5.9. DESIGN AND DETAILING RULES FOR COMPOSITE STEEL PLATE STRUCTURAL WALLS

5.9.1. Specific criteria

5.9.1.1 – Composite steel plate shear walls shall be designed to yield through shear of the steel plate.

5.9.1.2 – The steel plate should be stiffened by one or two sided concrete encasement and attachment to the reinforced concrete encasement in order to prevent buckling of steel.

5.9.2. Analysis

The analysis of the structure should be based on the materials and section properties defined in **5.2.2** and **5.4**.

5.9.3. Detailing rules

5.9.3.1 – It shall be checked that

$$V_{\mathrm{Ed}} < V_{\mathrm{Rd}} \qquad \textbf{(5.14)}$$

with the shear resistance given by:

$$V_{\mathrm{Rd}} = A_{\mathrm{pl}} \frac{f_{\mathrm{yd}}}{\sqrt{3}} \qquad \textbf{(5.15)}$$

where f_{yd} is the design yield strength of the plate and A_{pl} is the horizontal area of the plate.

5.9.3.2 – The connections between the plate and the boundary members (columns and beams), as well as the connections between the plate and the concrete encasement, shall be designed such that full yield strength of the plate can be developed.

5.9.3.3 – The steel plate shall be continuously connected on all edges to structural steel framing and boundary members with welds and/or bolts to develop the yield strength of the plate in shear.

5.9.3.4 – The boundary members shall be designed to meet the requirements of **5.8**.

5.9.3.5 – The concrete thickness should be not less than 200 mm when it is provided on one side and 100 mm on each side when provided on both sides.

5.9.3.6 – The minimum reinforcement ratio in both directions shall be not less than 0,25%.

5.9.3.7 – Openings in the steel plate shall be stiffened as required by analysis.