Standard 2.2 Work on scaffolding

LG Energy Solution
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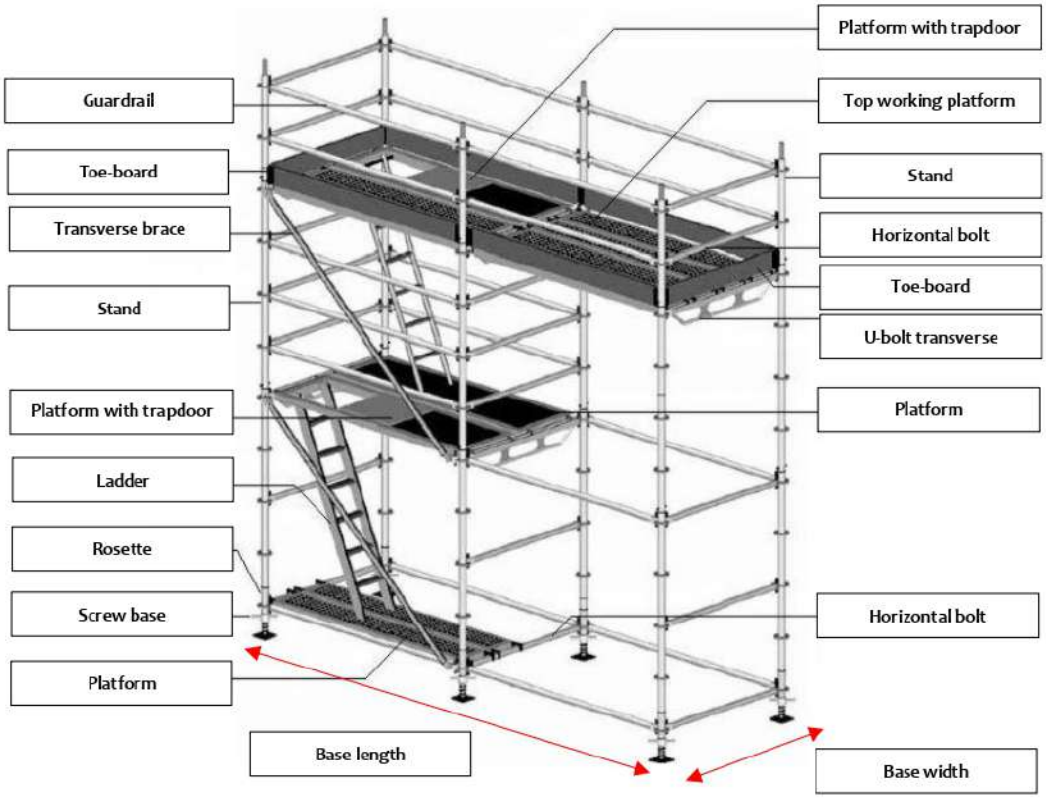
1. Characteristics of scaffolding

Scaffolding is a device for long-term work at height and should be used whenever conditions allow it. The scaffolding assembly and use must be carried out in accordance with the health and safety polish regulations and rules, on the basis of the scaffolding manufacturer's instructions and recommendations. Working scaffolding is a temporary construction structure, therefore, scaffolding overturning is treated as a construction collapse.

Due to particular criteria, the following types of scaffolding are distinguished:

a) **construction of structures** - frame, modular, rack, special,
b) **method of use** - stationary, movable,
c) **materials used** - wooden, steel, aluminum,
d) **mounting method** - free-standing, wall-mounted, suspended.



2. Scaffolding approved for use

In the LG ESWA plant it is allowed to use scaffolding which :

a) fulfill the norm requirements of **EN1004 for mobile and stationary scaffolding,**
b) the load capacity of the working platforms is at least **200 kg / m2** for scaffolds with a working platform height of **more than 1 m**, at least **150 kg / m2** for a platform height of up to **1 m**,
c) are equipped with complete protective barriers – guardrails (on all sides when the scaffolding is moved away from the wall by more than 0.2 m) with a 0.15 m high toe-board
d) ensure safe circulation path and free access to workstations - the distance of the farthest workstation from the communication section of the scaffolding it should not be more than 20 m, and between perpendiculars not more than 40 m
e) allow of the works performance in a position that does not cause excessive effort.
f) type of scaffolding - portable, mobile or stationary.

REMEMBER!

When working at height, including the use of scaffolding, it is required to use appropriate personal protective equipment:

a) a helmet for work at height, with a fastened chin strap,
b) footwear and work clothes,
c) a warning vest,
d) depending on the type of work - other adequate PPE.

Incomplete scaffolds, which has incorrectly installed or improper components - despite having a technical acceptance protocol - will not be admitted for use on LG ESWA territory.

3. Before assembling the scaffolding

Before each scaffolding erection, PLEASE, check:

a) all load-bearing elements of the scaffolding for cracks, crushing, deformation,
b) completeness and condition of the protections (cotter pins, fixings, clamps, bolts),
c) the technical condition of the working platform surface and hatch,
d) the condition of the wooden toe-boards in terms of cracks,
e) rotating rollers (if existing)- checking rotation, efficiency of brakes.

It is forbidden to:

a) throwing the scaffolding elements, exposing them to a damage,
b) storing parts of the scaffolding improperly - exposing them to unfavorable weather conditions and other factors, objects that could damage them,
c) make repairs of the scaffolding (welding, gluing, screwing, etc.),
d) painting, sticking to the scaffolding or its components, removing the manufacturer's labels from the scaffolding components.
e) installation of protective covers on scaffolding during strong winds and in places where swirls of wind may occur.

4. Conditions for the assembly and disassembly of the scaffolding

1. **The scaffolding erection** should be performed in a professional way so as not to endanger life and the health of people who will move on them, therefore, for this activity, the employee who's performing the erection must **have the appropriate qualifications of scaffolding assembly - IMBiGS (Institute of Mechanization of Construction and Rock Mining).**

2. The scaffolding erection zone should be flat, ensuring adequate load-bearing capacity of the soil (not less than 100 kPa), and profiled to allow groundwater outflow. Do not place scaffolding near excavations or water courses. The base for the scaffolding should be compacted and leveled, the base **should not be** leveled by backfilling or digging (it may cause uneven subsidence).

3. On the ground prepared for the scaffolding assembly, sleepers should be placed, e.g. wooden, non-cracked sleepers of appropriate dimensions, the feet of the scaffolding frames should be placed in the central part of the sleeper. Scaffolding set up in production areas should have additional safeguards to prevent damage to the floor (e.g. metal sheet, mat, etc.)

4. Around the scaffolding assembly and disassembly site, the safety zone range must be a 1/10 of the scaffolding height (not less than 6m), if necessary - provide a watchman also.

5. Each scaffolding made of metal elements placed outside should be grounded and have a lightning protection system. An authorized electrician should prepare a protocol on the measurement of earth resistance (earth resistance measured with alternating current with a frequency of 50 Hz should not exceed 10 Ω). The distance between the earth electrodes should not exceed 12 m.

6. **Scaffolding permissible load** - is the maximum unit load to which the working platform, on which there are people, tools, materials, machines, can be subjected. The platform load is calculated according to the following formula:

For a platform 2.5 m long, 0.6 m wide and with a load capacity of 200 kg / m2, it will be 300 kg

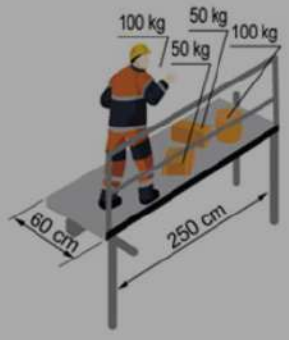
because 2.5 m x 0.6 m = 1.5 m2 -> 1.5 m2 x 200 kg / m2 = 300 kg

REMEMBER!

Daily technical review of the scaffolding is made by its user, checking if it has not suffered any damage, it is properly anchored, the condition of the working platforms 'surfaces' is correct and that there were no situations that would have a negative impact on the safety of the scaffolding, e.g. corrosion.

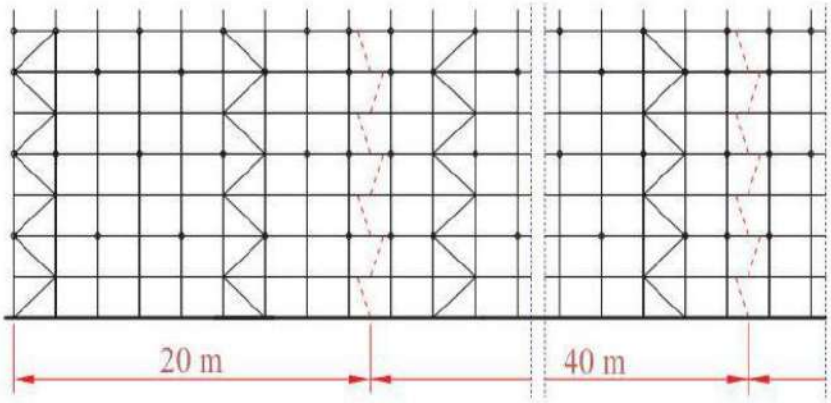
Periodic (formal) inspections are performed at least once a month by a person with appropriate qualifications in this regard.

After strong wind, rainfall and other factors posing a threat to the safety of work, and after work breaks longer than 10 days, perform an ad hoc inspection of the scaffolding.



7. Above the building exits, passageways or placed crossings under the scaffolding, protective canopies directed at an angle of 45 ° should be used towards the scaffolding. Canopies should be puncture resistant and provide effective protection against falling objects from a height. For scaffolding high up to 20m, the length of the roof should be min. 2.2m and 3.5m for the taller ones.

8. Scaffolding, the structure of which is four times higher than the smaller size of its base, is anchored. Anchoring starts from the second level, the anchors are evenly distributed over the entire surface of the scaffolding in accordance with the DTR (Operation and Maintenance Manual) or the scaffolding assembly design.



• Anchoring symbol

9. Immediately after assembly, the scaffolding is subject to technical acceptance by an **employee with building qualifications certified in the scope of construction**. (e.g. construction site manager) or **an employee designated by the employer with appropriate knowledge and experience in this field** (e.g. scaffolding fitter).

10. The scaffolding acceptance is confirmed in the Scaffolding Approval Protocol, which specifies: load capacity of the structure, intended use, assembly contractor (including contact details, telephone number), date of commissioning the scaffolding for use, earth electrode resistance, scaffold inspection dates and contact details of the person who approved the scaffolding.

11. The scaffolding technical acceptance protocol should be hung on the scaffolding after acceptance, in such a way that it will not be damaged and is not exposed to adverse weather conditions. **Scaffolding with this protocol is approved for use.**

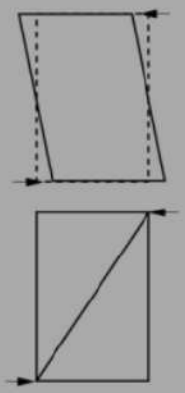
12. In case of a change in the location of the scaffolding and, therefore, its partial or complete disassembly, its next assembly at the destination and subsequent technical acceptance is carried out, meeting the conditions set out in point. 9-10.

13. It is forbidden to assemble or disassemble the scaffolding when visibility is restricted and without sufficient lighting at dusk and at night, during rainfall and snowfall, glazed frost, storms and winds with a speed exceeding 10 m / s.

REMEMBER!

Wooden scaffolding and other than metal ones that do not meet the EN-1004 standards are not allowed to be used, their use is strictly prohibited.

The vertical bracings in the scaffolding structure act as structural stiffeners in the vertical plane. When assembling the scaffolding, the bracing rule should be used in a triangle



The number and arrangement of the scaffold anchors and the value of the anchoring force should be specified in the scaffolding design or refer to the data contained in the manufacturer's documentation.

It is forbidden to place the scaffolding on unstable ground, and on infrastructure elements of buildings not intended for this purpose.

5. Performing work on scaffolding

1. The scaffolding is used as intended, based on the manufacturer's operating manual, in accordance with the Operation and Maintenance Manual, and if necessary - the guidelines contained in Safe Work Instruction (IBWR).
2. When working on the scaffolding, the maximum working load of the platform should not be exceeded.
3. The materials, tools and devices necessary for the work should be stored on the platforms in a way that prevents them from falling out through the toe board, or use additional security.
4. During work on the scaffolding, the work area should be fenced off to prevent access by unauthorized persons, if the circumstances of the work require it - an observer should be appointed.

5. **It is forbidden to:**

   a) collecting and leaving materials or tools on the scaffolding overnight and longer breaks,
   b) entering and leaving the scaffolding in places not intended for this, as well as climbing stands, stringers and handrails,
   c) use of scaffolding with damaged structural elements,
   d) moving mobile scaffoldings when there are people on them,
   e) work on the scaffolding during limited visibility and at dusk and at night without sufficient lighting, during rain and snowfall, during black ice, storm and wind with a speed exceeding 10 m / s.
   f) throw materials, tools and its components from the scaffolding,
   g) mounting any devices and tools on the scaffolding, placing ladders on the working platforms,
   h) towing mobile scaffolding by forklifts and other transport devices,

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6. If the scaffolding platform is set to a working height not higher than 1m (2), work on it is not classified as work at height, therefore **additional** security measures are not required - in all other cases (1), the requirements and security measures apply as for standard work at height.

REMEMBER!

The load-bearing capacity of the scaffolding anchoring to the building wall must be checked by carrying out tests. The proof load should be 1.2 times the anchorage force. Anchorages should be checked successively during the scaffolding assembly.

The number of anchoring attempts is 20% at a concrete wall and 40% at other walls. The minimum number of checked anchorages is 5.

Operation and maintenance documentation as well as assembly or assembly design should be available to employees supervising this type of work.

Due to the type of facade construction of LG ESWA buildings (modular panels), scaffolding anchoring is not possible on external walls. Any non-routine work related to the use of scaffolding should be performed in accordance with the Instructions for Safe Work Execution, otherwise it will not be possible to carry out such work.

6. Good and bad practices in scaffolding work

Protective equipment for working at height must be used when assembling / disassembling the scaffolding. Tools that are necessary for the assembly activities should be properly secured against falling (rope, tool belt).

Before starting work on the scaffolding, the work area must be properly fenced off, especially if there are passages in the vicinity of the scaffolding. The doors should be locked from the side of the works and marked for their exclusion from use from the opposite side - if this is not possible - an observer should be appointed who will watch over the safe movement of third parties or devices in the vicinity of the scaffolding.

Moving on the scaffolding is possible only from the inside of the scaffolding. It is forbidden to use other routes of ascent / descent. During these activities, the scaffolding should be stopped and set in a stable and safe way, it is also advisable to protect the other employee.

The scaffolding should not be stored or their components in places not intended for this. They are then exposed to factors that may damage them, and they may also be the cause of near misses or accidents involving outsiders.

REMEMBER!

For related activities with the assembly / disassembly of the scaffolding, from a few to a dozen people may be involved - it is important that at least one of them has the appropriate installation qualifications, while all persons performing assembly activities at a height of more than 1m, they should have medical certificates stating that there are no health contraindications for performing this type of work.

While working on the scaffolding, it is forbidden to place ladders, platforms, stools and other structures not included in the scaffolding equipment on it.

On the scaffolding working platform, it is allowed to store hand-held extinguishing agents (fire extinguisher, fire blanket) during fire and hazardous works (e.g. metal cutting).

The manager is responsible for the safety of work and workers on the scaffolding. This person should exercise uninterrupted supervision, especially when particularly dangerous works are performed.

Scaffolding can act also a protective function, securing the workplace from the side of the unsecured space. In this case, the scaffolding is not used for work, but as a barrier to prevent falling from a height.