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GENERAL SPECIAL INSTRUCTIONS

Office of U. S. Surveyor General,  
316 Custom House, Portland, Ore.  
October 1, 1916.

U. S. Surveyors and Transitmen,  
General Land Office,  
District No. 8 (Oregon)

Sirs:

In order to avoid repetition and reduce work in preparing special instructions to cover each assignment of surveys, under group numbers, the following General Special Instructions will be observed by you while engaged in the execution of such surveys, being applicable to all Groups to which you may be assigned.

In this connection you are directed not to proceed with the execution of any survey, provided for under a group number, until Assignment Instructions have been issued to you by the Assistant Supervisor of Surveys for Oregon.

PUBLIC LAND SURVEYS:

(a) The governing principles in the fixation of township boundary lines included in a group of surveys is to so adjust such lines, if possible, to avoid the use of an unnecessary number of closing corners; to minimize the number of fractional lots and place the same along the N. and W. boundaries of a Tp., to provide for a regular survey of Sec. 36 in all townships, and in general, to establish proper governing boundaries for the subdivisions thereof, as prescribed by the Manual.

(b) I desire to emphasize the necessity of a thorough examination, where the existing evidence of the old original exterior lines is deficient and indicates the necessity of restoring or re-surveying, and while the expense of retracing and re-establishing such old Tp. bdy. lines (as may be necessary to properly close the new upon the old surveys) is relatively high, I wish to emphasize



the resultant simplification of the subdivisional lines of a township, after the boundaries are fixed; also the saving in expense and complications in the end. If any or all of the four bdrs. of a township to be subdivided have been previously surveyed and there is reason to question their accuracy or the condition of the corner monuments thereon, you are authorized to retrace all the previously surveyed boundaries before proceeding with the subdivisional survey, and to reconstruct all corners thereon, whose condition fails to meet the requirements as to cor. monuments and their accessories. In this connection it is assumed that ordinarily no retracement of boundary lines controlling subdivisional surveys which have been executed under the direct system will be required. The retracement so made, will develop the true bearings and distances between the successive corners and all data obtained therein will be embodied in the field notes.

(c) In reconstructing all old original cors., that serve in defining the boundaries of lands covered by possible filings or entries, you will leave such old original corners intact and establish alongside of them, iron posts as accessories and make your description in returns of field notes so definite and complete that there will be no doubt as to the original position of cor., for example: "at a point 1 lk. west of the cor. I set an iron post" etc.

Such original corners and their accessories must not be destroyed, except when an independent resurvey is authorized, and then only where they will be of no further service, in which case they must first be tied by course and distance to a cor. of the resurvey.

The above indicates the policy of the General Land Office in the matter of preserving old corners (when applicable).

(d) Examination of returns of surveys from the various states, by the General Land Office, discloses the fact that many of the sections, as surveyed, are defective in that they fail to close within the allowable limit of closing error.

In order to avoid special and expensive field investigations to determine the cause of a misclosure, it is imperative that you satisfy yourself, before leaving the field, that each and every section surveyed by you closes within the liberal limit of closing error.

In this connection, you are advised that all townships, frac'l. townships, sections and frac'l. sections will be required to close within a limit of 1/640 of the perimeter thereof, both in latitude and in departure. It is to be understood that Sec. 180, page 66 of the Manual of 1902, is modified accordingly.



(e) In order that public land survey methods and practice may meet the required standard of efficiency, the following general instructions will be observed -as outlined in Annual Surveying Instructions from General Land Office dated August 17, 1916-: Paragraph 145 of the Manual will be changed to read as follows:

"The random of a latitudinal section line will always be run parallel to the true south boundary of the section to which it belongs and when a section has no linear south boundary the random will be run parallel to the true south boundary of the first section to the south having a south boundary in the range of sections in which it is situated and fractional true lines will be run in a similar manner."

Following this principle, the random of a meridional section line will be run parallel to the true east boundary of the section to which it belongs.

When the establishment of a range line with a length of 6 miles would result in the projection of the township line to a closing, the range line will be terminated at the point of its mutual intersection with the township line carried in on a cardinal course from the opposite township corner.

The course of the governing boundary or governing subdivisional line of a township shall not vary more than 10' of arc from a cardinal course and all newly established section lines shall be so run as not to depart more than 21' of arc from a cardinal course nor more than 21' of arc from their governing lines.

Governing subdivisional lines may be run between corresponding corners on the exterior boundaries of a township when varying not more than 10' of arc from a cardinal course, in case the usual governing boundary or boundaries are defective but not subject to rectification; otherwise the usual sectional correction lines and sectional guide meridians will be established.

The number of closing corners shall be reduced to a minimum and where practicable and necessary to accomplish this end, corners for two sections and quarter-section corners for two quarter sections shall be established, except on standard parallels. Every section should have its four  $\frac{1}{4}$  cors., in order to determine its legal center.

Standard lines shall be double chained only when no closings are to be made thereon during the process of the survey under assignment.

The limit of distance to bearing trees will be changed from 3 chs. to 5 chs. and in addition to the markings thereon now required, SC shall be placed on all bearing trees to Standard Corners and CC on those to Closing Corners. Bearing trees shall not be marked unless they stand in the sections to which they relate.

Special effort shall be made to avoid witness corners, even if the setting of the true corner involves considerable time and expense and slight departure from requirements as to depth, etc.

The township, shall, in general, be deemed the unit of survey and the section the unit of subdivision.

Mounds of earth are hereby eliminated as accessories and



the earth taken from pits shall be scattered.

Mounds of stone shall be given first preference as accessories and the term "pits impracticable" shall be eliminated.

MODIFICATIONS TO THE MANUAL:

"Standard Field Tables": This volume contains the entire scope of standard tables necessary in the execution of your work, Upon requisition to this office said tables will be furnished you and others will be supplied for your principal assistants, if needed.

"Ephemeris of the Sun and Polaris, and Tables of Azimuths of Polaris" is a new annual supplement to the Manual for distribution, a copy of which, for the year in which survey is executed, will be furnished you. This publication contains every function of the Sun and Polaris necessary for determining the true meridian by approved methods.

Measurements: In addition to the method of measurement prescribed in the Manual, approval is extended to the use of long steel tapes in making measurements directly on the slope, including the use of clinometers in the determination of slope angles, the slope distances to be properly reduced to true horizontal distances for entry in the official field notes; the fact of the use of the long steel tape and clinometer method is required to be stated in the field notes. Approval is extended to a restricted and proper use of the stadia method in measurement over surfaces that cannot be accurately measured with the steel tape. You are required to include in your field notes the record of the test of the stadia wire interval as often as

once a week when used, and to state in your field notes the essential features of the record of every stadia measurement, but not the detailed process of each reduction.

Instruments: Your instrument must conform to the requirements of the Manual, and the certificate of approval of your instrument by the Supervising Surveyor must appear in your field notes.

#### APPROVED METHODS OF OBSERVATION TO DETERMINE THE TRUE MERIDIAN

1. Polaris by elongation
2. Polaris by the hour angle method with record of independent time determination.
3. A series of three altitude observations of the sun for azimuth, taking the resulting mean.
4. A series of three equal altitude observations of the sun for meridian, taking the resulting mean.
5. A solar attachment, properly adjusted to hold the true meridian at all approved hours of solar work within 1'30" of the true meridian as determined by the other approved methods as outlined above.

You are cautioned to observe the requirements of the Manual, both in frequency and in the record of the above determinations and tests.

#### APPROVED METHODS OF OBSERVATION FROM WHICH TO DETERMINE CORRECT LOCAL MEAN TIME FOR USE WITHIN 24 HOURS IN HOUR ANGLE OBSERVATIONS OF POLARIS

1. Altitude observation of the sun.
2. Meridian observation of the sun.
3. Comparison with standard telegraphic clock.

The essential elements of all azimuth and time determinations must appear in the field notes, but the field notes should not be unnecessarily elaborated to show the detailed process of reductions.

#### CORNER MONUMENTS

Iron posts will be furnished to you for use in place of the usual corner material prescribed in the Manual, but the accessories provided in the Manual will be constructed as usual.



You will be required to mark the brass caps of the iron posts with the appropriate marks and in a uniform manner as shown on the sample diagram of markings herewith attached.

Three classes of corners will be employed in your survey:

1. An iron post, 3 ft. long, 3 ins. in diam., for all standard township corners, closing township corners and corners common to one, two or four townships.

2. An iron post, 3 ft. long, 2 ins. in diam., for all section corners, including closing section corners.

3. An iron post, 3 ft. long, 1 in. in diam., for all  $\frac{1}{4}$  section corners, meander corners, closing corners of all lines intersecting the lines of metes and bounds surveys and all angle corners of tracts surveyed by metes and bounds.

All witness corners are required to be of the same size as would be used for the true corner.

You are directed to mark the year on all corners, thus indicating when the survey is executed.

#### APPROVED CORNER MONUMENTS

Iron post corners are hereby required to be witnessed by bearing trees excepting only the absence of sound trees of suitable size within a distance of 5 chains, and in addition to the markings thereon, now required, SC shall be placed on all bearing trees to standard cors. and CC on those to closing cors. Bearing trees shall not be marked unless they stand in the secs. to which they relate.

When impracticable to use iron posts, the best native stone, if of proper quality, may be used as prescribed in the Manual. When impracticable to use iron posts or suitable native stone, wooden posts (witnessed by bearing trees) may be used as prescribed in the Manual; also the usual accessories are required at all corners, except mounds of earth, which have been eliminated and the earth taken from pits shall be scattered.

Standard Tp. Cor.



Fig. 2. C.C. on Stand. Parallel

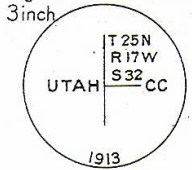


Fig. 3. Closing Tp. Cor.

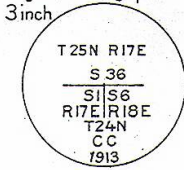


Fig. 4. Closing Tp. Cor.

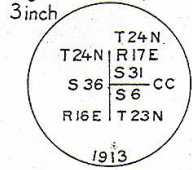


Fig. 5. Closing Tp. Cor.

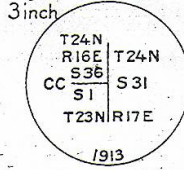
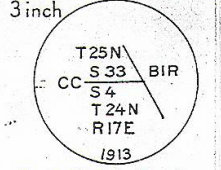


Fig. 6. C.C. on Reservation Bdy



on Reservation Bdy.



Fig. 8. Cor. of 4 Tps.

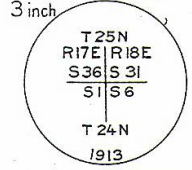


Fig. 9. Cor. of 2 Tps.

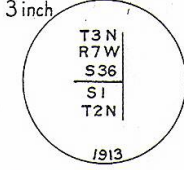


Fig. 10. Cor. of 1 Tp.

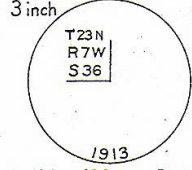


Fig. 11. Standard Sec. Cor.

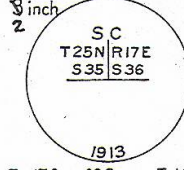
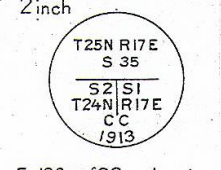


Fig. 12. Closing Sec. Cor.



Cor. of 4 Secs. on Range

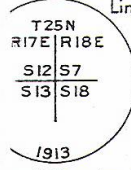


Fig. 14. Cor. of 4 Secs. on Tp. Line

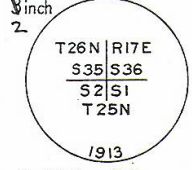


Fig. 15. Cor. of 4 Secs. Interior

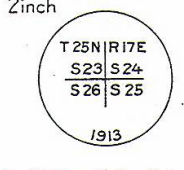


Fig. 16. Cor. of 2 Secs. on Range

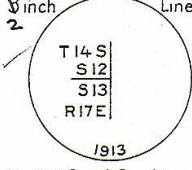


Fig. 17. Cor. of 2 Secs. on Tp. Line

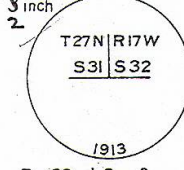
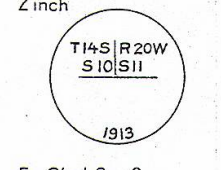


Fig. 18. Cor. of 2 Secs. Interior



Cor. of 2 Secs. Interior

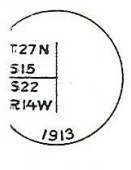


Fig. 20. Cor. of 1 Sec.

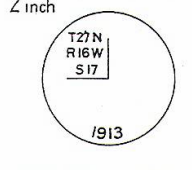


Fig. 21. Stand. 1/4 Sec. Cor.

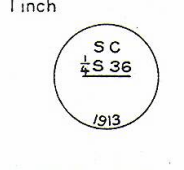


Fig. 22. C.C. on 1/4 Sec. Line

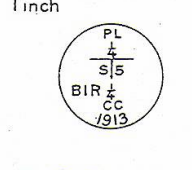


Fig. 23. 1/4 Sec. Cor.

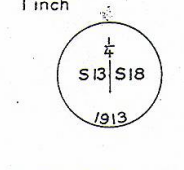
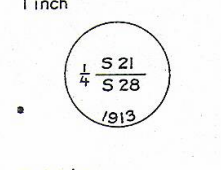


Fig. 24. 1/4 Sec. Cor.



1/4 Sec. Cor. Common

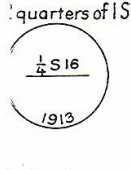


Fig. 26. Center 1/4 Cor.

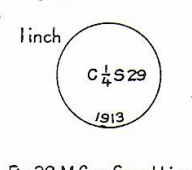


Fig. 27. Stand. 1/8 Cor.

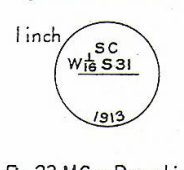


Fig. 28. C.C. on 1/8 Line



Fig. 29. 1/8 Sec. Cor.

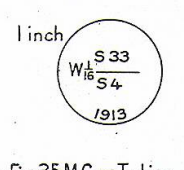
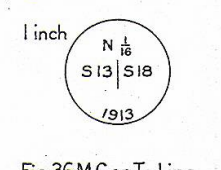


Fig. 30. 1/8 Sec. Cor.



1/8 Sec. Cor.

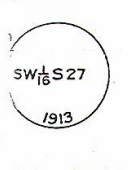


Fig. 32. M.C. on Stand. Line

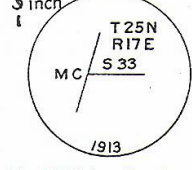


Fig. 33. M.C. on Range Line

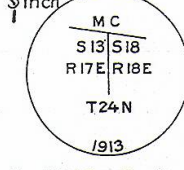


Fig. 34. M.C. on Range Line

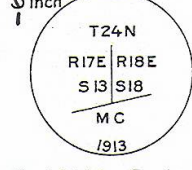


Fig. 35. M.C. on Tp. Line

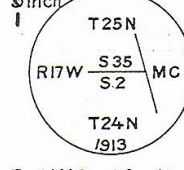
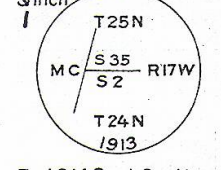


Fig. 36. M.C. on Tp. Line



M.C. on Sec. Line

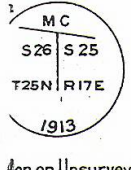


Fig. 38. M.C. on Sec. Line

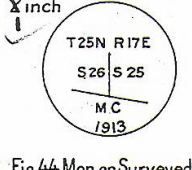


Fig. 39. M.C. on Sec. Line

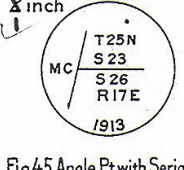


Fig. 40. M.C. on Sec. Line

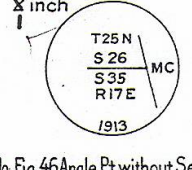


Fig. 41. M.C. on 1/4 Sec. Line

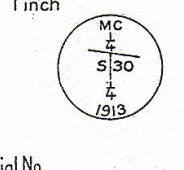
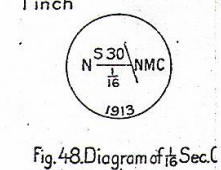


Fig. 42. M.C. on 1/8 Sec. Line



Mon. on Unsurveyed Land.



Fig. 44. Mon. on Surveyed Land.

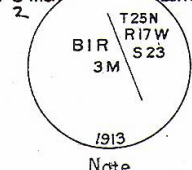


Fig. 45. Angle Pt. with Serial No.

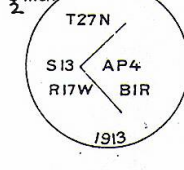


Fig. 46. Angle Pt. without Serial No.

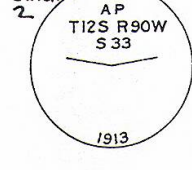


Fig. 47. Cor. of Private Claim

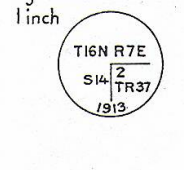
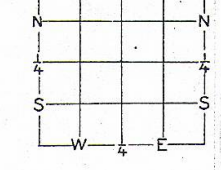


Fig. 48. Diagram of 1/8 Sec. C.



ways Mark:-  
SC for Standard Cor., on N. half of cap. CC for Closing Cor., on half from which closing is made. WC for Witness Cor., on half of cap toward true point for corner. Witness Corners will be marked exactly as if set at true point, with WC added. Letters and figures will be stamped to be read from the South side of post. - 7 -

Standard Die Sets { A, C, E, M, N, P, R, S, T, W, 1, 2, 3, 4, 5, 6, 7, 8, 0.  
Note: BIR = Blackfeet Indian Reservation.



### BLAZING OF TREES

The provisions of the Manual in regard to the blazing of tree trunks must be strictly complied with, excepting only the blazing of trees having branches growing to the ground, the expense of blazing such trees being prohibitive.

### CUTTING OF UNDERGROWTH

All undergrowth must be sufficiently removed to permit the proper projection of all lines, and within distances of 5 chains of all corners, and within 2 chains of lines of travel, the undergrowth must be sufficiently removed to enable the settler and other interested people to immediately identify the true line of survey. It is obvious that the same requirements must apply to the true line of survey over tops of ridges.

### SKETCHES

All surveyors are required to comply with the requirements of the Manual of 1902 (Sec. 190, page 68) in regard to topographic sketches, which must be kept up on the line as the field work progresses. In the preparation of plats or sketches, you should endeavor to maintain the highest standard of work as to topographical features, thereby aiding the draftmen in this office to clearly interpret your field notes, and map same.

### CLASSIFICATIONS

The classifications at the end of each mile, describing and classifying the land, soil, timber and undergrowth, are required to be explicit. The general character of the land, the kind of

soil, as well as the rate of classification, must be shown, the kind of timber, as well as whether heavy or scattering, and the kind of undergrowth, as well as whether dense or scattering.

The general descriptions are required to give full information of interest to prospective settlers, and you are advised to give careful thought to this subject.

It is not intended to set aside any considerable space in the notes for this purpose; hence, entries should be as concise as possible yet specific for each portion of the line surveyed, while features common to large portions of the township, should, to avoid repetition, appear in the "General Description" at the end of the notes. No additional entries are contemplated in the line-notes proper, other than to more fully record what the Manual already prescribes, when needed for the fuller purpose above stated.

Topographic features should be considered, as affecting the use of the lands, and as exposing to or sheltering from storms or unfavorable winds. The position of the lands relative to adjacent areas, as being higher or lower, and the "exposure" (to the south, east, etc) as being favorable or otherwise, should be noted. When lands are rolling or hilly, the character of the uplands, slopes and valleys should be observed, for quite often the uplands and slopes are denuded of good soil and the valleys are of small value. Steep slopes are often subject to soil denudation. The system of natural drainage in several portions of the township should also be stated.

In addition to noting streams or other sources of water, with the character of the latter, the presence in the soil of water available for plant use should be observed, and also what can be readily done for lands needing irrigation or drainage.

The agricultural value of the lands depends to no small extent upon the relations existing between soils and subsoils. The usual excavations at corners will aid in this determination to some extent, and exposures on steep banks and in ravines and drains should also be examined for this purpose.

The ordinary record, as "soil, sandy loam, 3rd rate" should be supplemented whenever possible with a more definite description. In regions where surveys are contemplated, soils ordinarily speaking, are in general composed of humus or decomposed organic matter, clay and sand of various kinds, or of a friable mixture of all of these called loam, in widely varying proportions; and with the soils may be stones, gravel, broken or partly disintegrated rocks and shales, etc. As the relative amounts of the



constituents determine in a large degree a proper use of the land, whatever brief terms with usual significations are employed, although not expected to be quantitatively exact, should be sufficiently descriptive in this respect. Texture, depending on the relative amounts of grains of various sizes, is of importance as affecting the aeration of soils and plant use of moisture. Color is often indicative of constituents. Soils are also popularly described as stiff, friable, strong, weak, rich, poor, dry, wet, cold, warm, sharp, fine or soft, etc. If calcareous, that fact should be stated.

If farming is done, DRY OR OTHERWISE, along or near any line, the vegetable or cereal crop should be noted as to kind, condition, yield, etc. In other cases conclusions should be drawn from facts and conditions observed, as to the agricultural uses of the lands, but care should be taken that this is done only within the surveyor's knowledge of the subject.

A description at the end of the notes of a line surveyed, prepared in harmony with the above, may, for instance, be found as follows:

"S. 30 chs., high gently rolling prairie, E. slope; soil, rich dark clay loam, 4 to 8 ins. deep, medium texture, moist; on clay subsoil; good growth of bunch grass; N. 50 chs., broken and hilly; ridges with light poor sandy loam, washed on slopes, stony; valleys, good brown clay loam with some gravel, drains to NE.; subsoil clay and decomposing shales. No. timber."

In the "General Description", the geological formations whence come the bases of the soil and subsoil should be noted, if known, and what apparent action of the kind is now in progress.

#### MINERAL CLAIMS AND HOMESTEAD ENTRY SURVEYS

When the records of this office show mineral or homestead entry surveys in a township included in your assignment, you will be furnished with blue-print of plats, and copies of field notes, of said surveys and directed to make proper connections, preferably from the nearest regular cor. of your survey to a corner of the homestead or mineral claim; closing corners are not required at the intersection of section lines, nor need intersections be given.

While it is understood that patented claims only are to be



shown on the agricultural plat of a township, together with all lottings and areas made fractional thereby, you are directed to "tie in" (as outlined above) all homestead and mineral claim surveys, whether patented or not, so that when segregations come to be in order, this office can prepare the necessary Supplemental plat without a second expedition to the field.

#### LOCATION OF SOURCES OF WATER SUPPLY

You are directed to carefully note the location of streams, springs or water holes, which because of their location, may be deemed by you to be of value in connection with the utilization of public grazing lands and which may be designated as public water places.

The appropriate legal subdivision or subdivisions, within which these are located, will be listed separately by you and submitted with returns of survey and upon receipt thereof, a copy of such list, in duplicate, will be promptly forwarded the Hon. Commissioner for further action.

#### FIELD NOTES

1. Hereafter, the dates of original surveys and names of surveyors will be eliminated from the body of the field notes and a diagram will be provided at the beginning of each book of notes showing the dates of survey, and in case of double parties, the lines run by each surveyor.
2. In resurveys, the date of commencement and completion of each township shall be shown, and the lines run by each surveyor shall be shown on a diagram.
3. The record of daily solar observation and daily latitude tests shall be eliminated; all scientific data shall be segregated and the same, with description of instruments, shall be placed at the beginning of the notes of



each township or small group of townships, including a statement as to the maintenance of the instrument in adjustment throughout the survey.

4. Random lines will be eliminated from dependent resurvey notes; you will be required, however, to furnish this office with such data as may be required to check the recorded true lines, the same to be transmitted to the Hon. Commissioner of the General Land Office with the returns of survey.  
The practice of recording random lines in the notes of independent resurveys and original surveys will be continued.
5. The use of the expression "I run" will be eliminated from field notes.
6. You will not be required to take a final oath to your field notes but will certify on honor to the correctness thereof; certificates from field assistants will be eliminated, their names and positions only being required.
7. The date of Assignment Instructions will, in addition to the date of the special instructions, appear on the title page of field notes.
8. The time limit, for field note writing, is hereby rescinded when the field notes are prepared under the supervision of the Assistant Supervisor.
9. The method of diagram showing corner markings shall be employed in the field notes and wherever practicable all the lines of a township surveyed shall be included in one book of field notes.
10. In complicated surveys and resurveys, you, who execute the field work, shall write up the returns thereof, either in long hand, with rubber stamps, or on a typewriter in finished form; where on a typewriter, a carbon copy shall be made at the same time.  
The practice, -when working on regular original surveys- of filing your field tablets or explanatory notes for extension in this office shall be continued and extended as far as possible.  
The method to be ultimately adopted for the preparation of completed returns, from your field tablets, is at present undetermined; therefore, instructions on this particular feature may be changed in the near future.
11. As Surveyor General I will audit vouchers and sign vouchers in the capacity of auditing officer.
12. For the markings on posts, inserted in the field notes, you are directed, for future work, to conform to a de-



scriptive diagram, the following of which are specimens:

"Set an iron post \* \* \* for  $\frac{1}{4}$  sec. cor.,  
with brass cap marked

S21  
    
 $\frac{1}{4}$  S28  
1916

and raise a mound of stone \* \* \* "

" \* \* \* for cor. of secs. 23, 24, 25 and  
26, with brass cap marked

T25N | R17E  
       
S23 | S24  
       
S26 | S25  
1916

from which \* \* \* "

"Intersect N. bdy. of Tp., 5.56 chs. E.  
of cor. \* \* \*

Set an iron post, \* \* \* for closing cor.  
of secs. 1 and 2, with brass cap marked

T25N | R17E  
       
S35  
       
S2 | S1  
T24N | R17E  
CC  
1916

and dig pits \* \* \* "

It will be seen that these diagrams are intended to be copies of actual markings on the brass caps, and your good judgment will not require further development. Said typewritten notes, so prepared, will be submitted to you for examination, and if found correct, will be properly signed by you. It is to be hoped that your best efforts will be given in making this method a success.

13. The following extract from G.L.O. letter 187896 "E" WHC dated March 6, 1915, will aid you in properly using the words "RETRACEMENT" or "RESURVEY" when submitting field returns to this office:

"A resurvey presumes primarily one or more lost corners whose positions are restored by a proper consideration of the original record and the nearest existing public land corners. The word "dependent" is not ordinarily used in connection with the word "resurvey", unless the greater part, or all, of the interior corners of a township are to be restored. The act of determining the relative position of one properly identified corner with respect to another, even though accompanied by a reconstruction of the corner monuments themselves, is not a resurvey but is a retracement merely."



All Special Instructions issued you, in the absence of directions to the contrary, will not be considered as confidential and certified copies may be secured as of other public records, but the results of such investigation and reports thereon shall be considered as the exclusive property of the Government and strictly confidential, until after my approval and the General Land Office shall have taken whatever action is to be taken thereon.

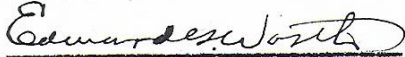
ADDITIONAL INSTRUCTIONS

Should occasion arise requiring an interpretation of the foregoing General Instructions or special instructions covering each assignment (all of which are issued subject to the approval of the Hon. Commissioner of the General Land Office, and to such modifications thereof as he may at any time direct), you are requested to promptly submit all questions to this office.

In order to further standardize the Direct System of surveys in the interests of simplicity and efficiency in the field work, and, as far as possible, uniformity in proper field methods in the execution of surveys and in the preparation of the returns thereof, it is earnestly desired that you carefully study and familiarize yourselves with each and every detail of the foregoing instructions.

MCB  
UAC

Respectfully yours,

  
U. S. Surveyor General of Oregon

DEPARTMENT OF THE INTERIOR  
General Land Office  
Approved, \_\_\_\_\_ 1916

Assistant Commissioner