

## REPORT OF THE COMMITTEE ON ROADSIDE DEVELOPMENT

H. J. NEALE, *Chairman*

This constitutes the report of the seventeenth annual meeting of this Committee. Although we cannot report that we have conclusively solved any of the major roadside problems, we feel confident that the progress made will be most fruitful. Roadside development is a collaborative problem involving not only the landscape engineer but engineers of design, location, right of way, and safety, all of whom play a most important part in improved roadside design.

A journey over our newer highways in all regions of the country will serve to demonstrate to any qualified observer many indications of progress.

Highways for the future are being provided with wider rights of way, flatter and more streamlined cross sections, as well as more liberal rounding of slopes and drainageways on most primary and many secondary highways. Wider and safer road shoulders are adding safety to heavily travelled roads. Serious hazards to safety and much inconvenience to

traffic prevails where wide shoulders are not available for emergency retreats to prevent head-on collisions or for motor or tire repairs.

Improved mulching and grassing techniques are being demonstrated in all humid regions.

Turnouts at bus and truck loading points are being established on heavily travelled highways. Wayside turnouts and rest areas equipped with safe drinking water and sanitary facilities are being provided in many states. The public is recognizing and appreciating these driver services.

Increasing interest is being manifested by highway officials and engineers in the reports of our sub-committee on shoulders which first appeared in the Proceedings of 1945.

Several papers and progress reports were presented and discussed at this meeting. These will be published in a separate report of the Committee on Roadside Development this year. Brief synopses of these papers and reports follow:

### TREES AS AN ELEMENT IN HIGHWAY LAND DAMAGE

Mr. George G. Holley of the Public Roads Administration presented an analysis of methods evolved during the past half century for evaluating roadside shade trees. Too often trees on lands acquired for highway use or trees damaged during highway construction are considered as so much timber or cordwood and thus are given low valuation in estimates made by highway officials. The paper includes a suggested formula for determining the value of such trees. This is based on the factors of: (1) specie, (2) condition of the tree, (5) location as respects the road, homes or other developments, together with the acreage value of the lands in the area affected by the tree in question.

Typical examples are given for the use of the formula, together with tables covering trees ranging from 6 to 60 inches in diameter on lands valued from \$50 to \$10,000 per acre. A list of native trees for the cool humid regions is included. Tentative values in percentages are suggested for each specie as a basis for estimating their values on highways.

### HIGHWAY ZONING IN VIRGINIA

Mr. E. W. Turner, Associate Landscape Engineer, of Virginia presented facts regarding a Highway Zoning program now under way in Virginia. This primarily concerns an attempt to reduce the cost of highway land damage on acquisition of rights of way for modernizing the highway system of the State.

A recent review of 73 highway projects including 178 miles of highway reconstruction in fifty counties showed that nearly \$3,000 per mile was expended for moving structures. It is hoped to reduce highway improvement costs by establishing highway zoning for set-back lines on all existing primary highways scheduled for reconstruction.

Rights of way from 110 to 160 feet in widths are being purchased in the various counties, and regional public meetings are being held to acquaint county officials and the public with the many advantages of zoning as an aid toward reducing costs of future highway development.

#### PROGRESS REPORT ON SPECIAL GRASS PLANTINGS ON AIRFIELDS

The presentation by Mr. Howard L. Hyland of the Civil Aeronautics Administration gave the general conclusions from first year plantings of *Zoysia japonica*, a promising turf grass, on airport sites in the Carolinas, Virginia, and Pennsylvania. A few tests of other turf grasses were initiated. The importance and need for such practical testing work applicable in determining the value of turf for both highway and airport development was stressed. It was emphasized that such work has been neglected in the past due to the fact that sources of revenue cannot be derived from turf improvements or designs as in the case of equipment or other patentable materials used in general construction.

The variable results secured from the limited plantings this season, indicate the definite need for more extensive tests. These should be made under as desirable conditions as possible and subjected to technically trained supervision in order to get the most reliable data. To be of most value in economical and practical turf development, this information should be obtained as early as possible if it is to prove beneficial for such work as the C.A.A. airport program now getting started.

#### STATING NEW REQUIREMENTS IN SPECIFICATIONS

Dr. John Monteith, Chief of the Turfing Division, Civilian Aeronautics Administration, makes a thorough and constructive analysis of the problem of purchasing seed and developing specifications for seeding operations under construction contracts for highways or airfields.

Seed is usually the most expensive single item in a turfing contract. Often it is the least clearly defined item in a specification. Many specifications contain statements as to seed requirements that are meaningless and yet give an appearance of ample protection. Such common clauses as 'shall meet the standards of state seed laws' or 'shall be mixed under the supervision of the engineer' are examples of inadequate specification requirements for seed. Seed quality is expressed chiefly in terms of percentage of purity and germination. The product of these two figures is the percentage of pure live seed (PLS). Expression of seed quality in terms of a minimum percentage of pure live seed (plus a statement of maximum weed seed tolerance) is considered most desirable for use in specifications, particularly in the case of mixtures of seed. This method provides the seedsman with a reasonable degree of flexibility in furnishing seed of the required quality. It is considered desirable to include a clause that makes provision for accepting seed of a higher quality than the stated minimum on the basis of payment for the total amount of pure live seed furnished.

#### PROGRESS REPORT ON STABILIZED TURF SHOULDERS CONSTRUCTED ON LONG ISLAND

Mr. Harry H. Iurka, Department of Public Works, New York, presented another progress record of experiments made in Long Island for the establishment of turf on stabilized earth shoulders.

In order to test various factors relating to the growth of turf on earth shoulders several areas along highways on Long Island were mechanically stabilized in 1945, 1946 and 1947. On these a range of soil preparations, seeds and seeding methods have been tested and previously reported. This is the 1947 status report, together with a report on new tests relating to traffic loads and shoulder 'build up.'

Based on the local conditions on Long Island it is indicated that the presence of finer soil fractions are of importance to stabilization and plant growth. Maintenance fertilizing and mowing are likewise important for the turf. The resulting effects of different shoulder materials, compaction, amendments, mulches,

kinds and rates of seed and season and methods of seeding are again reported to show changes to date. Most of these variables have had surprisingly small effect on the resulting turf.

Traffic tests were made on the turf covered stabilized shoulders to determine the degree of stability. The observations to date are affirmative.

Grades on roadside areas have been determined at four periods during one calendar year without sufficient change in elevation to indicate trends due to recognizable causes except winter heaving.

Mr. Iurka replaces Mr. F. H. Brant of North Carolina as chairman of this subcommittee.

#### PRELIMINARY REPORT ON EXPERIMENTAL STABILIZED TURF SHOULDERS FOR NEW JERSEY PARKWAYS

The paper presented by Mr. Oliver A. Deakin, Parkway Engineer of the New Jersey State Highway Department outlines the problem of designing a stabilized turf shoulder suitable for parkway use and of constructing a sample section before the fall of 1947. The four-fold design requirements of a shoulder are stated and alternate typical cross section designs with methods and materials for construction specified. Five different grass seed mixtures were used in seeding the experimental turf shoulder plots. Hay mulch was used at rate of 100 lb. per 1,400 sq. ft. Traffic delineators were placed 50 ft. apart along the edge of the bituminous portion of shoulder to keep off cars and trucks for a two-month period until a good stand of grass was obtained. Tentative findings are that stabilized types of turf shoulders may be built during summer months and successfully seeded when combined with mulching practices. The use of a 3-ft. bituminous transition strip along pavement edge eliminated wearing of turf next to the paved strip. The shoulder areas have proven satisfactory in both dry and wet weather for passenger vehicle use during the late summer and early fall. Turf shoulders greatly improve the appearance of highways and parkways. More complete observations over an extended period will be reported at a later date.

#### PROGRESS REPORT ON STUDY OF TURF GROWTH ON SOIL MIXTURE AVAILABLE FOR HIGHWAY SHOULDER CONSTRUCTION IN MICHIGAN

Messrs. James Tyson, Michigan State College, and E. A. Finney of the State Highway Department presented a progress report on turf experiments at the Michigan Agricultural Experiment Station near Lansing.

The series of tests in establishing turf on various soil mixtures without loam topsoil was begun in 1943.

Each plot consisted of a different type of local soil alone or combined with pitrun gravel or other local materials. Five hundred pounds of 10-6-4 fertilizer was applied to each acre of plot area. Seed mixtures of one-third rye-grass, one-third bluegrass, and one-third red fescue was sown on all plots.

Compaction was done with a cultipacker, and each type of soil used was subjected to mechanical analysis, density determinations and other laboratory tests.

Comments were made during discussion of the paper that to simulate road shoulder on airfield runway surface conditions six-ton, or heavier, sheepsfoot or rubber tired rollers might well be used to compact test plot soils. It was also noted that no mulching was done on the test plots. Under usual field highway conditions mulching combined with seeding is desirable.

#### DEVELOPMENT OF TURF ON STABILIZED SOILS

Mr. Edward B. Cale of the Corps of Engineers, U. S. Army, made a most interesting record of successful results in establishing turf on stabilized soils without loam topsoil, in army airfields and airports.

In the development and construction of military airfields, the Corps of Engineers has been faced with the necessity of constructing stabilized shoulders for airfield pavements and providing suitable turf cover thereon. Wartime construction of this type in the Florida sands indicated that satisfactory stabilization was accomplished by addition of limerock and that a good turf could be established on the stabilized surface.

To aid in establishing specific design criteria for such construction, investigations have been undertaken to determine the relation of the type of base material, thickness of base, degree of compaction, and rate of fertilization to the production of turf on various stabilized soils and the relative effectiveness of the turfed area developed by the different treatments for supporting various wheel loads.

### THE ROADSIDE IN HIGHWAY DESIGN

Mr. George B. Gordon of the Public Roads Administration presented a photographic record, and made a brief analysis of main progress in highway design over the 18 years since the committee was organized. These improvements in complete highway design are the basic foundation for major improvements in roadside development throughout the country.

During the 18 years since the setting up of the Joint Committee on Roadside Development, State highway departments in all regions of the country have carried out roadside development work on highways of the Federal-aid system. Most successful roadside work has been integrated with highway right-of-way acquisition, location, design, construction and maintenance. It is, therefore, believed by the author that for a full understanding of progress made in roadside development, it will be helpful to note the high points of change and advance made in the design of highways as a whole.

Improved highway location and design are necessary prerequisites for improvement in conservation of roadside features, improvement in shoulders, gutters, and drainage areas, better slope protection, safer and more convenient border development and better design and development of wayside areas and safety turnouts. Complete highway design considers all these roadside development objectives, and is based on good highway department staff organization. The landscape engineer is only one of a number of highway engineer specialists who are directly interested in, and responsible for better roadsides. Success in highway landscape development requires teamwork within the highway department as well as public cooperation and support outside it.

It is believed that by making full use of the lessons of experience we shall be able not only to improve roadsides but also to improve the whole highway from standpoints of safety, convenience, and appearance and, at the same time, decrease some of the unit costs of construction and annual highway maintenance.

It would appear evident to one who has read our reports and followed the work of the Committee on Roadside Development over the years that there are still some links missing in the chain connecting our committee activities and the work of highway design, construction, and maintenance done by highway engineers in the field. For example, take a recent chapter on "Roadside Maintenance" in a manual being prepared by a special Committee of the American Association of State Highway Officials. The author of this manual had apparently not had opportunity to avail himself of the information on various types of erosion control described in the reports of this committee during the years between 1938 and 1948. We have evidently not succeeded in

getting our committee reports into the hands of highway engineers who most need our help.

During 1948, the coordinators who will represent both the AASHO and the Highway Research Board in the various geographic divisions of the Public Roads Administration may be able to begin an attack on this problem.

We hope that highway engineers who read this record and the reports of the committee can help us with this problem. Attendance at such regional meetings as the Short Course on Roadside Development at Ohio State University will help.

May we go forward during 1948 toward more complete highway design and development, of which better roadside development forms an important part.