

side, and on salient curves the slope should be inwards:—a 1-30 slope would be considered normal.

(B) Dressing. By way of finishing up a stone road, it is customary to put on a final layer of some fine material: screenings, gravel, burnt clay, brickdust, etc., are all suitable materials for this purpose. The dressing presents a surface suitable for immediate use, prevents the stones working loose, and has a tendency to form a crust which facilitates drainage to the side.

(C) Superstructure. This is the term applied to the material forming the wearing course. The life of the road will depend to a great extent on the superstructure used. Trap rock, hard sandstone and granite, possess properties rendering them more fit for road building than certain other formations.

The wearing course must be capable of withstanding wear, but still have consolidating, or packing, properties.

When broken stone is laid on a foundation of larger stones (Telford method) a thickness of six inches will do for ordinary traffic. If the traffic is likely to be heavy two layers of, say, four or five inches depth, each rolled separately, will give better satisfaction. The lower layer should consist of stone that will pass through a three-inch ring, and the top layer should consist of stone that will pass through a two-and-a-half inch ring.

An excellent superstructure consists of Tarvia-filled macadam. The foundation and first layer of broken stone is laid and well rolled. A layer of some suitable filler is now added and rolled. A wearing course of broken stone three inches thick is now added and well rolled. This wearing course is saturated with Tarvia "X", about one and three-quarters gal. per square yard being used. A seal coat of $\frac{3}{4}$ " crushed stone, about one and a half inches thick is then added, and well rolled. About three-quarters of a gallon of Tarvia "X" per square yard is sprinkled over this. A dressing of pea-stone, or screenings, is then added and rolled. (Rolling should always be done from outside to center.)

(D) Soling. The chief advantage of a layer of large stone as a foundation, or soling, is the saving of crushing expenses. If the soling is laid on a well curved and rolled subgrade, underdraining will be found unnecessary, as water will run to the side through the interstices. The soling should be well rolled before attempting to lay the superstructure. The practice of making an excavation to hold the soling has been condemned, owing to the fact that the excavation usually holds water and tends to cause the collapse of the whole crust.

(E) Subgrade. Preparation of subgrade is the first and most important step in building a modern road. The material surface of the ground should be rolled before crowning the centre.

Earth to crown the center will be partly obtained from ditches along the side and partly from earth hauled from the cuts. The crown should be as free as possible from sods and surface soil, which once disturbed do not pack well.

Where soling is not going to be used and broken stone is to form the superstructure (macadam method), it will be found advisable to cover the subgrade with a layer of cinders three to four inches thick to carry water to the sides and prevent it from softening the subgrade.

When a road is first built it is assumed that a certain amount of water will get through the crust, and, keeping the subgrade dry, does more to prevent the surface collapsing, and ruts forming, than any other steps that can be taken.

(F) Gutter. When the width of metalling is around twenty-four feet, it is advisable to construct a gutter along the border of the metalling to

catch water off the road, and prevent the shoulders from being washed away.

Laterals should be built every fifty yards or so, to carry water from the gutter to the ditches; or the water may be let down into the side drains and carried from there to the ditches.

A curb along the outside of the gutter will prevent traffic from passing from the shoulders to the metalled portion. This arrangement will also prevent ruts forming along at the point where the metalling joins the shoulder.

(G) Side Drains. Owing to having the subgrade curved, some provision will have to be made to carry off the water that drains off this curved surface. The usual way to deal with this is to construct some form of side drains running parallel to the road, below the edge of the metalling.

The side drains may be constructed out of farm tile, or stones laid in an excavation.

Lateral drains will have to be constructed every fifty yards or so to carry water from these side drains to the ditches.

(H) Shoulders. That portion of the road bordering and supporting the metalled portion is called the shoulder. Material for the shoulders is usually obtained from the ditches. The shoulders are not suitable for wheeled traffic.

Metalled roads are not suitable for oxen or bullock traffic, owing to the severe grind on their feet. Cavalry also prefers to travel on the unmetalled portions.

(I) Laterals. The drains carrying water from the side drains and gutters are called laterals. Laterals should empty into the side ditches at a point above high water mark. Occasionally the side drains are omitted and the whole of the subgrade drained by under drainage or laterals. This is the method usually adopted on grades when there is a tendency for the water to travel in the direction of the slope, the laterals catching the water before it commences to scour the center of the road.

(J) Berm. That portion of the road for a few feet on either side of the ditches, is called the berm. Ordinarily the berms have no particular function to perform, but it is possible to convert one of them into a cycle track by adding cinders, etc.

(K) Ditch. Ditches are meant to carry away water that runs off the road surface, and not to drain the fields, as is generally the case.

The ditches should be wide, and sunken well below the subgrade level. Narrow, over-deep ditches are to be avoided. When a road is built on a foundation of logs (corduroy) it is customary to place the logs in excavations, or at any rate at a level where they can be kept damp. For this

reason side ditches are usually omitted along corduroy roads.

(L) Boundary Pillar. This is more or less an imaginary line marking the road limits. However, a mound of earth along this line prevents water from draining off the field into the side ditches.

(To be continued.)

WELCOME TO YOU, LIEUT. GALLAGHER

We have pleasure in extending to Lieut. O. G. Gallagher our welcome to St. Johns, and have enlisted the services of the Royal Flying Corps for the delivery of our message.

CONGRATULATIONS.

"Knots and Lashings" extends its hearty congratulations to—

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2nd Cpl. A. Johnson.
2nd Cpl. H. F. Hebley.
2nd Cpl. J. J. Gifford.
2nd Cpl. W. E. Lewis.

HOW, INDEED?

"Sick" Corporal.—"Anybody going sick this morning?"

Sapper.—"What's on the syllabus today?"

"Sick" Corporal.—"I don't know."

Sapper (peevishly).—"How do they expect a man to know whether to go sick or not unless he knows what's on the syllabus?"

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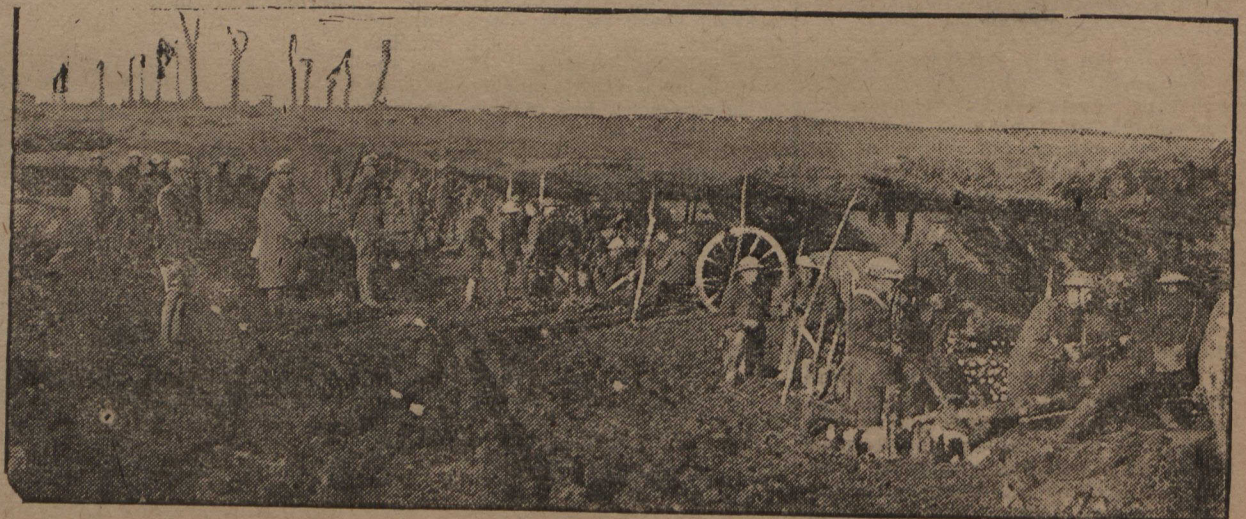
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