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Alfred Leick, Editor
University of Maine

CONTENTS

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The most recent issues of this journal were published in November 1978, November 1979, and November 1980.

DISCUSSION

Proc. Paper 16617

INFORMATION RETRIEVAL

The key words, abstract, and reference "cards" for each article in this Journal represent part of the ASCE participation in the EJC information retrieval plan. The retrieval data are placed herein so that each can be cut out, placed on a 3 × 5 card and given an accession number for the user's file. The accession number is then entered on key word cards so that the user can subsequently match key words to choose the articles he wishes. Details of this program were given in an August, 1962 article in CIVIL ENGINEERING, reprints of which are available on request to ASCE headquarters.

[a]Discussion period closed for this paper. Any other discussion received during this discussion period will be published in subsequent Journals.

16646 SATELLITE POSITIONING AT SEA

KEY WORDS: **Doppler systems;** Equipment specifications; **Hydrographic surveys;** Hydrography; **Positioning; Satellites;** Surveying

ABSTRACT: A description of the present doppler satellite positioning system is given along with guidelines on its use for hydrographic surveying operations. Characteristics of several commercially available systems for vessel positioning are listed along with criterion for determining optimum equipment selection. The operational aspects of surveying in remote regions using satellite positioning is considered. Formulas for transforming coordinates from one datum to another are given.

REFERENCE: Collins, James (Vice-Pres., Craven Thompson & Assoc., Inc.), "Satellite Positioning at Sea," *Journal of the Surveying and Mapping Division,* ASCE, Vol. 107, No. SU1, **Proc. Paper 16646**, November, 1981, pp. 1-9

16623 TRANSMISSION LINE SURVEYS

KEY WORDS: Analytical photogrammetry; **Cost effectiveness;** Mapping; **Photogrammetry; Surveying;** Surveying instruments; **Transmission lines**

ABSTRACT: A fully analytical stereoplotter has been acquired by the Bonneville Power Administration to reduce the time and costs required to survey transmission lines for engineering design. Two major transmission line projects have recently been surveyed photogrammetrically using the analytical stereoplotter. Costs in terms of man-hours to perform several types of surveys by field survey crews, mechanical reconstruction stereoplotters and the analytical stereoplotter are compared and discussed. The analytical instrument has been found to be highly cost effective for specialized types of surveys requiring frequent re-setting of models of photographic stereopairs.

REFERENCE: Williams, Kirk E. (Head, Surveying and Mapping Section, Branch of Transmission Engrg., Bonneville Power Administration, Portland, Oreg.), and Wilson, Wallace C., "Transmission Line Surveys by Analytical Stereoplotter," *Journal of the Surveying and Mapping Division,* ASCE, Vol. 107, No. SU1, **Proc. Paper 16623**, November, 1981, pp. 11-20

16651 STANDARD FOR SYMBOLOGY ON ENGINEERING SCALE MAPS

KEY WORDS: **Cartography;** Design; Drawings; Mapping; **Maps; Standards; Symbols**

ABSTRACT: Though many organizations have been studying or emphasizing the need for a standard set of map symbols for large scale maps (1:240 to 1:4800), little to date has been done to develop a standardized legend. The main problems associated with producing a standard legend are, providing a unique symbol for each feature, making computer programing of the symbols possible, implementing the standard once it is adopted, and maintaining the standard. These problems and their solutions are addressed. The actual set of symbols and their development are presented in Chapter V of the forthcoming manual, "Manual on Map Uses, Scales, and Accuracies for Engineering and Associated Purposes". This manual is being prepared by the Committee on Cartographic Surveying, of the Surveying and Mapping Division, ASCE.

REFERENCE: Jacober, Robert P., Jr. (Cartographic Staff Officer, Defense Mapping Agency Aerospace Center, St. Louis, Mo. 63118), "Standard for Symbology on Engineering Scale Maps," *Journal of the Surveying and Mapping Division,* ASCE, Vol. 107, No. SU1, **Proc. Paper 16651**, November, 1981, pp. 21-24

16629 THE SURVEYING ENGINEER AND NAD-83

KEY WORDS: **Cadastral surveys;** Coordinates; Ellipsoids; **Geodetic coordinates; Pacific Northwest;** Parameters; **Surveying**

ABSTRACT: Parameters used for NAD-83 and the datum shifts expected in the Pacific Northwest are reviewed. The suggested changes needed in State laws are discussed with reference to suggestions for a model law by NGS. The current use of State Plane Coordinates by survey engineers is discussed in terms of boundary, control, and multi-purpose cadastre surveys and the expected change of technique and records are analyzed.

REFERENCE: Colcord, J. E. (Prof., Dept. of Civ. Engrg., Univ of Washington, Seattle, Wash. 98195), "The Surveying Engineer and NAD-83," *Journal of the Surveying and Mapping Division,* ASCE, Vol. 107, No. SU1, **Proc. Paper 16629**, November, 1981, pp. 25-31

16647 SURVEY CONTROL FOR I-205 COLUMBIA RIVER BRIDGE

KEY WORDS: **Bridge construction;** Columbia River; **Control joints; Distance measuring equipment; Electronic equipment; Positioning;** Surveying

ABSTRACT: The establishment of the principal control points required for the Columbia River Bridge construction using present day electronic distance measuring equipment is reviewed. Selection of the survey equipment was based on the distances at the bridge site to be measured and simplicity of operation. Familiarization and confidence were gained by traversing the river and verifying existing points set earlier by the location survey. The bridge site was studied and five locations were selected for permanent monuments. Shelters for protection of the instrument were constructed, distances measured and angles turned. Closure was made and coordinates determined with the aid of a computer terminal and the Highway Division COGO program. To date the bridge piers and some of the superstructure have been successfully positioned with a minimum effort utilizing the five control points. The electronic distance measuring equipment and computer terminal have proven to be a time and labor saving combination for establishing survey control of this type.

REFERENCE: Howard, John D. (Resident Engr., Oregon Highway Div., Dept. of Transportation, State Highway Div., 1919 NW Thurman Portland, Oreg. 97209), "Survey Control for I-205 Columbia River Bridge," *Journal of the Surveying and Mapping Division,* ASCE, Vol. 107, No. SU1, **Proc. Paper 16647**, November, 1981, pp. 33-44

16659 RETRACEMENT SURVEYS IN PACIFIC NORTHWEST

KEY WORDS: Boundaries (property); **Contracts; Estimates;** History; Land ownership; Monuments; Pacific Northwest; **Public land; Surveying**

ABSTRACT: Search and perpetuation of U.S. Public Land Survey section corners makes contracting for section subdivision surveys less costly. The U.S. Forest Service needs to identify 1,500 miles of property boundary per year. The contract estimates and statement of work needed is more realistic when based on recovered original survey corners. Forest Service personnel rely on the original instructions issued the surveyor, the manual in effect at time of survey and the knowledge gained in previous search and retracements. Attention is given to the monuments, accessories to the monument and traits of individual surveyors. Emphasis is given to evaluation, perpetuation and recordation of evidence. Corner information is filed with the Forest Supervisor and is available to the public. The data provides the information for identifying the forest boundaries and determining the surveys needed for the Land Adjustment Program.

REFERENCE: Long, Gordon H. (Regional Cadastral Engr., U.S. Forest Service, Region Six, Portland, Oreg.), "Retracement Surveys in Pacific Northwest Coast Range," *Journal of the Surveying and Mapping Division,* ASCE, Vol. 107, No. SU1,

16672 GEOMETRIC FRAMEWORK FOR LAND DATA SYSTEMS

KEY WORDS: **Cadastral surveys;** Computer applications; **Data systems;** Earth sciences; **Land classification;** Land titles; **Land usage planning;** Mapping; Surveying

ABSTRACT: The necessary geometric framework for the successful development and application of such land data systems should permit identification of land areas by coordinates down to the individual parcel level, while permitting the precise mathematical correlation of real property boundary and earth science data. The paper examines such a geometric framework developed by combining two unrelated survey control systems established by the federal government for real property boundary and earth science mapping. Although the specific geometric framework described is applicable only to those parts of the United States which have been covered by the U.S. Public Land Survey System, the fundamental concept involved is applicable to any area.

REFERENCE: Bauer, Kurt W. (Executive Dir., Southeastern Wisconsin Regional Planning Commission, Waukesha, Wisc. 53187), "Geometric Framework for Land Data Systems," *Journal of the Surveying and Mapping Division,* ASCE, Vol. 107, No. SU1, **Proc. Paper 16672**, November, 1981, pp. 59-65

U.S. Customary-SI Conversion Factors

In accordance with the October, 1970 action of the ASCE Board of Direction, which stated that all publications of the Society should list all measurements in both U.S. Customary and SI (International System) units, the following list contains conversion factors to enable readers to compute the SI unit values of measurements. A complete guide to the SI system and its use has been published by the American Society for Testing and Materials. Copies of this publication (ASTM E-380) can be purchased from ASCE at a price of $3.00 each; orders must be prepaid.

All authors of *Journal* papers are being asked to prepare their papers in this dual-unit format. To provide preliminary assistance to authors, the following list of conversion factors and guides are recommended by the ASCE Committee on Metrication.

To convert	To	Multiply by
inches (in.)	millimeters (mm)	25.4
feet (ft)	meters (m)	0.305
yards (yd)	meters (m)	0.914
miles (miles)	kilometers (km)	1.61
square inches (sq in.)	square millimeters (mm^2)	645
square feet (sq ft)	square meters (m^2)	0.093
square yards (sq yd)	square meters (m^2)	0.836
square miles (sq miles)	square kilometers (km^2)	2.59
acres (acre)	hectares (ha)	0.405
cubic inches (cu in.)	cubic millimeters (mm^3)	16,400
cubic feet (cu ft)	cubic meters (m^3)	0.028
cubic yards (cu yd)	cubic meters (m^3)	0.765
pounds (lb) mass	kilograms (kg)	0.453
tons (ton) mass	kilograms (kg)	907
pound force (lbf)	newtons (N)	4.45
kilogram force (kgf)	newtons (N)	9.81
pounds per square foot (psf)	pascals (Pa)	47.9
pounds per square inch (psi)	kilopascals (kPa)	6.89
U.S. gallons (gal)	liters (L)	3.79
acre-feet (acre-ft)	cubic meters (m^3)	1,233