CLASSIFICATION OF TRIANGULATION SYSTEM

The basis of the classification of triangulation figures is the accuracy with which the length and azimuth of a line of the triangulation are determined. Triangulation systems of different accuracies depend on the extent and the purpose of the survey. The accepted grades of triangulation are:

1. First order or Primary Triangulation
2. Second order or Secondary Triangulation
3. Third order or Tertiary Triangulation

First Order or Primary Triangulation:

The first order triangulation is of the highest order and is employed either to determine the earth's figure or to furnish the most precise control points to which secondary triangulation may be connected. The primary triangulation system embraces the vast area (usually the whole of the country). Every precaution is taken in making linear and angular measurements and in performing the reductions. The following are the general specifications of the primary triangulation:

1. Average triangle closure	: Less than 1 second
2. Maximum triangle closure	: Not more than 3 seconds
3. Length of base line	: 5 to 15 kilometers
4. Length of the sides of triangles	: 30 to 150 kilometers
5. Actual error of base	: 1 in 300,000
6. Probable error of base	: 1 in 1,000,000
7. Discrepancy between two measures of a section	: 10 mm kilometers
8. Probable error or computed distance	: 1 in 60,000 to 1 in 250,000
9. Probable error in astronomic azimuth	: 0.5 seconds

Secondary Order or Secondary Triangulation

      The secondary triangulation consists of a number of points fixed within the framework of primary triangulation. The stations are fixed at close intervals so that the sizes of the triangles formed are smaller than the primary triangulation. The instruments and methods used are not of the same utmost refinement. The general specifications of the secondary triangulation are:

1. Average triangle closure   : 3 sec

2. Maximum triangle closure   : 8 sec

3. Length of base line   : 1.5 to 5 km

4. Length of sides of triangles   : 8 to 65 km

5. Actual error of base   : 1 in 150,000

6. Probable error of base   : 1 in 500,000

7. Discrepancy between two
    measures of a section   : 20 mm kilometers

8. Probable error or computed distance   : 1 in 20,000 to 1 in 50,000

9. Probable error in astronomic azimuth   : 2.0 sec

Third Order or Tertiary Triangulation:

      The third-order triangulation consists of a number of points fixed within the framework of secondary triangulation, and forms the immediate control for detailed engineering and other surveys. The sizes of the triangles are small and instrument with moderate precision may be used. The specifications for a third-order triangulation are as follows:

1. Average triangle closure   : 6 sec

2. Maximum triangle closure   : 12 sec

3. Length of base line   : 0.5 to 3 km

4. Length of sides of triangles   : 1.5 to 10 km

5. Actual error of base   : 1 in 75, 0000

6. Probable error of base   : 1 in 250,000

7. Discrepancy between two
    Measures of a section   : 25 mm kilometers

8. Probable error or computed distance   : 1 in 5,000 to 1 in 20,000

9. Probable error in astronomic Azimuth   : 5 sec.