

BUREAU OF ENGINEERING

PART F

SEWER DESIGN

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City Engineer

GENERAL PROVISIONS

PURPOSE

The Bureau of Engineering Manual is published as a reference and training guide for all Bureau employees.

The Manual summarizes and outlines policy, practices and procedures that have been developed to increase the efficiency of Bureau operations. Its purpose is to inform and instruct employees about the current standards in Bureau practice. The standards have been adopted to encourage uniformity in the work of division and district offices of the Bureau of Engineering. The various sections of the Manual as dated in the upper right hand corner of each page supersede all prior dated Standard Practice Instructions, Office Standards, Special Orders and other directives relating to material covered.

SCOPE

The Manual covers all phases of work in the Bureau. Elementary information available in standard engineering and public administration textbooks is not included. Graphs, office standards, and data applicable to City usage are included to assist in the solution of typical problems; however, it is not practical to cover all operations in great detail.

The Manual is a guide. It is not a substitute for professional experience. Sound judgment must be exercised in the application of Manual provisions to specific circumstances. For routine operations and procedures, the Manual instructions should be the standard. The contents do not preclude use of different methods when special or emergency conditions warrant and when proper authorization is obtained.

If a major deviation from the standard is necessary or desirable, the Engineer of Design should be informed by memorandum, so that it can be evaluated as a possible Manual change.

ORGANIZATION AND RESPONSIBILITY

The Manual will be published in sixteen parts. Each part will be a separate volume of related material. The Engineer of Design has the primary responsibility for coordination and preparation of the material or revisions to the Manual.

The Divisions/Districts assigned Manual Part (s) shall be responsible for the preparation of material of text and illustrations and any subsequent necessary revisions, all to be submitted to the Engineer of Design. The Engineer of Design will review all submittals for sufficiency and appropriateness for inclusion in the Manual prior to the City Engineer's approval.

The Bureau of Engineering Manual assignments are:

| PART | TITLE | ASSIGNED DIVISION/DISTRICT |
|-------------|-----------------------------|--|
| | Management | Executive |
| A | Administration | Administration |
| B | Office Guide | Administration – Office Automation |
| C | Operations and Control | Project Management |
| D | Land Development | Land Development and Mapping Central - One-Stop |
| E | Street Design | Central |
| F | Sewer Design | Collection Systems Engineering |
| G | Storm Drain Design | Storm Water Management |
| H | Structural Design | Structural Engineering |
| I | Drafting and Cartography | Land Development and Mapping |
| J | Survey | Survey |
| K | Real Estate | Real Estate |
| L | Architecture | Architectural Special Projects |
| M | Construction | Construction |
| N | Geology and Soils | Construction – Geotechnical Services |
| O | Systems | Administration - Systems Planning and Development |
| P | Wastewater Treatment Design | Hyperion Engineering Design |
| Q | Environmental | Project Management Environmental Engineering |
| O | Systems | Administration - Systems Planning and Development |

REVISION

The Manual is revised as needed to keep it current and to include new or changed policy, data and/or methods.

In general, revisions are implemented by issuance of a "Manual

Revision Transmittal" (Form Eng. 5.911) accompanying revised sheets to be inserted in the Manual. Superseded sheets should be discarded. The transmittals are numbered consecutively by parts and will indicate the scope of the revisions, any superseded Special Orders, and/or Memoranda and the reasons why changes are being made in the Manual.

In some cases Special Orders may be issued which supersede sections of the Manual and serve as interim instructions. In these cases, revisions to the Manual should be prepared as soon as possible after issuance of the Special Order.

Detailed instructions for Manual revisions will be included in Part C, Operations and Control.

FORMAT

1. The Manual is organized on the Closed Decimal System as illustrated in [Figure GP1](#).
2. The Manual and revisions are typed on sheets with headings illustrated by [Figure GP2](#). Each major division (e.g., 140, 230, 670) shall start on a new sheet. Long, selfcontained, secondary divisions (e.g., 142, 234, 678) may start on a new page when appropriate.
3. Each part of the Manual consists of the following:
 - a. Title Sheet - Signed by City Engineer and shall be revised each time there is a revision of that part.
 - b. General Provisions - Identical for all parts.
 - c. Preface - A brief general statement of the scope of that part.
 - d. General Outline - A list of chapters by general subject matter, the Index and an appendices listing.
 - e. Table of Contents - A table at the beginning of each chapter listing section numbers, subjects, and dates of revision.
 - f. List of Figures - A list when appropriate following the Table of Contents. Unless otherwise noted, the figures are inserted at the end of each chapter.
 - g. Index - Follows the last chapter for each part.
 - h. Appendix - As needed for important references too lengthy to incorporate in the text.

DISTRIBUTION

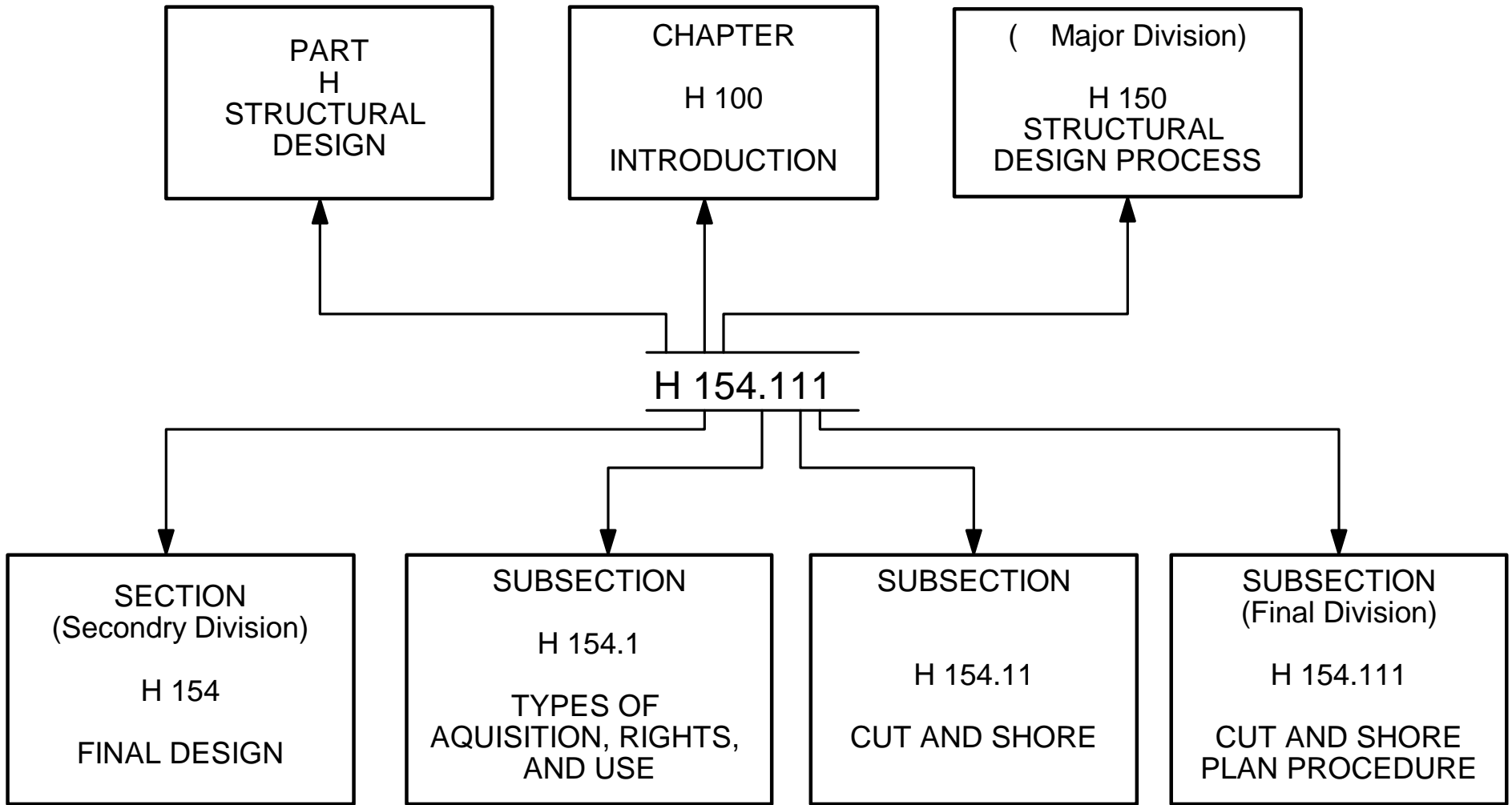
TO BUREAU OF ENGINEERING OFFICES

Each division and district office is assigned at least one complete copy of the Manual (18 parts). Additional parts as necessary are assigned to those offices with personnel who require them for frequent use.

Assignment and distribution of the Manual and its revisions are the responsibility of the Engineer of Design.

TO OTHER BUREAUS, DEPARTMENTS, AGENCIES AND INDIVIDUALS

The Manual is intended primarily for use by Bureau personnel. Due to costs of reprinting, the distribution of Manuals is limited and, therefore, restricted to Bureau personnel. Upon publication of a completed Part of the Manual, the Administration Division will make available for sale to others a microfiche set (50 to 60 pages of Manual Parts per fiche/jacket). It shall be the responsibility of the Client/Purchaser to acquire means for viewing and/or printing with the microfiche.



SAMPLE

FIGURE GP1

E 311 VOLUME

The specific types of traffic volume counts that are generally used by the street designer are as follows.

E 311.1 HOURLY TRAFFIC

The traffic pattern for most City streets shows considerable variation in traffic volume during different hours of the day (such as rush hour) and even a greater volume variation throughout the year. The most

DRH (in vehicles per hour) finds its greatest application in:

- a. Determining the magnitude of peak period.
- b. Evaluating capacity deficiencies.
- c. Establishing traffic controls, since volume is one of the warrants for the:
 1. Installation of signs, signals, and markings.
 2. Designation of through streets, one-way streets, unbalanced flow, and traffic routing.
 - (a) Prohibition of parking, stopping, and turning.
 - (b) Geometric design or redesign of streets and intersections.
 - (1) For example, a tabulation of traffic by direction of movement shows
 - (2) In contemplating the design of a highway and in determining its capacity, the DHV for one direction

DESIGN SPEEDS FOR CITY STREETS

| Class of Street | Design Speed |
|------------------|--------------|
| Major | 50 mph |
| Secondary | 40 " |
| Collector | 40 " |
| Local - Flat | 30 " |
| Local - Hillside | 25 " |

1" Margin

Table 313

(Line 60)