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ENGINEERING TECHNICAL INFORMATION SYSTEM

FIELD NOTES•TECHNICAL REPORTS
DATA RETRIEVAL•MANAGEMENT
PROFESSIONAL DEVELOPMENT

VOLUME 11 NUMBER 3

Field



Notes

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FOREST SERVICE

MARCH 1979

U.S. DEPARTMENT OF AGRICULTURE



ENGINEERING FIELD NOTES

Volume 11 Number 3

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FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE Washington, D.C. 20013

WO ENGINEER WINS NATIONAL AWARD

In its first annual President's Award for Practical Papers, the American Society of Photogrammetry (ASP) has awarded Terry Gossard third prize for his article "Applications of DTM in the Forest Service." His article was published in Photogrammetric Engineering and Remote Sensing (December 1978). Judging for the award was based on practical and applied values in advancing the state of the art in photogrammetry.

Terry is a geometronics engineer on the Washington Office Engineering Staff. The following three pages show copies of the letters of congratulations Terry received from John R. McGuire, Chief of the Forest Service, and from Clifford J. Crandall, President of ASP, and a copy of the award certificate presented at the ASP annual meeting.

UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE WO

March 22, 1979

Mr. Terry W. Gossard
Engineering Staff
Forest Service
U.S. Department of Agriculture

Dear Terry:

While I was at the ASP meeting yesterday I learned from Rex McHail of the President's award given to you at the meeting. Congratulations! Sorry I could not get there in time for the awards presentation.

Sincerely,

JOHN R. McGUIRE

Chief

6200-11 (1/69)



AMERICAN SOCIETY OF PHOTOGRAMMETRY

105 N. VIRGINIA AVE., FALLS CHURCH, VIRGINIA 22046, TELEPHONE: (703) 534-6617

February 21, 1979

Mr. Terry W. Gossard 7205 Ashview Drive Springfield, Virginia 22153

Dear Mr. Gossard:

It is indeed a pleasure to inform you that you have been selected as the first recipient for Third Prize of the President's Award for Practical Papers, for your article "Applications of DTM in the Forest Service", published in Photogrammetric Engineering and Remote Sensing, December, 1978, pps. 1577 - 1586.

The Award presentation will be made at the ASP Annual Business and Awards Meeting in the Lincoln Room of the Washington Hilton Hotel, Washington, D. C., Wednesday, March 21, 1979, convening at 8:30 a.m. We should appreciate it if you could come to the room at 8:00 a.m. to meet the Officers and greet the other award winners. Coffee will be available. Please let the ASP Headquarters know if you plan to be at the meeting to accept your Award in person.

Again, let me congratulate you for being the first winner of Third Prize of this new Award, based on practical and applied values in advancing the state-of-the-art in photogrammetry, which we hope will stimulate more practical papers such as yours.

Clifford & Crandall.

Clifford J. Crandall President, ASP

CJC/ahd

MEMBER . INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY

American Society of Photogrammetry

This is to certify that

Terry W. Gossard

Having met all the requirements of the Deed of Award

was presented

The President's Award for Practical Papers

Third Prize

At the Annual Meeting of the Society, March 21, 1979.

Clifford J. Crandell Prosident

FHWA LAUNCHES A MAJOR RESEARCH PROGRAM IN LOW VOLUME ROADS

Adrian Pelzner Chief Materials Engineer WO

There are over 2 million miles (3,218,000 km) of roads in the United States carrying fewer than 400 vehicles per day. A wide array of agencies and local governments operate and manage portions of this extensive road system. Some, but by no means all, of the agencies involved in administering the system are State DOT's, counties, townships, and such Federal agencies as the Bureau of Land Management and the U. S. Forest Service. The Nation's socioeconomic well being is directly influenced by its low volume road system. Current expenditures for the construction and maintenance of this road system are \$4 billion a year.

Although \$4 billion a year is a vast sum of money, it must be placed in perspective: This sum is being spent for the construction and maintenance of over 2 million miles of roads. As a basis of comparison, \$4 billion a year is considerably less than the annual expenditure only for construction on the 42,000 mile (67,578 km) Interstate Road System.

Over the years, the Federal Government has placed great emphasis and expenditure of funds on transportation problems in large metropolitan areas. The Government has concentrated its resources—funding, manpower, and research effort—on the primary and Interstate Road Systems. As a result of this emphasis, there is ample evidence that the low volume road system is deteriorating at a rapid rate due to lack of maintenance and capital improvements. There is growing concern over the adequacy of local rural roads to meet present and future needs of the Nation.

The Federal Highway Administration, recognizing the importance of low volume roads and the increasing inadequacy of the system, has initiated a massive research effort to develop new and improved technology for such roads. The research program calls for an expenditure of \$7 million to be obtained from several different funding sources. Nearly \$5 million of the total will be committed by FHWA under its direct contract authority. The program will take a number of years to accomplish; planning estimates for a variety of studies and technology transfer workshops in three major categories have been made through FY 1983.

STREAM CROSSINGS FOR LOW VOLUME ROADS

- -- Bridge Rehabilitation
- -- Bridge Replacement and Rehabilitation
- -- Deficiencies of Existing Low Volume Stream Crossings
- -- Structural and Hydraulic Considerations for Low Water Bridge Design
- -- Rehabilitation or Replacement Decision Criteria
- -- Culvert vs. Bridge Usage Decision Criteria
- -- Depressed Structures for Crossings Over Intermittent Streams
- -- Fail-Safe Designs
- -- Where Fatigue Can be Omitted From Bridge Design
- -- Low-Cost Retaining Walls

SURFACES FOR LOW VOLUME ROADS

- -- Defining the Low Volume Road System
- -- Reducing the Effects of Environment on the Utility of Low Volume Roads
- -- Criteria for Stabilization of Roadbeds
- -- Construction and Maintenance Practices for Low Volume Roadbeds and Surfaces
- -- A Simplified Design Method for Low Volume Road Surfaces
- -- Decision Criteria for Surfacing Low Volume Roads
- -- Planning-Stage Construction of Low Volume Roadways and Surfacings
- -- Special Equipment Needs for Construction and Maintenance

MATERIALS FOR LOW VOLUME ROADS

- -- Survey of Substandard and Waste Materials for Construction and Maintenance
- -- Establish Requirements of Materials for Low Volume Roads
- -- Evaluation of Low-Cost Materials for Use in Low Volume Roads
- -- Development of Specifications for Materials Used in Low Volume Roads
- -- Development of Low Volume Roads Materials Manual

The Federal Highway Administration has made arrangements for the Transportation Research Board (TRB) to review and critique this program of research on low volume roads. TRB in turn has selected a panel of engineers under the chairmanship of Professor Eldon Yoder of Purdue University to evaluate the program and to provide the necessary feedback and critique. The first meeting of the panel is scheduled for the latter part of April. One of the panel members is Adrian Pelzner of the Washington Office. Another panel member, who will also be providing a logging road perspective, is Professor Gary Hicks of Oregon State University. Professor Hicks has worked closely with the Forest Service on a variety of projects and administrative studies in Region 6.

Needless to say, the Forest Service has endorsed this program of research on low volume roads and has offered its full support and cooperation. It is entirely possible as the program develops, that the Forest Service will become more deeply involved. We have offered to make our road system available as a "laboratory" to test and evaluate any appropriate new or improved technology resulting from the research.

We will keep you informed regarding future developments on this major program of research on low volume roads.

SCS NATIONAL CONFERENCE

OF STATE CONSERVATION ENGINEERS

Washington Office Engineering representatives recently participated in the Soil Conservation Services (SCS) first meeting of all State Conservation Engineers. The week-long conference covered numerous topics relating to issues such as internal communications, A/E contract review and acceptance, the engineer's role, and training. The comments and concerns discussed were quite similar to those generally expressed at Forest Service meetings. Some of the key issues presented were:

1. The administrator of SCS issued Engineering Memorandum 6, on February 6, 1979, requiring professional registration for certain engineers. The following is an excerpt from the directive:

PROFESSIONAL REGISTRATION

SCS designs are to meet applicable requirements of Federal, State, and local laws and regulations. To comply with State laws, to demonstrate to regulatory agencies that SCS engineers are of proven competence, and to promote confidence and respect of engineers in the private sector, all State conservation engineers are to be registered in the State they serve. The Head, TSC Engineering Staff, and the Director, Engineering Division, are to be registered in at least one State.

A new State conservation engineer is to be given a reasonable time to become registered. State conservation engineers presently in position are encouraged to obtain registration even though they are exempt from this requirement by Civil Service regulations. In addition, it is SCS policy to encourage registration of other engineers, landscape architects, and geologists and certification of engineering technicians.

2. In the past, SCS has monitored operation and maintenance of all SCS-assisted dams in accordance with PL 534 and PL 566 for only 3 years after dam construction was completed. Exceptions were made if another agency or the local sponsors specifically requested assistance for additional lengths of time. This 3-year policy has been dropped. At this time SCS State offices should be in the

process of developing a continuing schedule for periodic maintenance inspection for all SCS-assisted dams. The change in policy reflects Forest Service and States concerns relative to the poor maintenance condition of many of the structures.

The final key issue discussed was future coordination between SCS and the Forest Service to expand mutually supportive activities within the Department of Agriculture. Items addressed were:

- -- Potential for uniform dam design standards
- -- Training for water resources engineers
- -- Policy for handling aging dams
- -- Maintenance of dams

WASHINGTON OFFICE NEWS

OPERATIONS

Harold L. Strickland Assistant Director

RID PROJECT STATUS

The goals of the RID Project and its planned development were outlined in the July 1977 issue of Field Notes. In the April 1978 issue, those intra-Forest Service grid and polygon systems under consideration for inclusion as part of the RID System were identified and discussed.

The RID Project Team has now concluded the short-range phase of the RID Project and has recommended adoption of a unified national system to meet the existing needs of the field users. This system will be supported and maintained at a national level by the Systems Operation and Maintenance (SO&M) Group, Washington Office, Engineering. Tom George, formerly RID Project Leader, now heads the SO&M Group.

The RID System, as now constituted, is composed of two subsystems:

- l. A versatile geographic-based cellular system called $\ensuremath{\mathsf{GRID}}$, and
- 2. A polygon system for manipulating digitized map data called POLY

The selection of these two systems to be subsystems to the RID System minimizes the impact on data previously collected for use by other Forest Service resource mapping systems. Dual subsystems also account for the different accuracy requirements for various users and the difference in computer costs for the two methods of data manipulation. The GRID subsystem is cheaper to use, but it is not as accurate as the POLY subsystem.

The RID Project Team has just published the Resource Information Display (RID) System Short-Range Phase (Final Report), together with a short summary document describing some of the key features of the RID System. A user's manual has also been prepared and is

being finalized for distribution. Copies will be available at the four RID System training sessions being planned.

The long-range phase of the RID Project has already begun. To determine what the needs of the Forest Service will be in the 1980s the Service has decided to conduct an $Information\ Needs\ Assessment\ (INA)$. To help us in this INA effort, we have entered into a cooperative agreement with the State University of New York at Buffalo (SUNY-Buffalo), which has extensive experience and expertise in related work involving computer mapping systems.

Each Region, Station, and Area has been asked to appoint an INA Coordinator for the RID Project in this INA effort. During May, members of the INA Team will meet with the Regional INA Coordinators and visit selected forests. These fact-finding visits and meetings will serve to provide to the INA effort the essential field input regarding the Forest Service's needs for the 1980s. The subsequent Service-wide survey, which will be administered by SUNY-Buffalo, will reflect the long-range concerns and needs of the Forest Service as perceived by the INA Coordinators, the respective field units involved, and Regions, Stations, and Areas.

SUNY will analyze the results, and from this analysis, the RID Project Team will be able to discern those resource information systems which provide viable, cost-effective alternatives to the existing RID System. Considering both the objectives of the long-range phase of the RID Project and the impact that a comprehensive INA can have on realizing that objective, we expect the INA Coordinators and the participating Forests to look upon this INA venture as a real opportunity to provide leadership in the area of resource information management for the 1980s.

The RID Project Team has undergone some personnel changes to accommodate the new direction of the RID Project. The Team is now composed of four members:

- 1. Ed Chapman, Project Leader
- 2. George Holguin, Computer Specialist
- 3. Bill Ubbens, Computer Specialist
- 4. Hue McOsker, Secretary

If you are interested in keeping posted on the progress of the RID System Project or have comments, suggestions, or questions, please contact the Project Leader, Ed Chapman, at FTS 235-2306.

CONSULTATION AND STANDARDS

Walter E. Furen Assistant Director

HUMAN RESOURCE PROGRAM BRIEFS

New Planning and Design Guides

Two new publications are currently being prepared for field distribution. The first is titled A Facility Planning and Design Guide for Youth Conservation Corps Residential Camps. This document will serve as a national guide to provide criteria, policies, and procedures to be used for planning, design, acquisition, and utilization of facilities for the YCC program. The second publication is A Facility Planning and Design Guide for the Young Adult Conservation Corps, and will provide similar guidance for the YACC program. This guide is actually an update of a publication of a similar title that received limited field distribution in June of 1977.

Field distribution of the YCC guide is scheduled for May and the YACC guide for July.

Job Corps Facility Survey

A field survey of Job Corps facilities was recently completed by a Washington Office Team of Human Resource Program and Engineering personnel. The objective of the survey was to evaluate the adequacy of (1) facility function; (2) planning, design, and construction sequence; and (3) cost effectiveness of Job Corps facility replacement program.

A total of six Job Corps Centers were visited in Regions 2, 6, and 8. While considerable differences existed from center to center in nearly all phases of the facilities program, several overall observations were made.

Attitudes toward the Job Corps Program appeared very good, and a general feeling of concern for improved facility management and quality improvement prevailed. Strong efforts are underway to enhance the development facilities program in all Regions.

The overall quality of construction accomplished through the Vocational Skills Training Program was judged to be very good. Likewise, the preparation of construction drawings to support this

program was being accomplished at a quality level and within a reasonable timeframe considering the adversities encountered.

In reviewing the facilities program at each center, a number of problem areas were noted, and specific recommendations were provided with emphasis on Service-wide needs. Some major needs included: improvements of the master planning and funding process, strengthening of the Work Program Officer position, better control of technical support for Job Corps projects, improved compliance with health and safety requirements, and the need to establish and maintain a standard operational philosophy for centers.

Based on the specific recommendations made in the survey report, an action plan will be formulated in the near future.

Relocatable Buildings

During recent years, many Regions have leased, acquired, and/or constructed new YCC residential camps in order to meet the National program target of having 75 percent of our enrollees in a residential program by 1980. Region 8 has had good success with relocatable concrete/masonry modular buildings at YCC camps.

Analyzing total facility needs, the Region determined that the primary need was for toilet buildings and kitchens with excellent durability characteristics, low operating and maintenance costs, and minimum sanitation problems. The Region concluded that buildings having a reinforced concrete floor (poured within a structural steel base frame), reinforced masonry walls, and conventional pitched roof would best meet requirements.

After some marketing research, the Region arranged for an A/E firm to prepare working drawings and specifications for:

- -- A fully equipped, compact kitchen to feed 60 people 12' x 40' size (3.7 m x 12.2 m)
- -- A men's toilet building for 30 people, both with laundry facilities 12' x 28' size (3.7 m x 8.5 m) and without laundry facilities 12' x 24' size (3.7 m x 7.3 m)
- -- A women's toilet building for 30 people, both with laundry facilities 12' x 28' size (3.7 m x 8.5 m) and without laundry facilities 12' x 24' size (3.7 m x 7.3 m)

The preliminary designs were reviewed by a Forest Service team of engineers, program administrators, and a Job Corps cook. Upon modification and acceptance of the design and specifications, the Region awarded a construction contract for two kitchens and four toilet buildings to be delivered to sites in Texas and Virginia. The units were transported to the sites and placed on prepared foundations. Evaluation after one season of use has shown that the

units are as good as or better than those constructed on site. Contract prices for January 1979 are estimated to be:

- -- Kitchen fully equipped \$43,000
- -- Toilet building with laundry \$19,400 each or total of \$38,800 for two (one men's and one women's)
- -- Toilet building without laundry \$16,600 each or total of \$33,200 for two (one men's and one women's)

These estimates do not include site preparation, utility connections, transportation costs, or setup costs. Adjacent screened enclosures for dish tray return, garbage cans, and service exits are also additional expenses; however, these enclosures can be easily constructed by YCC enrollees at a minimal cost.

Additional information may be obtained from Tom Smith, RO Staff Engineer in Region 8 (FTS 257-3367).

INVITATION TO READERS OF FIELD NOTES

Every reader is a potential author of an article for *Field Notes*. If you have a news item or short article you would like to share with Service engineers, we invite you to send it for publication in *Field Notes*.

Material submitted to the Washington Office for publication should be reviewed by the respective Regional Office to see that the information is current, timely, technically accurate, informative, and of interest to Forest Service Engineers (FSM 7113). The length of material submitted may vary from several short sentences to several typewritten pages; however, short articles or news items are preferred. All material submitted to the Washington Office should be typed double-spaced, and, ideally, all illustrations should be original drawings, glossy prints, or negatives.

Field Notes is distributed from the Washington Office directly to all Regional, Station, and Area Headquarters, Forests, and Forest Service retirees. If you are not currently on the mailing list, ask your Office Manager or the Regional Engineering Technical Data Systems Coordinator to increase the number of copies sent to your office. Copies of back issues are also available from the Washington Office.

Field personnel should submit material for publication or questions concerning Field Notes to their Regional Coordinators:

| R-1 | Melvin Dittmer | R-4 | Ted Wood | R-9 | Fred Hintsala |
|-----|----------------|-----|-------------|------|-----------------|
| R-2 | Royal M. Ryser | R-5 | Walt Weaver | R-10 | F. W. Baxandall |
| R-3 | Juan Gomez | R-6 | Kjell Bakke | WO | Al Colley |
| | | R-8 | Bob Bowers | | |

Coordinators should direct questions concerning format, editing, publishing dates, and other problems to:

Forest Service - USDA Engineering Staff (RP-E Bldg) Attn: Gordon L. Rome, Editor P.O. Box 2417 Washington, D.C. 20013

Telephone: (Area Code 703) 235-8198