



November 27, 2023

The 2023 edition of the City of Houston Infrastructure Design Manual will be effective November 27, 2023. The manual has been updated and revised to reflect changes to the City of Houston's general requirements; survey requirements; graphic requirements; easement requirements; utility location requirements; storm water design requirements; street paving design requirements; street cut design requirements; geospatial data deliverable requirements; traffic and signal design requirements; communication facility requirements; pedestrian, bicycle, and transit design requirements; and encroachment requirements.

Please keep in mind that the purpose of this manual is to establish the basic criteria from which engineers can design infrastructure in a manner acceptable to the Department and is not intended to address all design conditions or specialized situations.

For more detailed information concerning the updates to the Infrastructure Design Manual, Standard Drawings and the Standard Construction Specifications see the attached Executive Summary.

Respectfully,

DocuSigned by:
A handwritten signature in blue ink that reads "Carol Ellinger Haddock".
A93C410B72B3453...

Carol Ellinger Haddock, P.E.
Director, Houston Public Works

DocuSigned by:
A handwritten signature in blue ink that reads "Suhail Kanwar".
9EF8B0C641F5478...

Suhail Kanwar, M.S., P.E., CFM
City Engineer

Attachment: Executive Summary

cc: Randy Macchi, Chief Operating Officer
Veronica O. Davis, P.E., Deputy Director
Greg Eyerly, Deputy Director
Michael Ereti, P.E., Deputy Director
Lisa Garrison, Deputy Director
Christon K. Butler, MCD, Deputy Director
Margaret Wallace Brown, Director



EXECUTIVE SUMMARY

2022-2023 Review Cycle

The following executive summary highlights the implementation and some of the major updates to the City of Houston's (City) Infrastructure Design Manual (IDM), General Requirements, Standard Construction Specifications, and Standard Drawings from the 2022-2023 review cycle.

GENERAL CHANGES

The 2023 Infrastructure Design Manual, General Requirements, and Standard Construction Specifications show change bars on the left side of the page to indicate a major revision has taken place. For specific details on what changes took place, redlines will be posted on the Design and Construction Standards website for reference.

Numerous formatting changes and references to standards have been updated throughout the IDM, standard specifications and standard details.

INFRASTRUCTURE DESIGN MANUAL (IDM)

Chapter 1 General Requirements

This chapter was not officially part of the 2022-2023 review cycle. Since Chapter 16 was being updated to be a standalone communication facility chapter, tree protection requirements were moved from Chapter 16 to this chapter. References to related ordinances were also added. Telecommunication geospatial data deliverable requirements were added to the submittals section to align with communication facility requirements that were updated as part of the review cycle.

Chapter 2 Survey Requirements

This chapter was not officially part of the 2022-2023 review cycle. Due to frequent third-party damage to the City's underground infrastructure, language was added to clarify in which instances survey guidelines are required.

Chapter 3 Graphic Requirements

This chapter was not officially part of the 2022-2023 review cycle. Graphic requirements for aerial utilities and telecommunication facilities were added.

Chapter 5 Easement Requirements

This chapter was not officially part of the 2022-2023 review cycle. A requirement for combined storm and sanitary sewer easements was added due to it mistakenly being omitted from the 2022 IDM.

Chapter 6 Utility Locations

This chapter was not officially part of the 2022-2023 review cycle. Subsurface Utility Exploration (SUE) requirements were added to reduce the instances of third-party damage to City underground infrastructure.

Chapter 9 Stormwater Design and Water Quality Requirements



EXECUTIVE SUMMARY

2022-2023 Review Cycle

This chapter was not officially part of the 2022-2023 review cycle. Updates to detention requirements were made to align with the amendments to Chapter 42 of the Code of Ordinances.

Chapter 10 Street Paving Design Requirements

This chapter was not officially part of the 2022-2023 review cycle. Alley requirements were updated to align with the amendments to Chapter 42 of the Code of Ordinances. Roadway widening requirements were originally proposed to be added to Chapter 15 as part of this year's review cycle but were placed in this chapter instead.

Chapter 12 Street Cut Requirements

This chapter was not officially part of the 2022-2023 review cycle. Due to frequent third-party damage to the City's underground infrastructure, a requirement for plan and profiles for excavations greater than three feet in depth was added.

Chapter 13 Geospatial Data Deliverables

This chapter was not officially part of the 2022-2023 review cycle. Geospatial data deliverable requirements were added for telecommunication facilities.

Chapter 15 Traffic and Signal Design Requirements

The chapter was restructured to provide consistent flow and to emphasize areas of greater priority. Definitions and references sections were updated. Numerous figures were updated for clarity. A new Multimodal Service Standards section was added. The Traffic Impact Analysis (TIA) Process section was modified and restructured to emphasize goals of TIAs and encourage earlier TIA submittals. The Recommended Procedure for Estimating Trip Generation figure was removed because the process is rarely used. The Mitigation Measures Requirements section was updated to align results with City multimodal safety goals. The term "Level of Service (LOS)" was replaced with "Vehicle Level of Service (VLOS)" and updates were made to clarify that VLOS is only one factor for consideration and that multimodal service standards replaces VLOS as the primary consideration. Specific consideration for Transit Corridor Streets was removed. The Mitigation Decision Tree figure was updated to reflect the new process for mitigation. The Traffic Engineering Study for Design section was replaced by the Traffic and Design Studies section to better communicate expectations and standardize various types of traffic and design studies. A requirement for 13-hour turning movement counts was added. The School Zones section was modified to emphasize the City's commitment to Vision Zero. Additional requirements and clarity was added to the School Zones section. Modifications were made to the Loading Docks/Wells/Berths section. Driveway spacing criteria was updated for clarity and to align with the amendments to Chapter 42 of the Code of Ordinances. Swept path analysis requirements were also added to the driveway spacing criteria section. Requirements for the preservation and installation of blue tile street signs were added. A left-turn phasing guidelines flowchart from the Traffic Signal Timing Manual was added. Updates to the alternative phasing requirements were made. Changes to motor vehicle design speed were made to align with FHWA standards and a design walk speed was added. New requirements for pedestrian and bicycle accommodations at signals were added. Wireless magnetometers were removed as an approved detection method and camera detection was added.



EXECUTIVE SUMMARY

2022-2023 Review Cycle

Requirement for warning lights on drums and barricades was added to increase safety of bicyclist. Requirements were added for water filled barriers. The Neighborhood Traffic Management Program section was renamed to Traffic Calming and language was updated and added to focus more on design requirements rather than processes. The Intersection Turning Templates/Design Vehicles section was deleted because the requirements are covered elsewhere in the chapter. Cellular subscription language was modified to reflect new communication method via air card. The ITS notes to be added to plans were updated. The intersection geometric layout requirement was updated to include bicycle facilities. Pedestrian and bicycle movements were added to turning movement counts. Language was added to clarify situations in which TIA updates are required when a future phase changes for multi-phase developments. Numerous minor modifications were made to clarify design requirements.

Chapter 16 Communication Facility Requirements

The title of the chapter was changed from “Miscellaneous” to “Communication Facility Requirements”. Tree protection, residential subdivision markers and skybridge requirements were removed from the chapter to make it a standalone communications facility chapter. Definitions and references sections were updated. Requirements were added for compliance with Americans with Disabilities Act. A requirement was added to minimize interference with the City’s ITS devices. Criteria was updated and added for placement of communications facilities. Requirements were added for network node attachments to poles. Subsurface utility exploration requirements were added. Submittal requirements were added. Requirements for drawings were added. Requirements for pole load analysis were added. Quality Assurance requirements were added. Geospatial data deliverable requirements were added.

Chapter 17 Pedestrian, Bicycle, and Transit Design Requirements

The title of the chapter was changed from “Bicycle, Transit, and Pedestrian Design Requirements” to “Pedestrian, Bicycle, and Transit Design Requirements” to emphasize that the chapter does not just include bicycle requirements. The chapter was restructured to provide consistent flow. Definitions and references sections were updated. Numerous figures were updated and added for clarity. An overview section was added to emphasize the City’s plans and commitments defined in Vision Zero, Resilient Houston, Climate Action and Houston Bike Plan. Definitions and references sections were updated. A section on applicability of Chapter 17 requirements was added. A Shade and Green Infrastructure section was added. Requirements for pedestrian and bicycle temporary traffic control was added. The Pedestrian Realm section was updated to add requirements for intersections and midblock crossings that will enhance pedestrian safety. Curb ramp and corner treatment requirements were updated. Requirements for corridor crossing analysis and treatments were added. Bicycle facility design requirements were updated to provide guidance for bicycle facility design depending on context. New standards for all bicycle facility types along the corridor and at intersections were added. Requirements have been updated to provide guidance for bicycle boxes and two-stage turn queue boxes. New standards have been added for median closures. Requirements for a new type of intersection treatment called Protected Intersections was added. Standards for bicycle traffic signals was refined. A Transit Overview section was added to coordinate City design standards with Metro transit design guidelines. Requirements for transit stop configurations and placement were added including the addition of several types of floating bus stops. Transit pavement marking and signage requirements were added. The Design Bicyclist figure was removed because it’s no longer useful. The Bike Lane Retrofit figure and Bicycle Facility Type figure were



EXECUTIVE SUMMARY

2022-2023 Review Cycle

both updated to reflect Houston context and higher standards set by NACTO. The Criteria for Midblock Crosswalk table was renamed to Level of Treatment Criteria Summary, level of treatment D was removed and a note that high visibility signs may not be sufficient for these crossings and that higher levels of treatment may be necessary was added. The Minimum Sidewalk Width Standards table was updated to indicate the City's preferred width of 6 feet and minimum width of 5 feet for all other public streets. A Minimum Dimensions for Median Refuge Islands table was added. A Raised Crosswalk Dimensions and Slope table was added. The spacing requirements in the 'U' Rack Spacing Standards table were updated. Numerous minor modifications were made to clarify design requirements.

Chapter 18 Encroachment Requirements

A new encroachment requirements chapter was created. Residential subdivision marker requirements and skybridge requirements were moved from Chapter 16 to this chapter. Monitoring well encroachment requirements were added.

IDM Supplements

The City creates supplements for the IDM when there is a need to revise a current IDM chapter that is outside of its normal review cycle period. At the time when a new IDM is to be released, any active supplements are incorporated into the new IDM and those supplements subsequently deactivated.

Prior to the completion of the 2022-2023 review cycle, there were no active IDM supplements therefore no IDM supplements have been incorporated into the IDM for the 2023 release.

Infrastructure Design Manual Implementation

- The 2023 Infrastructure Design Manual is effective November 27, 2023.
- *Capital Improvement Projects*
Phase II final designs (60% submittals) that are submitted for a review on or after November 27, 2023, will be required to comply with the new Infrastructure Design Manual.
- *Private Sector*
Plans submitted for initial review on or after November 27, 2023, will be required to comply with the new Infrastructure Design Manual.

CONSTRUCTION SPECIFICATIONS

Revised Specifications

Various specifications, that are associated with the IDM chapters reviewed during the 2022-2023 review cycle, were reviewed and updated. A total of twenty-one (21) specifications included technical changes, three (3) specification were created, and six (6) specifications were retired. A new section named "Related Sections" was added to all specifications that reference City standard specifications. Specifications related to this year's review cycle were restructured to conform with CSI format. A list of all specifications that contained technical changes, were added or retired is provided at the end of this executive summary.



EXECUTIVE SUMMARY

2022-2023 Review Cycle

Specification Implementation

- *Capital Improvement Projects*

The 2023 construction specifications are effective November 27, 2023. Per Document 00700 General Condition, section 1.2.4:

“Reference to standard specifications, manuals, or codes of a technical society, organization, or association, or to laws or regulations of a governmental authority, whether specific or implied, mean the latest edition in effect as of date of receipts of bids, except as may be otherwise specifically stated in the Contract.”

- *Private Sector*

All projects in the public/private sector submitted on or after November 27, 2023, shall comply with the latest version of the City’s Construction Specifications.

STANDARD DETAIL REVISIONS

Revised Standard Details

Various standard details associated with IDM Chapters were up for review during the 2022-2023 review cycle. A total of forty-three (43) standard details included technical changes, six (6) standard details were created and three (3) standard details were retired. Title blocks were updated for all drawings associated with this year’s review cycle. Numerous drawings were renumbered and/or retitled. AutoCad drawings were standardized and will be available for public use. A list of all standard details that contained technical changes, were added or retired is provided at the end of this executive summary.

Revised Standard Detail Implementation

- The 2023 standard details are effective November 27, 2023.
- For Houston Public Works capital improvement projects, Phase II final designs that have already been submitted for a required review prior to November 27, 2023, it is recommended that all designers make an effort to incorporate the new changes into their current design to the extent that it does not increase cost or delay a project.

END OF EXECUTIVE SUMMARY

(See Next Page for List of New Revisions)



EXECUTIVE SUMMARY

2022-2023 Review Cycle

NEW IN THE 2023 REVISION

Infrastructure Design Manual (IDM), Standard Construction Specifications and Standard Details for Houston Public Works Design & Construction — 2023 Revision

Infrastructure Design Manual (IDM) Chapters Updated*:

- Ch. 1 – General Requirements
- Ch. 2 – Survey Requirements
- Ch. 3 – Graphic Requirements
- Ch. 5 – Easement Requirements
- Ch. 6 – Utility Locations
- Ch. 9 – Stormwater Design and Water Quality Requirements
- Ch. 10 – Street Paving Design Requirements
- Ch. 12 – Street Cut Requirements
- Ch. 13 – Geospatial Data Deliverables
- Ch. 15 – Traffic and Signal Design Requirements
- Ch. 16 – Telecommunication Requirements
- Ch. 17 – Pedestrian, Bicycle, and Transit Design Requirements
- Ch. 18 – Encroachment Requirements

New Standard Specifications:

- 02871 – Bike Racks
- 02890 – Pedestrian Crosswalk System Rectangular Rapid Flashing Beacon (RRFB)
- 16130 – Advanced Transportation Controller (ATC) Cabinet Assembly

Standard Specifications Updated*:

- 01554 – Traffic Control and Street Signs
- 01555 – Traffic Control and Regulation
- 01562 – Tree and Plant Protection
- 01582 Build Houston Forward Project Identification Signs
- 02221 Removing Existing Pavements, Structures, Wood, and Demolition Debris
- 02581 – Street Lighting Conduit
- 02582 – Traffic Pole Assemblies - Steel
- 02775 – Concrete Sidewalks
- 02893 – Traffic Signal Construction
- 02921 – Hydro Mulch Seeding
- 16711 – Traffic Signal Conduit
- 16712 – Solar Powered School Zone Field Equipment
- 16715 – Vehicle Signal Heads
- 16716 – Pedestrian Signal Heads

- 16718 – Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement
- 16719 – Countdown Pedestrian Signal Module
- 16727 – Traffic Signal Saw-Cut Loop Detector
- 16732 – Uninterruptable Power Supply (UPS) System for Traffic Signal Cabinets
- 16733 – Field Hardened Ethernet Switch
- 16735 – Fiber Optic Splice Enclosure
- 16750 – Accessible Pedestrian Push Button Station

Standard Specifications Retired/Deleted:

- 16734 – WiMax
- 16738 – Wireless Communication System
- 16743 – Code Division Multiple Access (CDMA) Modem Assembly
- 16744 – Ethernet Video MPEG-4 Encoder
- 16745 – Ethernet Video MPEG-4 Decoder
- 16751 – Wireless Magnetometer Vehicle Detection System

New Standard Details:

- 01554-05 – Houston Bikeway Signage
- 02760-11 – Bicycle Intersection Treatments (Sheet 2)
- 02771-02 – 14" Wide Precast Curb Stop Delineator for Bicycle Lanes
- 02775-09 – Perpendicular Curb Ramp
- 02775-10 – Retrofit Bikeway at Floating Bus Stop
- 02871-01 – Bicycle Rack Details

Standard Details Updated*:

- 01554-01 (prev. 01509-01) - General Notes and Ground Mounting Sign
- 01554-02 (prev. 01509-01A) - Sign Base Mounting Details
- 01554-04 (prev. 01509-02A) – Custom Signs
- 01555-01 (prev. 01512-01) - TCP Notes Channelizing Devices and Barricades
- 01555-02 (prev. 01512-02) - TCP Overall Traffic Control Layout
- 01555-03 (prev. 01512-03) - Traffic Control Layout



EXECUTIVE SUMMARY

2022-2023 Review Cycle

Standard Details Updated* (cont'd):

- 01555-04 (prev. 01512-04) - TCP One Lane Closure Phase 1 & 2
- 01555-05 (prev. 01512-05) - TCP One Lane Closure for One Block
- 01555-06 (prev. 01512-06) - TCP Typical 3-Way Intersection Phase 1 of 3
- 01555-07 (prev. 01512-07) - TCP Typical 3-Way Intersection Phase 2 of 3
- 01555-08 (prev. 01512-08) - TCP Typical 3-Way Intersection Phase 3 of 3
- 01555-09 (prev. 01512-09) - TCP 4-Way Intersection Phase 1 of 4
- 01555-10 (prev. 01512-10) - TCP 4-Way Intersection Phase 2 of 4
- 01555-11 (prev. 01512-11) - TCP 4-Way Intersection Phase 3 of 4
- 01555-12 (prev. 01512-12) - TCP 4-Way Intersection Phase 4 of 4
- 01562-02 – Tree Protection and Root Pruning in Sidewalk Repairs in Pedestrian Realm
- 01562-03 - Tree Protection with Sidewalk Repairs in Pedestrian Realm
- 01562-04 - Tree Protection Zero Curb Cut
- 01562-05 (combined 01562-05A & 01562-05B) - Tree Protection Tunneling Requirements
- 01562-06 - Tree Protection Trench Requirements
- 01582-01 - Construction Sign Build Houston Forward
- 02582-02 (prev. 02583-04A) - Traffic Signal Structures (Sheet 1 of 2)
- 02582-03 (prev. 02893-04B) - Traffic Signal Structures (Sheet 2 of 2)
- 02751-01 - Concrete Pavement Details
- 02752-01 - Pavement Expansion and Construction Joint Details
- 02752-02 - Sidewalk Expansion and Construction Joint Details
- 02754-01A - Driveway with 4"x12" Curb for Local Residential Street
- 02754-01B - Driveway Detail With 6" Curbed Streets
- 02754-02 - Driveways with Culverts on Open Ditch Type Streets
- 02754-03 - Proposed Driveway Through Sidewalk with Excessive Elevation Difference
- 02754-04 - Proposed Sidewalk Through Driveway with Minimal Elevation Difference
- 02760-01 (prev. 01510-01) - Pavement Markings General Notes and Legends
- 02760-04 (prev. 01510-04) - Standard Pavement Marking – Symbols
- 02760-09 (prev. 01510-09) - Bicycle Lane Pavement Markings

- 02760-10 (prev. 01510-09A) - Bicycle Intersection Treatments (Sheet 1 of 2)
- 02760-11 (prev. 01510-09B) - Bicycle Intersection Treatments (Sheet 2 of 2)
- 02775-01 - Typical Sidewalk Layout and Details for Streets with Curbs
- 02775-02 - Typical Curb Ramp Details
- 02775-03 - Parallel Curb Ramp
- 02775-04 - Curb Modification for Curb Ramps & Crosswalks
- 02775-05 - Commercial & High-Density Conditions Curb Ramp Details
- 02775-07 - Detectable Warning Surface (Options)
- 02775-08 - Sidewalks and Clear Zone Transit Corridor Street

Standard Details Retired/Deleted:

- 01580-04 - Construction Sign ReBuild Houston Project Drainage Utility Fee Funding
- 01580-05 - Construction Sign Rebuild Houston Project
- 01580-06 - Construction Sign Thumbs Up for Progress ReBuild Houston Project

*Only IDM chapters, specifications and standard details with technical changes have been included in the list.