Design Standards Letter

Letter Number: **G-1964-40**

Letter Date: **08/11/1964**

Effective Date: **10/01/1964**

Section/Plan No.: **None**

Subject: **Special Provisions and Instructions Pipe Culvert Design**

Body

ALL DIVISION, DISTRICT AND URBAN ENGINEERS AND CHIEF COUNSEL

By General Letters No. 20, 1964, and No. 20A, 1964, dated May 11 and May 12, 1964, respectively, you were furnished copies of special provisions and instructions concerning the design of pipe culverts.

This letter will replace and render void the aforesaid general letters.

The following instructions and the accompanying special provisions are to be used in the preparation of all future plans and will be applicable beginning with the October 1, 1964 Letting.

For the purpose of the following discussion, the term "High Type" pavement will be construed to mean only asphaltic concrete or Portland cement concrete. In general, cross road culverts which are located under High Type (asphaltic concrete or Portland cement concrete) surfaces only, regardless of the design traffic, should be selected and specified on the plans in accordance with approved past practice.

For those culverts which are located under other than High Type surfaces, i.e., bituminous mats, seals, aggregate, etc., or used for side drains regardless of traffic or surface type, the contractor is to be given the option of selecting any one or a combination of the pipe types which are permissible under one of three "Groups". These groups of alternates will be designated by "Group I", "Group II", or "Group III", and further defined as follows:

Group I contains three alternate pipe types which are (1) reinforced concrete, (2) vitrified clay, and (3) bituminous coated corrugated metal (steel) pipe. This group of three alternates will be specified for all cross road structures under all roads which have a design ADT of 400 vpd or more and a pavement surface type other than high type.

Group II contains three alternate pipe types which are (1) reinforced concrete, (2) corrugated metal, and (3) corrugated aluminum alloy pipe. This group of three alternates will be

specified for all cross road structures under all roads which have a design ADT of less than 400 vpd with a pavement surface type other than high type and for side drain installations such as under entrances and crossovers regardless of traffic volume or pavement surface type.

Group III contains three alternate pipe types which are (1) reinforced concrete, (2) bituminous coated corrugated metal, and (3) bituminous coated corrugated aluminum alloy pipe. This group of three alternates will be specified for locations described under Group II when such locations require the added corrosion resistance of bituminous coating. Pipe necessitating paved inverts will be considered a special case and are not included in this group.

Culvert pipe located under side road approaches or outer roadways will be treated in a manner similar to the cross road culverts dependent upon the traffic category or surface type.

If headwalls or other appurtenances are to be used for pipe in any group classification, they are to be specified in the normal manner and the quantities and pay items on the applicable standards and in the specifications will be used with no modification for the different pipe shell thicknesses.

For all installations on a project which required Group I, II, or III pipes, the maximum overfill height (height of fill over top of pipe) should be set out on the "B" sheets to avoid any confusion with respect to the pipe design applicable to the specific installation.

For installations on a project which normally would require Group I, II, or III pipes, but which constitute a special case, one pipe type may be selected and specified on the plans in accordance with past practice. Such special cases may include unstable support, high embankments, steep gradients, high erosive forces, special drainage systems such as storm sewers, sanitary sewers, underdrains, etc., or for any other valid engineering reason.

When a pipe type is specified for any of the above special cases, the District must furnish an explanation of the reason for such selection in the letter of transmittal.

We trust that these instructions adequately cover the procedure for the selection of the specific pipe type or group category; however, we will be pleased to furnish clarification for any item in question.

Until such time as the Design Manual is revised, the instructions should be followed.

L. V. McLaughlin
Engineer of Surveys and Plans