

GOLDBECK	QUALITY CONTROL DOCUMENT	01/W/KJ/2025/T
	TECHNICAL REQUIREMENTS FOR THE CONSTRUCTION OF REINFORCED CONCRETE PREFABRICATES	01/W/KJ/2025/R
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1. Scope

The following technical requirements cover the manufacture of reinforced concrete prefabricates at the GOLDBECK Prefab Elements Sp. z o.o. production plant.

2. General information

GOLDBECK Prefab Elements Sp. z o.o. manufactures reinforced concrete prefabricates based on the technical conditions outlined below, which were developed on the basis of current European standards. Before signing a contract, the parties may agree on individual conditions for the manufacturing of individual prefabricated elements. Manufactured elements require preparation for painting by the customer. The elements are not made of architectural concrete. Lime efflorescence is a natural process of concrete maturation and is not a basis for complaint.

3. Requirements for fabricated bar elements

Bar structural elements include columns, beams, rafters, stringers, replacements, girders, etc. Requirements based on the PN EN 13225 standard.

3.1. Tolerances

- Tolerance on the length of the element $\Delta L = \pm (10+L/1000) \leq 40$ mm
- Tolerance on the cross-section of the element depending on the nominal cross-sectional dimension:
 - For $L \leq 150$ mm $\Delta h_a, \Delta h_b$ is +10; -5 mm
 - For $L = 400$ mm $\Delta h_a, \Delta h_b$ is +15; -10 mm
 - For $L \geq 2,500$ mm $\Delta h_a, \Delta h_b$ is ± 30 mm
- Angular deviation tolerance of end sections δ is $h/100 \leq 5$ mm
- Tolerance of lateral flexure of each main surface ϵ is $L/700$
- Tolerance of convexity in the vertical plane (beam) Δv is $L/700^*$
- Tolerance for obliquity of the central vertical plane (beam) θ is $L/700$
- Tolerance for accessory mounting:
 - For linear elements the deviation along the length is ± 20 mm, offset in the axis is ± 20 mm, facing the element is ± 10 mm
 - For steel embed plates and fittings deviation along the length is ± 20 mm, offset in the axis is ± 20 mm, facing the element is ± 10 mm
- Tolerance for holes and cut-outs in dimension is ± 10 mm, in position is ± 25 mm

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*In the case of prestressed elements, a tolerance of 1.5 times is adopted (this value includes the effects of the tolerance associated with prestressing).

L - nominal linear dimension expressed in mm; h - the section dimension under consideration expressed in mm

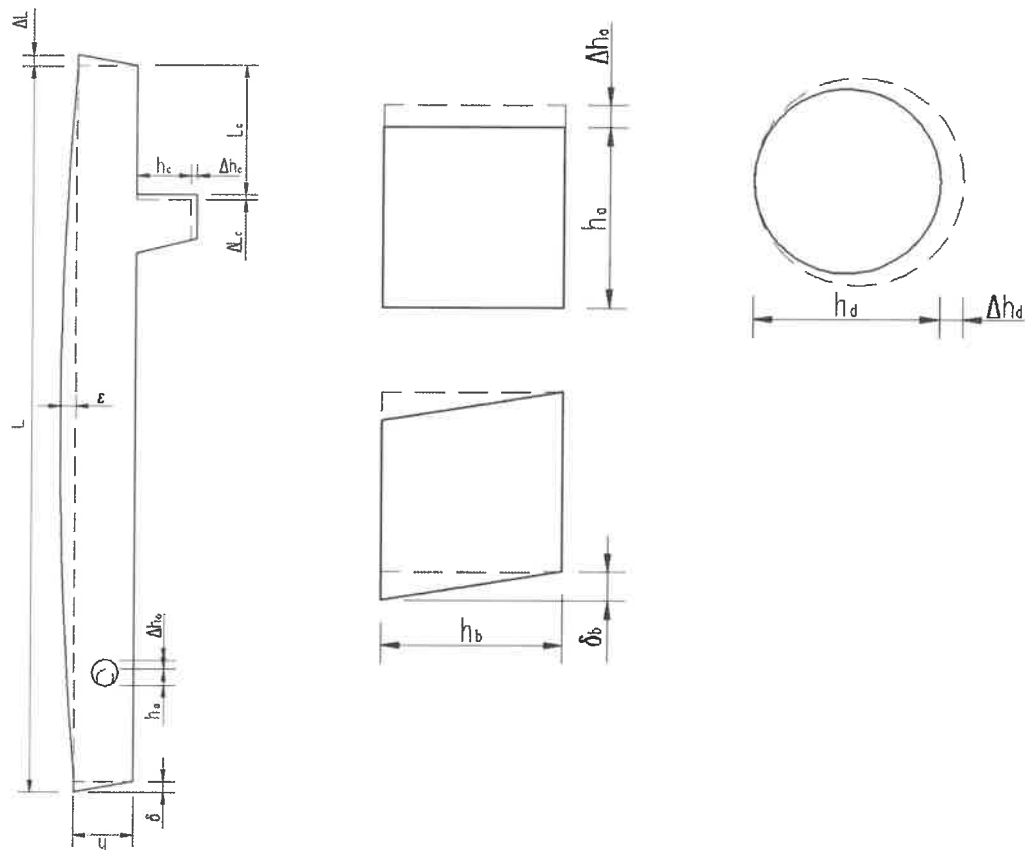


Fig.1 Dimensional tolerances for columns.

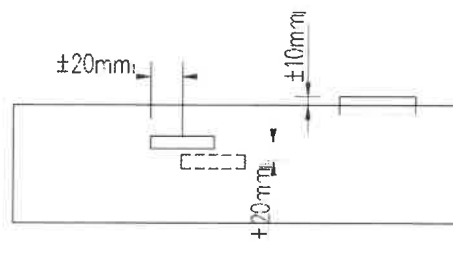


Fig.2 Tolerances for embedding of accessories.

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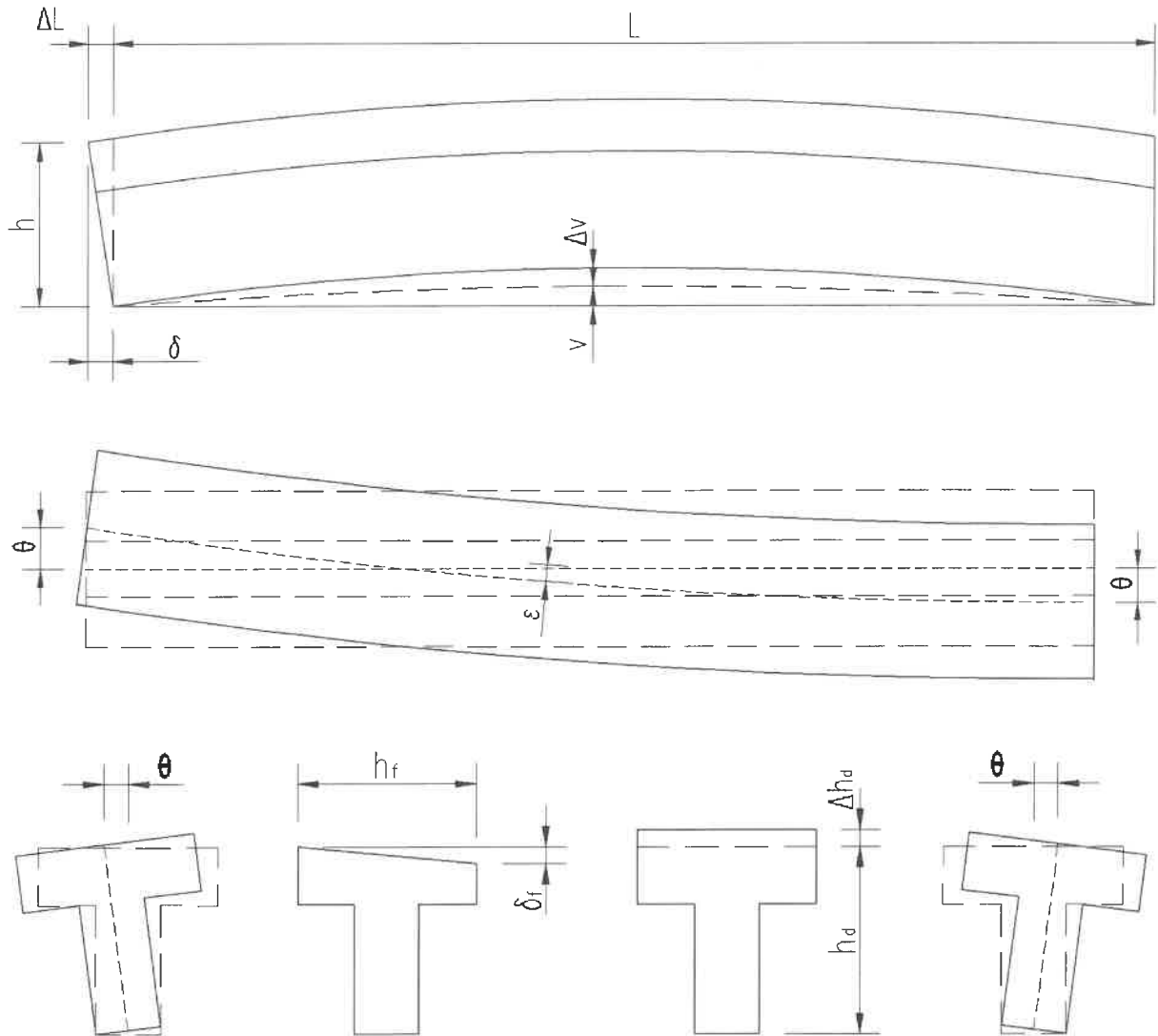


Fig.3 Dimensional tolerances for beams.

3.2. Surface finish

- Prefabricated elements are made in wooden formwork (shuttering plywood) or metal formwork. They have three smooth sides from the formwork and one surface is treated by mashing, roughening, rolling, etc., depending on how the construction documentation states. The edges of the prefabricated elements are interrupted with triangular strips if the construction documentation does not provide otherwise.

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- Formwork surfaces are smooth, but require mudding before painting work. The elements may have bubbles (pores) up to 5 mm deep and are allowed to occur with a diameter of $2\text{ mm} < d < 15\text{ mm}$ in the amount of $2,250\text{ mm}^2$ on a reference area of $0.5\text{ m} \times 0.5\text{ m}$. Visible formwork joints are allowed to occur.
- In accordance with the requirements of the standard, there is a possibility of the occurrence of cracks with a dilation of up to 0.3 mm (0.2 mm prestressed elements).
- Differences in the color of individual prefabricated elements resulting from the properties of the raw materials used are allowed. The rubbed surface may have a non-uniform gray color differing in color from the formwork surface, which is due to differences in manufacturing technology. On the matted surface there may be different shades of gray, stains, streaks, abrasions. On the formwork surface there may be different shades of gray streaks, stains, reflections of spacers, shadows of reinforcement. The condition of homogeneity of prefabricated elements must be clearly specified by the customer in the order and is the basis for charging additional fees for facade concrete. In facade concretes, the uniformity of color is evaluated from a point covering the full contour of the object.
- Traces due to use of spacers during storage and transportation of prefabricated elements are allowed.
- It is permissible to make local cosmetic corrections with jointing compounds or grinding, which may affect the lack of color uniformity.
- In the case of the presence of reinforcement extending beyond the face of the concrete, the reinforcement may be stained with concrete, which results from the technology of prefabrication. It is possible to protect the ends of weaves in prestressed elements against corrosion for an additional fee.

4. Requirements for fabricated wall elements

Wall structural elements include walls, foundations, etc. Requirements based on PN EN 14992.

4.1. Tolerances

- Tolerances **ΔL** of length, thickness **ΔB**, height **ΔH**, diagonals **|d₁-d₂|** for class A depending on the dimension of the element:
 - For 0 - 0.5 m is $\pm 3\text{ mm}$ (for small cladding elements is $\pm 2\text{ mm}$)
 - For >0.5 - 3 m is $\pm 5\text{ mm}$ (for small cladding elements is $\pm 2\text{ mm}$)
 - For >3 - 6 m is $\pm 6\text{ mm}$
 - For >6 - 10 m is $\pm 8\text{ mm}$
- Tolerances **ΔL** of length, thickness **ΔB**, height **ΔH**, diagonals **|d₁-d₂|** for class A depending on the dimension of the element:
 - For 0 - 0.5 m is $\pm 8\text{ mm}$

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- For >0.5 - 3 m is ± 14 mm
- For >3 - 6 m is ± 16 mm
- For >6 - 10 m is ± 18 mm
- Location tolerances for holes and inserts:
 - For class A is ± 10 mm
 - For class B is ± 15 mm
- Tolerances for flatness of the element
 - For class A, the tolerance at a distance of 0.2 m between measuring points is 2 mm, and at a distance of 3 m is 5 mm
 - For class B, the tolerance at a distance of 0.2 m between measuring points is 4 mm, and at a distance of 3 m is 10 mm
- Location tolerances of the electrical box
 - For class A, the position tolerance for longitudinal and transverse position is ± 10 mm, and for horizontal position is +3; -5 mm
 - For Class B, the position tolerance for longitudinal and transverse position is ± 15 mm, and for horizontal position is +3; -5 mm
- The tolerance for the location of holes and cut-outs is ± 10 mm in the height and width of the element
- Tolerance for embedding accessories:
 - For linear elements deviation in length is ± 20 mm, offset in axis is ± 20 mm, facing the element is ± 10 mm
 - For steel embed plates and fittings deviation along the length is ± 20 mm, offset in the axis is ± 20 mm, facing the element is ± 10 mm

Class A - applies to mold-side surfaces; class B - applies to other surfaces

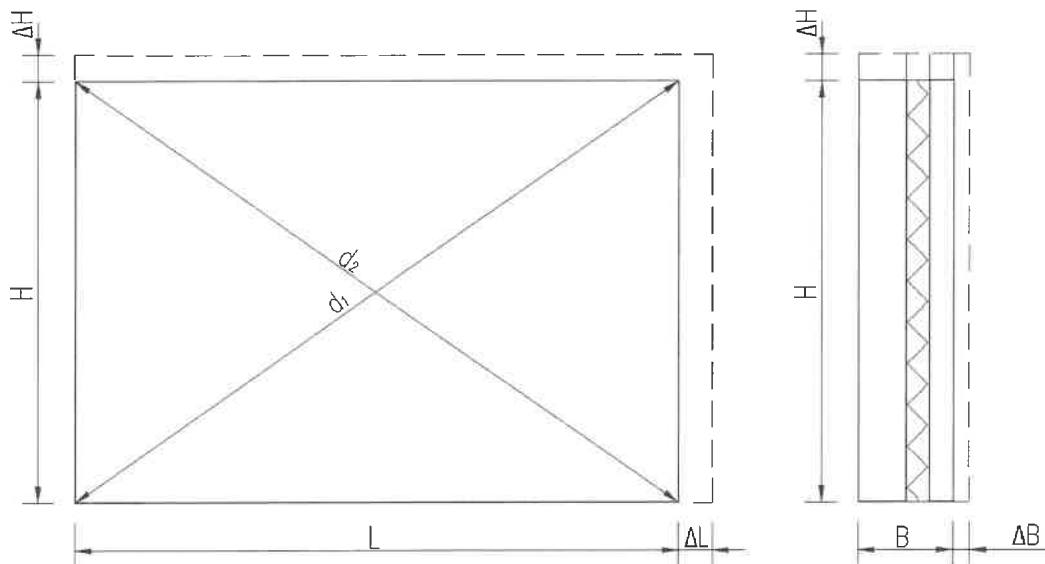


Fig.4 Dimensional tolerances for walls.

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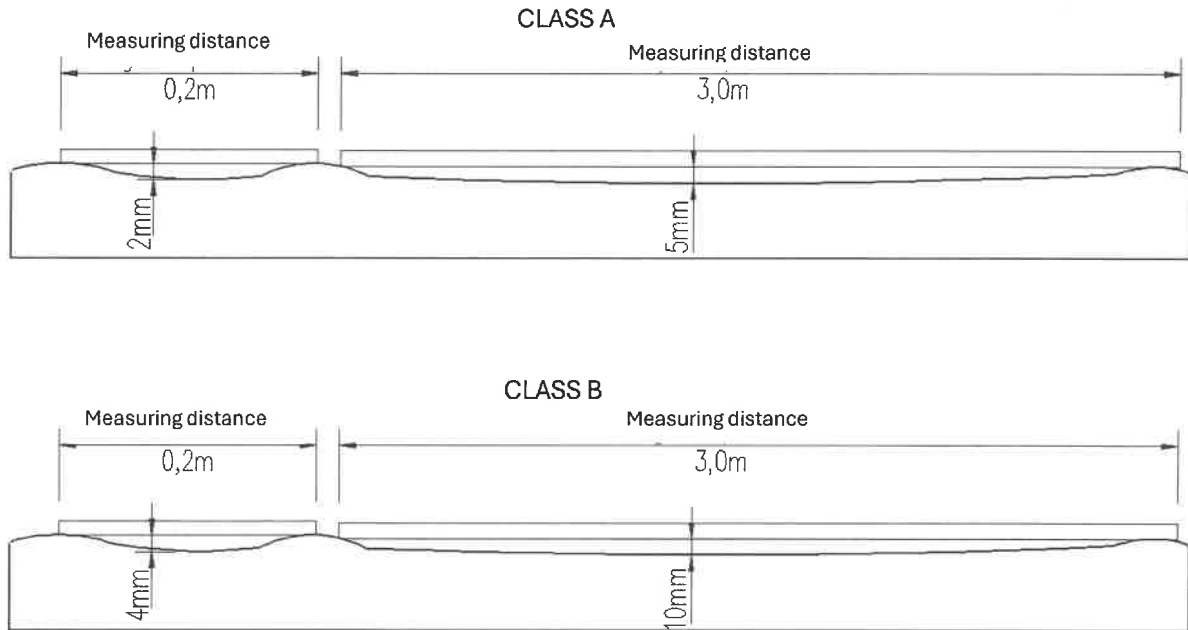


Fig.5 Tolerances for flatness of the element.

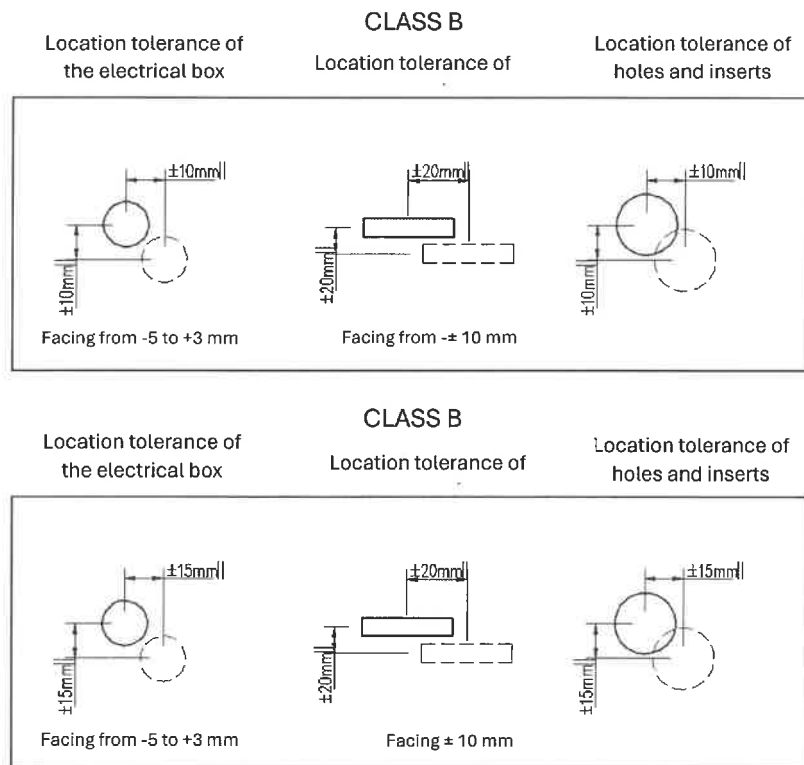


Fig.6 Embedding tolerances for electrical outlets, accessories, holes and inserts.

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4.2. Surface finish

- Prefabricated elements are made in wooden formwork (shuttering plywood) or metal formwork. They have three smooth sides from the formwork and one surface is treated by mashing, roughening, rolling, etc., depending on how the construction documentation states. The edges of the prefabricated elements are interrupted with triangular strips if the construction documentation does not provide otherwise.
- On the surface from the formwork is allowed to occur local cavities (pores) with a depth of 2 mm, and the total area with uniform occurrence of cavities may not exceed 2% of the total evaluated area. The area of individual bubbles must not exceed 1 cm².
- In accordance with the requirements of the standard, there is a possibility of the occurrence of cracks with a dilation of up to 0.3 mm.
- Differences in the color of individual prefabricated elements resulting from the properties of the raw materials used are allowed. The rubbed surface may have a non-uniform gray color differing in color from the formwork surface, which is due to differences in manufacturing technology. On the mashed surface there may be different shades of gray, stains, streaks, abrasions. On the formwork surface there may be different shades of gray streaks, stains, reflections of spacers, shadows of reinforcement. The condition of homogeneity of prefabricated elements must be clearly specified by the customer in the order and is the basis for charging additional fees for facade concrete. In façade concretes, the uniformity of color is evaluated from a point covering the full contour of the object.
- Traces due to use of spacers during storage and transportation of prefabricated elements are allowed.
- It is permissible to make local cosmetic corrections with jointing compounds or grinding, which may affect the lack of color uniformity.
- In the case of the presence of reinforcement extending beyond the face of the concrete, the reinforcement may be stained with concrete, which results from the technology of prefabrication.

5. Requirements for fabricated floor elements - composite floors

Requirements based on the PN EN 13747 standard.

5.1. Tolerances

- Tolerance on nominal length **ΔL** is ± 20 mm
- Tolerance on nominal width **ΔB** is + 5, - 10 mm

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- Tolerance on nominal thickness ΔH is + 10, -X mm where $X = \min(h_p/10; 10 \text{ mm}) \geq 5 \text{ mm}$; h_p - plate thickness
- The flatness tolerance of the molded surface for a 20 cm section is 1 mm, and for a 100 cm section is 3 mm
- Location tolerance of holes and cutouts is $\pm 30 \text{ mm}$
- Tolerance of embedment of accessories for the longitudinal direction is $\pm 50 \text{ mm}$, and for the transverse direction is $\pm b_w/10$, where b_w - the width of the concrete rib on site between the forming inserts,

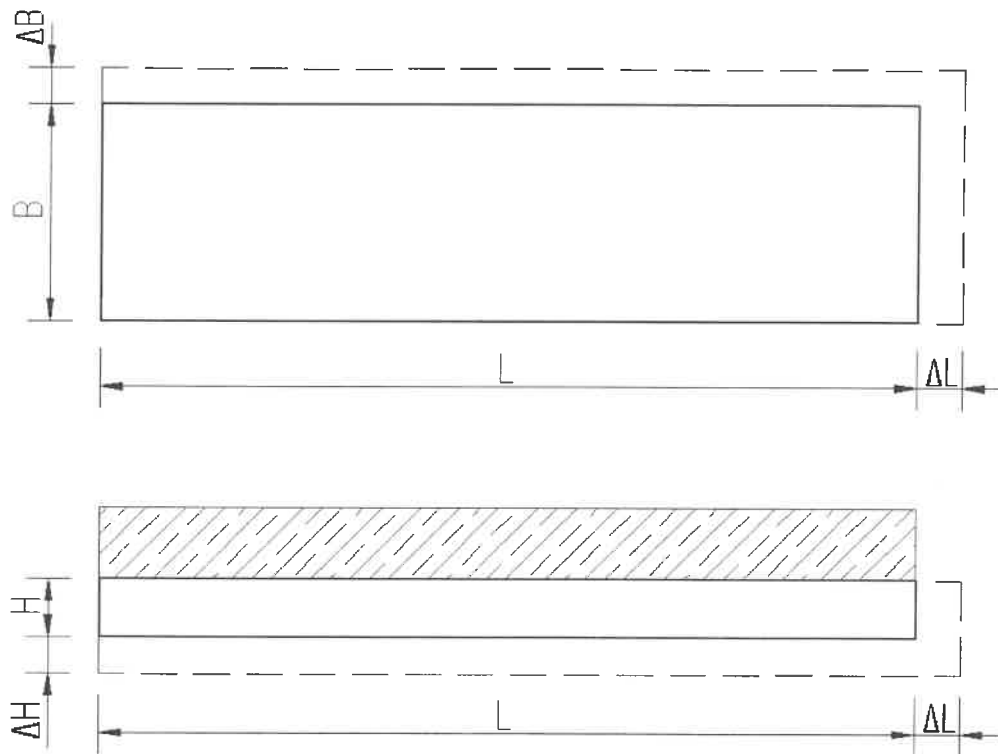


Fig.7 Dimensional tolerances for composite floors.

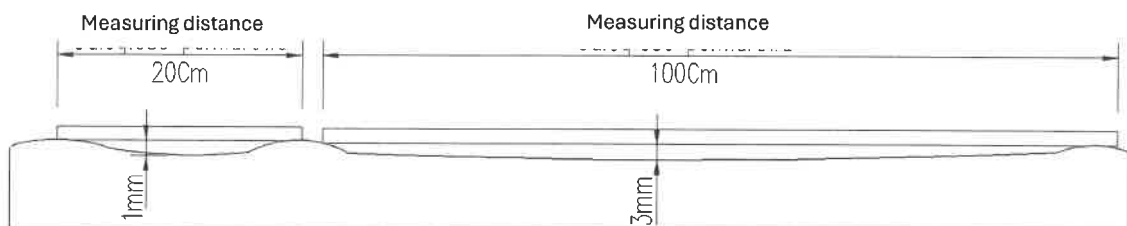


Fig.8 Surface flatness tolerances for composite floors.

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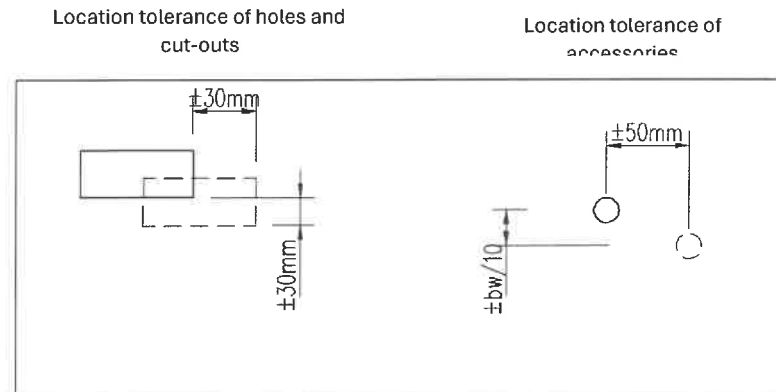


Fig.9 Tolerances for embedding of accessories.

5.2. Finishing of flat surfaces

- The top surface of the slabs is roughened unless otherwise specified in the construction documents. However, the standard method is to roughen the top surface to increase the adhesion of the slab to the over concrete. The bottom of the slab is smooth.
- On the surface from the formwork is allowed to occur local cavities (pores) with a depth of 2 mm, and the total area with uniform occurrence of cavities may not exceed 2% of the total evaluated area. The area of individual bubbles must not exceed 1 cm².
- The surface requires cosmetic treatment before painting work. At the request of the customer, it is possible to putty the surface for an additional fee.
- The occurrence of shrinkage cracks of 0.3 mm is allowed.
- Differences in the color of individual prefabricated elements resulting from the properties of the raw materials used are allowed. The rubbed surface may have a non-uniform gray color differing in color from the formwork surface, which is due to differences in manufacturing technology. On the mached surface there may be different shades of gray, stains, streaks, abrasions. On the formwork surface there may be different shades of gray streaks, stains, reflections of spacers, shadows of reinforcement. The condition of homogeneity of prefabricated elements must be clearly specified by the customer in the order and is the basis for charging additional fees for facade concrete. In façade concretes, the uniformity of color is evaluated from a point covering the full contour of the object.
- Traces due to use of spacers during storage and transportation of prefabricated elements are allowed.

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- It is permissible to make local cosmetic corrections with jointing compounds or grinding, which may affect the lack of color uniformity.
- In the case of the presence of reinforcement extending beyond the face of the concrete, the reinforcement may be stained with concrete, which results from the technology of prefabrication. It is possible to protect the ends of weaves in prestressed elements against corrosion for an additional fee.

6. Requirements for the fabricated floor elements - ribbed floor elements

Requirements based on the PN EN 13224 standard.

6.1. Tolerances

- Tolerance on the length of the element $\Delta L = \pm (10+L/1000) \leq 40$ mm
- Tolerance on the cross-section of the element depending on the nominal cross-sectional dimension:
 - For $L \leq 150$ mm is + 10; - 5 mm
 - For $L=400$ mm it is +15; -10 mm
 - For $L \geq 2,500$ mm is ± 30 mm
- The tolerance of the angular deviation of the ribs δ is ± 15 mm*
- The lateral flexure tolerance ϵ of each main surface is $L/1000$ or ± 10 mm (the greater value should be taken)*
- Tolerance on flatness is ± 15 mm
- Tolerance for skewness θ is ± 15 mm
- Tolerance for accessory mounting:
 - For linear elements deviation in length is ± 20 mm, offset in axis is ± 20 mm, facing the element is ± 10 mm
 - For steel embed plates and fittings deviation along the length is ± 20 mm, offset in the axis is ± 20 mm, facing the element is ± 10 mm
- Tolerance for holes and cut-outs in dimension is ± 10 mm, in position is ± 25 mm

*In the case of prestressed elements, a tolerance of 1.5 times is adopted (this value includes the effects of the tolerance associated with prestressing).

L - nominal linear dimension expressed in mm; h - the section dimension under consideration expressed in mm

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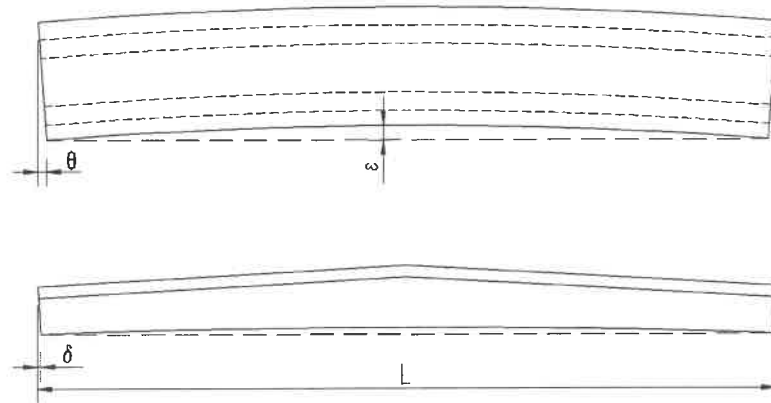


Fig.10 Dimensional tolerances of ribbed floors.

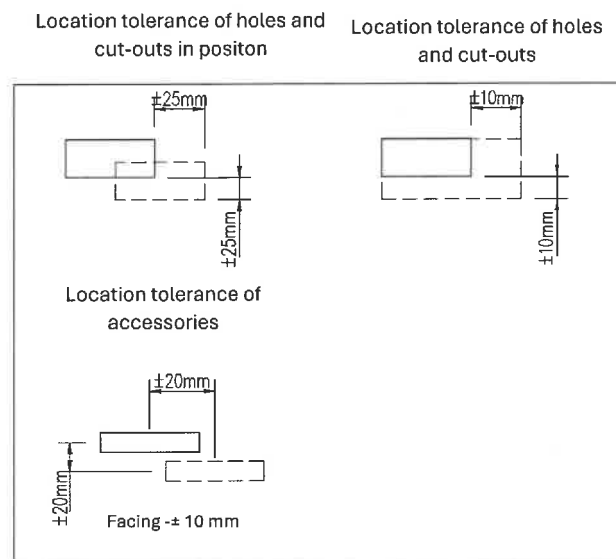


Fig.11 Tolerances for openings and accessories.

6.2. Finishing of flat surfaces

- Ribbed floor elements are made in steel molds. They have three smooth sides from the formwork and one surface is treated by mashing, roughening, rolling, etc., depending on how the construction documentation states.
- In accordance with the requirements of the standard, there is a possibility of the occurrence of cracks with a dilation of up to 0.3 mm (0.2 mm prestressed elements).
- Differences in the color of individual prefabricated elements resulting from the properties of the raw materials used are allowed. The rubbed surface may have a non-uniform gray color differing in color from the formwork surface, which is due

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to differences in manufacturing technology. On the mached surface there may be different shades of gray, stains, streaks, abrasions. On the formwork surface there may be different shades of gray streaks, stains, reflections of spacers, shadows of reinforcement. The condition of homogeneity of prefabricated elements must be clearly specified by the customer in the order and is the basis for charging additional fees for facade concrete. In façade concretes, the uniformity of color is evaluated from a point covering the full contour of the object.

- Traces due to use of spacers during storage and transportation of prefabricated elements are allowed.
- It is permissible to make local cosmetic corrections with jointing compounds or grinding, which may affect the lack of color uniformity.
- In the case of the presence of reinforcement extending beyond the face of the concrete, the reinforcement may be stained with concrete, which results from the technology of prefabrication. It is possible to protect the ends of weaves in prestressed elements against corrosion for an additional fee.

7. Requirements for the fabricated foundation elements

Foundation structural elements include footings, foot pillars, foundation footings, etc. Requirements based on the PN EN 14991 standard.

7.1. Tolerances

- Tolerance on the length of the element $\Delta L = \pm (10+L/1000) \leq 40$ mm
- Tolerance on the cross-section of the element depending on the nominal cross-sectional dimension:
 - For $L \leq 150$ mm $\Delta h, \Delta b$ is + 10; - 5 mm
 - For $L=400$ mm $\Delta h, \Delta b$ is +15; -10 mm
 - For $L \geq 2,500$ mm $\Delta h, \Delta b$ is ± 30 mm
- Angular deviation tolerance of end sections δ is $h/100 \leq 5$ mm
- Tolerance of lateral flexure of each main surface ϵ is $L/700$
- Tolerance for accessory mounting:
 - For linear elements deviation in length is ± 20 mm, offset in axis is ± 20 mm, facing the element is ± 10 mm
 - For steel embed plates and fittings deviation along the length is ± 20 mm, offset in the axis is ± 20 mm, facing the element is ± 10 mm
- Tolerance for holes and cut-outs in dimension is ± 10 mm, in position is ± 25 mm

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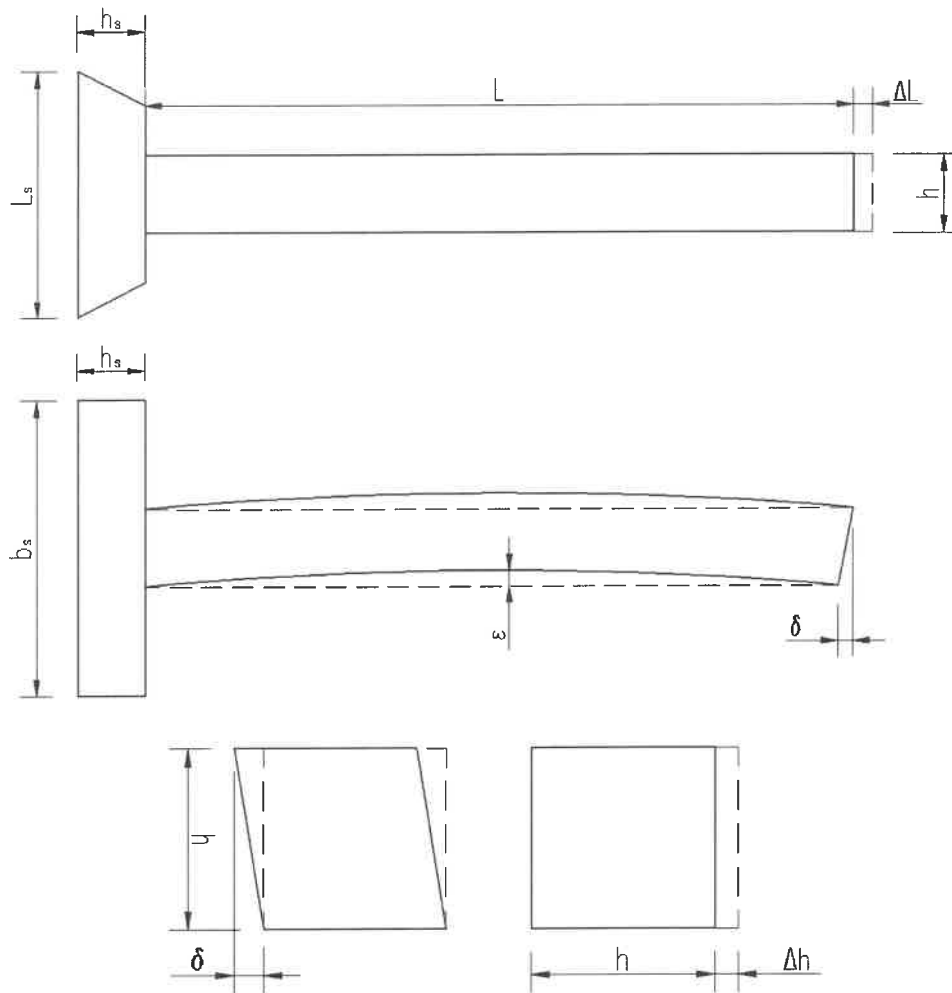
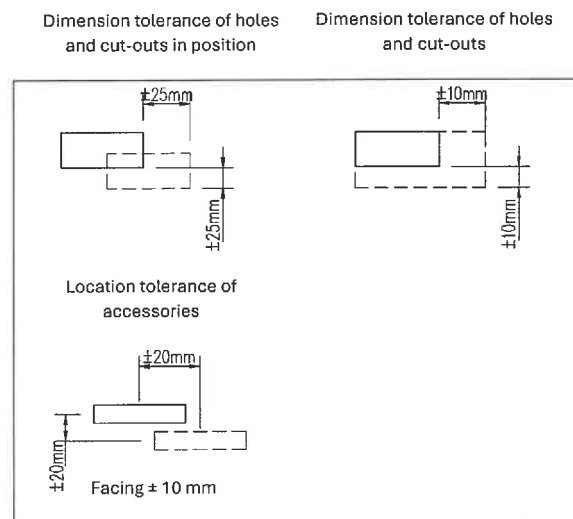


Fig.12 Dimensional tolerances for foundation elements



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Fig.13 Tolerances for openings and accessories.

7.2. Finishing of flat surfaces

- Prefabricated elements are made in wooden formwork (shuttering plywood) or metal formwork. They have three smooth sides from the formwork and one surface is treated by mashing, roughening, rolling, etc., depending on how the construction documentation states. The edges of the prefabricated elements are interrupted with triangular strips if the construction documentation does not provide otherwise.
- Formwork surfaces are smooth, but require mudding before painting work. The elements may have bubbles (pores) up to 5 mm deep and are allowed to occur with a diameter of $2\text{ mm} < d < 15\text{ mm}$ in the amount of $2,250\text{ mm}^2$ on a reference area of $0.5\text{ m} \times 0.5\text{ m}$. Visible formwork joints are allowed to occur.
- In accordance with the requirements of the standard, there is a possibility of the occurrence of cracks with a dilation of up to 0.3 mm.
- Differences in the color of individual prefabricated elements resulting from the properties of the raw materials used are allowed. The rubbed surface may have a non-uniform gray color differing in color from the formwork surface, which is due to differences in manufacturing technology. On the mashed surface there may be different shades of gray, stains, streaks, abrasions. On the formwork surface there may be different shades of gray streaks, stains, reflections of spacers, shadows of reinforcement. The condition of homogeneity of prefabricated elements must be clearly specified by the customer in the order and is the basis for charging additional fees for facade concrete. In facade concretes, the uniformity of color is evaluated from a point covering the full contour of the object.
- Traces due to use of spacers during storage and transportation of prefabricated elements are allowed.
- It is permissible to make local cosmetic corrections with jointing compounds or grinding, which may affect the lack of color uniformity.
- In the case of the presence of reinforcement extending beyond the face of the concrete, the reinforcement may be stained with concrete, which results from the technology of prefabrication. It is possible to protect the ends of weaves in prestressed elements against corrosion for an additional fee.

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8. Requirements for the fabricated stair elements

Stair structural elements include flights of stairsss, steps, and staircase landings.

Requirements based on PN EN 14843.

8.1. Tolerances

- Tolerance on the length of the element $\Delta L = \pm (10+L/1000) \leq 40$ mm
- Tolerance on the cross-section of the element Δh , Δb depending on the nominal cross-sectional dimension:
 - For $L \leq 150$ mm is + 10; - 5 mm
 - For $L \leq 400$ mm is + +15
- Angular deviation tolerance of end sections δ is $h/100 \leq 5$ mm
- Tolerance for step height and width is ± 5 mm
- Tolerance for deviation of dimensions characterizing the surface is $\Delta d = (2+L/500)$ mm
- Tolerance for accessory mounting:
 - For linear elements deviation in length is ± 20 mm, offset in axis is ± 20 mm, facing the element is ± 10 mm
 - For steel embed plates and fittings deviation along the length is ± 20 mm, offset in the axis is ± 20 mm, facing the element is ± 10 mm
- Tolerance for holes and cut-outs in dimension is ± 10 mm, in position is ± 25 mm

L - nominal linear dimension expressed in mm; h - the section dimension under consideration expressed in mm

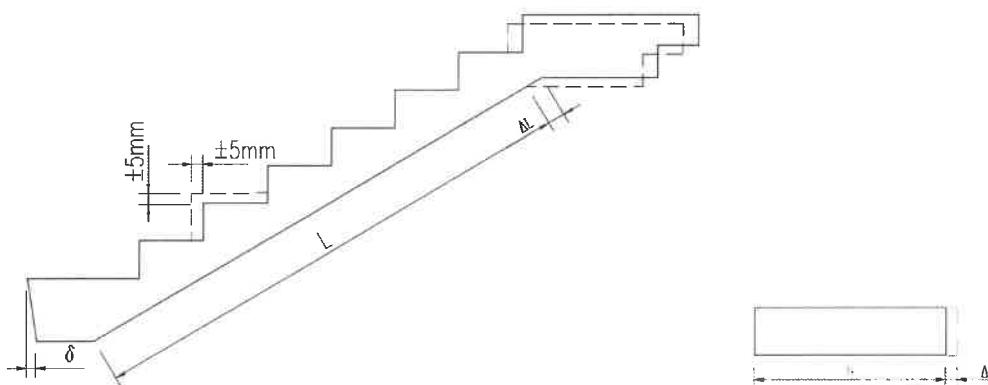


Fig.14 Dimensional tolerances for stair elements.

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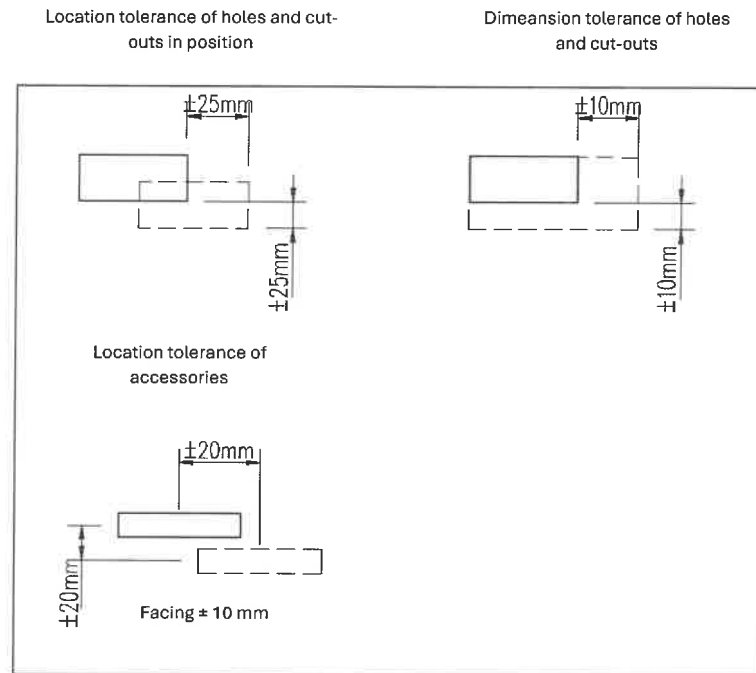


Fig.15 Tolerances for openings and accessories.

8.2. Finishing of flat surfaces

- Prefabricated elements are made in wooden formwork (shuttering plywood) or metal formwork. They have three smooth sides from the formwork and one surface is treated by mashing, roughening, rolling, etc., depending on how the construction documentation states. The edges of the prefabricated elements are interrupted with triangular strips if the construction documentation does not provide otherwise.
- In accordance with the requirements of the standard, there is a possibility of the occurrence of cracks with a dilation of up to 0.3 mm.
- Differences in the color of individual prefabricated elements resulting from the properties of the raw materials used are allowed. The rubbed surface may have a non-uniform gray color differing in color from the formwork surface, which is due to differences in manufacturing technology. On the mashed surface there may be different shades of gray, stains, streaks, abrasions. On the formwork surface there may be different shades of gray streaks, stains, reflections of spacers, shadows of reinforcement. The condition of homogeneity of prefabricated elements must be clearly specified by the customer in the order and is the basis for charging additional fees for facade concrete. In façade concretes, the uniformity of color is evaluated from a point covering the full contour of the object.

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- Traces due to use of spacers during storage and transportation of prefabricated elements are allowed.
- It is permissible to make local cosmetic corrections with jointing compounds or grinding, which may affect the lack of color uniformity.
- In the case of the presence of reinforcement extending beyond the face of the concrete, the reinforcement may be stained with concrete, which results from the technology of prefabrication. It is possible to protect the ends of weaves in prestressed elements against corrosion for an additional fee.

9. Requirements for the fabricated retaining elements

Retaining structural elements include retaining walls, docks, etc. Requirements based on PN EN 15258.

9.1. Tolerances

- Tolerance on the length of the element $\Delta L = \pm (10+L/1000) \leq 40$ mm
- Tolerance on the cross-section of the element Δh , Δb depending on the nominal cross-sectional dimension:
 - For $L \leq 150$ mm is + 10; - 5 mm
 - For $L \leq 400$ mm is + 15; - 10 mm
 - For $L \geq 2,500$ mm is ± 30 mm
- The tolerance for diagonal difference $|d_1-d_2|$ is ± 15 mm
- The flatness tolerance for a measuring distance of 0.2 m is ± 2 mm, and for a distance of 3 m is ± 5 mm
- Tolerance for holes and cut-outs in dimension is ± 10 mm, in position is ± 25 mm

L - nominal linear dimension expressed in mm

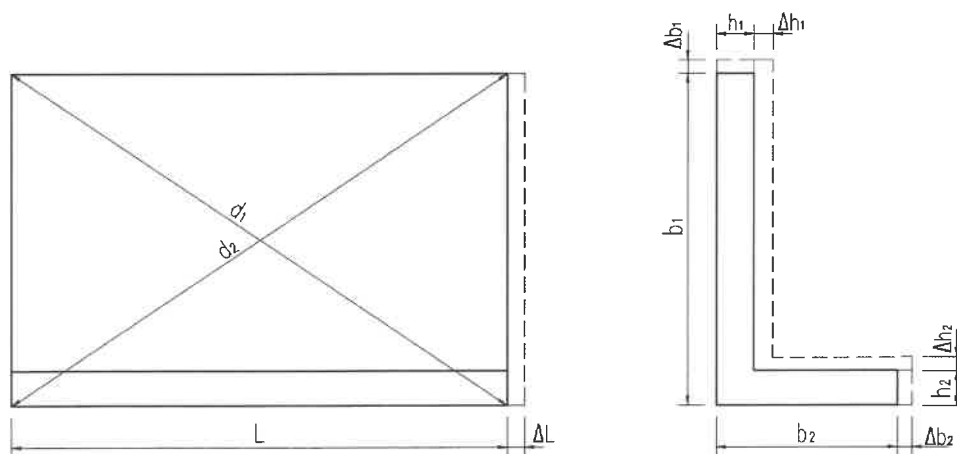


Fig.16 Dimensional tolerances for retaining elements.

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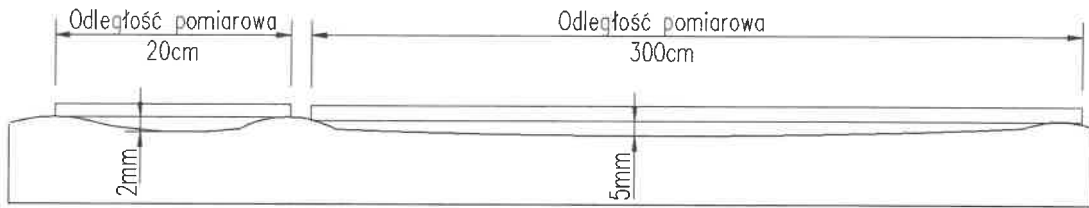


Fig.17 Flatness tolerances.

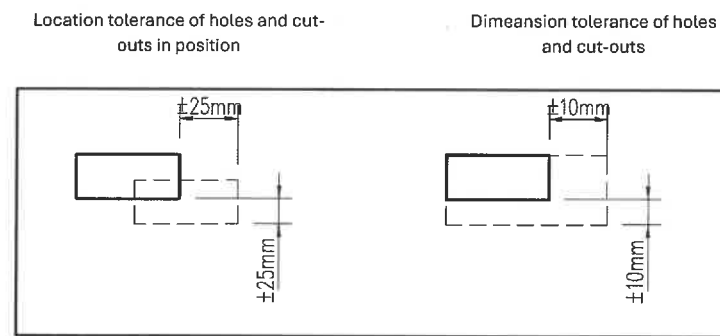


Fig.18 Tolerances for holes and cut-outs.

9.2. Finishing of flat surfaces

- Prefabricated elements are made in wooden formwork (shuttering plywood) or metal formwork. They have three smooth sides from the formwork and one surface is treated by mashing, roughening, rolling, etc., depending on how the construction documentation states. The edges of the prefabricated elements are interrupted with triangular strips if the construction documentation does not provide otherwise.
- Formwork surfaces are smooth, but require mudding before painting work. The elements may have bubbles (pores) up to 5 mm deep and are allowed to occur with a diameter of $2\text{ mm} < d < 15\text{ mm}$ in the amount of $2,250\text{ mm}^2$ on a reference area of $0.5\text{ m} \times 0.5\text{ m}$. Visible formwork joints are allowed to occur.
- In accordance with the requirements of the standard, there is a possibility of the occurrence of cracks with a dilation of up to 0.3 mm (0.2 mm prestressed elements).
- Differences in the color of individual prefabricated elements resulting from the properties of the raw materials used are allowed. The rubbed surface may have a non-uniform gray color differing in color from the formwork surface, which is due

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to differences in manufacturing technology. On the mached surface there may be different shades of gray, stains, streaks, abrasions. On the formwork surface there may be different shades of gray streaks, stains, reflections of spacers, shadows of reinforcement. The condition of homogeneity of prefabricated elements must be clearly specified by the customer in the order and is the basis for charging additional fees for facade concrete. In façade concretes, the uniformity of color is evaluated from a point covering the full contour of the object.

- Traces due to use of spacers during storage and transportation of prefabricated elements are allowed.
- It is permissible to make local cosmetic corrections with jointing compounds or grinding, which may affect the lack of color uniformity.
- In the case of the presence of reinforcement extending beyond the face of the concrete, the reinforcement may be stained with concrete, which results from the technology of prefabrication. It is possible to protect the ends of weaves in prestressed elements against corrosion for an additional fee.

10. Requirements for fabricated bridge elements

Retaining structural elements include bridge beams and bridge slabs. Requirements based on the standard PN EN 15050.

10.1 Tolerances

- Tolerance on the length of the element $\Delta L = \pm (10+L/1000) \leq 40$ mm
- Tolerance on the cross-section of the element depending on the nominal cross-sectional dimension:
 - For $L \leq 150$ mm $\Delta h, \Delta a, \Delta b$ is + 10; - 5 mm
 - For $L=400$ mm $\Delta h, \Delta a, \Delta b$ is +15; -10 mm
 - For $L \geq 2,500$ mm $\Delta h, \Delta a, \Delta b$ is ± 30 mm
- Vertical skewness tolerance $v1$ is $\pm 0.015h$ mm
- Horizontal skewness tolerance $v2$ is $\pm 0.02 b$ or $\pm 0.02 a$ mm
- Verticality tolerance g is $\pm 0.015h$ mm
- Transverse deviation tolerance θ is $L/500^*$
- The tolerance of insert and hole location for a single insert/hole is ± 30 mm, and for mutual location in a group is ± 5 mm

*In the case of prestressed elements, a tolerance of 1.5 times is adopted (this value includes the effects of the tolerance associated with prestressing).

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L - nominal linear dimension expressed in mm; h - considered dimension of the section expressed in mm; a, b - considered width in the section expressed in mm

10.2. Finishing of flat surfaces

- Prefabricated elements are made in wooden formwork (shuttering plywood) or metal formwork. They have three smooth sides from the formwork and one surface is treated by mashing, roughening, rolling, etc., depending on how the construction documentation states. The edges of the prefabricated elements are interrupted with triangular strips if the construction documentation does not provide otherwise.
- Formwork surfaces are smooth, but require mudding before painting work. The elements may have bubbles (pores) up to 5 mm deep and are allowed to occur with a diameter of $2\text{ mm} < d < 15\text{ mm}$ in the amount of $2,250\text{ mm}^2$ on a reference area of $0.5\text{ m} \times 0.5\text{ m}$. Visible formwork joints are allowed to occur.
- In accordance with the requirements of the standard, there is a possibility of the occurrence of cracks with a dilation of up to 0.3 mm (0.2 mm prestressed elements).
- Differences in the color of individual prefabricated elements resulting from the properties of the raw materials used are allowed. The rubbed surface may have a non-uniform gray color differing in color from the formwork surface, which is due to differences in manufacturing technology. On the mashed surface there may be different shades of gray, stains, streaks, abrasions. On the formwork surface there may be different shades of gray streaks, stains, reflections of spacers, shadows of reinforcement. The condition of homogeneity of prefabricated elements must be clearly specified by the customer in the order and is the basis for charging additional fees for facade concrete. In facade concretes, the uniformity of color is evaluated from a point covering the full contour of the object.
- Traces due to use of spacers during storage and transportation of prefabricated elements are allowed.
- It is permissible to make local cosmetic corrections with jointing compounds or grinding, which may affect the lack of color uniformity.
- In the case of the presence of reinforcement extending beyond the face of the concrete, the reinforcement may be stained with concrete, which results from the technology of prefabrication. It is possible to protect the ends of weaves in prestressed elements against corrosion for an additional fee.

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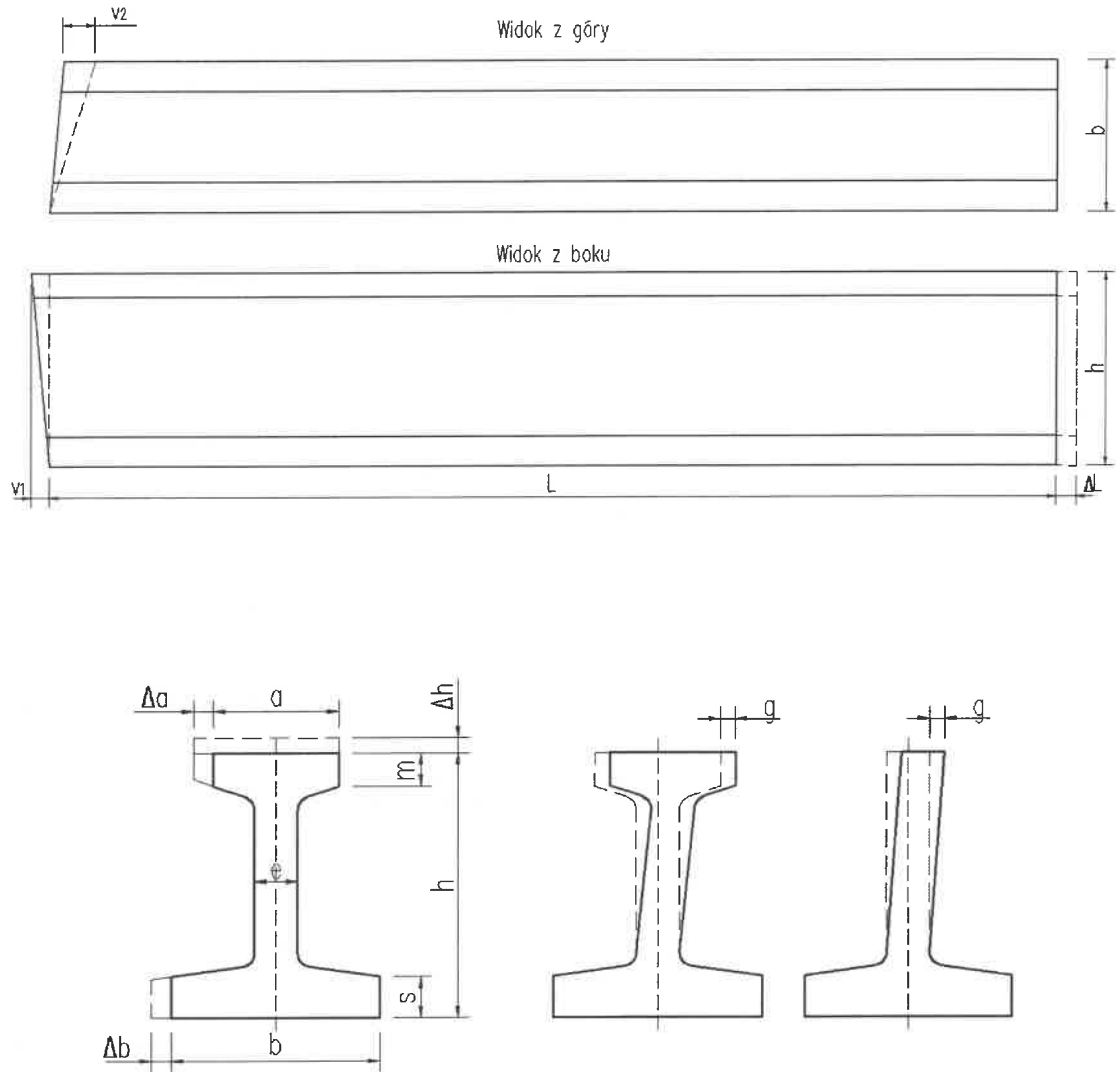


Fig.17 Dimensional tolerances for bridge elements.

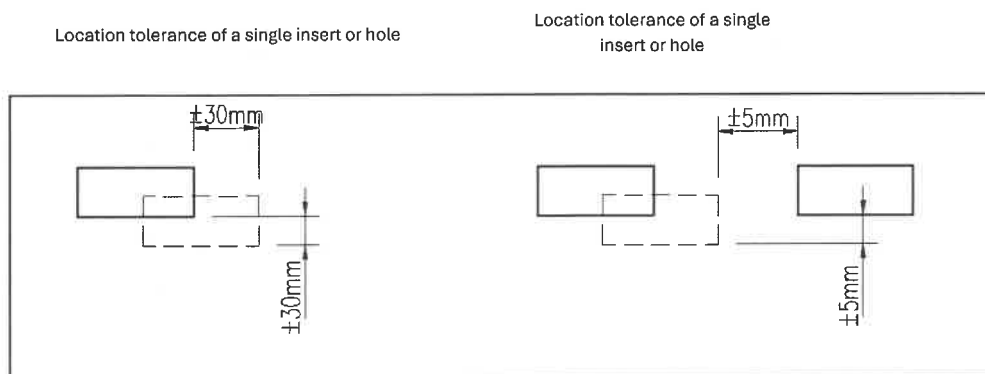


Fig.18 Location tolerances for inserts and holes.

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11. Requirements for elements not covered by the harmonized standard

11.1. Tolerances

Fabrication tolerance in accordance with Section 3.1 of GOLDBECK Prefab Elements Technical Conditions for Prefabricated Elements and the requirements of PN EN 13369.

11.2. Finishing of flat surfaces

Finishing of flat surfaces in accordance with Section 3.2 of GOLDBECK Prefab Elements Technical Conditions for Prefabricated Elements.

Guidelines developed based on:

- PN EN 13369 Common rules for precast concrete elements
- PN EN 13670 Execution of concrete structures
- Eurocode 2
- PN EN 206 Concrete. Requirements, properties, production and conformity
- PN EN 13224 Precast concrete products. Ribbed floor elements
- PN EN 13225 Precast concrete products. Bar structural elements
- PN EN 13747 Precast concrete products. Floor slabs for composite floor systems
- PN EN 14843 Precast concrete products. Stairs
- PN EN 14991 Precast concrete products. Foundation elements
- PN EN 14992 Precast concrete products. Wall elements
- PN EN 15050 Precast concrete products. Bridge elements
- PN EN 15258 Precast concrete elements. Retaining wall elements

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