3.1.6. Material requirements

3.1.6.1 – In buildings of both *Low Ductility Class* (DCL) and *Normal Ductility Class* (DCN) reinforcing steel of class B or C in EN 1992-1-1:2004, Table C.1 shall be used.

3.1.6.2 – The following material requirements shall apply for buildings of *Nominal Ductility Class* (DCN):

(a) Concrete of a class lower than C 16/20 shall not be used.

(b) Only ribbed bars shall be used as reinforcing steel.

(c) Welded wire meshes may be used, if they meet the requirements in **(b)** above and in **3.1.6.1**.

3.1.7. Local ductility requirements

3.1.7.1 – For the required overall ductility of the structure to be achieved, the potential regions for plastic hinge formation, to be defined later for each type of building element, shall possess high plastic rotational capacities.

3.1.7.2 – In order to satisfy the requirement given in **3.1.7.1**, the following conditions shall be met:

(a) The curvature ductility factor μ_φ of all critical regions of elements, including column ends (depending on the potential for plastic hinge formation in columns) shall be at least equal to the following values:

$$\begin{aligned} \mu_\varphi &= 1 + 2\left(\frac{q}{I} - 1\right)\frac{T_S}{T_1} && (0 \le T_1 \le T_S) \\ \mu_\varphi &= 2\frac{q}{I} - 1 && (T_S < T_1) \end{aligned} \qquad \textbf{(3.3)}$$

(b) Local buckling of compressed steel within potential plastic hinge regions of primary seismic elements shall be prevented. Relevant application rules are given in **3.2.3**, **3.3.3** and **3.4.3**.

3.1.7.3 – Appropriate concrete and steel qualities are adopted to ensure local ductility as follows:

(a) Steel used in critical regions of seismic elements should have high uniform plastic elongation (see **3.1.6.1**);

(b) Tensile strength to yield strength ratio of the steel used in critical regions of primary seismic elements should be significantly higher than unity. Reinforcing steel conforming to the requirements of **3.1.6.1** may be deemed to satisfy this requirement;

(c) Concrete used in primary seismic elements should possess adequate compressive strength and a fracture strain which exceeds the strain at the maximum compressive strength by an adequate margin. Concrete conforming to the requirements of **3.1.6.2** may be deemed to satisfy these requirements.

3.1.7.4 – In critical regions of elements with longitudinal reinforcement of steel class B in EN 1992-1-1:2004, Table C.1, the curvature ductility factor μ_φ should be at least equal to 1.5 times the value given by **Eq.(3.3)**.