1903

Contour map

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THESIS

FOR THE DEGREE

OF

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1903.

CONTOUR MAP.

as used by Locating Engineers.

In discussing the contour map as used by locating engineers, I will confine myself chiefly to the method of obtaining same, rather than the use.

The method of procuring this map as discussed below is used by the Choctow, Oklahoma and Gulf Railroad Company of the Rock Island System.

The paper on which the contour map is made is of the best detail(manilla) paper. This is kept in a continuous roll, breaking the line should the work approach nearer than two inches to the edge.

This detail paper is found to be best, for maps in the field, as it can be used in damp weather. The color and toughness also withstands the rough handling to which it is subjected.

The ink used is the best water proof. Red, black, blue and green being the colors used.

From the "transit notes" the preliminary line is plotted (as work progresses) by the Meridian System," the bearings being noted on the preliminary lines.

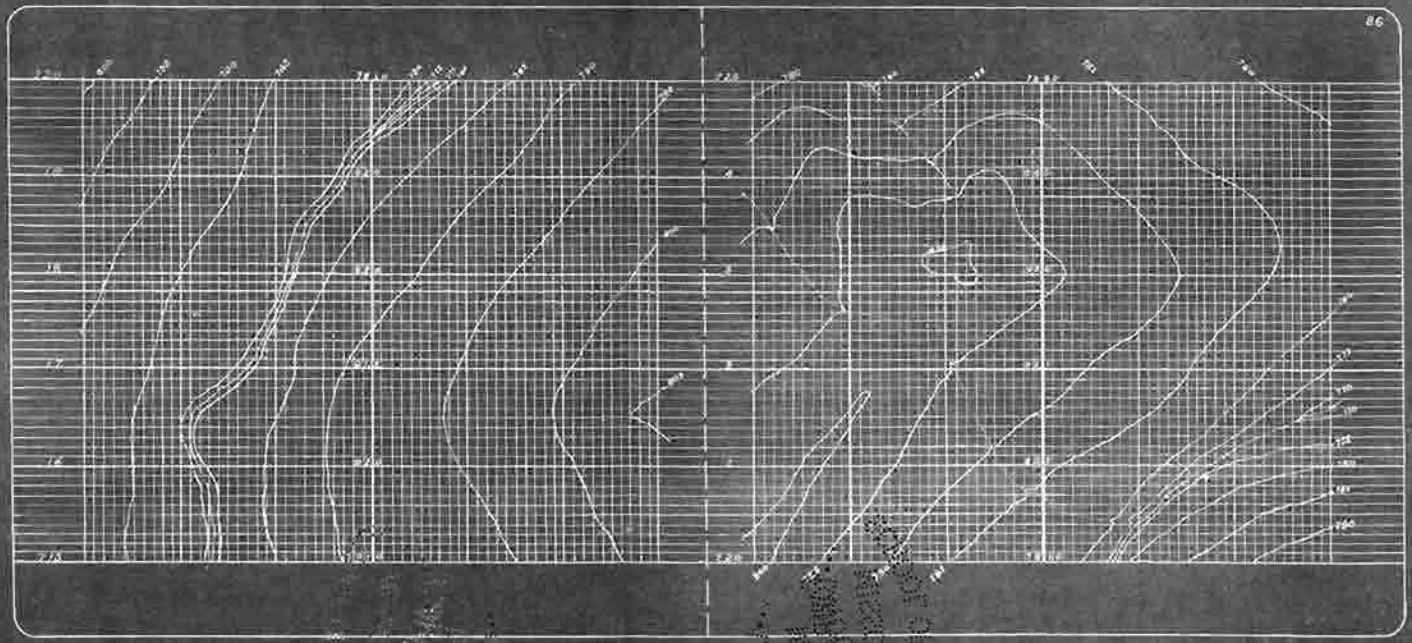
Sections, townships and range lines are indicated as shown in Figure Two. (2).

The meridian system of plotting referred to above may be explained as follows:-

The variation which fits the section lines of the district in which you are working is determined from this and the calculated course of the preliminary line, the true course is obtained.

An arbitrary line is taken as the meridian, all true causes are plotted

FIG. 1.



from it. The true meridian is carried through the map parallel to itself.

Topography.

Having the preliminary line plotted it is used as the base line for the topographical work. This is generally confined to three hundred (300) feet each side of the base line.

The topography party consists of from three(3) men in ordinary country to a double party in very rough country.

Note Book.

Figure one (1) shows a page of the topographers note book.

In beginning work the date is placed on the upper left hand corner,from the page and book from which the notes were continued.

The scale indicated in figure one (1) is one inch to one hundred feet. These squares of one inch are again divided into tenths,thus making it better adapted to field plotting of all data at right angles to the preliminary line. All work,such as plotting fences,houses,barned,etc. are to scale and lengths indicated in note book on their respective sides. All data is recorded as soon as collected. In so doing all chances of misplotting ~~is~~ are done away with.

Great stress is layed upon the neatness as well as accuracy of the work presented by the note book. Note books are relayed daily,thus giving the draughtsmen,as it were,notes of yesterday to be plotted to-day.

The dotted line,Figure one (1), is the fold and the heavy lines,on each side,represents the preliminary line.

Stationing is from bottom to top of page as in transit notes,and are indicated to left of page. ex (715-720) (720-725) as shown in Figure. The elevation of each station is put on center line opposite its station number as shown in figure one (1) (791.0 -781.0) (781.0 _788.0)

Instruments.

Instruments used are the hand (sock) level, small pocket compass. and topographers level rod and in case of a beginner a one hundred foot steel tape. The tape is not used by an experienced hand as by constant practice pacing can be done surprisingly close.

The level rod as used by topographers assistant varies with the height of eye above the ground.

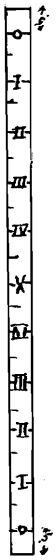


Figure 0. shows a rod used by a man whose eye is 5.5 feet above the ground.

The use will be noted further on.

When level notes have not been recorded during the previous night, they are entered in field, the leveler leaving notes on slip of paper every five hundred feet.

Procedure in locating a Contour (all contours are Multiples of five feet) Fig. (0). In leveling, the elevation of a point is found by taking the rod reading from the height of instrument. In contour work it is just opposite, the rod reading is calculated for a required contour.

Example:--

Station 715 Figure one (1) has an elevation of 790.0. Then 790.0+5.5 (height of eye)- 796.5 is the elevation of the eye. To locate contour 795, the rod reading would be 796.5-795.0=1.5 feet above the ground or a reading of one foot on Rod. Figure (0).

All this is mental calculation and is computed while going from station to the next.

Next point after computing the rod reading is to follow a line at right angles to the preliminary line. This line is determined by standing over the station one is working from and extending the arms in opposite directions along the preliminary line,then bringing the hands together. Select some tree,fense post,stone,tift of grass or some object in line for front sight.

The rodman "paces" along this line until stopped by the assistant who takes a reading,having the rodman move backward or forward until the reading calculated is obtained.

Contour 795:150 feet is spotted. Figure one (1).

Contour 800 is found similarly,assistant taking a reading of .5 above ground or 0 on rod,from point at which contour 795 was located.

Same method in locating the next contour,etc. until the limit ,300 feet is reached.

The left side of station 715 is carried on about the same,the first reading being 6.5 feet above ground or upper 1V by rod for contour 790,etc.

All things which will enable and benefit the locater to locate are ruled in to scale,such as fence lines,grave yards,orchards,etc.

From the material thus collected the contour map. Figure two (2) is produced.

The Contour Map.

Streams,contours,etc are all put on the map by two methods.

First,- By reproducing the sections in note book,on map to the scale (in this case) one inch = 200 feet,in pencil and after tracing in contour in ink,the section erased.

Second,-

By using scale. This is the more rapid provess and consequently used to a great extent. It consists of a flat scale so placed on map that it is at right angles to the preliminary line at the required station,and all contours,ravines,etc are spotted,then similar elevations connected,thus giving the contour. By working backwards we can do away with spotting and bring contours,etc from one section to the next by line.

All streams and ravines shown in blue,the preliminary line in red. All otherdata in black.

Projected Location.

On this map the projected location is placed in pencil,and from the countours the "porjected profile". From these an approximate extimate of the line is made.

The projected location being satisfactory the location is made.

Location.

This is done by two methods,owing to the nature of the previous work.

1st. Should there be no error in the preliminary line the distance is scaled from an important "hub" station ~~and~~ on the preliminary line to projected line,also computing the bearing of the latter line. This point on the porjected line is located in the field and ~~stated~~ using computing course,as a starter, checking by measuring to the preliminary line at different intervals until the complete tangent is run. The next tangent is run in the same way;the angle of intersection measured and a suitable curve run in.

The second method is used in case of an error in the preliminary line.

This differs from the first method in that a contour is located instead of using a scale distance,otherwise it is the same.

Should this location prove to be satisfactory it is termed the final location.

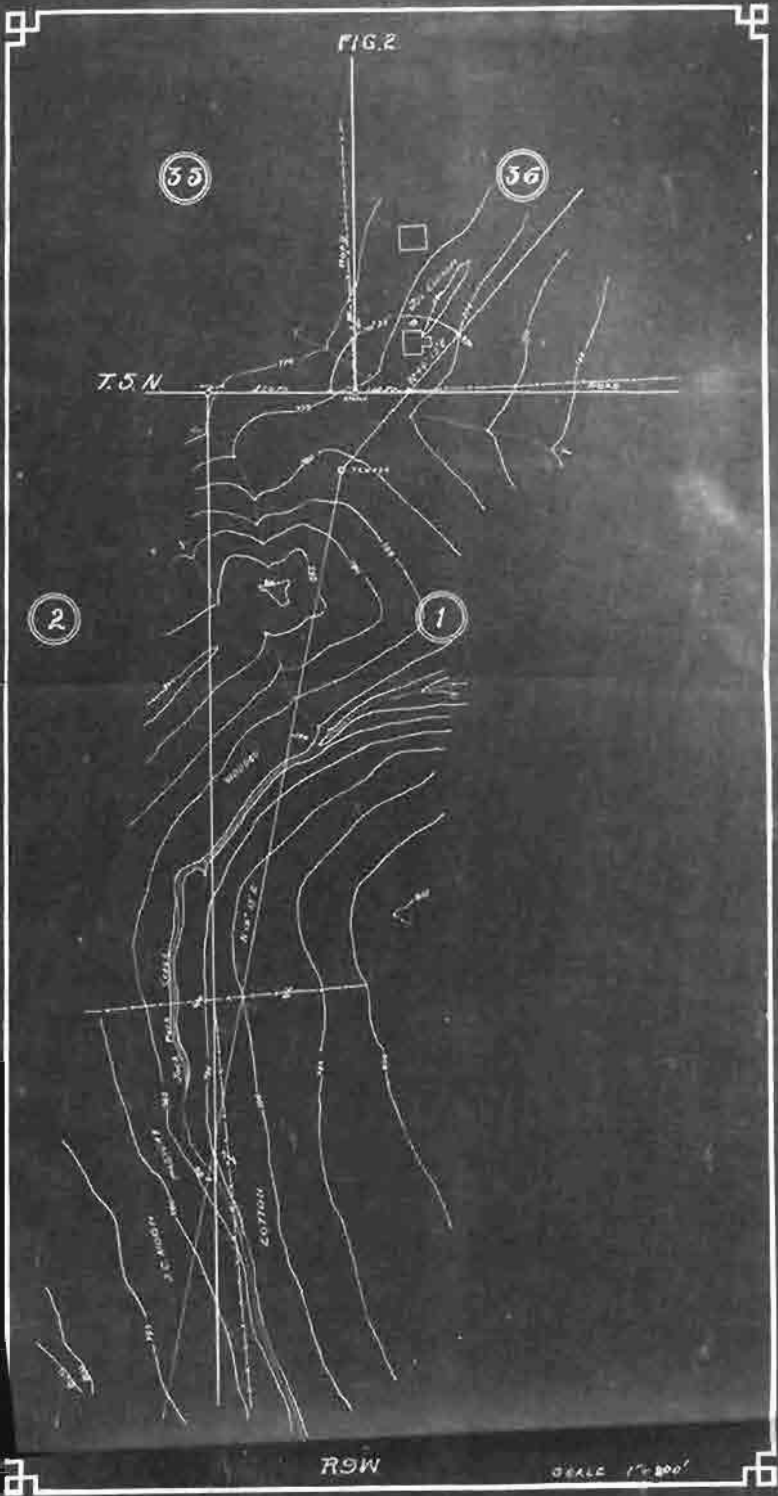


FIG. 2
33
36
T. 5 N.
2
1
R. 9 W.
SCALE 1" = 800'