5.00 Building Structure

5.01 Generally

As a general principle, GU requires the design of its new buildings to incorporate flexibility for future changes in internal layout or use. This requirement should be reflected in the design of the building structure. GU does not seek to impose any structural design principles or methodologies on Consultants or Contractors, however it does require a structural design which combines both flexibility and economy.

5.02 Floor to Floor Heights

Floor to floor heights should be kept to a minimum while at the same time allowing sufficient space in ceilings for services distribution to maintaining a minimum ceiling height of 2.70m. Floor to floor height should match adjacent buildings if appropriate.

5.03 Location of Columns

Careful consideration must be given to the location of columns within the building. Columns located on the centre line of the building generally impose constraints on the layout of the floors, particularly those levels incorporating Academic Offices. As it is the general policy of GU to locate Academic Offices on the external wall of the building to provide maximum natural light to these spaces, and all offices are generally of equal size, this often results in a central corridor which must not be obstructed by columns.

Columns within the body of a functional space should be avoided wherever possible. This applies in particular to Lecture Theatres and Seminar Rooms.

Clear span slabs with no intermediate columns are desirable if budgetary constraints permit.

5.04 Slabs

Floor slabs shall be designed for the most economical construction and flexibility of use with due consideration to long-term deflections and the need to provide for penetrations both initially and during the course of the building's life.

All buildings shall be designed for floor loadings generally in accordance with AS 1170.

Library stack areas shall be designed for floor loadings of 6.0kN/m^2 provided that stack height is limited to 2.3m.

Provision shall be made for the installation of compactus shelving and other areas of special loading if specifically nominated by the Space Description Forms.

The slab design shall provide for the need to core holes, now or at a later date, up to 200mm diameter adjacent to columns, or to provide penetrations up to 1200mm square in selected areas.

All floors are to be finished within a maximum tolerance of $\pm$ 3mm in a 3000mm straight edge.

Thermal resistance (R-values) of the floor is to be >1.0m^2 K/W.

As stated in the previous Clause, clear spanning slabs without intermediate support are desirable. In designing such slabs, consideration should be given to the depth of beams to accommodate ductwork and other services suspended below the slab without unnecessarily increasing the floor to floor height.

If post tensioned slabs are installed, the location of all tendons must be marked on the underside of the slab to ensure that any future core holes cut in the slab do not intersect any stressing cables.

Construction and expansion joints shall be positioned to minimise cracking and to avoid unsightly gaps in floors and wall as a result of long term movement of the structure.

All internal floor slabs on ground shall be placed on moisture barrier equivalent to 300 micron thick 'Fortecon' polythene membrane, turned up at the perimeter and with all joints sealed.

5.05 Structural Walls

Concrete or masonry walls should be kept to minimum to ensure flexibility for future internal modifications or alterations. Masonry walls should be limited to lift shafts, fire stairs and plant rooms wherever possible. Masonry walls required for bracing purposes should be carefully located so as not to impact severely on flexibility.

5.06 Tanking

Floors, walls and lift pits shall be fully tanked where below grade or subject to hydrostatic pressure.

5.07 Termite Control

Protection from subterranean termites shall be provided to all new buildings. All workmanship and materials shall conform to the requirements of AS 3660 Part 1: New Building Work.

All tree stumps and root boles which have been exposed during excavation, together with any dead logs and other timber debris, shall be removed from the building site.

Stainless steel mesh barriers which comply with the requirements of Section 6 of AS 3660.1, are to be used to provide protection against termite entry. Stainless steel mesh barriers shall also be used between the slab edge and the wall, and across wall cavities in masonry wall structures. The use of chemically impregnated barrier systems shall not be used without the specific approval of the Superintendent.

Termite caps or strip shielding complying with the requirements of Section 5 of AS 3660.1 shall be installed on all foundation walls, piers, stumps and other substructures in such a manner that the structure is isolated by the barriers from the substructure.

The Contractor shall provide the Superintendent with a Certificate of Installation in accordance with AS 3660.1 Appendix A, from the installer of the termite management system.

5.08 Sealing Penetrations

Fire rated sealing of penetrations through floors and walls shall be done in accordance with the requirements of the BCA and AS3000. Fire rated floor slabs and walls must have their fire-stopping capabilities restored after the installation of cabling, conduits, cable trays, ducting or pipework which pass through any penetrations. 'Hilti Firestop' foam, blocks, logs, plugs and mastic, or tested equal, are the preferred materials for the sealing of penetrations through fire rated floors and walls, installed strictly in accordance with the manufacturers printed instructions.