

# **HIGHWAY DESIGN MANUAL**

**COMMONWEALTH OF PUERTO RICO  
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS  
HIGHWAY AUTHORITY**



COMMONWEALTH OF PUERTO RICO  
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS  
HIGHWAY AUTHORITY

HIGHWAY DESIGN MANUAL  
1979

RECOMMENDED:



Luis E. Landrau, P.E.  
Executive Director  
Puerto Rico Highway  
Authority

APPROVED:



E. Olivieri-Cintrón, P.E.  
Secretary  
Transportation and  
Public Works

## INTRODUCTION

This Highway Design Manual includes the basic highway design policies and procedures of the Department of Transportation and Public Works. It will provide guidance to the Department personnel, its outside consultants, and other Commonwealth and Municipal agencies for the design of safe, efficient and attractive highways. The manual incorporates the most recent design concepts and practices developed by the American Association of State Highway and Transportation Officials, the Federal Highway Administration and the Transportation Research Board. Traffic safety aspects are emphasized throughout on such features as geometric design, cross section elements, structures, traffic control devices, safety barriers, location of utilities, highway lighting, and pedestrian facilities.

The manual will aid in obtaining consistency and uniformity in the application of standards and policies to those agencies engaged in highway design. The manual will improve the highway design process from the preliminary stages through the development of final construction plans. It will promote the design of safer highways and appurtenances which will contribute to lower accident rates in the future.

Design procedures and criteria are subject to change or additions which will be incorporated in this manual by revisions issued and signed by the Secretary of the Department of Transportation and Public Works.

## ACKNOWLEDGEMENTS

Credit is given and appreciation expressed to Mr. Manuel A. Pietrantoni, Consulting Engineer, who devoted his professional experience in the preparation of 14 chapters of the manual and to the personnel of the Department of Transportation and Public Works and the Highway Authority who assumed the responsibilities to complete the contents of this manual.

Acknowledgement is made to the Puerto Rico Traffic Safety Commission and the Federal Highway Administration for their technical and financial assistance and to the American Association of State Highway and Transportation Officials (AASHTO), the Transportation Research Board (TRB) and the National Cooperative Highway Research Program (NCHRP) for permission to use material from their publications.

Finally, much credit for the content of the manual must go to the individuals of the Highway Authority and Public Works Areas who contributed to the working drafts and to those who provided excellent review comments in those drafts.

## ORGANIZATION OF THE DESIGN MANUAL

This Manual comprises twenty one (21) chapters, each one subdivided into sections and subsections.

A decimal numbering system is used to identify each chapter, section and subsection. For example:

2-08 identifies section 8 of chapter 2.

3-04.02 identifies subsection 2 of section 4 of chapter 3.

Tables within each chapter are identified by the chapter number and a digit as for example Table 5-1.

Figures within each chapter are identified by the chapter number and a letter as for example Figure 6-A.

Charts within each chapter are identified by chapter number and a Roman number as for example Chapter 4-I.

The pages within each chapter are numbered consecutively and identified by the chapter number and page number within the chapter as for example page 7-8.

# HIGHWAY DESIGN MANUAL

## Table of Contents

CHAPTER 1	– General Design Criteria
CHAPTER 2	– Typical Sections
CHAPTER 3	– Basic Design Elements
CHAPTER 4	– Intersections
CHAPTER 5	– Interchanges
CHAPTER 6	– Bridges
CHAPTER 7	– Pavements
CHAPTER 8	– Traffic Barriers and Fencing
CHAPTER 9	– Traffic Control Devices
CHAPTER 10	– Lighting
CHAPTER 11	– Highway Drainage
CHAPTER 12	– Soils
CHAPTER 13	– Utilities
CHAPTER 14	– Landscaping
CHAPTER 15	– Pedestrian Facilities
CHAPTER 16	– Field Survey Data and Photogrammetry
CHAPTER 17	– Environmental Considerations
CHAPTER 18	– Route and Project Planning
CHAPTER 19	– Contract Plans, Specifications and Estimates
CHAPTER 20	– Computer Programs
CHAPTER 21	– Administrative Procedures for Projects Design