

DISTRICT 5 GROUP MEETING - ST. JOSEPH, MISSOURI

P. H. DANIELLS, *Coordinator*

(Iowa, Kansas, Missouri, Nebraska)

MARCH 25-26

Federal engineers from the Public Roads Administration, Soil Conservation Service, Work Projects Administration, and National Youth Administration, State highway engineers from Kansas and Missouri, landscape engineers from the four States of this district, and nurserymen attended this meeting and took an active part in the group discussion of all subjects considered.

The following papers were presented at the morning sessions:

- (1) *The Place of Roadside Improvement in Highway Construction*, by Wilbur H. Simonson, Senior Landscape Architect, Public Roads Administration.
- (2) *Trends in Roadside Improvement Design*, by Franklin T. Rose, Landscape Architect, Kansas Highway Commission.
- (3) *Standards and Specifications of Plant Materials*, by John M. Hall, Landscape Engineer, Mount Arbor Nursery, Shenandoah, Iowa.
- (4) *Maintenance Problems on Roadside Improvement Projects*, by A. V. Ely, Maintenance Engineer, Hannibal, Mo. (well-illustrated by lantern slides)
- (5) *Public Highways and Erosion Control*, by John S. Glass, Assistant to Chief Engineer, Soil Conservation Service, Milwaukee, Wisconsin (well-illustrated by lantern slides).

The afternoons were devoted to field trips: to the Kelsey Nursery, to inspect modern methods of growing, packing, and storing first quality nursery stock; to visit demonstration roadside projects in Kansas to see the finished job properly constructed and maintained, particularly the various methods of establishing grass ground cover along roadsides; and in Missouri to inspect some Federal-aid and W.P.A. roadside improvement projects near St. Joseph and the City Park and Boulevard System.

The provision in the new Federal-aid Legislation which makes 3 percent of the Federal-aid grant each year available for the purchase of roadside areas created considerable interest and discussion. (See June 21, 1941: Public Roads Administration General Administrative Memorandum No. 126.)

Conservation of our natural resources such as existing trees, plants, and topsoil is considered of first importance.

Erosion control along our roadsides is receiving major consideration. Erosion can best be controlled by a naturalistic planting of (vegetative) ground covers and grass. In this way the natural beauty of our roadsides and the adjoining landscape is accentuated.

It was generally agreed that the 1-percent roadside fund has a greater value when used as a demonstration fund. At the present rate of construction in most States, the 1-percent fund could not possibly take care of more than 10 percent of the yearly construction mileage to say nothing of the great mileage of old construction so much in need of roadside treatment. The time has come when roadside improvement should no longer be treated as an unwanted orphan but should be taken into the highway family as a regular member. The features proven worth while in the roadside demonstration projects should be incorporated as a part of regular highway design.

There was no question regarding the economies to be secured by incorporating the basic roadside improvement items with roadway construction and letting all in the same contract. However, there is still some question as to the advisability of including items of purely seasonal operation in the general construction contract. This too will perhaps work satisfactorily when the contractors become accustomed to having this type of work included in their contracts.

The following few "highlights" are noted from 5 papers, as numbered above for reference:

1. THE PLACE OF ROADSIDE IMPROVEMENT IN HIGHWAY CONSTRUCTION

"It is essential that basic roadside operations be carried out in conjunction with all other operations which enter into the design, construction, and maintenance of a modern highway.

"A survey of existing highway conditions is the first step in the design of a road in order to fit the details of construction into the different surroundings. A study of proposed highway and roadside improvement in relation to existing highway and roadside conditions is fundamental; the purpose, of course, is to develop in each locality the type of improvement most suited to the variable roadside conditions.

"The survey and analysis of roadside factors which control highway development calls for the technical skill of men well trained for the work. The entire right-of-way, together with all property frontages, within view of the driver on the highway, is included in the roadside analysis of the whole highway cross-section design. Three factors - traffic, topography, and soils, influence and control the cross-section lay-out. In the design of the roadbed surfacing and shoulders, the traffic requirement is the primary control. Types of topography and soils are also important in the roadbed (area within the outer edges of the shoulders) lay-out but are usually secondary factors in the determination of widths and types of road surfacing and shoulders excepting in "rough" or heavy mountainous topography where the relative influence of these physical factors is increased. Outside the roadbed or traffic area, however, topography and soils more largely influence and control the cross-section lay-out and the type of roadside treatment to be used. All the technical skill within a highway organization is therefore needed to find the best

solution to these related problems but to the landscape engineer primarily falls the responsibility of analyzing basic roadside factors in terms of ground cover protection and plant growth requirements.

"* * * with the additional present emergency requirements suddenly superimposed on the existing system of roads, there will be added difficulties of administration and execution in the translation of these immediate requirements into finished construction. Therefore, careful planning and good organization are all the more prerequisite for producing effective results and to meet the emergency problems quickly and safely.

"The coordinate development of roadside portions of highways along with the construction of the traveled way or roadbed portions of highways is an essential of modern highway improvement if the fullest service is to be rendered to the public within a reasonable ultimate cost. Practical solutions must be found so as to reduce extra costs of maintenance due to roadside erosion, to the drifting of snow, and to related highway problems, like the drifting sand, falling of fences, and so on. Such practical questions as the continual clogging of ditches, the slipping and sloughing of earth slopes, and the proper construction and maintenance of road shoulders to fit different traffic and soil conditions are everyday problems pressing upon the attention of the highway and roadside engineer for solution. The highway engineers and particularly the highway landscape engineers, should start now to find the answers to some of these basic roadside problems in order to be prepared to meet the larger needs for improved roadside practices.

"The general aim is a survey by administrative districts to determine low-cost methods which can be applied on a large scale to establish ground covers on newly graded raw soils, supplemented by such other soils or low-cost materials as may be obtained within or near the highway right-of-way.
* * * Survey divided into three parts: (a) Road shoulder; (b) Drainage area or gutter; and (c) Other roadside areas, like cut and fill slopes, etc.

"As a coordinating program for 1941, the survey outline emphasizes the value of cooperation of all highway engineers and officials looking toward the gradual revision of landscape construction specifications and the steady improvement of methods for the protection of roadside surfaces so that wasteful erosion and obsolete construction and maintenance practices may be eliminated. Positive emphasis is placed on deliberate and definite design to prevent erosion getting started rather than on measures that must be resorted to by maintenance forces to restore eroded areas. Engineers know that the unit cost of replacing soil that has been washed away from embankments and cut-slope areas is usually several times the cost of originally placing that material; and unless measures are taken to prevent erosion when initial construction of large mileage takes place, the replacement process tends to be a repeated and costly operation to the highway maintenance departments. Practically all measures of controlling erosion work are toward the establishment of protective covers of vegetation because they are usually less expensive than

structural measures that have been used heretofore. * * * The BEST SOLUTION IS TO PROVIDE (during regular highway design and construction operations) GROUND CONDITIONS FAVORABLE TO THE GROWTH OF VEGETATION.

"* * * if roadside practices are made adaptable to the coming construction needs at reasonable unit costs, roadside improvement work is likely to grow in volume and to continue expanding for a long time as increased experience tends steadily to reduce the unit costs of these basic operations.

"In the adaptation of construction procedure to meet each problem as it arises, we are at the very threshold of what might be termed the scientific period of highway planning and design (for modern traffic operation and plant maintenance).

"The simplification of highway procedure points toward an ultimately firm foundation for a better job of final roadside development in the coming years."

2. TRENDS IN ROADSIDE IMPROVEMENT FROM BEAUTIFICATION TO NATURALIZATION

"A good many of the first roadside improvement plans in several of the States dealt chiefly with planting trees and shrubs along the roadsides. The plant varieties selected were not always indigenous to the particular section of roadside and the plants were sometimes planted in poor locations. The landscape engineer, however, has profited by some of these early mistakes and is now working more closely with the highway engineers to help solve problems of a roadside nature. * * * More and more attention is being given to types of work that will assist in securing a vegetative protection on our shoulders, shoulder slopes, and backslopes. Securing such protection not only enhances the beauty of the roadsides, but also means reduced maintenance costs in cleaning eroded soil from pavements, reduced costs in patching eroded shoulders and slopes, and reduced costs in removing the soil that is deposited in ditches and which clogs drains.

"The landscape engineer is required to spend considerable time in the field determining soil types and observing existing vegetative growth on and adjacent to the highway * * * to determine kinds of seeds and fertilizers and plants needed along each section of highway, and suitable locations.

"There is a definite trend toward 'naturalization' of roadside plantings. Few exotic plants are now used. Items planted today have some relation to the kinds of materials growing in that particular area."

3. COMMON SENSE STANDARDS - INSPECTION

"We are all used to getting near perfection and exact duplicate copies in this machine world. Nature, however, is still producing living and growing plants in the old way, with no dyes, machine tools, calipers, and aliners so we cannot expect every 2-inch elm to be 14 feet high with 10 side branches and 500 leaves each. There must naturally be some deviation allowed, but a good inspector is capable of seeing that the specifications are lived up to without going over backward in the other direction

"In preparing specifications * * * consider the problems the (plant source) nurserymen have to meet in regard to the natural growth of material and the varieties and grades available for use."

4. ROADSIDE MAINTENANCE

"* * * remember when the V-type ditch began cutting down and the wood-type check came into existence? * * * then followed wire and sod checks. Soon afterward we realized the importance of stopping some of the ditches that were cutting into the slopes and we built some sod spillways. The use of sod grew rapidly; many banks were laid back and sodded, or seeded.

"* * * about this time, the designing department got interested * * * it is hard for a maintenance engineer, in discussing this subject, to separate maintenance and construction problems.

"To my way of thinking, the protection against backslopes being washed into gutters, fences falling in, deep ditches being cut into adjoining land, side ditches caving in the shoulder, or undermining the backslopes, is of importance both from the standpoint of protecting the investment and serving the public from a safety standpoint. This protection work should be done using the material at hand, sod, native shrubs and trees, stone, and in some cases materials purchased from nurseries. We are including under the head of erosion control, shoulder maintenance particularly shoulder stabilization.

"Within the last few years there has been a growing demand for roadside parks. After construction, these immediately become a maintenance problem. Upkeep cost needs to be given equal, if not greater, consideration to initial cost in design of roadside areas.

"Another important phase of roadside improvement is a selective mowing program that is being done by the Maintenance Department. We find for very little expense that it is possible to have some outstanding plantings on the roadside * * * we are stressing the stabilization of shoulders in our program * * * we are exercising every precaution in our planning and plans to increase natural beauty of highways, keeping away as far as possible from additional maintenance cost.

"We find judicious plantings are the result of judicious planning."

5. PUBLIC HIGHWAYS AND EROSION CONTROL

In this paper Mr. Glass reviewed the work of the Soil Conservation Service in relation to highway erosion control and recognized the necessity for close cooperation with highway organizations because run-off water and erosion know man-made boundaries. Paper 5 was illustrated with colored slides showing erosion damage to farmers' and public property, the value of soil conservation, and various erosion control practices, including engineering structures.

Note: Copies of above excerpted papers are available, if desired, on direct request to the coordinator.