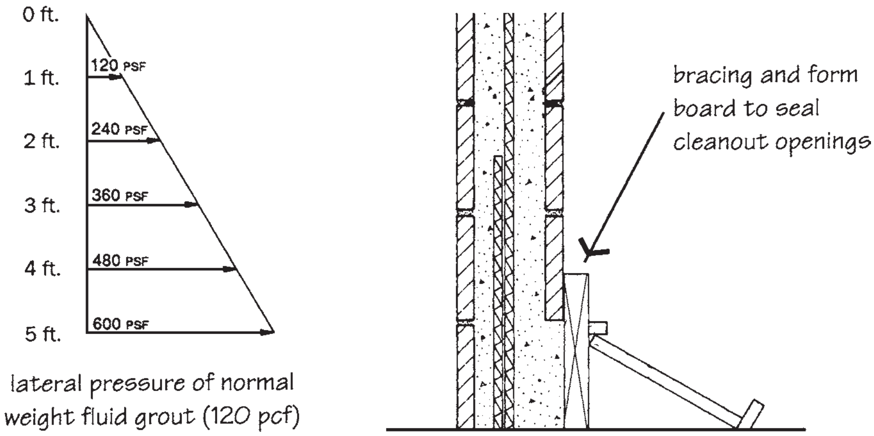


Figure 15-55 Grouting cleanouts and plugs. (*From* Informational Guide to Grouting Masonry, *Masonry Institute of America, 1992.*)

15.4 PREFABRICATED MASONRY

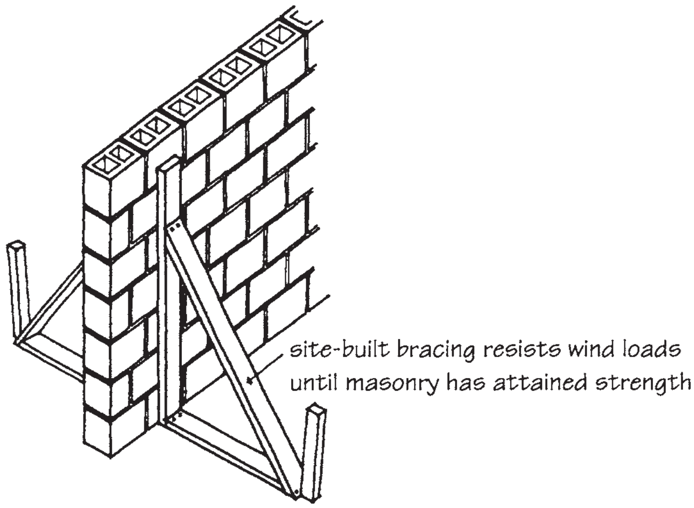
Techniques for prefabricating brick masonry were developed in France, Switzerland, and Denmark during the 1950s, and adopted in the United States in the early 1960s. Reducing on-site labor led the construction industry to use of prefabricated building components, but the masonry industry was a late entrant into the field. The evolution of analytical design methods for masonry, together with improved units and mortars, has made masonry prefabrication a feasible and economical masonry alternative to other systems such as precast concrete (*see Fig. 15-59*).

Prefabrication methods are used most successfully on brick and stone wall panels and spandrel sections backed by lightweight metal frames. A major requirement for the economic feasibility of preassembly is the repetition of design elements in the structure. Large numbers of identical sections may be mass-produced in environmentally favorable locations, then hoisted into place at the job site for field connections. The need for on-site scaffolding can be eliminated, and panelization allows the construction of complicated shapes without the need for expensive falsework and shoring. Quality control is more easily maintained under factory conditions by automating mortar batching systems and standardizing curing conditions. Prefabrication may also shorten the total construction time, allow earlier occupancy, and benefit the owner by increased income and lower interim financing costs.

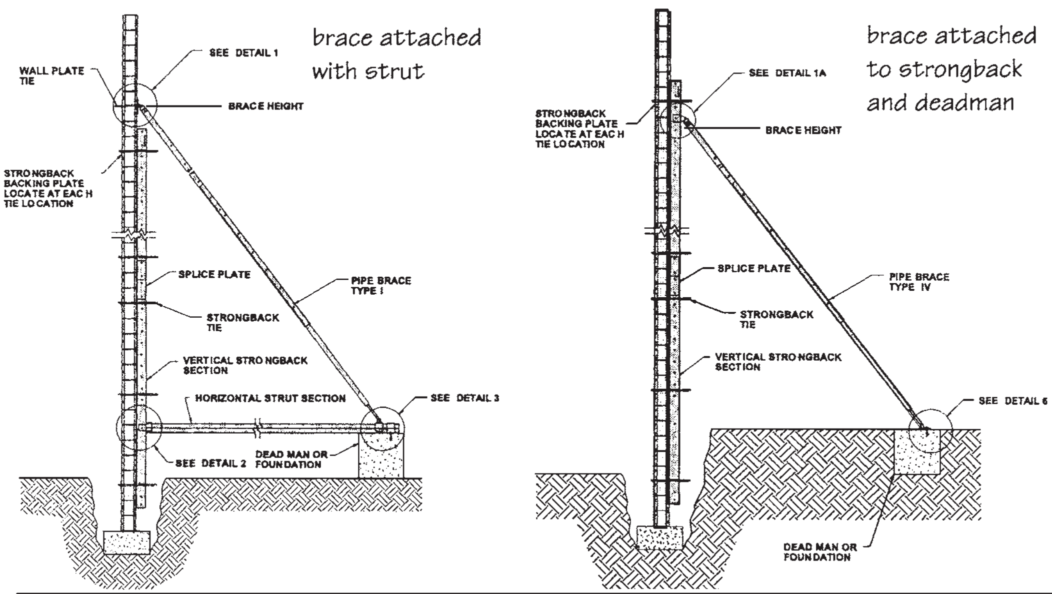
Panel connections for facing materials generally combine the use of shelf angles and welded, bolted, or masonry tie anchors, depending on the type of structural frame used. Allowance must still be made for differential movement between masonry and concrete or steel.

15.5 CONSTRUCTION TOLERANCES

Historically, most construction was done on site and custom fitted. Within generous limits, brick and stone could be laid to fit existing conditions; roof timbers were cut to fit whatever the masons built; and hand-made doors and windows could be made to accommodate the peculiarities of any opening. Today we have metals that are fabricated at the mill, stone that is cut and dressed at the quarry, and concrete that is cast before erection. These prefabricated components are not easily customized on the job, and they must be fitted to site-built frames. Suddenly construction tolerances become very important in ensuring that the puzzle pieces fit together with



(*From NCMA* TEK Bulletin 72.)



(*From Dur-O-Wall* Technical Bulletin 99-2, *1999*)

Figure 15-56 Examples of site-built and proprietary masonry bracing systems.

reasonable accuracy—puzzle pieces that may come from a dozen different manufacturers in a half-dozen competing industries.

Little is exact in the manufacturing, fabrication, and construction of buildings and building components. Tolerances allow for the realities of fit and misfit of the various parts as they come together in the field and ensure proper technical function such as structural safety, joint performance, secure anchorage, moisture resistance, and acceptable appearance. Webster defines tolerance as "the allowable deviation from a standard, especially the range of variation permitted in maintaining a specified dimension."

Each construction trade or industry develops its own standards for acceptable tolerances based on economic considerations of what is reasonable