Text consolidated by Valsts valodas centrs (State Language Centre) with amending regulations of:

7 August 2018 [shall come into force from 14 August 2018].

If a whole or part of a paragraph has been amended, the date of the amending regulation appears in square brackets at the end of the paragraph. If a whole paragraph or sub-paragraph has been deleted, the date of the deletion appears in square brackets beside the deleted paragraph or sub-paragraph.

Republic of Latvia

Cabinet

Regulation No. 794

Adopted 23 December 2014

**Regulations Regarding the Latvian Construction Standard LBN 204-14, Design of Steel Structures**

*Issued pursuant to*

*Section 5, Paragraph one, Clause 3 of the Construction Law*

1. The Regulation approves Latvian Construction Standard LBN 204-14, Design of Steel Structures (hereinafter – the Latvian Construction Standard LBN 204-14).

2. The Ministry of Economics shall, in cooperation with the relevant technical committee for standardisation, recommend the national standardisation authority a list of standards that need to be developed, adapted, and applied in connection with this Regulation.

[*7 August 2018*]

3. The national standardisation body shall publish on its website a list of Latvian national standards and annexes to the relevant standards to be applied for the purpose of enforcement of the Latvian Construction Standard LBN 204-14.

[*7 August 2018*]

4. Steel structures shall be designed in accordance with the Eurocode standards and their national annexes which are in effect on the day when the designing is commenced.

5. If structures designed until the day of coming into force of this Regulation are being rebuilt or renewed, also such structures which correspond to the construction standards for the design of structures that were in force from 1988 until the day when this Regulation comes into force, shall be deemed as suitable structures in local inspections of steel structural elements if the following conditions are concurrently fulfilled:

5.1. load on the structural element does not increase after rebuilding or renewal;

5.2. the scheme for the calculation of the structural element does not change;

5.3. above-level deflections or other signs of the unsafeness of structures are not found in the technical inspection.

6. Building designs which have been accepted or submitted to a building authority for evaluation until the day when this Regulation comes into force and the technical solutions of which correspond to the requirements of laws and regulations in force at the relevant time need not to be reworked according to the requirements of the Latvian Construction Standard LBN 204-14. Building designs which have been developed on the basis of planning and architectural orders issued until 1 October 2014 need not be reworked according to the requirements of this Regulation.

7. The Regulation shall come into force on 1 January 2015.

Prime Minister Laimdota Straujuma

Minister for Economics Dana Reizniece-Ozola

(Approved by

Cabinet Regulation No. 794

of 23 December 2014)

**Latvian Construction Standard LBN 204-14,**

**Design of Steel Structures**

1. The construction standard shall prescribe the requirements to be complied with when designing steel structures for buildings and engineering structures.

2. Eurocode standard LVS EN 1990, Eurocode – Basis of structural design, standards of Eurocode 1 family of design standards LVS EN 1991, Eurocode 1: Actions on structures, and standards of Eurocode 3 family of design standards LVS EN 1993, Eurocode 3: Design of steel structures, the list of which and their relevant national annexes are published by the national standardisation body on its website shall be applied in designing steel structures.

[*7 August 2018*]

3. Alternative solutions which differ from the provisions of Eurocode standards may be used in designing steel structures if a justification is provided for the non-use of the intended solution and if the alternative solutions correspond to the principles included in the Eurocode and they warrant the structures almost the same level of safety, suitability for operation and survivability as might be expected when using the Eurocode.

4. The requirements for the welded joints:

4.1. it shall be required to mark the welded joints in the design according to the requirements of the applicable standard, providing a reference thereto in the general instructions of the design. It shall be required to indicate either the calculated thickness of the weld (a), or the cathetus of the weld (z) according to Figure 1; it shall be permissible to use the designations of welds hitherto used in Latvia for the designation of the welds if a detailed explanation of designations is provided in the sheet of the general indicators of the design;

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Figure 1.

4.2. the dimension and form of corner seams of welded joints shall be determined in conformity with the following conditions:

4.2.1. the thickness (cathetus) of the corner seam may not exceed a ≤ 0.85 t (z ≤ 1.2 t), where t – thickness of the thinnest element to be joined;

4.2.2. if the corner seam is created at the rounded corner of a rolled profile (with the nominal thickness t), the thickness (cathetus) shall not exceed a ≤ 0.65 t (z ≤ 0.9 t);

4.2.3. the thickness (cathetus) of the corner seam shall be determined according to the calculation but not smaller than indicated in Table 1;

4.2.4. special technological conditions must be taken into account for steel with the liquid limit above 460 Mpa and also for steel elements with thickness above 80 mm for corner seams;

4.2.5. it is preferable to determine the ratio of the catheti of the corner seams as 1:1. If the thickness of the elements to be welded is different, it shall be permissible to form seams with different catheti in conformity with the requirements laid down in Sub-paragraphs 4.2.1, 4.2.2, and 4.2.3 of this Construction Standard.

Table 1

|  |  |  |  |
| --- | --- | --- | --- |
| Type of joint | Type of welding | Liquid limit of steel MPa | Minimum dimensions of welds a (z) (mm) at the thickest element to be joined t (mm) |
| 4–5 | 6–10 | 11–16 | 17–22 | 23–32 | 33–40 | 41–80 |
| T-shaped joint with bilateral welding; joint of the overlap and the corner | Manual welding | up to 285 | 2.8 (4) | 2.8 (4) | 2.8 (4) | 3.5 (5) | 3.5 (5) | 4.3 (6) | 4.3 (6) |
| above 285 up to 460 | 2.8 (4) | 3.5 (5) | 4.3 (6) | 5 (7) | 5.7 (8) | 6.4 (9) | 7.1 (10) |
| Automatic and semi-automatic welding | up to 285 | 2.2 (3) | 2.8 (4) | 2.8 (4) | 3.5 (5) | 3.5 (5) | 4.3 (6) | 4.3 (6) |
| above 285 up to 460 | 2.2 (3) | 2.8 (4) | 3.5 (5) | 4.3 (6) | 5 (7) | 5.7 (8) | 6.4 (9) |
| T-shaped joint with unilateral corner seam | Manual welding | up to 380 | 3.5 (5) | 4.3 (6) | 5 (7) | 5.7 (8) | 6.4 (9) | 7.1 (10) | 8,5 (12) |
| Automatic and semi-automatic welding | 2.8 (4) | 3.5 (5) | 4.3 (6) | 5 (7) | 5.7 (8) | 6.4 (9) | 7.1 (10) |

Derogations from these requirements shall be permissible only on the basis of a detailed design for the performance of welding work which includes a detailed description of the technological process (the requirements specified for the temperature and control of the elements to be welded).

5. Upon designing steel structures, it shall be necessary to conform to the following limit on the slenderness of elements:

*λ i ≤ λ u* ,

where *λ i = Lef / i*

*λ i*– slenderness of the element;

*λ u*– ultimate slenderness;

*Lef* – length of the calculated element;

*i*– inertia radius of the element;

5.1. slenderness of compressed elements of steel structures shall not exceed the values indicated in Table 2;

5.2. slenderness of drawn elements of steel structures shall not exceed the values indicated in Table 3;

5.3. slenderness of the element shall be calculated, taking into account the calculated length of the element determined according to the instructions of specific technical literature which is not in contradiction with the requirements of Eurocode.

Table 2

|  |  |
| --- | --- |
| Elements of structures | Ultimate slenderness of drawn elements*λ* u |
| 1. Bracings and struts transferring the band and support reaction of plane busbars and structural constructions from pipes and pair angle bars: |  |
| a) in height up to 50 m; | 150 |
| b) in height above 50 m. | 120 |
| 2. Not referred to in Paragraph 1: |  |
| a) elements of plane busbars and structural constructions from pipes and pair angle bars; | 180 |
| b) elements of structural constructions from one angle iron attached with a bolted attachment. | 200 |
| 3. Main columns. | 150 |
| 4. Ancillary columns (poles of the wall framework and overhead lighting and similar), elements of the column grate, elements of the vertical couplings of columns (below the beams of the crane path). | 180 |
| 5. The elements of couplings not indicated in Paragraph 4 and also bars reducing the calculated length of drawn bars and other unloaded elements. | 200 |

Table 3

|  |  |
| --- | --- |
| Elements of structures | Ultimate slenderness of drawn elements*λ* u if the structure is exposed to |
| dynamic load | static load |
| 1. Band and support bracings of plane busbars and structural constructions. | 250 | 400 |
| 2. Elements of busbars and structural constructions not referred to in Paragraph 1. | 300 | 400 |
| 3. Elements of vertical couplings of columns (below the beams of the crane path). | 300 | 300 |

Notes:

1. If structures are not bearing dynamic load, the slenderness of drawn elements must be checked in vertical plane only.

2. Slenderness of previously stressed drawn elements is not limited.

3. If due to unfavourable placement of load the sign of internal forces may change, the ultimate slenderness for drawn elements must be determined in the same manner as for drawn elements.

4. Loads according to which the strength of the elements of the structure are calculated and also loads the calculated value of which is determined, using the dynamic amplification factor, shall be regarded as directly applied dynamic loads.

Derogations from these requirements shall be permissible only on the basis of a detailed design of making and assembly which is justified by calculations, providing for the relevant additional requirements both for tolerance and their control. These requirements shall not apply to the suspension elements in structures.

6. Thermal actions:

6.1. thermal actions on structures caused by changes in thermal and service temperature must be taken into account in building designs if due to the thermal movement and/or tensions there is a possibility of exceeding the load-bearing or serviceability limit states;

6.2. thermal actions need not be viewed for the structures which are not exposed to the daily and seasonal climate changes and also changes in the temperature caused by operation.

Minister for Economics Dana Reizniece-Ozola