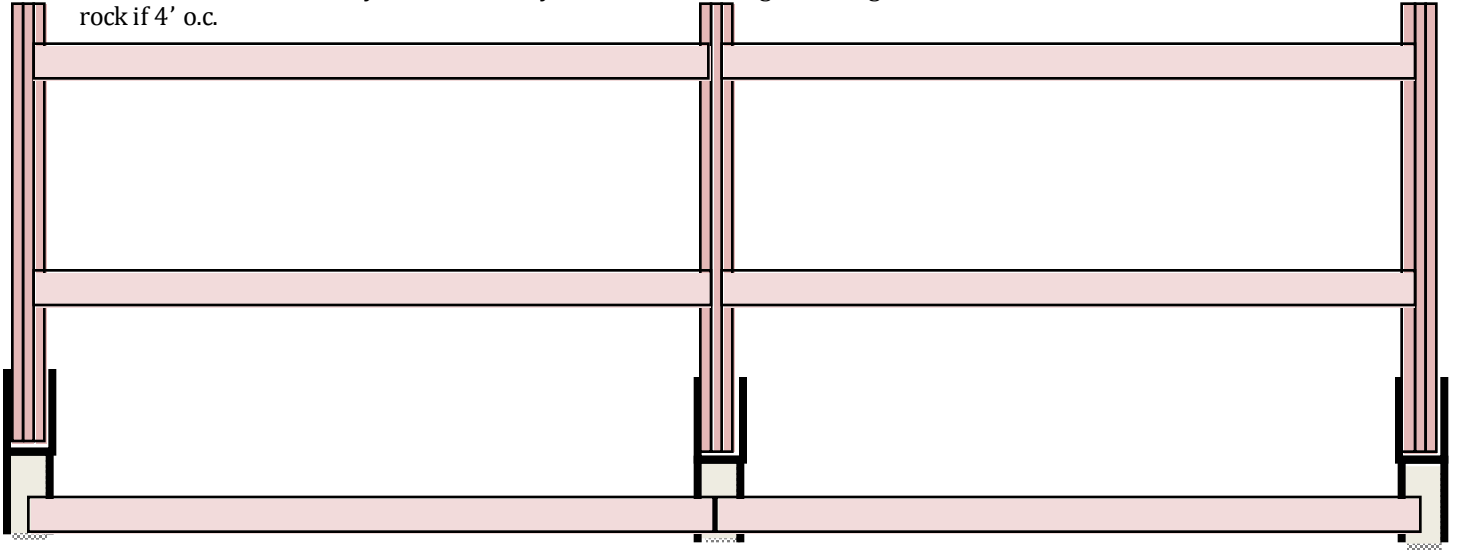
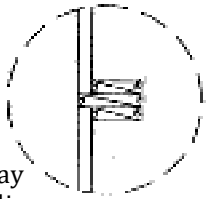
The pre-assembled wall sections can be quickly and easily installed. First plant the Perma-Columns in the ground preferably 8-16' o.c. (span in lengths that require fewer wood cuts). Once the Perma-Columns are installed, insert each wall section spanning between two Perma-Columns. Drive two screws partway through the Perma-Column bracket so the screw doesn't protrude through the other side of the pre-fabricated wall section, then clamp in another 2x6 for the center ply (orange below) and screw them in the rest of the way. Continue to nail the center ply to the wall section with ring-shank nails or other fasteners per ASAE EP559, then slide in the next wall section and fasten that to the center ply and the other side of the Perma-Column bracket.

Below illustration shows Perma-Column's that could span from 8' o.c. up to 16' o.c., and the horizontal studs (bookshelf girts) could span from 2' up to 4' o.c. If the inside and outside liners are steel we shouldn't need anything in between because the steel will provide lateral strength. If the inside liner is sheetrock and/or the inside and/or outside were OSB or plywood, because those components typically measure 4x8' and can be installed horizontally with all ends at a member, insert additional 2x6" blocks shown in red on the right and a sill plate tap-conned onto the concrete floor shown in green for the bottom fastening of the wall finish material. Option: pre-fabricate with exterior cladding, wrap/insulation, etc. Instead of using pre-fab laminated columns, make a laminated column by fastening pre-assembled wall sections into the Perma-Column bracket. At corners add two 2-bys and fasten the endwall section against the plies.



Traditional Post-Frame Wall with Posts from 8' to 16' o.c. and Girts 2' to 4' o.c.

The most energy-efficient wall option of all uses inside and/or outside girts with steel cladding 4' o.c. and columns up to 16' o.c. This would avoid the use of pre-fabricated walls with bookshelf girts and create a bay that could be 8' or more wide, about 8.5" thick, without breaks in the insulation. Option: For a vertical nailing surface, use a wider member for the center ply of the column and butt the girts against the center ply on the inside wall to horizontally attach 4x8' drywall at 8' o.c.; using smaller girts on the inside 2' o.c. or thicker sheet rock if 4' o.c.



For tall and wide buildings, there are different ways to stiffen the frame when going more than 8' o.c. Girt and purlin spacing may be reduced and girt, purlin and column size increased. Another method is to bookshelf the girts using hangars, brackets or pre-assembled wall sections. Another means to strengthen the diaphragm is to use 4-ply columns and mechanically and/or adhesively laminating two trusses together into a 2-ply or "sandwich" truss. Frames are also strengthened with larger members like 2x8's, 2x12's, engineered products, etc. Here is an illustration of 4-ply columns with a 2-ply laminated truss; purlins could be hung between trusses on saddles nailed on edge atop the trusses or notched; both interior and exterior girts with interior and exterior wall linings will increase diaphragm strength to allow wider column spacing.

