

DISTRICT 7 GROUP MEETING - FRANKFORT, KENTUCKY

PHILIP TROEGER, *Coordinator*

(Kentucky, Illinois, Indiana, Michigan)

APRIL 29-30
AND MAY 1

The practical phases of roadside improvement covering the techniques of roadside practices and the economic advancement of highway construction and maintenance programs as a whole were discussed, especially basic work such as slope flattening, seeding, mulching, sodding, and associated operations to help maintenance and safety.

SHOULDERS (11 FEET WIDE) - STRIP SODDING ALONG EDGES OF PAVEMENTS IN INDIANA - The practice of strip sodding was started in 1939 to check excessive shoulder erosion on U S 30, a divided highway. Estimates show that in one short section, 15,000 cubic yards of soil were lost through shoulder wash. The sod is placed adjacent to the edge of the (concrete) slab and at the break of the shoulder grade; sod strips are 4 feet wide; the remaining 5-foot to 6-foot portion of unsodded shoulder is later seeded; on hills, transverse sod strips are placed at right angles to the center line.

The newly laid sod strip along the pavement is temporarily protected by beth strips and traffic reflector buttons until the sod mat has become sufficiently rooted to withstand traffic wear.

Sod is purchased complete in place for 17 cents to 22 cents per square yard and is placed only on new high-type roads. The sod treatment is eliminating the high maintenance cost of metal-type shoulders. The increased shoulder pitch of 1 inch per foot practically eliminates the building up of a high grass edge preventing surface run-off from the pavement as occurs on old-type shoulders with 1/4-inch pitch.

Illinois does not do any strip sodding.

Michigan is experimenting with a mulch worked into the shoulder for stabilization. In new construction, Kentucky places a 2-foot sod strip next to pavement on an 8-foot shoulder.

Standardization in the width of sod strip is needed.

Kentucky has had some success with Bermuda strip sodding on railroad fills, but the chief objection was the fire hazard in western Kentucky, a serious tendency where annual burning of right-of-way may be practiced.

The States might try out experimental sections, using various pitches of shoulder, slope ratios, and different methods of shoulder treatment and surface

stabilization for different widths of sod strips on primary base soils (sand, loam, or clay, etc.). Each State has opportunity through use of demonstration roadside funds to test out all possibilities for assembly of field data for determination of a sound shoulder design and surface treatment policy.

Shoulders might also be graded in units of width starting with 12:1 (1-inch pitch), say in the first 3-foot or 4-foot unit next to slab, then increasing to 8:1 slope in the second (3-foot or 4-foot) unit, then 6:1 for the third unit, to a 4:1 or maximum ratio to the bottom of the drainage channel or gutter. This would give a rounded shoulder appearance from the edge of slab surface to the center of the ditch line, thus making all three - pavement, shoulder, and gutter - integral to the highway graded section.

It was generally agreed that specifications for sod thickness should average $1\frac{1}{2}$ inches to 2 inches. A practical means of measuring thickness was suggested by piling 2 or more layers of sod face to face and then dividing the total measure of thickness by the number of layers.

"Stabilization" should be accompanied with some type of material which would give favorable opportunity for the growth of a vegetative ground cover. Improvement in techniques of soil preparation and amendments such as topsoil, loam, sand, clay, cinders, fertilizers, and mulches may considerably reduce construction and maintenance costs.

In Indiana, in some sections, limestone chips, 4 inches deep x 30 inches wide, have been placed along the edge of the slab, and the shoulders then sowed to Korean Lespedeza, with excellent results because the limestone improves soil conditions for plant growth.

SNOW BARRIERS IN MICHIGAN - "Mechanical" means applied for control of snow. Excellent reference on "Snow Control by Tree Planting" in *Michigan State College Engineering Experimental Station Bulletin*, Vol. 13, No. 1.

MOWING - In Indiana the number of times of maintenance mowing depends upon the class of road.

Michigan has discontinued the mowing of backslopes, saving money by naturalizing the slopes for blending into the native surroundings.

Roadside clippings are used as mulch in both States. Saving such valuable mulch cuttings for building up ground covers on the States' own right-of-way has tended to discourage and displace the former old practice of permitting farmers to volunteer to mow the roadsides for the hay which they removed from the right-of-way, with resultant loss to the State.

GROUND COVER, SOD, SEEDING, MULCHING, AND EROSION CONTROL - In Illinois last year \$2,000,000 were spent for erosion control, grading and black locust seedling planting on old construction. On new construction, 4:1 slopes

Grass mulch experiments: Successful - now in use in Mississippi - place 2-inch to 4-inch topsoil with grass roots on new graded slopes - then run a light tractor over this treatment * * * best results found on 3:1 slopes - work on roadsides developing from standpoint of maintenance - public not satisfied with anything other than right-of-way maintenance in a front yard maintenance manner.

MR. ALDERMAN - Engineer of Plans - Georgia: We do not use any fills over 2:1 slopes - agreed with government 3 or 4 years ago to build no fill slopes steeper than 2:1 - has not worked any hardship on anybody * * *. On 2:1 slopes grass grows better and stays better.

Each State has individual problems and individual conditions. Projects on old roads always involve widening and regrading - actually a reconstruction job. Georgia has not tried to put roadside improvement on anything but a paved road - has adopted policy of grassing every project, from one end to the other - including area between edge of pavement and the shoulder.

Brought out in discussion that slopes be modified so that they can be incorporated in all our primary road construction - made a part of original construction - go ahead and grade projects on regular Federal aid * * * and then put the 1-percent strictly in the planting. Florida uses 1-percent on active Federal work in doing little refinements that fund is for. * * * Alabama, also in Georgia - grassing, finishing and dressing, mulching, topsoiling, etc.

EXCERPTS FROM ADDRESS BY H. C. HEADLEY
HIGHWAY ENGINEER, PUBLIC ROADS ADMINISTRATION

"Military Highway" - strategic network.

* * * believe that all of the design that has been developed in roadside improvement (demonstrations) will be used in the design of the strategic network, and the only difference will be in width of roadbed. * * * may be forced to pave a lot of these roads 5 or 10 years ahead of what we normally would expect to do under our stage improvement."

Standards: Strategic network - 11-foot and 12-foot traffic lanes - 10-foot shoulders - 160 feet right-of-way for 2-lane service and 200 feet for 4-lane service. The 42-foot roadbed, which is the two 11-foot traffic lanes plus 10-foot shoulders, is developing rapidly - even faster than was anticipated. The States are sold on it. In this district, one or two States now do not want to build a width of roadbed less than 42 feet on their main State system. Tennessee is one; they made the jump from 32 to 37, and then went up

Note: (On 2-lane or 4-lane - get a width of roadway that is indicated by studies of your State-wide planning survey and width will take care of traffic conditions - then set right-of-way necessary to give an easy margin.)

ANALYSIS OF ROADSIDE DEVELOPMENT OPERATIONS - 7TH DISTRICT PUBLIC ROADS ADMINISTRATION - JANUARY 1, 1941

(Prepared by H. J. Schnitzler)

<u>Grazing</u>		<u>Illinois</u>	<u>Indiana</u>	<u>Kentucky</u>	<u>Michigan</u>
Maximum shoulder width		—	11 ft.	8 ft.	10 ft.
Minimum shoulder width		10 ft. on primary roads	8 ft.	3 ft.	8 ft.
Shoulder slopes (inches per foot)		3 in.	1 in.	4 in. with lip curb	4 in.
Backslopes		3 to 1 to R/W limit	4 to 1 up to 2 ft.	3 to 1 up to 4 ft.	4 to 1 up to 10 ft.
Are warped slopes standard?		No	2 to 1 above 10 ft.	2 to 1 above 4 ft.	2 to 1 above 10 ft.
Are slopes sandpapered?		Yes	Yes	Yes	No
Are borrow pits graded and seeded by contractor?		Yes	No	Yes	Yes
Are trees left on shoulder?		No	Yes	No	Yes
Are trees left in center strip?		Yes	Few	No	Yes
Are trees saved by meandering ditch?		Yes	Yes	No	Yes
Is topsoil stockpiled?		No	No	No	No
Is extra topsoil furnished?		No	Seldom	Yes	Yes
<u>Seeding</u>					
Date specifications - spring		3/1 to 4/30	2/15 to 8/15	3/1 to 5/15	4/1 to 8/15
Date specifications - fall		8/1 to 10/15	6/1 to 11/1	8/15 to 10/15	8/15 to 10/15
Materials per acre - spring (cover crop)		20 lb.-40 lb. oats (see spec.)	1 bu. oats or 25 lb. millet	peren. rye 20 lb.-clover 20 lb.	50 lb. peren. and red top
Materials per acre - fall (cover crop)		20 lb.-40 lb. rye (see spec.)	1 bu. rye	peren. rye 20 lb.-clover 20 lb.	50 lb. peren. and red top
Materials per acre - spring (grasses)		See specifications	40 lb. Ky. blue-40 lb. red top-20 lb. lespedeza	50 lb. Ky. blue-26 lb. clover	50 lb. Ky. blue, Can. blue, clover
Materials per acre - fall (grasses)		See specifications	40 lb. Ky. blue-40 lb. red top	50 lb. Ky. blue-20 lb. white clover	50 lb. Ky. blue, Can. blue, clover
Seeds tested by		Seed commissioner	Seed commissioner	Ky. D. Exp. Station	Dept. of Agriculture
Depth of seeding (cover crop)		Drilled and dragged	Drilled 1 inch	Harrowed	Raked
Depth of seeding (grasses)		Roll and mulched 4 in.	Lightly harrowed	Harrowed	Harrowed
Steepest slope seeded		2 to 1	2 1/2 to 1	1 to 1	3 to 1
Fertilizer used		—	400 lb. 10:6:4 or 4:12:8	750 lb. 3 T limestone	300 lb. 10:6:4
Bid price per acre		—	\$36.70	—	\$35.00
Proble with quality of seed		Very little	Some	Yes	No
Seeding by construction or		Highway construction	Construction and maintenance	Construction	Maintenance
<u>Maintenance</u>					
Slopes toward pavement					

<u>Sodding</u>	<u>Illinois</u>	<u>Indiana</u>	<u>Kentucky</u>	<u>Michigan</u>
Date specifications - spring	3/1 to 7/1	3/1 to 6/1	3/1 to 5/15	End of freezing to 6/1
Date specifications - fall	Sept. to frost	9/1 to 12/1	8/15 to 11/15	8/15 to freezing
Inspected by landscape engineer	Yes	Yes	Yes	No
Thickness recommended	2 in. to 2½ in.	1½ in.	3 in.	2 in. to 4 in.
Flattest slope sodded	2 to 1	2 to 1	3 to 1	2 to 1
All or part of shoulders sodded	None	Yes	Some	Some
Ditches sodded	Some	Yes	Yes	Yes
Steepest ditches sodded	—	3½	Variable	Variable
Fertilizers used per acre	None	400 lb. to 600 lb.*	750 lb.	None
Strip sodding recommended	None	Some	Some	No
Annual sq. yardage contracted	500,000	2,700,000	62,474	2,000,000
<u>Mulching</u>				
On seeded areas or slopes	Some	Yes	Some	Yes
On backlopes	Some	Yes	Yes	Yes
On shoulders	No	Yes	Some	Yes
Material	Straw	Straw, peat, chaff**	Straw	Straw, peat, hay
Thickness	4 in.	2 in.-4 in.	1 ton per acre	2-4 tons per acre
Bid prices	—	2¢ to 3¢ sq. yd.	\$10 to \$12 per acre	\$30 to \$60 per acre
Successful for erosion control	Yes	Yes	Yes	Yes
Successful for protecting seeding	Yes	Yes	Yes	Yes
Practical contract operation	No	Yes	Yes	Yes
<u>Shoulders</u>				
Standard width	10 ft.	11 ft.	3 ft. to 8 ft.	8 ft. to 10 ft.
Standard gradient (pitch)	—	1 in. to 1 ft.	4 in. to 1 ft.	½ in. to 1 ft.
Portion stabilized	None	4 ft. and 3 ft.	18 in. to 2 ft.	All
Materials	—	Sod	Gravel, stone, bituminous, sod	Bituminous, clay, gravel, topsoil
Treatment	—	Compacted and sodded	Maintenance, some	Some
Sod reduce maintenance	—	Yes	Yes	Questionable

* 4:24:12 or 4:12:8

** Field hay