Bonding-metal strips form a cleavage-plane, and are not very effective once severe fracture has occurred. They are most effective in resisting longitudinal stresses in the wall.

Expanded-metal bond, on the other hand, forms no plane of weakness, and, provided the mortar is sound, it will in most instances prevent complete collapse of a severely ruptured wall. However, it is rather less efficient than the metal band in behaviour under longitudinal stresses in the wall.

It is recommended that expanded metal be used at least every six courses or wire mesh every four courses.

Cross-ties in cavity walls are notably lacking. Their liberal use should be insisted upon.

Reinforced-concrete Bands.—Next to dependable foundations, of paramount importance are the reinforced-concrete bands. Instances have been encountered where plain concrete has been used; and again, where it has been considered merely an architectural feature, the brickwork has been cement-plastered to give that appearance. It is essential that the band be continuous round the whole building, otherwise its object is defeated. A band should be situated at each floor-level and immediately under the wall-plate. Common practice is to reinforce the under-side alone; but the wall develops a bellying movement, like a sail, and steel should be placed on the two sides to take this lateral bending. Particular attention must be paid to the junction of bands at corners, as this point has been a frequent source of failure. A substantial reinforced fillet is beneficial.

It has been objected that the band forms two planes of weakness on its two horizontal faces. For the lower face this is obviously incorrect, as the concrete is poured directly upon the rough brickwork. The upper surface may be chipped or scraped before the concrete has set for bonding with the next course.

Where the distance between successive bands has not been greater than about 12 ft., damage is non-existent or negligible. There are outstanding instances of greater height, but the above limit is recommended for safety.

In two collapsed walls it is noted that the cavity has been carried up through the band.

Floor Systems.—Floor beams or joists must be securely anchored into the reinforced-concrete bands. A reinforced-concrete floor system with beams monolithic with the bands undoubtedly gives most satisfaction and a positive means of tying the walls.

Partition Walls.—Brick partition walls, unless built into concrete floors above and below, require a reinforced-concrete band securely tied into the bands of the main walls.

Window Areas.—A consideration of more importance in brick construction than any other type is the avoidance of window or door areas near corners of the building.

Gables.—Gable end-walls require careful treatment. Tying securely to roof-joists, rafters, or roof-principals, with anchor-bolts and heavy washers, has proved successful, but is not an infallible remedy unless the roof is well braced against the longitudinal movement and the gable not too extensive. A light reinforced-concrete band over the larger gable-walls will give a more positive medium into which to sink the anchor-bolts.

Roof-trusses.—Weak anchorage of wall-plates to band frequently caused collapse by allowing walls to spread. Similarly, roof-trusses insecurely attached to the bands or merely bedded in a course of brickwork were a primary cause of failure. No claim of superiority can be ventured for any particular type of truss, the light and the heavy construction being equally associated with successful and unsuccessful resistance to the shocks. In no case can failure be attributed to the trusses directly, except in so far as inadequate anchorage was concerned.

That the most satisfactory type of roof-truss to use with brick bearing-walls is one of the knee-braced type, there seems no doubt. In the three instances in which it has been used locally it appears to have had a considerable bracing effect and been a definite factor in preserving the stability of the walls.

Façades.—The earthquake has revealed a striking feature in building-construction that is current in probably all New Zealand towns. This is the provision of massive and imposing architectural façades of brick or concrete, disguising flimsy interior frames of timber or light brickwork. In most cases no effort was exerted to tie these adequately to the framework, so that the front portion crashed to the ground or became dislodged and had to be demolished. Owing to the heavy strains that would be induced in the structure and the difficulty of tying the two together effectively, a heavy ornamental façade to a timber frame should be prohibited. It is not sufficient to rely upon brick interior and end walls to tie back these façades unless the bands of each are thoroughly interlaced.

Parapets, &c.—The peril resulting from high parapet walls balanced above a building, of heavy cornices, and of projecting pediments needs no emphasis to one who has visited this area. It is recommended that all parapets be of reinforced concrete continuous from the band, or, if of brick, limited to four courses above the band.

Pillars, &c.—Brick piers and pillars, &c., should not be tolerated under any circumstances, as, by the nature of the material, it is not to be expected to withstand the heavy shear and bending stresses induced by an earthquake.

Towers.—The erection of towers warrants serious consideration in all types of construction, but is most reprehensible in brick designs. As an inelastic construction, it is least adapted to structures of irregular elevation.

General.—Whereas in timber and reinforced-concrete construction the oversight of one important point will, in all possibility, result in fracture and damage to a greater or lesser extent, the neglect of one cardinal principle in brick design is liable to precipitate complete collapse and disaster. Hence, the necessity for competent and careful design and workmanship cannot be overstressed. No examples of buildings of this type over two stories high are available here, but the impression gained is that every confidence can be placed in its behaviour at least to these dimensions.