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SCIENCE IN THE DESIGN OF STREETS

NECESSITY OF REGARD FOR FUTURE NEEDS—ARRANGEMENT DEPENDENT UPON TOPOGRAPHY, PRESENT ACTIVITIES AND FUTURE OUTLOOK OF SURROUNDING TERRITORY—POINTS IN CONSTRUCTION OF PAVEMENTS.

By J. RUSSELL ELLIS,

Assistant City Engineer, Regina, Sask.

THE problem of proper street design is as broad and varied as any problem could well be. If the matter were always handled in a scientific manner and by a skilled designer there would be little excuse for writing this article. Too often, however, are the very underlying and essential points in the problem which require study and skilled judgment arbitrarily fixed by the legally constituted authorities in charge without proper advice, thought or knowledge. We have probably all seen the street which is too narrow or too wide for the use to which it is placed, in the first instance permitting of insufficient roadway room or width of sidewalk or both, and in the latter case causing an excessive cost of maintenance or suffering for lack of the same. Even when the width of the street is satisfactory the location is often ill-adapted to the fundamental requirements of the traffic to which it is subjected. Again, the width and arrangement of roadway, sidewalks and parking strips are stupidly fixed. Still again, the choice of elevation, gradients, kind of paving materials and facilities for storm water drainage are commonly noticeable as features of which improper treatment has resulted in **inexcusable confusion**.

The first step required to be taken in dealing with the problem in a scientific manner is a reconnaissance of the territory tributary to the street. For the purpose of this paper it will be assumed that our street has already been laid out and various improvements made upon the abutting property as is the case nine times out of ten when the engineer is given a hand in the design. A map drawn to a fairly large scale—not less than one hundred feet to the inch—should be provided with the street lines and all abutting property divisions accurately shown. This should be used in conjunction with a small scale map if available showing the streets and natural topographical features in the section of the city or town which is traversed by the street under consideration. After a careful study of the maps, in which possible changes in width or location may be noted, the investigation will be carried to the field. Here all improvements along the street will be sketched in upon the large scale map in approximate position; any apparent diversion of traffic to other streets and the reasons therefor will be noted, and any obvious errors or omissions in the map lines or topography will be observed. The general character of the use of the con-

tiguous territory, such as business, manufacturing, residential, residential mixed with business and public use, will be tabulated with the limits of each. Some study of the work involved in improvement, such as the cutting down of hills and the bridging or filling of depressions, should also be made. It will probably be possible at this time to make use of the conclusions drawn from the first study of the maps and to correct them where necessary. Along with these studies a reliable traffic census will be required. For this work it will be necessary to decide to what extent of detail the conditions will warrant the investigations to go. Various forms for recording the observations have been devised and rules established which are available for reference but need not be blindly followed. Certain it is, however, that records should be taken at different times during the day, at different seasons of the year and during different conditions of the weather. Where heavy and fairly continuous traffic is encountered it will probably be advisable to have the reports cover the entire twenty-four hours of the day. Concerning the information necessary to record, Professor A. H. Blanchard has made the following classification:—

1. Differentiation between horse-drawn vehicle traffic and motor car traffic.
2. Division of each of these classes of traffic into pleasure and commercial traffic.
3. Subdivision of commercial traffic into loaded and unloaded vehicles.
4. Determination of the weight per linear inch of width of tire of all types of commercial traffic.
5. Subdivision of the two classes of horse-drawn vehicles traffic, dependent upon the number of horses.
6. Subdivision of pleasure motor car traffic upon the basis of weight and speed, since, in many instances, the greatest damage to certain types of roads is caused by seven-seat touring cars, limousines or laundaulets, travelling at speeds of 40 to 60 miles an hour.
7. Extraordinary character of local traffic; for example, traction engines hauling trailers, motor bus traffic, ice wagons, mill drays, etc.

It would be well to remember, however, that this classification was made for the study of road design in general, and it seems to the writer that some modification might be made when considering street design alone. At