General instructions for calculation

Constructive solutions

The shape of the concrete stairs: U-shaped with running steps
Type of concrete stairs: Smooth lined
The position of the stairs in relation to the walls: Freestanding
Form of steps: Straight
The shape of the first steps: The usual first and second steps

Stairs are made of B25 concrete and A-3 reinforcement
Design norms DBN V.2.6-98:2009
Dimensions in plan 2400 mm x 1900 mm.
Stair height:
Width of march: 900 mm
Stair plate 150 mm thick.
Resting the stairs on the concrete slab of the 1st floor: hard pinching
Resting the stairs on the concrete slab of the 2nd floor: hard pinching
Decoration of steps: wood
Railings: glass

The calculation was performed by the "Lira" software complex

The calculation is based on the finite element method.
PC "Lira" implements the provisions of design standards DBN V.2.6-98:2009.
The calculation scheme includes the following types of elements: shell.
The calculation is made for the following static loads:

loading 1: permanent loads (own weight from/kb + weight from the decoration of the steps + weight of the railing)
load 2: temporary load (payload)
load 3: short-term load (calculation for sway: 100 kg is applied in the center of the longest march and the deflection along the Z axis should not exceed 0.7 mm.)

Features of the calculation scheme

Since the stairs from above rest on the free edge of the slab and the slab undergoes its own deformations from permanent and temporary loads, we include the floor slab of the second floor in the calculation scheme.

loading on slab 1: permanent loads (own weight of concrete + cement-sand screed + floor)
loading onto plate 2: temporary load (payload)

The main types of works and constructions for which acts for the closure of hidden works are drawn up (Appendix L (DBN A.3.1-5-2009. "Organization of construction production")

L.3. Monolithic concrete and reinforced concrete structures:
- acceptance of the assembled and prepared formwork for concreting;
- compliance of fittings and embedded parts with the working drawing;
- selection of concrete control samples;
- selection of control samples of bath welding;
- inspection and acceptance of all structures and their elements, which are closed in the process of subsequent concreting;
- acceptance of finished concrete and reinforced concrete structures with an assessment of their quality;

1. Initial data
1.1 Initial data:
The working documentation of the project is developed according to the design task approved by the customer.
The standard mark of 0.000 is the level of the finishing floor of the first floor.
1.2 Climatic conditions and loads:
According to NSTU (National Standards of Ukraine) NB V.1.1-27:2010 "Building Climatology" - the construction site is located in the zone that refers to:
- to climatic region I, with the average outdoor temperature
the air of the coldest Friday is minus 22°C;
- the normative depth of seasonal freezing of loams (according to clause 7.5.3 NBR(National building regulations) B.2.1-10-2009) is 108 cm.
According to NBR B.1.2-2:2006 "Loads and influences", the building is located in the zone that refers to:
- to the 5th district according to the normative value of the mass of the snow cover and is 1.60(160) kPa (kgf/ml);
- to the 2nd wind district with the normative value of wind pressure flow and 0.43(43) kPa (kgf/ml);

2. Basic calculation provisions
2.1 Design calculations are made in accordance with regulatory documents:
- NBR V.2.6-161:2010 "Wooden structures. Substantive provisions";
- NBR V.2.6-163:2010 "Steel structures. design standards, manufacturing and installation";
- NBR V.2.6-98:2009 "Constructions of buildings and structures. Concrete and reinforced concrete structures. Substantive provisions";
- NBR V.1.2-2:2006 "Loads and impacts".

Change	Count	Sheet	№Doc.	Sign.	Date	001/19-K3			
						Kiev region, Vyshhorod district, (Lebedivska silska rada) cottage town Riviera villas			
						Construction of concrete monolithic stairs	Stage	Sheet	Sheets
							P	03	15
Developed		Karpov A.Y.				General instructions for calculation	Stairs-A		
Verify		Tkach K.G.							