RECOMMENDATIONS FOR TRANSPORT, UNLOADING, STORAGE, INSTALLATION AND OPERATION OF COMPOSITE LIGHTING POLES MARKED WITH SYMBOLS: SKPF, SKPW, SKPF-Ł, SKPW-Ł

l. TRANSPORT

l. The party organizing the transport is responsible for the proper protection of the product during loading and transport,

2. The transport organiser shall ensure that the means of transport are suitable for the transport of items of appreciable length. The transport of transported products must not interfere with or create a hazard in road traffic. The transport organiser should ensure that the means of transport has

- a transport platform with a minimum length equal to the length of the longest item being transported,
- a removable roof and/or side panels for loading with a forklift, crane or overhead crane,
- a transport platform equipped with a tarpaulin to cover the transported products during unfavourable weather conditions (snow, slush, wet road salt); the tarpaulin should be removed immediately after the goods have been transported to the unloading point; products should not be stored under the tarpaulin
- approved straps made of soft material, meeting the requirements of standards, to properly secure products during transport.

3. ALUMAST S.A. reserves the right to refuse to load products if the means of transport does not meet the requirements set out in section 2. If the party organising the transport demands that the products are loaded despite failure to meet the above requirements, the full responsibility for any damage incurred during transport and any consequences arising therefrom will be borne by the party itself. ALUMAST S.A. reserves the right to refuse to load products, without incurring any legal or financial consequences, whenever transport for any objective reason may pose a threat to human health or life.

4. Composite poles manufactured by ALUMAST S.A. should be transported in polyethylene film packaging with separators to prevent contact of gel-coated surfaces with galvanized brackets. It is unacceptable for the surfaces of the poles to come into contact with each other during transport, because of the possibility of damaging the zinc or gel-coated coating during transport.

5. When transporting poles without frames, use spacers to isolate galvanized surfaces from each other.

6. Foundations, booms and other elements should be placed on pallets for transportation and properly secured in a way that prevents their displacement or overturning.

7. When transporting painted products, use appropriate wooden spacers.

8. When transporting galvanized and/or painted items, it is prohibited to load any unsecured items.

9. Damage to the gelcoat or zinc coating which occurred during transport shall be immediately reported to the supplier by drawing up a protocol of receipt of shipment and sending it to the guarantor. With the consent of the guarantor, damaged areas can be repaired by cleaning the damaged area (the surface should be uniform, light grey, metallic, without traces of corrosion) and painting with paint rich in zinc, to a total thickness of 100pm.

10. Products should not be thrown, dragged or rolled.

11. Do not move products by holding or suspending by cables or moving parts.

ll. UNLOADING

1. Unloading must be carried out with special care and in a manner that ensures the safety of all persons involved in the process.

2. Before proceeding with the unloading procedure, the storage area for the products must be prepared (see Section III for a description of a properly prepared area).

3. Unloading should be carried out in such a way as not to damage the products being unloaded.

4. Due to the lightness of the product, ALUMAST S.A. recommends manual unloading.

5. Painted or gel-coated products protected with foil during transport must be unpacked immediately after unloading. Leaving the foil on gel-coated or painted products may result in permanent damage to the protective coating. Damage caused in this way is not subject to warranty.

6. During the unloading it is not allowed to
- throw products off the truck,
- drag the products along the side of the truck.
7. Damage to the zinc coating caused during unloading should be repaired immediately by cleaning the damaged area (the surface should be uniform, light grey, metallic, with no signs of corrosion) and painted with zinc-rich paint to a total thickness of 100pm.
8. After unloading, check the completeness of all items in the kit and the condition of the products after transport.

III. STORAGE

1. The products should be stored in a dry place on hardened surfaces.
2. The area where the products are to be stored must be cleared of sharp and hard objects that can damage the stored elements and pose a hazard to persons working during storage.
3. If the products are stored without racks, wooden spacers wrapped with PE or PP foil should be used.
4. Products should be stored on supports that guarantee their stable and safe positioning.
5. Foundations, extension arms, fuse panels, and other components are recommended to be placed on pallets for storage.
6. The storage of products should take place in places inaccessible to animals, away from places where plant protection agents or other chemicals are stored.
7. During the storage process, ensure that the air circulates as freely as possible between the products.
8. It is not recommended to cover or wrap stored items with foils or tarpaulins.
9. Products should not be thrown, dragged or rolled.
10. Do not move products by holding or suspending cables or moving parts.

IV. INSTALLATION OF FOUNDATIONS

1. The installation of the foundations should be carried out with special care and with observance of health and safety rules in such a way as to ensure the safety of all persons participating in the process.
2. Before placing the foundation in the ground, check the correctness of the development with the site plan or construction design.
3. If the foundation has not been protected by the manufacturer with an insulation coating, it should be painted with a bituminous coating before installation.
4. Two-piece (split) foundations must be bolted together before installation using the screws provided.
5. The foundations are designed for foundation in soil with the following parameters:
- the adopted foundation conditions at the building height take into account the existence of non-cohesive soils in a compacted state, this state corresponds to the occurrence of native soils such as gravels, sandy gravels, coarse sands and medium sands, - the occurrence of ground water below the foundation level,
-foundation on a flat terrain (installation of foundations on slopes is unacceptable)
6. Before starting to excavate the foundations, the contractor is obliged to check
-the location of ,
-underground reinforcement of the area,
-ground and water conditions.
7. Changes and deviations from the foundation conditions require a project preparation and consultation with and approval of the project author.
8. Excavation should be done using technology that takes into account the depth of the excavation, terrain, and soil conditions.
9. The foundation should be placed in a previously prepared excavation either manually or with the use of a lifting device. The dimensions of the excavation should be larger than the dimensions of the foundation in order to enable the process of soil compaction around the foundation.
10. Conduit or conduit shall be routed through openings located in the foundation.
11. The foundation should be levelled and backfilled with native soil.

12. After all installation activities, the correctness of the foundation foundation should be checked - the levelling of the upper surface.
13. Guidelines showing the installation of the foundation in the ground are presented in a separate manual.

V. INSTALLATION OF LIGHTING COLUMNS

1. Erection and assembly of poles should be performed by qualified persons with special care and observance of health and safety rules in a manner ensuring the safety of all persons involved in the process.
2. Before erecting a pole, it is necessary to check that the development is correct in accordance with the ground plan or the construction project
3. If the pole consists of two or more segments, before erection it is necessary to carry out the operation of merging the pole. Booms, heads, crosspieces, crowns and electrical equipment should be mounted horizontally, but it is possible to mount these elements vertically after the pole has been erected using a lifter.
4. Depending on the type of joint used, the outriggers, heads, crosspieces and crowns are mounted on the top of the column by - The piston rod is inserted into the top of the post and clamped in place using the supplied bolts. The screws must be tightened to a torque of 5 Nm,
5. The operation of placing columns must be preceded by unscrewing inspection doors (applies to lighting poles), which are intended for the pole from which they were unscrewed - do not swap covers between columns.
6. If the column is to be placed directly into the ground or in an aggressive environment (salts, moisture, etc.) additional protection with bituminous paint is recommended,
7. The following steps are required to mount the pole on the foundation:
-the column should be placed on the foundation so that the holes in the footing of the column match with the Bolt holes in the foundation, or the column should be placed on the pins protruding from the foundation, taking special care not to damage the thread located on them, - during the operation of erecting the column, it is necessary to take into account the routing of the power supply cables,
-if the pole is installed on foundation anchors or on foundations with pins, it is recommended to install the pole on nuts with washers screwed on the anchors. The lower nuts allow precise plumbing of the column,
-Put a plastic protective cap on each bolt or nut.
8. The following steps are required to install the pole directly into the ground:
- preparation of a suitable excavation with a minimum depth equal to the nominal depth of the pole,
-using a crane equipped with a plastic strap sling, fasten the post in such a way as not to damage the gelcoat and place it in the excavation,
- remember to lay the power cables,
-backfill the pole with the material obtained from the excavation, compacting it in layers of about 15 cm, until a soil compaction factor ID of at least 0.97 is achieved.
9. The pole, once in the upright position, should be supported until the Foundation Bolts are tightened or, in the case of a pole placed directly in the ground, until the excavation is backfilled.
10. If required, screw the earthing to the base plate.
ATTENTION: The erected lighting column must have the luminaires fitted within 24 hours as vibration may cause damage or strain to the supporting parts of the column and may effectively reduce the reliable working life of the column.
11. Any damage to the zinc coating during installation shall be repaired immediately by cleaning the damaged area (the surface shall be uniform, light grey, metallic, without traces of corrosion) and painting with zinc-rich paint, to a total thickness of 100 mm:
for category C1 -C4 - required inspection 1 time per year (preferably just after the winter period) for category C5 - required inspection 2 times per year to avoid the possibility of the structure affecting the safety of the environment, resulting from damage to the structure caused by random events - accidents.

VI. EXPLOITATION SERVICE AND MAINTENANCE

1. Exploitation of the product and the warranty period commences upon completion of proper installation in accordance with the manufacturer's instructions.

2. Under pain of forfeiture of the guarantee provided by the manufacturer, during the operation of the products it is not allowed to - any kind of additional loading of the structure not in compliance with the ALUMAST S.A. recommendations included in the catalogue cards and/or on the product nameplates. Installation of additional elements such as road signs, Christmas decorations, information boards, etc., is only possible with the manufacturer's written approval,

- carrying out any alterations or repairs to the structure (welding additional elements, drilling holes, mounting brackets),
- unless special protective coatings have been applied, covering the structure with posters, leaflets, etc.

3. According to EN ISO 1461, the durability of the zinc coating depends on the corrosive load of the environment in which the structure is operated. Standard EN-ISO 12944-2 distinguishes 5 categories of corrosion resistance:

C1 (very weak) - interiors of buildings

C2 (poor) atmosphere with low pollution and dry climate, e.g. rural areas

C3 (medium) - urban atmosphere with medium pollution and also moderate coastal climate

C4 (strong) - industrial areas, coastal areas with moderate salinity

C5 (very strong) - highly industrialized areas with high humidity, aggressive atmosphere, also coastal areas with high salinity

4. The purchaser of the product during the service life of the structure is obliged to carry out periodic maintenance under penalty of losing the guarantee.

The frequency of maintenance during normal use of the product depends on the category of environmental corrosion resistance

For category C1 -C4, maintenance must be carried out once a year (preferably after the winter period) For category C5, maintenance must be carried out twice a year.

5. To avoid the possibility of the structure affecting the safety of its surroundings due to damage to the structure caused by random events (traffic accidents, damage due to vandalism), a general daily visual inspection of the structure should be carried out.

VIII. EXPLOITATION OF LIGHTING COLUMNES

Long term and safe use will be ensured by following the instructions in "RECOMMENDATIONS FOR TRANSPORTATION, DISPOSAL, STORAGE, ASSEMBLY AND OPERATION OF LIGHTING POILS". During the operation of lighting columns there may occur events of an exceptional nature, which may lead to damage to the structure or to the zinc coating,

1. It is recommended to perform a detailed operational inspection at least once every two years.
2. Cleaning and visual inspections of the structure should be performed at least every six months.
3. Maintenance inspections should be performed by a qualified person. 9. Each inspection should be concluded with drawing up a report with legible date and signature of the person carrying out the inspection.
4. The person conducting the review should pay particular attention to:

FOUNDATION SERVICE:

Verify that the foundation is properly set in the ground, the verticality and depth of the foundation, assess the quality of the soil around the foundation, check for damage to the bituminous coating, and visually inspect the foundation for mechanical damage.

REPAIR:

If any irregularities are found, it is recommended to correct the foundation or to embed it again in the ground in accordance with the above installation instructions. If any mechanical damage is found that poses a threat to the safe operation of the foundation, the foundation should be immediately replaced with a new one. If there are any defects in the bituminous coating, it should be replenished.

COLUMN CONSTRUCTION SERVICE:

Poles, like any other equipment, should be inspected regularly. It is recommended that this is done every three months. Looking for the effects of vibration is very important, because if it occurs, failure can occur in a relatively short time. The potential consequences of vibration are very serious, ranging from failure of a lighting

component to failure of the pole. Early signs of vibration can be observed. Early signs include internal humming of the column, parts of the lighting component falling off (e.g. nuts, shortened lamp life, etc.), and the failure of the lighting component. If any of these phenomena are present, further inspection should be carried out at the point where the pole connects to the mounting plate. Signs of fatigue should be looked for just above the fixing weld in the form of small cracks . Pay special attention to mechanical damage, (dents, bends, cracks, etc.), check the proper tightening of foundation bolts (number of bolts and washers, tightening force, number of protective caps), check the proper foundation and verticality, check the proper installation of inspection doors.

REPAIR:

If mechanical damage to the structure is found, immediately replace the product with a new one, complete and/or tighten the foundation bolts, complete the protective caps.

BOOM SERVICE:

Particular attention should be paid to mechanical damage (twists, cracks, etc.), check the proper assembly of extension arms (tightening force, axis of assembly with respect to the pole, completeness of screws).

REPAIR:

If any mechanical damage is found on the extension arm, immediately replace the component with a new one, replace with original bolts and/or tighten the bolts of the extension arm (5 Nm) correcting the alignment of the extension arm with respect to the pole.

SERVICE OF THE ZINC COATING:

The condition of the zinc coating shall be checked for the presence of corrosion centres, mechanical damage (abrasions, scratches, etc.), chemical damage (efflorescence, pitting, peeling, discoloration, etc.), measurements of the zinc coating thickness shall be carried out according to PN-EN ISO 1461 standard.

REPAIR:

In case of mechanical or chemical damage of the coating or in case of corrosion outbreaks, the coating shall be repaired by cleaning the damaged area (the surface shall be uniform, light grey, metallic, without traces of corrosion) and painting with zinc-rich paint, to a total thickness of 100 mm. In case the coating damage or corrosion foci constitute more than 0,5% of the surface of galvanized element or the single corrosion area or damage has a surface greater than IOcm2, the manufacturer shall be immediately notified in order to obtain information as to the possibility of further use of the column and its repair or replacement.

GEL-COAT SERVICE:

Check the condition of the gelcoat coating for mechanical damage (scuffs, scratches, etc.), chemical damage, pitting, peeling, discoloration, etc.)

REPAIR:

If any mechanical or chemical damage of the coating is found, the gelcoat coating shall be repaired with the use of a repair kit from ALUMAST S.A. and according to the recommendations included in the kit.