DESCRIPTION OF SPUN POLE PLANT OPERATIONS

At present, THE.MO.S. AS is producing span concrete poles for the Greek electricity distribution network . This network uses 18 different type of poles ranging from 10 to 15 m in length, base diameter from 340 to 535 mm and top diameter from 175 to 310 mm. Each pole is used for a specific purpose and so the reinforcement and the geometric characteristics vary. The taper of the poles towards the top is 5 mm/m. Each pole has several through-holes in order to attach components in the field.

Fig. 1. Half 3-meter mold (interior)

For the production of poles articulated 3-meter conic molds are used (Fig 2 and 3) which are put together to form a length of 12 or 15m. For poles that are 10,11, 13 and 14 m in length, special 1 or 2 m spacers are used in the bottom of the immediately larger mold. (Pic. 1). All the molds have special nuts for the support of dowels which will form the required holes necessary for fixing accessories onto the poles as required by the specifications.

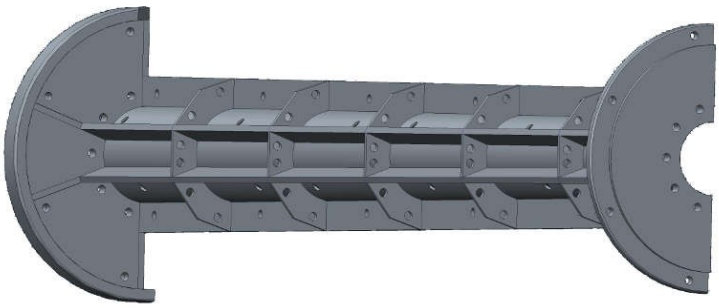

Fig. 2. Half 3-meter mold (exterior)

The molds are designed in such a way that permits easy separation along the longitudinal axis to form 2 semicircular parts, top and bottom. This facilitates the placement of the reinforcement into the "bottom' part of the mold and the subsequent pouring of concrete. After concreting is finished the two parts are bolted together and the mold is placed on the centrifugal machine.

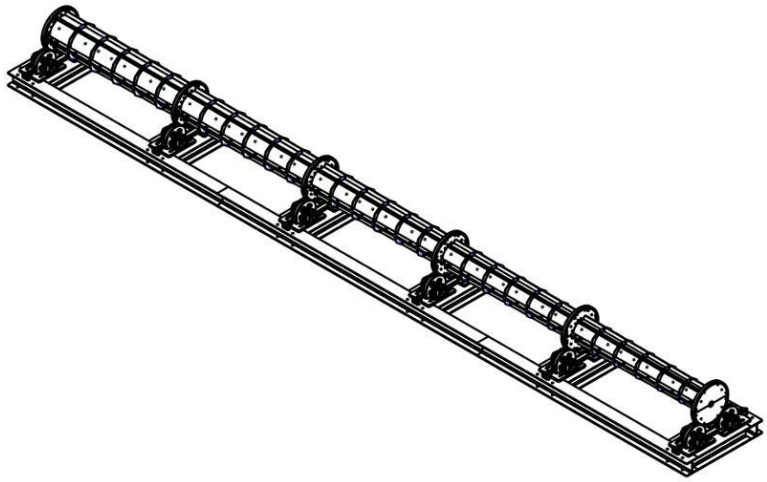

Fig. 3. 15-m mold placed on the centrifugal machine.

The production of spun concrete molds takes place in a circular manner as follows:

- *Placement of the lower half of the mold on the concreting bench (from the previous phase, the interior of the mold as already oiled and the steel reinforcement is in place)*
- *Placement of conic dowels on the lower half the mold. Welding of the two earthing bronze nuts.*
- *Concrete pouring with suitable vehicle, using the specific quantity of concrete for the pole type*
- *Sealing of the mold by placing the top half and bolting the two parts together. At the same time the conic dowels for the top half are fixed.*
- *Transport the filled up mold to the centrifugal machine and spinning at 300-400 rpm for 7-10 minutes. (Pic. 3).*
- *Transport the spun mold to the curing chamber. Each mold remains in the curing chamber for approximately 4 hours at a temperature of about 50 ^{o}C. [During curing the production continues with the rest of the molds]*
- *After curing the mold is transported to the demolding bench where: α) the bolds joining the upper and lower halves of mold are unscrewed b) the dowels forming the holes are removed c) The upper halft of the mold is removed (Pic. 2) and placed on a wagon to return to the beginning of cycle d)the new pole is rolled directly on a special wagon by rotation of the lower part of mold*
- *the new pole is transported to storing place.*

- *The empty mold, separated in two parts is driven to the concreting area, where a) the upper part is lifted by a crane in order to be cleaned and oiled b) the lower part is cleaned and oiled on the wagon, and then does a few maneuvers in order for the reinforcement cage to be placed inside it. The cage, fully assembled with spacers on it, comes with a monorail from the adjacent steel assembling area within the plant.*

THE.MO.S. SA has a fully equipped laboratory to check the quality of aggregates and the concrete. There is also a special testing area where the poles can be fixed and tested in bending or in torsion and bending simultaneously (Fig 5).

According to the specifications of the client, the poles are stored in a covered area (Fig. 40 Within this area, there is a 5-ton portal-crane moving on rails, to facilitate the stacing pf poles ant their loading on tracks (Pic 4).

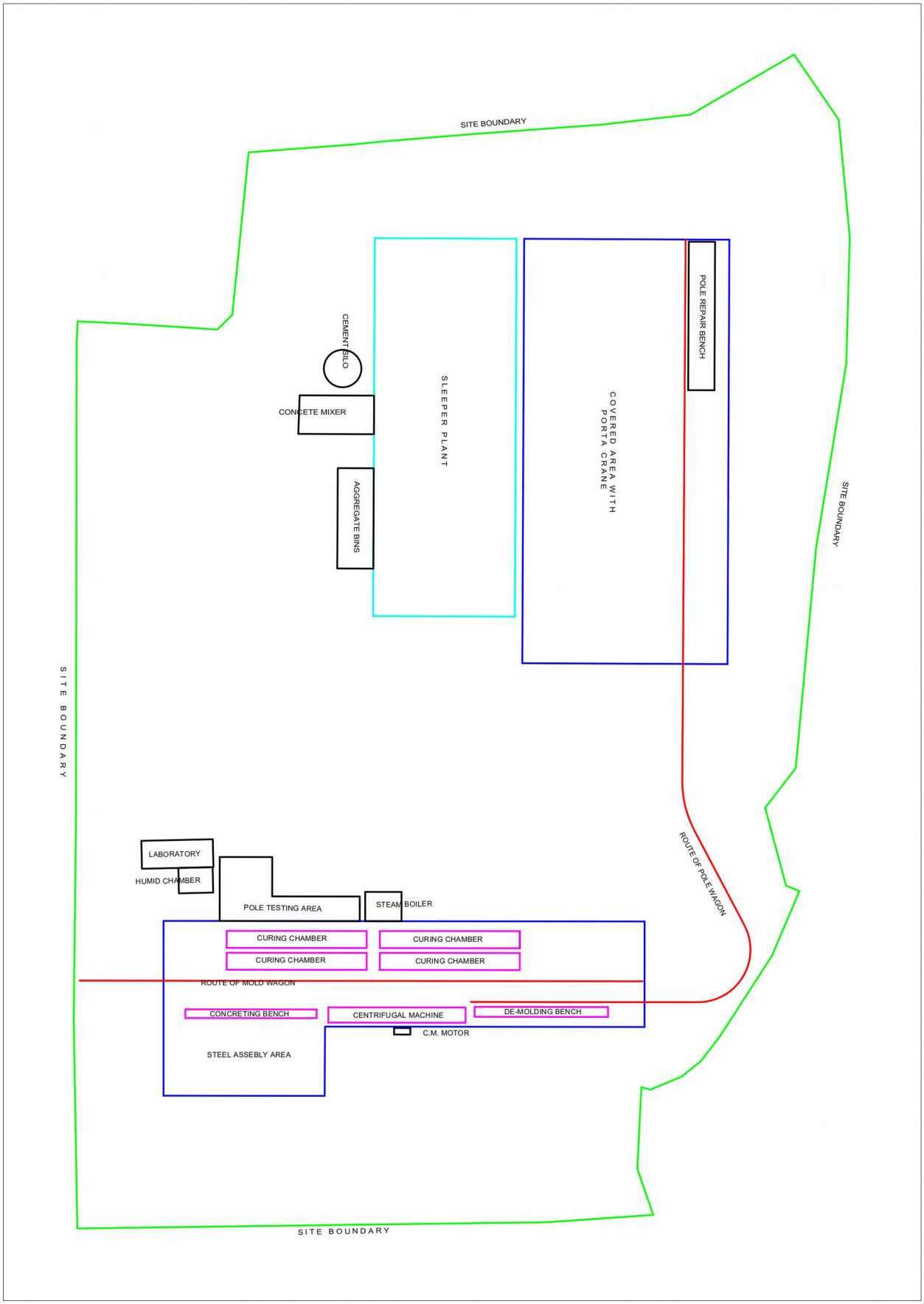

Fig. 4 Main areas of the spun concrete poles plant

Pic. 1 Reinforcement cage within the lower half of mold ready for concreting. At the bottom of the mold the spacer to reduce the length of the pole.

Pic 2. Mold on the demolding bench. The upper half is already removed

Pic. 3. Rotating mold

Pic. 4 Covered area for stacking the poles

Pic. 5. Pole testing in combined bending and torsion

Pic. 6 Pole loading on truck