1. CONCRETE POLES

The concrete poles to be used must be 10m in height minimum and 12m high where there is a road crossing. The poles must be manufactured in strict adherence to the following specifications:

8.1 Concrete for Manufacture

The pre-stressed high strength and high quality concrete poles must be compliant with modern technology of concrete density by centrifugation method that allows achievement of a high level of density that guarantees the stability and bearing capacity of the spun concrete poles.

Unless otherwise specified, the concrete used for the manufacture of the poles shall have the following properties with concrete required values in MPa (Mega Pascals):

8.1.1 Maximum Water/Cement Ratio by Weight 0.6

8.1.2 Minimum Cement Content (kg per cubic meter of concrete) 280

8.1.3 Nominal Maximum Size of Aggregate (mm) (cast & pre-stressed) 20

8.1.4 Nominal Maximum Size of Aggregate (mm) (Centrifugally spun) 14

8.1.5 Minimum characteristic compressive strength for cast concrete F'c at 28 days 25 MPa

8.1.6 Minimum characteristic compressive strength for Centrifugally spun F'c at 28 days 50 MPa

8.1.7 Minimum characteristic compressive strength for Pre-stressed at 28 days 30 MPa

8.1.8 Minimum characteristic compressive strength for Pre-stressed at transfer 25 MPa

8.2 Handling Strength Requirements.

8.2.1 Poles shall be designed not only to withstand the rated design and ultimate strength shown in the specs above, but must be able to accommodate allowances for handling, transportation and erection.

8.2.2 All poles shall be capable of withstanding single point pickup from the horizontal position when lifting from a point 30% of the overall length down from the tip.

8.3 Drawing and Design Information.

The supplier will furnish detailed design drawings and computations for the poles bid including but not limited to the following:

8.3.1 Total weight and center of gravity of each pole.

KENYA - EASTERN AFRICA REGIONAL TRANSPORT, TRADE AND DEVELOPMENT FACILITATION PROJECT (SECOND PHASE OF PROGRAM) (IDA/R2015-0143) EARTTDFP - P148853): FIBER OPTIC NETWORK PROJECT FINAL DESIGN

8.3.2 Calculations of cracking and ultimate moment capacities at not more than 1.5m intervals.

8.3.3 Reinforced pickup points, including both one-point and two-point pickup locations.

8.3.4 Detail of cross section and all points where reinforcing changes.

8.4 Pole Installation

Concrete poles will be transported by trucks and dropped off as close as possible to the designated point. Poles will then be moved to the given coordinates, where the hole will be dug and the pole erected.

Poles must be erected vertically and in straight lines, one to the other, as much as possible, except where the road curves.

Figure 20: Correct pole location

Concrete pole handling and installation is a very delicate job due to possible injury to the workers and possible damage to the poles if care and safety is not emphasize. Those involved in the installation of concrete poles must adhere to the following rules and specifications:

8.4.1 Poles shall be supported and protected during transportation, site storage, lifting and setting to prevent damage to the pole.

8.4.2 Pole lifting and setting equipment must be used at all times as much as possible. If not possible, a minimum of four (X4) qualified pole-handlers must be available during pole erection.

8.4.3 Spalls or other damage incurred during these operations shall be repaired to restore the pole to "as new" condition.

8.4.4 Holes for the poles must be 1600mm deep and 200mm wider, in diameter, than the diameter of the pole used.

8.4.5 Concrete must be used to backfill and secure the pole; instead of using the spoil only.

November 2017

**KENYA - EASTERN AFRICA REGIONAL TRANSPORT, TRADE AND
DEVELOPMENT FACILITATION PROJECT (SECOND PHASE OF PROGRAM)
(IDA/R2015-0143) EARTTDFP - P148853): FIBER OPTIC NETWORK PROJECT
FINAL DESIGN**

8.4.6 Concrete must be cured for 3 days to allow proper setting of the pole before the installation of the Aerial cable.