SECTION 2. DESIGN OF WALLS FOR AXIAL COMPRESSION

The tables in this section can be used to directly establish the compression load capacity of 140 ***mortarless*** masonry walls of a wide range of heights and lengths constructed with masonry units of Grade 15 or 20, and grouted with concrete of Grade 15, 20 or 25.

Design Procedure: Axial Compression

Step 1: Calculate ultimate limit state load on the wall.

Step 2: Select a *mortarless* block size and strength (grade) based on local availability and price, and any other requirements (architect's requirements, fire rating, sound rating, thermal rating etc).

Step 3: Based on the wall height and/or length, and the end restraint conditions, check that the minimum requirements for robustness will be satisfied with the selected block. (Refer Part 3 Section 1)

Step 4: Calculate the effective eccentricity at the top and bottom of the wall panel (e_1 and e_2 respectively) to represent the end bending moments. (Refer Part 3 Section 2.2). Note that for design purposes the eccentricity (e_2) at the bottom of each storey height panel of wall will be zero.

Step 5: Ascertain whether the wall height *H* or the wall length *L* will be used to determine compression load capacity (refer Part 3 Section 2.2), but if in doubt use the wall height *H.*

Step 6: If the wall height *H* is to be used, calculate the eccentricity e_1 and eccentricity ratio e_2/e_1 for the wall panel. (Note again that generally the eccentricity ratio will be equal to zero because the eccentricity at the base of the base will be taken as zero for design purposes.) Use the appropriate of Tables 1 – 5 in Sections 2.2.1 to 2.2.4 for the selected block grade, grout strength and effective height factor (a_v) to determine the maximum design load in compression based on the actual height *H* of the wall panel.

Step 7: If the wall length *L* is to be used, calculate the eccentricity e_1 at the top of the wall panel. Use the appropriate of Tables 6 – 15 in Sections 2.2.1 to 2.2.4 for the selected block grade, grout strength, effective height factor (a_v), and effective length factor (a_h) to determine the maximum design load in compression. Note that the square root of *HxL* is used in these tables to determine the maximum design load for the wall panel.

Step 8: If the load capacity is not adequate, make the necessary adjustments to block strength, grout strength or wall thickness etc and check again.

Fire, sound attenuation etc:

Step 9: Check that the wall satisfies all other requirements in terms of durability, slenderness, thickness etc.