INSTRUCTIONS FOR INSTALLING THE LIGHTING COLUMN WITH A FOOTPLATE AND DIRECTLY TO THE GROUND

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1. List of machines and tools necessary for mast assembly:

- Crane / Excavator to unload from the trailer about 5 tons,
- 3 people for mast assembly,
- mast setting on wooden supports 4 pcs - form of trestles,
- flat wrenches for fixing nuts in foundation anchors,
- Ropes or synthetic ropes for auxiliary works (load capacity 3,500 kg, length approx. 10m),
- a basket lift with a height of up to 15 m - the height depends on the conditions at the foundation of the structure and its height (if needed).

2. Preparation for assembly

a) Preparation of mast sections.
Before you assemble the mast sections, please read the assembly instructions.

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(Date of assembly and legible signature of the person responsible for the assembly in accordance with the instructions)

b) Check that the lower and upper parts are not soiled. If so, clean them thoroughly with a cloth.

3. General guidelines for mounting the spread footing .

a) for the foundation of the spread footing, a narrow spatial foundation excavation should be made with a depth appropriate for the assumed foundation level,
b) in the case of mineral soils with the required load-bearing capacity, the foundation footing is set directly on the ground substrate
c) in the case of cohesive soils, the excavation should be deepened by 20 cm. At the bottom of the excavation lay gravel or lean concrete with a thickness of 20 cm, with appropriate compaction,
d) in the case of a high level of groundwater, the bottom of the excavation should be received by an authorized geotechnician,
e) when mounting the foot, the top plane should be leveled very precisely,
f) to backfill the excavation, use sandy soils or sandstones. The soil humidity during its pouring and compacting should be close to the optimum humidity,
g) backfilled soil should be compacted with layers of a thickness appropriate to the possibility of compacting used mechanical rammers,
h) the density ratio of foundation backfill should be: Id = 0.98.

Additional provisions:

a) installation of foundations should be performed by qualified people, taking into account the proper assembly technology, in a manner ensuring work safety,
b) concrete foundation, unless it has been factory protected, it should be paint with a bituminous coating or other with similar properties,
c) the foundations are intended for foundation in the ground with the following parameters:
    - frost depth of the soil - 1.00 m
    - accepted conditions for the sitting of foundations at the height of the building take into account the settlement of non-cohesive soils, variously stratified in the compacted state, which corresponds to the occurrence of native mineral soils, which are all kinds of gravels, coarse and sands thick and medium sands,

- groundwater - below the foundation level,
- foundation in a flat area - outside the escarpment,

d) before performing excavations for foundations, the Contractor is required to check:
   - location,
   - geological and ground conditions,
   - arming the underground area,

e) any changes and deviations from the foundation conditions specified above require a design of the foundation and must be strictly consulted and accepted by the author of the project,

f) the method of excavation should be selected depending on the depth of excavation and terrain, as well as ground conditions,

g) place the foundation in the previously prepared excavation by hand or using a lifting device,

h) pass the casing pipes or power cords through the openings in the foundation,

i) level and cover the foundation with native soil, thickening every 20 cm, the soil compaction ratio Is should be at least 0.92,

j) after the assembly, check the correctness of the sitting a foundation - the upper edge of the foundation should be leveled and should not protrude above the ground level by more than 5 cm in any place.

REMARK

AFTER ASSEMBLY, THE FOOTPLATE OF THE LIGHTING POLE MUST NOT BE LESS BELOW THE GROUND LEVEL.

4. Guidelines for mounting a steel lighting column on a foundation footing

Earthworks should be carried out in accordance with Polish Standard PN-86 / B-02480 or the currently valid standard in the country.

In the case of assembly of multi-segment poles, read the instructions for assembling multi-segment poles.

To lift the shaft of the pole, use a crane equipped with a sling of rope clamps.

The exact positioning of the crane must be determined by the operator. The crane's ropes are fastened on the shaft of the pole at approx. 2/3 of the height by performing self-locking loops. When lifting the pole to a vertical position, one should closely observe the place of the clamp and gradually move the structures to the location of the foundation.

After placing the pole on the foundation, it should be screwed with nuts and washers supplied with the foundation.

After tightening the pole, check the correctness of the assembly of the whole structure and then unclip the ropes. The moment with which to screw the nut is:

- for M20 - 140Nm
- for M24 - 241Nm
- for M27 - 355Nm
- for M30 - 483Nm

The tightening torques of the bolts were determined for the coefficient of friction of μ = 0.15 for slightly oiled connections.

5. **Installation instructions for lighting columns for digging directly into the ground.**

Technology and the course of work on the implementation of lighting columns depends on the ground conditions[1].

Earthworks should be carried out in accordance with the Polish Standard PN-86 / B-02480 or currently valid in the country.

Before starting the excavation, check that underground devices are not in the excavation zone. Any collisions should be removed or existing devices secured with the consent of the user.

The excavation should precede the removal of native soil to a depth up to 20 cm, on a surface with the dimensions of the sides increased by approx. 1 m from the excavation contour.

For the arrangement of poles in the ground provides for drilling holes in the ground with a diameter of 0,55 m or excavating performed manually or mechanically. It is recommended to perform them with a narrow-gauge excavator, assuming the bottom dimensions and depth of excavation, specified on product datasheets.

1 Geotechnical parameters and soil capacity requirements should be confirmed by a person with appropriate qualifications.

The solutions assumed excavation with 20% deviation of the side walls from the vertical. In the case of cohesive soils, when there is no landslides, the excavation can be made with vertical walls while maintaining the dimensions of the excavation bottom.

In the case of mineral soils with the required capacity, the shaft of the pole is placed directly on the ground substrate. With cohesive soils, the excavation should be deepened by 20 cm, and gravel or lean concrete with a thickness of 20 cm should be laid at the bottom of the excavation with a suitable density. In the case of a high level of groundwater, the bottom of the excavation should be taken by an authorized geotechnician.

Backfilling of excavations should be performed very carefully, due to the decisive importance of correct performance of this operation on the capacity of the foundation. Backfilling should be performed with layers of thickness suitable for the possibility of compaction of used mechanical compactors. It is recommended additionally to backfill the excavation use sandy soils or sandblasts with soil moisture, during its pouring and compaction, close to the optimum humidity.

After backfilling the excavation, the native soil should be scattered (set aside from the outer layer) up to 15 cm above the area near the perimeter of the pole, with the slope outside to the contour line of the excavated backfill.

Additionally, in very aggressive ground, additional protection of steel elements against corrosion should be used in the underground part using the varnish or asphalt masses.

6. Installation of additional elements on the lighting column.

On the lighting poles there is the possibility of mounting additional elements, such like brackets, heads, beams.

The attachment of additional elements takes place on the upper part of the pole by letting the fixing end into the pole and tightening the set screws preventing the elements from rotating during operation.

In the case of non-standard solutions for fixing additional elements, the assembly method is developed individually after consultation with the customer.

7. Operation of structures and service inspections.

The owner or manager of a building object is obliged to maintain and use the facility in accordance with its intended purpose and maintain it in a proper technical and aesthetic condition, preventing its performance and technical efficiency from deteriorating, and subjecting periodic inspection consisting in checking the technical condition in accordance with the provisions of The Construction Law..

Service inspections regarding structures should consist of:

a) visual inspection of the condition of key elements of the lighting structure (pole, bracket, beam, head and foundation),

b) visual inspection of the condition of the belaying system - if it occurs on the structure,

c) assessment of the condition of controlled construction elements, paying attention to:

- occurrence of corrosion centers in places exposed to weather conditions, especially in aggressive environments,
- subsidence of land - carried out near the construction of earthworks or construction,
- occurrence of structural cracks in the places of welded joints (base of the stem - stem, stem-rib, base-rib),
- occurrence of changes in the geometry of the structure cross-section (bending, mechanical damage),
- occurrence of defects in anti-corrosion coatings (damage to the zinc coating, painting).

The service inspection should be carried out at least once a year, and after the occurrence of severe adverse weather conditions (eg storm, heavy icing).

Inspections must be carried out (in accordance with the construction law) by persons with appropriate qualifications.

All service inspections must be documented in the form of a report. **After the review, its copies should be sent to the email at przeglady@elmonter.pl**

Failure to carry out inspections results in the loss of the guarantee.

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