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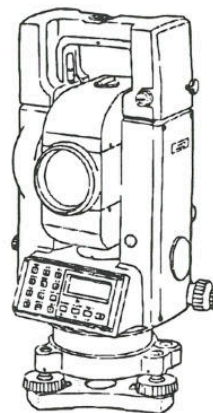
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VOLUME 4 NO. 4

JANUARY 1993



Convention Agenda
Page 10



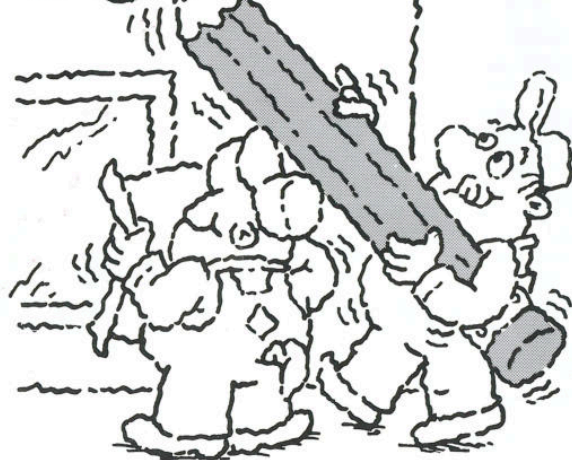
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CLASS OF MEMBERSHIP APPLIED FOR: (check one only and please submit dues with application, prorated for the remainder of the calendar year)
_____ MEMBER, ANNUAL DUES \$75 (Persons duly registered, PLS or PE&LS, in Wyoming.)

AFFILIATE MEMBER

- _____ Associate Member, annual dues \$50. (Persons employed under the direction of a PLS and working toward PLS registration in Wyoming.)
- _____ Special Member, annual dues \$50. (Not meeting above qualifications but with a particular interest in, or association with, the profession of land surveying.)
- _____ Special Member, student, annual dues \$15. (Pursuing a post secondary academic course of study, and currently enrolled.)
- _____ Sustaining Member, annual dues \$100. (Persons, institutions or corporations desiring to assist PLSW financially.)

I AGREE TO OBSERVE THE CONSTITUTION AND BY-LAWS OF THE PROFESSIONAL LAND SURVEYORS OF WYOMING AND THE CHAPTER TO WHICH I WILL BELONG AND TO SUPPORT SAID ORGANIZATIONS IN THEIR ENDEAVORS.

(APPLICANT'S SIGNATURE)

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NOTE: All portions of the state have chapters. Chapter dues or assessments may vary in amount. Applications are considered by the Board of Directors at quarterly meetings. Send completed application to PLSW, c/o R.L. Hudson, Sec./Treas., P.O. Box 784, Thermopolis, Wyoming 82443.

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Editorial Potpourri

- NEW MEMBER OF PLSW - At the Board of Directors meeting in Thermopolis, the application of Michael Zancanella, L.S. of Rock Springs was approved for membership in PLSW. Welcome and congratulations to Mike.
- PLSW MEMBERSHIP - If you are not a member of PLSW, you do not receive this publication. Join now. We need your support. An application is included in this issue. If you are a member, recruit a new member.
- SUPPORT OUR ADVERTISERS - Have you noticed our newest advertiser? Advertisers help make this publication possible. Support them.
- LOCAL PLSW NEWS - Send us a summary of your chapters activities for publication. The deadline for the next issue of *Lines and Points* will be 15 March, 1993.
- 1993 PLSW BOARD MEETINGS - The 1993 meeting locations of the Board of Directors will be as follows:

3 FEB 93	Laramie
1 MAY 93	Casper
18 SEP 93	Jackson
4 DEC 93	Rock Springs
- ANNUAL MEMBERSHIP MEETING - The annual membership meeting will be held at the WES Convention in Laramie on Thursday February 4, from 1 pm to 5 pm. An agenda of the Convention is presented in this issue. See you there.
- DUES NOTICES - The 1993 Dues notices have been mailed. Please note that you must pay your dues in order to vote. Tentative nominations for state offices are as follows:

<u>President-</u>	Bob St Claire
	Herb Stoughton
<u>Vice President-</u>	Chris Hamilton
	Pete Hutchinson
<u>Secretary/Treasurer-</u>	Rick Hudson
- LINES AND POINTS FAX - The *Lines and Points* fax number is 307-235-5604.
- WE GOOFED! - John Lee brings to our attention that the caption to the photo on page 10 of the October 1992 issue of *Lines and Points* wrongly identified Francis Eickbush, Director of Cadastral Survey. The caption should have identified Ray Brubaker, State Director of Land Management. Sorry Ray and thanks John.

Front Cover Artwork
By Ray Blaha - Casper

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PLSW (Professional Land Surveyors of Wyoming) is a state-wide organization of Registered Land Surveyors licensed to practice in the Equality State of Wyoming. PLSW is dedicated to improving the technical, legal, and business aspects of surveying in the State of Wyoming. PLSW is affiliated with the American Congress on Surveying and Mapping and the Western Federation of Professional Land Surveyors.

Editorial Staff: John Hibsman, Steve Strang, Don Davis.

Lines and Points subscription \$50/year

Advertising Information

Camera ready advertisements with payment should be mailed to *Lines & Points*, PLSW, Box 904, Casper, WY 82602.

Advertising rates are as follows:

	Year	Issue
Full page	\$300	\$80
Half page	\$175	\$50
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President's Notes

Becky Braman, President

1992 has slipped away. During this year, PLSW has continue to work for the surveyors of the state. During the recent Board of Directors' meeting in Thermopolis, a tentative budget was drawn up which reflects goals of continuing education opportunities, national representation and the providing of information to our members.

As part of our goals for continuing education, Stan Abell and Herb Stoughton, the co-chairmen of the Education Committee, have set up a technical session during the Wyoming Engineering Society convention. This session will be Friday, February 5, the day after PLSW's annual meeting. The subject will be the Use of Statistics and Least Squares Adjustment. This subject should be of interest and use to not only the practicing land surveyor but also to engineers. Professional development certificates will be awarded to participants. Many thanks to the education committee, as well as to Pete Hutchison who has helped set up this program with Sally Steadman, the program chairperson for the WES convention. Also at the convention will be a Preconference Workshop on Professional Liability Insurance, based on Case Studies. This will be offered on Thursday, February 4, from 8:00 AM through noon, at a cost of \$25.00, with professional development certificates also available for this program. Many states now require continuing education for renewal of professional land surveyor licenses, and these programs will go far toward satisfying those requirements. (This requirement is currently voluntary in Wyoming.)

The PLSW annual meeting will be in Laramie at the Holiday Inn (junction of I-80 and US 287,) from 1 to 5 p.m., on Thursday, February 4. The PLSW Board of Directors will be meeting on the afternoon and/or evening of Wednesday, February 3, also in Laramie. All PLSW members are encouraged to attend these meetings.

As discussed here in the last issue of "Lines & Points," a revision of the Certified Land Corner Recordation has been made. The form, as revised by Mr. Scherbel of the State Board of Registration for Professional Engineers and Professional Land Surveyors, will be mailed with the election ballots in December, so every member will have a chance to vote on it. The majority opinion of PLSW will be presented to the State Board of Registration.

Be sure to express your opinion of the new corner form and to vote for the new PLSW officers. Stan Abell reminds everyone to read and follow the instructions for endorsing and sending in your ballot. (Surely a group of people who run electronic measuring equipment can follow instructions on signing ballots!)

The PLSW legislative committee needs each PLSW member's continued support to get the Record of Survey and State Plane Coordinate legislation passed.

The bills have been prepared and will be introduced, but legislative supporters are needed. Support from throughout the state would give us a much better chance of passage for this legislation. If you would like copies of the bills or if you have any questions, contact your PLSW Director or John Steil.

To bring this, my final President's message to a close, I would like to express my deep thanks to all the surveyors who have worked for the betterment of the profession during my terms as president. I would especially like to thank Rick Hudson for his thorough work as Secretary-Treasure, and Bill Braman for his personal support and encouragement.

PLSW Commissary

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If We Have Missed Or Errored Here, Please Inform

FEDERAL METRIC PROJECTS GAIN MOMENTUM

The General Services Administration, which serves as the "federal landlord," now has over \$1 billion in metric projects in the planning, design, or construction stages.

The National Institute of Standards and Technology is planning about \$1 billion in facilities work for its campuses in Gaithersburg, Maryland, and Denver, Colorado. Work is scheduled to be in metric.

Most of the Department of Energy's \$8.2 billion Super Collider project will be constructed in metric.

Two new Smithsonian Institution facilities which a total cost of over \$150 million will be built in metric.

The Army Corps of Engineers, Air Force, Office of the Secretary of Defense, NASA, and the Public Health Service are conducting over \$60 million in metric pilot projects with significantly more work in planning.

The \$400-\$500 million Defense Medical Facilities program for FY 95 is scheduled to be in metric.

The Department of State continues to build in metric with current projects totaling \$275 million.

BASIC METRIC

There are seven metric base units of measurement, six of which are used in design and construction. (the seventh, mole, is the amount of molecular substance and is used in physics.)

Quantity	Unit (Symbol)
length	meter (m)
mass	kilogram (kg)
time	second (s)
electric current	ampere (A)
temperature	kelvin (K)
luminous intensity	candela (cd)

Note that "weight" in common practice often is used to mean "mass."

Celsius temperature (°C) is more commonly used than kelvin (K), but both have the same temperature gradients. Celsius temperature is simply 273.15 degrees warmer than kelvin, which begins at absolute zero. For instance, water freezes at 273.15 K and at 0°C; it boils at 373.15 K and at 100°C. To move between Celsius and kelvin, add or subtract 273.15.



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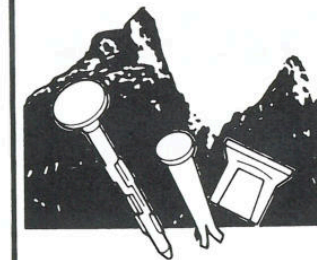
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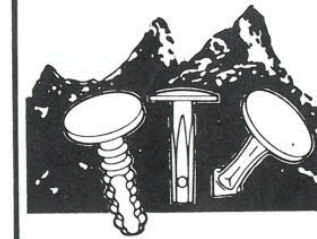
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METRIC MODULES AND GRIDS

The basic metric module is 100 mm (about 4 inches). Submodules in preferred order are 50 mm (about 2 inches), 25 mm (about 1 inch), 20 mm, 10 mm, and 5 mm. Multimodules in preferred order are 300 mm (about 1 foot), 600 mm (about 2 feet), 1200 mm (about 4 feet), 3000 mm (about 10 feet), and 6000 mm (about 20 feet). For buildings, the metric planning grid is usually 600 mm.

METRIC DRAWING SCALES

Metric scales are true ratios and are the same for both architectural and engineering drawings. Preferred scales are:

1:1	Same as full size
1:5	Close to 3" = 1'-0"
1:10	Between 1" = 1'-0" and 1-1/2" = 1'-0"
1:20	Between 1/2" = 1'-0" and 3/4" = 1'-0"
1:50	Close to 1/4" = 1'-0"
1:100	Close to 1/8" = 1'-0"
1:200	Close to 1/16" = 1'-0"
1:500	Close to 1" = 40'-0"
1:1000	Close to 1" = 80'-0"

Metric Management And Training

How should design and construction firms, product manufacturers, code officials, and others in the construction industry prepare for metric? The American National Metric Council and the U.S. Metric Association recommend the following management and training measures, which apply to organizations large and small:

Provide top level commitment. Top level management must provide a firm commitment to metric. This includes: announcing a formal metric policy, forming a metric committee, and appointing a metric coordinator to chair the committee and act as the organization's metric representative.

Set milestones. Establish a realistic, organization-wide metrication schedule with milestones and a completion date.

Collect information. Begin a metric reference library. A list of metric construction references is given in the *Metric Guide to Federal Construction*.

Develop training objectives. Write carefully worded, measurable training objectives with the goal of "enabling employees to perform their jobs with the same or greater degree of efficiency using metric."

Define the learner population. Determine who needs to know metric and to what extent they need to know it. Some employees may require an in-depth working knowledge of metric whereas others may never need to know it at all. Most probably will need to know only a few metric units.

Determine training needs. There are three kinds or levels of training: metric awareness training to help all employees overcome fear and resistance to change, management training to educate the people responsible for the transition to metric, and implementation training to teach specific metric skills to specific employees.

Train at the right time. Training should take place just prior to when an employee will use the new knowledge on the job; earlier training is ineffective.

Train only as needed. Train only as necessary to meet the goal of "enabling employees to perform their jobs with the same or greater degree of efficiency using metric." Training is not a panacea, and massive training programs are wasteful. Often, training can be performed completely on-the-job.

Train people to "think" metric. Link metric measurements to familiar objects. Avoid converting to inch-pound units as much as possible. For linear measurements use dual unit tape measures.

Monitor the metrication program. Make sure training matches the organization's metric transition schedule. If something changes, adjust either the training or the schedule.

Don't hide costs. There is a cost to metric conversion, both in time and money. Plan for it in advance, and monitor costs as transition takes place.

General metric publications and materials are available from the U.S. Metric Association, 10245

Andasol Avenue, Northridge, CA 91325, phone 818-368-7443, and the American National Metric Council, 1735 North Lynn Street, Suite 950, Arlington, VA 22209-2022, phone 703-524-2007.

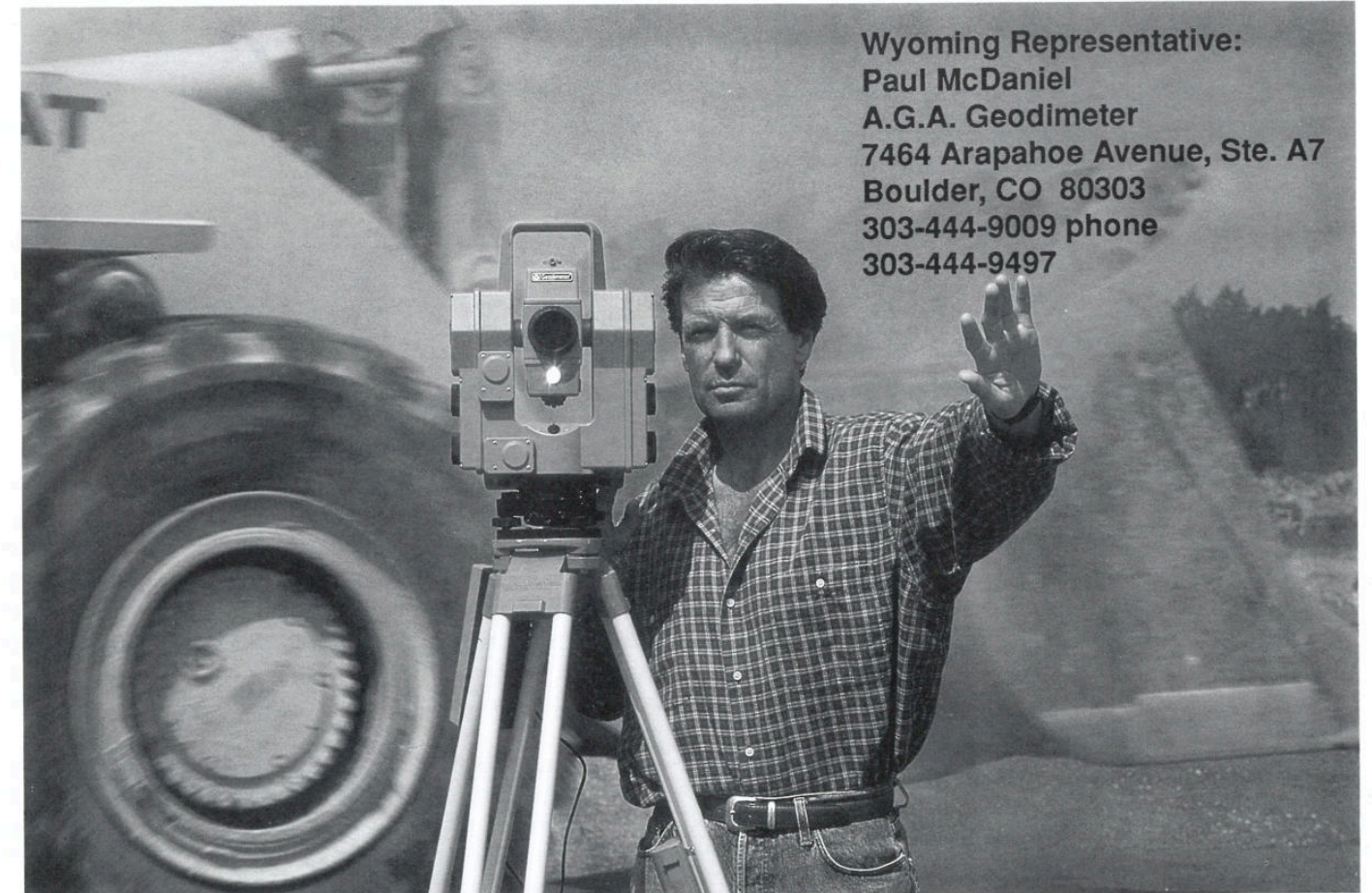
Stan Jakuba, a metric management and training consultant in Hartford, Connecticut and a member of the Construction Metrication Council contributed to this article.

VISUALIZING METRIC

A few basic comparisons that help in visualizing metric are well worth remembering:

- One millimeter (mm) is about 1/25 inch or slightly less than the thickness of a dime.
- One meter (m) is the length of a yardstick plus about 3-1/3 inches.
- One gram (g) is about the mass (weight) of a large paper clip.
- One kilogram (kg) is about the mass (weight) of a softbound model building code book (2.2 pounds).
- One liter (L) is about the volume of a 4 inch cube (100 mm x 100 mm x 100 mm)--a little over one quart. One liter of water has a mass of 1 kilogram.
- One inch is just a fraction (1/64 inch) longer than 25 mm (1 inch = 25.4 mm; 25 mm = 63/64 inch).
- Four inches are about 1/16 inch longer than 100 mm (4 inches = 101.6 mm; 100 mm = 3-15/16 inches).
- One foot is about 3/16 inch longer than 300 mm (12 inches = 304.8 mm; 300 mm = 11-13/16 inches).
- Four feet are about 3/4 inch longer than 1200 mm (4 feet = 1219.2 mm; 1200 mm = 3 feet, 11-1/4 inches).
- The metric equivalent of a typical 2-foot by 4-foot ceiling grid is 600 x 1200 mm, so metric ceiling tiles and lighting fixtures are about 3/8 inch smaller in one dimension and 3/4 inch smaller in the other.
- Similarly, the metric equivalent of a 4 by 8 sheet of plywood or drywall is 1200 x 2400 mm so metric sheets are about 1-1/2 inches shorter and 3/4 inch narrower.
- "Rounding down" from multiples of 4 inches to multiples of 100 mm makes dimensions exactly 1.6 percent smaller and areas about 3.2 percent smaller. About 3/16 inch is lost in every linear foot.

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THE WYOMING COORDINATE SYSTEM FOR THE NORTH AMERICAN DATUM OF 1983

A Position Paper

The purpose of this document is to introduce the reader to the concept of the Wyoming Coordinate System for the North American Datum of 1983, and its benefit to the people of the State of Wyoming.

In the 22 June 1979 issue of the *Federal Register*, the National Oceanic and Atmospheric Administration, U.S. Department of Commerce officially announced the institution of a new mathematical definition of the size and shape of the earth to be used for surveying, mapping, cartography, and geodesy in the United States and its territories. This action was necessitated because new technologies including satellite techniques, demonstrated that the currently used mathematical definition was unsatisfactory to satisfy the needs of statesmen, attorneys, politicians, geophysicists, astronomers, engineers, surveyors, mappers, and others. When the new system was developed, the new datum did not "move the points" (as was announced in several news releases), but corrected the coordinates [latitude and longitude] to more nearly represent the true physical interrelationship of points throughout the country.

There are numerous state agencies utilizing surveying, mapping, geographic, and cartographic information. Review of the Secretary of State's 1992 *Wyoming Official Directory* indicates that there are over forty agencies, offices, commissions, departments, and divisions employing mapping information in their work. Also, the municipal and county governments have boards, commissions, and agencies that utilize mapping data. The most evident are the planning and permitting commission, zoning commission, highway department, public safety and security organizations (civil defense, fire department, police/sheriff departments, etc.), public and private utilities (gas, water, telephone, cable television, sanitary and storm sewers, etc.), and others. Today, information gathered by these organizations are placing their data, which is geographically related, into computer data bases called geographic information systems (GIS) and land information systems (LIS).

Besides the GIS and LIS use of geographical positions, the design professions (engineering, surveying, architecture, landscape architecture) require accurate large scale maps with accurate geographic positions. The North American Datum of 1983 employs latitude and longitude to describe the mathematical coordinates (position) of specific points, which are cumbersome to use by nonsurveyors. The reader can visualize that the points are located on a sphere. However, the mathematical definition of the earth is not a sphere, but an oblate ellipsoid.

Since ancient times, geographers have studied the problem of depicting points on a spheroidal surface (the

earth) onto a flat surface (map) while retaining the geometrical relationships observed on the earth. It is not a simple task to transfer the geometrical relationship of definite points on the earth's surface to a flat surface. There is not a one-to-one relationship between the two throughout the map's area. The transformation of earth positional data to map positional data is based upon either mathematical or graphical projection. Thus the process has become a mathematical discipline. The subject of map projections is the "orderly transformation of points on the earth's surface to a map, and vice-versa, in order to present the data in a meaningful format for a specified use."

The proposed Wyoming coordinate system is designed to not distort angular and linear quantities of geometrical figures on the earth and the projected geometrical figures on the map. This class of map projections is called the conformal map projection. The most well known projection of this class is the Mercator projection. There are other classes of map projection, but maintaining the condition of conformality is not an inherent property. Examples of other classes of map projections are "equal area", "azimuthal", and "polyconic".

The fundamental reason for selecting the conformal map projection is to retain the geometrical relationships surveyed on the ground on the map. The design professions use the same geometrical relationships when preparing maps and plans for construction. Also, land surveyors prepare maps, boundary descriptions, and other documents applying the same geometrical principles.

The proposed Wyoming coordinate system is known as the transverse Mercator projection. This projection is employed throughout the world by the mapping community. The fundamental (underlying) mathematical transformation functions are well defined and understood. Besides the Wyoming proposal, twenty-one other states employ this system.

The benefits of adopting and employing the proposed coordinate system are:

1. The mathematical theory and the transformation formulae are well known and documented, thus minimizing the learning and training of users.
2. There exist inexpensive commercial computer software and data bases developed for the transverse Mercator projection.
3. Non-technical persons using the information generated on the Wyoming coordinate system will not have to make any changes in their application of the system for official functions.
4. The use of the Wyoming coordinate system for statutory, regulatory, and legal purposes will not adversely affect the legal "issues" unless there is a technical question.
5. Adoption of the Wyoming coordinate system identifies to persons and organizations using geographical data bases the geographic reference system which is "recognized" or "identi-

4. Setting, resetting or replacing of points to guide new construction for Department of Transportation construction projects, to include measurement by angles, distances and elevations of natural or man-made features in the air, in the surface and immediate subsurface of the earth, within underground workings and on the surface or within bodies of water.
5. Referencing and resetting of aliquot corners and monumented property corners disturbed by construction. If the corner falls within the traffic area of a highway, the corner position shall be substantially referenced with monumentation at locations assuring future perpetuation of the corner position. (Ref. W.S. 6-3-202 and W.S. 36-11-107).
6. Preparing and reviewing items pertaining to land surveying such as field notes, survey control listings, right of way retracements, right to way monument summaries, right of way applications, pit layout diagrams when tied to aliquot or property corners, right of way plans and legal descriptions. (Ref. W.S. 33-29-135).
7. Filing of monument records (Certified Land Corner Recordation Certificates) in the office of the appropriate County Clerk as required by Wyoming Statute. A Corner Record must be sealed and signed by the professional land surveyor who recovered or reestablished the monument. (Ref. W.S. 36-11-101 through 36-11-110).
8. Maintaining historical data on all land surveys and right of way plans made by the Department of Transportation.

Further understanding between the State Board of Registration for Professional Engineers and Professional Land Surveyors and the Wyoming Department of Transportation.

1. Public documents and records prepared by the Department relating to land surveying such as certified Land Surveyor Corner Recordation Certificates shall be signed and sealed by the professional land surveyor supervising the work. (Ref. W.S. 33-29-114, W.S. 33-28-135, W.S. 33-29-139; and Board Rules and Regulations, Chapter Five, Section 2(c).)
2. Descriptions of land shall be related to the U.S. Public Land Survey System and may include where applicable the Wyoming state plane coordinate or grid system.
3. The Department will preserve or reset USC&GS (NGS), USGS, and other agency bench marks and triangulation stations, within construction corridors, reporting such preservation actions to the agency involved.
4. When practical and feasible the Department will oversee the monumentation of the right of way on roads constructed under the State County Farm To Market program.
5. As the Department's budget and personnel permit, the Department will make an effort to monument

existing right of way acquired prior to this memorandum.

6. The State Board will review the Department's Land Surveyor development program and issue confirmation on the basis of content pertinent to professional land surveying. This, in combination with time and experience accrued in the performance of land surveying activities as outlined by this memorandum and under the supervision of a professional land surveyor, will qualify toward meeting Land Surveyor registration requirements.

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National Council Of Examiners For Engineering And Surveying Records Verification Program

The NCEES Records Verification Program provides and serves as a verifying agency for the Professional Engineer or Professional Land Surveyor who is seeking multiple state registration and who meets the requirement of holding a current registration with at least one registration board. Through this program, the Council verifies and houses the Record Holder's file which contains their college transcripts, registration information, professional engineer references and employment verifications. When registration in additional states is needed, a copy of the NCEES Council Record can be transmitted to other registration authorities with a written release.

The intent of the program is to reduce the amount of paperwork required by the registrant at such time as they choose to become registered in another state.

Licensure is not guaranteed based on the Council Record, as this is a distinctive function of the registration board. NCEES merely functions as a centralized recordkeeping service for the convenience of the professional who seeks multiple state registration. The Council Record is designed to be a recognized and reliable source of information for review.

Further information concerning this Program can be obtained by contacting the NCEES Records Department at P.O. Box 1686, Clemson, SC 29633-1686, telephone (803) 654-6824.

Memorandum Of Understanding

BETWEEN THE STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND PROFESSIONAL LAND SURVEYORS AND THE WYOMING DEPARTMENT OF TRANSPORTATION

Purpose: The purpose of this memorandum is to clarify the policy of professional land surveying within the Department of Transportation, as it applies to preliminary land surveys, right of way plans, legal descriptions, construction surveying and placement of right of way monuments along boundaries of Wyoming Department of Transportation right of way.

Applicability: This memorandum will be in effect and apply to all preliminary land surveys, right of way plans, construction surveys, and placement of right of way monuments after January 1, 1993, and shall be in full compliance by January 1, 1994.

Definitions:

1. "Aliquot Corner" - Means any section corner or quarter section corner and any other corner in the U.S. Public Land Survey System created by subdividing land according to the rules of procedure set forth in: Federal Law; Wyoming State Statutes: State Board Rules and Regulations; and Manual of Instructions for the Survey of Public Lands of the United States, 1973.
2. "Control Survey" - A survey conducted by the Wyoming Department of Transportation that establishes a survey centerline, baseline control traverse or network in the field used to tie aliquot corners, monumented property corners, existing right of way monuments, and topography for the purpose of location and restoring real property boundaries.
3. "Right of Way Plan" - A land survey map showing the survey centerline, baseline control traverse or network in relation to aliquot corners, property lines, topography and irregular parcels defined and described for the purpose of right of way acquisition.
4. "Construction Survey" - Survey work within a project such as bridge layouts, hydraulic installations, roadway alignment and subsequent elevation determinations.
5. "Right of Way Monuments" - A monument set by the Wyoming Department of Transportation used to define Department of Transportation boundaries in the field. These monuments are not to be confused with aliquot corners or corners that define intersecting property lines with the highway boundary. Such monuments are prima facie evidence of the boundaries of the right of way.
6. "Monument Record" - Means a written and illustrated document describing the physical appearance of a survey monument and its accessories, or of a bench mark or triangulation station. A Corner

Record (Certified Land Corner Recordation Certificate) shall be filed on all aliquot corners found or reestablished. If a monument has been found in the same condition as shown on the last recorded filing, no record need be filed.

7. "Irregular Parcel" - A method of defining parcels used by the Wyoming Department of Transportation but which is not uniquely defined on a subdivision plat but which are described by any of the following methods:
 - a. an aliquot part of a section
 - b. a metes and bounds description
 - c. book and page or receipt number reference
 - d. "Assessor's Tracts"
 - e. a bounds description that calls only for the owner's or adjoiner's line.
 - f. strip descriptions
8. "Monumented Property Corner" - Any monument or reference point which marks a property line, corner or boundary.

Compliance with Wyoming Statutes:

It is the intent of this memorandum to have the Wyoming Department of Transportation in compliance with Wyoming State Statutes and State Board of Registration for Professional Engineers and Professional Land Surveyors Rules and Regulations as it applies to professional land surveying. Beginning January 1, 1993 the Wyoming Department of Transportation will initiate procedures so the following duties are under the supervision of a registered professional land surveyor:

1. Control survey from which the right of way will be calculated, described and/or monumented.
2. Establishing of ties to aliquot corners, monumented properly corners and existing right of way monuments. The location, relocation, establishment, reestablishment of aliquot corners or property corners which identify land boundaries, rights of way or easements and which affect the size or position of irregular parcels defined by the Right of Way Program (Ref. W.S. 33-29-114 and W.S. 33-29-137).
3. Right of way monuments shall be set at all changes in alignment, boundary lines, angle points, and change of direction. Right of way monuments will be stamped and sealed under the direction of the professional land surveyor supervising the work.

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fied" as the *preferred* system.

6. The Wyoming coordinate system usage is voluntary - not mandatory. To make the system's usage mandatory, a regulatory agency/organization must so stipulate, which requires public hearings, etc. under the Administrative Procedures Statute.

The detriments of adopting the proposal and rebuttal are:

1. The use of the system is restrictive. Use of the system is only voluntary, unless stipulated by a regulator agency. If a governmental organization has required usage, the initiation of usage can only be initiated after public notice and comment in accordance to the Administrative Procedures Act.
2. The adoption of usage will incur additional costs. This is untrue. For GIS and LIS programs the data base should employ the geographic data base in which the information was collected/mapped/surveyed. Common points in the recorded system and the Wyoming coordinate system will permit a conformal transformation employing software that has already been developed to efficiently and economically transform the data base to the Wyoming coordinate system.
3. The adoption of the system has no benefit to governmental entities. Untrue! When organizations that are working in the same geographical area require knowledge of existing information affecting the proposed study/design/construction in that area, the requester will then have knowledge of existing information and expend resources only researching for information required that is not then available.
4. The Wyoming coordinate system supersedes the GLO (General Land Office) surveys. Untrue! The proposed statute specifically states that the original GLO surveys are paramount, and that any coordinates used to perpetuate original GLO corners are subordinate to the previously established rules of evidence pertaining to the perpetuation of the original survey monuments.

Appendix

State Agencies/Activities Utilizing Geographic Data Bases

1. Executive Department
Agriculture, Board of
2. Attorney General
Criminal Statistics
3. Commerce, Department of
Division of Parks and Cultural Resources
Division of Tourism and State Marketing
Division of Economic and Community Development
4. Drug and Alcohol Advisory Board
5. Drugs and Substances Control Board
6. Emergency Response Commission
7. Employment, Department of
Occupational Health and Safety Commission
Mine Inspections and Safety, Division of
Employment Division
8. State Engineer
Board of Control Division
Water Use Administration
Ground Water Division
Surface Water Division
Safety of Dams
9. Environmental Quality, Department of
Industrial Siting Council
Abandoned Mine Land
Air Quality
Land Quality
Water Quality
Solid Waste Management
10. Equalization, Board of
11. Game and Fish Commission
12. Geological Survey
13. Health, Department of
Public Health
Environmental Health
14. Land Commissioners and Farm Loan Board
State Forestry
Fire Prevention and Control
15. Livestock Board
16. Military Department
Emergency Management
17. Natural Gas Pipeline Authority
18. Oil and Gas Conservation Commission
19. Public Service Commission
20. Revenue Department
21. School District Organization Committee
22. Search and Rescue Advisory Council
23. State Treasurer
24. Department of Transportation
Highway Department
Highway Patrol Division
Aeronautics Commission
25. Water Development Commission

Prepared by H.W. Stoughton, Ph.D.



PLSW — Board of
Directors Meeting
February 3, 1993
Laramie

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member today!

Board Of Directors' Meeting Summary

The late fall meeting of the Board of Directors was held on Saturday, December 12, 1992, in Thermopolis.

The meeting was held at the Hot Springs County Museum and Cultural Center and was hosted by the Northwest Chapter. Arrangements for the pre-meeting breakfast and meeting facilities were made by Vickie Hudson. President Becky Braman called the meeting to order at 12:06 P.M. with 15 PLSW members present. All chapters were represented by their Director or an alternate in the case of the Northwest Chapter. The Vice President and Past President were absent.

Minutes of the September board meeting, held in Jackson, and previously mailed to board members, were approved with minor corrections. The summary of said meeting minutes appeared in the October edition of "Lines & Points".

The treasurer's report, presented by Rick Hudson, consisted of the latest bank statement, itemized expenses for September through November, and a balance sheet for the year to the 5th of December.

Becky Braman, as Wyoming governor to NSPS, gave an oral report of the meeting she attended last month in San Jose, California. She mentioned various topics that were discussed; in particular the activities of the governmental affairs committee in regard to the NGS mark maintenance program and railroad abandonment. A written report will follow and be made available to all members of PLSW.

She also mentioned that John Steil and Ray Connin are candidates for NSPS Area 7 Director and that Art Hipp is running for NSPS Vice President. Additionally, Herb Stoughton is currently serving as ACSM Director. All are members of PLSW, Art Hipp being an honorary member.

Other NSPS activities include the revision of ASCM/ALTA standards, as reported by Herb Stoughton, and the approval of the Manual on Construction Layout, discussed by Becky.

John Steil, as WFPS delegate, updated board members on the 1993 "West Fed" conference to be held next April at South Lake Tahoe. He also reported that two scholarships have been awarded and urged members to have interested candidates obtain application forms from him.

Oral reports were presented from the following committees; Membership, Nominations, Ethics, Education, Legislative, Public Relations, Corner Recordation, Handbook and Lines & Points. In addition to the oral reports, Herb Stoughton handed out copies of the Surveyors' Creed And Canons as adopted by NSPS, and Becky passed out copies of a letter from the state board of registration concerning corner recordation forms. Paul Scherbel, PLS member of that board, has reviewed the form submitted by PLSW at the September meeting and has prepared a draft of the form with features considered desirable by that board.

committee will make a "final" recommendation to the board of registration and that the "final" version will be included on the 1993 PLSW ballot at the annual state meeting in February.

Copies of the revised Rules and Regulations, dated October 15, 1992, of the State Board of Registration For Professional Engineers and Professional Land Surveyors were passed out. Comments concerning this matter were expressed by many of the persons present.

To be included in the 1993 update of our PLSW Handbook will be the above mentioned rules and regulations and the paper by Herb Stoughton on Polaris observations with the ephemeris through 1995, as well as updated membership, officer and committee listings.

Paul Scherbel reported on the Memorandum of Understanding between the State Board of Registration and the Wyoming Department of Transportation and that it had been, or shortly will be, approved by both parties. Copies were passed out to those in attendance and all agreed that the contents of the memo will be of great benefit to our profession. To all those persons who were involved in this project, PLSW extends a sincere "thank you".

Following a short break, Pete Hutchison presented an oral and written report of his committee concerning the Save Our Surveyors Honorarium proposal carried over from the September meeting. The proposal, by Paul Scherbel, involves the award of \$100 annually for excellence in the preparation of certified land corner recordation certificates. Your board voted to accept the proposal, in accordance with the recommendations of the committee. Contact your director for additional information.

A second matter of old business concerned the proposed state plane coordinate legislation. Chris Hamilton presented the revised version of the proposal along with the position paper authored by Herb Stoughton. Following a general discussion it was agreed that any member wishing to make additional changes should contact Chris as soon as possible.

The final matter of old business dealt with the taking of orders for chapter and state PLSW flags. Those chapters ordering flags/banners are the Northwest, Northeast and Southeast. Delivery of same at the annual state meeting in February is planned.

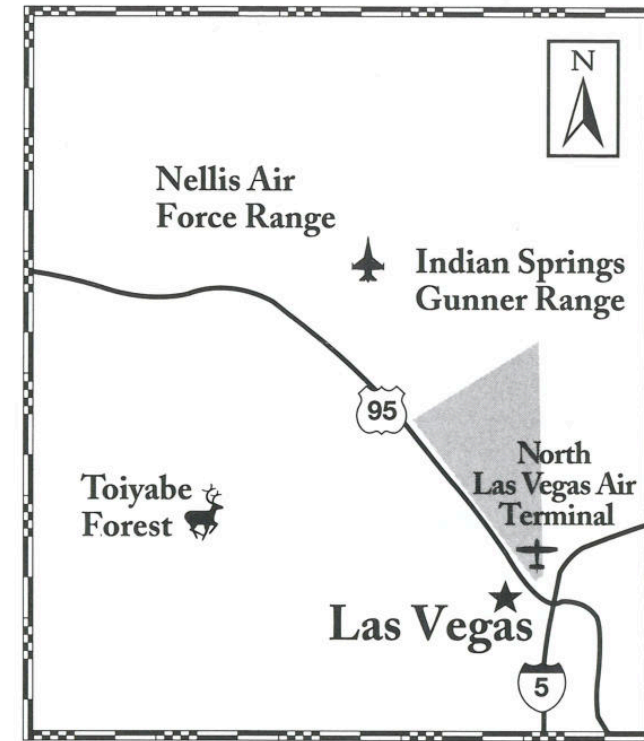
The 1992 PLSW honorary member is John W. "Jack" Donnell, of Worland.

He was nominated by the Northwest Chapter and will be acknowledged our annual state meeting. Congratulations Jack.

The annual state meeting will be in Laramie, on Thursday, February 4, 1993, from 1:00 to 5:00 P.M. in conjunction with the 73rd annual Wyoming Engineering Society convention.

Board meetings for 1993 will be as follows: Wednesday, February 3, at Laramie; Saturday, May 1, in Casper; Saturday, September 18, in Jackson, and Saturday, December 4, in Rock Springs.

After a general discussion concerning the 1993 election and annual state meeting, a motion was carried



The above is for illustrative reference only and not an exact representation.

Surveyors Beware!

By Rita Lumos

In the northwest area of the Las Vegas valley survey problems abound. According to Neil Forsyth, Chief, Cadastral Survey Field Section of the BLM, there is evidence that the original survey of Township 19 South, Range 60 East, M.D.M. was only partially surveyed, and many of the corners set were of a different material than those stated in the official notes. The early private surveyors in the area had their work cut out for them. The BLM did a dependent resurvey of the sections on the west side of the township in 1956, and along the north and a portion of the east side of the township in 1991.

In the interim between the original and dependent government surveys, numerous local surveyors have done work which may not have been based on the original corners. There exist nearly as many sets of section corners and property corners in the area as there have been surveyors doing work there. At the time of many of these surveys the area was remote, not particularly valuable, and wholly undeveloped. Who would ever imagine that Las Vegas would grow to its current size, or that the surrounding desert would be desirable ranch estate property?

In performing the latest dependent resurvey, the BLM researched all recorded surveys in the area, and if corners set by private surveyors were done according to proper procedures and in good faith, they accepted them wherever possible, regardless of exact positional accuracy. The problem areas occur where the long accepted points have no recorded history, or pedigree, and they are obviously in the wrong place. These are

not small problems. Some of the discrepancies are as much as 100 to 300 feet away from the newly established BLM corners.

We are now faced with many situations where the lines of occupation do not agree with the lines of title of hundreds of property owners. Roads, fences, houses, barns and other improvements are built in places other than those owned by the various owners. In Section 5 of the township, lenders are not lending, title companies are not insuring, and the power company is not energizing any property until the problem is resolved. This particular section is part federal land, partly within the City of Las Vegas, and partly within Clark County. Needless to say, no agency is anxious to approve any land divisions until the problems are resolved.

A meeting of the affected property owners, the BLM, and officials from the Cities of Las Vegas and North Las Vegas and Clark County was held last month to explain the extent of the problem and to try to suggest solutions. A committee of property owners in Section 5 is working toward a massive boundary line adjustment survey so that they can each end up owning what they previously thought that they owned. For this solution to work requires the approval and cooperation of all the property owners affected. The probability of this happening is much like the Dodgers winning the pennant this year.

The problem, however, does not stop in this one section and many more property owners will be faced with similar problems.

The various private surveys which were performed beginning in the late 1950's were obviously not done under our current standards of practice. Had they been, they would have been obligated to contact surveyors whose work did not agree with theirs, and to record maps reflecting their work. If those conditions had been met, today's problems would not exist.

I would strongly urge that anyone contemplating work in the area talk to the County or City Surveyor whose jurisdiction applies, as well as the BLM cadastral surveyors, before beginning work. They also need to be aware that considerably more research, field time, and processing time than normal will be required, and fees must reflect that fact.

A valuable lesson is to be learned from this misfortune. It is never acceptable to do less than a complete survey job, no matter how adverse the circumstances. It is always wise to talk to any other surveyor who has experience in the area in which you are working. Today, it is a requirement of statute to file a record of your surveys. These surveys should reflect all the work you have done in order to determine your client's property lines. Today, it is also a requirement of the Standards of Practice for Land Boundary Surveys that you contact the surveyor with whom you disagree and try to resolve the disagreement. Is everyone in compliance?

Design Professions Honor Rep. Jack Brooks And Host 20th Anniversary Of "Brooks Act"

On September 30, the Committee on Federal Procurement of Architectural & Engineering Services (COFPAES) and related design organizations hosted a Capitol Hill reception honoring Rep. Jack Brooks (D-TX) on the 20th Anniversary of the "Brooks Act" for Professional Design Services (Public Law 92-582). More than 150 guests attended, including members of Congress, congressional staff, key executive agency officials, and private-sector representatives of the architectural, engineering, and surveying and mapping professions.

As the 1992 Chair of COFPAES, the American Congress on Surveying and Mapping (ACSM) spearheaded the reception, organized support from the design professions and arranged the Inaugural Brooks' Medal Ceremony. ACSM attendees at the reception included Curtis W. Sumner, Chairman, Board of Governors, National Society of Professional Surveyors, Edward J. McKay, President, American Association for Geodetic Surveying, Paul B. Lapham, ACSM Board Member and 1992 COFPAES Chairman, John Lisack, Jr., ACSM Executive Director, and Nancy L. Parke, ACSM/ASPRS Government Affairs Director and 1992 COFPAES Secretariat.

COFPAES, composed of six national design professional organizations, has been an active coalition for more than twenty years. The purpose of COFPAES is to protect and promote the public interest by means of policies and procedures whereby the services of architects, engineers, surveyors and other related professionals may be engaged under circumstances that permit them to provide the highest quality of services consistent with public requirements. COFPAES members are ACSM, American Consulting Engineers Council, American Society of Civil Engineers, American Society of Landscape Architects, American Road and Transportation Builders Association, Planning and Design Division, and National Society of Professional Engineers/Professional Engineers in Private Practice.

The group toasted Brooks for his stalwart commitment to quality in professional design services in the public sector. Presenting the Inaugural COFPAES Brooks Medal to Brooks, 1992 COFPAES Chairman



Jack Brooks - (left)

Paul Lapham acclaimed:- "This medal recognizes your long-term contribution to advancing the public good by promoting qualifications-based selection and negotiated procurement of design services." The Brooks Law sets forth the procedures which all federal agencies are required to use in selecting and negotiating architectural, engineering, surveying, and other incidental services that members of these professions may "logically or justifiably perform." Lapham pointed to the widespread acceptance of quality-based selection in the public sector since adoption of the 1972 Brooks Law.

In future years, COFPAES will award the medal annually in Brooks' name to a group or individual whose efforts have made an outstanding contribution to promoting the highest quality of design services consistent with the requirements of the public.

Representatives John Conyers (D-MI), Chairman of the House Government Operations Committee and Frank Horton (R-NY), the Committee's Ranking Minority Member addressed the group praising the work of Brooks on behalf of the design community and his testament to quality-based selection of design services. The Government Operations Committee has legislative jurisdiction over federal procurement laws, including the Brooks Law.

In receiving his award, Brooks stressed the need for the design community to remain ever vigilant to congressional efforts to weaken or eliminate qualifications-based selection (QBS). Brooks noted "I'll continue to do my best to uphold QBS for the design professions but next year you will have to spend a great deal of your time educating the 150 or so new members of Congress about the need for QBS and the positive contributions this process has bestowed on the American public."

COFPAES Chair Paul Lapham, representing the American Congress on Surveying and Mapping, thanked Brooks for having set a standard of excellence and a legacy of working in the public interest. Lapham concluded that Brooks "had indeed earned our admiration, appreciation, and respect. This medal is just a small acknowledgment of the many positive contribu-

wherein the membership will vote on the matter of sponsoring a seminar or rebating individual chapters with a portion of the 1993 dues. Directors can provide additional information on these issues.

The balance of the meeting was devoted to budget matters, specifically the preparation of the 1993 budget worksheet. The final version will be presented at the annual state meeting.

The meeting was adjourned by common consent at 4:30 P.M.

Dated this 19th day of December, 1992.

Secretary /Treasurer
R. Hudson

"From the writing of a Practical Land Surveyor who gave the working years of his life to a profession he served."

"Now I lay them down to rest
My transit, tape and orange vest
My shovel's dull
My pick is broke
My chaining pins are just a joke
My plum-bob string is full of knots
My notebook's full of jumbled jots

No more to look for corners rare
The Highway took them
I know not where
No more to solve the Lawyers' deed
Much of which was sour seed
No more to run the ratty-race
Set by Ed-u-cations pace
No more with clients will I plea
Who think that surveys should be free

Yes, it was tough
As you can see
But never dull - Don't you agree?"



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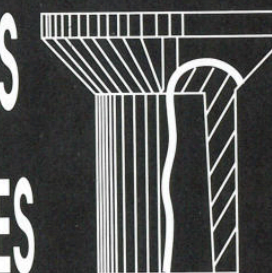
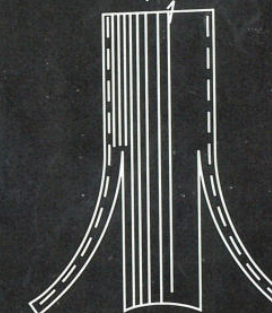
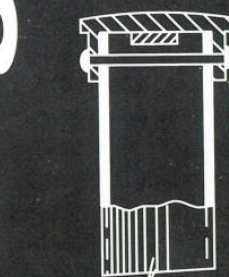
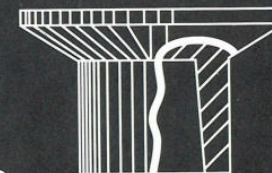
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WYOMING ENGINEERING SOCIETY ANNUAL MEETING

February 4, 5, 6 1993
Holiday Inn - Laramie, Wyoming

CONVENTION AGENDA

THURSDAY, FEBRUARY 4

- 8-12 Preconference Workshop: Professional Liability Insurance Case Studies
Presented by Design Professional Insurance Company
- 8-12 WACES
- 8-1:30 WACES Board Meeting
- 1-5 PLSW Becky Braman, President
- 1-2 WSPE Dave Hanlin, President
- 2-3:30 WACES Robert Overfield, President
- 3:30-5 ASCE Corky Stetson, President
- 5:30 Territorial Prison Tour (Optional)
- 6:00 Cash Bar
- 7:00 Dinner & Show

FRIDAY, FEBRUARY 5

- 8:30 Opening Session *President Walt Pilch*
Invocation *Don Lamb*
Welcome *Dean Sam Hakee,*
College of Engineering
Mayor of Laramie
- 8:45 Engineering Practices
Thomas D. Hixson, NSPE President-Elect
Professional Ethics
Surveying Practices & Procedures
Herbert W. Stoughton
Use of Statistics and Least Squares Adjustment
- 9:45 Coffee Break
- 10:00 Engineering Practices
Tom Edgar, Moderator
Superfund *Tom Sale, CH2M Hill*
Peter Huntoon, UW Geology
Emergency Response Planning
Joe Teig, Holland & Hart
Surveying Practices & Procedures
(Continued)
- 12:00 Lunch
"Anchor Dam" *Todd Jarvis, Professional Geologist*
- 1:30 College of Engineering
Dave Whitman, Moderator
Past, Present, Future: Panel Discussion
Surveying Practices & Procedures
(Continued)
- 3:00 Coffee Break
- 3:15 State Board of Registration *John Steadman,*
SBR-PE&PLS President
- 4:15 Focus on Exhibits
- 5:30 Door Prize Drawings
- 6:30 Cash Bar
- 7:30 Banquet
- 9:00 Dancing

SATURDAY, FEBRUARY 6

- 8:00 Roundtable Breakfast
- 9:00 Governmental Issues
Ray Jacquot, Moderator
Public Works Standard Specifications
Wyoming Public Works Council
Surveying Legislation
PLSW Legislative Committee
Current & Future Programs
Dennis Hemmer, DEQ Director
- 10:30 Coffee Break
- 10:45 Territorial Prison Restoration
Joe Lord, Moderator
Craig Post, Chief Operations Officer
Dick Warvi, AIA
Geographical Information Systems
Stan Abell, Moderator
Larry Ostresh, UW Geog & Rec
Phil Stuckert, Casper City Engineer
- 12:15 Lunch
- 1:30 Tours
- 3:30 Business Meeting
- 6:30 Cash Bar
- 7:00 Awards Banquet
- 9:00 Dancing

*Professional Development Certificates will be awarded to participants.

WES will be sponsoring a Professional Liability Insurance Case Study Workshop, Thursday, February 4, 1993 from 8:00 am to 12:00 noon. The seminar will be held at the Holiday Inn, Laramie, in conjunction with the Annual Meeting and will be conducted by the Design Professional Insurance Company. Presentations will be made by a claims representative, an attorney, and account managers. The workshop is appropriate for consulting engineers, owners, and educators.

The cost for the workshop is \$25 (payable to Wyoming Engineering Society) which includes reference material and coffee breaks. To register, please contact:

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Update On The Wyoming High Precision GPS Network

By Ron Regan, Wyoming Transportation Department
Photogrammetry and Surveys

This project has received funding from the Federal Highway Administration, Wyoming Transportation Department, and the Bureau of Land Management. It will be done as a cooperative agreement between National Geodetic Survey (NGS) and the Wyoming Transportation Dept.

Tentative schedule shows field observations being taken sometime in the spring or summer of 1993. Positions should be published by NGS by the end of 1993 or early 1994. Positions will be an updated NAD 83 horizontal and NAVD 88 vertical. There will be 56 points around the state at about 50-100 Km intervals. This will allow for one point near most major cities in the state. Reconnaissance has started on the location of these points. Any responses on the location of these points are welcome.

As a part of the agreement with the FHWA, the WTD is doing a survey on GPS surveying, and will try to provide some seminars to WTD employees and private surveyors around the state. **Responses to the Questionnaire can be sent to the Wyoming Transportation Department, Photogrammetry and Surveys, Attn: Ron Regan, P.O. Box 1708, Cheyenne, WY, 82002-9019.**

QUESTIONNAIRE

The WTD plans on giving seminars on GPS pertaining to knowledge gained from working with NGS on the High Precision GPS Network. This Questionnaire is to gain knowledge of what is known about GPS Surveying and the High precision GPS Network.

- 1) Any previous experience with GPS? **YES NO**
(IF YES ANSWER QUESTIONS A-D)
- A) List the following for the most in depth GPS project.
1. Total number of new points controlled _____
 2. Total number NGS points used as the base control _____
 3. Number of receivers used _____
 4. Types of Receiver used _____
- B) GPS surveying methods used.
1. Static Networking **YES NO**
 2. Static Traversing **YES NO**
(leap frogging of receivers)
 3. Static Radial **YES NO**
 4. Kinematic **YES NO**
 5. Pseudo-Kinematic **YES NO**
(pseudo-static)
 6. Rapid Static **YES NO**
- C) List method(s) used most often.
1. _____
 2. _____
 3. _____
- D) Main use of GPS surveying

1. GIS or LIS **YES NO**
2. Geodetic Control **YES NO**
1st Order **YES NO**
2nd Order **YES NO** } according to NGS GPS specs
3rd Order **YES NO**
3. Property or Boundary Surveys **YES NO**
Tied to NGS Control? **YES NO**
4. Other _____

QUESTIONNAIRE

(to be used with the question 2-6)

- 1 = Very Knowledgeable
- 2 = Somewhat Knowledgeable
- 3 = Basic Understanding
- 4 = Very Little or No Knowledge

- 2) GPS Surveying Methods.
- A. Static Method _____
 - B. Static Traversing _____
 - C. Pseudo-Kinematic _____
 - D. Rapid Static _____
- 3) Wyoming's High Precision GPS Network _____
- 4) Coordinate Datums (NAD83, NAD27, WGS84) _____
- 5) Control Networks _____
- 6) NGS GPS Specifications _____
- 7) Items you would like to see in GPS training seminars: (circle each desired item)
- A. Basic Information on GPS
 - B. GPS surveying methods;
 1. Static **Detailed or Basic**
 2. Static Traversing **Detailed or Basic**
 3. Kinematic **Detailed or Basic**
 4. Pseudo-Kinematic **Detailed or Basic**
 5. Rapid Static **Detailed or Basic**
 - C. Setting up a GPS project;
 1. Planning **Detailed or Basic**
 2. Reconnaissance **Detailed or Basic**
 3. Field work **Detailed or Basic**
 4. Processing raw data **Detailed or Basic**
 5. Adjusting & Checking data **Detailed or Basic**
 - D. Blue booking data for inclusion into NGS data base **Detailed or Basic**
 - E. Other _____



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