



City of Hutto

Agenda

Joint Meeting

City Council & Planning and Zoning Commission

Thursday, June 5, 2025 at 6:00 PM

Council Chambers, City Hall – 500 W. Live Oak Street

1. CALL SESSION TO ORDER

2. ROLL CALL

2.1. City Council:

Mayor Mike Snyder

Mayor Pro Tem Peter Gordon

Councilmember Brian Thompson

Councilmember Dan Thornton

Councilmember Randal Clark

Councilmember Evan Porterfield

Councilmember Amberley Kolar

2.2. Planning and Zoning Commission:

Bryan Lee, Chair

Susanna Boyer, Vice Chair

Hazel Sherrod

Cheryl Stewart

Richard Hudson

Tony Wertz

Jim Morris

3. PUBLIC COMMENT

Please fill out required registration form before meeting. Public comment is limited to 3 minutes. Councilmembers and Commissioners can not talk about any items not on the agenda per state law. Written comments for this meeting may also be sent to comments@huttotx.gov PRIOR to 4:00 pm on June 5, 2025. The email must include name, address, phone # and email to be recognized properly. Written comments will be provided to Councilmembers and Commissioners.

4. OTHER BUSINESS

4.1. Conduct a public hearing and consider a recommendation to City Council for the adoption of the Unified Development Code. (Ashley Bailey)

4.2. Consideration and possible action by the Planning and Zoning Commission relating to a recommendation for an ordinance for the adoption of the Unified Development Code including Engineering Criteria Manuals.

4.3. Consideration and possible action by the City Council relating to an ordinance for the adoption of the Unified Development Code including Engineering Criteria Manuals.

5. ADJOURNMENT

6. CERTIFICATION

I certify that this notice of the June 5, 2025 Hutto City Council meeting was posted in accordance with the Texas Open Meetings Act on the City of Hutto website (huttotx.gov) and the City Hall bulletin board (500 W. Live Oak Street) on May 30, 2025 before 5:30 P.M.


Laura Hallmark



The City of Hutto is committed to complying with the Americans with Disabilities Act. The Hutto City Council Chamber is wheelchair accessible. Request for reasonable special accommodations must be made 48 hours prior to the meeting. Please email the City Secretary's office at CitySecretary@huttotx.gov or call (512) 759-4839 for assistance.

AGENDA ITEM REPORT

4.1.



To: City Council
Subject: Conduct a public hearing and consider a recommendation to City Council for the adoption of the Unified Development Code. (Ashley Bailey)
Meeting: Thursday, June 5, 2025
Department: Development Services /
Staff Contact: Ashley Bailey

BACKGROUND INFORMATION:

Updating a Unified Development Code (UDC) is crucial for ensuring that land use regulations remain aligned with a community's goals, legal requirements, and development trends. Hutto's updated UDC integrates zoning, subdivision regulations, design standards, and environmental controls into a coherent framework that supports sustainability, economic vitality, and aligns the development standards with the goals adopted by the SOAR 2040 Comprehensive Plan. The item tonight is to adopt an updated Unified Development Code for the City of Hutto.

The major changes are as follows:

1. A reduction of zoning districts while maintaining the allowed uses and aligning districts with Hutto SOAR 2040.
2. Removal of the Form Based Code references, landscaping section rewritten and revised to provide for a myriad of options for developers, updated the lighting standards to align with typical standards, retirement of the desire to underground utility lines to protect city aesthetics.
3. Subdivision/Platting section in compliance with new state laws and provides for a faster submittal to approval workflow, which should maintain the approximate 45-60 day flow through the platting process.
4. First Engineering Manual separate from the UDC to establish the first Hutto-specific design manual.

The notification for this item was sent to the paper with the joint meeting language which was inadvertently left out of the notice when the paper published the item.

SUMMARY OF REQUEST:

STAFF REVIEW:

FISCAL NOTES:

AGENDA ITEM REPORT

4.1.



ATTACHMENTS:

1. Council Meeting Presentation 05.22.2025 (1)
2. Hutto_UDC_DRAFT_05.15.2025
3. Hutto_EDM_DRAFT_05.15.2025
4. Green Brick - Trophy Letter (street trees) 5.30.2025

Plan Commission Hearing

CITY OF HUTTO

Unified Development Code and Engineering Design Manual

May 22, 2025

1	PROJECT TEAM
2	UDC OVERVIEW
3	EDM OVERVIEW
4	NEXT STEPS

MEETING AGENDA

PROJECT TEAM



Chance Sparks, FAICP, CNU-A
Principal-in-Charge



Caitlin Admire, AICP, LEED AP, ENV SP
Project Manager



Wilson Kerr, AICP
Assistant Project Manager



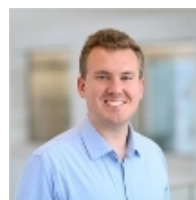
Sean Compton
Advisory Services



Matthew Gaal
Transportation



**Caroline Stewart,
AICP**



Connor Roberts



Seth Pilger

**+ A DEEP BENCH
OF TALENT &
EXPERTISE**

SCOPE OF WORK

PROJECT UNDERSTANDING

Develop and update Unified Development Code and a unified Engineering Criteria Manual, consistent with standards, procedures and best management practices in Texas.

UDC Organization

UDC	Chapter	Title
	1	Administration
	2	Land Use Standards
	3	Development Standards
	4	Subdivision Regulations
	5	Historic Preservation
	6	Stormwater & Drainage Standards
	7	Water & Wastewater Standards
	8	Procedures
	9	Definitions

Chapter 2 | Land Use Standards

Chapter 2 | Land Use Standards

- *Revised zoning districts*
- *Established a Zoning Equivalency table to demonstrate how the existing zoning districts relate to the new districts*
- *Reduced the number of zoning districts from 15 to 12*
- *Each district has its own:*
 - a) *Purpose statement that aligns with the Comprehensive Plan*
 - b) *Subdistricts listed as necessary*
 - c) *Dimensional standards table*
 - d) *Special Regulations provided as necessary*

Chapter	Section	Title
2	10.201	Intent
	10.202	Zoning Map
	10.203	Zoning Districts
	10.204	Permitted Uses
	10.205	Agricultural Uses
	10.206	Residential Uses
	10.207	Commercial & Retail Uses
	10.208	Industrial Uses
	10.209	Institutional & Civic Uses
	10.210	Temporary Uses
	10.211	Accessory Uses
	10.212	General Performance Standards

MAJOR

CHANGES

Equivalency Table for Zoning Districts

Previous Zoning District		Current Zoning Districts (2024)	
Traditional Zoning Districts			
SF-R Single Household Rural Estate		AR Agriculture and Rural Residential District	
SF-1 Single Household Medium Density	SF-1 Base	R-1 Legacy Single-Family District	
	SF-1 Alley loaded, Cul-de-sac, or Detached Garage	R-1 Legacy Single-Family District	
	SF-1 Zero Lot Line	N-1 Neighborhood Hamlet District	N-1 Single-family, Detached
	SF-1 Village	N-1 Neighborhood Hamlet District	N-1 Zero Lot Line

MAJOR

CHANGES

N-1 Neighborhood Hamlet District – Single Family, Detached

Size of Lots		
Minimum Lot Area		4,500 sf
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	50 ft
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Overall: 20 ft Garage Door: 24 ft
Minimum Side Yard		5 ft
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

MAJOR

CHANGES

Permitted Use Table

Use Table Symbology		
Symbol	Meaning	Description
P	Permitted by Right	A “P” in a district column indicates that a use is permitted by right, provided it meets applicable use-specific standards. These uses are subject to all other applicable regulations of this section.
C	Permitted Subject to Conditions	A “C” in a district column indicates that a use is permitted subject to conditions.
S	Permitted with a Specific Use Permit	An “S” in a district column indicates that a use is permitted with a specific use permit.
-	Not Permitted	A “—” in a district column indicates that a use is not permitted as a primary use.

	Zoning District										
	AR	R-1	N-1	N-2	N-2(H)	CC	B	M	MU-1	MU-2	PR
Institutional & Civic Uses											
<i>Amenity center</i>	C	C	C	C	P	C	-	-	C	C	C
<i>Aquatic facility</i>	P	P	P	P	P	P	P	P	P	P	P
<i>Athletic facility</i>	S	S	S	C	C	P	-	-	S	S	P

Chapter 3 | Development Standards

Chapter 3 | Development Standards

- *Removed General Standards*
- *Removed FBC References*
- *All specific Design Guidelines and Engineering Standards moved to ECM*
- *Strengthened Landscaping Language*
- *Updated Outdoor Lighting Standards*
- *Undergrounding Utility Lines*

Chapter	Section	Title
3	10.301	Intent
	10.302	Bulk, Setbacks, Buffers
	10.303	Site Design
	10.304	Parking & Access
	10.305	Architectural Design
	10.306	Landscaping
	10.307	Fences and Walls
	10.308	Outdoor Lighting
	10.309	Signs

MAJOR CHANGES

Development Standards - Low Water Use Requirements

10.306.6.2 Low Water Use Plantings

Low water use plantings are required to promote water conservation and reduce operational maintenance costs. The use of low water use plants and hardscaping features shall comply with the following:

- (a) To maximize water efficiency, plants with low water needs must be grouped together and not mixed with those requiring higher water usage. This strategic placement minimizes irrigation needs and promotes plant health.
- (b) The use of mulch is encouraged throughout the landscaped area. Mulch helps conserve soil moisture, reduce weed growth, prevent soil compaction, and regulate soil temperatures.
- (c) Hardscaping features such as gravel, permeable paving, decorative rock, and low-water-use pathways are encouraged as part of the landscape design. These elements reduce the overall water demand and enhance the landscape's aesthetic appeal. Permeable materials must be used to the maximum extent practicable to support stormwater infiltration and reduce runoff.

MAJOR

CHANGES

Landscaping Graphic Updates

- Graphics updated for clarity
- Easily digestible for readers
- Graphics used on major section updates throughout
 - Used sparingly to avoid confusion

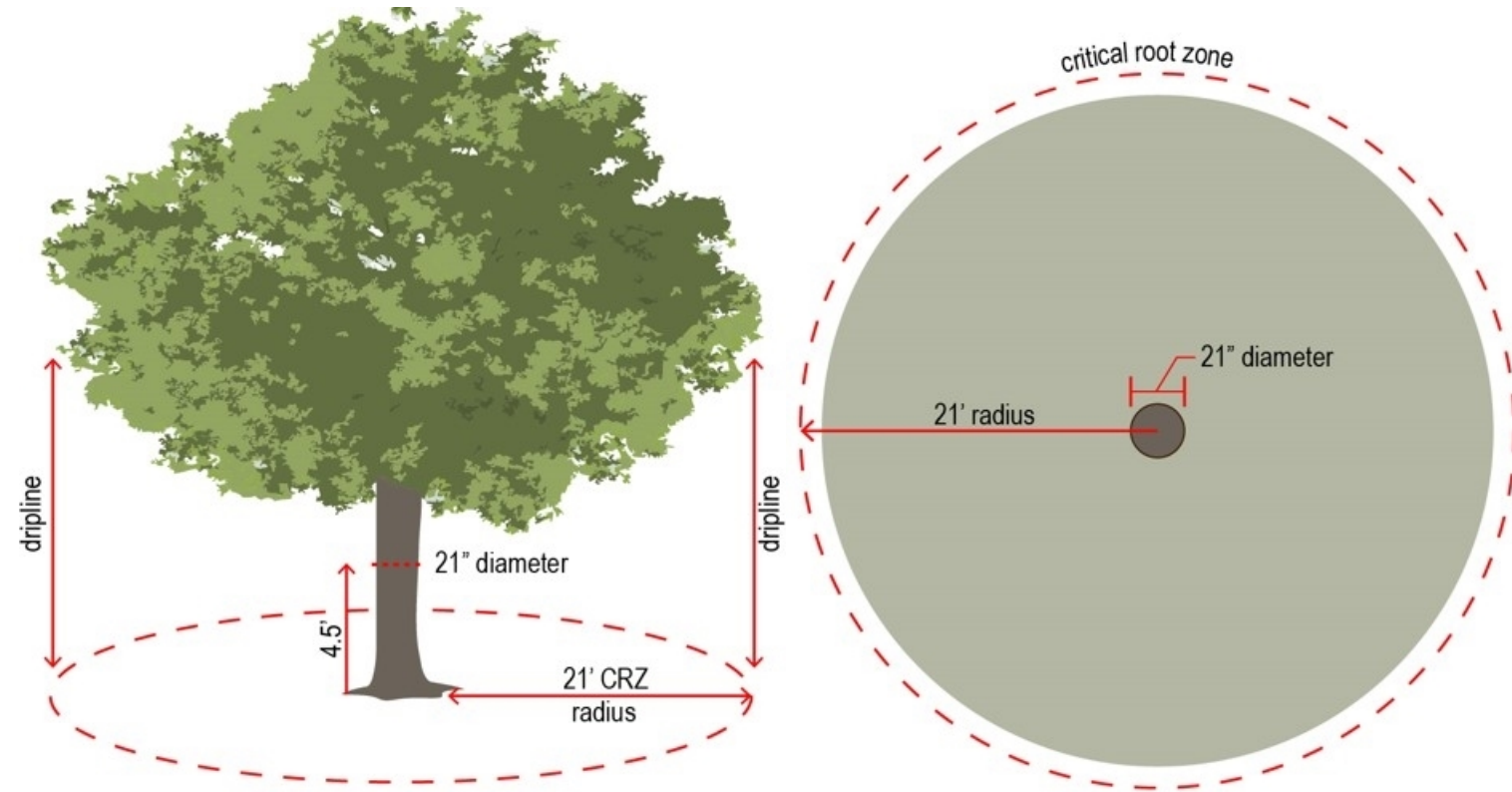


Figure 306.9-1: Critical Root Zone

Chapter 4 | Subdivision Regulations

Chapter 4 | Subdivision Regulations

- *Removed Some Plat Types*
- *Updated Approval Procedures*
- *Updating Procedures to Meet State Law Changes*
 - *Timeline for Approval*
 - *Improvement Requirements*
 - *Timeline for Construction of Public Improvements*
- *Moved Construction Standards and Street Improvement Standards to ECM*

Chapter	Section	Title
4	10.401	Intent
	10.402	Applicability & Exceptions
	10.403	Lot Division & Adjustment Process
	10.404	Plat Types
	10.405	General Provisions
	10.406	Assurance for Improvement Completion
	10.407	Construction Standards
	10.408	Lot Configuration
	10.409	Easements
	10.410	Parkland & Open Space Dedication
	10.411	Pedestrian & Bike Facilities
	10.412	Street Classification
	10.413	Streets Improvement Standards
	10.414	Street Grid, Circulation, & Connectivity
	10.415	Driveways & Easements
	10.416	Road Adequacy Standards

MAJOR CHANGES

Plat Types & Procedures

Plat Types:

- *Preliminary Plat*
- *Final Plat*
- ***Replat****
- ***Amended Plat****
- ***Plat Vacation****
- ~~*Minor Plat*~~

**** New Plat Type***

Approval Authority:

- *Preliminary Plat – P&Z*
- *All Other Plats – Director of Development Services*

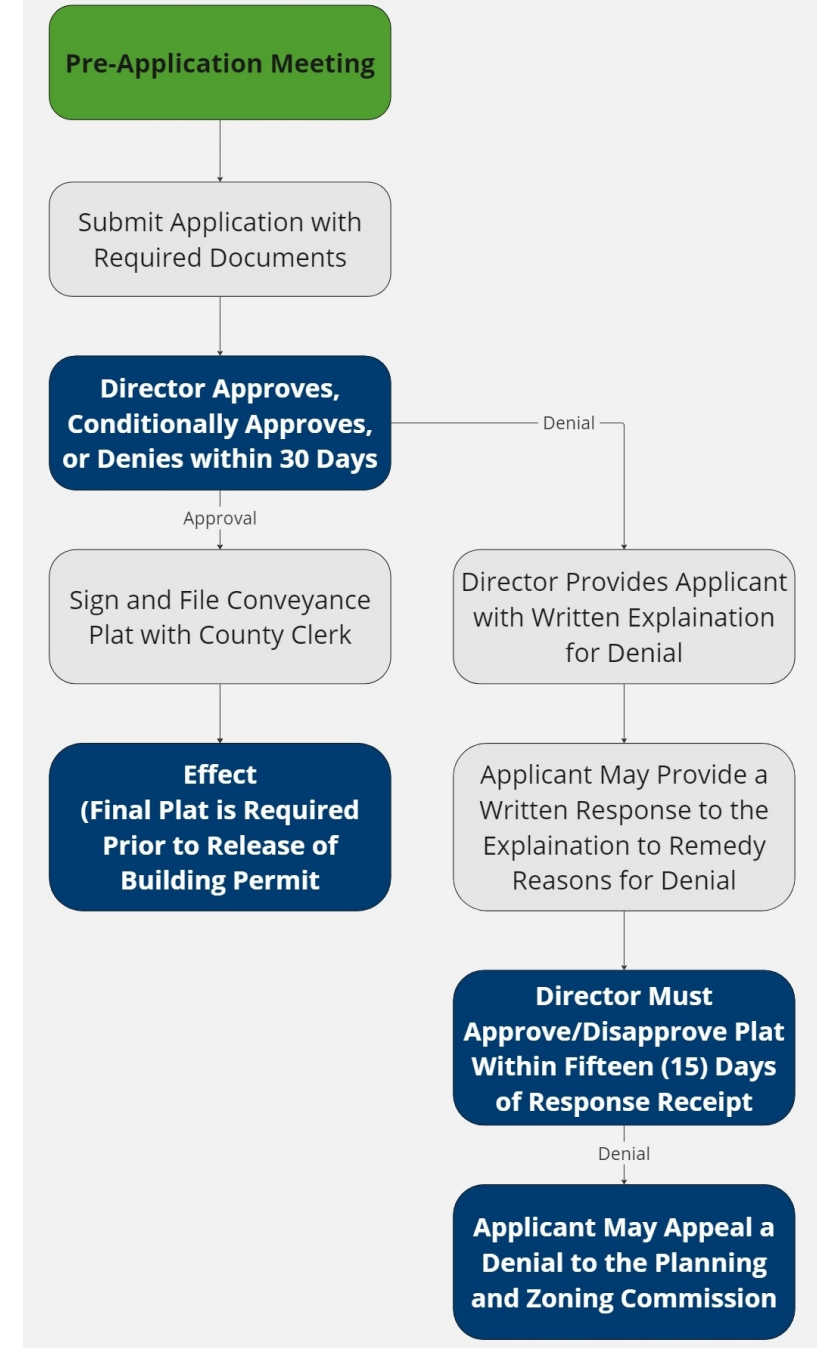
State Law Changes:

- *30 Day Action Window*
- *2 Year Timeline for Construction of Public Improvements*

MAJOR CHANGES

Flow Charts

- *Provide an easily digestible breakdown of the platting process*
- *Reduces barriers to entry for non planners and developers*
- *Updated to include state law “shot clock” changes*



Stakeholder Engagement

Internal Stakeholders:

- *P&Z Commission*
- *Building & Standards Commission*
- *ZBA*
- *Department Directors & Staff*

External Stakeholders:

- *Gray Engineering*
- *Oncor*
- *Drenner Group*
- *Various Industrial Developers*

Online Engagement

Online Engagement:

- *Webpage Live Since December 2024*
- *Promoted through Hey Hutto Newsletter*
- *Website Created and Managed by FNI*
- *Updated Documents Based on Public Comments*

The screenshot displays the City of Hutto's online engagement platform for the Unified Development Code and Engineering Design Manual. The header includes the City of Hutto logo and the title 'City of Hutto Unified Development Code and Engineering Design Manual'. Below the header, there is a section titled 'Choose a document you want to comment on below:' with a grid of document thumbnails. One thumbnail is selected, showing the 'Engineering Design Manual' with a 'Chapter 9 Definitions' section. The main content area displays the text of the selected document, which includes definitions for freestanding wireless facilities and conditions for preferred facility types. A green banner at the top of the document area reads: 'Click anywhere in the document to add a comment. Select a bubble to view comments.' On the right side, there is a 'Comments' sidebar with a search bar and a list of comments. The first comment is from Vincent G Huebinger, dated Feb 20 2025 at 2:23PM, on page 86. The second comment is from Joe R Wyman, dated Feb 14 2025 at 1:36PM, on page 22, marked as a 'Suggestion'. Both comments are currently 'Resolved' and have no assigned user.

City of Hutto
Unified Development Code and Engineering Design Manual

Choose a document you want to comment on below:

Engineering Design Manual thumbnail icon

Engineering Design Manual

Chapter 9 Definitions

View Edit AI Search Pins Comments Report Embed

20250129_HTO_Chap Page 87 of 94

Type to search Comment Add Pins Drag

Click anywhere in the document to add a comment. Select a bubble to view comments.

(c) Freestanding Facilities

Freestanding wireless facilities are permitted as follows:

(1) Freestanding wireless facilities are subject to specific use per CC, B, M, and PR districts.

(2) Towers 35 ft. - 100 ft. tall must be separated from existing towers by at least 3,500 ft. Towers greater than 100 ft. tall must be separated from towers by at least 3,500 ft.

10.211.13.4 Conditions: Preferred Facility Types

Order of preference for new permanent wireless facilities, from most preferred to least preferred:

(a) Co-location on existing tower or broadcast antenna towers (if not possible, then);

(b) Attached antennas (if not technically possible, then);

(c) Concealed/stealth antennas

Freestanding antenna structures that are not concealed or "stealthed" are permitted if other viable options are available for the free standing facility.

10.211.13.5 Conditions: Co-Location

(a) Cooperation

Comments

Resolved Assigned to: - Select -

Vincent G Huebinger Feb 20 2025 at 2:23PM on page 86

carriers can no longer use the unipole concealment smokestack method. They are failing miserably. Too much enclosed heat

Resolved Assigned to: - Select -

Joe R Wyman Feb 14 2025 at 1:36PM on page 22 Suggestion

Once approved by the City, provisions of the PUD can not be modified without approval of the City Council.

Resolved Assigned to: - Select -

Questions?

HUTTO UNIFIED DEVELOPMENT CODE

DRAFT

5/15/2025

2025

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Chapter 1. Administration

10.101. Title and Effective Date

- (a) This document is Chapter XX of the Municipal Code of Ordinances of the City of Hutto, Texas. It shall be officially known as the “Unified Development Code of the City of Hutto, Texas”, and is referred to internally in this document as this “UDC”.
- (b) This UDC shall become effective on XX, 2025.

10.102. Purpose

This UDC is enacted to:

- (a) Implement community, neighborhood and other applicable land use and development plans; and provide planned and orderly land use in the City.
- (b) Promote good planning practice, public design, architecture and urban design; and protect building and property values.
- (c) Preserve Hutto’s distinctive sense of place, distinct identity, sense of community and “small city” feel; and ensure new development respects and reinforces the City’s built, natural and social environment.
- (d) Encourage development of vacant land in established neighborhoods.
- (e) Encourage best practices and innovation in land development.
- (f) Promote efficient and safe vehicle circulation, while accommodating and integrating alternative forms of transportation.
- (g) Promote water, energy and natural resource conservation.
- (h) Preserve open space and prevent overcrowding.
- (i) Provide the physical and social infrastructure needed to serve City residents and visitors.
- (j) Buffer externalities occurring on adjacent, more intensive uses.
- (k) Secure safety from fire and other dangers, and provide for adequate sun, light and air.
- (l) Provide land use classification and land development distribution.
- (m) Improve mobility for all modes of transportation and promote traffic safety.
- (n) Implement the City’s comprehensive plan, [Hutto SOAR 2040](#).

10.103. Authority

- (a) The Unified Development Code is adopted under the authority of the constitution and laws of the State of Texas, including Section 211 and Section 212 of the Texas Local Government Code and under the provisions of the City Charter.
- (b) Whenever any provision of this UDC refers to or cites a section of the Texas state statutes and that section is later amended or superseded, this UDC shall be

deemed to refer to the amended section or the section that most nearly corresponds to the superseded section.

- (c) Whenever a section of this UDC requires or authorizes an officer or employee of the City to do some act or perform some duty, it shall be construed to authorize the officer or employee to designate, delegate and authorize subordinates to perform the act or duty, unless the terms of that section provide otherwise.

10.104. Applicability

10.104.1. General Applicability

Unless otherwise stated herein, this UDC applies to all regulations and other matters regarding land use and development of land, including zoning, subdivision, platting, floodplains, urban design, and historic preservation, for property located within the City and if applicable, its extraterritorial jurisdiction (ETJ).

10.104.2. Incorporated Areas

In the City corporate limits, all provisions of this UDC apply to all land, buildings, structures, and uses, except as provided for within this UDC.

10.104.3. Extraterritorial Jurisdiction Areas

In the extraterritorial jurisdiction, signage and water and wastewater provisions of this UDC apply to all land, buildings, structures, and uses. Subdivision and platting provisions (Chapter 4) apply to the extraterritorial jurisdiction provided in V.T.C.A. Local Government Code Chapter 212.

10.104.4. Zoning

Zoning regulations do not apply to uses or activities exempt from zoning under Texas Local Government Code (TLGC) Section 211.013.

10.104.5. Public Buildings, Structures, and Uses

In the erection of buildings or other structures, City-owned utilities shall conform to architectural design as required by this UDC.

10.105. Severability

Nothing in this UDC shall be construed to affect any suit or proceeding pending in any court, or any rights acquired, or liability incurred, or any cause or causes of action acquired for existing, under any previously existing ordinance; nor shall any existing legal right or remedy of any character be lost, impaired or affected by enacting this UDC.

10.106. Savings Clause

Adoption of this UDC will not release or change any penalty, liability or right the City incurred under old regulations. This UDC is held as remaining in force for sustaining actions for enforcement of any penalty, liability or right of the City, sustaining any order made in those actions, and sustaining any actions before City staff, contract professionals, elected and appointed bodies, and any court.

10.107. Consistency with Comprehensive Plan

This UDC shall implement the goals, objectives and policies of the comprehensive plan Hutto SOAR 2040 under TLGC Section 211.004. This UDC is deemed in conformance with Hutto SOAR 2040. Modifications to this UDC and rezoning efforts must adhere to the criteria outlined in TLGC

Section 211.004: (1) lessen congestion in the streets; (2) secure safety from fire, panic and other dangers; (3) promote health and the general welfare; (4) promote adequate light and air; (5) prevent the overcrowding of land; (6) avoid undue concentration of population; and (7) facilitate the adequate provisions of transportation, water, sewers, schools, parks and other public requirements. An amendment to the text of this UDC is consistent with and in conformance with Hutto SOAR 2040 if it conforms to the goals and policies stated in that plan, as the plan will be updated on an annual basis.

10.108. Scheduled Updates

Regular updates shall be made to this UDC to modify procedures and standards for workability and administrative efficiency, and to update the procedures and standards to reflect changes in the law or the state of the art in land use planning and urban design. The UDC updates will be conducted as needed. Except for amendments initiated by City agencies, elected bodies and appointed boards, amendments submitted during the update include the following:

- (a) Amendments for changes that do not alter the impact of the provision being addressed, including spelling, grammar correction, formatting, text selection, or addition of text in conformance to existing ordinances, statutes or case law.
- (b) Clarification amendments to ease interpretation and understanding of existing provisions. Clarification amendments shall not change or alter the intent or meaning of existing provisions.
- (c) The Director of Development Services shall provide written administrative determinations pursuant to this UDC. Such written administrative determinations are based on case or project experience and may or may not result in the creation of an amendment to this UDC.

10.109. Enforcement

Enforcement provisions are in section 10.806.

10.110. Graphics and Photos

Graphics and photos used throughout this UDC shall illustrate specific components of this UDC. In the event of a conflict between written language and the graphics and photos contained in this UDC, the written language will control.

Chapter 2. Land Use Standards

10.201. Intent

The zoning regulations and districts established in this Chapter are intended to conform with Hutto SOAR 2040 and promote the health, safety, and general welfare of the City of Hutto.

10.202. Zoning Map

10.202.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.202.2. Zoning Map Established

- (a) Zoning district boundaries are shown on the official map titled “City of Hutto Official Zoning Map,” as amended. The map is adopted as a part of this UDC by reference. Development Services staff will maintain and update the zoning map to reflect zoning amendments, annexation, updated property boundaries and street alignments and error correction.
- (b) The official zoning map has the signature of the Mayor, attested by the City Secretary, and bearing the Seal of the City of Hutto under the following words:
This is to certify that this is the official zoning map for the City of Hutto, Texas.
- (c) Regardless of the existence of other zoning maps that may be published, the City of Hutto Official Zoning Map is the final authority of the current zoning status of all property in the City of Hutto. The official zoning map shall be filed in the Office of the City Seretary and shall be made available to the public when City Hall is open.

10.202.3. Zoning Map Amendments

- (a) The Director of Development Services is responsible for amending the official zoning map to reflect zoning amendments as soon as possible after the effective date of zoning map amendments.
- (b) No unauthorized person may alter or modify the official zoning map.
- (c) The Director of Development Services may authorize printed copies of the official zoning map to be produced, and maintain digital or printed copies of superseded versions of the official zoning map for historical reference.

10.202.4. Zoning Map Replacement

- (a) If the official zoning map becomes damaged, destroyed, lost or difficult to interpret because of the nature and/or number of changes and additions, City Council may adopt a new official zoning map to supersede the previous map.

The new official zoning map shall correct drafting or other errors or omissions in the previous map, but no correction will have the effect of amending the original map or any amendments. The new official zoning map will have the signature of the Mayor, attested by the City Secretary, and bearing the Seal of the City of Hutto under the following words:

This is to certify that this official zoning map supersedes and replaces the official zoning map adopted (date of adoption of map being replaced) as part of Ordinance No, (ordinance number) of the City of Hutto, Texas.

- (b) The previous map or significant parts remaining shall be preserved, along with available records related to its adoption or amendment, unless the map was destroyed or lost.

10.202.5. Zoning Map Interpretation

- (a) A boundary shown following a street, highway, alley, right-of-way, trail, easement or watercourse is considered to follow the feature's centerline.
- (b) A boundary shown roughly parallel to a street, highway, alley, right-of-way or other straight feature is considered as parallel. If the zoning map does not show a distance, the map scale determines the boundary location.
- (c) A boundary shown running to but not extending into a body of water is considered to run in a straight line until it intersects with another boundary or the city limits.
- (d) A boundary shown following an approximate lot or municipal boundary line is considered to be following the line.
- (e) A boundary shown following a shoreline is considered to follow property lines along the shoreline, or the high-water mark, whatever is more encompassing.
- (f) Zoning map scale determines boundary location when a boundary is shown crossing a lot or parcel.
- (g) Where a street, property line or other physical feature varies from the zoning map or other uncertainties exist, City Council will fix the exact district boundary location.

10.203. Zoning Districts

10.203.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.203.2. Equivalency Table for Zoning Districts

The table below identifies zoning districts adopted in previous ordinances and the regulations that now apply to those districts.

Previous Zoning District		Current Zoning Districts (2025)	
Traditional Zoning Districts			
SF-R Single Household Rural Estate		AR Agriculture and Rural Residential District	
SF-1 Single Household Medium Density	SF-1 Base	R-1 Legacy Single-Family District	
	SF-1 Alley loaded, Cul-de-sac, or Detached Garage	R-1 Legacy Single-Family District	
	SF-1 Zero Lot Line	N-1 Neighborhood Hamlet District	N-1 Single-family, Detached
	SF-1 Village	N-1 Neighborhood Hamlet District	N-1 Zero Lot Line
SF-2 Two to Four Household		N-1 Neighborhood Hamlet District	N-1 Single-family, Attached
			N-1 Duplex
			N-1 Multiplex
MF Multiple Household		N/A	
MH Manufactured Home		N/A	
B-1 Local/Neighborhood	N-2 Neighborhood Village District	N-2 Single-family, Detached	
		N-2 Zero Lot Line	
		N-2 Single-family, Attached	
		N-2 Duplex	
		N-2 Multiplex	
		N-2 Multifamily	
		N-2 Commercial and Institutional	
B-2 General		CC Commerce Corridor District	
LI Light Industry		B Business and Light Industrial District	
I General Industry		M Manufacturing and Industrial District	
Special Purpose Districts			
REC Recreation		PR Public and Recreational District	

PUD Planned Unit Development		PUD Planned Unit Development	
Overlay Districts			
H Historic District Overlay		H Historic District Overlay	
G Gateway Overlay		N/A	
Form Based Code			
FBC	T-1	AR Agriculture and Rural Residential District	
	T-2	AR Agriculture and Rural Residential District	
	T-3	N-1 Neighborhood Hamlet District	
	T-4	N-2 Neighborhood Village District	
	T-5	N-3 Neighborhood Town District	
OT	OT-3	N-1 Neighborhood Hamlet District	
	OT-4R	N-2 Neighborhood Village District	
	OT-4T	N-2 Neighborhood Village District	
	OT-5H	N-3 Neighborhood Town District	
	OT-5C	N-3 Neighborhood Town District	
	SD-A	N-3 Neighborhood Town District	
New Zoning Districts			
N/A		MU-1 Mixed-Use Commercial District	
N/A		MU-2 Mixed-Use Regional District	
N/A		Neighborhood Village District (Historic)	Single-Family, Detached
			Zero Lot Line
			Single-Family, Attached
			Duplex
			Multiplex
			Commercial and Mixed Use
N/A		ID Innovation District Overlay	

10.203.3. Traditional Zoning Districts

Traditional Zone Prefixes:

Zoning District		
Traditional Zone Prefixes		
AR	Agriculture and Rural Residential District	
R-1	Legacy Single-Family	
N-1	Neighborhood Hamlet District	Single-Family, Detached
		Zero Lot Line
		Single-Family, Attached
		Duplex
		Multiplex
N-2	Neighborhood Village District	Single-Family, Detached
		Zero Lot Line
		Single-Family, Attached
		Duplex
		Multiplex
		Multifamily
N-2(H)	Neighborhood Village District (Historic)	Single-Family, Detached
		Zero Lot Line
		Single-Family, Attached
		Duplex
		Multiplex
		Commercial and Mixed Use
N-3	Neighborhood Town District	
MU-1	Mixed-Use Community District	
MU-2	Mixed-Use Regional District	
CC	Commerce Corridor District	
B	Business and Light Industrial District	
M	Manufacturing and Industrial District	

10.203.3.1 AR Agriculture and Rural Residential District

(a) General Purpose and Description

The AR District provides for estate-style single-family dwellings and agricultural uses, including farming, ranching, and crop cultivation.

(b) Dimensional Standards

Size of Lots	
Minimum Lot Area	87,120 sf (2 ac)
Minimum Lot Width	200 ft
Size of Yards	
Minimum Front Yard	50 ft
Minimum Side Yard	20 ft
Minimum Rear Yard	50 ft
Height	
Maximum Building Height, Primary	45 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	20 ft
Maximum Building Height	25 ft

10.203.3.2 R-1 Legacy Single-Family District

(a) General Purpose and Description

The R-1 District is for existing neighborhoods and shall not be used to zone new areas. This district shall encompass suburban-style single-family dwellings, typically served by front-loaded garage configurations.

(b) Dimensional Standards

Size of Lots	
Minimum Lot Area	5,500 sf
Minimum Lot Width	50 ft
Size of Yards	
Minimum Front Yard	25ft
Minimum Side Yard	5 ft
Minimum Rear Yard	20 ft
Height	
Maximum Building Height, Primary	35 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	5 ft
Maximum Building Height	25 ft

10.203.3.3 N-1 Neighborhood Hamlet District

(a) General Purpose and Description

The N-1 District primarily provides for the creation or redevelopment of residential land uses, with building types in accordance with the International Residential Code for one- and two-family dwellings, including detached and attached single-family dwellings, zero-lot line configurations, duplexes, and multiplexes with three to four dwelling units.

(b) Sub-Districts

(1) Single-Family, Detached

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		4,500 sf
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	50 ft
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Overall: 20 ft Garage Door: 24 ft
Minimum Side Yard		5 ft
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

(2) Zero Lot Line

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		4,000 sf
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	50 ft
	Front Entry, side-facing or pass-through garage/carport	Prohibited
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Overall: 20 ft Garage Door: 24 ft
Minimum Side Yard		0 ft along passive façade lot line 10 ft along active façade lot line
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

(3) Single-Family, Attached

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		2,000 sf
Minimum Lot Width	Rear Entry	20 ft
	Front Entry	Prohibited
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Prohibited
Minimum Side Yard		0 ft along shared walls 7.5 ft for endcap lots
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	Prohibited
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		Prohibited
Maximum Building Height		25 ft

(4) Duplex

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		4,000 sf
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	Prohibited
	Front Entry, side-facing or pass-through garage/carport	50 ft
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Prohibited
Minimum Side Yard		0 ft along interior bisect line 5 ft along exterior lot lines
Minimum Rear Yard	Rear Entry	25 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

(5) Multiplex

(A) Dimensional Standards

Size of Lots	
Minimum Lot Area	8,000 sf
Minimum Lot Width	80 ft
Size of Yards	
Minimum Front Yard and Corner Side Yard	10 ft
Minimum Side Yard	10 ft
Minimum Rear Yard	10 ft
Height	
Maximum Building Height, Primary	35 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	5 ft
Maximum Building Height	25 ft

10.203.3.4 N-2 Neighborhood Village District

(a) General Purpose and Description

The N-2 District primarily provides for residential land uses, with appropriately scaled neighborhood-serving nonresidential uses, such as commercial or retail nodes, and small-scale multifamily buildings with no more than fifteen (15) dwelling units.

(b) Sub-Districts

(1) Single-Family, Detached

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		4,500 sf
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	50 ft
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Overall: 20 ft Garage Door: 24 ft
Minimum Side Yard		5 ft
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

(2) Zero Lot Line

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		4,000 sf
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	50 ft
	Front Entry, side-facing or pass-through garage/carport	Prohibited
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Overall: 20 ft Garage Door: 24 ft
Minimum Side Yard		0 ft along passive façade lot line 10 ft along active façade lot line
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

(3) Single-Family, Attached

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		2,000 sf
Minimum Lot Width	Rear Entry	20 ft
	Front Entry	Prohibited
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Prohibited
Minimum Side Yard		0 ft along shared walls 7.5 ft for endcap lots
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	Prohibited
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		Prohibited
Maximum Building Height		25 ft Prohibited

(4) Duplex

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		4,000 sf
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	Prohibited
	Front Entry, side-facing or pass-through garage/carport	50 ft
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Prohibited
Minimum Side Yard		0 ft along interior bisect line 5 ft along exterior lot lines
Minimum Rear Yard	Rear Entry	25 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

(5) Multiplex

(A) Dimensional Standards

Size of Lots	
Minimum Lot Area	8,000 sf
Minimum Lot Width	80 ft
Size of Yards	
Minimum Front Yard and Corner Side Yard	10 ft
Minimum Side Yard	10 ft
Minimum Rear Yard	10 ft
Height	
Maximum Building Height, Primary	35 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	5 ft
Maximum Building Height	25 ft

(6) Multifamily

(A) Dimensional Standards

Size of Lots	
Minimum Lot Area	20,000 sf
Minimum Lot Width	100 ft
Size of Yards	
Minimum Front Yard and Corner Side Yard	25 ft
Minimum Side Yard	15 ft
Minimum Rear Yard	15 ft
Height	
Maximum Building Height, Primary	45 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	15 ft
Maximum Building Height	25 ft

(7) Commercial and Institutional

(A) Dimensional Standards

Size of Yards	
Minimum Front Yard and Corner Side Yard	25 ft
Minimum Side Yard	0 ft adjacent to other nonresidential uses The lesser of 20 ft or 2 ft for every 1 ft of building height when adjacent to residential uses
Minimum Rear Yard	0 ft adjacent to other nonresidential uses 20 ft when adjacent to residential uses
Height	
Maximum Building Height, Primary	35 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	Same as main building
Maximum Building Height	15 ft

10.203.3.5 N-2(H) Neighborhood Village District (Historic)

(a) General Purpose and Description

The N-2(H) District provides for a neighborhood district consisting of a mix of appropriately scaled commercial, institutional and residential uses set in the City's historic center. The N-2(H) District is intended to accommodate mixed-use buildings with residential dwellings above the ground floor and commercial and residential uses complimenting the area's historic character. The District shall include "active use open space" which is open to and intended for users of the development and the general public.

(b) Subdistricts

(1) Single-Family, Detached

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		N/A
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	50 ft
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Overall: 20 ft Garage Door: 24 ft
Minimum Side Yard		5 ft
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

(2) Zero Lot Line

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		N/A
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	50 ft
	Front Entry, side-facing or pass-through garage/carport	Prohibited
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Overall: 20 ft Garage Door: 24 ft
Minimum Side Yard		0 ft along passive façade lot line 10 ft along active façade lot line
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

(3) Single-Family, Attached

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		N/A
Minimum Lot Width	Rear Entry	20 ft
	Front Entry	Prohibited
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Prohibited
Minimum Side Yard		0 ft along shared walls 7.5 ft for endcap lots
Minimum Rear Yard	Rear Entry	20 ft
	Front Entry	Prohibited
Height		
Maximum Building Height, Primary		45 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		Prohibited
Maximum Building Height		25 ft
		Prohibited

(4) Duplex

(A) Dimensional Standards

Size of Lots		
Minimum Lot Area		N/A
Minimum Lot Width	Rear Entry	40 ft
	Front Entry	Prohibited
	Front Entry, side-facing or pass-through garage/carport	50 ft
Size of Yards		
Minimum Front Yard and Corner Side Yard	Rear Entry	10 ft
	Front Entry	Prohibited
Minimum Side Yard		0 ft along interior bisect line 5 ft along exterior lot lines
Minimum Rear Yard	Rear Entry	25 ft
	Front Entry	15 ft
Height		
Maximum Building Height, Primary		35 ft
Accessory Structure Criteria		
Minimum Side and Rear Yard		5 ft
Maximum Building Height		25 ft

(5) Multiplex

(A) Dimensional Standards

Size of Lots	
Minimum Lot Area	N/A
Minimum Lot Width	80 ft
Size of Yards	
Minimum Front Yard and Corner Side Yard	10 ft
Minimum Side Yard	10 ft
Minimum Rear Yard	10 ft
Height	
Maximum Building Height, Primary	35 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	5 ft
Maximum Building Height	25 ft

(6) Commercial and Mixed Use

(A) Dimensional Standards

Size of Yards	
Minimum Lot Area	N/A
Height	
Maximum Building Height, Primary	35 ft (Generally) 45 ft (Mixed use residential on top of commercial)
Accessory Structure Criteria	
Minimum Side and Rear Yard	5 ft
Maximum Building Height	25 ft

10.203.3.6 MU-1 Mixed-Use Community District

(a) General Purpose and Description

The MU-1 District provides for a mixed-use community district consisting of commercial, institutional and residential uses at a scale designed to serve community needs broader than those of nearby neighborhoods. The District is intended to accommodate commercial uses and development styles. The District is intended to promote storefront-style buildings, and accommodate mixed-use buildings with residential dwellings above the ground floor, while also integrating active use open space which is open to and intended for users of the development and the general public. The MU-1 District shall step down in scale and height when abutting R-1 and N-1 Districts.

(b) Dimensional Standards

Size of Lots	
Minimum Lot Area	87,120 sf (2 ac)
Minimum Lot Width	
Rear Entry	200 ft
Front Entry, Front-Facing Garage/Carport	200 ft
Front Entry, Side-Facing or Pass-Through Garage Carport	200 ft
Minimum Front Yard and Corner Side Yard	
Rear Entry	50 ft
Front Entry, Front-Facing Garage/Carport	50 ft
Minimum Side Yard	20 ft
Minimum Rear Yard	
Rear Entry	50 ft
Front Entry	50 ft
Height	
Maximum Building Height, Primary	45 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	20 ft
Maximum Building Height	25 ft

10.203.3.7 MU-2 Mixed-Use Regional District

(a) General Purpose and Description

The MU-2 District provides for a regional district consisting of a mix of commercial, institutional and residential uses, that accommodates a wide variety of commercial uses and development styles at a scale more intense than M-1. The District is intended to promote storefront-style buildings, and accommodate mixed-use buildings with residential dwellings above the ground floor, while also integrating active use open space which is intended for users of the development and the general public. The MU-2 District shall not be developed on sites abutting R-1 Districts and when abutting N-1 Districts, the MU-2 District shall step down in scale and height. The MU-2 District is appropriate for sites bordering designated or future arterial roadways identified in Hutto SOAR 2040.

(b) Dimensional Standards

Size of Lots	
Minimum Lot Area	87,120 sf (2 ac)
Minimum Lot Width	
Rear Entry	200 ft
Front Entry, Front-Facing Garage/Carport	200 ft
Front Entry, Side-Facing or Pass-Through Garage Carport	200 ft
Minimum Front Yard and Corner Side Yard	
Rear Entry	50 ft
Front Entry, Front-Facing Garage/Carport	50 ft
Minimum Side Yard	20 ft
Minimum Rear Yard	
Rear Entry	50 ft
Front Entry	50 ft
Height	
Maximum Building Height, Primary	45 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	20 ft
Maximum Building Height	25 ft

10.203.3.8 CC Commerce Corridor District

(a) General Purpose and Description

The CC District provides retail, office, and personal and business services. CC-zoned land shall be grouped at the intersections of arterial streets; “strip-like” commercial zoning is discouraged.

(b) Dimensional Standards

Size of Yards	
Minimum Front Yard and Corner Side Yard	25 ft
Minimum Side Yard	0 ft adjacent to other nonresidential uses The lesser of 30 ft or 2 ft for every 1 ft of building height when adjacent to residential uses
Minimum Rear Yard	0 ft adjacent to other nonresidential uses 30 ft when adjacent to residential uses
Height	
Maximum Building Height, Primary	45 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	Same as main building
Maximum Building Height	15 ft

10.203.3.9 B Business and Light Industrial District

(a) General Purpose and Description

The B District is for commercial enterprises, including research and development, light manufacturing, packaging, warehousing, distribution, and skilled mechanical trades. B District zoned land shall be grouped in contiguous areas, close to transportation facilities but with minimal frontage on current and future arterials, buffered from residential areas, and in areas that are not ideal or suitable for residential or commercial uses.

(b) Dimensional Standards

Size of Yards	
Minimum Front Yard and Corner Side Yard	25 ft
Minimum Side Yard	0 ft adjacent to other nonresidential uses The greater of 50 ft or 2 ft for every 1 ft of building height when adjacent to residential uses
Minimum Rear Yard	0 ft adjacent to other nonresidential uses The greater of 50 ft or 2 ft for every 1 ft of building height when adjacent to residential uses
Height	
Maximum Building Height, Primary	60 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	Same as main building
Maximum Building Height	15 ft

10.203.3.10 M Manufacturing and Industrial District

(a) General Purpose and Description

The M District primarily provides higher-intensity land uses, typically devoted to industrial and manufacturing uses and vehicle repair facilities. M District zoned land shall not be designated on tracts abutting residential neighborhoods or tracts bordering designated arterial roadways or any future arterial roadways identified in Hutto SOAR 2040.

(b) Dimensional Standards

Size of Lots	
Minimum Lot Area	87,120 sf (2 ac)
Size of Yards	
Minimum Front Yard and Corner Side Yard	50 ft
Minimum Side Yard	0 ft adjacent to other industrial uses The greater of 50 ft or 2 ft of every 1 ft of building height when adjacent to non-industrial uses
Minimum Rear Yard	0 ft adjacent to other industrial uses The greater of 50 ft or 2 ft of every 1 ft of building height when adjacent to non-industrial uses
Height	
Maximum Building Height, Primary	60 ft
Accessory Structure Criteria	
Minimum Side and Rear Yard	Same as main building
Maximum Building Height	15 ft

10.203.4. Special Purpose Districts

Special Purpose Zone Prefixes

- (a) PR Public and Recreational District
- (b) PUD Planned Unit Development

10.203.4.1 PR Public and Recreational District

- (a) General Purpose and Description

The PR District primarily provides for public and recreation uses that take advantage of the land in its natural state and encourage outdoor recreation uses that could not easily be provided in the already urbanized portions of the area.

- (b) Dimensional Standards

No dimensional standards are required for this district.

10.203.4.2 PUD Planned Unit Development

- (a) General Purpose and Description

The PUD District permits innovative land use concepts that are not allowed under existing zoning, encouraging flexible planning and design techniques where conventional zoning is too rigid. A PUD District may accommodate development with mixed or varied uses or allow a degree of flexibility in applying the standards and rules in this UDC to achieve superior results to development on sites that may have unusual topography, unique settings, or difficult or costly development conditions.

- (b) District Standards

- (1) Designated PUD Districts shall have unique standards that are described in the adopting section for that district.
- (2) Standards of this UDC shall apply in every PUD district unless specifically superseded by the standards of the PUD district.
- (3) PUDs cannot be used to circumvent Unified Development Code standards and permit substandard development and, uses that are otherwise not permitted in the City (for example, junkyards, high-rise pylon signs, or other unpermitted uses), or other uses and development that does not conform with the spirit and intent of this UDC.

10.203.5. Overlay Districts

Overlay Zone Prefixes

- (a) H Historic District Overlay
- (b) ID Innovation District Overlay

10.203.5.1 H Historic District Overlay

(a) Intent

The H District Overlay preserves structures, sites or neighborhoods with outstanding historical and cultural significance.

(b) Designation Of Existing Sites

Any existing designated historic landmark, site or district in the City when this UDC is adopted is designated as an H District Overlay. Special standards for existing sites will continue to apply to the H District Overlay.

(c) District Standards

- (1) Being an overlay district, regulations for the underlying zoning districts remain in effect, except as provided for within this UDC.
- (2) Regulations for a specific H District Overlay, as described in Section 10.503 of this UDC, apply to properties or structures wholly included in that overlay, as well as portions of property located in the district.
- (3) If there is a conflict between the overlay regulations and the underlying district, overlay regulations control, even when the applicable regulation is not the higher standard.
- (4) City Council findings for a specific H District Overlay define the scope of the City's interest in protecting the historic resource and will provide guidelines used by the Historic Preservation Commission, along with applicable regulations, in considering whether to grant or deny a certificate of appropriateness.
- (5) Each designated H District Overlay may have unique standards described in the adopting section. Standards for underlying districts remain in effect unless replaced by district-specific standards.

(d) Maintenance

- (1) Parties responsible for an improvement on a structure or lot in an H District Overlay shall keep the following in good repair:
 - (A) Exterior portions of the improvement and exterior portions of a structure in the overlay that may be affected by the improvement.
 - (i) Interior portions of the improvement that, if not maintained, may cause or tend to cause their exterior portions to deteriorate, become damaged, or fall into disrepair.
 - (B) The provisions of this section supplement other laws about property maintenance, including those outlined in Ordinance Chapter 6, Division 9 Property Maintenance Code.

10.203.5.2 ID Innovation District Overlay

(a) Intent

The ID District Overlay provides for an area where commerce, education, and research thrive via a mix of applicable uses in a public realm focused on connectivity that encourages cross-industry collaboration.

(b) District Standards

- (1) Being an overlay district, regulations for the underlying zoning districts remain in effect, except as provided in this UDC.
- (2) Regulations for a specific ID District Overlay apply to properties or structures wholly included in that overlay, as well as portions of property located in the district.
- (3) If there is a conflict between the overlay regulations and the underlying district, overlay regulations control, even if the applicable regulation is not the higher standard.
- (4) Preferred uses include the below, which could be considered by City Council as permitted specific uses even if the specific uses do not meet the underlying district requirements:
 - (A) Educational institutions.
 - (B) Medium- to high-density residential.
 - (C) High-tech, light manufacturing and production, flex industrial and R&D businesses.
 - (D) Retail and commercial establishments that cater to the daily needs of businesses and residents within the district, including but not limited to groceries and day care.
 - (E) Retail and commercial establishments that contribute to the culture of the districts, including “third places” such as coffee shops, restaurants and bars, live music venues, and art studios/galleries. Requirements, such as noise limitations, should be in place as needed to ensure these uses don’t create nuisances for district residents (see Section 10.212).
 - (F) Open spaces and public facilities that encourage public gathering and social interaction.
- (5) Uses that could be described as the following should be prohibited, even if they meet the underlying district requirements:
 - (A) Heavy industrial uses or other uses that cause pollution and nuisances.
 - (B) Uses that do not contribute to the culture and function of the district, including but not limited to self-storage or vehicle repair.

10.204. Permitted Uses

10.204.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.204.2. General Standards

10.204.2.1 Indoor Location

All uses shall be performed entirely inside a permanent structure conforming to this UDC and other applicable standards unless otherwise allowed in this UDC.

10.204.2.2 Principal Uses

Only one principal use is permitted on a lot, unless otherwise allowed in this UDC. This restriction does not apply to commercial and industrial centers and buildings planned for multiple users, such as shopping and commercial centers, office buildings, flex space buildings, or mixed-use developments.

10.204.2.3 PUD Uses

Permitted uses in the PUD district shall conform to the approved PUD development plan.

10.204.3. Permitted Use Table Abbreviations

Use Table Symbology		
Symbol	Meaning	Description
P	Permitted by Right	A “P” in a district column indicates that a use is permitted by right, provided it meets applicable use-specific standards. These uses are subject to all other applicable regulations of this section.
C	Permitted Subject to Conditions	A “C” in a district column indicates that a use is permitted by right, subject to conditions for the use in that specific zoning district.
S	Permitted with a Specific Use Permit	An “S” in a zoning districts column indicates that a use requires a specific use review and approval by City Council.
-	Not Permitted	A “—” in a zoning district column indicates that a use is not permitted as a primary use or specific use in the zoning district.

10.204.4. Agricultural Uses

	Zoning District										
	AR	R-1	N-1	N-2	N-2(H)	CC	B	M	MU-1	MU-2	PR
Agricultural Uses	C	-	-	-	-	-	-	-	-	-	-

10.204.5. Residential Uses

	Zoning District										
	AR	R-1	N-1	N-2	N-2(H)	CC	B	M	MU-1	MU-2	PR
Residential											
<i>Accessory dwelling unit</i>	-	S	P	P	P	-	-	-	-	-	-
<i>Assisted living/nursing home</i>	-	S	C	C	-	-	-	-	S	S	-
<i>Boarding and rooming house</i>	-	-	-	S	-	-	-	-	-	-	-
<i>Dwelling, attached single-family</i>	-	-	P	P	P	-	-	-	C	C	-
<i>Dwelling, detached single-family</i>	P	P	P	-	-	-	-	-	C	C	-
<i>Dwelling, duplex</i>	-	-	P	P	-	-	-	-	C	C	-
<i>Dwelling, live-work</i>	-	-	S	S-C	P	-	-	-	P	P	-
<i>Dwelling, manufactured home</i>	-	C	C	C	-	-	-	-	-	-	-
<i>Dwelling, manufactured home park</i>	-	S	S	-	-	-	-	-	-	-	-
<i>Dwelling, modular home</i>	-	P	P	P	-	-	-	-	-	-	-

<i>Dwelling, multifamily</i>	-	-	-	P	P	-	-	-	P	P	-
<i>Dwelling, multiplex</i>	-	-	P	P	P	-	-	-	P	P	-
<i>Dwelling, zero-lot line single-family</i>	-	P	P	P	-	-	-	-	C	C	-
<i>Group home</i>	C	C	C	C	P	-	-	-	-	-	-
<i>Halfway house</i>	S	S	S	S	S	-	-	-	-	-	-
<i>Independent living facility</i>	-	-	-	P	P	-	-	-	-	-	-
<i>Nursing home</i>	-	-	-	S	C	P	-	-	-	-	-

10.204.6. Commercial and Retail Uses

Zoning District											
	AR	R-1	N-1	N-2	N-2(H)	CC	B	M	MU-1	MU-2	PR
Commercial and Retail Uses											
<i>Adult-oriented business</i>	-	-	-	-	-	-	S	-	-	-	-
<i>Banks and Financial Institutions</i>				C	P	P	-	-	-	-	-
<i>Campground, recreational vehicle park</i>	P	-	S	-	-	-	-	-	-	-	S
<i>Car wash</i>	-	-	-	-	-	C	C	C	-	-	-
<i>Club/lodge facility</i>	-	-	-	-	S	P	-	-	-	-	-
<i>Convenience store</i>	-	-	-	C	P	P	-	-	-	-	-
<i>Convenience store: with gasoline sales</i>	-	-	-	S	S	P	-	-	-	-	-

<i>Day care, child (1-6 children)</i>	P	P	P	P	P	P	-	-	C	C	-
<i>Day care, child (greater than 6 children)</i>	S	S	S	C	C	S	-	-	S	S	-
<i>Day care, adult (1-4 persons)</i>	S	S	S	C	C	P	-	-	S	S	-
<i>Day care, adult (greater than 4 persons)</i>	-	-	-	C	C	P	-	-	-	-	-
<i>Day care, pet</i>	-	-	-	S	S	P	P		S	S	
<i>Entertainment facility, theater</i>	-	-	-	-	S	P	-	-	-	-	-
<i>Farm product sales</i>	C	C	C	C	C	C	-	-	-	-	-
<i>Food catering</i>	-	-	-	C	P	P	-	-	-	-	-
<i>Funeral home</i>	-	-	-		S	P	-	-	-	-	-
<i>Kennel</i>	S	-	-	-	S	-	S	-	-	-	S
<i>Large item sales and rental: class 1</i>	-	-	-	-	-	S	P	P	-	-	-
<i>Large item sales and rental: class 2</i>	-	-	-	-	-	-	S	P	-	-	-
<i>Lodging, hotel</i>	-	-	-	S	P	P	P	-	S	S	S
<i>Lodging, motel</i>	-	-	-	S		S	S	-			-
<i>Lodging, bed and breakfast</i>	S	S	S	C	P	P	-	-	S	S	-
<i>Nightclub</i>	-	-	-		S	P	-	-			-
<i>Office</i>	-	-	-	C	P	P	-	-	P	P	-
<i>Personal and business service</i>	-	-	-	C	P	P	P	P	C	C	-

<i>Recreation facility, indoor</i>	-	-	-	S	S	P	P	-	-	-	-
<i>Recreation facility, outdoor</i>	-	-	-	S	S	S	-	-	-	-	P
<i>Restaurant, bar</i>	-	-	-	C	C	P	-	-	C	C	-
<i>Retail store (no more than 5,000 sq. ft.)</i>	-	-	-	C	C	P	-	-	P	P	-
<i>Retail store (greater than 5,000 sq. ft.)</i>	-	-	-	S	P	P	-	-	S	S	-
<i>Personal loan services</i>	-	-	-	-	-	-	P	P	-	-	-
<i>Travel plaza, truck stop</i>	-	-	-	-	-	-	-	S	-	-	-
<i>Veterinary Clinic</i>	-	-	-	S	C	P	P	-	-	-	-

10.204.7. Industrial Uses

Zoning District											
	AR	R-1	N-1	N-2	N-2(H)	CC	B	M	MU-1	MU-2	PR
Industrial Uses											
<i>Data Center</i>	-	-	-	-	-	-	-	P	-	-	-
<i>Industrial use, general</i>	-	-	-	-	-	-	-	P	-	-	-
<i>Industrial use, heavy</i>	-	-	-	-	-	-	-	S	-	-	-
<i>Industrial use, light</i>	-	-	-	-	-	-	P	P	-	-	-
<i>Research laboratory</i>	-	-	-	-	-	-	P	P	-	-	-
<i>Self-storage facility</i>	-	-	-	-	-	S	S		-	-	-
<i>Trade use</i>	-	-	-	C	C	C	P	P	-	-	-

<i>Vehicle minor repair facility</i>	-	-	-	S	S	C	P	P	-	-	-
<i>Vehicle major repair facility</i>	-	-	-	-	-	-	C	P	-	-	-
<i>Vehicle storage facility</i>	-	-	-	-	-	-	P	P	-	-	-
<i>Warehouse & distribution facility</i>	-	-	-	-	-	S	P	P	-	-	-

10.204.8. Institutional and Civic Uses

Zoning District											
	AR	R-1	N-1	N-2	N-2(H)	CC	B	M	MU-1	MU-2	PR
Institutional & Civic Uses											
<i>Amenity center</i>	C	C	C	C	P	C	-	-	C	C	C
<i>Aquatic facility</i>	P	P	P	P	P	P	P	P	P	P	P
<i>Athletic facility</i>	S	S	S	C	C	P	-	-	S	S	P
<i>Cemetery</i>	S	S	-	-	-	-	-	-	-	-	S
<i>Community facility</i>	P	P	P	P	P	P	P	P	P	P	P
<i>Golf course</i>	S	S	S	S	-	-	-	-	-	-	S
<i>Hospital</i>	-	-	-	-	S	P	-	-	-	-	-
<i>Park</i>	P	P	P	P	P	P	P	P	P	P	P
<i>Park and ride lot (as principal use)</i>	-	-	-	C	C	C	C	-	S	S	-
<i>Public utility substation</i>	P	P	P	P	P	P	P	P	P	P	P
<i>Religious land use or assembly</i>	P	P	P	P	P	P	P	P	P	P	P

<i>School: no more than 5 students</i>	-	P	P	P	P	P	-	-	P	P	-
<i>School: at least 6 students</i>	-	C	C	C	C	C	-	-	C	C	-

10.204.9. Temporary Uses

Zoning District											
	AR	R-1	N-1	N-2	N-2(H)	CC	B	M	MU-1	MU-2	PR
Temporary Uses											
<i>Construction equipment storage lot</i>	S	S	S	S	S	S	S	S	S	S	S
<i>Construction field office</i>	P	P	P	P	P	P	P	P	P	P	P
<i>Garage sale</i>	P	P	P	P	P	-	-	-	-	-	-
<i>Mobile Food Vendor</i>	-	-	-	P	P	P	-	-	P	P	-
<i>Model home / lot sales</i>	P	P	P	P	P	-	-	-	C		-
<i>Portable storage container</i>	P	P	P	P	P	P	P	P	P	P	P
<i>Temporary building</i>	S	S	S	S	S	S	S	S	S	S	S

10.204.10. Accessory Uses

Accessory uses, and structures are intended to allow property owners full use of the property while maintaining the character of the surrounding area. Accessory uses and structures shall be built and used only for purposes that are secondary and compatible to the principal use of the property and shall be placed on the same lot as the principal use.

Zoning District											
	AR	R-1	N-1	N-2	N-2(H)	CC	B	M	MU-1	MU-2	PR
Accessory Uses											
<i>Antenna, radio hobbyist</i>	C	C	C	C	C	C	C	C	C	C	C

<i>(no more than max hgt in district)</i>											
<i>Antenna, radio hobbyist (greater than max hgt in district)</i>	S	S	S	S	S	S	S	S	S	S	S
<i>Antenna, non-residential use: no more than 15 ft. above roofline</i>	-	-	-	C	C	C	C	C	-	-	C
<i>Antenna, non-residential use: other</i>	-	-	-	S	S	S	S	S	-	-	-
<i>Fueling station</i>	S	-	-	S	S	C	C	C	-	-	-
<i>Wireless facility: attached</i>	S	S	S	P	S	P	P	P	S	S	S
<i>Wireless facility: concealed</i>	S	S	S	P	P	P	P	P	S	S	S
<i>Wireless facility: freestanding</i>	-	-	-	-	-	S	S	S	-	-	S
<i>Donation drop-off box</i>	-	-	-	S	C	S	S		-	-	S
<i>Drive through facility</i>	-	-	-	-	S	P	-	-	-	-	S
<i>Home occupation</i>	P	P	P	P	P	-	-	-	P	P	-
<i>Residential accessory structure</i>	P	P	P	P	P	-	-	-	P	P	-
<i>Satellite dish</i>	C	C	C	C	C	C	C	C	C	C	C
<i>Swimming pool</i>	P	P	P	P	P	S	P	P	-	P	P

<i>Vending machine (outdoor)</i>	-	-	-	P	P	P	P	P	-	-	-
<i>Free-standing cisterns</i>	C	C	C	P	S	P	P	P	C	C	C
<i>Wind energy system</i>	C	C	C	C	C	C	P	P	C	C	C

10.204.11. Applicability and Enforcement

10.204.11.1 Excluded Uses

If a use is not expressly permitted in a zoning district, it is prohibited. Prohibited uses in all zoning districts may include uses not explicitly listed as prohibited in this code.

10.204.11.2 New and Undefined Uses

- (a) As commerce and technology evolve, new types of land use may develop, and forms of land use not anticipated may seek locations in the City. To provide for unanticipated uses, the Director of Development Services will consider the appropriateness of an undefined use in a particular zoning district. Approval criteria include:
 - (1) Impacts of the use, including externalities and use of public services and infrastructure.
 - (2) The use is similar in nature and impact to a use listed and defined as a permitted use in that zoning district or PUD.
 - (3) The use is not similar in nature and impact to a use defined and listed as a prohibited use in that zoning district or PUD, or prohibited in the district but permitted in a different district.
 - (4) The use conforms to the intent of the zoning district and applicable plans.
 - (5) The interpretation does not lower the protection given to the public by this UDC.
 - (6) The use does not have the potential to create a dynamic that would harm the vitality or future development potential of surrounding commercial, industrial and residential areas.
 - (7) General interpretation standards in Section 10.808.
- (b) Performance standards and conditions for uses similar in nature and impact are considered.
- (c) If Development Services staff finds the proposed land use inappropriate for the district, the applicant may appeal the decision to the Zoning Board of Adjustment within thirty (30) days of the determination.

10.204.12. Nonconforming Uses

Nonconforming uses are addressed in Section 10.805.

10.205. Agricultural Uses

10.205.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.205.2. Agricultural Use

10.205.2.1 Definition

Agricultural Use: The use of land for agricultural purposes, including husbandry and keeping of farm animals, crop production, horse stables and greenhouses, and other similar uses.

10.205.2.2 Permitted Locations

- (a) Agricultural uses are conditionally permitted in the AR district.

10.205.2.3 Conditions

- (a) Intensive agricultural uses are prohibited. This includes factory farming, hog farms, dairy farms, feed lots, slaughtering, manure and compost storage and processing, silage fermentation, and keeping more than two animal units (animal unit as defined by Texas Cooperative Extension) per acre of land dedicated to agricultural uses.

Small vegetable and fruit gardens are not considered “crop production” and are permitted in all zoning districts.

10.206. Residential Uses

10.206.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.206.2. Assisted Living/Nursing Home

10.206.2.1 Definition

Assisted Living/Nursing Home: A home operated by a business or non-profit organization where ill or elderly people are provided with lodging and meals, with or without nursing care.

10.206.2.2 Permitted Locations

- (a) Assisted living facilities are subject to specific use permit review in R-1, MU-1 and MU-2 districts.
- (b) Assisted living facilities are conditionally permitted in N-1 and N-2 districts.
- (c) Independent living facilities are permitted by right in N-2 and N-2(H) districts, subject to applicable use-specific standards.
- (d) Nursing homes are subject to specific use permit review in the N-2 zoning district.
- (e) Nursing homes are conditionally permitted in the N-2(H) zoning district and permitted by right in the CC zoning district subject to applicable use-specific standards.

10.206.2.3 Conditions

- (a) Assisted and independent living facilities shall have direct access from a collector or higher street.
- (b) Nursing homes shall have direct access from a collector or higher street.
- (c) The following conditions shall be met when nursing homes are adjacent to Single-Family Residential (SF-1):
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall
 - (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
 - (3) Height
 - (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.
 - (4) Outdoor Lighting
 - (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property

10.206.3. Boarding and Rooming House

10.206.3.1 Definition

Boarding and Rooming House: A building used to provide lodging for four or more boarders or roomers, with compensation typically taking the form of money, services, or other valuable

considerations. This arrangement does not include immediate family members of the occupant who may be occupying the building. Bed and breakfast inns are not considered boarding and rooming houses.

10.206.3.2 Permitted Locations

- (a) Boarding and rooming houses are subject to specific use permit review in the N-2 district.

10.206.4. Dwelling

10.206.4.1 Definition

A structure or part of a structure providing complete, independent living facilities for a household, including permanent provisions for living, sleeping, eating, cooking and sanitation.

10.206.4.2 Permitted Locations

- (a) Refer to the permitted use table to identify the locations of dwelling subcategory uses.

10.206.5. Dwelling, Accessory Unit

10.206.5.1 Definition

Dwelling, Accessory Unit: A separate dwelling unit, either detached from or attached to the principal dwelling unit. Also known as a mother-in-law apartment.

10.206.5.2 Permitted Locations

- (a) Accessory dwelling units are permitted subject to specific use permit review in the R-1 district.
- (b) Accessory dwelling units are permitted by right in N-1, N-2 and N-2(H) districts subject to applicable use-specific standards.

10.206.5.3 Conditions

- (a) Only one accessory dwelling unit is permitted on a lot.
- (b) The Lot size for single-family dwellings where an accessory dwelling unit may be added shall be at least seven thousand eight hundred (7,800) square feet.
- (c) Accessory dwelling units shall be attached to the rear of the main house or incorporated into a detached garage without eliminating the garage's parking spaces. Complete conversion of a detached garage into an accessory dwelling unit is prohibited.
- (d) The floor area for accessory dwelling units shall be four hundred (400) square feet to eight hundred (800) square feet, or four hundred (400) square feet to thirty-three percent (33%) of the total living area of the host structure, whatever is smaller.
- (e) Accessory dwelling units shall have a separate entrance from the outdoors, oriented to the side or rear of the lot if the unit is attached to the main house.

- (f) Recreational vehicles, mobile homes, and shipping containers are prohibited as accessory dwelling units.

10.206.6. Dwelling, Live-Work

10.206.6.1 Definition

Dwelling, Live-Work: A dwelling where limited commercial use is permitted and operated by a member of the household that lives in the dwelling unit.

10.206.6.2 Permitted Locations

- (a) Live-work dwellings are subject to specific use permit review in the N-1 and N-2 districts.
- (b) Live-work dwellings are permitted by right in N-2(H), MU-1 and MU-2 districts subject to applicable use-specific standards.

10.206.6.3 Conditions

- (a) The live-work designation applies to an entire multiple-household development or a designated portion, rather than to individual units separately.
- (b) Commercial uses in live-work dwellings are limited to offices, studios, personal service establishments and home occupations.
- (c) Commercial uses in a live-work dwelling may occupy no more than 50% of the ground floor area for an individual dwelling unit.
- (d) Live-work designation when adjacent to single-family detached dwellings, the following conditions shall be met:
 - (1) Landscape Buffer
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall
 - (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across from a public right-of-way, building signage facing the property is allowed.
 - (3) Height
 - (A) All buildings shall be set back a minimum of one (1) foot for each foot of height from adjacent single-family detached dwellings.
 - (4) Outdoor Lighting
 - (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.206.7. Dwelling, Manufactured Home

10.206.7.1 Definition

Dwelling, Manufactured Home: A structure, constructed on or after June 15, 1976, according to the rules of the United States Department of Housing and Urban Development, transportable in one or more sections, which, in the traveling mode, is eight body feet or more in width or 40 body feet or more in length, or, when erected on-site, is 320 or more square feet, and which is built on a permanent chassis and designed to be used as a dwelling with or without a permanent foundation when connected to the required utilities, and includes the plumbing, heating, air conditioning, and electrical systems. All references in this article to manufactured housing or manufactured home(s) shall be referenced to HUD-code manufactured housing unless otherwise specified. This includes mobile homes.

10.206.7.2 Permitted Locations

- (a) Manufactured home dwellings are conditionally permitted in R-1, N-1 and N-2 districts.

10.206.8. Dwelling, Manufactured Home Park

10.206.8.1 Definition

Dwelling, Manufactured Home Park: A parcel of land under single entity ownership that has been planned and improved for the placement of two or more manufactured homes and all streets, service drives, and community areas.

10.206.8.2 Permitted Locations

- (a) Manufactured home parks are subject to specific use permit review in R-1 and N-1 districts.

10.206.8.3 Conditions

- (a) Permitted uses include one manufactured home on each approved space or lot, accessory buildings for use by the occupant of the structure on that lot, amenity centers, accessory buildings for use by the owner or manager of the manufactured home park, and one single household dwelling on at least six thousand (6,000) square feet lot for the owner's or manager's residence.
- (b) Manufactured home parks shall meet the open space standards of Chapters 3 (Development Standards) and 4 (Subdivision Standards). The development shall include amenities and be designed only for the renting or leasing of manufactured home sites.
- (c) Manufactured home parks can only be converted to manufactured home subdivisions after first conforming to all subdivision standards and rezoning from MH.
- (d) A six (6) foot-tall perimeter fence is required, conforming to fencing and screening standards in Section 10.307.

10.206.9. Dwelling, Modular Home

10.206.9.1 Definition

Dwelling, Modular Home: As governed by the definition within the Texas Manufactured Housing Standards Act (Article 5221f-1.), a structure or building module that is transportable in one or more sections on a temporary chassis or other conveyance device, and that is designed to be installed and used by a consumer as a permanent residence on a permanent foundation system. The term includes the plumbing, heating, air-conditioning and electrical systems contained in the structure. The term does not include a Mobile Home or Manufactured Home as defined in the Texas Manufactured Housing Standards Act (Article 5221f, V.A.C.S.).

10.206.9.2 Permitted Locations

- (a) Modular home dwellings are permitted in R-1, N-1 and N-2 districts.

10.206.9.3 Conditions

- (a) Modular Homes shall meet the site design standards of Section 10.304.4.

10.206.10. Dwelling, Multifamily

10.206.10.1 Definition

Dwelling, Multifamily: A building containing five or more separate dwelling units on one lot, including apartments, condominiums, lofts, and adaptive reuse of larger structures.

10.206.10.2 Permitted Locations

- (a) Multifamily dwellings are permitted by right in N-2, N-2(H), MU-1 and MU-2 districts, subject to applicable use-specific standards.

10.206.10.3 Conditions

- (a) Developing a mix of housing types creates more housing choices for residents, and opportunities for more diversity in the community. Multiple household developments are encouraged to provide a range of housing types to promote a diverse community of mixed ages, family types, and incomes.

10.206.11. Dwelling, Attached Single-Family

10.206.11.1 Definition

Dwelling, Attached Single-Family: A dwelling unit that is part of a structure with each dwelling unit attached by a common wall to another and access is from a private entrance, each designed and constructed for occupancy by one household.

10.206.11.2 Permitted Locations

- (a) Single-family attached dwellings are permitted by right in N-1, N-2 and N-2(H) districts subject to applicable use-specific standards.
- (b) Single-family attached dwellings are conditionally permitted in MU-1 and MU-2 districts.

10.206.12. Dwelling, Detached Single-Family

10.206.12.1 Definition

Dwelling, Detached Single-Family: A single dwelling unit that is not attached to any other dwelling or building by any means, except an approved accessory dwelling unit per Section 10.204 Permitted Uses. Also called a single-family house.

10.206.12.2 Permitted Locations

- (a) Single-family detached dwellings are permitted by right in AR, R-1 and N-1 districts subject to applicable use-specific standards.
- (b) Single-family detached dwellings are conditionally permitted in MU-1 and MU-2 districts.

10.206.13. Dwelling, Zero Lot Line Single-Family

10.206.13.1 Definition

Dwelling, Zero Lot Line Single-Family: A single household detached dwelling sited where one wall is on the property boundary but is not a shared wall with a structure on the adjacent property.

10.206.13.2 Permitted Locations

- (a) Single-family zero lot line dwellings are permitted by right in R-1, N-1 and N-2 districts subject to applicable use-specific standards.
- (b) Single-family zero lot line dwellings are conditionally permitted in MU-1 and MU-2 districts.

10.206.14. Dwelling, Duplex

10.206.14.1 Definition

A building containing two dwelling units sharing a common wall on a single lot.

10.206.14.2 Permitted Locations

- (a) Duplex dwellings are permitted by right in N-1 and N-2 districts subject to applicable use-specific standards.
- (b) Duplex dwellings are conditionally permitted in MU-1 and MU-2 districts.

10.206.15. Dwelling, Multiplex

10.206.15.1 Definition

A building containing three or four separate dwelling units on one lot, including triplexes and quadplexes.

10.206.15.2 Permitted Locations

- (a) Multiplex dwellings are permitted by right in N-1, N-2, N-2(H), MU-1 and MU-2 districts subject to applicable use-specific standards.

10.206.16. Group Home

10.206.16.1 Intent

Group homes are a necessary use serving a vital function in the community, but their concentration in certain areas can have a perceived adverse affect on an area. A careful review of proposed group

homes is necessary to verify that they are compatible with the residential character of the surrounding area and are a welcome addition to the city.

10.206.16.2 Definition

Group Home: A residence for not more than six (6) persons with disabilities and two (2) supervisors. Such an entity shall be licensed and comply with Chapter 123 of the Human Resources Code.

10.206.16.3 Permitted Locations

- (a) Group homes of up to six (6) residents, excluding supervisors, are permitted by right in the N-2(H) district subject to applicable use-specific standards.
- (b) Group homes of up to six (6) residents, excluding supervisors, are conditionally permitted in AR, R-1, N-1 and N-2 districts.
- (c) New group homes shall be placed at least seven hundred fifty (750) feet from other established group homes.

10.206.16.4 Conditions

- (a) Appearance and residential character of the structure cannot be altered, either through the use of colors, materials, construction (except provisions for the physically handicapped) and lighting; emission of sound, noise, vibration and electromagnetic interference; or outdoor storage.
- (b) Signs identifying the property as a group home are prohibited.
- (c) Safehouses and shelters for victims of domestic violence are exempt from review and spacing standards for group homes.

10.206.17. Halfway House

10.206.17.1 Intent

Halfway Houses serve a vital function in the community, but the concentration of Halfway Houses in certain areas may have a perceived adverse effect on an area. Careful review of proposed Halfway House developments is necessary to verify that they are compatible with the surrounding area's residential character.

10.206.17.2 Definition

Halfway House: Pursuant to Texas Human Resources Code § 42.002, a halfway house is a licensed home for inmates on release from more restrictive custodial confinement or initially placed in lieu of such more restrictive custodial confinement, wherein supervision, rehabilitation, and counseling are provided to mainstream residents back into society, enabling the residents to live independently. Such placement is pursuant to the authority of the Texas State Department of Corrections.

10.206.17.3 Permitted Locations

- (a) Halfway houses are subject to specific use permit review in AR, R-1, N-1, N-2 and N-2(H) districts.
- (b) New halfway houses shall be placed at least two thousand (2,000) feet from other established halfway houses, and at least seven hundred fifty (750) feet from other established group homes.

- (c) Halfway houses housing moderate and high risk (level 2 and 3), and civil commitment sex offenders are subject to the same spacing standards from schools, places of worship, and other landmarks as required for individual offenders under city, county and state law.

10.206.17.4 Conditions

- (a) Appearance and residential character of the structure cannot be altered, either through the use of colors, materials, construction (except provisions for the physically handicapped) and lighting; emission of sound, noise, vibration and electromagnetic interference; or outdoor storage.
- (b) Signs identifying the property as a halfway house are prohibited.

10.207. Commercial and Retail Uses

10.207.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.207.2. Adult Oriented Use

10.207.2.1 Intent

- (a) The right to possess and distribute sexually oriented materials, such as pornography and sex toys, and the right to present and see sexually oriented entertainment, such as erotic or nude dancing, is protected by the First Amendment of the U.S. Constitution. However, the clustering, inappropriate placement or inadequate regulation of adult uses can affect the mix of people and businesses attracted to an area, creating a de facto “red light district” and an area where criminals can find easy prey and harm the public health, safety and welfare.
- (b) Considering Hutto’s geographical constraints, an adult-oriented business would have a disproportionately large impact on the City compared to a larger community with few geographical constraints for expansion and a large supply of land ideal for commercial development.
- (c) These standards intend to:
 - (1) Regulate adult-oriented uses to promote the health, safety, morals, and general welfare of the City.
 - (2) Protect Hutto's small-city character and the potential to attract high-quality commercial development that is not sexually oriented.
 - (3) Prevent the creation of an environment that could potentially affect the reputation and small-city character of Hutto and thus discourage residents and non-adult-oriented businesses from locating in the City.

- (4) Apply fair, uniform standards that allow sexually oriented businesses in locations where their presence will cause no detrimental secondary effects.
- (d) These standards are not intended to:
 - (1) Impose limitations or restrictions on the content of communicative materials, including sexually oriented materials.
 - (2) Restrict or deny access by adults to sexually oriented materials protected by the First Amendment.
 - (3) Deny access by the distributors and exhibitors of sexually oriented entertainment to their intended market.
 - (4) Condone or legitimize the presentation and distribution of sexually oriented entertainment and material.

10.207.2.2 Definitions

- (a) *Adult-Oriented Use*: A business that is offering or display of live entertainment related to "specified sexual activities" or "specified anatomical areas" as the primary attraction to the premises. This includes but is not limited to: adult bookstores, adult novelty shops, adult video rentals, adult photo studios, adult cabarets, nude modeling studios, adult hotels and motels, and adult motion picture theaters.
- (b) Specified anatomical areas includes:
 - (1) Human genitals, pubic region, buttocks, anus, area between genitals and anus, or female breast below a point immediately above the top of the areola; or
 - (2) Human male genitals in a discernibly turgid state, even if completely and opaquely covered.
- (c) Specified sexual activities includes:
 - (1) Fondling or other intentional touching of human genitals, pubic region, buttocks, anus, or female breasts;
 - (2) Sex acts, normal or perverted, actual or simulated, including intercourse, oral copulation, or sodomy;
 - (3) Masturbation, actual or simulated;
 - (4) Human genitals in a state of sexual stimulation, arousal or tumescence;
 - (5) Excretory functions as part of or with activities in this subsection.

10.207.2.3 Permitted Locations

- (a) Adult-oriented uses are subject to specific use permit review in the B district.
- (b) Adult-oriented uses shall be at least two hundred fifty (250) feet from the boundary of any residential zone district (inside and outside the City), structure occupied as a residence, public park or playground, child day care center, place of worship or assembly, or school; and at least two thousand (2,000) feet from another adult-oriented use.

10.207.2.4 Conditions

- (a) Adult-oriented uses shall conform to site planning, architectural design, landscaping and signage rules that are applicable to other businesses in the underlying zoning and overlay district, regardless of tradition or the proprietor's preferences.
- (b) Adult-oriented uses may display only one sign attached to the building exterior with the establishment name only. Signs or displays depicting specified anatomical areas or specific sexual activities cannot be displayed on the building or inside the building where they would be visible outside.
- (c) Entries and windows shall be placed or screened to prevent the interior from being viewed from outside the establishment.
- (d) Improvements to the site and any parts of the building, including signage, awnings, and other exterior embellishments, cannot be in fluorescent or high-intensity colors.
- (e) Adult-oriented uses, including viewing rooms of at least one hundred fifty (150) square feet of floor space for film or video display of specified sexual activities or specified anatomical areas, shall conform to the following standards:
 - (1) A manager's station shall have at least thirty-two (32) square feet of floor area.
 - (2) Alteration in the configuration or location of a manager's station may be made only with an amendment to the specific use permit approval.
 - (3) More than one employee is on duty and situated in each manager's station at times a patron is present inside the premise.
 - (4) The interior of the premises shall be configured so there is an unobstructed view from a manager's station of every area of the premises where any patron is permitted access for any purpose, excluding restrooms. Restrooms cannot have video reproduction equipment. If the premises have two or more manager's stations designated, then the interior of the premises shall be configured so there is an unobstructed view of each area of the premises where any patron is permitted access for any purpose from at least one of the manager's stations. The view required in this subsection shall be by direct line of sight from the manager's station.
 - (5) The view area specified in the above subsection shall be unobstructed by doors, walls, merchandise, display racks or other materials.
 - (6) Only one person may occupy a viewing room at a time.
 - (7) The premise shall be equipped with overhead lighting fixtures that illuminate at least one (1) footcandle as measured at the floor level to areas where patrons have permitted access. The illumination shall be maintained during business hours.
- (f) Exemption: a person appearing in a state of nudity in a modeling class operated by a proprietary school, licensed by the State of Texas; a college, junior college, or university supported entirely or partly by taxation; by a private college or

university that maintains and operates educational programs where credits are transferable to a college, junior college, or university supported entirely or partly by taxation; or in a structure with no sign visible from the exterior of the structure and no other advertising that indicates a nude person is available for viewing; and where, to participate in a class a student shall enroll at least three days in advance of the class; and where no more than one nude model is on the premises at any time.

10.207.3. Bank and Financial Institutions

10.207.3.1 Definition

Bank and Financial Institutions: A Texas Department of Banking charter granted establishment primarily engaged in the provision of bank and financial institution services. Typical uses include banks, savings and loans, credit unions, and similar services. Bank and Financial Institutions do not include check cashing or payday loan establishments, loan or mortgage brokers, stockbrokers, or other financial institutions without a state bank charter. An automatic teller machine is not considered a bank or financial institution.

10.207.3.2 Permitted Locations

- (a) Banks are permitted by right in N-2(H) and CC districts subject to applicable use-specific standards.
- (b) Banks are conditionally permitted in the N-2 district.

10.207.3.3 Conditions

- (a) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
 - (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
 - (3) Height
 - (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.
 - (4) Operating Hours
 - (A) Hours are limited to 7:00 AM to 10:00 PM, unless approved by a specific use permit.
 - (5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.4. Campground, Recreational Vehicle Park

10.207.4.1 Definition

Campground, Recreational Vehicle Park: Land to be used for temporary living accommodations for recreational, camping, and travel use, including, but not limited to, travel trailers, truck campers, camping trailers, and self-propelled motor homes.

10.207.4.2 Permitted Locations

- (a) Campgrounds and recreational vehicle parks are permitted by right in the AR district subject to applicable use-specific standards.
- (b) Campgrounds and recreational vehicle parks are subject to specific use permit review in the N-1 and PR districts.

10.207.5. Car Wash

10.207.5.1 Definition

Car Wash: A facility for the washing, waxing, or cleaning of automobiles, recreational vehicles, or light-duty trucks. A car wash may be full-service or self-service.

10.207.5.2 Permitted Locations

- (a) Car washes are conditionally permitted in CC, B and M districts.

10.207.5.3 Conditions

- (a) Structures or equipment related to cleaning vehicles (car wash bays, vacuums, vending machines) shall be located at least fifty (50) feet from the boundary of any residential zoning district, places of residence such as nursing homes and extended care facilities, or lodging establishments. Vacuums cannot be located in the street yard.
- (b) Washing facilities shall occur under a roofed area with at least two walls.
- (c) Car wash facilities next to residential zoning districts, places of residence such as nursing homes and extended care facilities, and lodging establishments:
 - (1) Shall be screened and buffered to minimize impact on residential properties.
 - (2) May operate only between 7:00 AM and 9:00 PM.
 - (3) Cannot have loudspeakers or equipment that emits audible signals such as beeps, buzzers and bells that would be audible off the site.

10.207.6. Club/Lodge Facility

10.207.6.1 Definition

Club/Lodge Facility: An establishment providing meeting, recreational, or social facilities for a private or nonprofit association, primarily for use by members and guests. This does not include places of worship or assembly.

10.207.6.2 Permitted Locations

- (a) Club/lodge facilities are permitted by right in the CC district subject to applicable use-specific standards.
- (b) Club/lodge facilities are subject to specific use permit review in the N-2(H) district.

10.207.6.3 Conditions

- (a) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
 - (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
 - (3) Height
 - (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.
 - (4) Operating Hours
 - (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.
 - (5) Outdoor Lighting
 - (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.7. Day Care, Child (1-6 Children)

10.207.7.1 Definition

Day Care, Child (1-6 Children): Child Care Home (<6 Children) Regular care occurring in the caretaker's own residence for not more than six (6) children, excluding children who are related to the caretaker but in no case exceeding twelve (12) children at any given time. See Chapter 42 of the Human Resources Code, Regulation of Certain Facilities, Homes, and Agencies that Provide Child Care Services.

10.207.7.2 Permitted Locations

- (a) Day care hosting up to six (6) children less than sixteen (16) years old is permitted by right in the AR, R-1, N-1, N-2, N-2(H) and CC districts subject to applicable use-specific standards.

- (b) Day care hosting up to six (6) children less than sixteen (16) years old is conditionally permitted in the MU-1 and MU-2 districts.

10.207.7.3 Conditions

- (a) Day care facilities in the N-2 district shall be no more than two thousand five hundred (2,500) square feet.
- (b) Outdoor play areas shall be enclosed by a four (4) foot to six (6) foot high fence.

10.207.8. Day Care, Child (Greater than 6 Children)

10.207.8.1 Definition

Day Care, Child (Greater than 6 Children): Child Care Home (6+ Children) Regular care occurring in the caretaker's own residence for more than six (6) children, excluding children who are related to the caretaker. See Chapter 42 of the Human Resources Code, Regulation of Certain Facilities, Homes, and Agencies that Provide Child Care Services.

10.207.8.2 Permitted Locations

- (a) Day care hosting more than six (6) children less than sixteen (16) years old is conditionally permitted in the N-2 and N-2(H) districts.
- (b) Day care hosting more than six (6) children less than sixteen (16) years old is subject to specific use permit review in the AR, R-1, N-1, CC, MU-1 and MU-2 districts.

10.207.8.3 Conditions

- (a) Day care facilities in the N-2 district shall be no more than two thousand five hundred (2,500) square feet.
- (b) Outdoor play areas shall be enclosed by a four (4) foot to six (6) foot high fence.

10.207.9. Day Care, Adult (1-4 Persons)

10.207.9.1 Definition

Day Care, Adult (1-4 Persons): A facility that provides services under an Adult Day Care Program on a daily or regular basis, but not overnight, one (1) to four (4) elderly or handicapped persons who are not related by blood, marriage, or adoption to the owner of the facility. Adult Day Services Centers (also referred to as Adult Day Care Centers) shall be licensed by the Texas Department of Human Services.

10.207.9.2 Permitted Locations

- (a) Adult day care centers that can accommodate up to four(4) persons are permitted by right in the CC district, subject to applicable use-specific standards.
- (b) Adult day care centers hosting up to four (4) persons are subject to specific use permit review in AR, R-1, N-1, MU-1 and MU-2 districts.
- (c) Adult day care centers that can accommodate up to four (4) persons are conditionally permitted in N-2 and N-2(H) districts.

10.207.10. Day Care, Adult (Greater than 4 Persons)

10.207.10.1 Definition

Day Care, Adult (Greater than 4 Persons): A facility that provides services under an Adult Day Care Program on a daily or regular basis, but not overnight, to four (4) or more elderly or handicapped persons who are not related by blood, marriage, or adoption to the owner of the facility. Adult Day Services Centers (also referred to as Adult Day Care Centers) shall be licensed by the Texas Department of Human Services.

10.207.10.2 Permitted Locations

- (a) Adult day care centers providing services to four (4) or more persons are permitted by right in the CC district subject to applicable use-specific standards.
- (b) Adult day care centers providing services to four (4) or more persons are conditionally permitted in N-2 and N-2(H) districts.

10.207.11. Day Care, Pet

10.207.11.1 Definition

Day Care, Pet: A facility where pets are kept for all or part of a day. Secondary services at pet day care facilities may include obedience classes, training, grooming, and overnight boarding.

10.207.11.2 Permitted Locations

- (a) Pet day care facilities are permitted by right in the CC and B districts subject to applicable use-specific standards.
- (b) Pet day care facilities are subject to specific use permit review in N-2, N-2(H), MU-1 and MU-2 districts.

10.207.11.3 Conditions

- (a) Buildings used for pet day care and boarding services shall be completely enclosed and soundproof.
- (b) Outdoor play yards shall be at least one hundred (100) feet from a residential zone district and completely screened by a solid screening material six (6) feet to eight (8) feet high.
- (c) Potentially offensive odors cannot be detectable off the site.

10.207.12. Entertainment Facility, Theater

10.207.12.1 Definition

Entertainment Facility, Theater: A building or part of a building devoted to showing motion pictures or dramatic, musical, or live performances.

10.207.12.2 Permitted Locations

- (a) Entertainment facilities and theaters are permitted by right in the CC district.
- (b) Entertainment facilities and theaters are subject to specific use permit review in the N-2(H) district.

10.207.13. Farm Product Sales

10.207.13.1 Definition

Farm Product Sales: Outdoor sale of food or plant products grown on the premises in an agricultural zoning district; or customarily involving growers from throughout a region selling food or plant products they have grown in a zoning district where the use is permitted.

10.207.13.2 Permitted Locations and Duration

- (a) Farm product sales of food or plant products grown on the premises are conditionally permitted in AR, R-1, N-1, N-2, N-2(H) and CC districts.

10.207.14. Food Catering

10.207.14.1 Definition

Food Catering: A business where the principal use is the preparation and storage of food on the premises that is delivered and consumed by the customers off the premises.

10.207.14.2 Permitted Locations

- (a) Food catering is permitted by right in the N-2(H) and CC districts.
- (b) Food catering is conditionally permitted in the N-2 district.

10.207.14.3 Conditions

- (a) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
 - (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
 - (3) Height
 - (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.
 - (4) Operating Hours
 - (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.15. Funeral Home

10.207.15.1 Definition

Funeral Home: A building used for the preparation of the deceased for burial and display of the deceased and related ceremonies or services, including cremation and the storage of caskets, funeral urns, funeral vehicles, and other funeral supplies.

10.207.15.2 Permitted Locations

- (a) Funeral homes are permitted by right in the CC district.
- (b) Funeral homes are subject to specific use permit review in the N-2(H) district.

10.207.16. Fueling Station

10.207.16.1 Definitions

Fueling Station: An establishment engaged primarily in the sale of gasoline, petroleum products, electric energy, and fuels, including renewables.

10.207.16.2 Permitted Locations

- (a) Fuel stations are conditionally permitted in CC, B and M districts.
- (b) Fuel stations are subject to specific use permit review in AR, N-2 and N-2(H) districts.

10.207.16.3 Conditions

- (a) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
 - (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
 - (3) Height
 - (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.

(4) Operating Hours

- (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.17. Recreation Facility, Indoor

10.207.17.1 Definition

Recreation Facility, Indoor: An indoor establishment for exercise, relaxation, amusement or sport, and amenities that are secondary to the recreational use, including but not limited to, gymnasiums, health clubs, bowling alleys, pool halls, video arcades, and shoot ranges. Indoor recreation facilities do not include facilities supervised by licensed medical personnel in medical settings, athletic departments in schools, professional sports team facilities, amenity centers, or community centers.

10.207.17.2 Permitted Locations

- (a) Indoor recreation facilities are permitted by-right in the CC and B districts.
- (b) Indoor recreation facilities are subject to specific use permit review in N-2 and N-2(H) districts.

10.207.17.3 Conditions

- (a) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
- (1) Landscape Buffer:
- (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
- (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
- (2) Building Signage
- (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
- (3) Height
- (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.
- (4) Operating Hours
- (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.18. Recreation Facility, Outdoor

10.207.18.1 Definition

Recreation Facility, Outdoor: A mostly outdoor establishment for exercise, relaxation, amusement or sport, and amenities that are secondary to the recreational use, including but not limited to, miniature golf courses, go-cart tracks, and batting cages. This does not include amusement parks, facilities in athletic departments of schools, professional sports teams, public parks and playgrounds, amenity or community centers.

10.207.18.2 Permitted Locations

- (a) Outdoor recreation facilities are permitted by right in the PR district.
- (b) Outdoor recreation facilities are subject to specific use permit review in N-2, N-2(H) and CC districts.

10.207.18.3 Conditions

- (a) Improvements or activity areas shall be located at least one hundred (100) feet from the boundary of any residential zoning district or lodging establishment.
- (b) Outdoor recreation facilities next to residential zoning districts, places of residence such as nursing homes and extended care facilities, and lodging establishments:
- (c) Shall be screened and buffered with masonry (stone, brick, decorative CMU, similar materials) walls to minimize their impact.
- (d) May operate only between 9:00 AM and 9:00 PM.
- (e) Cannot have loudspeakers or equipment that emits audible signals such as beeps, buzzers and bells that would be audible off the site.

10.207.19. Kennel

10.207.19.1 Definition

Kennel: The boarding of dogs, cats, or other household pets, operating as a business or a legitimate animal rescue operation. Kennels may also incorporate pet day care, dog training facilities, and spaces for events such as conformation shows and agility competitions.

10.207.19.2 Permitted Locations

- (a) Kennels are subject to specific use permit review in AR, N-2(H), B and PR districts. Keeping a large number of pets will require special attention to determine whether they will adversely affect the surrounding area and whether the pets are kept in a humane environment.

10.207.19.3 Conditions

- (a) Animals shall be kept in a clean, safe and humane environment.

- (b) Boarding and activity areas shall be located where they will have minimal impact on nearby residential areas.
- (c) Noise and odor cannot be more significant than what would be expected for a typical resident with a companion animal.
- (d) Puppy and cat mills, where pets are bred in large numbers solely for profit, are prohibited.

10.207.20. Large Item Sales And Rental: Class 1

10.207.20.1 Definition

Large Item Sales and Rental: Class 1: Use of a building, land area, or other premises for the display and sale, lease, or rental of any of the following, where most of the inventory is stored outdoors.

- (a) Vehicles that are intended for sale to the general consumer market. This includes automobiles, vans, light trucks, and sport utility vehicles.
- (b) Golf carts, neighborhood electric vehicles (NEVs), and similar vehicles.
- (c) Motorcycles and dirt bikes.
- (d) Personal watercraft, kayaks, canoes and rowboats.
- (e) Small off-road vehicles, including all-terrain vehicles, dune buggies, and four-wheelers.
- (f) Automobile, truck and motorcycle parts, accessories and aftermarket items (stores specializing in the sales of those items).
- (g) Boats.
- (h) Home spas and hot tubs (except indoor sales/display).
- (i) Bulk lumber and bricks, in a screened storage area.
- (j) Landscaping materials, in a screened storage area.
- (k) Small portable buildings, sheds, garages, gazebos, decks, and other prefabricated structures (not manufactured homes and prefabricated metal buildings), as an incidental accessory use.
- (l) Pottery, statues, fountains and similar items, displayed or stored outdoors.
- (m) Accessories related to the above items.

10.207.20.2 Permitted Locations

- (a) Class 1 large item sales and rental uses are permitted by-right in B and M districts.
- (b) Class 1 large item sales and rental uses are subject to specific use permit review in the CC district.
- (c) Outdoor storage of inventory, repair work, or other repair service conducted for accessory use is considered subject to the site plan review process.

- (d) The unattended display of large items for sale in the public right-of-way, undeveloped parcels, or other private property not approved for large item sales and rental is prohibited in any district.

10.207.20.3 Conditions

- (a) Outdoor storage of class 1 large items is subject to general performance standards for outdoor storage and display.

10.207.21. Large Item Sales And Rental: Class 2

10.207.21.1 Definition

Large Item Sales and Rental: Class 2: Use of a building, land area or other premises for display and sale, lease or rental of any of the following, where most of the inventory is stored outdoors.

- (a) Large vehicles that require a commercial driver's license (CDL) to operate and are not intended for sale to the general consumer market. This includes flatbed and work bed trucks, buses, tractor-trailers, dump trucks, yard trucks, and similar vehicles.
- (b) Trailers, tow dollies, and all equipment or machinery designed to be towed by a vehicle.
- (c) Moving vans, trucks and trailers.
- (d) Construction, land clearing, hauling, earth moving, drilling, aerial lift, and similar heavy equipment.
- (e) Forklifts, bobcats, trenchers, and similar items.
- (f) Air compressors, generators, mobile pumps, and similar items.
- (g) Farming, agricultural and arborist equipment.
- (h) Recreational vehicles, including motor homes, motor coaches, converted buses, travel trailers, fifth wheels, fold-down trailers, camper trailers, and similar items.
- (i) Truck caps, lids, campers, camper shells, cargo extensions, cargo covers, tonneau covers, plows, racks, bed liners, and similar items.
- (j) Small portable buildings, sheds, garages, gazebos, decks, and other prefabricated structures (not manufactured homes).
- (k) Prefabricated and above-ground swimming pools.
- (l) Bulk mulch, wood chips, soil, fill dirt, peat, gravel, rocks, sand and similar items.
- (m) Bulk construction materials.
- (n) Scaffolding.
- (o) Pallets.
- (p) Accessories related to the above items.

10.207.21.2 Permitted Locations

- (a) Class 2 large item sales and rental uses are permitted by-right in the M district.
- (b) Class 2 large item sales and rental uses are subject to specific use permit review in the B district.
- (c) Outdoor storage of inventory, and repair work or other repair service conducted as an accessory use, is considered subject to the site plan review process.
- (d) Unattended display of large items for sale in the public right-of-way, undeveloped parcels, or other private property not approved for large item sales and rental is prohibited in all zoning districts.

10.207.21.3 Conditions

- (a) Outdoor storage of class 2 large items is subject to general performance standards for outdoor storage and display.
- (b) Class 2 items shall be presented and stored to minimize their visual impact. Extending vertical elements on lifts, cranes, telehandlers, truck-mounted cement pumps and other equipment shall be kept lowered.

10.207.22. Lodging, Hotel

10.207.22.1 Definition

Lodging, Hotel: A facility providing transient accommodations to the public, where access to overnight-stay rooms is granted through enclosed, interior hallways. Accessory uses may include restaurants, swimming pools, workout rooms, and other amenities.

10.207.22.2 Permitted Locations

- (a) Hotels are permitted by right in N-2(H), CC and B districts subject to applicable use-specific standards.
- (b) Hotel establishments are subject to specific use permit review in P, MU-1, MU-2 and PR districts.

10.207.22.3 Conditions

- (a) Hotel establishments are not intended for hourly or long-term residence. Guests may stay no more than sixty (60) consecutive days and cannot stay on the premises for at least fifty percent (50%) of a one-year period.
- (b) A room cannot be rented out more than once in a 24-hour period.
- (c) When adjacent to single-family detached dwellings, the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.

(2) Building Signage

- (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.

(3) Height

- (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent single-family detached dwellings.

(4) Operating Hours

- (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.23. Lodging, Motel

10.207.23.1 Definition

Lodging, Motel: A facility providing transient accommodations to the public, where access to overnight-stay rooms is granted from exterior balconies or pathways. Accessory uses may include restaurants, swimming pools, workout rooms, and other amenities.

10.207.23.2 Permitted Locations

- (a) Motels are subject to specific use permit review in N-2, CC and B districts.

10.207.23.3 Conditions

- (a) Motel establishments are not intended for hourly or long-term residence. Guests may stay no more than sixty (60) consecutive days and cannot stay on the premises for at least fifty percent (50%) of a one-year period.
- (b) A room cannot be rented out more than once in a 24 hour period.
- (c) When adjacent to single-family detached dwellings, the following conditions shall be met:

(1) Landscape Buffer:

- (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
- (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.

(2) Building Signage

- (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.

(3) Height

- (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent single-family detached dwellings.

(4) Operating Hours

- (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.24. Lodging, Bed And Breakfast

10.207.24.1 Definition

Lodging, Bed and Breakfast: An owner-occupied single household residence used as a lodging establishment.

10.207.24.2 Permitted Locations

- (a) Bed and breakfasts are permitted by right in N-2(H) and CC districts subject to applicable use-specific standards.
- (b) Bed and breakfast inns are conditionally permitted in the N-2 district.
- (c) Bed and breakfast inns are subject to specific use permit review in AR, R-1, N-1, MU-1 and MU-2 districts.

10.207.24.3 Conditions

- (a) Bed and breakfast inns are not intended for long-term residence. Guests may stay no more than thirty consecutive days and cannot stay on the premises for at least twenty (20%) of a one-year period.
- (b) Six or fewer rooms at bed and breakfast inns may be rented for overnight accommodation.
- (c) One or two people who do not live at the home may be employed at the bed and breakfast inn.
- (d) Food service at bed and breakfast inns is limited to breakfast, brunch and lunch for paying guests only. Provisions for food preparation, such as cooktops, are prohibited in guest rooms.
- (e) The time and frequency of receptions, private parties and similar events at bed and breakfast inns are considered in the specific use permit review process based on the inn's location and size.
- (f) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or

(B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.

(2) Building Signage

(A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.

(3) Height

(A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.

(4) Operating Hours

(A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

(A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.25. Nightclub

10.207.25.1 Definition

Nightclub: A type of entertainment facility that includes a dance floor, lightshow, and/or stage for the playing of live music.

10.207.25.2 Permitted Locations

- (a) Nightclubs are permitted by right in the CC district.
- (b) Nightclubs are subject to specific use permit review in the N-2(H) district.

10.207.26. Office

10.207.26.1 Definition

Office: A space where professionals, including but not limited to medical and dental practitioners, lawyers, engineers, accountants, and other qualified individuals, conduct professional services. This includes urgent care facilities but not emergency medical services.

10.207.26.2 Permitted Locations

- (a) Offices are permitted by right in the N-2(H), CC, MU-1 and MU-2 districts subject to applicable use-specific standards.
- (b) Offices are conditionally permitted in the N-2 district.

10.207.26.3 Conditions

- (a) Medical offices are not hospitals and are not intended for emergency medical services, inpatient treatment and overnight stays.
- (b) When adjacent to single-family detached dwellings, the following conditions shall be met:

- (1) Landscape Buffer
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a 6-foot-tall wall
- (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
- (3) Height
 - (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent single-family detached dwellings.
- (4) Operating Hours
 - (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.
- (5) Outdoor Lighting
 - (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.27. Personal and Business Service

10.207.27.1 Definition

Personal and Business Service: An establishment or place of business primarily engaged in the provision of services of a personal nature. Typical uses include but are not limited to, barber and beauty shops, nail salons, tailors, dog grooming shops, print shops, copy shops, shoe repair shops, and services of an informational or instructional nature, including driving schools, dance studios, martial arts studios, and business.

10.207.27.2 Permitted Locations

- (a) Personal and business service establishments are permitted by right N-2(H), CC, B and M districts.
- (b) Personal and business service establishments are conditionally permitted in N-2, MU-1 and MU-2 districts.

10.207.27.3 Conditions

- (a) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.

(2) Building Signage

- (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.

(3) Height

- (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.

(4) Operating Hours

- (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.28. Restaurant

10.207.28.1 Definition

Restaurant: An establishment engaged in the sale of food and beverages to customers in a ready-to-consume state.

10.207.28.2 Permitted Locations

- (a) Restaurants are permitted by right in the CC zoning district.
(b) Restaurants are conditionally permitted in N-2, N-2(H), MU-1 and MU-2 districts.

10.207.28.3 Conditions

- (a) Fermented malt beverages may be produced for consumption on the premises, and limited distribution off the premises, as an accessory use (brewpubs, picobreweries). Brewing capacity may be no more than one thousand five hundred (1,500) gallons per week.
- (b) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
- (1) Landscape Buffer:
- (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
- (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
- (2) Building Signage
- (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the

residential property is across a public right-of-way, building signage facing the property is allowed.

(3) Height

- (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.

(4) Operating Hours

- (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.29. Bar/Tavern

10.207.29.1 Definition

Bar/Tavern: An establishment that serves alcoholic beverages by the drink for on-site consumption and that derives more than seventy-five percent (75%) of the gross revenue from the on-premises sale of alcoholic beverages and does not have a TABC Food and Beverage Permit defining the establishment as a restaurant.

10.207.29.2 Permitted Locations

- (a) Bars or Taverns are permitted by right in the CC zoning district.
- (b) Bars or Taverns are conditionally permitted in N-2, N-2(H), MU-1 and MU-2 districts.

10.207.29.3 Conditions

- (a) Fermented malt beverages may be produced for consumption on the premises, and limited distribution off the premises, as an accessory use (brewpubs, picobreweries). Brewing capacity may be no more than one thousand five hundred (1,500) gallons per week.
- (b) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
 - (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.

(3) Height

- (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.

(4) Operating Hours

- (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.30. Retail Store (No more than 5,000 square feet)

10.207.30.1 Definition

Retail Store (No more than 5,000 square feet): An establishment under five thousand (5,000) square feet in floor area engaged in the retail sales or rental of goods or merchandise to the public for personal or household consumption or to services incidental to their sale or rental.

10.207.30.2 Permitted Locations

- (a) Retail stores of no more than five thousand (5,000) square feet are permitted by right in CC, MU-1 and MU-2 districts.
- (b) Retail stores of no more than five thousand (5,000) square feet are conditionally permitted in N-2 and N-2(H) districts.

10.207.30.3 Conditions

- (a) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:

(1) Landscape Buffer:

- (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
- (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.

(2) Building Signage

- (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.

(3) Height

- (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.

(4) Operating Hours

- (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.31. Retail Store (Greater than 5,000 square feet)

10.207.31.1 Definition

Retail Store (Greater than 5,000 square feet.): An establishment over five thousand (5,000) square feet in floor area engaged in the retail sales or rental of goods or merchandise to the public for personal or household consumption or to services incidental to their sale or rental.

10.207.31.2 Permitted Locations

- (a) Retail stores of greater than five thousand (5,000) square feet are permitted by right in N-2(H) and CC districts.
- (b) Retail stores of greater than five thousand (5,000) square feet are subject to specific use permit review in N-2, MU-1 and MU-2 districts.

10.207.31.3 Conditions

- (a) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
- (1) Landscape Buffer:
- (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
- (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
- (2) Building Signage
- (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
- (3) Height
- (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.
- (4) Operating Hours
- (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.
- (5) Outdoor Lighting
- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.32. Personal Loan Services

10.207.32.1 Definition

Personal Loan Services: Check-cashing and personal loan services, pawn shops, and rent-to-own establishments as defined in Section 371.003 of the Texas Financial Code, as amended.

10.207.32.2 Permitted Locations

- (a) Personal loan service establishments are permitted by right in B and M districts.

10.207.33. Travel Plaza, Truck Stop

10.207.33.1 Intent

- (a) Travel plazas serve an essential role in America's well-developed transportation network. However, modern travel plazas are designed and operated in a way that is incompatible with Hutto's design regulations, desired character and long-term planning goals. Externalities generated by travel plazas cause significant disruption to the area around them, even when carefully regulated and buffered. Towering high-rise pylon signs, an undesirable blight and an unwanted intrusion into a shared visual landscape are trademarks of travel plazas. Bright lights mounted on tall poles illuminate acres of paved parking, with little or no landscaping, for idling "big rigs." The daily traffic and noise from hundreds of large trucks will be added to the already heavy traffic on US 79 and other major arterials. Travel plazas also tend to attract mechanical commercial development that, when grouped, can prevent the creation of a vibrant commercial district with a wide variety of uses.
- (b) With Hutto's geographical constraints, a truck stop would have a disproportionately large impact on the City and, therefore, shall still meet all required design standards as outlined in this UDC.

10.207.33.2 Definition

Travel Plaza, Truck Stop: An establishment engaged primarily in the fueling, servicing, repair, or parking of commercial vehicles, including the sale of accessories and equipment for such vehicles. A travel plaza or truck stop may also include, but is not limited to, overnight accommodations, showers, restaurant facilities, and other diversions intended primarily for the use of truck crews and interregional travelers.

10.207.33.3 Permitted Locations

- (a) Travel plazas and truck stops are subject to specific use permit review in the M district.

10.207.34. Veterinary Clinic, Small Animal

10.207.34.1 Definition

Veterinary Clinic, Small Animal: A facility operated under the supervision of a licensed veterinarian, where domestic animals and pets are admitted for examination, observation, diagnosis, and medical treatment.

10.207.34.2 Permitted Locations

- (a) Veterinary clinics serving small animals are permitted by right in B and CC districts.
- (b) Veterinary clinics serving small animals are conditionally permitted in the N-2(H) district.
- (c) Veterinary clinics serving small animals are subject to specific use permit review in the N-2 district.

10.207.34.3 Conditions

- (a) Facilities of a veterinary clinic, including treatment rooms, cages, pens, kennels and exercise runs, shall be maintained in a completely enclosed, soundproof building.
- (b) Potentially offensive odors cannot be detectable off the site.
- (c) Crematoria are prohibited accessory uses to veterinary clinics.
- (d) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
 - (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
 - (3) Height
 - (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.
 - (4) Operating Hours
 - (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.
 - (5) Outdoor Lighting
 - (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.207.35. Veterinary Clinic, Large Animal

10.207.35.1 Definition

Veterinary Clinic, Large Animal: A facility operated under the supervision of a licensed veterinarian, where bovine, equine, swine, fowl, and similar large livestock animals and pets are admitted for examination, observation, diagnosis, and medical treatment.

10.207.35.2 Permitted Locations

- (a) Veterinary clinics serving large animals are permitted by right in B and CC districts.
- (a) Veterinary clinics serving large animals are conditionally permitted in the N-2(H) district.
- (b) Veterinary clinics serving large animals are subject to specific use permit review in the N-2 district.

10.207.35.3 Conditions

- (a) Facilities of a veterinary clinic, including treatment rooms, cages, pens, kennels and exercise runs, shall be maintained in a completely enclosed, soundproof building.
- (b) Potentially offensive odors cannot be detectable off the site.
- (c) Crematoria are prohibited accessory uses to veterinary clinics.
- (d) When adjacent to Single-Family Residential (SF-1), the following conditions shall be met:
 - (1) Landscape Buffer:
 - (A) Minimum of twenty-five (25) feet of landscape buffer from adjacent residential; or
 - (B) Minimum of fifteen (15) feet of landscape buffer with a six (6) foot-tall wall.
 - (2) Building Signage
 - (A) All building signage shall face the right-of-way or an internal parking lot. Building signage cannot face any adjacent residential property. If the residential property is across a public right-of-way, building signage facing the property is allowed.
 - (3) Height
 - (A) All buildings shall be setback a minimum of one (1) foot for each foot of height from adjacent SF-1 properties.
 - (4) Operating Hours
 - (A) Hours are limited to 7:00 AM to 10:00 PM, unless otherwise approved by specific use permit.

(5) Outdoor Lighting

- (A) All outdoor lighting shall be fully shielded, hooded and cannot trespass onto any adjacent property.

10.208. Industrial Uses

10.208.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.208.2. Data Center

10.208.2.1 Definition

Data Center: An industrial facility primarily engaged in the storing, processing, and distribution of data through on-site, networked computer systems or other electronic devices; including accessory offices for employees and security personnel; either in conjunction with a business not located on the site, or for individual compensation.

10.208.2.2 Permitted Locations

- (a) Data centers are permitted by right in the M district.

10.208.2.3 Conditions

- (a) Data Centers are allowed with Planning and Zoning Commission recommendation and City Council approval. Data centers are permitted a maximum height of one hundred twenty (120) feet.
- (b) Regardless of height, Data Centers shall be subject to the criteria applicable to all Industrial uses identified by this Unified Development Code.

10.208.3. Industrial Use, General

10.208.3.1 Definition

Industrial Use, General: Manufacturing operations utilizing partially processed materials to create finished items or parts with a moderate to relatively high value per unit weight, including, but not limited to, production of motor and transit vehicles, trailers, modular and manufactured buildings, as well as bottling plants and breweries. This does not include mining and extraction, petrochemical industries, rubber refining, primary metal or related industrial, light industrial, or heavy industrial.

10.208.3.2 Permitted Locations

- (a) General industrial uses are permitted by right in the M district.

10.208.4. Industrial Use, Heavy

10.208.4.1 Intent

Heavy industrial uses can create significant disruption to the area around them, even when carefully regulated and buffered. Noise, odor, heavy vehicle traffic and/or unsightly conditions can be anticipated. Because of Hutto's geographical constraints, heavy industrial uses would have a disproportionately large impact on the City.

10.208.4.2 Definition

Industrial Use, Heavy: Manufacturing primarily involved in the basic processing and manufacturing of materials or products from extracted or raw materials, or the storage or manufacturing processes utilizing flammable or explosive materials, as well as those with the potential for hazardous conditions. Heavy industrial also includes work processes involving solvents, sanitary waste transfer stations, recycling establishments, junkyards, and transport terminals, such as truck and rail terminals and container storage.

10.208.4.3 Permitted Locations

- (a) Heavy industrial uses are subject to specific use permit review in the M district.

10.208.5. Industrial Use, Light

10.208.5.1 Definition

Industrial Use, Light: Manufacturing, predominantly from previously prepared materials, of finished products or parts, including processing, fabrication, assembly, treatment, packaging, incidental storage, sales, or distribution, including, but not limited to, the manufacture of electronic instruments, preparation of food products, microbrewing, musical instruments, and pharmaceuticals. This does not include mining and extraction, petrochemical industries, rubber refining, motor vehicle and heavy equipment manufacturing, primary metal or related industries.

10.208.5.2 Permitted Locations

- (a) Light industrial uses are permitted by right in the B and M districts.

10.208.6. Research Laboratory

10.208.6.1 Definition

Research Laboratory: A facility for scientific research, investigation, testing, or experimentation that does not involve the manufacture or sale of products except as incidental to the primary purpose of the laboratory.

10.208.6.2 Permitted Locations

- (a) Research laboratories are permitted by right in the B and M districts.

10.208.7. Self-Storage Facility

10.208.7.1 Definition

Self-Storage Facility: A controlled access and fenced facility containing individual storage units or spaces of varying sizes that are leased for the storage of items (excluding vehicles) and other non-hazardous, non-perishable, durable goods.

10.208.7.2 Permitted Locations

- (a) Self-storage facilities are subject to specific use permit review in the CC and B districts.

10.208.7.3 Conditions

- (a) Uses unrelated to the short-term storage of household items and non-hazardous, non-perishable durable goods are prohibited at self-storage facilities. This includes automobile, boat, vehicle and heavy equipment storage; storage of hazardous items, perishable goods or animals; and use as a residence, office, workshop, studio, band rehearsal area or place of business.
- (b) Electrical service to individual units shall be only for lighting and climate control. Electrical outlets cannot be provided in individual units.
- (c) One dwelling occupied by the owner or on-site manager and their household is permitted as an accessory use to a self-storage facility.
- (d) Shall not be used as a general warehouse facility.

10.208.8. Trade Use

10.208.8.1 Definition

Trade Use: A business or occupation requiring specialized training in manual or mechanical skills, including, but not limited to, carpentry, plumbing, electrical, heating, ventilation and air conditioning, and furniture upholstery. A trade use also includes small custom industry, where goods are produced or repaired by hand, using hand tools or small-scale equipment.

10.208.8.2 Permitted Locations

- (a) Trade uses are permitted by right in the B and M districts.
- (b) Trade uses are conditionally permitted in N-2, N-2(H) and CC districts.

10.208.9. Vehicle Minor Repair Facility

10.208.9.1 Definition

Vehicle Minor Repair Facility: A facility where light vehicle maintenance activities such as engine tune-ups, lubrication, brake repair, air conditioning service, tire sales and installation, car washing, detailing, and polishing are conducted.

10.208.9.2 Permitted Locations

- (a) Vehicle minor repair facilities are permitted by right in the B and M districts.
- (b) Vehicle minor repair facilities are conditionally permitted in the CC district.
- (c) Vehicle minor repair facilities are subject to specific use permit review in the N-2 and N-2(H) districts.

10.208.9.3 Conditions

- (a) Inoperable vehicles shall be enclosed behind a six (6) foot-tall screening wall or kept in an enclosed building.
- (b) Vehicle repair shall be conducted indoors or inside the screening wall.

10.208.10. Vehicle Major Repair Facility

10.208.10.1 Definition

Vehicle Major Repair Facility: A facility where heavy maintenance activities such as engine overhauls, vehicle painting, body or fender work, and welding are conducted without the sales of fuel.

10.208.10.2 Permitted Locations

- (a) Vehicle major repair establishments are permitted by right in the M district.
- (b) Vehicle major repair establishments are conditionally permitted in the B district.

10.208.10.3 Conditions

- (a) Inoperable vehicles shall be enclosed behind a six (6) foot-tall screening wall.
- (b) Vehicle repair shall be conducted indoors or inside the screening wall.

10.208.11. Vehicle Storage Facility

10.208.11.1 Definition

Vehicle Storage Facility: A facility that includes secured indoor or outdoor areas, intended for short or long term storage of automobiles, light trucks, motorcycles, recreational vehicles, boats, camper trailers, commercial vehicles and commercial trailers; either in conjunction with a business not located on the site, for compensation.

10.208.11.2 Permitted Locations

- (a) Vehicle storage facilities are permitted by right in the B and M districts.

10.208.11.3 Conditions

- (a) Vehicle storage facilities cannot be used to store trucks and/or trailers weighing over seventeen thousand (17,000) pounds, construction and heavy equipment, junk, vehicles the Code of Ordinances considers junked or abandoned, or parts.
- (b) Vehicle storage facilities cannot be used for general auto sales or auto auctions, although the occasional sale of unclaimed vehicles is permitted.
- (c) Outdoor storage areas at vehicle storage facilities shall be screened in conformance to outdoor storage area fencing standards in Section 10.307.4.

10.208.12. Warehouse And Distribution Facility

10.208.12.1 Definition

Warehouse and Distribution Facility: A facility for storage, wholesale, and distribution of manufactured products; including accessory offices, showrooms, or incidental retail sales (no more than 10% of the building gross floor area) but excluding bulk storage of materials that are inflammable, explosive, or that create hazardous or commonly recognized offensive conditions; and where the products, supplies, or equipment that are distributed from the facility are not used or consumed on the premises.

10.208.12.2 Permitted Locations

- (a) Warehouse and distribution facilities are permitted by right in the B and M districts.

- (b) Warehouse and distribution facilities are subject to specific use permit review in the CC district.

10.209. Institutional and Civic Uses

10.209.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.209.2. Amenity Center

10.209.2.1 Definition

Amenity Center: An establishment providing recreational and meeting facilities for exclusive use of the residents of the residential development or employees of the business or office complex where the business or office is located including, but not limited to, swimming pools, workout rooms, meeting rooms, leasing and sales offices for the development where it is located, and similar amenities.

10.209.2.2 Permitted Locations

- (a) Amenity centers are permitted by right in the N-2(H) district.
- (b) Amenity centers are conditionally permitted in AR, R-1, N-1, N-2, CC, MU-1, MU-2 and PR districts.

10.209.2.3 Conditions

- (a) Principal vehicular access in residential districts shall be from a collector street.
- (b) Principal vehicular access in business parks shall be from an internal street.

10.209.3. Aquatic Facility

10.209.3.1 Definition

Aquatic Facility: A facility that contains one or more swimming pools, splash pads, and supporting infrastructure.

10.209.3.2 Permitted Locations

- (a) Aquatic facilities are permitted by right in all zoning districts.

10.209.4. Athletic Facility

10.209.4.1 Definition

Athletic Facility: An area, field, building or combination thereof, that is constructed and equipped for use in participatory and/or spectator-oriented sports and athletics. This use includes, but is not limited to, facilities intended for the instruction, practice, and competitive events associated with basketball, volleyball, soccer, tennis, gymnastics, swimming, baseball or football. Accessory uses may include offices, snack bars, limited sales, and locker rooms.

10.209.4.2 Permitted Locations

- (a) Athletic facilities are permitted by right in CC and PR districts.
- (b) Athletic facilities are conditionally permitted in N-2 and N-2(H) districts.
- (c) Athletic facilities are subject to specific use permit review in AR, R-1, N-1, MU-1 and MU-2 districts.

10.209.5. Cemetery

10.209.5.1 Definition

Cemetery: A place or ground used or intended to be used for the burial or entombment of the dead, whether human or animal, including a mausoleum. This does not include crematories or mortuaries.

10.209.5.2 Permitted Locations

- (a) Cemeteries are subject to specific use permit review in AR, R-1 and PR districts.
- (b) Cemeteries are prohibited on parcels occupied by residences.

10.209.6. Community Facility

10.209.6.1 Definition

Community Facility: Publicly owned facility or building primarily intended to serve the community's recreational, educational, cultural, administrative, and entertainment needs including, but not limited to, police and fire stations, government administration buildings, community centers, maintenance facilities, and related accessory uses.

10.209.6.2 Permitted Locations

- (a) Community facilities are permitted by right in all zoning districts.

10.209.7. Golf Course

10.209.7.1 Definition

Golf Course: A tract of land laid out with at least nine holes for playing a game of golf and improved with tees, greens, fairways, and hazards. Golf courses may also include a clubhouse with a restaurant, bar, practice area, driving range, and other related accessory structures. This does not include a miniature golf course.

10.209.7.2 Permitted Locations

- (a) Golf courses are subject to specific use permit review in AR, R-1, N-1, N-2 and PR districts.

10.209.8. Hospital

10.209.8.1 Definition

Hospital: A facility, whether or not licensed or required to be licensed by the State of Texas, providing primary health services and medical or surgical care to the persons, primarily inpatients, suffering from illness, disease, injury, deformity, and other abnormal physical or mental conditions, and related facilities.

10.209.8.2 Permitted Locations

- (a) Hospitals are permitted by right in the CC district.
- (b) Hospitals are subject to specific use permit review in the N-2(H) district.

10.209.9. Park

10.209.9.1 Definition

Park: An open recreation facility or tract of land available to the general public.

10.209.9.2 Permitted Locations

- (a) Parks are permitted by right in all zoning districts..

10.209.10. Park And Ride Lot (as Principal Use)

10.209.10.1 Definition

Park and Ride Lot: Parking facility provided for users of a public transit facility located on the site.

10.209.10.2 Permitted Locations

- (a) Park and ride lots as the principal use of a parcel are conditionally permitted in N-2, N-2(H), CC and B districts.
- (b) Park and ride lots as the principal use of a parcel are considered subject to specific use permit review in MU-1 and MU-2 districts.

10.209.11. Public Utility Substation

10.209.11.1 Definition

Public Utility Substation: A facility used for collecting, processing, or distributing a public utility commodity. Public utility substations include electrical substations and high-tension power distribution lines, water tanks and pumps, telephone switching offices and exchanges, and similar uses; but not wireless service facilities, storage and equipment yards, and business offices.

10.209.11.2 Permitted Locations

- (a) Public utility substations are permitted in all zoning districts.

10.209.12. Religious Land-Use or Assembly

10.209.12.1 Intent

Places of religious assembly play a positive role in their host communities and shall be planned carefully, to ensure they have the same positive impact on the city's built environment as they do on the spiritual development and quality of life of its citizens.

10.209.12.2 Definition

Religious Land-Use or Assembly: A structure or group of structures intended for regular gatherings of people to attend, participate in or conduct religious services and other related activities and associated accessory uses. Associated accessory uses may include religious instruction classrooms, offices, counseling programs, private school, youth programs, parking, child and adult daycare facilities, summer camps, recreational facilities, caretaker's quarters, temporary food bank, thrift shop, sale of religious items, and cemeteries. Parochial schools are permitted per Section 10.209.13.

10.209.12.3 Permitted Locations

- (a) Religious land-use or assembly is permitted by right in all zoning districts.

10.209.12.4 Conditions

- (a) Conditional review criteria for places of worship or assembly include the standard review criteria in Chapter 8 (Procedures), and the following:
 - (1) Traffic generation, parking and circulation, and the potential impact on surrounding areas.
 - (2) Site design, landscaping, lighting, signage and other features.
 - (3) Building size and scale, and compatibility with surrounding existing and future land uses.
 - (4) Potential noise detectable at the property line.
 - (5) Accessory uses, including parsonages, schools, day care, and offices for organizations directly related to the institution.
- (b) Places of worship or assembly shall have direct access from a collector or higher street.
- (c) Social groups, activity groups, spiritual development groups and organizational committees related to a congregation may meet in a congregant's home without conditional approval. Likewise, small gatherings of people for ceremonies that could be described as the equivalent of a religious service do not require conditional approval.

10.209.13. School

10.209.13.1 Definition

School: A public or private educational facility serving at least six students offering instruction at the elementary, junior, middle, and high school levels in the branches of learning and study required to be taught in the schools of Texas. This also includes colleges and universities. This does not include home schooling of children by parents or tutors at their residence.

10.209.13.2 Permitted Locations

- (a) Schools with five students or less are permitted by right in R-1, N-1, N-2, N-2(H), CC, MU-1 and MU-2 districts.
- (b) Schools with six students or more are conditionally permitted in R-1, N-1, N-2, N-2(H), CC, MU-1 and MU-2 districts.

10.209.13.3 Conditions

- (a) Specific use permit review criteria for schools include the standard review criteria in Chapter 8 (Procedures), and the following:
 - (1) Traffic generation, parking and circulation, and the potential impact on surrounding areas.
 - (2) Building and site design, including architecture, landscaping, lighting, signage and other features.

- (3) Building size and scale, and compatibility with surrounding existing and future land uses.
 - (4) Potential noise detectable at the property line.
 - (5) Accessory uses, including stadiums and athletic fields.
- (b) Schools shall have direct access from a collector or higher street.

10.210. Temporary Uses

10.210.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.210.2. Construction Equipment Storage Lot

10.210.2.1 Definition

Construction Equipment Storage Lot: Temporary use where vehicles, materials, equipment, sorted debris intended for recycling, and fill material accessory to a construction project is kept.

10.210.2.2 Permitted Locations and Duration

- (a) Construction equipment storage lots are subject to specific use permit review in all zoning districts.
- (b) Construction equipment storage lots may be used for up to one year. The Director of Development Services may approve an extension of six months on a written request that details reasons for the requested extension.

10.210.2.3 Conditions

- (a) Sites are used only for construction equipment used for a project on that parcel, an adjacent parcel, or other parcels in the same subdivision. For street construction projects, a construction equipment storage lot shall be placed on a N-2, CC or B zoned parcel next to the street.
- (b) Sites cannot be used as a staging area for off-site construction activity.
- (c) Equipment is removed when construction is complete.
- (d) On-site disposal of waste or scrap materials is prohibited.
- (e) Sites shall be watered down as needed to prevent fugitive dust.
- (f) Manufacturing activity, such as an asphalt hot-mix plant, concrete batch plant or rock crushing, are prohibited.
- (g) Sites shall be maintained in a neat, orderly fashion. Sorted debris to be recycled and fill shall be covered to prevent fugitive dust and trash.

- (h) Sites shall be reclaimed as close to their original condition as possible in thirty (30) days after construction is complete.

10.210.3. Construction Field Office

10.210.3.1 Definition

Construction Field Office: Site and structure, usually a portable building, used for temporary offices related to construction activity.

10.210.3.2 Permitted Locations and Duration

- (a) Construction field offices are permitted by right in all zoning districts, subject to site plan approval by Development Services staff. Construction field offices may be used during the associated construction project.

10.210.3.3 Performance Standards

- (a) Field offices may only be used for a project on that parcel, an adjacent parcel, or other parcels in the same subdivision. For street construction projects, a construction field office may be placed on N-2, CC and B zoned parcels no more than one thousand (1,000) feet from the street.
- (b) Field offices cannot have sleeping and/or cooking facilities.
- (c) Field office sites shall be maintained in a neat, orderly fashion.
- (d) Field office structures shall meet setback standards in the underlying zoning district.
- (e) Field office sites shall be reclaimed as close to their original condition as possible in thirty (30) days after construction is complete, or a certificate of occupancy for the associated project is complete.

10.210.4. Garage Sale

10.210.4.1 Definition

Garage Sale: The sale of used or secondhand items of personal property at a dwelling unit. This term also includes "yard sales," "tag sales," "porch sales," "lawn sales," "rummage sales," "estate sales" or similar sales of tangible personal property at a dwelling unit.

10.210.4.2 Permitted Locations and Duration

- (a) Garage sales are permitted by right on the site of occupied dwelling units in AR, R-1, N-1, N-2 and N-2(H) districts.
- (b) Garage sales may be up to three days long. A garage sale at an individual dwelling unit may only be held two times per year at the dwelling unit.
- (c) Garage sales held by a block club, neighborhood organization, homeowners association or similar group may be held twice in a calendar year.

10.210.4.3 Conditions

- (a) Garage sales cannot create a disturbance or become a nuisance in the surrounding area.

10.210.5. Mobile Food Vendors

10.210.5.1 Definitions

Mobile Food Vendors: A business that operates or sells food for human consumption from a cart, trailer or kitchen mounted on a chassis, with an engine for propulsion, or that remains connected to a vehicle with an engine for propulsion or disconnected from an engine for propulsion.

10.210.5.2 Permitted Locations

- (a) Mobile food vendors are permitted by right in N-2, N-2(H), CC, MU-1 and MU-2 districts.

10.210.5.3 Conditions

- (a) A mobile food vendor shall have proof of current inspections from the Fire Marshal and Williamson County and Cities Health District (WCCHD).
- (b) Proof of valid registration from Texas Department of Motor Vehicles for the mobile food vendor unit.
- (c) Any mobile food vendor that wishes to locate and remain stationary on a private lot within a permitted zoning district shall require approval by the Development Services Department. Approvals shall be valid for one year and are site-specific.
- (d) If a mobile food vendor is stationary for a minimum of two business hours on a private lot, preparing and serving food from the mobile food unit, not serving from or within the right-of-way, and located on a private lot, the mobile food vendor shall provide a notarized agreement between the property owner the property owner's designee and the vendor stating the vendor, employees, and customers have permission to occupy the area and have access to public restrooms during all hours of operation.
- (e) A mobile food vendor shall provide a scaled site plan showing the proposed food truck location in relation to the lot boundary, distance from other food trucks (if applicable), and any site amenities (seating, landscaping, improved parking area, etc.).
- (f) The mobile food vendor shall show proof of contract for wastewater removal with a vendor approved by Texas Commission on Environmental Quality (TCEQ) to dispose of all wastewater from the mobile unit if there is no approved wastewater connection and grease trap on site. All mobile food vendors are required to comply with Hutto's Illicit Discharge Ordinance (City Code of Ordinances 24.08.002).
- (g) The mobile food vendor shall show proof of contract for waste grease recycling and/or removal. All mobile food vendors are required to comply with Hutto's Illicit Discharge Ordinance (City Code of Ordinances 24.08.002).
- (h) This section does not apply to special events and small market events. Motor vehicles in the designated vendor zone that sell food items shall be designed and intended for vending. Ordinary vehicles, vans, and pick-up trucks shall not be permitted for food vending operations. The International Property Maintenance Code, federal, state and county codes, and all other applicable

codes and ordinances adopted by the City shall apply to the designated vendor zone regarding structures and properties.

10.210.6. Model Home/Lot Sales

10.210.6.1 Definition

Model Home/Lot Sales: A dwelling unit temporarily used for display purposes as an example of dwelling units available or to be available for sale or rental in a particular subdivision or other residential development approved by the City. Model homes may also incorporate sales or rental offices for dwellings within the development.

10.210.6.2 Permitted Locations

- (a) Model homes are permitted by right in AR, R-1, N-1, N-2 and N-2(H) districts.
- (b) Model homes are conditionally permitted in the MU-1 district.

10.210.6.3 Conditions

- (a) Model homes shall be issued a temporary certificate of occupancy. The temporary certificate of occupancy will expire in one (1) year, unless the approval condition still exists.
- (b) If garage space was used as office space, it shall be converted back into a garage for vehicle parking before a permanent certificate of occupancy is issued.
- (c) Once all other homes the builder plans to build in a development are sold, the model home shall be placed on the market and sold as a residence.
- (d) Model homes may be used to market homes only in the development where they are placed.

10.210.7. Portable Storage Container

10.210.7.1 Definition

Portable Storage Container: A container designed for temporary storage of personal property, usually delivered and removed by truck or trailer.

10.210.7.2 Permitted Locations and Duration

- (a) Portable storage containers are permitted by right in all zoning districts.

10.210.7.3 Conditions

- (a) Portable storage container size shall be no more than sixteen (16) feet long, no more than eight (8) feet high and no more than eight (8) feet wide.
- (b) Only one (1) portable storage container may be on a property.
- (c) Portable storage containers shall be placed on a hard surfaced area, such as a driveway.
- (d) Portable storage containers may be placed on a property for no more than thirty (30) consecutive days and no more than sixty (60) days in a calendar year, and only in conjunction with moving and relocation activity.

- (e) Portable storage containers require a permit from the Development Services Department. A placard will be issued that prominently shows the date of placement and removal.

10.210.8. Temporary Building

10.210.8.1 Definition

Temporary Building: A building or structure intended to provide basic shelter from the elements, usually fabricated away from the site where it is located, designed for placement where there is no permanent foundation, and intended for removal after a short time.

10.210.8.2 Permitted Locations and Duration

- (a) Temporary buildings are subject to specific use permit review in all zoning districts.
- (b) Temporary buildings may be used for one year. After one (1) year, the building shall be removed or replaced with a permanent structure, or the specific use permit approval shall be renewed for another year. Maximum duration of a temporary building is five (5) years. A temporary building cannot be replaced with another temporary building.

10.210.8.3 Conditions

- (a) Temporary buildings are subject to setback, site planning, landscaping and parking standards in the underlying zoning district or applicable to the use, and shall meet all fire code requirements.
- (b) Temporary buildings cannot be placed in front of a principal building.
- (c) Temporary buildings providing classrooms for schools, places of worship and assembly, and similar institutions may be permitted only where those buildings are part of an approved site plan for future development of the site.
- (d) Temporary building sites shall be reclaimed as close to its original condition as possible in thirty (30) days after temporary buildings are removed, if they are not replaced with a permanent structure.

10.211. Accessory Uses

10.211.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.211.2. Antenna, Radio Hobbyist

10.211.2.1 Definition

Antenna, Radio Hobbyist: Exterior transmitting or receiving device, and its support structure, used in telecommunications that radiates and captures radio signals on frequencies allocated by the Federal Communications Commission for amateur (ham) radio, Citizens Band (CB), and General Mobile Radio Service (GMRS) use; or captures radio signals as part of a hobby. This does not include roof mounted whip antennas or simple wire antennas not supported by a dedicated antenna tower.

10.211.2.2 Permitted Locations

- (a) Radio hobbyist antenna towers below the maximum permitted height for freestanding structures, as specified by zoning district regulations, are conditionally permitted in all zoning districts.
- (b) Radio hobbyist antenna towers above the maximum permitted height for freestanding structures, as specified by zoning district regulations, are subject to specific use permit review in all zoning districts.

10.211.2.3 Conditions

- (a) Towers shall be placed outside the front yard, outside of required setback areas.
- (b) Towers shall be set back a distance of at least fifty percent (50%) of its height from all property lines, and set back from other on- and off-site towers and supporting structures far enough so one tower does not strike another tower, support structure or overhead utilities if a tower or support structure fails.
- (c) Antenna elements cannot overhang into required setbacks.
- (d) Only one (1) amateur radio antenna tower is permitted on a property. Where the main use is an amateur radio club, more than one tower is permitted if space and setbacks permit.
- (e) Builders of radio hobbyist antennas shall sign a hold harmless agreement, acknowledging the City is not responsible for enforcing covenants that restrict or prohibit amateur radio towers, and is not responsible for conflicts with covenants or property owner associations.
- (f) Hobby radio operations shall conform to FCC rules. Externalities resulting from illegal radio operation that affect neighboring properties are considered a zoning violation and will also be reported to appropriate law enforcement and federal government agencies.

10.211.3. Antenna, Non-Residential Use

10.211.3.1 Definition

Antenna, Non-Residential Use: Exterior transmitting or receiving device, and its supporting structure, used in telecommunications that radiates and captures radio signals used in the day-to-day operation of a non-residential use such as a business, government agency, or other organization. This does not include wireless facilities, speculative towers leased to businesses and services located off-site, and broadcasting.

10.211.3.2 Permitted Locations

- (a) Non-residential antennas, no more than fifteen (15) feet above the roofline of the dominant structure on a site, are conditionally permitted in N-2, N-2(H), CC, B, M and PR districts, subject to Development Services staff review and approval.
- (b) Non-residential antennas from fifteen (15) feet above the roofline of the dominant structure to one hundred (100) feet tall, or fifteen (15) feet above the surrounding tree canopy, are subject to specific use permit review in N-2, N-2(H), CC, B and M districts.

10.211.3.3 Conditions

- (a) Towers shall be placed outside the front yard, and outside of required setback areas.
- (b) Towers shall be set back a distance of at least fifty percent (50%) of its height from all property lines, and set back from other on- and off-site towers and supporting structures far enough so one tower does not strike another tower, support structure or overhead utilities if a tower or support structure fails.
- (c) Towers shall be self-supporting. Towers cannot be supported with guy wires.
- (d) Antenna elements cannot overhang into required setbacks.

10.211.4. Donation Box

10.211.4.1 Definition

Donation Box: A container or structure located outside of an enclosed building, used for collection of charitable or for-profit donated items.

10.211.4.2 Permitted Locations

- (a) Donation boxes are conditionally permitted in the N-2(H) district.
- (b) Donation boxes are subject to specific use permit review in N-2, CC, B and PR districts. Specific use permit approval applies for two years.
- (c) After two years, the donation drop-off box shall be removed, or the specific use permit approval renewed.

10.211.4.3 Conditions

- (a) One donation box may be placed on a property.
- (b) Donation boxes cannot obstruct pedestrian or vehicular circulation, nor be located in public rights-of-way, required building setbacks, landscape areas, areas in front of the primary building on the site, drive aisles, required parking spaces, fire lanes, loading zones, or other unsafe location.
- (c) Donation boxes may have a capacity of no more than six (6) cubic yards (162 cubic feet), and a height of no more than six and a half (6.5) feet.
- (d) Donation boxes shall be clearly marked with:
 - (1) The specific items and materials requested for donation;

- (2) The name of the operator or owners of the donation container;
- (3) A local telephone number where the owner, operator or agent of the owner or operator may be reached at any time, and;
- (4) A notice stating that no items or materials may be left outside of the box.
- (e) Donated items shall be collected and stored in the box. Donated items cannot be left outside of boxes. Donations not fully enclosed in a donation box are considered a zoning violation and public nuisance, with the donations and box subject to removal by the City at the owner's expense.

10.211.5. Drive-Through Facility

10.211.5.1 Definition

Drive-Through Facility: Element of a business where goods or services are passed through exterior windows or mechanical devices to patrons in queued motor vehicles.

10.211.5.2 Permitted Locations

- (a) Drive-through facilities are permitted by right in the CC district.
- (b) Drive-through facilities are subject to specific use permit review in the N-2(H) and PR districts.

10.211.5.3 Conditions

- (a) Drive-through facilities shall be greater than one hundred (100) feet from a residential zoning district.
- (b) Drive-through facilities are subject to additional regulations in Chapter 3.

10.211.6. Free-Standing Cisterns

10.211.6.1 Definition

Free-Standing Cisterns: A reservoir or tank for storing rainwater.

10.211.6.2 Permitted Locations

- (a) Free-standing cisterns are permitted by right in N-2, CC, B and M districts.
- (b) Free-standing cisterns are conditionally permitted in AR, R-1, N-1, MU-1, MU-2 and PR districts.
- (c) Free-standing cisterns are subject to specific use permit review in the N-2(H) district.

10.211.7. Home Occupation

10.211.7.1 Definition

Home Occupation: An occupation or business activity that results in a product or service for financial gain and is conducted in whole or part in the dwelling unit or accessory building and is clearly an accessory or incidental use and subordinate to the residential use of the dwelling unit. Home occupations do not include businesses conducted in designated live- work residence.

10.211.7.2 Permitted Locations

(a) Home occupations are permitted by right in AR, R-1, N-1, N-2, N-2(H), MU-1 and MU-2 districts.

(1) Home occupations permitted by right are limited to uses that are primarily office oriented, where the residential character of the home is unchanged. Types of businesses and professions typical of home occupations include, but are not limited to: art studio; home office for telecommuting; food catering; professional office; office for insurance or real estate sales; computer consulting and desktop publishing; tutoring; music instruction; limited mail order and Internet sales; counseling, and no more than one sales party per month.

(b) Prohibited Uses

Uses that could potentially alter the residential character of the surrounding neighborhood, and uses with a pronounced tendency to grow to where the residential character of a dwelling is compromised, are prohibited as home occupations. Types of businesses and professions typical of those prohibited for home occupations include, but are not limited to: barber and beauty services, machine shop; medical, dental or veterinary office; massage therapy (on-site); vehicle repair or body work; vehicle sales, vehicle storage; vehicle restoration; private schools with scheduled or organized classes; retail sales; restaurant; welding; undertaking; and boarding houses.

10.211.7.3 Conditions

(a) Area and Location

(1) Home occupations can occupy no more than two hundred (200) square feet or no more than ten percent (10%) of a dwelling floor area. Occasional meetings can exceed the floor area standards.

(2) Home occupations are prohibited in accessory buildings. Occupied accessory dwelling units are exempted.

(b) Employees

(1) Employees of home occupations are limited to people living in the dwelling.

(c) External Effects

(1) Noise, vibration, odor, glare, smoke, and other external effects cannot be detectable off-site.

(2) Changes to the residence exterior that detract from the residential character of the neighborhood are prohibited.

(3) Outdoor storage of goods and materials are prohibited.

(d) Parking and Traffic

(1) Parking shall be off-street, except for occasional meetings.

(2) Traffic cannot exceed that typical of a residential neighborhood.

- (3) Truck pick-up and delivery is prohibited, except occasional service by parcel carriers serving residential customers in the area.

(e) Sales

- (1) Only incidental sales of services and products are permitted. Sales between the proprietor and the public at the residence are prohibited, excluding occasional sales parties (one per month maximum).

(f) Signage and Advertising

- (1) Signage identifying the home occupation is prohibited.

(g) Vehicles

- (1) Heavy equipment and commercial vehicles cannot be stored on residential properties.

(h) Visitation

- (1) Home occupations can have no more than four (4) business-related visitations a day. Monthly sales parties are exempted.
- (2) Visitations are restricted to the hours between 6:00 AM and 9:00 PM only.
- (3) Small items for repair cannot be dropped off or picked up.
- (4) Advertising shall not publicize the address, which could attract people to the home and harm the residential character of the surrounding area.

10.211.8. Residential Accessory Structure

10.211.8.1 Definition

Residential Accessory Structure: Structures such as a shed, carport, or garage that is detached from and incidental to a residential host structure. This does not include accessory dwelling units.

10.211.8.2 Permitted Locations

- (a) Residential accessory structures are permitted by right as an accessory use to a residential use in AR, R-1, N-1, N-2, N-2(H), MU-1 and MU-2 districts.

10.211.8.3 Conditions

- (a) Residential accessory structures cannot be the primary structure on a lot.
- (b) Accessory structures cannot have separate electrical meters or kitchen facilities.
- (c) Accessory structures at least two hundred (200) square feet shall be designed so they are architecturally integrated with the host structure through, architectural elements, color, roof pitch and roofing materials.

10.211.9. Satellite Dish

10.211.9.1 Definition

Satellite Dish: Earth station antenna at least two (2) feet in diameter, used for satellite communication services.

10.211.9.2 Permitted Locations

- (a) Satellite dishes no more than six (6) feet tall, and no more than ten (10) feet in diameter, used for audio and video reception and high-speed Internet access at residences, or day-to-day operation of a business or service on the property, are conditionally permitted in all zoning districts.
- (b) Satellite dishes at least six (6) feet tall or at least ten (10) feet in diameter, used in day-to-day operation of a business or service on the property, are conditionally permitted in all zoning districts.
- (c) These standards do not apply to small (no more than two (2) feet in diameter) DBS (Dish Network, DirecTV), satellite internet, and similar dishes.

10.211.9.3 Conditions

- (a) Satellite dishes shall be placed outside of the front yard, and behind the front of the house or main building, at least ten (10) feet from interior and rear property lines.
- (b) Structural bases of satellite dishes shall be screened from public view and from adjoining properties by walls, fences, buildings, and/or landscape at least six (6) feet high.
- (c) Wires and cables connected to the dish or supporting structures shall be placed underground, except wires and cables flush with the surface of a building or the dish structure.
- (d) Satellite dishes cannot have advertising or highly reflective surfaces that are visible from adjacent properties or the public right-of-way.

10.211.10. Swimming Pool

10.211.10.1 Definition

Swimming Pool: Manmade water body designed for swimming and bathing. This does not include wading pools (no more than thirty (30) inches deep), spas and hot tubs, or pool sales.

10.211.10.2 Permitted Locations

- (a) Swimming pools shall not encroach into any easements.
- (b) Swimming pools are permitted by right as an accessory use in AR, R-1, N-1, N-2, N-2(H), B, M, MU-2 and PR districts and by special use permit in the CC district.

10.211.10.3 Conditions

- (a) Swimming pool areas shall be enclosed by a screen or a fence four (4) to six (6) feet tall. Gates leading to the pool area from the street or adjacent properties shall be self-latching to prevent uncontrolled access.

10.211.11. Vending Machine (Outdoor)

10.211.11.1 Definition

Vending Machine (Outdoor): Machine with a footprint of at least four (4) square feet located outside of an enclosed building, which dispenses products stored in the machine by insertion of cash, credit or debit card, tokens, or similar objects. This does not include newspaper boxes.

10.211.11.2 Permitted Locations

- (a) Vending machines are permitted by right in N-2, N-2(H), CC, B and M districts.
- (b) Vending machines located inside an enclosed building are not regulated by this section.

10.211.11.3 Conditions

- (a) One vending machine per five thousand (5,000) square feet of host structure GFA is permitted on a site, with a maximum of ten (10) vending machines for a property.
- (b) Vending machines cannot obstruct pedestrian or vehicular circulation, or be located in public rights-of-way, required building setbacks, landscape areas, areas in front of the primary building on the site, drive aisles, required parking spaces, fire lanes, loading zones, or other locations that may be unsafe or create a condition detrimental to surrounding land uses and developments.
- (c) Vending machines shall be at least one hundred (100) feet from residential zoning districts. Vending machines on sites next to residential zoning districts, places of residence such as nursing homes and extended care facilities, and lodging establishments cannot have audible alerts or messages, and shall be positioned so illuminated parts face away from residential and lodging uses.
- (d) Illumination and electronic displays for a vending machine shall be static, with no animation or intermittent lighting, intentional or not.

10.211.12. Wind Energy System

10.211.12.1 Definition

Wind Energy System: A wind-driven turbine (whether roof or tower mounted), and associated control or conversion electronics for the purpose of providing electrical power to a privately owned lot or parcel.

10.211.12.2 Permitted Locations

- (a) Wind energy systems are permitted by right in B and M districts.
- (b) Wind energy systems are conditionally permitted in AR, R-1, N-1, N-2, N-2(H), CC, MU-1, MU-2 and PR districts.

10.211.13. Wireless Facility

Those most likely to refer to wireless facility are zoning and leasing consultants and RF engineers representing wireless service providers. Most other land use standards are not germane to their site selection process. For ease of reference and reproduction, the design criteria for wireless facilities are included here instead of the use specific design rules in Section 10.305.

10.211.13.1 Intent

To accommodate wireless communication needs of Hutto residents, businesses and visitors, while protecting the City's public health, safety, general welfare and visual environment, these standards for wireless facilities are established to:

- (a) Enhance the ability to provide wireless services to City residents, businesses and visitors.

- (b) Protect the City's environmental resources and visual environment from the potential adverse visual effects of wireless facility development, through careful design and siting standards.
- (c) Reduce the number of towers needed to provide communications services, by requiring placement of new facilities on existing structures wherever possible, and requiring co-location of wireless providers on existing and new towers.
- (d) Use performance standards and incentives to promote the location of wireless facilities on concealed structures and existing buildings and towers.

10.211.13.2 Definitions

- (a) *Wireless Facility, Attached:* Wireless facility incorporating an antenna mounted on an existing building, silo, smokestack, water tower, utility or power pole, or support structure other than an antenna tower.
- (b) *Wireless Facility, Concealed:* Wireless facility incorporating an antenna with a support structure that screens or camouflages the presence of antennas and/or towers from public view, in a way appropriate to the site's context and surrounding environment including, but not limited to, manmade trees, clock towers, flagpoles, light structures, steeples, and similar objects.
- (c) *Wireless Facility, Freestanding:* Equipment, physical plant and area of the property and/or building used to provide wireless services, including cables and wires, conduits, pedestals, antennas, towers, concealed structures, electronic devices, equipment buildings and cabinets, landscaping, fencing and screening, and parking areas. Also known as a cellular tower, cell site, or CMRS facility.

10.211.13.3 Permitted Locations

(a) Attached Facilities

Attached wireless facilities are permitted or considered as follows:

- (1) Wireless equipment attached to or mounted on an existing building or structure (or later similar replacement structure) is permitted by right in the N-2, CC, B, and M districts, subject to design review and approval by Development Services staff.
- (2) Wireless equipment attached to or mounted on an existing building or structure (or substantially similar replacement structure) is subject to specific use permit review in AR, R-1, N-1, N-2(H), MU-1, MU-2 and PR districts.
- (3) Wireless equipment on residential buildings with less than four dwelling units is prohibited.

(b) Concealed Facilities

Concealed facilities are permitted or considered as follows:

- (1) Concealed facilities no more than forty (40) feet high are permitted by right, subject to design review and approval by Development Services staff, in N-2, N-2(H), CC, B, and M districts.

- (2) Concealed facilities no more than forty (40) feet high at schools, places of worship, amenity centers, community facilities and other sites not primarily occupied by residential uses are subject to specific use permit review in AR, R-1, N-1, MU-1, MU-2 and PR districts.

(c) Freestanding Facilities

Freestanding wireless facilities are permitted as follows:

- (1) Freestanding wireless facilities are subject to specific use permit review in CC, B, M, and PR districts.
- (2) Towers thirty-five (35) feet to one hundred (100) feet tall shall be separated from existing towers by at least two thousand five hundred (2,500) feet. Towers greater than one hundred (100) feet tall shall be separated from existing towers by at least three thousand five hundred (3,500) feet.

10.211.13.4 Conditions: Preferred Facility Types

- (1) Order of preference for new permanent wireless facilities, from most preferred to least preferred, is:
 - (2) Co-location on existing tower or broadcast antenna towers (if not technically possible, then);
 - (3) Attached antennas (if not technically possible, then);
 - (4) Concealed/stealth antennas
- (b) Freestanding antenna structures that are not concealed or “stealthed” are permitted only when no other viable options are available for the free standing facility.

10.211.13.5 Conditions: Co-Location

(a) Cooperation

- (1) Wireless providers shall cooperate in good faith to achieve collocation of wireless facilities and equipment with other wireless providers.
- (2) Wireless providers cannot act to exclude other providers from co-locating on the same building, structure or location when co-location is structurally, technically and otherwise possible.

(b) Provisions for Co-Location at New Facilities

- (1) Freestanding wireless antenna support structures and facilities at least thirty-five (35) feet tall shall be designed to accommodate two or more carriers.

10.211.13.6 Conditions: Design

(a) Setbacks

- (1) Freestanding wireless antenna towers shall be set back a minimum distance of three(3) times the tower height from limited access highways and major and minor arterials. Otherwise, freestanding wireless antenna towers shall

be set back a distance equal to or more than the structure height from property lines.

- (2) Ground mounted equipment setback standards are the same as for buildings in the underlying zoning district.

(b) Facility Design

- (1) Wireless facilities shall be consistent with the surrounding built environment (planned or existing) considering exterior materials, roof form, scale, mass, color, texture and character. Facilities shall also be compatible with the surrounding natural environment considering landforms, topography, and other natural features.
- (2) If a facility is an accessory use to an existing use, the facility shall be constructed from materials equal to or better than the materials of the principal use.

(c) Attached Antenna Design

- (1) Building mounted antennae shall be mounted flush as possible to the host structure, without projecting above the parapet.
- (2) Roof mounted antennae may be no more than ten (10) feet over the building height, and may exceed the maximum building height requirement in the underlying zoning district. Roof mounted antennae shall be placed as close to the center of the roof as possible.
- (3) Building and roof mounted antennae and supporting structures shall be placed, painted and/or screened to be architecturally and visually compatible with the host structure, and integrated into the architectural details of the building as much as possible.

(d) Freestanding Antenna Design

- (1) Wireless towers, structures and equipment shall be painted or coated with muted earth colors that provide camouflage and blend with the surrounding built and natural environment.
- (2) Guyed towers are prohibited.

(e) Equipment Building and Cabinet Design

- (1) Equipment buildings and screening walls shall be compatible with the surrounding built environment, considering exterior materials, roof form, scale, mass, color, texture and character.
- (2) Equipment buildings and screening walls shall be constructed with materials that are equal to or better than the materials of the principal use.
- (3) Equipment cabinets shall be placed, painted and/or screened to be architecturally and visually compatible with the surrounding built and natural environment.

(f) Screening and Landscaping

- (1) Screening and landscaping appropriate to the context of the site and in harmony with the character of the surrounding environment is required when part of a facility is visible from a public right-of-way or adjacent properties.
- (2) Landscaping shall form a dense cluster at the base of the facility or screening wall. Trees spaced thirty (30) feet apart shall be planted along the street of facilities that front on a public street.

(g) Lighting

- (1) Antenna structures cannot be artificially lighted unless required by the FAA or other state or federal agency.
- (2) Beacons shall be used instead of strobe lights if aviation-related safety lighting is required.
- (3) Security lighting may be mounted no more than twenty (20) feet high and shall be directed toward the ground to reduce light pollution, prevent offsite light spillage, and avoid illuminating the tower.

(h) Noise

- (1) Equipment cannot generate noise that may be heard beyond the site. Exceptions are generators used in emergencies where the regular power supply for a facility is temporarily interrupted, air conditioners, and noise made during regular maintenance.

10.211.13.7 Conditions: Abandonment

- (a) Wireless facilities are considered abandoned if they are unused by all providers at the facility for one hundred eighty (180) consecutive days.
- (b) Development Services staff may request documentation about tower or antenna usage from the facility owner.
- (c) When abandoned, the facility owner shall reuse the facility in ninety (90) days, transfer the facility to another owner who will reuse it, or dismantle and remove the facility.
- (d) If the facility remains ninety (90) days after abandonment, the City may remove it at the facility and/or property owner's expense. If the facility is removed, City approval of the facility will expire.

10.211.13.8 Conditions: Information Disclosure

- (a) Wireless providers shall meet with Development Services staff at their request to give information about the proposed system design. Information will not be recorded and is treated as a confidential trade secret.
- (b) Development Services staff may share non-confidential information with other interested parties seeking to place wireless facilities in the City, to promote co-location and co-development of facilities.

10.212. General Performance Standards

10.212.1. General

Permitted uses shall conform in operation, location, and construction to general performance standards and use-specific performance standards. Standards in this section supplement related local (Code of Ordinances), state and federal standards.

10.212.2. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.212.3. Electrical and Radio Frequency Disturbance

Uses cannot create electrical or radio frequency disturbance that adversely affects the operation of electrical and electronic equipment in the vicinity.

10.212.4. Flammable and Explosive Materials

10.212.4.1 Manufacture and Storage of Explosive Materials

- (a) Uses involving manufacture or storage of compounds or products that decompose by detonation are prohibited.
- (b) Chlorates, nitrates, perchlorates, phosphorus, and similar substances and compounds in small quantities for use by industry, school laboratories, pharmacists or wholesalers may be permitted when approved by the Williamson County Emergency Services District #3 / Hutto Fire Rescue.

10.212.4.2 Storage of Flammable Materials

Storage and use of flammable liquids and materials such as pyroxylin plastics, nitrocellulose film, solvents, and petroleum products are permitted only when the storage or use conforms to Williamson County Emergency Services District #3 / Hutto Fire Rescue standards.

10.212.5. Hazardous and Waste Materials

Storage, use and handling of hazardous substances (as defined by the National Fire Protection Association Guide or successor publication) and/or waste, or the storage and disposal of solid, liquid, gaseous and/or sanitary waste, is prohibited.

10.212.6. Lighting and Glare

10.212.6.1 Outdoor Lighting

Outdoor lighting shall conform to lighting design standards in Section 10.308.

10.212.6.2 Glare

Uses cannot produce intense glare or direct illumination across the bounding property line. Glare or light cannot be so intense that it creates a nuisance or detracts from the use and enjoyment of nearby properties.

10.212.7. Noise

Noise nuisances shall be governed per the City of Hutto Code of Ordinances Chapter 14, Division 2, Article 14.03 Noise.

10.212.8. Odor

10.212.8.1 Offensive and Unhealthy Odors

Uses generating odors of an intensity and character detrimental to the health, safety, welfare or comfort of the public shall be removed, stopped, or modified to remove the odor. The odors shall be reasonably prevented when perceptible at the property line.

10.212.8.2 Restaurants and Food Service

Cooking odor shall be removed to the maximum extent possible using best available ventilation technology.

10.212.9. Outdoor Storage and Display

10.212.9.1 General Items and Equipment

General outdoor storage of equipment, machinery, building materials, shipping containers, pallets and similar materials is permitted only in the B district, and shall be screened in conformance to fence design standards in Section 10.307.

10.212.9.2 General Outdoor Storage Areas

Areas used for general outdoor storage as an accessory use to a commercial or industrial use shall be screened in conformance to fence design standards in Section 10.307.

10.212.9.3 Junk

Outdoor storage of junk is prohibited.

10.212.9.4 Off-Site Storage

Outdoor storage and display of items not related to a business on the property is permitted only in the B district, screened in conformance to fence design standards in Section 10.307.

10.212.9.5 Recreational Vehicles and Boat Storage

- (a) Storage areas for resident-owned recreational vehicles and boats may be designated in residential developments either during the initial review of the development, or later considered subject to specific use permit review. Storage areas shall be owned and maintained by a homeowners association.
- (b) Otherwise, off-site storage of recreational vehicles and boats is permitted only in the B district on a parcel approved for vehicle storage use in Section 10.208.11.

10.212.9.6 Trash Enclosures

Storage areas, solid waste dumpsters, trash compactors and large items for solid waste pick-up shall be screened in conformance to architecture and fence design standards in Chapter 3.

10.212.9.7 Vehicles for Sale

- (a) Outdoor display of vehicles for sale or rent, at sites approved for that use, shall conform to the following standards.
- (b) Vehicles cannot be displayed or stored in the public right-of-way, private access roads or drive aisles.
- (c) Vehicles cannot be displayed or stored in landscape areas or buffers.
- (d) Vehicles cannot be displayed or stored on elevated pads, ramps, or similar structures.
- (e) Only automobiles, vans, light trucks, and sport utility vehicles with a gross vehicle weight of less than seven thousand five hundred (7,500) pounds intended for sale or rental to the general consumer market may be parked in the row closest to the public right-of-way. Vehicles in the parking row closest to the public right-of-way cannot display attention-getting displays and devices normally not found on vehicles owned by the general public.
- (f) Inventory parking cannot cause the amount of parking available for customers, employees and general loading to decrease below the minimum amount required by Section 10.304.9.
- (g) Inventory shall be screened from adjacent residential properties in conformance to fence design standards in Section 10.307. Inventory cannot be visible above the peak of the wall when viewed by a person of normal height standing on the ground of adjacent properties.

10.212.9.8 Vehicles to be Repaired

- (a) Vehicles storage for repair is permitted only on parcels approved for minor and major vehicle repair businesses.
- (b) Vehicles stored for repair, and related parts, shall be placed in an area inside the building envelope, screened in conformance to fence design standards in Section 10.307.
- (c) Vehicles and parts cannot be visible above the peak of the wall when viewed by a person of normal height standing on the ground of adjacent properties or the closest rights-of-way.
- (d) Vehicles and parts shall be set back at least twenty (20) feet from adjacent residential properties.
- (e) Ten or less wrecked or inoperable vehicles may be stored outdoors at a major vehicle repair businesses, for active restoration projects or customer repair work. Wrecked or inoperable vehicles shall be stored inside screened areas per Section 10.307.

10.212.9.9 Other Products for Sale

- (a) Outdoor sales of items not described above shall conform to the following standards.
- (b) Outdoor display of items normally produced or sold in the principal structure on the property is permitted during business hours only.

- (c) Inventory cannot be displayed between the principal structure and the public right-of-way, except an area ten (10) feet of the front of the building and twenty (20) feet on both sides of the entrance. Exceptions are landscaping materials, nursery stock, sidewalk sales and street fairs, farmer's markets, Christmas tree sales, and garage sales.
- (d) Inventory cannot be displayed or stored in landscape areas or buffers; in the public right-of-way or on private access roads; or on elevated pads, ramps and similar structures.
- (e) Inventory shall be screened from adjacent residential properties in conformance to fence design standards in Section 10.307. Inventory cannot be visible above the peak of the wall when viewed by a person of normal height standing on the ground of adjacent properties.
- (f) Inventory shall be set back at least twenty (20) feet from adjacent residential properties.

10.212.9.10 Large Items

Large items shall be presented and stored in a way that minimizes their visual impact. Extending vertical elements of man lifts, cranes, truck mounted cement pumps and similar equipment shall be kept lowered. Large items may be subject to specific use permit review.

10.212.9.11 Expected Uses

Screening standards do not apply to working farm equipment used on an operating farm, or construction equipment, vehicles, building materials and field offices for use on the property while a building permit is in effect for construction.

10.212.10. Smoke and Particulate Matter

10.212.10.1 Air Pollution

Uses cannot discharge across the lot lines fly ash, dust, smoke, vapors, noxious, toxic or corrosive matter, or other air pollutants in a concentration that is detrimental to health, animals, vegetation or property, or conflicts with public air quality standards as set by the Texas Commission on Environmental Quality and Texas Open Burning Act.

10.212.10.2 Fugitive Dust

Uses generating fugitive dust and particulate matter shall be conducted so dust and particulates are not transported across the bounding property line in concentrations of four grains per one thousand (1,000) cubic feet of air or more.

10.212.10.3 Gases

Uses cannot emit gas that is injurious or destructive, harmful to person or property, or explosive.

10.212.11. Traffic Impact

Development Services or Public Works staff may require a traffic study for proposals for development projected to generate at least one hundred (100) peak hour vehicle trips. When a traffic impact study is required, the type and scope of the study will be decided during a pre-application meeting with Development Services and Public Works staff. Representatives from other agencies and departments may also be involved.

10.212.12. Toxic and Noxious Matter

Maximum concentration of toxic or noxious matter across a bounding property line is ten percent (10%) of the threshold limit for an industrial worker as determined by state or federal standards, whichever is stricter.

10.212.13. Vibration

Uses cannot generate earth borne vibration limits at the bounding property line that would be detectable without the aid of instruments.

Chapter 3. Development Standards

10.301. Intent

Site design standards establish design criteria and minimum standards for development in the city. The rules are intended to:

- (a) Enhance and protect Hutto's character, built environment, quality of life and community image through clearly articulated development design goals and policies, design guidelines and minimum design standards.
- (b) Protect and promote Hutto's long-term vitality through design standards that encourage and reward high-quality development while discouraging less attractive and less enduring alternatives.
- (c) Minimize adverse impacts of vehicular circulation to existing neighborhoods and to the surrounding physical environment.
- (d) Enhance and protect the security and health, safety and welfare of Hutto residents.

10.302. Bulk, Setbacks and Buffers

10.302.1. Intent

Bulk, setback and buffer standards regulate the placement of buildings and other improvements on a parcel. Land use regulations traditionally regulate building placement so adequate light and air can be provided to building occupants and slow the spread of fires from building to building. However, building placement can be crucial in defining a community's sense of place.

10.302.2. Applicability

This section applies in the following areas:

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	No

10.302.3. Setback Encroachment and Additional Setback Standards

These uses and structures may encroach into a yard or require setbacks as outlined in this section. Encroachments across property lines, into the public right-of-way, or utility, drainage access, conservation or drainage easements are prohibited. Additional standards and requirements for such encroachments are detailed within this section.

10.302.3.1 General Requirements in Addition to Zoning District Tables

In addition to requirements outlined in the Zoning District Tables in Chapter 2 (Land Use Standards), the following setback requirements apply to other structures or uses in addition to those found in Chapter 2.

Table 302-1: General Requirements

Type of structure or use	Residential uses	Non-residential uses
Air conditioning equipment	Any part of the side and rear yard	n/a
Arbors and trellises	Any yard, at least 5 feet from neighboring property lines	
Awnings	No more than 3 feet into front, side or rear setback; may hang over easements	No more than 6 feet into front, side or rear setback; may hang over easements; may hang over public ROW with approval of City Council
Backflow prevention devices	Within an easement in the front yard	Any yard on the site
Bay windows, chimneys, entry vestibules less than 8 feet wide and less than 33% of the wall length, overhanging eaves	No more than 3 feet into any setback	
Open deck greater than 5 feet above grade	At least 5 feet into the rear setback if the area underneath is left unscreened and unenclosed	n/a
Open deck no more than 5 feet above grade	Into the rear setback, at least 10 feet from a property line	n/a
Ramps and other access devices required by the ADA	Any yard on the site	
Retaining walls	Any yard on the site	
Swimming pools and spas	At least 3 feet away from any freestanding structure and at least 5 feet away from all side and rear lot lines; shall be placed in the rear yard and may not be located within any easement	

10.302.3.2 Drainage Easement Setbacks

Minimum structural setbacks from drainage easements shall be determined based on the greater of the full studied one percent (1%) floodplain, delineated wetlands or one hundred (100) feet from the centerline of the waterway. However, in no case shall setbacks be less than the following:

- (a) Watercourses draining an area of at least a half (0.5) square miles with a defined bed and bank, designated one percent (1%) floodplains, and Category 3 wetlands: 25 feet.
- (b) Watercourses draining an area of a half (0.5) to twenty (20) square miles and Category 2 wetlands: 75 feet.
- (c) Watercourses draining an area of greater than twenty (20) square miles and Category 1 wetlands: 125 feet.

10.302.4. Bufferyard

10.302.4.1 Bufferyards Between Lots

Bufferyards are required between certain land uses to prevent or minimize potential nuisances such as noise or light and to provide a transition between uses that may not be compatible with each other.

10.302.4.2 Bufferyard Standards

- (a) Bufferyards shall be landscaped in accordance with the tree and shrub standards found in Section 10.306.
- (b) Bufferyards shall be measured from the property line and extend inward by the required distance unless an existing easement interferes. In such case, the Director of Development Services may authorize a variation to the bufferyard to accommodate the required planting and bufferyard width to the maximum extent practicable.
- (c) No site development shall be permitted within a required bufferyard. This includes but is not limited to, parking, drive aisles, alleys, accessory buildings, dumpsters, storage, or light fixtures. Passive recreation, including pedestrian trails and seating areas, may be permitted within required bufferyards, provided that the required depth of the bufferyard and all required plantings are provided.
- (d) A non-residential use developed in a residential zoning district will be required to provide a low level bufferyard adjacent to residential development, as defined in Section 10.302.4.3(a).
- (e) Detention or retention ponds may be permitted within the bufferyard up to twenty-five percent (25%) if it is determined by the City Engineer that there is no other feasible option for the detention of stormwater. If detention or retention is located within the required bufferyard, the requirements of this section shall be met in full within the remaining bufferyard area, and additional screening or aesthetic treatment of the pond may be required depending on the location and circumstances of the site.
- (f) The Director of Development Services may approve up to a fifty percent (50%) bufferyard reduction for properties abutting a drainage easement or other designated open space.
- (g) Development within or adjacent to a PUD district shall be subject to the bufferyard requirements for the most appropriate zoning district based on the use of the property.
- (h) Notwithstanding Section 10.302.4.3, Development Services staff may require a masonry wall within a required bufferyard in order to mitigate nuisances caused by light, noise, odor, or any other source.

10.302.4.3 Required Bufferyards

The table below indicates the level of bufferyard required between each zoning district or land use. Letters “a” to “c” correspond to the type of bufferyard required and the specific situations in which the bufferyard is required. A box “-” indicates that a bufferyard is not required between those development types.

Table 302-2: Bufferyard Requirements

	Adjacent District										
	PR	AR	R-1	N-1	N-2	N-2(H)	MU-1	MU-2	CC	B	M
PR	-	-	-	-	-	-	-	-	-	-	-
AR	-	-	-	-	-	-	-	-	-	-	-
R-1	a	a	-	-	-	-	-	-	-	-	-
N-1	a	a	a	-	-	-	-	-	-	-	-
N-2	b	b	b	a	a	a	-	-	-	-	-
N-2(H)	a	a	a	a	a	-	-	-	-	-	-
MU-1	a	a	a	a	a	a	-	-	-	-	-
MU-2	c	c	c	b	b	b	a	-	-	-	-
CC	b	c	c	b	b	b	b	a	-	-	-
B	c	c*	c*	c*	c*	c*	b	a	-	-	-
M	c	c*	c*	c*	c	c	c	c	b	a	-

*bufferyard C between B/M districts and residential districts have specific provisions; see below.

(a) A low level bufferyard (“a”) shall consist of the following:

- (1) A ten (10) foot wide planting area with a continuous landscape hedge not less than three (3) feet in height is required; or a five (5) foot wide planting area plus a masonry wall, living screen, or wrought-iron/metal fence not less than six (6) feet in height is required in accordance with Section 10.302.4.2(h).
- (2) For every fifty (50) linear feet of bufferyard, a minimum of two (2) canopy trees and one (1) ornamental tree is required. These trees shall be distributed throughout the bufferyard to avoid clustering.
- (3) The masonry wall, living screen, or wrought-iron/metal fence shall be positioned as the outermost element, with landscaping, such as low shrubs, provided on the exterior side facing the adjacent property or right-of-way to soften the appearance of the wall To the maximum extent practicable, the visual appearance of the wall shall be attractive with architectural details such as friezes, decorative cornices, tile work, murals, changes in materials, 3D brick patterns, moldings, offsets, reveals, protruding posts pilasters, projecting ribs, or other 3D features incorporating or suggesting architectural or structural members.

(b) A medium level bufferyard (“b”) shall consist of the following:

- (1) A twenty (20) foot wide planting area with a continuous landscape hedge not less than three (3) feet in height is required; or a fifteen (15) foot wide planting area plus a masonry wall, living screen with approval from the

Director of Development Services, or wrought-iron/metal fence not less than six (6) feet in height is required in accordance with Section 10.302.4.2(h).

- (2) For every fifty (50) linear feet of bufferyard, a minimum of two (2) canopy trees and one (1) ornamental tree is required. These trees shall be distributed throughout the bufferyard to avoid clustering. The masonry wall, living screen, or wrought-iron/metal fence shall be positioned as the outermost element, with landscaping, such as low shrubs, provided on the exterior side facing the adjacent property or right-of-way to soften the appearance of the wall. To the maximum extent practicable, the visual appearance of the wall shall be attractive with architectural details such as friezes, decorative cornices, tile work, murals, changes in materials, 3D brick patterns, moldings, offsets, reveals, protruding posts pilasters, projecting ribs, or other 3D features incorporating or suggesting architectural or structural members

(c) A high level bufferyard (“c”) shall consist of the following:

- (1) A twenty-five (25) foot wide planting area with a continuous landscape hedge not less than three (3) feet in height is required; or a twenty (20) foot wide planting area plus a masonry wall, living screen with approval from the Director of Development Services, or wrought-iron/metal fence not less than six (6) feet tall in accordance with Section 10.302.4.2(h).
- (2) Any B or M zoning district adjacent to a residentially zoned property shall provide a thirty (30) foot wide planting area and an eight (8) foot tall masonry wall with two (2) canopy trees and one (1) ornamental tree distributed every fifty (50) linear feet of bufferyard.
- (3) For every fifty (50) linear feet of bufferyard, a minimum of two (2) canopy trees and one (1) ornamental tree is required. These trees shall be distributed throughout the bufferyard to avoid clustering.

10.302.4.4 Bufferyards Adjacent to Development Perimeter Walls

Where a development perimeter wall is provided, a bufferyard consisting of the following shall be provided between the wall and the street:

- (a) A ten (10) foot wide planting area;
- (b) For every fifty (50) linear feet of bufferyard, a minimum of two (2) canopy trees and one (1) ornamental tree, and;
- (c) A continuous landscape hedge not less than three (3) feet in height.

10.303. Site Design

10.303.1. Applicability

This section applies in the following areas:

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	No

10.303.2. Siting and Orientation: Multiple Household Developments

10.303.2.1 Applicability

These standards apply to all multifamily dwelling uses.

10.303.2.2 Building Orientation

Buildings shall be oriented towards either the perimeter streets, or an internal drive or road network that recreates a traditional grid or traditional village, rather than orientation only to internal parking lots.

10.303.2.3 Common Open Space

(a) Common Open Space Required

The minimum amount of common open space (as a percentage of gross land area) is twenty percent (20%).

(b) Common Open Space Siting

- (1) Common open space shall be amassed into meaningful, quality open spaces. Designated common open space may be in a natural, undisturbed state, landscaped for more formal courtyards or plazas, or developed for active or passive recreation.
- (2) Common open space land shall be compact and contiguous to the maximum extent practicable, unless the land is used as a continuation of an existing greenway, trail, or other linear park, or unless specific topographic features require a different configuration.
- (3) Common open space shall be reasonably accessible to all residents of the development.

(c) Areas not considered as common open space

The following do not count towards require common open space:

- (1) Private lots, yards, balconies and patios dedicated for use by a specific unit.
- (2) Public right-of-way or private streets and drives.
- (3) Open parking areas and driveways for dwellings.
- (4) Land covered by structures except ancillary structures associated with use of open space such as gazebos and picnic shelters.
- (5) Designated outdoor storage areas.
- (6) Land areas between buildings, and between building and parking lots or driveways, of greater than forty (40) feet.

- (7) Required perimeter setbacks.
- (8) Detention/retention facilities, including drainage swales, unless designed for use as accessible and useable year-round community amenities by the residents of the development (e.g., picnic areas, passive recreation areas, playgrounds, ponds for fishing and/or boating, etc.).
- (9) Areas under high-tension power lines.
- (10) Wetlands that are saturated for greater than fifty percent (50%) of the year.

10.303.3. Siting and Orientation: Non-Residential Sites and Structures

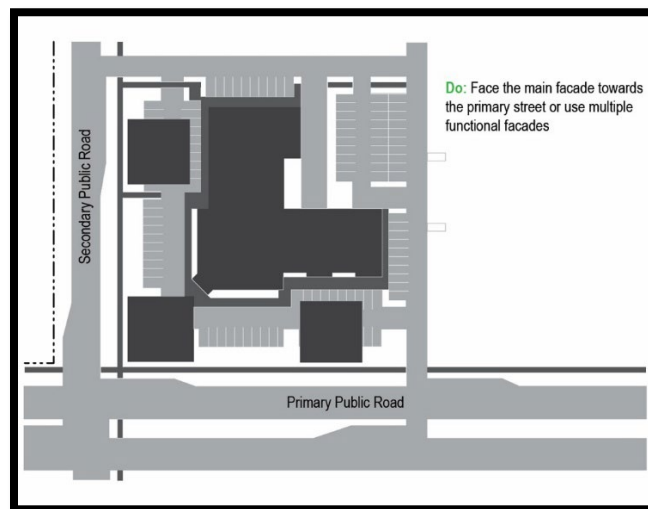
10.303.3.1 Applicability

These standards apply to all nonresidential developments.

10.303.3.2 Orientation to Streets

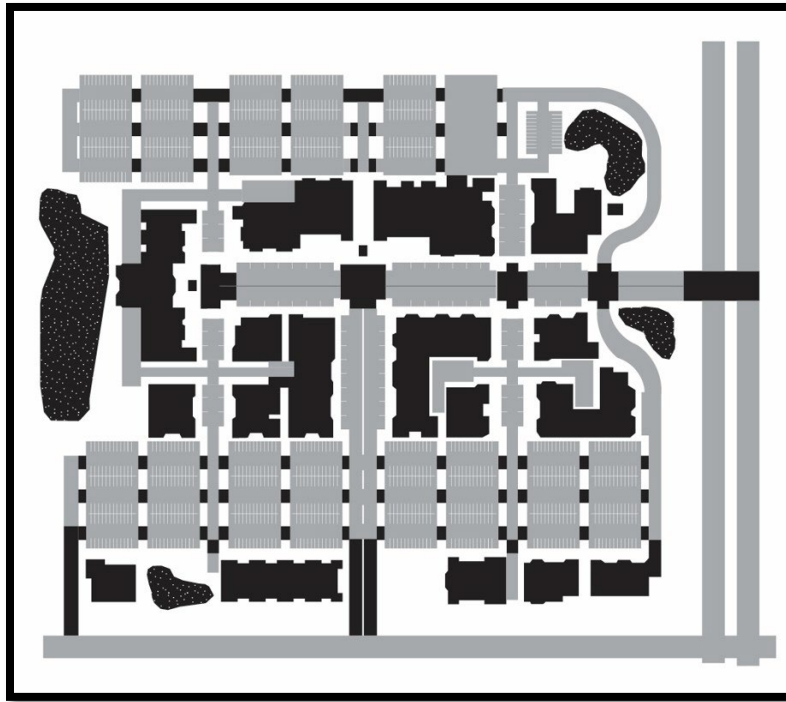
- (a) The primary façade and pedestrian entrance of a building shall be oriented towards the public right-of-way when not facing an internal street. Refer to Figure 303.3-1. for further guidance.

Figure 303.3-1: Non-Residential Structure Orientation



- (b) In shopping and commercial centers, and developments with multiple buildings, buildings shall be oriented towards either the perimeter streets, or an internal drive or road network that recreates a village street, rather than orientation only to internal parking lots. Pedestrian crossings shall be provided within the development through pedestrian tables/raised crosswalks, lit/flashing crosswalks, pedestrian sheds, chicanes, or similar design. Refer to Figure 303.3-2 for further guidance.

Figure 303.3-2: Multiple Non-Residential Structures Orientation



10.303.3.3 Orientation to Walkways

One main building entrance shall open directly onto a connecting walkway with pedestrian frontage. Sides of a principal building facing a public street shall have one or more customer entrances. When a principal building faces more than two public streets, this requirement will apply only to two sides.

10.303.3.4 Plazas

Commercial buildings shall be placed in a way that creates plazas and pedestrian gathering areas at least two hundred (200) square feet in size to buffer pedestrians from traffic and circulation areas.

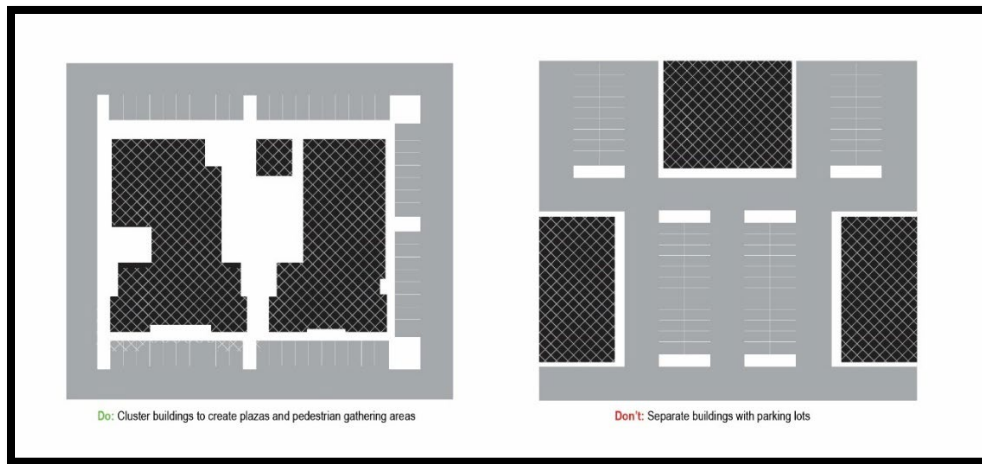
10.303.3.5 Views

Commercial buildings shall be oriented to promote views through and into each commercial development, with view corridors at least fifteen (15) feet wide between structures or landscape features.

10.303.3.6 Clustering

In larger master planned and multiple building projects, buildings shall be clustered to create defined pedestrian areas, minimize the footprint of impervious surfaces, and encourage shared amenities (see Figure 303.3-3).

Figure 303.3-3: Clustering Multiple Non-Residential Structures



10.303.4. Modular Homes

A modular home shall meet the following requirements.

- (a) The modular home meets or exceeds all building code requirements that apply to other dwelling units concerning on-site construction.
- (b) The modular home conforms to all applicable zoning standards for the respective zoning district.
- (c) the Building Official is so notified in writing for the purpose of establishing procedures for inspection, issuing building permits, and compliance with the Texas Manufactured Housing Standards Act (Texas Occupations Code § 1201).
- (d) The modular home is placed on an approved platted lot.
- (e) Per the Texas Occupation Code § 1202.253, single family and duplex modular homes shall:
 - (1) Have a value equal to or greater than the median taxable value for each single family dwelling located within five hundred (500) feet of the lot on which the modular home is proposed to be located, as determined by the most recent county certified tax appraisal roll;
 - (2) Have exterior siding, roofing, roof pitch, foundation fascia, and fenestration compatible with the single family dwellings located within five hundred (500) feet of the lot on which the modular home is proposed to be located;
 - (3) Comply with applicable zoning district regulations and development standards, including setbacks, yard requirements, subdivision controls, architectural and landscaping standards, minimum square footage, and other site design requirements for single-family dwellings; and
 - (4) Be securely affixed to an approved permanent foundation.

- (f) For purposes of above subsection e, “value” means the taxable value of the industrialized housing and the lot after installation of the housing as determined by the appraisal district.

10.303.5. Intersection Sight Distance

For sight visibility line standards refer to Division B, Section 10 of the Hutto Engineering Design Manual.

10.303.6. Sidewalks

10.303.6.1 Sidewalks Required

Sidewalks in conformance with Division B, Section 11 of the Hutto Engineering Design Manual shall be provided along public or private street frontages. A continuous internal pedestrian walkway at least 5 feet wide shall be provided from the perimeter public sidewalk to the primary public entrance of a non-residential building or multifamily residential development.

10.303.6.2 Sidewalks Required for Use Change

Sidewalks in conformance to Section 10.411 and Section 10.412 shall be constructed along the public right-of-way adjacent to any lot that changes use. A Certificate of Occupancy for new construction will not be issued until the sidewalk is constructed by the applicant and accepted by the city.

10.303.7. Internal Pedestrian Circulation

10.303.7.1 Applicability

The following standards apply to all nonresidential development.

10.303.7.2 Internal Walkways

Internal walkways extending the full length of a building shall be provided along all façades or walls featuring a customer entrance and along all façades abutting public parking areas. Internal walkways shall be placed at least 6 feet or more from the façade or wall along at least 30% of its length, to provide beds for foundation landscaping, outdoor seating and patios, and building articulation. Sidewalks are not required in service areas.

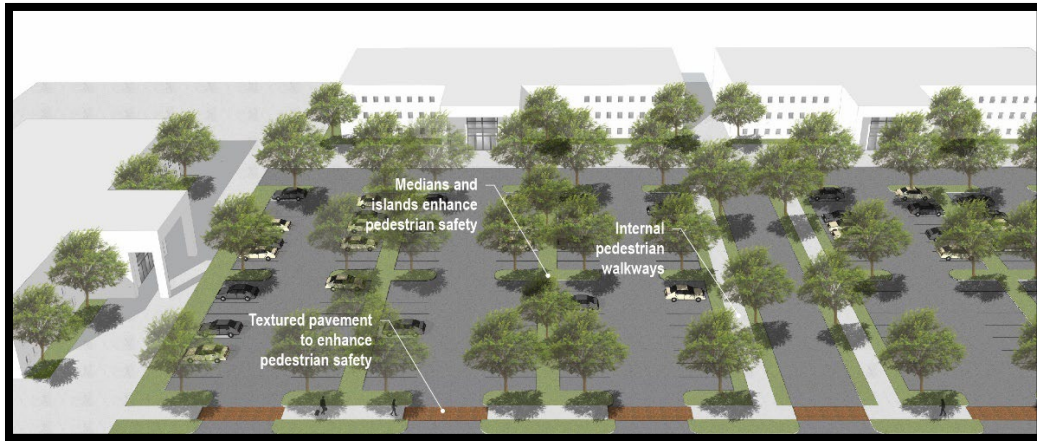
10.303.7.3 Pedestrian Connectivity

Connecting walkways, at least five (5) feet wide shall link sidewalks with building entries through parking areas, all points in the development, and buildings on adjacent parcels. Circulation patterns shall be as obvious and simple as possible. All likely pedestrian routes shall be considered in the design phase of a development to prevent shortcuts through parking and landscape areas. An internal pedestrian walkway at least 5 feet wide shall be provided from the perimeter public sidewalk to the primary public entrance.

10.303.7.4 Conflict Points

Internal pedestrian walkways within parking and vehicular areas shall be visually or physically distinguished from driving surfaces using textured pavement, pedestrian tables, bump-outs, or similar features. These elements emphasize conflict points and enhance pedestrian safety (see Figure 303.7-1).

Figure 303.7-1: Well-Defined Conflict Points



10.303.7.5 Aggregation of Plazas

Pedestrian areas and plazas shall be aggregated, and not distributed in low impact areas such as building peripheries, areas behind structures, or where they are barely visible.

10.303.7.6 Orientation of Plazas

Pedestrian areas and plazas shall be oriented to views of activities, architectural landmarks or distinctive natural land forms wherever possible.

10.303.8. Signature Elements

Primary vehicular entrances to businesses, office and industrial parks, shopping and commercial centers, on sites at least ten (10) acres, shall include one or more signature elements. A signature element should link the project design to Hutto's heritage and culture and shall be approved by the Director of Development Services. Examples of signature elements include:

- (a) Public art.

Figure 303.8-1 Public Art Example



Creative features that reflect the City's branding, such as silos or hippos.

Figure 303.8-2 City Branding Example - Silos



Figure 303.8-3 City Branding Example - Hippo



- (b) Water features, such as a water fountain or waterfall.

Figure 303.8-4 Water Feature Example



- (c) Clock or bell tower.

Figure 303.8-5 Clock Tower Example



10.303.8.2 Signature Element Design Criteria

Signature elements shall meet the following design criteria:

- (a) Scale

The signature element shall be appropriately scaled to the size and height of the primary buildings on the site. It shall serve as a focal point and be clearly visible from primary vehicular entrances and adjacent streets.

(b) Material

Materials used for signature elements shall be durable and consistent with the architectural style of the development.

(c) Placement

- (1) Signature elements shall be positioned at primary vehicular entrances and shall not obstruct pedestrian or vehicular circulation. Signature elements shall also integrate with the surrounding landscaping features to create a cohesive design.
- (2) Signature elements shall not encroach setback requirements to the maximum extent practicable. The Director of Development Services may approve an encroachment, provided that the element is not located within any required easement.

10.303.9. Utilities

10.303.9.1 Utility Lines

For utility line standards refer to Division A, Section 1 of the Hutto Engineering Design Manual.

10.303.10. Service Areas

10.303.10.1 Applicability

These standards apply to all nonresidential developments except in the M district.

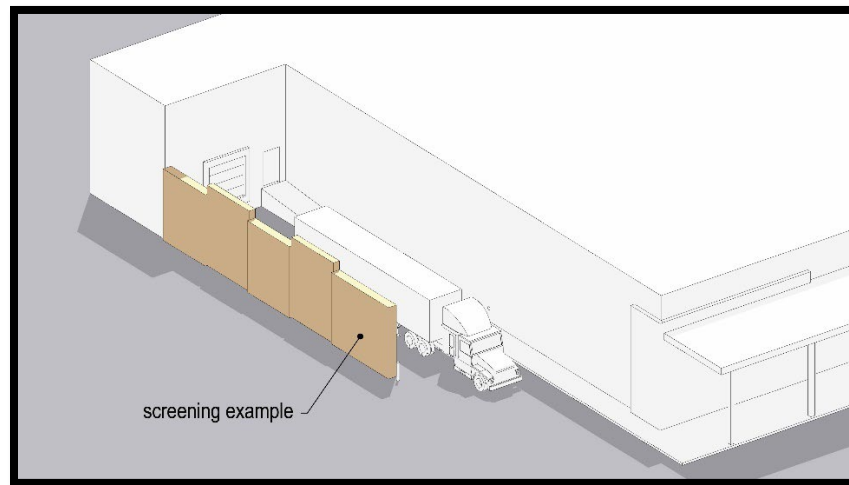
10.303.10.2 Orientation

- (a) Service entrances, loading docks, off-street loading areas, waste disposal areas and similar uses shall be oriented toward service roads and away from the public right-of-way and residential areas, unless fully screened.
- (b) Service areas cannot be placed where they will be readily visible from adjacent buildings or where they will harm important or identified view corridors.

10.303.10.3 Screening

Service entrances, loading docks, off-street loading areas, waste disposal areas and similar uses shall be screened from view of residential districts, public rights-of-way, pedestrian gathering areas and primary entrances. Screening is also required for drive-through aisles and mechanical commercial uses located within one hundred fifty (150) ft of residential zoning districts. Acceptable screening methods include wing walls, landscape screens, building orientation changes, or fencing, all of which is compatible with the architectural theme of the main building (see Figure 303.10-1).

Figure 303.10-1: Loading Dock Screening Illustration



10.303.10.4 Dumpster Enclosures

Dumpster enclosures shall be located at least twenty-five (25) feet from residential zoning districts and fully screened from any public area and public rights-of-way. Enclosures shall be placed to the rear of the property to the extent possible and include a solid metal gate to remain closed except when in use. For dumpster enclosure design requirements, refer to Section 10.307.4 of this Chapter.

10.303.10.5 Vehicle Service Bays

Vehicle service bays and loading area garage doors shall be oriented away from all residential zoning districts, public areas, and public rights-of-way unless they are oriented perpendicularly or separated by a building or masonry screening wall at least the height of the service bays. Screening walls separating service bays from a residential district shall be of masonry material with no openings.

10.303.10.6 Coordination of Service Area Locations

Service area location shall be coordinated with adjacent developments wherever possible, so shared service drives can be used.

10.303.10.7 Access Routes

- (a) Service circulation in a development shall be designed to provide safe movement for anticipated vehicles.
- (b) Fire lanes and routes for service, emergency and utility access shall be clearly marked.

10.303.10.8 Gas Tank Vent Pipes

Tank vent pipes shall be screened, placed in an inconspicuous location and painted a dark color, or integrated into the building architecture.

10.303.11. Water Bodies and Retention Areas

10.303.11.1 Project Incorporation

Natural and manmade water bodies at least twenty thousand (20,000) square feet placed next to a public right-of-way shall be integrated into the overall design of a project in one of the following ways:

- (a) Provide a walkway at least eight (8) feet wide, with native tall trees on average twenty-five (25) feet centers, and shaded benches or picnic tables every one hundred fifty (150) linear feet.
- (b) Provide a public access pier with covered structure and seating, and appropriate pedestrian access.
- (c) Provide a plaza or courtyard at least two hundred (200) square feet with shaded benches and/or picnic tables next to the water body.

10.303.11.2 Slope

- (a) Retention basins shall be designed with at least 5:1 side slopes to two (2) feet below the normal water line.
- (b) Fenced retention basins will only be approved in extreme situations and will be placed to the side and/or rear of the parcel as far from the public right-of-way as possible.

10.303.12. Land Disturbance

New development shall maintain the natural topography of the site to minimize water runoff. The layout shall follow the land's natural contours to the maximum extent practicable. Extensive grading or the use of large retaining walls to enforce a design that does not align with the site's natural features is not permitted. Any grading or modifications, including berms and swales, shall be designed to integrate with the natural landscape, providing smooth transitions between changes in slope. The Director of Development Services has the authority to adjust these requirements as needed for individual cases.

10.303.13. Defensible Space

- (a) New development and related open space shall be designed to facilitate principles of Crime Prevention Through Environmental Design (CPTED). CPTED strategies include natural territorial reinforcement, natural surveillance, natural access control, maintenance and activity support.
- (b) CPTED operates on four (4) essential principles:
 - (1) Natural Surveillance

People are less likely to commit a crime if they think someone will see them do it. Lighting, landscaping, and building transparency can play large roles in maximizing natural surveillance.
 - (2) Natural Access Control

Aim to direct the flow of people to minimize the opportunity for crime. Rather than rely strictly on keeping intruders out with fences, etc., the design of walkways, signs, and building design play important roles in this.

(3) Territorial Reinforcement

Clearly distinguishing public spaces from private spaces can enhance the public's perceived proprietorship on a space. Physical design elements such as pavement treatment, landscaping, and signage can provide this reinforcement.

(4) Maintenance

If one broken window or nuisance is allowed to exist, more will likely follow. Maintenance codes and private covenants can provide beneficial safeguards against such issues.

10.304. Parking and Access

10.304.1. Intent

The on-site vehicular circulation and parking system is a critical factor in the safety and success of a development. The parking/access/circulation system shall provide safe, efficient, convenient, and functional movement of multiple modes of transportation both on and off site where pedestrian/bicycle/vehicle conflicts are minimized. However, site planning that considers only the convenience of drivers can result in a dysfunctional built environment centered entirely on the motor vehicle; garagescapes and large seas of parking, for example.

Parking standards are intended to ensure vehicles are accommodated in the built environment, but their presence does not dominate it.

10.304.2. Applicability

This section applies in the following areas:

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	No

10.304.3. General Standards

10.304.3.1 Applicability

Parking, access and design standards apply to all uses, unless otherwise stated. Vehicle display and storage areas at vehicle dealers, vehicle repair businesses and vehicle storage facilities, and areas intended for the storage or movement of vehicles on industrial sites are not exempt.

10.304.3.2 Large Vehicles and Equipment

Outdoor storage or overnight parking of semi-trucks, semi-trailers, and other vehicles having a gross vehicle weight rating of at least seventeen thousand (17,000) pounds is prohibited in residential and commercial districts.

- (a) Exceptions are pickup trucks, personal recreational vehicles not being used for habitation, and vehicles associated with a business on a commercial site. Further regulations on large vehicles and equipment can be found in Chapter 22, Article 22.04 of the Hutto Code of Ordinances.

- (b) Construction equipment may only be stored on lots in residential and commercial districts while construction is permitted.

10.304.4. Access

10.304.4.1 Shared Access

- (a) Shared and master planned access, secondary roads and/or access easements across parcels will be required where considered necessary by Development Services staff and/or City Engineer to minimize potential congestion, decrease accident potential and reduce the number of curb cuts and conflict points along a street.
- (b) Developments shall be designed to provide for shared access with adjacent commercial and industrial parcels with a reduction of curb cuts along public right-of-way. Provisions shall be made for connection of pedestrian and vehicle circulation systems with adjacent parcels.
- (c) Property owners cannot block access to parking lot connections on adjacent parcels.

10.304.4.2 Curb Cuts

Refer to Division B, Section 13 of the Hutto Engineering Design Manual.

10.304.4.3 Driveway Throats

Refer to Division B, Section 12 of the Hutto Engineering Design Manual.

10.304.4.4 Emergency Access

Site design elements shall reasonably accommodate access standards of emergency vehicles and services. Designated fire lanes shall serve as dedicated mutual access easements, facilitating unimpeded movement between private properties for emergency vehicles.

10.304.4.5 Service Functions

Service functions shall be integrated into the circulation pattern in a way that minimizes interaction with customer vehicles and pedestrians.

10.304.4.6 Connectivity for Multifamily Residential Developments

Multifamily residential developments shall not be planned as “pods” isolated from surrounding development but instead shall be integrated into the larger grid of public streets and private access driveways. Multifamily developments shall have pedestrian and vehicular connections to adjacent residential development, and where practical, adjacent commercial development.

10.304.5. Circulation

10.304.5.1 Circulation Routes

- (a) Circulation and parking areas in a development shall be designed to be safe, efficient, and attractive, considering use by all modes of transportation.
- (b) Parking lots shall provide well-defined circulation routes for vehicles, bicycles and pedestrians.
- (c) Circulation routes shall focus on main entries and exits and identify secondary access points.

- (d) The inclusion of multiple pathways or routes for vehicles, bicycles and pedestrians within the development, cannot reduce land available for landscaping or walkways.
- (e) Vehicle circulation paths shall be designed and sited to calm traffic Horizontal deflection and psychological traffic calming (traffic circles, corner neckdowns, chicanes, tapers, pedestrian tables, speed humps, landscape medians, small turn radii, decorative paving) are encouraged.

10.304.5.2 Safety and Conflict Points

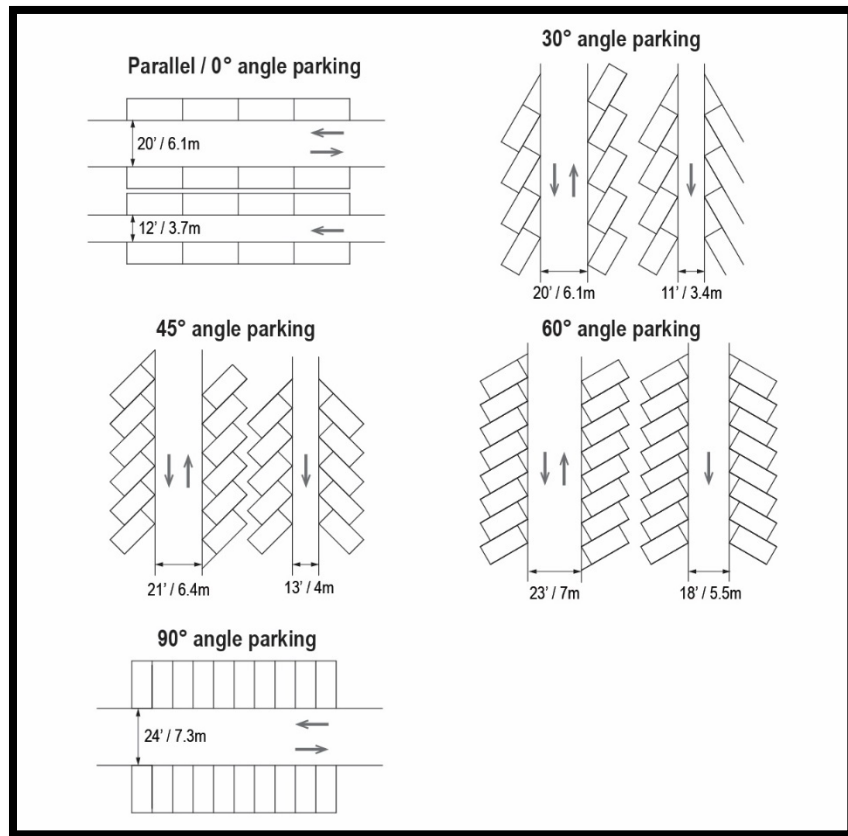
- (a) Circulation areas shall be designed so vehicles can proceed safely without posing a danger to pedestrians or other vehicles, and without interfering with parking areas. Standard traffic control devices and signs shall be used to direct traffic where necessary.
- (b) To the maximum extent practicable, pedestrians and vehicles shall be separated through walkways or sidewalks. Where complete separation of pedestrians and vehicles is not possible, landscaping, bollards, decorative paving, lighting and other permanent methods shall be used to delineate pedestrian areas and other conflict points.

10.304.6. Parking Aisles

10.304.6.1 Aisle and Curb Cut Dimensions

- (a) Access drive lanes and aisles shall have the following widths (excluding added width from curb return areas) at the property line:
 - (1) Residential driveway: 12 feet – 20 feet.
 - (2) Residential parking lot: 12 feet – 14 feet one way, 20 feet – 24 feet two way.
 - (3) Nonresidential parking lots to 99 spaces: 15 feet one way, 20 feet – 36 feet two way.
- (b) Parking area aisles shall have these minimum widths (see Figure 304.6-1):
 - (1) Angle 0° / parallel to aisle: at least 12 feet one way, at least 20 feet two way.
 - (2) Angle 30°: at least 11 feet one way, at least 20 feet two way.
 - (3) Angle 45°: at least 13 feet one way, at least 21 feet two way.
 - (4) Angle 60°: at least 18 feet one way, at least 23 feet two way.
 - (5) Angle 90°: at least 24 feet.

Figure 304.6-1: Parking Area Aisle Dimensional Standards

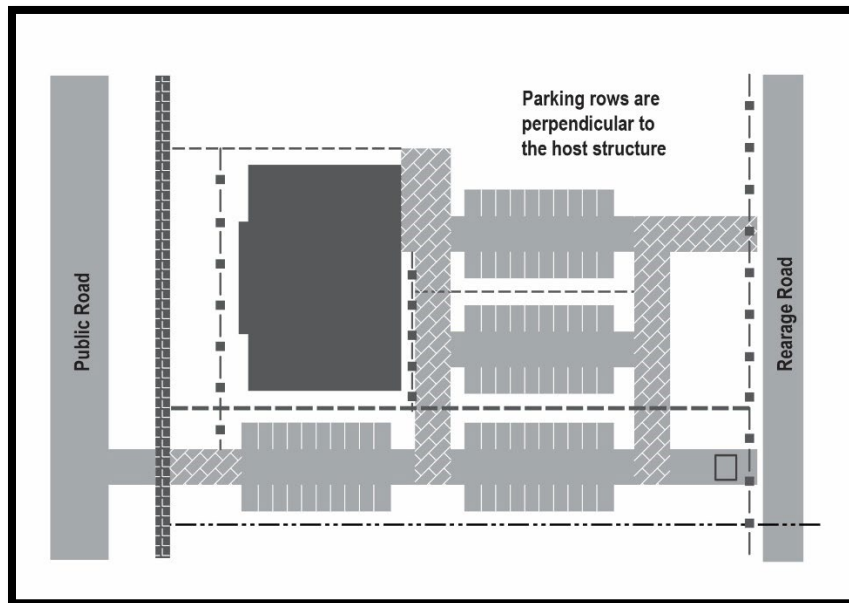


- (c) Drive aisles functioning as fire lanes shall comply with the width and construction requirements of aerial fire apparatus access roads under the City's adopted fire code.

10.304.6.2 Aisle Orientation

In large parking lots, parking aisles shall be oriented perpendicular to buildings where possible in order to minimize the need for pedestrians to walk parallel to moving cars and across landscaped areas (see Figure 304.6-2).

Figure 304.6-2: Parking Aisle Orientation



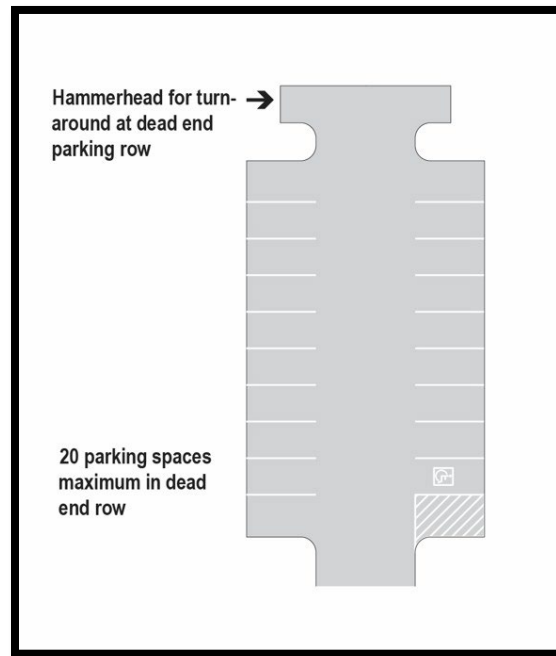
10.304.6.3 Mixture of Angles and One-Way and Two-Way Aisles

Mixture of one-way and two-way parking aisles, or different degrees of angled parking in a parking area is prohibited, except when individual parking areas are separated by a landscaped buffer at least 5 feet wide, with limited access.

10.304.6.4 Dead End Aisles

- (a) Dead end aisles shall be avoided wherever possible. Where a dead end aisle is unavoidable, adequate space for unimpeded turn-around shall be provided.
- (b) Dead end aisles may not exceed 150 ft in length measured along the centerline of the aisle.
- (c) Refer to Figure 304.6-3 for further guidance.

Figure 304.6-3: Dead End Parking Aisle Illustration



10.304.6.5 Head-in/Head-out and Parallel Parking from the Public Right-of-Way

Parking areas shall be designed so vehicles can leave without backing or fronting out onto a public street or having to reenter a public street to access another aisle on the same lot. Driveways for individual dwelling units are exempted.

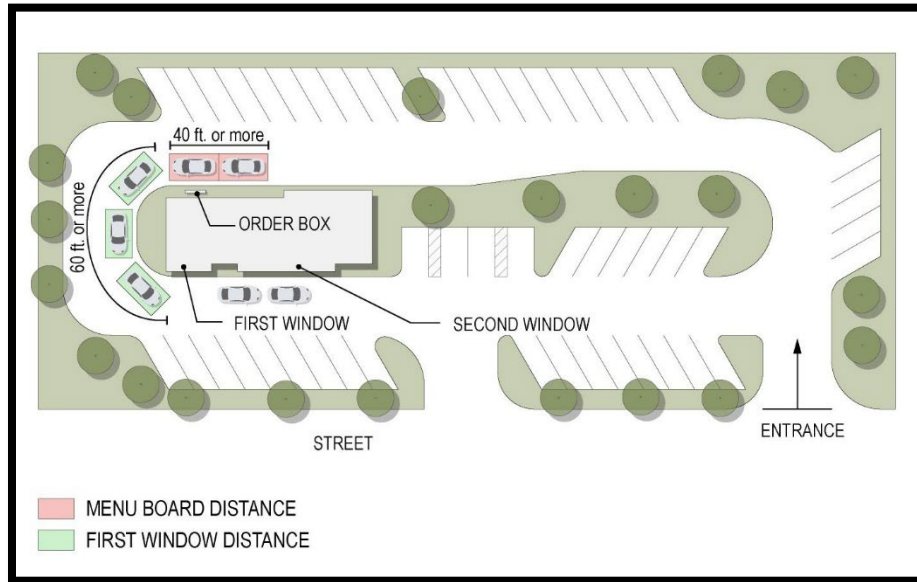
10.304.7. Stacking/Queuing Areas

10.304.7.1 Drive-Through Aisles

- (a) Off-street stacking lanes for drive-through aisles shall be provided as follows:
 - (1) Bank teller window, ATM: at least sixty (60) feet measured from teller, window or ATM.
 - (2) Restaurant drive-through: at least forty (40) feet measured from order box, at least sixty (60) feet between order box and first payment or pick-up window.
 - (3) Car wash: at least sixty (60) feet measured from the wash bay entrance.
 - (4) Other uses with drive-through windows (pharmacy, dry cleaners, etc.): at least sixty (60) feet measured from window.
 - (5) A stacking space shall be an area on a site measuring nine (9) feet by twenty (20) feet with direct forward access to a service window or station of a drive-through facility.
- (b) Drive-through aisles shall be physically separated from parking and circulation areas, and:
 - (1) Cannot interfere with the on-site parking and circulation for other vehicles on the site.

- (2) Cannot interfere with on-site parking.
 - (3) Cannot result in traffic queuing into a drive aisle, adjacent property or street.
 - (4) An escape lane shall be an area measuring a minimum of ten (10) feet wide that provides access around the drive-through facility. An escape lane may be part of a circulation aisle.
- (c) Drive-through aisles, elements and windows cannot be on a street-facing side of the building.

Figure 304.7-1 Restaurant Drive-Through Illustration



10.304.7.2 Gas Pumps and Electric Vehicle Charging (EVC) Stations

(a) Gas Pumps

There shall be at least twenty (20) feet space for one vehicle stacked behind the vehicle at the far end of a row of gas pumps, and room for other vehicles to bypass stacked vehicles at fueling areas.

(b) EVC Stations

Each charging station space shall be a minimum of nine (9) feet wide by eighteen (18) feet long, with adequate access for vehicles to maneuver without obstructing traffic flow or stacking areas for gas pumps.

10.304.8. Parking and Loading Space Bulk Standards

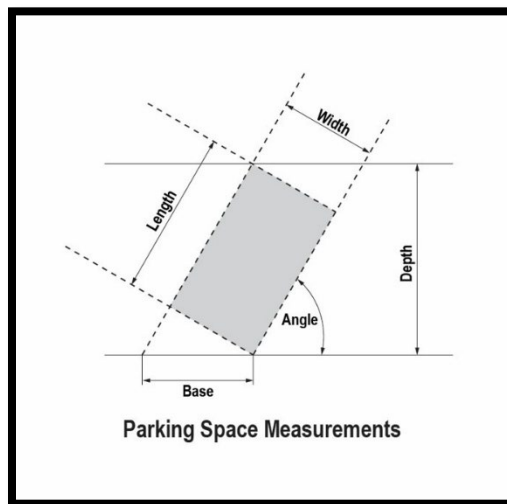
10.304.8.1 Parking Space Dimensions

Parking spaces shall have the dimensions outlined in Table 304-1 and illustrated in Figure 304.8-1.

Table 304-1: Minimum Parking Space Dimensions

Type Of Parking Space	Minimum Dimensions
Standard parking space	9 feet x 18 feet
Standard parallel parking space	7 feet x 23 feet
Motorcycle space	4.5 feet x 9 feet
Off-street loading space	12 feet x 25 feet
Bicycle space	Stationary fixture allowing users to secure both wheels and the bicycle frame using a 6 feet cable and lock. Options include: - Freestanding bicycle rack - Wall-mounted bracket - Enclosed bicycle locker - Three point bicycle rack - Fenced, covered, locked or guarded bicycle storage area

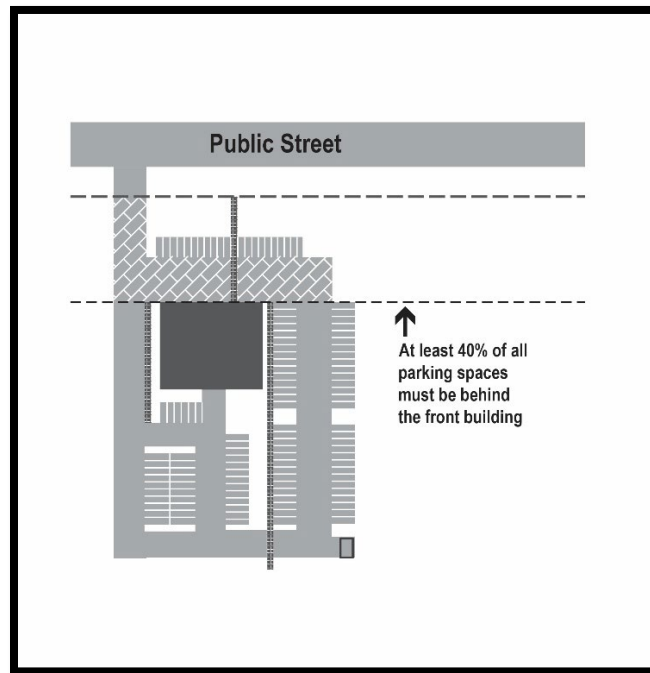
Figure 304.8-1: Parking Space Dimensional Standards



10.304.8.2 Parking Space Location

- Parking for non-residential uses on non-corner lots shall have at least forty percent (40%) of the parking spaces placed behind the front building line (see Figure 304.8-2).
- Parking for non-residential projects on corner lots shall have at least thirty percent (30%) of the parking spaces placed behind the front building line.

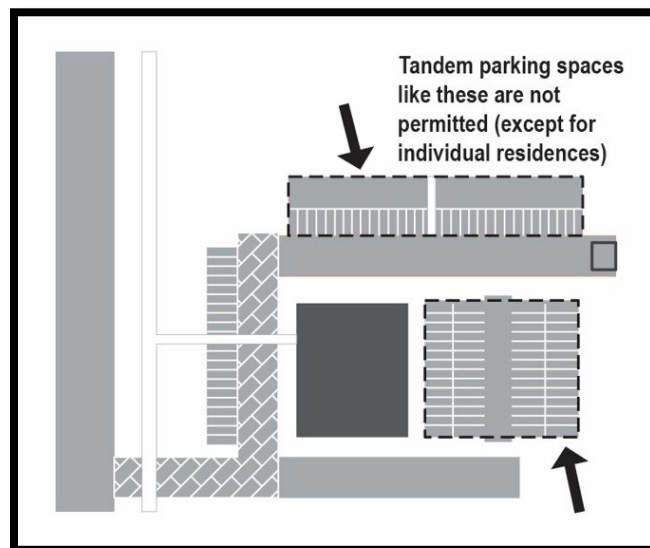
Figure 304.8-2: Parking Space Location Illustration



10.304.8.3 Tandem Parking

Tandem parking spaces, where the only access to a parking space is from another parking space, are permitted only for individual residential units. For further information see Figure 304.8-3.

Figure 304.8-3: Tandem Parking Dimensional Standards



~~10.304.8.4~~ Residential Lot Coverage

Parking and driveway areas may cover no more than thirty-three percent (33%) of the front yard or no more than fifty percent (50%) of the front yard at the end of a cul-de-sac of single-family detached, zero lot line, single family attached, duplex or multiplex uses.

10.304.9. Parking and Loading Space Number Standards

10.304.9.1 Required Parking Spaces

Uses shall offer the minimum amount of parking that is necessary to meet anticipated normal demand. The number of required off-street parking spaces for a use is found in Table 304-2.

Table 304-2: Minimum Number of Required Parking Spaces

Agricultural use classification	Required spaces (minimum)
Agricultural use	1 per dwelling

Residential use classification	Required spaces (minimum)
Accessory dwelling unit	1 per dwelling
Assisted living facility	1/10 Enrolled 1 per Employee
Boarding and rooming house	1/10 Enrolled 1 per Employee
Dwelling unit: attached single-family	2 per dwelling
Dwelling, detached single-family unit	2 per dwelling in garage, 2 in driveway
Dwelling, duplex	2 per dwelling
Dwelling, live-work	2 per dwelling
Dwelling, multifamily	1 per dwelling Visitor spaces equal to 10% of all parking spaces
Dwelling, multiplex	1 per dwelling
Dwelling, zero-lot line single-family	2 per dwelling
Group home	1/10 Enrolled 1 per Employee

Halfway house	1/1,000 SF GFA
Independent living facility	1/10 Enrolled 1 per Employee Visitor spaces equal to 10% of all parking spaces
Nursing home	1/10 Enrolled 1 per Employee

Commercial and retail use classification	Required spaces (minimum)
Adult-oriented business	1/500 SF GFA
Banks and Financial Institutions	
Campground, recreational vehicle park	
Car wash	
Club/lodge facility	
Convenience store	
Convenience store: with gasoline sales	
Day care, child (1-6 children)	1/10 Enrolled 1 per Employee
Day care, child (greater than 6 children)	
Day care, adult (1-4 persons)	
Day care, adult (greater than 4 persons)	
Day care, pet	1/500 SF GFA
Entertainment facility, theater	
Farm product sales	
Food catering	
Funeral home	
Kennel	

Large item sales and rental: class 1	
Large item sales and rental: class 2	
Lodging, hotel	
Lodging, motel	
Lodging, bed and breakfast	
Nightclub	
Office	
Personal and business service	
Recreation facility, indoor	
Recreation facility, outdoor	
Restaurant, bar	
Retail store (no more than 5,000 SF)	
Retail store (greater than 5,000 SF)	
Personal load services	
Travel plaza, truck stop	
Veterinary clinic	

Industrial use classification	Required spaces (minimum)
Data Center	1/5,000 SF GFA
Industrial use, general	1/1,000 SF GFA
Industrial use, heavy	1/1,000 SF GFA
Industrial use, light	1/1,000 SF GFA
Research laboratory	1/1,000 SF GFA
Self-storage facility	1/1,000 SF GFA
Trade use	1/1,000 SF GFA
Vehicle minor repair facility	1/1,000 SF GFA
Vehicle major repair facility	1/1,000 SF GFA
Vehicle storage facility	1/1,000 SF GFA

Warehouse and distribution facility	1,2,000 SF GFA
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Institutional use classification	Required spaces (minimum)
Amenity center	1/500 SF GFA indoor space 1/ 2,500 SF GFA outdoor activity space
Aquatic facility	1/500 SF GFA
Athletic facility	1/500 SF GFA indoor space 1/ 2,500 SF GFA outdoor activity space
Cemetery	No requirements
Community facility	1/500 SF GFA indoor space 1/ 2,500 SF GFA outdoor activity space
Golf course	1/500 SF GFA indoor space 3/hole
Hospital	1/500 SF GFA
Park	1/ 2,500 SF GFA outdoor activity
Park and ride lot (as principal use)	No requirements
Public utility substation	No requirements
Religious land use or assembly	1/500 SF GFA
School: no more than 5 students	2.5/ 1,000 SF GFA
School: at least 6 students	2.5/1,000 SF GFA

Temporary use classification	Required spaces (minimum)
All temporary use classifications described in 10.204.9	No requirements

Accessory use classification	Required spaces (minimum)
Antenna, radio hobbyist (no more than max hgt in district)	No requirements
Antenna radio hobbyist (greater than max hgt in district)	No requirements
Antenna, non-residential use: no more than 15 feet above roofline	No requirements
Antenna, non-residential use: other	No requirements
Fueling station	1 per 2 pumps
Wireless facility: attached	No requirements
Wireless facility: concealed	No requirements
Wireless facility: freestanding	No requirements
Donation drop-off box	No requirements
Drive-through facility	Refer to stacking/queuing area standards
Home occupation	1 per dwelling
Residential accessory structure	No requirements
Satellite dish	No requirements
Swimming pool	No requirements
Vending machine (outdoor)	No requirements
Freestanding cisterns	No requirements
Wind energy system	No requirements

10.304.9.2 ADA Compliance

All ADA parking spaces and related ADA accessibility features are required to be installed in accordance with the current edition of the ADA Standards for Accessible Design (the “ADA Standards”) as published by the Department of Justice. Where discrepancies exist between this UDC and the ADA Standards, the ADA Standards shall apply. All required parking shall meet the ADA Standards.

10.304.9.3 Motorcycle Parking Spaces

One or more motorcycle parking spaces shall be provided for every one hundred (100) standard vehicle parking spaces provided for non-residential uses, when the parking lot has greater than fifty (50) spaces.

10.304.9.4 Minimum Required Loading Spaces

The required number of off-street loading spaces is determined by gross floor area. Outdoor storage, sales, or display areas shall be added to the gross floor area if these areas contain materials that are received or distributed by trucks (Display areas for an Auto Dealership are excluded from this calculation). If a development has more than two uses, the off-street loading space requirement is the highest number of spaces required by a single use. Required loading spaces follow the standards prescribed in Table 304-3.

Table 304-3: Minimum Required Loading Space

Building Square Footage	Loading Spaces Required
0 – 10,000	0
10,001 – 50,000	1
50,001 – 100,000	2
100,001 – 200,000	3
Each additional 100,000	1 additional

10.304.9.5 Bicycle Parking

- (a) One or more bicycle parking spaces shall be provided for every twenty (20) vehicle parking spaces required as a minimum for non-residential uses. Bicycle parking design shall follow standards recommended by the Association of Professional and Bicycle Professionals.
- (b) A reduction in the minimum required automobile parking may be allowed equal to one automobile parking space for each two bicycle parking spaces provided. Additional bicycle parking spaces provided above the required number may not reduce the required number of automobile parking spaces by more than thirty-five (35%) percent.

10.304.9.6 Adjustments and Reduction to Parking Requirements

(a) Generally

- (1) In specific instances established below, the Director of Development Services may approve a reduction in the required parking spaces. Applications for a reduction shall include the following information:
 - (A) A parking study that substantiates the need for a reduced number of spaces; and
 - (B) A plan showing how the parking spaces are provided on the site.
- (2) Multiple parking adjustments and reductions may be used.
- (3) The maximum required parking reduction shall not total more than thirty-five (35%) unless specifically authorized in this Section.

(b) Adjustments and Reductions by the Director of Development Services

(1) Shared Parking

- (A) Where different non-residential uses create staggered parking demand periods, shared parking calculations among adjacent parcels may be used to justify reducing the amount of required parking.
- (B) With the approval of a site plan, off-street parking facilities for different buildings, structures, or uses, or for mixed uses, may be provided and used collectively or jointly in any zoning district in which separate off-street parking facilities for each constituent use would be permitted, subject to the following provisions:
 - (i) A legally sufficient written agreement assuring the perpetual joint usage of the common parking for the combination of uses or buildings is properly drawn and executed by the parties concerned, approved as to form and execution by the City Attorney, and filed with and made part of the application for a Site Plan for new construction or Certificate of Occupancy for existing buildings.
 - (ii) Up to 60% of the parking spaces required for places of entertainment or for a religious facility may be provided and shared by banks, offices, and similar uses not normally open, used, or operated during evening hours if specifically approved by the Planning and Zoning Commission.
 - (iii) Additional parking shall be obtained by the owners if the City determines that such shared use results in a public nuisance by providing an inadequate number of parking spaces or otherwise adversely affecting the public health, safety, or welfare.

(2) Captive Market

Parking requirements for retail and restaurant uses may be reduced up to twenty-five (25%) where it can be determined that some portion of the patronage of these businesses comes from other uses (i.e., employees of

area offices patronizing restaurants) located within the same building or a maximum walking distance of five hundred (500) feet.

(3) On-Street Parking

Designated on-street parking spaces located no more than two hundred (200) feet from the main entrance of a building with a commercial use may be counted towards the required parking spaces for a use in the Neighborhood Village (Historic) District and Commerce Corridor District. On-street parking counted toward the required parking for any use or business shall not encroach into residential areas.

(4) Mixed Use District Parking

Any new development in the Mixed-Use (MU-1 and MU-2) Districts may apply a fifteen percent (15%) reduction to the required parking ratio established in the Use Table for that particular use.

(5) Neighborhood Village District (Historic) Parking

Any new development in the Neighborhood Village District (Historic) may apply a twenty-five (25%) reduction to the required parking ratio established in the Use Table for that applicable use.

Required parking for a restaurant with drive-through service and no dine-in seating and carryout orders may be reduced as long as three parking spaces or more are provided.

(c) Adjustments and Reductions by City Council

- (1) The City Council may reduce the parking requirements by thirty-five percent (35%).
- (2) The City Council may reduce parking if the applicant can clearly demonstrate that the required parking provisions create unnecessary hardship due to the particular nature or conditions of the proposed use.

10.304.9.7 Building or Use Enlargement

When a building or use is enlarged twenty-five percent (25%) or more, additional parking and loading spaces shall be provided based on the enlargement in compliance with the minimum required spaces.

10.304.9.8 Space Computation and Fractions

Fractional results will be rounded up when computing the number of required parking and loading spaces.

10.304.10. Development Standards

10.304.10.1 Surface standards and paving materials

(a) Permanent Surfacing

- (1) Parking and loading areas shall have a permanent surface of concrete, brick, paver blocks, stamped concrete, or a solid surface of similar or better durability and performance characteristics.

- (2) Porous pavement and concrete may be used for individual parking spaces and lightly used drive aisles. Porous pavement and concrete is discouraged for busy drive aisles, service drives and truck/freight loading areas. Porous pavement cannot be used for handicapped parking spaces.
- (b) Permanent Surfacing Exception: Single and Two Household Dwellings
 - (1) Porous pavement may be used as a parking surface for single and two household dwellings.
 - (2) Driveways may have a “Hollywood driveway” design, where the driving surface is broken up into paved tracks at least two and a half (2.5) feet wide for the wheels, separated by a three (3) foot planted strip (see Figure 304.10-1)
 - (3) Parking on an unpaved surface is prohibited.

Figure 304.10-1: Hollywood Driveway



- (c) Permanent Surfacing Exception: Temporary Uses

Permanent parking surfaces are not required for temporary uses. A parking plan shall be approved for temporary uses, subject to Development Services staff review.

10.304.10.2 Grading and Drainage

Parking and loading areas shall be graded and drained to dispose of all surface water, in conformance to the approved drainage plan for the site.

10.304.10.3 Markings

- (a) Parking spaces, motorcycle parking spaces, aisles, entryways, loading spaces and queue spaces surfaced in permanent materials shall be marked to show their location.
- (b) Handicapped parking spaces shall be marked with the international symbol of accessibility on the space and on a sign at the head of the parking space.

- (c) Parking space markings for one, two and three household dwellings are not required.

10.304.10.4 Shopping Cart Return Areas

Shopping cart return areas shall be defined by landscaping and curbs.

10.305. Architectural Design

10.305.1. Intent

Architecture is a major contributing factor to Hutto's unique sense of place. Architectural design regulations are intended to promote quality architecture and preserve the City's sense of place.

10.305.2. Applicability

This section applies in the following areas:

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	No

10.305.3. Detached Single Family, Attached Single-Family, Zero Lot Line, Duplex and Multiplex Residence Design

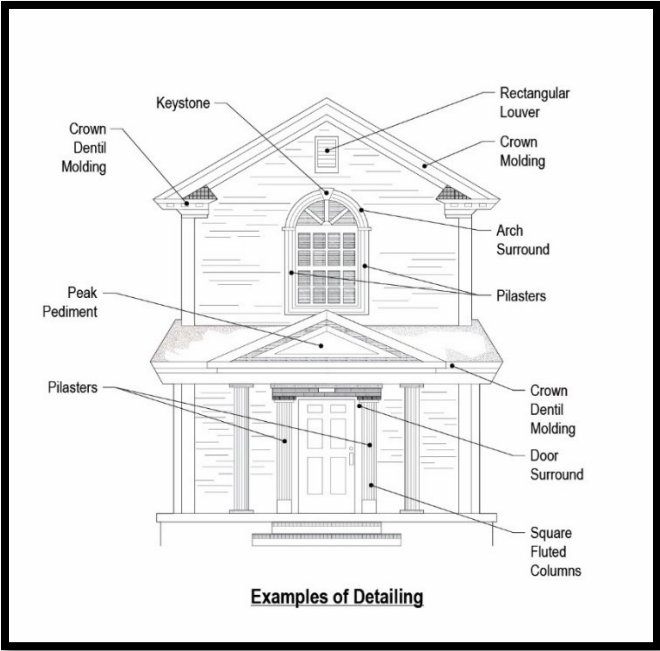
10.305.3.1 Intent

The intent of this section is to enhance Hutto's unique character by requiring interesting, high-quality residential architectural design.

10.305.3.2 Facades

Façades shall be articulated using color or arrangement to emphasize the façade elements. Exterior wall planes may vary in height, depth, or direction. Design elements and detailing shall be continued completely around the structure, including the presence of windows and window treatments (for walls that face the public right-of-way) and trim detailing. Doors and windows shall be detailed to add visual interest to the façade. See Figure 305.3-1 for further guidance.

Figure 305.3-1: Façade Design and Detailing for Single-Family, Duplex and Multiplex Residential Uses

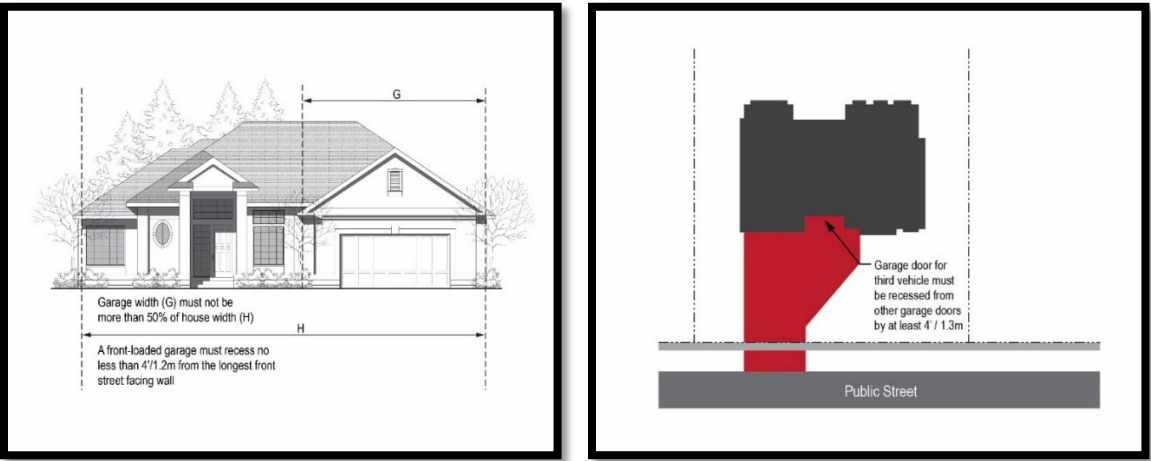


10.305.3.3 Garages

(a) Front Loading Garages

New housing development shall avoid front elevations resulting in a streetscape dominated by the sight of garage doors. A front-loading garage shall recess no less than four (4) feet from the longest front street facing wall (refer to Figure 305.3-2).

Figure 305.3-2: Design Guidelines for Front Loading Garages



10.305.3.4 Repetitive Design

Development of ten or more detached single-family, attached single-family, zero lot line, duplex or multiplex dwellings shall have five or more different elevations, or a number of elevations equal to at least ten percent (10%) of the number of lots in the development phase, whichever is more.

Different trim levels on houses with a nearly identical floor plan are not considered different elevations. Houses of the same elevation, including those with identical, similar or mirrored floor plans, cannot be placed on adjacent lots or directly across the street from each other. Up to six townhomes may be attached in a single row.

10.305.3.5 Mechanical Equipment Screening

- (a) Rooftop equipment is prohibited.
- (b) Ground mounted mechanical equipment (air condition units, etc.) shall be hidden or screened with architecturally integral wing walls or living screening material that will grow to the same height as the equipment being screened or placed where they are not visible from the public right-of-way.
- (c) Solar panels are exempt from mechanical equipment screening standards.

10.305.4. Multifamily Residence Design

10.305.4.1 Intent

These standards are intended to provide a distinctive, quality, consistent, architectural character and style in new multiple household residential development that avoids monotonous and featureless building massing and design, and ensure building design and architectural compatibility in a multi-unit development.

10.305.4.2 Architectural Style

- (a) Distinct groups of buildings shall share a common, identifiable, complementary design or style in a multifamily residential development. This includes non-residential structures in the development such as amenity centers, laundry and maintenance buildings, garages, carports, and dumpster enclosures.
- (b) A multifamily residential structure shall have a single definitive, consistent style. Mixing of various architectural styles on the same building is inappropriate.

10.305.4.3 Form and Mass

- (a) A single, large, dominant building mass should be avoided.
- (b) Multifamily residential building designs should incorporate visually heavier and more massive elements at the building base, and lighter elements above the base.
- (c) Changes in mass should be related to entrances, the integral structure and/or the interior space organization and activities, and not just for cosmetic effect.

10.305.4.4 Exterior Walls

- (a) Pattern
 - (1) Facades shall be articulated with bays, insets, balconies, porches, or stoops related to entrances and windows.
- (b) Long Walls and Facades
 - (1) The maximum length of a multifamily residential building is two hundred (200) feet.

- (2) Wall and roof planes shall include offsets or setbacks of at least four (4) feet in the horizontal plane at intervals no greater than fifty (50) feet.

(c) Building Entries

- (1) Building entries adjacent to a public street, private drive or parking area shall be pedestrian-scaled, expressing human activity or use in relation to building size. Elements such as doors, windows, entranceways corners, setbacks, and offsets can be used to create pedestrian-friendly scale.
- (2) Common balconies on perimeter walls providing access to two or more units are prohibited.

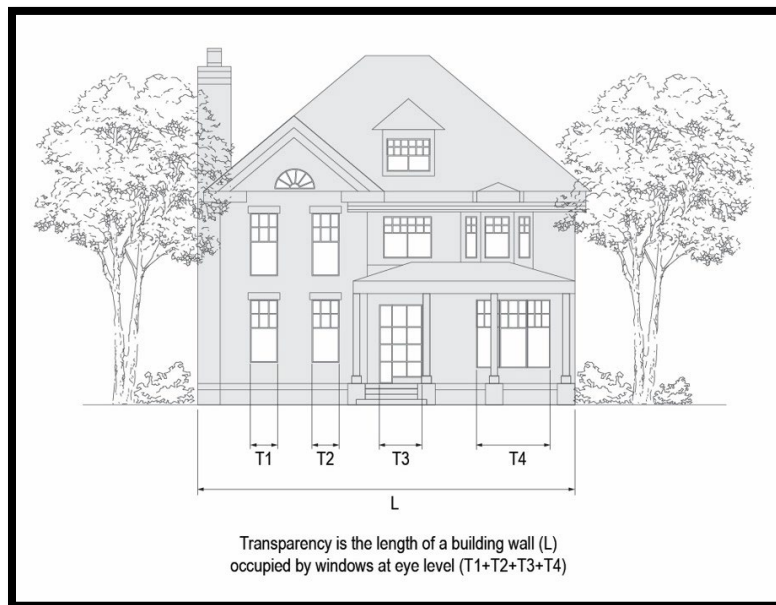
(d) Garage Doors

Front-loading garage doors may comprise no more than fifty percent (50%) of the total length of the front façade of a multifamily residential building's front façade. Every two single-bay garage doors or every double garage door shall be offset by at least four (4) feet from the plane of an adjacent garage door.

(e) Windows and Transparency

- (1) All walls and elevations on all floors of multifamily residential buildings shall have windows, except when necessary to assure privacy for adjacent property owners.
- (2) Windows should be located to maximize the possibility of occupant surveillance of entryways and common areas.
- (3) See Figure 305.4-1 for additional information on building transparency.

Figure 305.4-1: Building Transparency Illustration



(f) Building Roofs

- (1) On buildings with pitched roofs, the minimum roof pitch is 6:12.

- (2) On buildings where flat roofs are the predominant roof type, parapet walls shall vary in height and/or shape at least one every fifty (50) feet along a wall.
- (3) On buildings where sloping roofs are the predominant roof type, each building shall have a variety of roof forms.
- (4) Roof forms shall be designed to correspond and denote building elements and functions such as entrances and arcades.

(g) Mechanical Equipment Screening

- (1) Rooftop mechanical equipment shall be hidden or screened with architecturally integral elements at least as high as the equipment to be screened. Makeshift equipment screen, such as wooden or plastic fences, are prohibited.
- (2) Ground mounted mechanical equipment shall be hidden or screened with architecturally integral wing walls and/or landscaping.
- (3) Solar panels are exempt from mechanical equipment screening standards.

10.305.5. Manufactured Housing Design

10.305.5.1 Intent

Manufactured home design that is aesthetically and spatially similar to site built houses will ensure their compatibility with the existing built environment, and meet the city's goals of providing affordable housing.

10.305.5.2 Design Standards

Manufactured housing shall meet the following minimum standards.

- (a) Minimum living area is six hundred (600) square feet. No outside horizontal dimension shall be less than fourteen (14) feet, except extensions comprising no more than fifty percent (50%) of the total enclosed floor area.
- (b) Houses shall be tied down securely in conformance to applicable regulations before occupancy.
- (c) Houses shall be of adequate quality and safe design, as certified by a label stating the unit is constructed in conformance to the federal Manufactured Home Construction and Safety Standards in effect on the date of manufacture or other applicable standards required by state and federal law. Manufactured houses without certification but meeting all other standards may be accepted as safe and quality construction provided:
 - (1) Electrical material, devices, appliances and equipment are in safe condition.
 - (2) Mechanical systems, including space and water heating, are in safe condition.
 - (3) Plumbing, gas piping, and wastewater systems are in safe condition.
- (d) Houses shall be in sound structural condition. Structures that show evidence of fire damage are not permitted.

- (e) Manufactured houses shall be installed by a party licensed by the State of Texas in conformance to state law, or the frame shall be supported by and tied to a foundation system capable of safely supporting loads imposed as determined by the character of the soil. The minimum acceptable foundation design shall be a series of eight (8) inch grout-filled concrete block piers spaced no more than eight (8) feet on center and bearing on one (1) foot by one (1) foot solid concrete footings. A tie-down and anchoring system separate and apart from the foundation shall be provided as recommended by the manufacturer, if different from the foundation ties.
- (f) Axle and hitch assemblies shall be removed on placement on the foundation.
- (g) Electrical power supply shall be from a meter installation on the building, or from a permanently installed meter.
- (h) Garage and carport additions shall cover a paved parking area, be connected to the street with a paved driveway, and meet setback standards.
- (i) Patio and porch covers are permitted if they cover an improved patio or porch deck and meet setback standards.
- (j) Living area additions shall meet the minimum building setback standards.
- (k) The house shall be sited on level ground. All walls and floors shall be level.

10.305.6. Residential Common Amenity Area

10.305.6.1 Applicability

The provisions of this Section apply to:

- (a) Attached multifamily development;
- (b) Manufactured housing parks; and
- (c) Any development type where three or more dwelling units are located on a single lot or parcel, with each dwelling unit located in a structure with three or more dwelling units.

10.305.6.2 Common Amenity Area Requirements

- (a) The developer shall provide a common amenity area. This amenity area is in addition to any required parkland dedication or open space requirement.
- (b) The amenity area shall be privately constructed, maintained and operated by the developer, residents of the subdivision through an incorporated homeowners association or property owners association, or the owner of the manufactured home lease community, and the person or entity responsible for ownership and maintenance. Operational responsibilities shall be noted on the plat and/or on a separate instrument recorded in the Official Records of Williamson County.

- (c) Common amenity area(s) accessible to all residents shall be provided at the following rate:

Table 305-1: Minimum Common Area Amenities

Number of Dwelling Units	Minimum Number of Amenities
0 - 12	0
13 - 49	1
50 - 99	2
100 - 149	3
150 - 199	4
200 or more	5

- (d) The required amenity area(s) shall be selected from those listed below. Director of Development Services approval shall be required for any amenity types not listed. When more than one amenity is required, they shall differ from one another.
- (1) Playground equipment—The manufacturer shall certify that it meets all commercial recreational safety standards.
 - (2) Picnic areas—Minimum of two (2) tables and two (2) cooking grills per one hundred (100) dwelling units.
 - (3) Trails (walkways or bike trails)—At least the distance of the property's perimeter.
 - (4) Landscaped sitting areas—Minimum of one bench per building in an organized grouping or dispersed throughout development.
 - (5) Fenced dog park—Minimum size of two thousand five hundred (2,500) square feet with a twenty-five (25) foot minimum depth.
 - (6) Private fitness facility.
 - (7) Business center.
 - (8) Sport courts.
 - (9) Clubhouse—To include kitchen and social room for resident use.
 - (10) Swimming pool.
 - (11) Laundry facility.
 - (12) Electric vehicle charging stations.
 - (13) Community garden - Minimum two hundred (200) square feet.
 - (14) After-school center for children.
- (e) The common amenity area shall be designed to adequately serve the number of dwellings within the development, according to accepted City standards set by

the Parks and Recreation Department. All equipment and other improvements shall be of commercial quality and approved by the Director of Parks and Recreation.

- (f) Amenities shall be located so that no primary egress door of a unit is more than five (5) times further from an amenity than the primary egress door of the unit closest to the same amenity. In no case shall the primary egress door of any unit be further than one thousand (1,000) feet from an amenity. Multistory or multifamily buildings with internal corridors may use the primary egress door of the entire building when measuring distance under this requirement.
- (g) At least fifty percent (50%) of the common amenity area shall be located outside the one percent (1%) floodplain.
- (h) Where possible, amenities should provide connections to nearby public amenities including, but not limited to, plazas, public parks, community centers, public libraries, trails, or similar community amenities as determined by the Director of Parks and Recreation.
 - (1) An offsite amenity may count toward one of the required amenity areas if:
 - (A) The development is a horizontal or vertical mixed-use development;
 - (B) At least three (3) public amenities are required;
 - (C) A public amenity is located within a quarter mile of the lot; and
 - (D) Enhanced pedestrian facilities of ten (10) feet or more are provided to connect pedestrians to the amenity.

10.305.7. Commercial, Office, Public, Institutional, and Mixed Use Building Design

10.305.7.1 Intent

Building design shall contribute to Hutto's sense of place by using predominant elements, features, color range and activity areas tailored specifically to the site and its context. Standard formula or prototype building designs shall be modified if necessary to conform to Unified Development Code design standards. In shopping and commercial centers or multiple building developments, individual buildings shall include predominant characteristics shared by all buildings in the development so the development forms a cohesive place.

10.305.7.2 Architectural Style

- (a) Distinct groups of buildings on a site shall share a common, identifiable, complementary design or style. This includes accessory structures such as freestanding canopies, accessory and maintenance buildings, and dumpster enclosures.
- (b) A building shall have a single definitive, consistent style. Mixing of various architectural styles on the same building is discouraged.

10.305.7.3 Form and Mass

A single, large, dominant building mass shall be avoided in new buildings and projects involving changes to the mass of existing buildings. Changes in mass should be related to entrances, tenant spaces, the integral structure and/or the interior space organization and activities, and not just for

cosmetic effect. False fronts incorporating only changes in color and/or parapet treatment are prohibited.

10.305.7.4 Exterior Walls

(a) Base and Top

- (1) Facades and walls shall have a recognizable base with (but not limited to):
 - (A) thicker walls, ledges or sills;
 - (B) planters.
- (2) And a recognizable top with (but not limited to):
 - (A) cornice treatments, other than colored stripes or bands alone;
 - (B) sloping roof with overhangs and brackets;
 - (C) stepped parapets.

Figure 305.7-1: Commercial Building Sloped Roof Design



Figure 305.7-2: Commercial Building Flat Roof Design



(b) Four Sided Design

All walls shall include materials and design characteristics consistent with those on the front (see Figure 305.7-3).

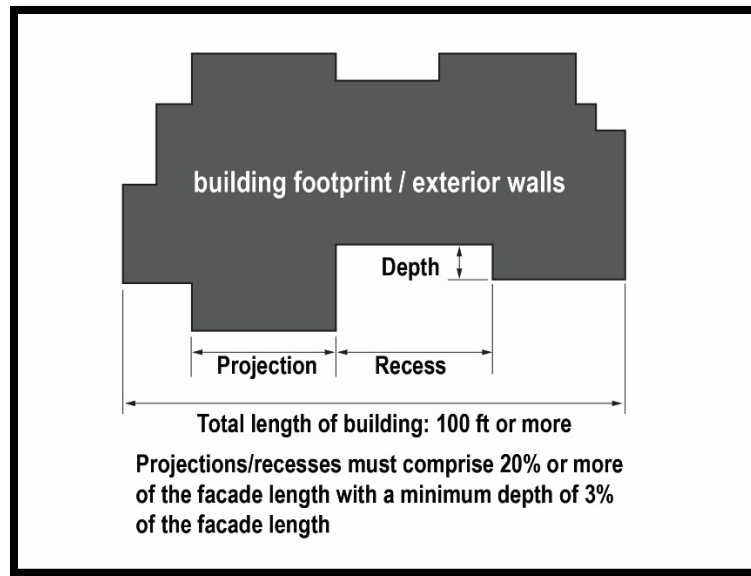
Figure 305.7-3: Four Sided Design



(c) Long Walls and Façades; Projections and Recesses

Walls at least one hundred (100) feet long shall include wall plane projections or recesses having at least three percent (3%) depth of the façade length and extending at least twenty percent (20%) of the façade length (see Figure 305.7-4).

Figure 305.7-4: Commercial Building Exterior Walls: Long Walls & Facades



(d) Exterior Walls

Exterior walls cannot have a blank, uninterrupted length greater than thirty (30) feet without including two or more of these features:

- (1) Change in plane;
- (2) Windows;
- (3) Other equivalent element(s) that subdivide the wall into human scale proportions;
- (4) Side or rear walls may include false windows and door openings defined by frames, sills and lintels, or similarly proportioned modulations, only when actual doors and windows are not possible because of the building use.

(e) Primary Building Entrances

Primary building entrances shall be clearly defined and recessed or framed by a sheltering element such as an awning, arcade, or portico to provide shelter from the sun and inclement weather (See Figure 305.7-5).

Figure 305.7-5: Primary Building Entrance



(f) Retail Building Entrances

Anchor stores, at least twenty-five percent (25%) of the stores in a shopping center; and freestanding, single-use buildings, shall have a clearly defined, highly visible customer entrance with four or more of the following elements:

- (1) Arcades;
- (2) Arches;
- (3) Canopies or porticos;
- (4) Details such as tile work and moldings integrated into the building structure and design;
- (5) Display windows;
- (6) Integral planters or wing walls that include landscaped areas and/or places for sitting;
- (7) Outdoor patios;
- (8) Overhangs;
- (9) Peaked roof forms;
- (10) Raised corniced parapets over the door;
- (11) Recesses and/or projections.

At least 25% of the stores in a shopping center shall also have two or more of the elements listed above. See Figure 305.7-6 for further clarification.

Figure 305.7-6: Retail Building Front Entrance Design Elements



(g) Awnings

Awnings may only be used in detached increments above individual windows, doors, and entries (see Figure 305.7-7).

Figure 305.7-7: Commercial Building Awning Design Standards



(h) Transparency in Commercial Buildings

- (1) At ground level, buildings shall have a high level of transparency. Façades and walls that face the street, pedestrian walkways, plazas, and parking areas (excluding the building rear) shall be transparent between two (2) feet and seven (7) feet above the grade or walkway along at least seventy-five percent (75%) of its length (see Figure 305.7-8)
- (2) Side walls shall be transparent between two (2) feet and seven (7) feet above the grade or walkway along at least twenty-five (25%) of its length.
- (3) Where the internal arrangement of a building makes it impossible to provide transparency along a portion of a wall, a combination of sculptural, mosaic, or bas-relief artwork and transparent window areas or displays may substitute for fifty (50%) of required transparent areas, except when fronting plaza areas.

Figure 305.7-8: Commercial Building Transparency Standards



(i) Garage Doors

- (1) Garage bay doors shall be segmented, with windows covering at least fifty (50%) of the garage surface. Roll-up garage doors are prohibited. Garage doors shall be recessed at least two (2) feet behind the building façade.
- (2) Vehicle service areas and bays shall be screened or sited so visibility from the public right-of-way to the maximum extent practicable. Bay doors cannot face the street or be visible from residential zoning districts.
- (3) Garage bay doors shall be integrated into the overall design of the site with color, texture, and windows (see Figure 305.7-9).

Figure 305.7-9: Commercial Garage Door Design Standards



10.305.7.5 Building Roofs

(a) Roof Form Design

Roof forms shall correspond to and denote building elements and functions such as entrances, arcades, and porches. Roof forms should relate to adjacent buildings or developments.

(b) Required Features

Sloping roofs shall have one of the following features:

- (1) Overhanging eaves, extending at least one and a half (1.5) feet past the supporting walls.
- (2) Sloping roofs that do not exceed the average height of the supporting walls, with an average slope of at least one (1) feet of vertical rise for every three (3) feet of horizontal run and no more than one (1) feet of vertical rise for every one (1) feet of horizontal run.

(c) Roof Lines

The continuous plane of a roof line may be no more than one hundred (100) feet (see Figure 305.7-10).

Figure 305.7-10: Commercial Building Roofline Standards



(d) Drive-Through Areas

Drive-through areas shall be architecturally integrated into the host structure (see Figure 305.7-11).

Figure 305.7-11: Commercial Building Drive-Through Standards



10.305.7.6 Canopies

(a) Architectural Integration

Canopies shall include design elements found on the main building, including color and roof pitch.

(b) Canopy Support Poles

Canopy support poles shall include decorative corbels consistent with the overall architectural theme of the site, or pole covers at least eighteen (18) inches wide with a similar surface material and architectural treatments as the dominant material on the main structure.

(c) Canopy Fascias

Canopy fascias shall be the same color as the dominant color of the main building. Striping and banding on canopies is prohibited. See Figure 305.7-12 for additional information.

Figure 305.7-12: Canopy Design Standards



10.305.7.7 Building Color

(a) Building Colors

- (1) Building colors should be low reflecting, muted and neutral or earth-toned. Roof colors shall be muted and compatible with the dominant building color.
- (2) High-intensity colors, metallic colors, black or grey, fluorescent colors, single color schemes and groups of stripes are prohibited as the predominant building color or color scheme.
- (3) High-intensity colors, and black or grey, may be used on building trim and accents.

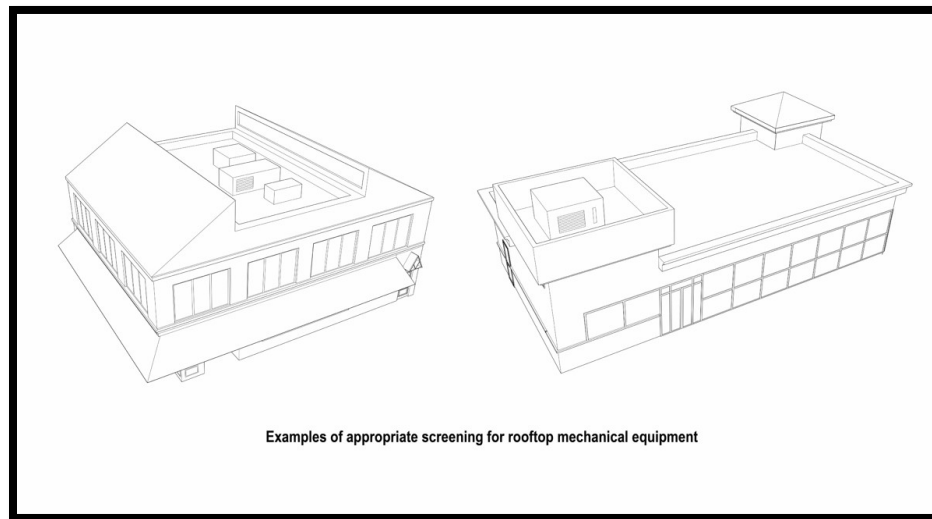
(b) Color Changes

Color changes shall occur only at a change of plane or reveal line. Color changes at outside corners, piecemeal embellishment, and frequent material changes are prohibited.

10.305.7.8 Mechanical Equipment Screening

- (a) Rooftop mechanical equipment shall be hidden or screened with architecturally integral elements at least as high as the equipment to be screened. Makeshift equipment screens, such as wood or plastic fences, are prohibited (see Figure 305.7-13).
- (b) Ground-mounted mechanical equipment shall be hidden or screened with architecturally integral wing walls and/or landscaping.
- (c) Solar panels are exempt from mechanical equipment screening standards.

Figure 305.7-13: Mechanical Equipment Rooftop Screening Illustration



10.305.7.9 Utility Equipment Screening

- (a) Electrical meters, switch boxes, panels, conduit, and related utility equipment shall be placed in the most inconspicuous location possible.
- (b) Utility equipment shall be painted or coated to match the color of the mounting surface (see Figure 305.7-14).
- (c) Utility equipment located in an area that is frequently seen by the general public shall be screened with a wing wall architecturally integrated into the host structure (see Figure 305.7-14).

Figure 305.7-14: Utility Equipment Screening Standards



10.305.7.10 Co-Branded Uses

Co-branded uses such as restaurants and convenience stores shall be well integrated into the host structure. Disharmonious architectural elements, such as a different façade or roof pitch from the

rest of the host structure, are prohibited to emphasize the presence or corporate identity of a co-branded use. See Figure 305.7-15 for additional information.

Figure 305.7-15: Co-Branded Uses Architectural Elements



10.305.8. Industrial Building Design

10.305.8.1 Intent

The public infrequently visits industrial sites. However, industrial areas are often quite visible to the city's residents and visitors. Quality architectural design creates a professional environment that reflects positively on Hutto and its businesses. This section shall not apply to industrial structures over two hundred thousand (200,000) square feet in area.

10.305.8.2 Character and Image

- (a) In industrial parks, each building shall include predominant characteristics shared by all buildings in the development, so the development forms a cohesive place.
- (b) Distinct groups of buildings on a site shall share a common, identifiable, complementary design or style. This includes accessory structures such as freestanding canopies, accessory and maintenance buildings, and dumpster enclosures.

10.305.8.3 Form and Mass

A single, large, dominant building mass should be avoided in new buildings and, to the extent possible, in projects involving changes to the mass of existing buildings. Changes in mass shall be related to entrances, the integral structure and/or the organization of interior spaces and activities and not merely for cosmetic effect.

10.305.8.4 Exterior Walls and Facades

(a) Pattern

Façades and walls shall feature a repeating pattern of architectural or structural bays, expressed through changes in plane—such as offsets, reveals, pilasters,

projecting ribs, fenestration patterns, or piers—along with at least one of the following elements. All elements shall repeat at intervals of no more than thirty (30) feet.

- (1) Color change;
- (2) Texture change;
- (3) Material module change.

(b) Four Sided Design

All façades and walls shall include design characteristics consistent with those on the front façade.

(c) Garage Doors

Bay doors shall be screened using wing walls, strategically placed berms on the site, or other effective screening and site planning techniques to minimize visibility from the public right-of-way. Bay doors shall be integrated into the overall design theme of the site with color and windows. Segmented garage bay doors with windows are preferred to roll-up garage doors.

(d) Primary Building Entrances

Primary building entrances shall be clearly defined and recessed or framed by a sheltering element such as an awning, arcade or portico to provide shelter from the sun and inclement weather.

10.305.8.5 Green Roofs

- (a) Green roofs and solar panels are strongly encouraged. Green roofs should cover at least fifty (50%) of the roof area, where feasible, and shall include appropriate vegetation, waterproofing, and drainage systems.

10.305.8.6 Building Color

- (a) Building colors shall be low reflecting, muted and neutral or earth toned. Roof colors shall be muted and compatible with the dominant building color.
- (b) High intensity colors, metallic colors, black or grey, fluorescent colors, single color schemes and groups of stripes are prohibited as the predominant building color or color scheme.
- (c) Brighter high-intensity colors, and black or grey, may be used on building trim and accents.
- (d) Color changes shall occur only at a change of plane or reveal line. Piecemeal embellishment and frequent color changes are prohibited.

10.305.8.7 Mechanical Equipment Screening

- (a) Rooftop mechanical equipment shall be hidden or screened with architecturally integral elements at least as high as the equipment to be screened. Makeshift equipment screens, such as wooden or plastic fences, are prohibited.
- (b) Ground mounted mechanical equipment shall be hidden or screened with architecturally integral wing walls and/or landscaping.

- (c) Solar panels are exempt from mechanical equipment screening standards.

10.305.8.8 Utility Equipment Screening

- (a) Electrical meters, switch boxes, panels, conduit, and related utility equipment shall be placed in the most inconspicuous location possible.
- (b) Utility equipment shall be painted or coated to match the color of the mounting surface.
- (c) Utility equipment located in an area that are frequently seen by the general public shall be screened with a wing wall architecturally integrated into the host structure.

10.305.9. Non-Residential Amenities and Enhanced High-Quality Design

10.305.9.1 Applicability

- (a) In order to encourage quality development beyond minimum standards, incentives are available for all new buildings and expansions to existing buildings in this chapter except as expressly stated herein.
- (b) Calculation and Cumulative Impact
 - (1) The incentive bonus options provided in this section shall be calculated based on the by-right measures allowable in the applicable district per Section 10.203.
 - (2) Incentive bonuses may be applied cumulatively to a development.

10.305.9.2 Non-Residential Amenities and Enhanced High-Quality Design Elements

- (a) Outdoor patios at least two hundred fifty (250) square feet and exclusive of sidewalks.
- (b) Provide patios for outdoor dining equivalent to five percent (5%) of the site or thirty percent (30%) of the planned restaurant dining area.
- (c) Provide a Parking Reclamation Plan to convert future unneeded parking into value-added spaces such as buildings or parks. At a minimum, the plan shall address circulation, pedestrian connections, utilities, and drainage.
- (d) Extra-wide sidewalks (15 feet or more) along the front facade of each building.
- (e) Provide public art equivalent to one percent (1%) or more of the overall project cost.
- (f) Provide at least one signature element, such as a monument or archway, that is not used for advertising any tenants but may display the name of the development or the City.
- (g) Arrange Useable Open Space so that no boundary of the open space faces an off-street parking area.
- (h) Use of one or more decorative bridges, which may include bridge culverts, that are integrated with a water feature, such as a detention/retention pond. The bridge should conform to and be a coordinated element of an established design motif used throughout the development's common areas by employing

natural stone or brick veneer, wrought iron railings, downward-directed lighting, and decorative insets. The development should be laid out so that decorative bridges can be seen from multiple angles and are designed for convenient pedestrian access.

10.306. Landscaping

10.306.1. Intent

Landscaping standards are established to:

- (a) Reinforce Hutto's unique community identity;
- (b) Enhance human health and wellbeing;
- (c) Enhance the quality and appearance of the city;
- (d) Provide vegetation for screening and buffering;
- (e) Support people-centered placemaking; and
- (f) Improve the environment by:
 - (1) Protecting and conserving natural resources including water, soil, existing trees and vegetation;
 - (2) Preserving and enhancing the urban forest and tree canopy coverage for shade, climate control, air and water quality, stormwater runoff and erosion control, and wildlife habitat.
 - (3) Use of regionally appropriate native plants results in a more natural appearance, resilience, functionality of plant communities, and decreased operational maintenance costs. Beyond minimum municipal landscape compliance, landscape areas shall be placed where best-suited for the site conditions considering orientation, light availability, structures, and impact to residents and visitors.

10.306.2. Applicability

This section applies in the following areas:

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	No

10.306.3. General standards

All plant species shall be selected from the Plant List maintained by the Director of Development Services; native cultivars and dwarf varieties are permissible. Deviations from this list shall be approved by the Director of Development Services and requested in writing with justification for each proposed deviation.

- (a) Each property shall provide at least two (2) different species of trees. Up to seventy-five (75%) of all trees per lot or site may be of the same species.

- (b) Planting areas for each canopy tree provided shall provide at least one thousand (1,000) cubic feet of soil volume and be covered with mulch or other groundcover.
- (c) All trees shall be planted on the parcel being developed.
- (d) For newly planted trees, no compaction, placement of impervious cover or paving shall take place within six (6) feet from the trunk of a tree or within the Half CRZ, whichever is greater.

10.306.3.2 Preservation of Existing Vegetation

Existing trees, shrubs, and groundcover may be used to meet landscape requirements.

- (a) Preserved Protected Trees may be credited towards the landscape requirements of this Section.
- (b) Existing trees of a Protected Tree species but under six (6) inch DBH that remain on a site may be credited toward the landscape requirements of this Section, subject to approval by the Director based on the assessed health, structure, growth habit, presence of disease or decline, and the available growing space of the tree.
- (c) Existing plants of nuisance species may not be credited toward the landscape requirements of this Section.
- (d) Trees used to meet required landscape credits shall not also be used towards Protected Tree mitigation credits.

10.306.3.3 Minor Modifications

The Director of Development Services may approve minor deviation of any numeric development standard of this subchapter up to a maximum of ten percent (10%) to protect natural features, address unusual site conditions, or conditions that arise through the development review process due to occasionally conflicting myriad development requirements. Minor modifications are intended to provide reasonable flexibility and avoid the need for a formal variance request.

- (a) Approval Criteria for Requested Modifications
 - (1) Shall be in general conformity with the stated purposes of this Section;
 - (2) Meets all other applicable zoning, building, drainage, water quality, and safety code requirements;
 - (3) Shall have no significant adverse impact on the health, safety, or general welfare of surrounding property owners on the general public, or such impacts will be substantially mitigated; and
 - (4) Shall be necessary to compensate for some practical difficulty or unusual aspect of the site not shared by landowners in general.

10.306.3.4 Visibility

In cases where visibility standards conflict with required planting placement, visibility and safety standards shall take precedence, subject to approval by the Director of Development Services.

10.306.3.5 Utility Clearances

All clearance values may be modified by the City Engineer. Root barriers are required when trees are within right-of-way.

(a) Underground Utilities

- (1) All trees shall be placed at least five (5) feet from wet utilities.
- (2) All trees shall be placed at least four (4) feet from electric and gas lines.

(b) Overhead Utilities

The following minimum clearances shall be maintained from overhead electric utilities:

- (1) Canopy Trees: 30 feet
- (2) Ornamental Trees: 20 feet
- (3) Shrubs: 10 feet

(c) Electric Appurtenances and Streetlights

The following minimum clearances shall be maintained from electric appurtenances and streetlights:

- (1) Canopy Trees: 10 feet
- (2) Ornamental Trees: 8 feet
- (3) Shrubs: 6 feet

10.306.4. Required Landscaping: Single, Two, Three and Four Household Dwellings

10.306.4.1 Tree Planting Requirements

Lots with single, two, three and four household dwellings shall have at least the following number of trees:

- (a) One (1) canopy tree for every five thousand (5,000) square feet of lot area rounded to the nearest whole tree.

10.306.4.2 Shrub Planting Requirements

- (a) Lots shall contain at least one shrub for every one thousand (1,000) square feet of lot area. Lots of fifty thousand (50,000) square feet or more in area are required to provide at least one hundred (100) shrubs.
- (b) One (1) ornamental tree may be substituted for five (5) required shrubs.
- (c) All required shrubs shall be placed between the street and the front of the dwelling.

10.306.4.3 Groundcover

Any portion of the residential lot not used for buildings, parking, driveways, walkways, or utilities shall be retained in or restored to its natural state or landscaped in accordance with the following:

- (a) Living groundcover and plants. Appropriate soil amendments, weed barrier and mulching shall be applied to all planting areas.

- (b) Organic materials (such as mulch or wood chips), inorganic materials such as decorative gravel or rocks (using aggregates meeting requirements to maintain permeability performance), or synthetic/artificial turf constituting no more than 50 percent (50%) of the total lot area not used for impervious cover.
- (c) A maximum of 30 percent (30%) of the lot area between the street and the front of the dwelling may be covered with mulch, gravel or rock. No synthetic/artificial turf is allowed within the lot area between the street and the front of the dwelling.

10.306.4.4 Planting Size

Canopy trees shall be at least eight (8) feet in height and ornamental trees shall be at least six (6) feet in height at the time of planting. Shrubs shall have at least one (1) gallon containers, be at least one (1) foot in height at the time of planting and reach a mature height of at least two (2) feet.

10.306.5. Required Landscaping: Non-Residential and Multifamily Residential Development

10.306.5.1 Applicability

Non-residential and multifamily developments shall be landscaped as follows. Additional plantings may be required in accordance with bufferyard standards, and screening requirements.

10.306.5.2 Minimum Requirements

Non-residential and multifamily developments shall achieve five (5) points for every five hundred (500) square feet of landscape area required.

10.306.5.3 Minimum Landscape Area Required

A minimum percentage of the total area being developed shall be landscaped in accordance with the following percentages:

- (a) Commercial and retail uses: 15%
- (b) Multifamily residential: 20%
- (c) Institutional and civic uses: 15%
- (d) Industrial uses: 10%

10.306.5.4 Menu of Landscape Elements

The following landscaping elements are eligible for earning credits toward meeting landscape requirements in Section 10.306.5. Refer to Table 306-1 for specific point values assigned to each element.

- (a) Planting areas that utilize low-maintenance, drought-resistant native or adapted plant species:
 - (1) Canopy trees.
 - (2) Ornamental trees.
 - (3) Shrubs, forbs, or ornamental grasses (not groundcovers or native grasses less than six (6) inches in height). Cacti shall be used sparingly as their root systems do less to filter water or build soil.
 - (4) Groundcovers or native grasses less than six (6) inches in height.

- (5) Plants that create habitat for birds and pollinators.
- (b) Protecting existing trees on the site that are less than six (6) inches DBH.
- (c) Utilizing structural soils to provide additional soil volume for trees in urbanized landscapes, beyond the minimum requirement.
- (d) Restoration of disturbed areas (disturbed previously or during construction) to a naturally performing state after construction.
- (e) Minimizing impervious cover:
 - (1) Limiting the impervious cover on a site to below allowable maximums;
 - (2) Removing existing on-site impervious cover and restore to natural conditions; or
 - (3) Use of permeable pavement in place of typical impervious cover, such as in driveways, parking lots, walkways and patios.
- (f) Installation of green stormwater infrastructure, such as bioretention planters, biofiltration planters or vegetated swales, capable of capturing and filtering at least the first inch of rainfall (as this is the most contaminated).
- (g) Installation of a green roof.
- (h) Reduction of potable water use for irrigation via alternative water sources (such as graywater systems).
- (i) Other Innovative Approaches. Applicant may propose other innovative, regionally appropriate LID/GI elements. Will require applicant and review staff to agree on appropriate credit for the specific approach being proposed.
- (j) Landscaped parking lot islands with canopy trees to provide shade and reduce heat islands.
- (k) Bioretention planters integrated into parking lot designs for stormwater management.

10.306.5.5 Credit Table

The following table provides the point values assigned to each eligible landscaping element. These credits are used to calculate compliance with the landscaping requirements outlined in Section 10.306.5.2.

Table 306-1: Landscaping Credits

Landscape Element	1 point per...
New tree – canopy (20+ ft height at maturity)	1 tree planted
New tree – ornamental (<20 ft height at maturity)	2 trees planted
New native/adapted shrubs, forbs or ornamental grasses.	10 shrubs planted
New native/adapted groundcovers or turf	150 SF of area at 60% plant cover

New habitat plants	100 SF of area at 30% plant cover
Protection of existing tree	0.5 trees
Use of structural soils	300 cubic feet of additional soil volume provided
Restoration of areas disturbed by construction	100 SF of area restored
Reduction in impervious cover allowed	500 SF of impervious cover reduced
Removal of existing impervious cover	300 SF of impervious cover removed
Use of pervious paving	200 SF of pervious paving used in place of typical impervious cover
Installation of GSI	75 SF of GSI
Green roof, intensive (12"+ media depth)	300 SF of area at 50% plant cover
Green roof, extensive (<12" media depth)	500 SF of area at 50% plant cover
Alternative water sources for irrigation	500 SF of area utilizing alternative water source for irrigation (can apply to planting areas required by other sections of code).
Landscape islands with canopy trees	1 island with at least 1 canopy tree planted and a minimum area of 150 SF
Bioretention planters integrated into parking lot	75 SF of bioretention planter area

10.306.5.6 Calculating Points

Points will be earned for each landscaping element listed in Table 306-1 based on the corresponding credit values.

10.306.5.7 Exceeding Minimum Points

Projects exceeding the minimum required points may reduce the required landscape area in Section 10.306.5.2 by five hundred (500) square feet for every five points earned above the minimum, up to a maximum reduction of two thousand five hundred (2,500) square feet.

10.306.5.8 Alternative Compliance

- (a) Projects certified under the Sustainable SITES Initiative (SITES), which promotes sustainable land design and development practices, may earn additional landscape points as follows:
 - (1) Sustainable SITES certified = 20 points
 - (2) Sustainable SITES Silver = 30 points
 - (3) Sustainable SITES Gold/Platinum = 40 points
- (b) Applicants shall provide verification of certification from Green Business Certification Inc. (GBCI) as part of the development application process to confirm which alternative compliance option is applicable.

10.306.6. Street Trees

(a) Placement

- (1) Street trees are encouraged along new and reconstructed streets to enhance pedestrian comfort and improve the urban canopy.
- (2) Where provided, trees should be placed on the outer side of the sidewalk within a designated planting strip or right-of-way to maximize shade while minimizing conflicts with utilities and infrastructure.
- (3) Alternative placements may be considered where right-of-way constraints exist, subject to approval by the Director of Development Services.

(b) Species and Canopy Considerations

- (1) Trees shall be selected from an approved list of drought-tolerant, non-invasive, and regionally appropriate species.
- (2) Large canopy trees are preferred where feasible, except where overhead utility conflicts require smaller ornamental species.

(c) Utility Coordination and Infrastructure Protection

- (1) Where street trees are installed, they shall be located at least five (5) feet from underground wet utilities and four (4) feet from electric and gas lines.
- (2) To prevent conflicts with streetlights and electric transformers, the following minimum clearances should be maintained:
 - (A) Canopy trees: 10 feet
 - (B) Ornamental trees: 8 feet
- (3) For locations near overhead power lines, recommended minimum clearances are:
 - (A) Canopy trees: 30 feet
 - (B) Ornamental trees: 20 feet
- (4) Root barriers are recommended when trees are planted within five (5) feet of sidewalks or curbs to prevent pavement displacement.

(d) Maintenance and Replacement

- (1) Where street trees are planted, adjacent property owners or developments are encouraged to maintain them, including pruning and watering as needed.
- (2) If a tree dies or becomes hazardous, replacement with an equivalent species is recommended to maintain the streetscape.

10.306.7. Plant Materials, Maintenance and Replacement

10.306.7.1 Plant List

Plants to meet the requirements of this Section shall be listed on the “Plant List” maintained by the Director of Development Services. If specific site conditions limit the survival of plants on the

approved list, alternative species may be used with the Director of Development Services approval, provided they offer comparable water efficiency and suitability to the local environment.

10.306.7.2 Low Water Use Plantings

Low water use plantings are required to promote water conservation and reduce operational maintenance costs. The use of low water use plants and hardscaping features shall comply with the following:

- (a) To maximize water efficiency, plants with low water needs shall be grouped together and not mixed with those requiring higher water usage. This strategic placement minimizes irrigation needs and promotes plant health.
- (b) The use of mulch is encouraged throughout the landscaped area. Mulch helps conserve soil moisture, reduce weed growth, prevent soil compaction, and regulate soil temperatures.
- (c) Hardscaping features such as gravel, permeable paving, decorative rock, and low-water-use pathways are encouraged as part of the landscape design. These elements reduce the overall water demand and enhance the landscape's aesthetic appeal. Permeable materials shall be used to the maximum extent practicable to support stormwater infiltration and reduce runoff.

10.306.7.3 Plant Species that Reduce Pesticide and Fertilizer Use

Plant species shall be selected that minimize the need for pesticides and fertilizers.

10.306.7.4 Reduce Outdoor Water Use

- (a) Seventy-five percent (75%) of landscape areas shall be designed so as not to require permanent irrigation systems. This does not apply to:
 - (1) Water used during establishment period
 - (2) Water used to irrigate food production gardens.
 - (3) Water used as required by local regulations in fire-prone areas for fire suppression systems
 - (4) Water used for athletic fields (if vegetated)
- (b) Planting shall happen at the optimal season to reduce or eliminate the need for watering for establishment.
- (c) If turfgrasses are to be used, they shall be regionally appropriate and minimize post-establishment requirements for irrigation
- (d) Improve water-retention capacity of soil by increasing organic matter (e.g., adding compost)

10.306.7.5 Nuisance and Prohibited Plants

- (a) Nuisance and prohibited species may not be planted or used to meet the City's landscaping requirements and are not protected by tree preservation regulations.

- (b) Nuisance plants are all plants listed in Texas Administrative Code Section 19.300 (Noxious and Invasive Plant List). Other plants may be prohibited at the discretion of the Director of Development Services on a case-by-case basis.
- (c) Nuisance and prohibited plants can be found in the Plant List maintained by the Director of Development Services.

10.306.7.6 Edging

Edging shall be used to contain and separate lawn areas and landscape areas.

10.306.7.7 Topsoil

To the maximum extent practicable, topsoil removed during construction activity shall be conserved for later use on areas requiring re-vegetation and landscaping.

10.306.7.8 Plant Quality

Landscape plants shall be free of defects, and of normal health, height, leaf density and size appropriate to the species, and free from defects, as defined by American Association of Nurserymen standards.

10.306.7.9 Installation and Bond

Landscaping shall be installed using sound horticultural practices, in a way that encourages quick establishment and healthy growth. Landscaping in each phase shall either be installed or the installation shall be secured with a letter of credit, escrow or performance bond for one hundred fifty percent (150%) of landscaping value before a certificate of occupancy for any building in a phase is issued.

10.306.7.10 Maintenance

All landscape elements including trees and vegetation, irrigation systems, fences, walls and paving are considered elements of the project in the same way as structures, parking, stormwater infrastructure, and other site elements. The applicant, landowner or successors shall be jointly and severally responsible for regular maintenance of all landscaping elements in good condition in accordance with this section. Landscaping shall be maintained free from disease, pests weeds and litter.

(a) Reduce Pesticide and Fertilizer Impacts

- (1) This section applies to non-residential and multifamily residential development.
- (2) Projects shall maintain an integrated pest management plan that utilizes natural prevention and control techniques.
- (3) When necessary, pesticides and fertilizers shall be selected based on reduced impacts including toxicity, persistence (i.e., how long it remains in the environment), and/or bioavailability (i.e., how readily it is absorbed by biological organisms).
- (4) Projects are permitted an initial use of pesticides for the purpose of eradicating or controlling invasive species found on site and controlled initial use of fertilizers is permitted when necessary to establish vegetation.

- (5) Projects are permitted an initial use of pesticides for the purpose of eradicating or controlling invasive species found on site and controlled initial use of fertilizers is permitted when necessary to establish vegetation.

10.306.7.11 Replacement

Landscape elements that are removed or dead shall be replaced within thirty (30) days.

10.306.8. Irrigation

10.306.8.1 Automatic Irrigation Required

(a) Purpose

The purpose and intent of this section is to ensure that all applicable landscape plantings are sufficiently watered until established and maintain health, vigor, and coverage.

(b) Applicability

All parcels proposing development or redevelopment after the effective date of this UDC are required to provide irrigation in accordance with this section.

(c) Exceptions:

- (1) Single-family and Two-family Residential;
- (2) Undisturbed natural areas or existing trees and vegetation;
- (3) Low Water Use Plantings areas established for at least two (2) years that do not require supplemental water;
- (4) Trees established for at least two (2) years.

(d) Irrigation Requirement:

When irrigation is necessary, systems shall be designed and installed to:

- (1) Deliver water efficiently, such as the use of drip or low-flow emitters that target the root zones of plantings.
- (2) Include climate-based controllers that prevent unnecessary watering.
- (3) Have trees, shrubs, and ground cover irrigated in separate hydrozones that can be discontinued by zone as plants become established.

(e) Maintenance

Irrigation systems shall be maintained to prevent water waste from misdirected or broken sprinklers or other system component.

10.306.8.2 Irrigation Plan Required

An irrigation plan shall be provided with the landscape plan for review, if applicable.

10.306.9. Tree Preservation and Removal

10.306.9.1 Purpose

The purpose of this section is to ensure effective administration of the tree preservation regulations.

10.306.9.2 Applicability

The tree preservation regulations apply to all properties within the zoning jurisdiction.

(a) No tree removal permit is required for a Nuisance Tree.

(b) Protected Trees

All trees six (6) inches or greater DBH shown in the Plant List are Protected Trees regardless of health.

10.306.9.3 Tree Removal Permits

(a) A tree removal permit is required for the proposed removal of a protected tree in both nonresidential and residential areas, regardless of the tree's health.

(b) No tree removal permit is required for a Nuisance Tree.

10.306.9.4 Permit Fees

Permit fees are determined by City Council.

10.306.9.5 Dead, Diseased, and Imminently Hazardous Trees

A tree removal permit is required for the proposed removal of a protected tree that is determined to be Dead, Diseased, and Imminently Hazardous by a State of Texas certified arborist. A tree assessment report for a dead, diseased, or imminently hazardous tree proposed for removal shall be provided with a tree survey of all protected trees on the subject property.

10.306.9.6 Healthy Protected Trees

A tree removal permit is required for the proposed removal of a protected tree. A tree survey showing the location, size, condition, and species of all protected trees on the subject property shall be provided. Tree surveys shall include as-built information for properties with existing development.

(a) Additional Criteria for Removal of Protected Trees

(1) Protected Trees sixteen (16) inches or greater DBH may only be removed with approval of the Planning and Zoning Commission.

(2) The requirements of this section do not apply if:

(A) The subject tree is located within an existing or proposed easement for required stormwater, water, wastewater, or electric utility infrastructure and the Director of Development Services determines redesign of the proposed easement or utility alignment is infeasible.

(B) The subject tree is located within two (2) feet of an existing building.

(C) If the subject tree is determined to be Dead, Diseased, or Imminently Hazardous by a State of Texas certified arborist.

(b) Transplanting of a Protected or Heritage Tree

Protected Trees may be transplanted to a suitable location on the same property, as approved by the Director. To qualify, a tree transplanting company from the City's approved vendor list or one otherwise approved in writing by the Director, shall be used and fiscal surety shall be filed with the City to guarantee

a two-year monitoring and maintenance program for the transplanted trees. The property owner/manager shall submit quarterly statements that demonstrate compliance with the required tree monitoring and maintenance provided by an approved tree care service. If compliance is not demonstrated, the surety will be used by the City provide the required monitoring and maintenance. Monitoring shall include soil moisture analysis, fertilization, pest and disease management, soil amendments, and any other service deemed necessary by the Director or the tree care service. This surety shall remain in place until the end of the two-year period.

10.306.9.7 Mitigation for Removal

- (a) Inches removed from a site shall be mitigated at a 1:1 inch basis of the total diameter inches of Protected Trees removed, measured at DBH.
- (b) Mitigation requirements do not apply to a Protected Tree that is already dead, dying or fatally diseased prior to starting a project. The property owner shall submit a report from an ISA certified arborist making such determination in writing, providing technical documentation for the determination. The Director may perform a site inspection to verify the accuracy of the determination.
- (c) Replacement of Removed Trees
 - (1) Replacement inches shall be planted on the subject property.
 - (2) Canopy trees shall be at least eight (8) feet in height and ornamental trees shall be at least six (6) feet in height at time of planting.

10.306.9.8 Maintenance and Care

Replacement trees shall be maintained in good condition in accordance with the provisions of this Section.

10.306.9.9 Unauthorized Removal

Any unauthorized removal of a protected tree shall be mitigated for at a rate of 2:1 (for example, two (2) inches mitigated for every one (1) inch removed).

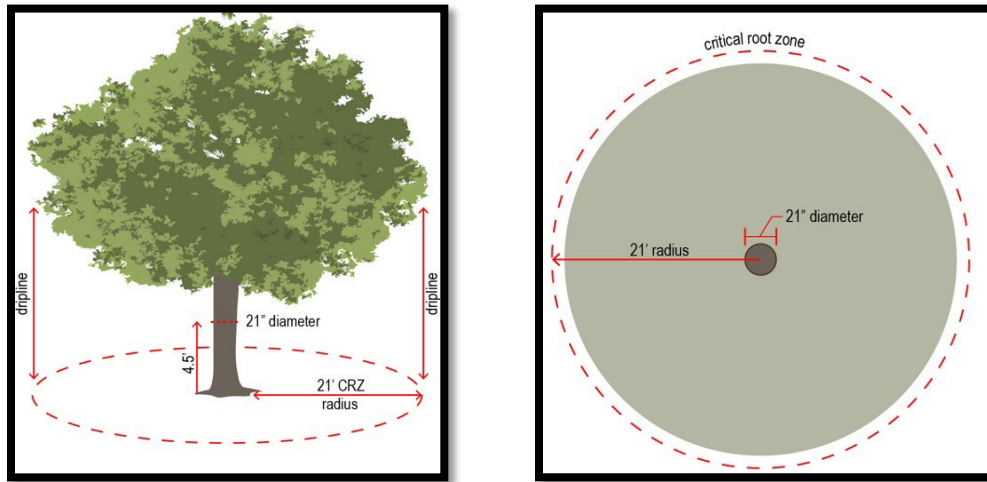
10.306.10. Critical Root Zone Preservation

The full root system of a tree may extend significantly beyond the dripline but the Critical Root Zone (CRZ) is of critical importance to the health and longevity of a tree. Excavation, open trenching, placement of fill, storage or staging of equipment, spoils, or materials may not occur within this zone.

- (a) The CRZ is generally represented as a circle around the center of the tree trunk where the radius of the circle is a numerical value of feet proportional to the diameter in inches of the tree generally measured at four and a half (4.5) feet from average grade. The Half CRZ is a smaller circle within the CRZ with a radius half that of the CRZ. The Quarter CRZ is a circle within the Half CRZ with a radius one-quarter that of the CRZ.
 - (1) The entirety of the Quarter CRZ shall be preserved at natural grade.
 - (2) Up to two (2) inches of cut are allowed within the Half CRZ.

- (3) Up to four (4) inches of cut are allowed within the remainder of the Outer CRZ to the dripline.

Figure 306.10-1: Critical Root Zone



(b) Modified Critical Root Zone

Root systems grow in response to site conditions and constraints and may not be accurately represented by the typical centered and equidistant method described above. The Director of Development Services may determine a Modified CRZ is more appropriately representative of the root system of a tree provided it is proportional.

(c) Grade and Slope

Finished grade of soil in the CRZ shall slope away from the trunk at least 1 percent slope to ensure positive drainage and prevent water from pooling near trunks.

(d) Development in CRZ

- (1) No building construction is permitted within the CRZ for any tree being preserved.
- (2) No permanent development of any kind is permitted within the Half CRZ.
- (3) Development is permitted within a maximum of fifty percent (50%) of the Outer CRZ. Only permeable flatwork without compaction, soil removal for grading, decking, or similar construction, is allowed and shall not affect the branching of the tree.

10.306.11. Tree Protection During Construction

10.306.11.1 Tree protection zone

- (a) Tree protection shall be provided around protected trees and natural areas designated for preservation and prevent access throughout duration of construction.

- (b) The Director of Development Services may approve exceptions to Tree Protection requirements as needed for site-specific considerations where strict compliance is impractical. Examples include location of existing structures, paving, infrastructure, and access where no reasonable alternative is available.

10.306.12. Landscaping and Site Aesthetics

- (a) Parcels proposing a nonresidential use of five (5) or more residential structures shall provide and maintain the following appurtenances in any combination:
 - (1) Seating and Tables;
 - (2) Sunshades and Shelters;
 - (3) Recycling and Waste Receptacles;
 - (4) Bicycle Parking;
 - (5) Planters;
 - (6) Charging Station;
 - (7) Lighting.
- (b) Site appurtenances shall be provided in accordance with the following:
 - (1) At least two (2) appurtenances per one hundred (100) linear feet of internal walkway or sidewalk along a street or internal drive.
 - (2) At least one (1) seating and tables item and one (1) recycling and waste receptacles per two hundred fifty (250) square feet of plaza area.
 - (3) At least one (1) seating and tables item and one (1) recycling and waste receptacles per one hundred (100) square feet of Colonnade or Loggia.
 - (4) One (1) seating and tables item and one (1) recycling and waste receptacles per bus stop.

10.307. Fences and Walls

10.307.1. Intent

- (a) Fence and wall standards are established to:
 - (1) Enhance safety of people, property, and animals;
 - (2) Enhance the quality and appearance of the City;
 - (3) Provide attractive screening and buffering;
 - (4) Delineate public and private space.
- (b) Unless otherwise specified, fences and walls are not required but all proposed fences and walls shall comply with this section.

10.307.2. Applicability

This section applies in the following areas:

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	No

10.307.2.1 General standards

(a) Placement

- (1) A fence or wall may not be placed in a right-of-way.
- (2) Fences and walls shall comply with all setback requirements specific to the zoning district and shall not obstruct sight lines at intersections, driveways, or pedestrian pathways.
- (b) A fence or wall may be freestanding or attached to a structure.
- (c) Fence support posts may not be angled or non-vertical.
- (d) Fencing and walls shall be maintained in good structural and aesthetic condition in accordance with this section.
- (e) Fencing and walls shall be responsive to and consistent with the primary structures on a site using materials, finishes, and detailing that match or are compatible with materials used on structures.

10.307.2.2 Alternative Screening Options

Property owners may propose alternative screening methods that meet or exceed the intended level of screening. Such proposals shall be approved by the Director of Development Services. Alternative screening options can include but are not limited to:

(a) Living Plant Screening

A continuous hedge or row of shrubs/trees planted at a minimum spacing to form a continuous screen. Plants shall be at least four (4) feet in height at installation and reach a height of at least six (6) feet at maturity.

(b) Berms

Use of landscaped berms to provide elevation and additional screening. Berms shall be a maximum height of three (3) feet.

10.307.2.3 Maintenance

Fences, living plant screening and adjacent landscaping shall be maintained by their owners in good structural condition and repair. This includes general maintenance, painting and staining, and the replacement of broken, warped or missing portions with materials of equal or better quality that are consistent in design. Fences, wall and hedges shall be vertically aligned and maintained upright; and in good structural or living condition. Angled or non-vertical fence support posts are prohibited.

10.307.3. Materials

(a) Finished side out

Fences with an unfinished or rough side and a finished or smooth side shall be placed so the finished or smooth side faces out.

(b) Prohibited materials

Materials not originally intended for use in constructing a fence are prohibited as fencing and screening materials. Examples of prohibited materials include plywood, particleboard, corrugated metal sheets (not incorporated into a frame), railroad ties, tires, door panels, and other makeshift materials.

(c) Barbed wire and electric fences

Electrically charged, barbed wire and razor wire fences are prohibited. Exceptions are fences used to enclose livestock on farms, serve a public or quasi-public institution for public safety or security purposes, and temporarily securing construction vehicles and materials on a construction site.

10.307.4. Height and Linear Transparency Requirements

The following table is tailored to address the unique needs of different land uses.

Table 307-1: Fence Requirements

Fence Type	Height	Linear Transparency
Residential Front Yards	Maximum 3.5 feet	Minimum 50%
Residential Side and Rear Yards	Maximum 8 feet	N/A
Tennis / Basketball Courts	Maximum 12 feet	Minimum 75%
Industrial Perimeter Security Fencing	Maximum 8 feet	Minimum 75%
Temporary Perimeter Security Fencing	Maximum 8 feet	N/A
Outdoor Storage Area	Minimum 6 feet Maximum 8 feet or the height of the tallest object to be screened	Maximum 25%
Dumpster Enclosure	Maximum 8 feet or the height of the dumpster to be screened	N/A
Development Perimeter Wall	Minimum 6 feet Maximum 8 feet or 4 feet when adjacent to open space	N/A
Utility Substation or Facility	Minimum 6 feet Maximum 12 feet or sufficient to conceal the substation	N/A

10.307.5. Gated Communities

Gated communities with public street are prohibited.

10.308. Outdoor Lighting

10.308.1. Intent

Poorly designed exterior lighting can adversely affect abutting properties and contribute to light pollution. Regulating exterior lighting can control its negative effects, while still allowing property owners and businesses to meet functional security and safety needs.

10.308.2. Applicability

This section applies in the following areas.

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	No

- (a) Except as described below, all outdoor lighting installed after the date of effect of this UDC shall comply with these requirements. This includes, but is not limited to, new lighting, replacement lighting or any other lighting whether attached to structures, poles, the earth, or any other location.

(1) Exemptions

- (A) Lighting within public or private right-of-way or easement for the principal purpose of illuminating streets or roads. No exemption shall apply to any lighting within the public or private right-of-way or easement when the purpose of the luminaire is to illuminate areas outside the public or private right-of-way or easement, unless otherwise stated in separate regulation.
- (B) Lighting that is removed or destroyed less than thirty percent (30%) of the total value of all lighting on a property.
- (C) Repairs to existing luminaires not exceeding twenty-five percent (25%) of total installed luminaires.
- (D) Temporary lighting for theatrical, filming on location, and performance areas with applicable City permits.
- (E) Underwater lighting in swimming pools and other water features.
- (F) lighting that is only used under emergency conditions.
- (G) Low Voltage Landscape Lighting.
- (H) All lighting required by federal or state laws or regulations.

10.308.3. General Standards

10.308.3.1 Display Levels and Light Pollution

- (a) Lighting shall be designed to minimize light pollution and spillage on adjacent properties.
- (b) Illumination at the property line shall be no more than one and a half (1.5) footcandles.
- (c) Illumination spillover onto adjacent residential zoned properties shall be no more than a half (0.5) footcandles.
- (d) Streetlights in public right-of-way shall be solar-powered wherever possible.

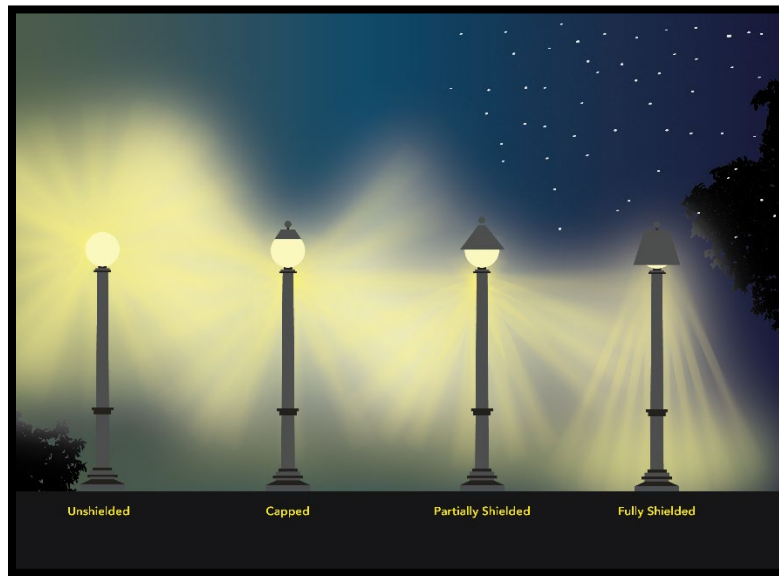
10.308.3.2 Allowed Correlated Color Temperature

The allowable correlated color temperature of all lighting fixtures shall not exceed three thousand (3,000) Kelvins (K).

10.308.3.3 Shielding

Outdoor lighting shall be shielded (full cutoff). Shielding is achieved when light rays are not emitted above the horizontal plane of a fixture (see Figure 308-1).

Figure 308.3-1: Light Fixture Shielding



10.308.3.4 Illumination of Background and Foreground Spaces

- (a) Background spaces such as parking lots shall be illuminated as unobtrusively as possible to meet the functional needs of circulation, security and safety.
- (b) Foreground spaces, such as building entrances and plaza seating areas, shall use proximate lighting that defines the spaces without glare.

10.308.4. Prohibited Lighting

The following light sources are prohibited:

- (a) Laser source light.
- (b) Strobe light.

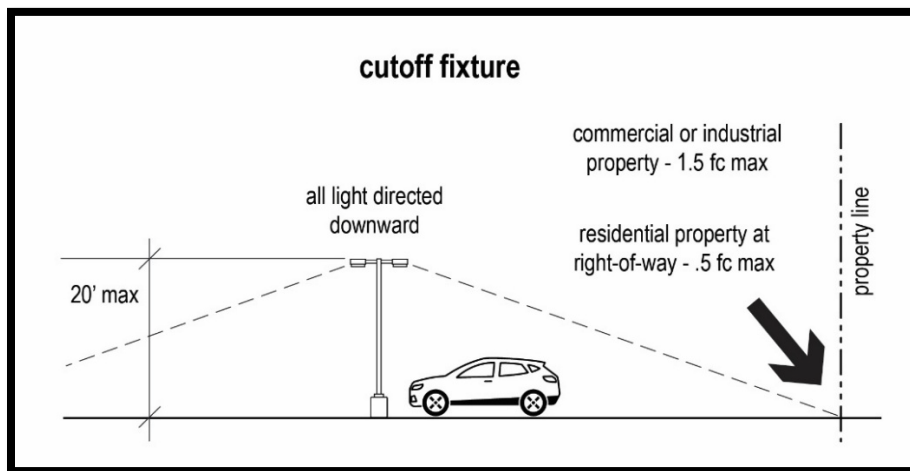
- (c) Flashing, blinking, or variably intense light, intentional or resulting from a defect. Exceptions are:
 - (1) Traditional holiday lighting not used to draw attention to a sign.
 - (2) Flashing or blinking lights required by law.
- (d) Beacon or searchlight, including temporary display. Beacons are permitted on structures where the Federal Aviation Administration requires them.
- (e) Lighting devices that may be confused with warning, emergency or traffic signals are prohibited.
- (f) Lighting cannot be used for advertising or attracting attention.

10.308.5. Light Poles

10.308.5.1 Maximum Height

- (a) Parking areas: 20 feet
- (b) Pedestrian areas and drive aisles: 16 feet
- (c) Sports fields: 60 feet
- (d) Temporary lighting at construction sites: 60 feet
- (e) See Figure 308.5-1 for further guidance.

Figure 308.5-1: Outdoor Lighting Shielding Illustration



10.308.5.2 Design

- (a) Light poles shall have a base, middle and top.
- (b) Light pole design shall be consistent with the style, character and period of architecture on the site.
- (c) Cobra head light poles are prohibited in residential areas and pedestrian-oriented commercial streets. Decorative cobra head street light poles may only be used on arterial streets, and streets in vehicle-oriented commercial and industrial areas. Where used, cobra head street light poles shall incorporate a

supplemental non-cobra style light mounted at twelve (12) feet to fourteen (14) feet height to illuminate the sidewalk.

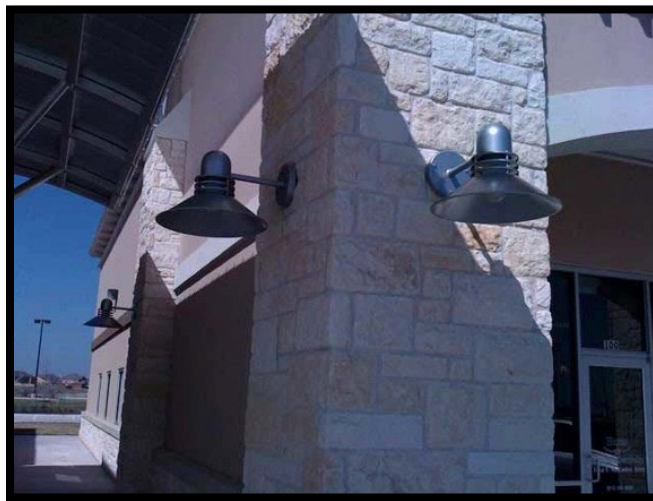
- (d) Bare metal poles are prohibited.
- (e) Elevated form bases greater than four (4) inches above grade are prohibited.
- (f) Light poles shall be placed in landscape areas wherever possible. Light poles shall not obstruct sidewalks or bicycle paths.

10.308.6. Attached Light Fixtures

10.308.6.1 Sconces

- (a) Sconces or gooseneck lighting fixtures may be used to illuminate areas near building walls. Sconces shall direct light downward against the building wall and immediately adjacent areas (see Figure 308.6-1).
- (b) Light fixture design shall be consistent with the style, character and period of the host structure.

Figure 308.6-1: Attached Sconce



10.308.6.2 Wall Packs

- (a) Wall packs may only be used at the rear of industrial buildings to light unsafe areas. They cannot be used to draw attention to the building or provide general building or site lighting.
- (b) Wall packs shall be fully shielded to direct the light downward.
- (c) Source output per wall pack shall be no more than three (3) footcandles.

10.308.6.3 Awnings

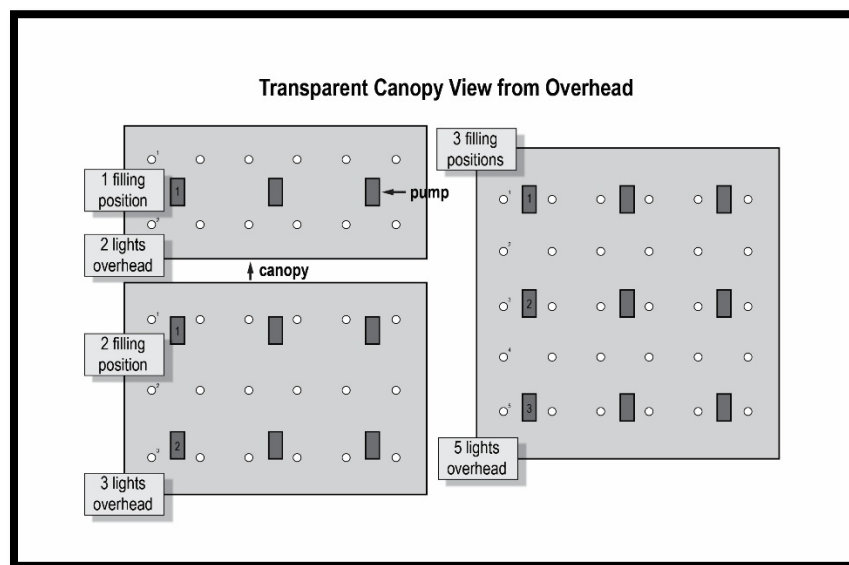
Awnings and canopy fascias cannot be internally illuminated.

10.308.7. Gas Station Canopies

10.308.7.1 Design

- (a) Lighting fixtures, including lenses, shall be completely recessed into the canopy ceiling if it is flat, or no lower than one (1) feet above the lowest point of the canopy roof or fascia if it is sloped.
- (b) Source output per fixture shall be no more than three (3) footcandles.
- (c) Canopy fascias cannot be illuminated, except logo signs permitted by sign requirements in Section 10.309.
- (d) See Figure 308.7-1 for additional information.

Figure 308.7-1: Gas Station Canopy Design Standards



10.308.8. Floodlights

- (a) Floodlights may be used only to light sports fields, outdoor recreation areas and construction sites.
- (b) Floodlights shall be fully shielded or provided with sharp cut-off ability, to minimize uplight, spill-light and glare.

10.308.9. Accent Lighting

- (a) Bottom-mounted lights used to illuminate landscaping and water features, or provide visual accents, are permitted.
- (b) Pole mounted accent lighting greater than one (1) foot tall is prohibited.
- (c) Roof-mounted and rooftop accent lighting is prohibited.
- (d) Banding of building plane changes (cornices, building corners, column edges, etc.) with neon or other illumination is prohibited.

10.308.10. Signs

- (a) Signs may be illuminated internally.

- (b) Bottom mounted lights may illuminate a monument sign no more than 8 feet tall. Lighting shall not spill over the edge of the sign face.
- (c) Exposed bulb that outline a sign are prohibited.
- (d) Blinking, chasing, or other changes in illumination intensity, color, or direction, intentional or not, are prohibited. This includes electronic message centers.

10.308.11. Alternative Conformance

The Director of Development Services may consider an alternative lighting plan. Alternative lighting plans shall clearly identify and discuss modifications, proposed alternatives, and how the alternative plan will meet the intent of this section better than a plan conforming to this section. Development Services staff will consider the proposed design protects natural areas from light intrusion, enhances neighborhood continuity and connectivity, and shows innovative and creative design.

10.309. Signs

10.309.1. Purpose

The purpose of this Section is to regulate signs of all types (temporary and permanent) in a manner that:

- (a) Protects constitutional rights to free speech by providing ample opportunities for expression through signs, while avoiding content-based distinctions, and providing clear approval standards;
- (b) Protects public health and safety by:
 - (1) Minimizing visual traffic hazards, distractions and obstructions for motorists, cyclists, and pedestrians, or signs causing confusion by virtue of visual similarity to traffic control signs;
 - (2) Reducing hazards caused by collapse, fire, collision, decay or abandonment;
 - (3) Not obstructing firefighting or police surveillance; and
 - (4) Encouraging the upgrading, updating, or removal of signs that are poorly maintained, or do not conform to this Section, and preventing signs that are potentially dangerous due to structural deficiencies and disrepair.
- (c) Enhances the appearance and economic value of the landscape, by providing that signs:
 - (1) Do not interfere with scenic views;
 - (2) Do not create a nuisance to persons using the public rights-of-way;
 - (3) Do not constitute a nuisance to occupancy of adjacent and contiguous property by their brightness, size, height, or movement; and
 - (4) Are not detrimental to land or property values.
- (d) Promotes the community's appearance, character, quality, and business climate by encouraging signs that are attractive and functional for their intended

purpose, and that are in scale and harmony with the development site and building(s) and with surrounding areas;

- (e) Reduces and prevents visual clutter or potential deterioration of the community's appearance and attractiveness; and
- (f) Implements the goals and policies of the City's adopted planning policies by establishing uniform standards and procedures to regulate the size, type, number, design, placement, illumination, timeframe for display, and maintenance of signs.

10.309.2. Applicability

This section applies in the following areas:

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	Yes

10.309.2.1 Generally

- (a) This Section applies everywhere within the City's corporate boundaries and its extraterritorial jurisdiction, except as specifically stated otherwise in this Section.
- (b) This Section does not prohibit signs required by state or federal law and does not authorize signs that state or federal law prohibits.
- (c) A person shall not erect, operate, display, or otherwise use any sign that this Section prohibits.
- (d) A person shall not erect, operate, display, or otherwise use any sign at a time, place, or manner that this Section prohibits.

10.309.2.2 Message Neutrality

- (a) Despite any other provision of this Section, no sign is subject to any limitation based on the content of its message.
- (b) Any sign authorized in this Section may contain any noncommercial copy or messages instead of a commercial or another noncommercial message.

10.309.3. Prohibited Signs

The following signs and related objects are prohibited from being installed or publicly displayed at any location within the City's corporate boundaries and its extraterritorial jurisdiction, except as provided for within this Section, and if only after authorized issuance of a City-issued sign permit required by this Section.

- (a) Moving and flashing signs, including signs that flash, revolve, rotate, swing, undulate or otherwise attract attention through the movement or flashing of lights, LEDs, or other parts, or through the impression of movement or flashing.

- (b) Signs which employ a motion picture machine, or which display moving images, or images which give the impression of motion, including those using digital display.
- (c) Signs which are of a size, location, movement, content, coloring, or manner of illumination, which may be confused with or construed as a traffic-control device or which hide from view any traffic or street sign or signal, or which obstruct the view in any direction at a street or road intersection.
- (d) Signs placed on or affixed to vehicles, trailers, or equipment that are parked on a public right-of-way, public or private property so as to be visible from a public right-of-way where the apparent purpose is to direct people to another property.
- (e) No person shall attach any sign, paper or other material to, or paint, stencil or write anything on, or otherwise mark on any sidewalk, curb, gutter, street utility pole, tree, public building or structure unless authorized by this Section or by the City Council or its delegated representatives. This prohibition does not apply to signs with a permitted license agreement by City Council.
- (f) No person shall erect or allow to be erected any sign in, on or over public rights-of-way and easements, railroad right-of-way or designated fire lanes unless specifically exempted by this Section or unless erected under a valid, unexpired permit and a license agreement by City Council.
- (g) No person shall paint a sign or attach a sign to the exterior of a fence or railing.
- (h) No person shall hold, display, or wear a sign unless on private property and not in the right-of-way.
- (i) Signs which do not comply with any applicable provision of a building code, electrical code or other applicable code or ordinance of the City.
- (j) Messages displayed from searchlights.
- (k) Signs that are in disrepair to the extent that the cost of repair would exceed 50% of the value of a similar sign if purchased new and signs in danger of falling or that are otherwise unsafe to the public.
- (l) Signs that display multidimensional projections of diffracted light are prohibited.
- (m) Signs that are located on or that interfere with the use of public sidewalks, required off-street parking areas, or vehicle maneuvering areas unless specifically regulated in this Section.
- (n) A sign other than a traffic control sign or signal, in a sight visibility line as defined by the Division B, Section 14 of the Hutto Engineering Design Manual.
- (o) Any unauthorized sign on or attached to a public streetlight, utility pole, hydrant, bridge, traffic-control device, street sign or other public structure or building, or any sign located in, on, over or within a public street, sidewalk, alley, easement or right-of-way.
- (p) Signs (illuminated from within or without) that are illuminated in such a manner, to such intensity, or without shielding, so as to constitute a hazard to the

operation of motor vehicles upon a street or substantially interfere with the reasonable enjoyment of property.

- (q) Signs located on private property without the consent of that property owner.
- (r) Signs that use a revolving beam or beacon resembling any emergency vehicle or are located or illuminated in such a manner as to obscure or otherwise interfere with the effectiveness of an official traffic sign, signal or device, or so as to prevent any traveler on any street from obtaining a clear view of approaching vehicles for a distance of at least two hundred fifty (250) feet along the street.
- (s) Billboards.
- (t) All signs not expressly allowed, exempted, or permitted under this Section.

10.309.4. Exempt Signs

The following signs and related objects are generally allowed to be erected and publicly displayed at any location within the City's corporate boundaries and its extraterritorial jurisdiction, except as otherwise specifically prescribed within this Section, and a city-issued sign permit is not required in order to erect and display any of the following signs unless specifically set forth in this Section. This Section shall not apply to:

- (a) Any signs and signals properly authorized by law, signs authorized by statute or a state agency in accordance with the Texas Manual of Uniform Traffic Control Devices, and other traffic signals, public warnings, or legal notices provided that such objects are installed in a location and in a manner and condition required by federal or state statute, a state agency, or a City ordinance or authorized authority.
- (b) Nonconforming signs and existing billboards as defined in this UDC.
- (c) Signs required by governmental bodies or agencies having proper jurisdiction for a public purpose by law, statute or ordinance. This also includes any signs the City Council decides by ordinance or resolution to erect within its corporate boundaries, extraterritorial jurisdiction or any real property that it may own or control.
- (d) Signs on vehicles, trailers, or equipment are exempted only to the extent such signs are incidental to the primary use of the vehicle, trailer, or equipment, provided that the vehicle, trailer, or equipment is in good mechanical repair and is not left in one place for more than seventy-two (72) hours without being moved.
- (e) Signs erected by the City that direct vehicular and/or pedestrian traffic, which may display arrows, words, or other symbols to indicate directions of facilities.
- (f) Address numerals and other similar information required to be maintained by law or governmental order, rule or regulation, provided that the size of the sign may not exceed the requirements of such law, order, rule or regulation.
- (g) Signs contained within a walled, fenced, or secured property or area.
- (h) Signs which are located in or adjacent to entrances or foyers.

- (i) Signs erected by governmental bodies or agencies serving the public, that are less than thirty-two (32) square feet in area.
- (j) Decorations, lights, pennants and similar devices on public property with the permission and under the supervision of the City.
- (k) Seasonal lights and decorations customarily displayed during federally recognized holidays.
- (l) Signs in plaza or public space structures located in the City's right-of-way, that are installed and maintained by the City or a contractor authorized by the City.
- (m) Noncommercial message(s).
- (n) Signs that are fully located within an enclosed building that are not observable from the exterior of that building.
- (o) Public/private art or sculptures no more than four (4) feet in height, ten (10) feet in length, and three (3) feet in width, placed in a manner which does not obstruct pedestrian walkways, nor obstruct visibility at driveway entrances or street intersections, and located wholly on private property are exempt from the requirements of this Section (see Figure 309.4-1 which shows examples of exempt and non-exempt art and sculptures – top and bottom left images are exempt; bottom right image is not exempt). No such art or sculpture shall be located on public property or right-of-way without first receiving a right-of-way agreement or easement approved by City Council.

Figure 309.4-1: Exempt and Non-Exempt Art and Sculptures



10.309.5. Computations and Interpretations

10.309.5.1 Sign Faces and Application. When a sign has multiple faces, the sign area shall be calculated as follows:

(a) One-Sided Sign

The area will be the area of the one face.

(b) Two-Sided Sign, Front and Back

The sign area is calculated separately for each side. The area of each side shall not exceed the maximum permitted sign area.

(c) Signs Faces on Different Planes of an Architectural Sign Structure

(1) Two (2) sign faces where the interior angle between the two (2) faces is forty-five (45) degrees or less. The sign area is calculated separately for each sign face. The maximum permitted sign area applies to each sign face.

(2) Two (2) sign faces where the interior angle between the two (2) faces is greater than forty-five (45) degrees. The sign area is the sum of the individual sign faces. The combined sign area of the two (2) faces shall not exceed the maximum permitted sign area.

(3) Where more than two (2) sign faces exist on a single architectural structure, the sign area is the sum of the individual sign faces. The combined sign area of the faces shall not exceed the maximum permitted sign area.

(d) All signs on a single supporting structure, that is not an architectural sign structure, shall be measured together as though they were one sign to determine the total sign area, except that signs separated by more than thirty-six (36) inches of air space at every point between the signs, and not separated by being located on different planes of an architectural sign structure, shall be measured separately and added together to determine the total effective area.

(e) Irregularly Shaped Signs

The sign area is the area enclosed by the smallest imaginary regular shape, or combination of shapes, which would fully contain all portions of the sign when rotated horizontally around the sign. Marquee signs are not considered freeform if information is only displayed on the front and back.

10.309.5.2 Measurement

The measurement required for signs by this Section shall be made using the following procedures:

(a) Setback

To apply the setback provisions of this Section for signs at any one point, the following measuring procedure shall be used:

(1) Draw an imaginary vertical extending upwards from the curb-line of the premises;

(2) Beginning at any point on the vertical line, draw an imaginary horizontal line perpendicular to the vertical line and curb-line extending toward the premises; and

- (3) Beginning at the point where the vertical line intersects the horizontal line, measure along the horizontal line for the required setback.

(b) Height

The maximum height of a sign mounted to the ground shall be determined by the method of measurement that allows the greater height, as follows:

(1) Curb-line Measurement

- (A) Measure along a vertical line extended upward from the nearest curb-line of the public street fronting the premises where the sign is to be located, to the maximum height allowed for the sign.
- (B) From that point, extend a horizontal line to where the sign is to be located.
- (C) The horizontal line is the maximum height allowed at that location.

(2) Street Level Measurement

- (A) Along elevated roadways, the height of a sign may be measured from the principal lane, the frontage road, or the ground, whichever allows the greatest height.
- (B) At the highest point of the sign, draw a horizontal line to the outer extremities of the sign.
- (C) At the center of the horizontal line, draw a vertical line to the street level (the level of the principal lane, the frontage road or the ground).
- (D) The vertical line may not exceed the height allowed for a sign at that location for that particular district.

(3) Natural Ground Level Measurement

- (A) At the highest point of the sign, draw a horizontal line to the outer extremities of the sign.
- (B) At the center of the horizontal line, draw a vertical line to the natural ground level below (the “natural ground level” shall include any changes in topography necessary for development of the property).
- (C) The vertical line may not exceed the height allowed for the sign at that location.

(c) Sign Area

- (1) Sign area means the area enclosed by the smallest imaginary regular shape (e.g. parallelogram, triangle, circle, trapezoid) or combination of regular shapes that will encompass the extreme limits of the writing, representation, emblem, or other display, or combination thereof, together with any material or color forming an integral part of the display or used to differentiate the sign from the backdrop or structure against which it is placed.
- (2) Sign area includes such features as decorative or ornamental elements or features, borders, trims, but not including the architectural enclosure or

supporting structure which is used solely for support of the sign, such as poles columns and cables, pylons, or architectural enclosures.

10.309.5.3 Sign Number Variables

Signs may be allocated by (note: this is not an inclusive list):

- (a) Lot;
- (b) Storefront;
- (c) Entrance;
- (d) Grounded Canopy;
- (e) Window; or
- (f) Building.

10.309.6. Sign Features

Signs may incorporate the following features established below; however, these features shall only be allowed as established in the tables in Section 10.309.10 through Section 10.309.12.

10.309.6.1 Illumination

- (a) Generally
 - (1) A sign that is "illuminated" means any sign that incorporates illumination on or in the sign, or that directs illumination toward or over all or part of the sign, or that is created by the projection of illuminations onto a surface (such as a building wall).
 - (2) Permanent signs may be illuminated by static and continuous internal, external, and halo illumination configurations as indicated in the tables in Section 10.309.10 through Section 10.309.12. for each sign type. Figure 309.6-1 shows the various illumination configurations (from top left to bottom right: halo illumination, external illumination, external illumination, internal illumination).

Figure 309.6-1: Illumination Configurations



(3) Temporary signs shall not be illuminated.

(b) Standards

The standards below apply to all signs that are illuminated.

- (1) Signs that are illuminated shall not operate at brightness levels of more than a half (0.5) foot-candles above ambient light conditions at the property line, as measured using a foot-candle meter. Illumination levels shall be measured in foot-candles with a meter sensor in a horizontal position at an approximate height of three feet above grade.
- (2) Illumination shall not include animation, moving video, or flashing, scrolling, intermittent, moving lights, rotating beams or flashing beacon lights.
- (3) Signs that are illuminated shall not be illuminated by flashing, intermittent, or moving lights, or lights that consist of an image projected upon a stationary object.
- (4) The illumination source for a sign or building shall be shielded from view from any point on the ground by either an opaque or translucent material.
- (5) Illumination shall comply with all applicable provisions of the City's Electrical Code.

- (6) Signs with illumination in or within one hundred (100) feet of a residential area shall be reduced to fifty percent (50%) of the maximum brightness level allowed by this Section between the hours of 12:00 AM and 6:00 AM.

10.309.6.2 Electronic Message Centers

(a) Generally

- (1) A sign that incorporates an electronic message center (EMC) means a sign that displays a digital copy, including any illuminated sign on which the illumination is not kept stationary or constant in intensity and color when the sign is in use, including any light emitting diode (LED) or digital panel, and which varies in color or intensity (Figure 309.6-2 shows examples of signs that incorporate EMCs).

Figure 309.6-2: EMCs Signs



- (2) Permanent signs may incorporate EMCs as indicated in the tables in Section 10.309.10 through Section 10.309.12. for each sign type.

- (3) Temporary signs shall not incorporate EMCs.

(b) Standards

(1) Hold Time

- (A) Each message on the sign shall be displayed for at least fifteen (15) seconds duration.
- (B) Message changes shall be completed instantaneously and shall be imperceptible.

(2) Electronic Copy

- (A) Signs incorporating EMCs shall only contain static messages changed exclusively by dissolve or fade transitions and shall not have movement or the appearance or optical illusion of movement during the static display period of any part of the sign.
- (B) A static message shall not include any flashing or varying of light intensity, and the message shall not scroll.
- (C) The change of message using dissolve or fade transition shall not exceed two (2) seconds of time between each message displayed on the sign.

(3) Brightness

- (A) The intensity of the light source for an EMC shall not produce glare, the effect of which constitutes a traffic hazard or is otherwise detrimental to the public health, safety or welfare.
- (B) An EMC shall not operate at brightness levels of more than 0.5 foot-candles above ambient light conditions at the property line, as measured using a foot-candle meter. Illumination levels shall be measured in foot-candles with a meter sensor in a horizontal position at an approximate height of three feet above grade.
- (C) Prior to the issuance of a sign permit, the applicant shall provide written certification from the sign manufacturer that the light intensity has been factory pre-set not to exceed a half (0.5) foot-candles above ambient light and that the intensity level is protected from end-user manipulation by password-protected software or other method as deemed appropriate by the Director of Development Services.

(4) Light Sensing Device

Each digital sign shall have a light-sensing device that will adjust the brightness as ambient light conditions change.

(5) Technology

- (A) The technology currently being deployed for EMCs is LED, but there may be alternate, preferred and superior technology available in the future.
- (B) Any other technology that complies with the performance standards for EMCs, including the maximum brightness levels as stated above, is permitted.

(6) Automatic Shutoff

An EMC shall:

- (A) Have automatic dimmer software or solar sensors to control brightness for nighttime viewing and variations in daytime ambient light.

- (B) Include systems and monitoring to either turn the display off, show "full black" on the display, or include a default mechanism that freezes the sign in one position if a malfunction occurs, and
- (C) Be designed so that a catastrophic power surge will cause the sign to go dark or to deploy the maximum brightness limitations, and
- (D) Automatically adjust the intensity of its display according to natural ambient light conditions.

(7) Resolution

- (A) EMC faces shall have a pixel pitch of no more than sixteen (16) millimeters.
 - (i) "Pixel pitch" means a measurement of the resolution of a digital display, in terms of the distance (generally in millimeters) between the center of a LED cluster (pixel) and the center of the next LED pixel.
 - (ii) A lower pixel pitch measurement indicates a higher display resolution.
- (B) The requirements of Subsection (b)(1) above applies only to signs that are constructed, rebuilt or replaced after the effective date of this UDC.

(c) Maintenance

- (1) The sign owner shall provide the Director of Development Services with the phone number and email address of a person who is available to be contacted at any time and who is able to turn off the EMC promptly after a malfunction occurs.
- (2) The light modules on electronic message centers shall be repaired or replaced if they become broken, burned-out, or substantially dimmed.

10.309.6.3 Changeable Copy

(a) Generally

Permanent signs may incorporate changeable copy as indicated in the tables in Section 10.309.10 through Section 10.309.12. for each sign type (Figure 309.6-3 shows examples of signs that incorporate changeable copies).

Figure 309.6-3: Changeable Copy Signs



(b) Standards

Changeable copies may be illuminated if the dimensions and standards allow illumination for the sign type in the district.

10.309.6.4 Neon

(a) Generally

- (1) Neon shall mean any sign that uses neon, argon, mercury or a similar gas to fill tubing, made of glass or similar material, which is charged with electricity and used to create an illuminated tubular sign or an illuminated decorative element(s) of a sign area. The tubing may contain an alternative illumination technology, such as, but not limited to, LEDs. Any nongaseous illumination technology, such as LEDs, shall produce illumination that appears to be a continuous, uninterrupted line, similar to illumination produced by gaseous illumination technology to be considered neon for the purposes of applicability of this Section (See Figure 309.6-4 as an example of a sign that uses neon).

Figure 309.6-4: Neon Signs



- (2) Permanent signs may incorporate neon as indicated in the tables in Section 10.309.10 through Section 10.309.12. for each sign type.

(b) Standards

- (1) The use of neon as a sign feature shall require review and approval by the Planning and Zoning Commission prior to approval of a sign permit based on the following factors:
 - (A) The neon uses colors that coordinate with the colors of the building and district in which it is located;
 - (B) The neon does not overwhelm or hide character-defining features of a building;
 - (C) The neon is placed and sized to reinforce the building's architecture and its surroundings; and
 - (D) The neon is placed at similar heights and façade locations as adjacent buildings or tenants to provide an integrated block appearance.
- (2) All neon signs shall comply with Section 10.309.6.1 Illumination.
- (3) The intensity of the neon lighting shall not produce glare, the effect of which constitutes a traffic hazard or is otherwise detrimental to the public health, safety or welfare.
- (4) Change of illumination to produce apparent motion of the visual image on neon signs, such as changes in luminance in a sequential or radial manner to produce what appears to be movement of an element of the sign shall be prohibited. Flashing and physical movement of a sign and/or its elements are also prohibited.

- (5) Signage that uses LED tubing or similar and has the appearance of neon is considered to be the same as neon if it produces a continuous lit appearance similar to neon lighting technology and does not create darker and/or shadowy spaces between individual LEDs that make the linear, illuminated image appear non-continuous.

10.309.6.5 Hand-Applied Paint

(a) Generally

Permanent signs may incorporate hand-applied paint as indicated in the tables in Section 10.309.10 through Section 10.309.12. for each sign type (See Figure 309.6-5 as an example of signs that use hand-applied paint).

Figure 309.6-5: Hand-Applied Paint Signs



(b) Standards

Where allowed by Section 10.309.10 through Section 10.309.12, painted signs shall follow the same regulations as non-painted signs of the same type. For example, a hand painted wall sign shall simply be considered a wall sign for the purposes of applicability of this Section.

10.309.7. Sign Types

10.309.7.1 Purpose

- (1) This Section establishes the required standards for signs from the following sign categories and subcategories:

(A) Permanent signs.

- (i) Freestanding signs;
 - (ii) Attached signs;
 - (iii) Incidental signs.
- (B) Temporary sign.
- (C) Special signs.
- (2) This classification system provides flexibility for persons and businesses who display signs, avoids sign distinctions that depend on a sign's message, supports the communities' aesthetic goals, and avoids potential traffic hazards and clutter.

10.309.7.2 Generally

This Section establishes standards for individual sign types. Subsections on each sign type addresses the following standards:

- (1) Images or graphics that illustrate the sign type;
- (2) A table summarizing the applicable sign standards, including:
 - (A) Text defining the sign type.
 - (B) If the sign type is allowed in the designated areas provided in the tables in Section 10.309.10 through Section 10.309.12.
 - (C) If a sign permit is required.
 - (D) The maximum number of signs of each type.
 - (E) Maximum sign dimensions, including:
 - (i) Sign area;
 - (ii) Height;
 - (iii) Location/setbacks;
 - (iv) Other requirements.
 - (F) If the sign features provided in Section 10.309.6. are allowed:
 - (i) Changeable copies;
 - (ii) Electronic message centers;
 - (iii) Illumination features;
 - (iv) Neon;
 - (v) Hand applied paint.

10.309.8. Sign Type Conversion

Table 309-1: Sign Type Conversion

Applicable			Previous
Sign Category	Sign Subcategory	Sign Type	Sign Type
Permanent	Freestanding	Monument Sign	Monument Sign
		Pole Sign	Pole Sign; Pylon Sign
		Subdivision Entry Sign	Development Sign
	Attached	Wall Sign	Wall Sign
		Canopy Sign	Canopy Sign; Awning Sign
		Grounded Canopy Sign	Canopy Sign
		Projecting Sign	Projecting Sign
		Hanging Sign	
		Marquee Sign	Attached Sign
		Window Sign	Window Sign
	Incidental	General Incidental Sign	Directional Sign
		Speaker Board	
Temporary		General Temporary	Garage Sale; Open House; Portable;
		Sidewalk Sign	A-frame Sign
		Banner	Banner
		Feather Sign	Banner
		Balloon	
Special		Mural	Mural
		Billboard	Billboard

10.309.9. Allocation System

10.309.9.1 Sign Districts

This Section regulates signs by location. This UDC regulates use, setbacks, building size, site design, and land use allowances by zoning districts. For the purposes of this Section, zoning districts and those areas within the City's ETJ are organized into sign districts to produce desirable sign outcomes. The sign districts are established in the table below.

Table 309-2: Sign Districts

Sign District	Zoning District
ARN	AR - Agriculture & Residential District
	R-1 - Legacy Single-Family District
	N-1 - Neighborhood Hamlet District
	PR - Public & Recreational District
NMH	N-2 - Neighborhood Village District
	N-2(H) Neighborhood Village District (Historic)
	MU-1 - Mixed-Use Community District
	N-3 - Neighborhood Town District
	H - Historic District Overlay
CGI	CC - Commerce Corridor District
	ID - Innovation District Overlay
	B - Business & Light Industrial District
	M - Manufacturing & Industrial District
MUR	MU-2 - Mixed Use Regional District
ETJ	ETJ - Extraterritorial Jurisdiction

10.309.9.2 Sign Permit Requirements by Sign District

Applicable permitting requirements for each sign type shall be as provided in this Section and shall comply with the procedures established Section 10.802.15.

10.309.10. Permanent Signs

10.309.10.1 Freestanding Signs

Freestanding signs are classified into one of the following sign types: monument signs, pole signs, or subdivision entry signs. Their associated regulations are established in this Section. A lot may have one freestanding sign, but not multiple unless specified elsewhere in this Section.

(a) Monument Signs

Figure 309.10-1: Monument Signs



(1) Generally

The following table establishes the standards for Monument Signs.

Table 309-3: Monument Sign Standards

Definition	A permanent, freestanding sign mounted to a solid base support at ground level with no open space between the bottom of the sign and the ground.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	NR	NR	✓	✓	NR
Permit Required?	✓	✓	✓	✓	✓
Number per Lot (max.)	1	1	1	1	1
Dimensions					
<u>Sign Area (max.)</u>					
Buildings < 50,000 sf	32 sf	40 sf	60 sf	40 sf	60 sf
Buildings ≥ 50,000 – 100,000 sf	48 sf	60 sf	80 sf	60 sf	80 sf
Buildings ≥ 100,000 sf	64 sf	80 sf	100 sf	80 sf	100 sf
<u>Sign Height (max.)</u>					
Buildings < 50,000 sf	6 ft	6 ft	10 ft	8 ft	8 ft
Buildings ≥ 50,000 – 100,000 sf	8 ft	8 ft	12 ft	10 ft	10 ft
Buildings ≥ 100,000 sf	10 ft	10 ft	15 ft	12 ft	12 ft
Setbacks (min.)					
From Front Property Line	5 ft	5 ft	5 ft	5 ft	5 ft
From Other Property Lines	5 ft	5 ft	5 ft	5 ft	5 ft
From Other Freestanding Signs	100 ft	100 ft	100 ft	100 ft	100 ft
Features					
Changeable Copy	NR	NR	✓	✓	✓
Electronic Message Center	✗	✗	✓	✓	✓
Illumination	NR	NR	✓	✓	✓
Neon	✗	✗	✗	✗	✗
Hand-Applied Paint	✗	✗	✗	✗	✗

(2) Number

(A) This Subsection generally allows one (1) double-sided monument sign for each lot fronting a street for the districts shown in the table unless the lot fronts multiple streets, in which an additional monument sign is allowed for each street frontage.

(B) No monument sign is allowed on a lot without frontage on to a street.

(3) Multi-Tenant Allowances

- (A) The maximum sign area for a monument sign on a lot with multiple tenants may be increased by twenty-five (25%).
- (B) No monument sign on a lot with multiple tenants with an increased maximum sign area allowance shall be located within two hundred (200) feet of another monument sign.
- (C) No monument sign on a lot with multiple tenants with an increased maximum sign area allowance shall be located within five hundred (500) feet of a residential use.
- (D) A monument sign on a lot with multiple tenants shall be set back at least fifteen (15) feet from the front property line.

(4) Design and Installation

- (A) Any electrical service provided to a monument sign shall be underground.
- (B) Monument signs shall be designed to withstand wind loads established by the Building Code.
- (C) All monument signs shall be placed in concrete bases or footings.
- (D) Monument signs shall be landscaped around the base of the sign in an area equal to three feet for each square foot of sign and base area.
- (E) An individual monument sign shall contain at a minimum a three-foot masonry base around all sides of the sign.
- (F) A monument sign may incorporate a changeable copy or an electronic message center based on the standards of Section 10.309.6 and the allowances established in the table above.

(b) Pole Signs

Figure 309.10-2: Pole Signs



(1) Generally

The following table establishes the standards for Pole Signs.

Table 309-4: Pole Sign Standards

Definition	A permanent, freestanding sign in which the sign face is mounted on one (1) or more poles/pillars and the base of the sign face is situated above the ground, leaving an open space between sign face and the ground.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	✗	✓	✗	NR
Permit Required?	-	-	✓	-	✓
Number per Lot (max.)	-	-	1	-	1
Dimensions					
<u>Sign Area (max.)</u>					
Buildings < 50,000 sf	-	-	60 sf	-	60 sf
Buildings ≥ 50,000 – 100,000 sf	-	-	80 sf	-	80 sf
Buildings ≥ 100,000 sf	-	-	100 sf	-	100 sf
<u>Sign Height (max.)</u>					
Buildings < 50,000 sf	-	-	10 ft	-	8 ft
Buildings ≥ 50,000 – 100,000 sf	-	-	12 ft	-	10 ft
Buildings ≥ 100,000 sf	-	-	15 ft	-	12 ft
Setbacks (min.)					
From Front Property Line	-	-	10 ft	-	10 ft
From Other Property Lines	-	-	5 ft	-	10 ft
From Other Freestanding Signs	-	-	100 ft	-	100 ft
Features					
Changeable Copy	-	-	✓	-	✓
Electronic Message Center	-	-	✓	-	✓
Illumination	-	-	✓	-	✓
Neon	-	-	✗	-	✗
Hand-Applied Paint	-	-	✗	-	✗

(2) Number

(A) This Subsection allows one (1) double-sided pole sign for each lot fronting a street for the sign districts shown in the table unless the lot fronts multiple streets, in which an additional pole sign is allowed for each street frontage.

(B) No pole sign is allowed on a lot without frontage on to a street.

(3) Location

Pole signs are only allowed if:

- (A) A lot abuts Interstate U.S. Highway 79 or State Highway 130.
- (B) Located within a distance of one hundred (100) feet from the right-of-way line of the linear segment of that thoroughfare and situated so as to be viewed from that thoroughfare.

(4) Multi-Tenant Allowances

- (A) The maximum sign area for a pole sign on a lot with multiple tenants may be increased by twenty-five (25%).
- (B) No pole sign on a lot with multiple tenants with an increased maximum sign area allowance shall be located within two hundred (200) feet of another pole sign.
- (C) No pole sign on a lot with multiple tenants with an increased maximum sign area allowance shall be located within five hundred (500) feet of a residential use.
- (D) A pole sign on a lot with multiple tenants shall be set back at least fifteen (15) feet from the front property line.

(5) Design and Installation

- (A) Any electrical service provided to a pole sign shall be underground.
- (B) Pole signs shall be designed to withstand wind loads established by the Building Code.
- (C) All pole signs shall be placed in concrete bases or footings.
- (D) All pole signs shall be landscaped around the base of the sign in an area equal to three square feet for each square foot of sign area.
- (E) Pole signs shall not have attached any guys or braces.
- (F) A pole sign may incorporate a changeable copy or an electronic message center based on the standards of Section 10.309.6 and the allowances established in the table above.

(c) Subdivision Entry Signs

Figure 309.10-3: Subdivision Entry Signs



(1) Generally

The following table establishes the applicable standards for subdivision entry signs.

Table 309-5: Subdivision Entry Sign Standards

Definition	A subdivision entry sign is a permanent, freestanding monument sign located at the entry of a platted subdivision from a street.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✓	✓	✓	✓	✓
Permit Required?	✓	✓	✓	✓	✓
Dimensions					
Sign Area (max.)	60 sf	50 sf	80 sf	60 sf	60 sf
Sign Height (max.)	6 ft	5 ft	8 ft	6 ft	6 ft
Setbacks					
From Adjacent Residential Use (min.)	20 ft	20 ft	20 ft	20 ft	20 ft
Features					
Changeable Copy	✗	✗	✗	✗	✗
Electronic Message Center	✗	✗	✗	✗	✗
Illumination	✓	✓	✓	✓	✓
Neon	✗	✗	✗	✗	✗
Hand-Applied Paint	✗	✗	✗	✗	✗

(2) Number and Location

Two (2) subdivision entry signs may be located at the intersection of a street or private driveway and an entry into a subdivision. The signs shall be configured as follows:

- (A) Two (2) signs with one (1) sign face each located on opposite sides of the street entry or private driveway;
- (B) One (1) sign with two (2) faces located within a landscaped area dividing two (2) one-way street entries or private driveways; or
- (C) One (1) sign located on one (1) side of the street entry or private driveway.

(3) Design and Installation

A subdivision entry sign shall:

- (A) Be constructed with stone, brick, concrete, metal, routed wood planks or beams, or similar durable, weatherproof materials.

- (B) Have a defined, bordered, landscaped area at the base of the sign.
- (C) Provide a required landscaped area that:
 - (i) Is parallel to the face of the sign;
 - (ii) Is around the base of the sign equal to two feet for each square foot of sign and base area;
 - (iii) Is kept neat and weed-free; and
 - (iv) Contains living plant materials covering at least fifty percent (50%) of the defined landscaped area. Artificial plant materials are not authorized for use.
 - (v) For double-sided subdivision entry signs, the landscaped area shall be allocated so that a portion of the required landscaping is located in front of each sign face.
- (D) When electrical service is provided to a subdivision entry sign, all electrical service shall be underground.
- (E) Only use external illumination if providing sign lighting.

10.309.10.2 Attached Signs

Attached signs are classified into one of the following sign types: wall signs, attached canopy signs, grounded canopy signs, projecting signs, hanging signs, window signs, and marquee signs. Their associated regulations are established in this Section.

- (a) Generally
 - (1) Internally lit channel letters and halo lit letters are preferred for attached signs.
 - (2) Domed, bullnose and bubble-style awning signs, and internally illuminated box signs are prohibited as attached signs.
 - (3) Attached signs:
 - (A) Cannot overlap features such as cornices, eaves, window and door frames, columns and other decorative elements.
 - (B) Shall be placed at least three (3) ft from the vertical edge of a wall and other attached signs unless otherwise specified in this Section.
 - (C) Shall be placed entirely below the lowest point of a building's parapet wall, except signs on water towers and smokestacks.

(b) Wall Signs

Figure 309.10-4: Wall Signs



(1) Generally

The following table establishes the applicable standards for wall signs.

Table 309-6: Wall Sign Standards

Definition	A wall sign is a permanent, attached sign painted on or affixed to the wall or surface of a building or display surface which is parallel to the supporting surface.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	NR	NR	✓	✓	NR
Permit Required?	✓	✓	✓	✓	✓
Dimensions					
Sign Area (max. % of wall)	20%	20%	15%	20%	15%
Vertical Clearance (min.)	8 ft	8 ft	8 ft	8 ft	8 ft
Sign Projection (max.)	1 ft	2 ft	1 ft	2 ft	2 ft
Features					
Changeable Copy	✗	✗	✗	✗	✗
Electronic Message Center	✗	✗	✗	✗	✗
Illumination	NR	NR	✓	✓	NR
Neon	NR	NR	✓	✓	NR
Painted on Wall	NR	NR	✓	✓	NR

(2) Number

There is no limit to the amount of wall signs allowed on a building; however, in no instance shall the cumulative wall sign allowance exceed the requirements in the table.

(3) Design and Installation

A wall sign:

- (A) Shall affix flush against the wall of the building or as flush as possible while allowing the plane of the face of the sign to remain perpendicular to the ground.
- (B) Shall not cover more than eighty percent (80%) of the wall's width.
- (C) The face of a wall sign cannot extend above the top surface of the face of the wall to which it is attached.

(c) Attached Canopy Signs

Figure 309.10-5: Attached Canopy Signs



(1) Generally

The following table establishes the applicable standards for attached canopy signs.

Table 309-7: Attached Canopy Sign Standards

Definition	An attached canopy sign is a permanent, attached sign painted, printed, attached, or otherwise applied to any facet of the covering or frame structure of an awning or attached structural canopy.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	✗	✓	✓	NR
Permit Required?	-	-	✓	✓	✓
Dimensions					
Sign Area (cumulative max. per attached canopy)	-	-	100 sf	75 sf	100 sf
Sign Projection (max.)	-	-	1 ft	1 ft	1 ft
Features					
Changeable Copy	-	-	✓	✓	NR
Electronic Message Center	-	-	✓	✗	NR
Illumination	-	-	✓	✓	NR
Neon	-	-	✗	✗	✗
Hand-Applied Paint	-	-	✓	✓	NR

(2) Number

There is no limit to the amount of attached canopy signs allowed on an attached canopy or building; however, in no instance shall the cumulative attached canopy sign allowance exceed the requirements in Table 309-7.

(3) Design and Installation

- (A) An attached canopy sign shall affix flush against the surface of the face of the attached canopy or as flush as possible while still allowing the plane of the face of the sign to remain perpendicular to the ground.
- (B) The face of an attached canopy sign cannot extend above the top surface of the face of the awning or canopy to which it is attached.

(d) Grounded Canopy Signs

Figure 309.10-6: Grounded Canopy Signs



(1) Generally

The following table establishes the applicable standards for grounded canopy signs.

Table 309-8: Grounded Canopy Sign Standards

Definition	A grounded canopy sign is a permanent, attached sign that is affixed to a grounded canopy. A grounded canopy is a permanent structure that is structurally independent of a building affixed to the ground, that is of rigid construction, and over which a covering is attached that provides weather protection, identity, or decoration.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	✗	✓	✓	NR
Permit Required?	-	-	✓	✓	✓
Dimensions					
Sign Area (cumulative max. per grounded canopy)	-	-	100 sf	75 sf	100 sf
Sign Projection (max.)	-	-	1 ft	1 ft	1 ft
Features					
Changeable Copy	-	-	✓	✓	NR
Electronic Message Center	-	-	✓	✗	NR
Illumination	-	-	✓	✓	NR
Neon	-	-	✗	✗	✗
Hand-Applied Paint	-	-	✗	✗	✗

(2) Number

There is no limit to the amount of grounded canopy signs allowed on a grounded canopy; however, in no instance shall the cumulative grounded canopy sign allowance exceed the requirements in the table.

(3) Design and Installation

- (A) A grounded canopy sign shall affix flush against the surface of the face of the grounded canopy or as flush as possible while still allowing the plane of the face of the sign to remain perpendicular to the ground.
- (B) The face of a grounded canopy sign cannot extend above the top surface of the face of the grounded canopy to which it is attached.

(e) Hanging Signs

Figure 309.10-7: Hanging Signs



(1) Generally

The following table establishes the applicable standards for hanging signs.

Table 309-9: Hanging Sign Standards

Definition	A hanging sign is a permanent, attached sign suspended/hanging from the underside of a canopy, awning, ceiling, marquee, roof overhang, a covered porch, or walkway.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	NR	✓	✓	✗
Permit Required?	-	✓	✓	✓	-
Number per Storefront (max.)	-	1	1	1	-
Dimensions					
Sign Area (max.)	-	16 sf	12 sf	16 sf	-
Vertical Clearance (min.)	-	8 ft	8 ft	8 ft	-
Sign Projection (max.)	-	4 ft	2 ft	4 ft	-
Features					
Changeable Copy	-	✗	✗	✗	-
Electronic Message Center	-	✗	✗	✗	-
Illumination	-	NR	✓	✓	-
Neon	-	✗	✗	✗	-
Hand-Applied Paint	-	NR	✓	✓	-

(2) Design and Installation

- (A) A hanging sign shall affix to the surface of the wall so that the face of the sign remains perpendicular to the ground.
- (B) A hanging sign may encroach a maximum of three (3) feet over a public sidewalk but shall not encroach over any parking or travel lane.

(f) Marquee Signs

Figure 309.10-8: Marquee Signs



(1) Generally

The following table establishes the applicable standards for marquee signs.

Table 309-10: Marquee Sign Standards

Definition	A marquee sign is a permanent, attached sign affixed to a marquee. A marquee is a type of attached canopy that has a top surface that is sloped less than twenty-five (25) degrees from the horizontal, is located less than ten (10) feet above the top of an operable exterior doorway, and frequently includes panels for changeable copy				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	NR	✓	✓	✓
Permit Required?	-	✓	✓	✓	✓
Number per Building/Storefront (max.)	-	1	1	1	1
Dimensions					
Sign Area (max. % of wall)	-	20%	20%	30%	30%
Vertical Clearance (min.)	-	8 ft	8 ft	8 ft	8 ft
Sign Projection (max.)	-	6 ft	6 ft	8 ft	8 ft
Features					
Changeable Copy	-	✓	✓	✓	✓
Electronic Message Center	-	✗	✗	✗	✗
Illumination	-	✓	✓	✓	✓
Neon	-	✓	✓	✓	✓
Hand-Applied Paint	-	✗	✗	✗	✗

(2) Design and Installation

A marquee sign:

- (A) Shall be located above the primary public entrance(s) of a building or storefront.
- (B) May extend the full length of the building façade but shall not extend above the wall to which it is attached.
- (C) May project over a sidewalk but shall not project above a street.

(g) Projecting Signs

Figure 309.10-9: Projecting Signs



(1) Generally

The following table establishes the applicable standards for projecting signs.

Table 309-11: Projecting Sign Standards

Definition	A projecting sign is a permanent, attached sign type that is affixed to and projects a foot or more from the wall of a building and is generally perpendicular to the building façade.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	NR	✓	✓	✗
Permit Required?	-	✓	✓	✓	-
Number per Building/Storefront (max.)	-	1	1	1	-
Dimensions					
Sign Area (max.)	-	30 sf	40 sf	40 sf	-
Vertical Clearance (min.)	-	8 ft	8 ft	8 ft	-
Sign Projection (max.)	-	6 ft	6 ft	6 ft	-
Features					
Changeable Copy	-	✗	✗	✗	-
Electronic Message Center	-	✗	✗	✗	-
Illumination	-	NR	✓	✓	-
Neon	-	NR	✓	✓	-
Hand-Applied Paint	-	NR	✓	✓	-

(2) Design and Installation

A projecting sign:

- (A) Shall affix to the surface of the wall so that the face of the sign remains perpendicular to the ground.
- (B) Shall not extend above the top of the wall to which it is attached.
- (C) Shall be located above the canopy line.

(h) Window Signs

Figure 309.10-10: Window Signs



(1) Generally

The following table establishes the applicable standards for window signs.

Table 309-12: Window Sign Standards

Definition	A window sign is a sign posted, printed, placed, or affixed to a window or glass door. A window sign includes any sign that is located inside a building, that is three feet or less from a window or glass door, and that is clearly visible from outside the building.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	NR	✓	✓	✗
Permit Required?	-	✓	✓	✓	-
Dimensions					
Sign Area (max. % of window/door)	-	25%	25%	25%	-
Features					
Changeable Copy	-	✗	✗	✗	-
Electronic Message Center	-	✗	✗	✗	-
Illumination	-	NR	NR	NR	-
Neon	-	NR	NR	NR	-
Hand-Applied Paint	-	NR	✓	✓	-

(2) Design and Installation

- (A) Window signs shall not obscure visibility into the building.
- (B) No fluorescent materials shall be used for window signs.
- (C) Window signs are only permitted on the first story of the building.
- (D) Temporary window signs as allowed by the ordinance are exempt from the maximum area limitation.
- (E) Mannequins and storefront displays of merchandise sold are not considered window signs.
- (F) Interior directory signage identifying shopping aisles and merchandise display areas shall also be exempt from the window sign limitation.

10.309.10.3 Incidental Signs

Incidental signs are classified into one of the following sign types: general incidental signs or speaker boards. Their associated regulations are established in this Section. A building or lot may have multiple incidental signs as allowed in this Section.

(a) General Incidental Signs

Figure 309.10-11: General Incidental Signs



(1) Generally

The following table establishes the applicable standards for general incidental signs.

Table 309-13: General Incidental Sign Standards

Definition	A general incidental sign is a small permanent sign, other than a speaker board, that is freestanding or attached to a building that is in addition to the primary sign types for the property, such as detached signs and attached signs, and that has a height and scale that is clearly subordinate to the primary sign types allowed for the property. Examples of typical general incidental signs include house numbers, occupant directories, property or tenant identification names or numbers, wayfinding signs, and directional signs, and signs warning the public against trespassing or danger from animals. The list of examples is not exhaustive and is provided to clarify the regulations and does not limit the content of general incidental signs. The City will not review the content of general incidental signs.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-“ = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	NR	NR	✓	✓	NR
Permit Required?	✓	✓	✓	✓	✓
Dimensions					
Sign Area (cumulative max per lot)	20 sf	20 sf	40 sf	50 sf	50 sf
Sign Area (max. per incidental sign)	4 sf	4 sf	6 sf	8 sf	8 sf
Sign Height (max. per incidental sign)	4 ft	4 ft	4 ft	4 ft	4 ft
Setbacks (min.)					
From Front Property Line	5 ft	5 ft	5 ft	10 ft	10 ft
From Other Property Lines	5 ft	5 ft	5 ft	10 ft	10 ft
From Other Freestanding Signs	10 ft	10 ft	10 ft	10 ft	10 ft
Features					
Changeable Copy	✗	✗	✗	✗	✗
Electronic Message Center	✗	✗	✗	✗	✗
Illumination	✗	NR	NR	NR	✗
Neon	✗	✗	✗	✗	✗
Hand-Applied Paint	✗	✗	✗	✗	✗

(2) Number

There is no overall limit to the number of general incidental signs allowed on a property; however, in no instance shall the cumulative general incidental

sign allowance exceed the requirements in the table, unless specified otherwise in this Subsection.

(3) Design and Installation

- (A) Vertical clearance and setback requirements for general incidental signs shall conform to the requirements for the similar primary sign type (i.e. wall sign, window sign, monument sign) as those requirements are defined in this Section.
- (B) The face of a general incidental sign cannot extend above the top surface of the face of the wall or structure to which it is attached.
- (C) An attached incidental sign shall affix flush against the wall of the building in which it is located.
- (D) A detached incidental sign shall have an enclosed base and be securely and firmly embedded in the ground.
- (E) Incidental signs constructed in conjunction with monument and pole signs shall be consistent with the building elements and materials of those established on the same lot and within the development.

(b) Speaker Boards

Figure 309.10-12: Speaker Board Signs



(1) Generally

The following table establishes the applicable standards for speaker board signs.

Table 309-14: Speaker Board Sign Standards

Definition	A speaker board is a professionally constructed and installed sign made of a durable, weather-resistant product such as metal or high-density plastic and may include a two-way speaker system for ordering from a vehicle in a drive-thru lane provided the volume of the speaker does not exceed ambient noise conditions as measured at the property line.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-“ = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	NR	✓	✓	NR
Permit Required?	-	✓	✓	✓	✓
Dimensions					
Sign Area (cumulative max. per lot)	-	36 sf	50 sf	70 sf	36 sf
Sign Height (max.)	-	6 ft	6 ft	6 ft	6 ft
Setbacks (min.)					
From Front Property Line	-	10 ft	10 ft	10 ft	10 ft
From Other Property Lines	-	10 ft	10 ft	10 ft	10 ft
From Single-Family Residence	-	100 ft	100 ft	100 ft	100 ft
Features					
Changeable Copy	-	✓	✓	✓	✓
Electronic Message Center	-	✗	✓	✓	✗
Illumination	-	✓	✓	✓	✓
Neon	-	✗	✗	✗	✗
Hand-Applied Paint	-	✗	✗	✗	✗

(2) Number

There is no overall limit to the number of speaker boards allowed on a property; however, in no instance shall the cumulative speaker board allowance exceed the requirements in the table, unless specified otherwise in this Subsection.

(3) Design and Installation

- (A) A speaker board shall provide no more than three (3) feet and no less than eighteen (18) inches of horizontal separation from the curb or edge of the driveway the speaker board faces.
- (B) Speaker boards shall provide a minimum landscaped area of two (2) square feet per one (1) square foot of sign area abutting the sign base. In cases where the location of the sign could not accommodate such

landscape area, the area may be reduced up to twenty-five percent (25%) at the Director of Development Services discretion.

10.309.11. Temporary Signs

Temporary signs are classified into one of the following sign types: general temporary signs, sidewalk signs, attached banners, detached banners, feather signs, or balloon signs. Their associated regulations are established in this Section. A building or lot may have multiple temporary signs as allowed in this Section. A temporary sign shall not be used as a placeholder for detached and attached signs unless specified elsewhere in this Article.

(a) General Temporary Signs

Figure 309.11-1 Temporary Sign



(1) Generally

The following table establishes the applicable standards for general temporary signs not specified elsewhere in Section 10.309.11.

Table 309-15: General Temporary Sign Standards

Definition	A general temporary sign is a sign constructed of cloth, canvas, light fabric, cardboard, wood, wallboard, metal, or other light materials, with or without frames, which is intended to be displayed for a limited period of time only. Examples of typical general temporary signs include public demonstrations, grand opening signs, contractor signs, real estate signs, garage sale signs, and signs that announce an event such as a carnival, circus, or similar event. The list of examples is not exhaustive and is provided to clarify the regulations and does not limit the content of general temporary signs. The City will not review the content of general temporary signs.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✓	✓	✓	✓	✓
Permit Required?	✗	✗	✓	✓	✓
Number per lot (max.)	2	2	4	4	4
Dimensions					
Sign Area (max. per sign)	24 sf	24 sf	40 sf	40 sf	40 sf
Sign Height (max.)	6 ft	6 ft	6 ft	6 ft	6 ft
Setbacks (min.)					
From Front Property Line	10 ft	10 ft	10 ft	10 ft	10 ft
From Other Property Lines	10 ft	10 ft	10 ft	10 ft	10 ft
From Single-Family Residence	100 ft	100 ft	100 ft	100 ft	100 ft
Features					
Changeable Copy	✗	✗	✗	✗	✗
Electronic Message Center	✗	✗	✗	✗	✗
Illumination	✗	✗	✗	✗	✗
Neon	✗	✗	✗	✗	✗
Hand-Applied Paint	✗	✗	✗	✗	✗

(2) Duration

A general temporary sign may be displayed for:

- (A) Ninety (90) consecutive days over one calendar year, or
- (B) Thirty (30) consecutive days three times during a calendar year, with each thirty (30) day period separated by at least fourteen (14) calendar days.

(3) Design and Installation

- (A) A detached general temporary sign shall be securely and firmly embedded in or on the ground.
- (B) A detached general temporary sign shall not use sandbags or other weighted objects to secure the sign to or in the ground.
- (C) A general temporary sign shall not use an adhesive (tape, glue, etc.) to affix the sign to any surface.

(b) Sidewalk Signs

Figure 309.11-2: Sidewalk Signs



(1) Generally

The following table establishes the applicable standards for Sidewalk signs.

Table 309-16: Sidewalk Sign Standards

Definition	A sidewalk sign is a temporary and portable sign that is ordinarily in the shape of an “A” or inverted “T” with back-to-back sign faces, an easel, or a similar configuration to be located on a sidewalk or walkway.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	NR	✓	✓	NR
Permit Required?	-	✗	✗	✗	✗
Number per tenant/storefront (max.)	-	1	1	1	1
Dimensions					
Sign Area (max. per sign)	-	6 sf	6 sf	6 sf	6 sf
Sign Height (max.)	-	3 ft	3 ft	3 ft	3 ft
Sign Width (max.)	-	30 in	30 in	30 in	30 in
Setbacks (min.)					
From Another Sidewalk Sign	-	10 ft	10 ft	20 ft	20 ft
Sidewalk/Walkway Clearance	-	5 ft	5 ft	5 ft	5 ft
Features					
Changeable Copy	-	NR	✓	✓	NR
Electronic Message Center	-	✗	✗	✗	✗
Illumination	-	✗	✗	✗	✗
Neon	-	✗	✗	✗	✗
Hand-Applied Paint	-	✓	✓	✓	✓

(2) Duration

All sidewalk signs shall only be displayed during a use’s business hours.

(3) Design and Installation

- (A) Sidewalk signs are not allowed in planter beds.
- (B) Sidewalk signs are allowed only where a building is within a build-to-zone or maximum setback, or where a front facade that includes an entryway open to the general public during normal business hours is within ten (10) feet of the edge of a public sidewalk.
- (C) Sidewalk signs shall leave a minimum, unobstructed sidewalk clearance as provided in the table or as otherwise required by the ADA and City fire code requirements, whichever is greater.

- (D) Sidewalk signs shall have no permanent attachments to the sidewalk.
- (E) Sidewalk signs shall be composed of wood, medium-density fiberboard, metal (iron or steel) frames, or other materials with equivalent weight and density. Sidewalk signs shall not be composed of plastic or similar materials.
- (F) The sign face of a sidewalk sign may include a chalkboard or dry-erase board.

(c) Banners

Figure 309.11-3: Attached Banner Signs



(1) Generally

The following table establishes the applicable standards for attached banners.

Table 309-17: Banner Standards

Definition	A banner is a temporary sign made of fabric, cloth, bunting, plastic, paper, or any other non-rigid material with no enclosing framework that is attached, mounted, tied, or otherwise placed on a building or pole attached to a building or on a frame or poles detached from the building. This definition does not include flags, pennants, feather signs, or streamers.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-“ = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	NR	NR	✓	✓	✓
Permit Required?	✓	✓	✓	✓	✓
Number per Lot (max.)	1	1	1	1	1
Dimensions					
Banner Area (max.)	32 sf	32 sf	48 sf	64 sf	64 sf
Sign Height (max.)	4 ft	4 ft	4 ft	6 ft	6 ft
Setbacks (min.)					
From Front Property Line	10 ft	10 ft	10 ft	10 ft	10 ft
From Adjacent Property Line	10 ft	10 ft	10 ft	10 ft	10 ft
From Another Banner	20 ft	20 ft	20 ft	20 ft	20 ft
From Another Sign	5 ft	5 ft	5 ft	5 ft	5 ft
Features					
Changeable Copy	✗	✗	✗	✗	✗
Electronic Message Center	✗	✗	✗	✗	✗
Illumination	✗	✗	✗	✗	✗
Neon	✗	✗	✗	✗	✗
Hand-Applied Paint	✗	✗	✗	✗	✗

(2) Duration

All banners shall meet the requirements for General Temporary Signs as established in 10.309.11(a) above.

(3) Design and Installation

(A) Banner may be allowed for each tenant if placed on a multi-tenant building but shall not exceed the maximum total banner area for the building.

(B) Banners shall not be attached to any window, door, or other sign.

(C) Banners shall not use an adhesive (tape, glue, etc.) to affix the attached banner to any surface.

(d) Feather Signs

Figure 309.11-4: Feather Signs



(1) Generally

The following table establishes the applicable standards for feather signs.

Table 309-18: Feather Sign Standards

Definition	A feather sign is a temporary, freestanding sign made of flexible material in the shape of a feather, quill, sail, blade, or teardrop, and mounted on a solid or flexible pole or cord that affixes to the ground.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	✗	✓	✓	✓
Permit Required?	-	-	✓	✓	✓
Number per Lot (max.)	-	-	2	3	3
Dimensions					
Feather Sign Area (max. per sign)	-	-	12 sf	20 sf	20 sf
Sign Height (max.)	-	-	12 ft	14 ft	14 ft
Setbacks (min.)					
From Front Property Line	-	-	10 ft	10 ft	10 ft
From Adjacent Property Line	-	-	10 ft	10 ft	10 ft
From Another Detached Banner	-	-	20 ft	20 ft	20 ft
From Another Detached Sign	-	-	5 ft	5 ft	5 ft
Features					
Changeable Copy	-	-	✗	✗	✗
Electronic Message Center	-	-	✗	✗	✗
Illumination	-	-	✗	✗	✗
Neon	-	-	✗	✗	✗
Hand-Applied Paint	-	-	✗	✗	✗

(2) Duration

All feather signs shall meet the requirements for General Temporary Signs as established in Section 10.309.11(a) above.

(3) Design and Installation

- (A) A feather sign may be allowed for each tenant if placed on a multi-tenant building but shall not exceed the maximum total banner area for the building.
- (B) Feather signs shall not be attached to any building, window, door, or other sign.

(e) Balloon Signs

Figure 309.11-5: Balloon Signs



(1) Generally

The following table establishes the applicable standards for balloon signs.

Table 309-19: Balloon Sign Standards

Definition	A balloon sign is a temporary sign either as an individual or grouping of inflatable devices, at least three feet in height or width, with or without a specific message, figures or designs attached to its surface, used or intended to be used to attract attention. An Inflatable Device is type of balloon sign that is a cold air inflated object, which may be of various shapes, made of flexible fabric, resting on the ground or structure, and equipped with a portable blower motor that provides a constant flow of air into the device. Inflatable devices are restrained, attached, or held in place by a cord, rope, cable, or similar method. Inflatable devices shall be included in the definition of Balloon Sign for the purposes of this Section. Balloons that do not meet the definitions in this Section are not regulated under this Section.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-“ = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	✗	✗	NR	NR
Permit Required?	-	-	-	✓	✓
Number per tenant/storefront (max.)	-	-	-	1	1
Dimensions					
Sign Height (max.)	-	-	-	15 ft	15 ft
Setbacks (min.)					
From Front Property Line	-	-	-	15 ft	15 ft
From Adjacent Property Line	-	-	-	15 ft	15 ft
From Another Balloon Sign	-	-	-	20 ft	20 ft
From Another Detached Sign	-	-	-	20 ft	20 ft
Features					
Changeable Copy	-	-	-	✗	✗
Electronic Message Center	-	-	-	✗	✗
Illumination	-	-	-	✗	✗
Neon	-	-	-	✗	✗
Hand-Applied Paint	-	-	-	✗	✗

(2) Duration

All balloon signs meet the requirements for General Temporary Signs as established in Section 10.309.11(a) above.

10.309.12. Special Signs

(a) Murals

Figure 309.12-1: Mural Signs



(1) Generally

The following table establishes the applicable standards for murals.

Table 309-20: Mural Standards

Definition	A mural is a hand-produced work in which paint is applied by hand directly on an exterior wall of a building or structure. A mural does not include: • Mechanically produced or computer-generated prints or images, including digitally printed vinyl sheets and wraps; • Works containing electrical or mechanical components; or • Works that involve changing or moving images or components.				
Key	✓ = yes, a permit is required or the feature is allowed ✗ = no/not allowed NR = the sign type or characteristic is allowed for nonresidential uses only sf = square feet ft = feet “-” = the standard does not apply				
Sign District → Requirement ↓	ARN	NMH	CGI	MUR	ETJ
General					
Allowed?	✗	✓	✓	✓	✗
Permit Required?	-	✓	✓	✓	-
Number per Building/Storefront (max.)	-	1	1	1	-
Dimensions					
Sign Area (max. % of wall)	-	85%	85%	85%	-
Features					
Changeable Copy	-	✗	✗	✗	-
Electronic Message Center	-	✗	✗	✗	-
Illumination	-	✓	✓	✓	-
Neon	-	✗	✗	✗	-
Hand-Applied Paint	-	✓	✓	✓	-

(2) Number

One mural may be displayed on a building in addition to other signs allowed in this Section.

(3) Design and Installation

A mural may be illuminated but shall only use external illumination methods.

(4) Additional Allowances

(A) Due to murals providing unique design elements, all murals require approval from the City Council based on the criteria in this Subsection, Table Mural Standards, and the requirements, below.

(B) In its review of proposed murals located in other sign districts, the City Council will review the proposed mural based on the following factors:

- (i) The mural uses durable, exterior grade paints and materials and weatherproof and ultraviolet-protective coatings;
- (ii) The mural uses colors that coordinate with the colors of the building;
- (iii) The mural is directed at and scaled to pedestrians;
- (iv) The mural does not overwhelm or hide character-defining features of a building;
- (v) The mural is placed and sized to reinforce the building's architecture and its surroundings;
- (vi) The mural is placed at similar heights and façade locations as adjacent buildings or tenants to provide an integrated block appearance.

Chapter 4. Subdivision Regulations

10.401. Intent

The subdivision standards are intended to, but are not limited to the following:

- (a) Promote the public health, safety and general welfare of the residents of the city and its extraterritorial jurisdiction.
- (b) Standardize the procedure and requirements for developing property and submitting plans for review and approval.
- (c) Establish reasonable standards of design and procedures for subdivisions, to further the orderly layout and beneficial use of land, and to ensure proper legal descriptions and documenting of subdivided land.
- (d) Establish adequate and accurate records of land subdivision.
- (e) Protect the character and the social and economic stability of all parts of the city, and to encourage orderly and beneficial development of all parts of the community.
- (f) Promote efficient land use by preventing overcrowding and unsustainable scattered development that would injure health, safety or the general welfare due to the lack of water supplies, sanitary sewer, drainage, transportation or other public services, or excessive expenditure of public funds for those services.
- (g) Provide the best possible design for each parcel being subdivided.
- (h) Create a highly connected transportation system to provide choices for pedestrians, bicyclists, public transit passengers, and drivers; promote walking, bicycling and public transit; connect neighborhoods to each other and to local destinations such as schools, parks, and shopping centers; reduce vehicle miles of travel and travel times; improve air quality; reduce emergency response times; increase effectiveness of municipal service delivery; and free up arterial capacity to better serve regional and long distance travel needs.
- (i) Ensure that public infrastructure are available and will have a sufficient capacity to serve the proposed subdivision and areas reasonably anticipated to be served by those infrastructures.
- (j) Provide open space through the most efficient design and layout of the land, including use of average density in providing for minimum width and area of lots, while preserving the density of land as established in this code and applicable plans.
- (k) Provide the cost of improvements at minimum to meet City standards that primarily benefit the parcel being developed is borne by the owner or developers of the tract.

10.402. Applicability and Exceptions

10.402.1. Exceptions

The provisions of this section shall not be applied to land in the extraterritorial jurisdiction of the city in any way regulating:

- (a) Cemeteries complying with all state and local regulations;
- (b) Division of land created by order of a court of competent jurisdiction;
- (c) Division of an existing legal lot caused by acquisition by the city, county, or state when the acquisition is in the best interest of the public health, safety and welfare. Resulting parcel(s) are considered legal lot(s) for development purposes on acquisition;
- (d) Division of land exempted from platting requirements by Texas Local Government Code Section 212;
- (e) Use of any building or parcel for any lawful purpose;
- (f) Bulk, density or number of buildings on a parcel;
- (g) Intensity of development on a parcel; and
- (h) Number of dwelling units that can be built on a parcel.

10.403. Lot Division and Adjustment Process

10.403.1. Applicability

This section applies to the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes; subject to exception above

10.403.2. General Requirements for Plats

Zoning Requirements

- (a) A property zoned within the City Limits that is being proposed for platting, subdivision, or developments shall be properly zoned by the City prior to the submission of a development application. The proposed development layout or subdivision shown on the proposed plat shall be in conformance with all standards listed in the zoning ordinance, these subdivision regulations, or any active development agreements.
- (b) Noncompliance with the requirements of the specific zoning district in which the subject property is located, or lack of proper zoning, constitute grounds for denial of a development application.
- (c) Any development application submitted for approval shall be in accordance with the City's zoning ordinance if the property is located within the City Limits.

Development applications for properties within the City Limits or extraterritorial jurisdiction shall be in accordance with Hutto SOAR 2040, including all adopted water, sewer, storm drainage, future land use, park, recreation, open space, and thoroughfare plans.

- (d) All plats shall be prepared by a registered professional land surveyor (RPLS) and Professional Engineer (PE).
- (e) Conveying land to adjacent property owners through quitclaim deeds without approval via a formal subdivision review process is prohibited.

10.403.3. Classification of Subdivisions

Prior to a plat relating to any tract of land being recorded with the county clerk, the property owner shall apply for and secure approval of the plat by the Director of Development Services, in accordance with the procedures listed within these subdivision regulations.

10.403.3.1 Major Subdivision

10.403.3.1.1. Applicability

A major subdivision permits the division of a parcel into four or more lots and/or tracts plus the extension of public infrastructure. The major subdivision process may be used to subdivide legal lots if the subdivision is not eligible for the short form subdivision process.

10.403.3.1.2. Criteria and Process

The major subdivision process and review criteria are described in Section 10.802.12. Submittal material requirements and internal review procedure is determined by Development Services staff and will be consistently applied for all similar projects.

10.403.3.2 Short Form Subdivision

10.403.3.2.1. Applicability

A short form subdivision provides for the timely review of proposed land division that does not discernibly impact surrounding properties, environmental resources, city character or public infrastructure. The short form subdivision process may be used for the following land divisions:

- (a) Division of existing legal uses with separate utilities, except nonconforming billboards. This process cannot be used to divide accessory uses from principal uses or create an opportunity for more principal uses.
- (b) Division of an unplatted parcel into four lots or less, with no new improvements and are in conformance to the Mobility Master Plan and Trails Master Plan, may qualify for the short form subdivision process. Any further subdivision shall be approved through the major subdivision process.
- (c) Divisions of land for schools, public infrastructure, open space, or other public uses.

10.403.3.2.2. Criteria and Process

The short form subdivision process and review criteria are described in Section 10.802.14. Submittal material requirements and internal review procedure is determined by Development Services staff and will be consistently applied for all similar projects.

10.403.4. Easement and Right-of-Way Vacation

10.403.4.1 Applicability

Right-of-way vacation permits the vacation of rights-of-way and easements that are no longer needed. Subject to review criteria, the City Engineer may grant a right-of-way or easement vacation for any right-of-way or easement of record where the city has jurisdiction and or the right-of-way vacation results in a new lot configuration, and also requires an amended plat.

10.403.4.2 Criteria and Process

The right-of-way vacation process and review criteria are described in Section 10.802.11. Submittal material requirements and internal review procedure is determined by Development Services staff and will be consistently apply for all similar projects.

10.404. Plat Types

10.404.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.404.2. Preliminary Plat

10.404.2.1 Purpose

A preliminary plat provides detailed graphic information and associated text showing property boundaries, easements, land use, streets, utilities, drainage, and other information required to evaluate proposed subdivisions of land as determined by Development Service Staff. The preliminary plat includes the location of all improvements required by this article and other applicable city ordinances, codes and policies. Preliminary plats cannot be recorded at the county clerk's office.

10.404.2.2 Applicability

A preliminary plat is required for all major subdivisions prior to the construction of public improvements. If a preliminary plat is omitted, a final plat shall be required in conformance with section 10.404.3.

10.404.2.3 Generally

The applicant shall prepare a preliminary plat which shall include a utility layout and plans for the construction of the subdivision and all associated public improvements, together with other supplementary materials as required by these subdivision regulations or by the Development Services Staff.

10.404.2.4 Preliminary Plat Contents, Generally

The Director of Development Services may establish – not inconsistent with this article – forms and standards with regard to the content, format, and graphics for conveyance plats. The proposed

conveyance plat shall show information as specified on a form or packet provided by the Development Services Staff.

10.404.2.5 Approval, Generally

Approval of the preliminary plat by the Planning and Zoning Commission shall be deemed general approval of the street and lot layout shown on the preliminary plat and shall not constitute acceptance or approval of the final plat or issuance of a permit .

10.404.2.6 Criteria and Process

The Director of Development Services may establish - not inconsistent with this article - forms and mandatory standards with regard to the content, format, and graphics for preliminary plats. The applicant shall file for approval of a preliminary plat, which conforms substantially with the preliminary site plan, or conveyance plat submitted by the applicant. The plat shall be prepared by or under the supervision of a registered public surveyor and or professional engineer in the state and shall bear his/her seal, signature, and date on each sheet. The payment of all applicable fees shall be required at the time of submission of application.

10.404.2.6.1. Application Process

(a) Pre-application meeting

Before preparing and applying for the preliminary plat, the applicant may schedule an appointment to meet with planning and engineering staff, parks and recreation department, public works department and emergency services district (fire department) as needed. The purpose of this meeting is to review the proposed development and its impacts on the surrounding area as well as discuss the procedures for approval of the plat and the requirements for the layout of new streets, street improvements, and the availability of city services; and to discuss application submittal procedures and requirements.

(b) Timing of Public Improvements

(1) After approval of:

- (A) The preliminary plat by the Planning and Zoning Commission;
- (B) Construction/engineering plans by the City Engineer; and
- (C) Following procurement of all applicable permits from other appropriate agencies (such as TxDOT, railroad authorities, TCEQ, U.S. Army Corps of Engineers, FEMA and/or Williamson County), the applicant shall cause a contractor(s) to install or construct the public improvements in accordance with the approved plans and the city's design standards and at the applicant's expense.

(c) Approval Procedure

A preliminary plat meeting all the requirements of the City shall be approved by the Planning and Zoning Commission. Preliminary plats shall be approved provided they comply with all appropriate ordinances and Hutto SOAR 2040. The Planning and Zoning Commission shall approve, conditionally approve, or deny a preliminary plat no later than thirty (30) calendar days, not to include holiday days, following the official submission date. If the Planning and Zoning Commission fails to approve or deny the application within thirty (30) calendar

days, not to include holiday days, following the official submission date, the preliminary plat shall be deemed approved.

(d) Conditional Approval or Denial Procedure

If the preliminary plat application is conditionally approved or denied, the Director of Development Services, as authorized by the Planning and Zoning Commission, shall provide a written explanation of the reason for denial. The applicant may provide a written response that satisfies each condition for the conditional approval or remedies each reason for denial on the official submittal date. The Planning and Zoning Commission shall determine whether to approve or disapprove the previously conditionally approved or denied plat within 15 calendar days of receipt of the applicant's written response.

(e) Appeal Procedure

An applicant has the right to appeal the denial of a plat by the Planning and Zoning Commission to Hutto City Council.

(f) Effect of Approval

(1) Approval of a preliminary plat by the Planning and Zoning Commission constitutes authorization for the City Engineer to release construction plans subject to his/her final approval and for the City Engineer to authorize for the property owner to commence grading of the site and construction of such public improvements. Approval of a preliminary plat also authorizes the property owner, upon fulfillment of all requirements and conditions of approval, to submit for approval an application for final plat approval. Upon release of the construction plans, the City Engineer may, upon request of the applicant, issue a certificate indicating the construction plans have been released and construction of the improvement is thereafter authorized. Additional certificates may be issued by the City Engineer authorizing the construction of private utilities on a phased schedule. The certificate shall read as follows:

"The preliminary plat for (insert name of the subdivision or addition) as approved by the City of Hutto Planning and Zoning Commission on (insert date of approval) is authorized for use with engineering plans for the construction of public improvements as approved by the City Engineer. A final plat shall be approved by the Director of Development Services upon the completion of all public improvements or the provision of a subdivision improvement agreement under the terms of the subdivision ordinance and submission of a final plat in compliance with section 10.404.3 of the subdivision ordinance of the City of Hutto"

(g) Lapse of Preliminary Plat Approval

The approval of a preliminary plat shall be effective for a period of two (2) years following the date that the preliminary plat is approved by the Planning and Zoning Commission, at the end of which time the applicant shall have submitted and received approval for a final plat.

10.404.2.6.2. Standards for Approval

No preliminary plat shall be approved unless the following standards have been met:

- (a) The plat substantially conforms with the approved concept plan, preliminary site plan, or conveyance plat.
- (b) The construction plans have been reviewed by the city engineer.
- (c) Provision for installation and dedication of public improvements has been made.
- (d) The plat conforms to applicable zoning and other regulations.
- (e) The plat meets all other requirements of these regulations.

10.404.2.6.3. Construction Plan Procedure and Requirements

(a) General Application Requirements

Construction plans shall be prepared by or under the supervision of a professional engineer or architect registered in the state as required by state law governing such professions. Plans submitted for review to the City shall be dated and bear the responsible professional engineer's or architect's name, serial number and the designation of "engineer," "professional engineer," or "P.E." or "architect" and an appropriate stamp (affixed seal) and a statement near the engineer's or architect's identification, stating that the documents are for preliminary review and are not intended for construction. Final plans acceptable to the City shall bear the affixed seal and signature of the professional engineer or architect and the date signed on all sheets of the plans. Public works construction in streets, alleys, or easements that will be maintained by the City shall be designed by a professional engineer registered in the state.

(b) Construction Plans

The applicant shall submit the required number of sets of the complete construction plans that have been approved by the City Engineer for all streets, alleys (if any), storm sewers and drainage structures, water and sanitary sewer facilities, screening and retaining walls, landscaping, and irrigation, and any other required public improvements for the area covered by the preliminary plat. Construction plans shall be in conformance with the design standards and with the requirements set forth within these subdivision regulations. The construction plans shall also contain any plans deemed necessary to show or document compliance with any other applicable codes and ordinances of the City that are related to development of a land parcel. The construction plans shall show information as specified on an application form or packet provided by the City Engineer.

(c) Construction Plan Review Procedure

Construction plans and the required number of copies of the plan shall be submitted to the City Engineer for final approval. The plans shall contain all necessary information for construction of the project, including screening walls, permanent BMPs, and other special features. All materials specified shall conform to the engineering construction standards of the City. Each sheet of the

plans shall contain a title block including space for the notation of revisions. This space is to be completed with each revision to the plan sheet and shall clearly note the nature of the revision and the date the revision was made and space for the City Engineer to sign off on each approved revision. The City Engineer will release the plans for construction, after approval of the preliminary plat by the commission and payment of all inspection fees. Upon such release, each contractor shall maintain one set of approved plans, stamped with City release, on the project at all times during construction. This procedure shall also apply to approval of a final plat, if a preliminary plat is omitted.

(d) Failure to Commence Construction

If construction has not commenced within one (1) year after approval of the plans, resubmittal of plans may be required by the City Engineer for meeting current standards and engineering requirements.

10.404.2.6.4. Revisions to Approved Preliminary Plat

- (a) Minor revisions to the preliminary plat are commonly required before the final plat is approved. Such minor revisions may include slight enlargement or shifting of easements or lot lines, addition of private or franchise utility easements, correction of bearings or distances, correction of minor labeling errors, addition of erroneously omitted informational items and labels, reduction of proposed lots, reduction of proposed development density, etc., and such revisions may be delineated on the final plat without having to reapprove the preliminary plat. Whether or not revisions are "minor" in nature shall be determined by the Director of Development Services and/or City Engineer.
- (b) Major revisions, if required, such as obvious reconfiguration of lot lines or easements, relocation of driveways or access easements or fire lanes, any modification to the perimeter or boundary of the property, and relocation or addition or deletion of any public improvement (including corresponding easement), shall necessitate resubmission and reapproval of the plat as a "revised preliminary plat". The procedures for such reapproval shall be the same as for a preliminary plat. If an application for a revised preliminary plat expires due to failure to submit a complete application, or if the revised preliminary plat is complete, and considered by the Planning and Zoning Commission and is denied, the previously submitted preliminary plat(s) shall also be deemed to have been denied thus necessitating submission of a new application governed by the regulations, rules and other laws in effect at the time of the submission of the new application.

10.404.2.7 Preliminary Plat Procedure Flow Chart



10.404.3. Final Plat

10.404.3.1 Purpose

A final plat provides detailed graphic information and associated text showing property boundaries, easements, streets, utilities, drainage, and other information required for the maintenance of public records of the subdivision of land. Final plats are recorded and used as a plat of record, subject to the regulations in this chapter.

A final plat shall be in accordance with the preliminary plat, as approved, and shall incorporate all applicable conditions, changes, directions, and additions imposed by the Director of Development Services and City Engineer upon the preliminary plat. The final plat shall not be submitted prior to approval of the preliminary plat (when required).

10.404.3.2 Criteria and Process

Only final plat applications that include the required data, completed application form, submission fee, number of copies of the plat, record drawings, approved engineering construction plans, and other required information will be considered complete, shall be accepted for filing by the city, and shall be approved or disapproved by the Director of Development Services. Incomplete final plat applications will not be accepted for filing and will not be approved by the Director until the proper information is provided to City Staff.

10.404.3.2.1. Information Required Upon or With a Final Plat

The Director of Development Services may establish, not inconsistent with this article, forms and standards with regard to the content, format, and graphics for final plats. The proposed final plat shall show information as specified on a form or packet provided by the Development Services Department.

10.404.3.2.2. Standards for Final Plat Approval

- (a) The plat substantially conforms with the approved preliminary plat, as revised if revisions were a necessary condition for approval, and other studies and plans, as applicable; and
- (b) The plat and accompanying documents conform to these subdivision regulations, Hutto SOAR 2040, and applicable zoning, subdivision and any other applicable codes or ordinances of the City that are related to development of a land parcel.
- (c) Required public improvements have been constructed and are ready to be accepted, and/or an improvement agreement has been accepted by the City, providing for the subsequent completion of improvements.
- (d) Provision has been made for adequate public facilities under the terms of this ordinance.

10.404.3.2.3. Timing of Public Improvements

- (a) When all of the public improvements have been constructed and a request is made for acceptance of same by the City, the City Engineer shall confirm that the public improvements have been completed in accordance with the approved plans and specifications and with all applicable City standards and regulations and shall confirm receipt by the City of the required maintenance bond. In determining compliance, the City Engineer shall obtain from the

applicant: one sealed set of "as-built" or "record drawing" and a digital copy of all plans (in a format as determined by the City Engineer); a signed letter bearing sealed certification by the design engineer confirming the contractors' compliance with these subdivision regulations, and with all city construction standards set forth in the design standards and other applicable city design documents; and certification signed by the property owner before a notary that all dedications required for the public improvements have been fully conveyed. After said materials are received, and the City Engineer confirms compliance as set forth above, the City Engineer shall inform the City Manager of same and the City Manager shall receive and accept for the city the title, use, and maintenance of the public improvements.

- (b) City Staff shall require that all public improvements be installed, offered for dedication, and ready for acceptance by the City prior to the final plat approval, unless the applicant has entered into a City-approved improvement agreement under Section 10.404.3.2.2(c).

10.404.3.2.4. Approval Procedure

A final plat meeting all of the requirements of the city and all conditions of the approved preliminary plat shall be approved by the Director of Development Services. Final plats shall be approved provided they comply with all appropriate ordinances and Hutto SOAR 2040. The Director of Development Services shall approve, conditionally approve, or deny a final plat no later than thirty (30) calendar days following the official submission date. If denied, the Director of Development Services shall provide written explanation of the reason for denial. If the Director of Development Services fails to approve or deny the application within thirty (30) calendar days following the official submission date, the final plat shall be deemed approved.

10.404.3.2.5. Conditional Approval or Denial Procedure

If the final plat application is conditionally approved or denied, the Director of Development Services shall provide written explanation of the reason for denial. The applicant may provide a written response that satisfies each condition for the conditional approval or remedies each reason for denial. The Director of Development Services shall determine whether to approve or disapprove the previously conditionally approved or denied plat within fifteen (15) days of receipt of the applicant's written response.

10.404.3.2.6. Appeal Procedure

An applicant has the right to appeal the denial of a plat by the Director of Development Services to the Planning and Zoning Commission.

10.404.3.2.7. Effect of Approval and Acceptance of Improvements

As soon as practicable after the final plat has been approved by the City for recordation, the Director of Development Services or designee shall initiate the recordation of the final plat with the county clerk. No conveyance or sale of any portion or lot of the property may occur until after the final plat is approved by the Director of Development Services and duly recorded by the applicant. It is the applicant's responsibility to confirm that the final plat has been duly recorded, and an applicant's failure to confirm same is at the applicant's sole risk.

10.404.3.2.8. Revisions to Approved Final Plat Prior to Filing at the County

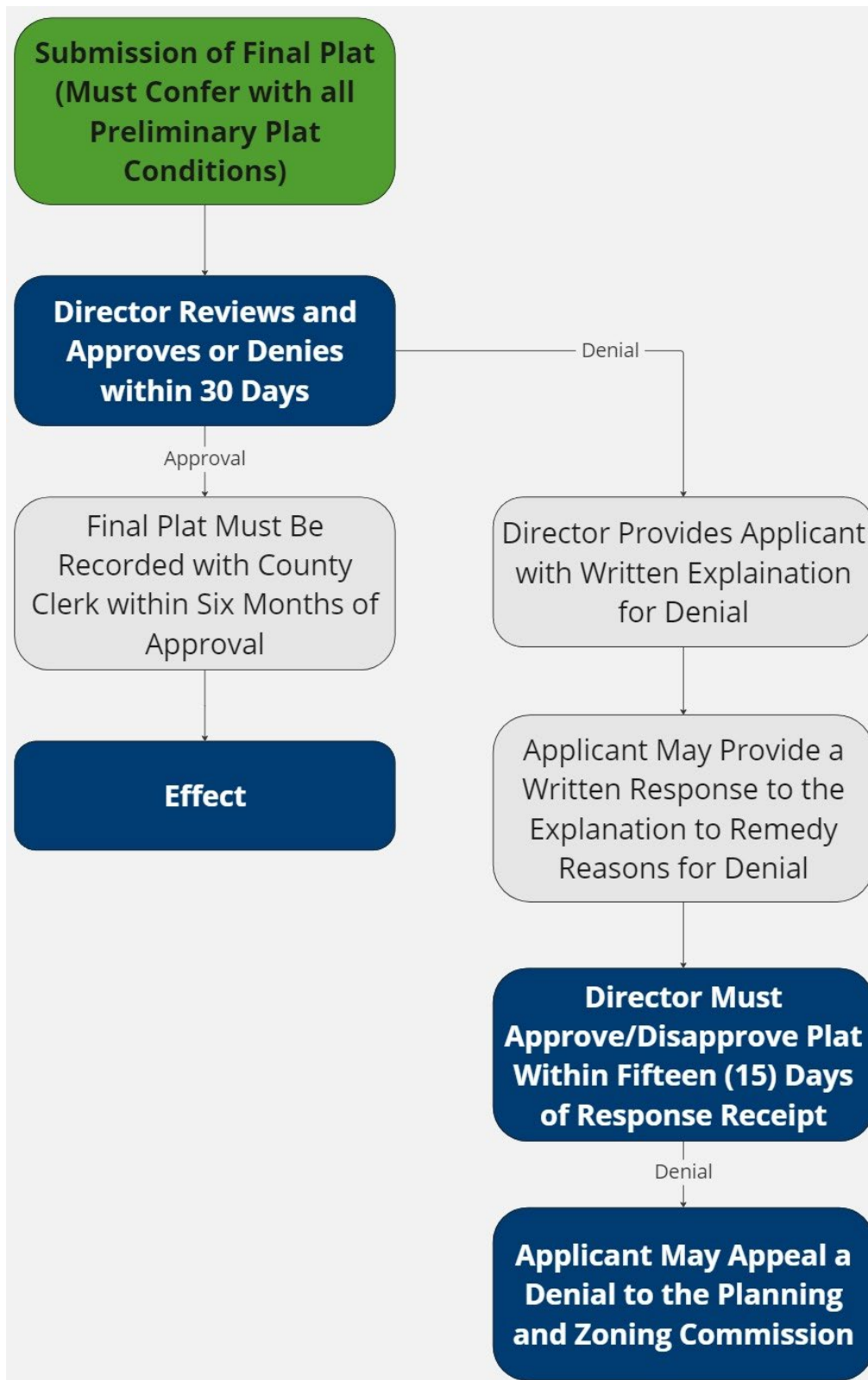
- (a) Minor revisions to the final plat are occasionally required before the final plat is recorded. Such minor revisions may include slight enlargement or shifting of easements or lot lines, addition of private or franchise utility easements, correction of bearings or distances, correction of minor labeling errors, addition of erroneously omitted informational items and labels, etc., and such revisions may occur on the record without having to reapprove the final plat. Whether or not revisions are "minor" in nature shall be determined by the Director of Development Services and/or City Engineer.
- (b) Major revisions, such as obvious corrections or reconfiguration of lot lines or easements, relocation of driveways or access easements or fire lanes, any modification to the perimeter or boundary of the property, and relocation or addition or deletion of any public improvements (including corresponding easement), shall necessitate resubmission and reapproval of the plat as a "revised final plat" unless otherwise approved by the director of development services, as applicable. The procedures for such reapproval shall be the same as for a final plat. If an application for a revised final plat expires due to failure to submit a complete application, or if the revised final plat is complete, and considered by the Director and is denied, the previously submitted final plat and any preliminary plat(s) shall also be deemed to have been denied thus necessitating submission of a new application governed by the regulations, rules and other laws in effect at the time of the submission of the new application.
- (c) Subsequent to final plat approval by the Director, the applicant shall return signed and notarized copies of the final plat, as approved, along with any other required documents and fees necessary for filing the plat with the county clerk, to the planning department within forty-five (45) calendar days following approval, in accordance with requirements established by the City; or if construction of any public improvement is required prior to the filing of a final plat, the owner or developer shall return signed and notarized copies of the final plat, as approved, along with any other required documents and fees necessary to the planning department before said public improvements will be accepted by the City and before said final plat will be recorded with the county clerk.
- (d) All easements shall be included on the final plat, including the recording information for those easements that are filed or recorded as separate instruments, as required by utility companies and the City prior to filing the final plat.

10.404.3.2.9. Lapse of Final Plat Approval

The approval of a final plat shall be effective for a period of six (6) months following the date that the final plat is approved by the Director of Development Services, at the end of which time the applicant shall have recorded the final plat with the county clerk. If the applicant has not met the requirements for recording of the final plat with the county clerk within six (6) months, the final plat approval shall be null and void, and the applicant shall be required to submit a new plat for review subject to the then existing zoning restrictions and subdivision regulations. No

certificate of occupancy or change of occupancy permit will be allowed for the property until the applicant has recorded the final plat with the county clerk.

10.404.3.3 Final Plat Approval Process Flowchart



10.404.4. Replat

10.404.4.1 Applicability

Unless otherwise expressly provided for herein, a property owner who proposes to replat any portion of an already approved and filed final plat, other than to amend or vacate the plat, shall first obtain approval for the replat under the same standards and by the same procedures prescribed for the final platting of land by these subdivision regulations. All improvements shall be constructed in accordance with the same requirements as for a construction or final plat, as provided herein.

10.404.4.2 Replatting Without Vacating Preceding Plat

A replat of a final plat or portion of a final plat may be recorded and is controlling over the preceding plat without vacation of that final plat if the replat:

- (a) Is signed and acknowledged by only the owners of the property being replatted;
- (b) Is approved by the Director of Development Services;
- (c) Does not amend or remove any covenants or restrictions previously incorporated in the final plat.

10.404.4.3 Requirements for Certain Replats

In addition to compliance with subsection 10.404.4.2 of this section, a replat without vacation of the preceding plat must conform to the requirements of this section if:

- (a) During the preceding five (5) years, any area to be replatted was limited by a zoning classification to residential use for not more than two residential units per lot; or
- (b) Any lot in the preceding plat was limited by deed restrictions to residential use for not more than two residential units.
- (c) **Public Hearing and Notification Requirements for Certain Replats**
 - (1) If a replat that meets the above criteria requires a variance or exception, a public is required and notification is required before the fifteenth (15) calendar day before the date of the hearing by publication in an official newspaper or a newspaper of general circulation in the county. Notice of the public hearing shall also be given by written notice before the 15th calendar day before the date of the hearing, with a copy or description of any requested waivers/suspensions, sent to the property owners, as documented on the most recently approved ad valorem tax roll of the city, of lots that are in the original subdivision and that are within two hundred (200) feet of the lot(s) to be replatted. If the subdivision is located within the extraterritorial jurisdiction, the most recently approved county tax roll of the property upon which the replat is requested. The written notice may be delivered by depositing the notice, properly addressed with postage prepaid, in a post office or postal depository within the boundaries of the municipality.
 - (2) If the replat requires a variance and is protested by the owners of at least twenty percent (20%) or more of the total land area of lots to whom notice is required to be given under subsection (1), above, then approval of the replat will require the affirmative vote of at least three-fourths (3/4)

of the members present of the commission. For a legal protest, written instruments signed by the owners of at least twenty percent (20%) of the total land area of the lots or land immediately adjoining the area covered by the proposed replat and extending two hundred (200) feet from that area, but within the original subdivision, must be filed with the city prior to the close of the public hearing. The area of streets and alleys shall be included in the twenty percent (20%) land area calculation.

- (3) Compliance with subsection (2) above is not required for approval of a replat for any part of a preceding plat if the area to be replatted was designated or reserved for other than single- or two-family (i.e., duplex) residential use by notation on the last legally recorded plat or in the legally recorded restrictions applicable to the plat.

10.404.4.4 Adding or Deleting Lots

Any replat that adds or deletes lots shall include the original subdivision and lot boundaries. If a replat is submitted for only a portion of a previously platted subdivision, the replat shall reference the previous subdivision name and recording information and shall state on the replat the specific lots which have changed along with a detailed "purpose for replat" statement.

10.404.4.5 Vacation of Plat

If the previous plat is vacated as prescribed in section 212.013 of the Texas Local Government Code, as amended, and as provided in section 10.404.8 of this article, a replat would not be required for the area vacated. It would, instead, be submitted as a new subdivision plat and reviewed accordingly.

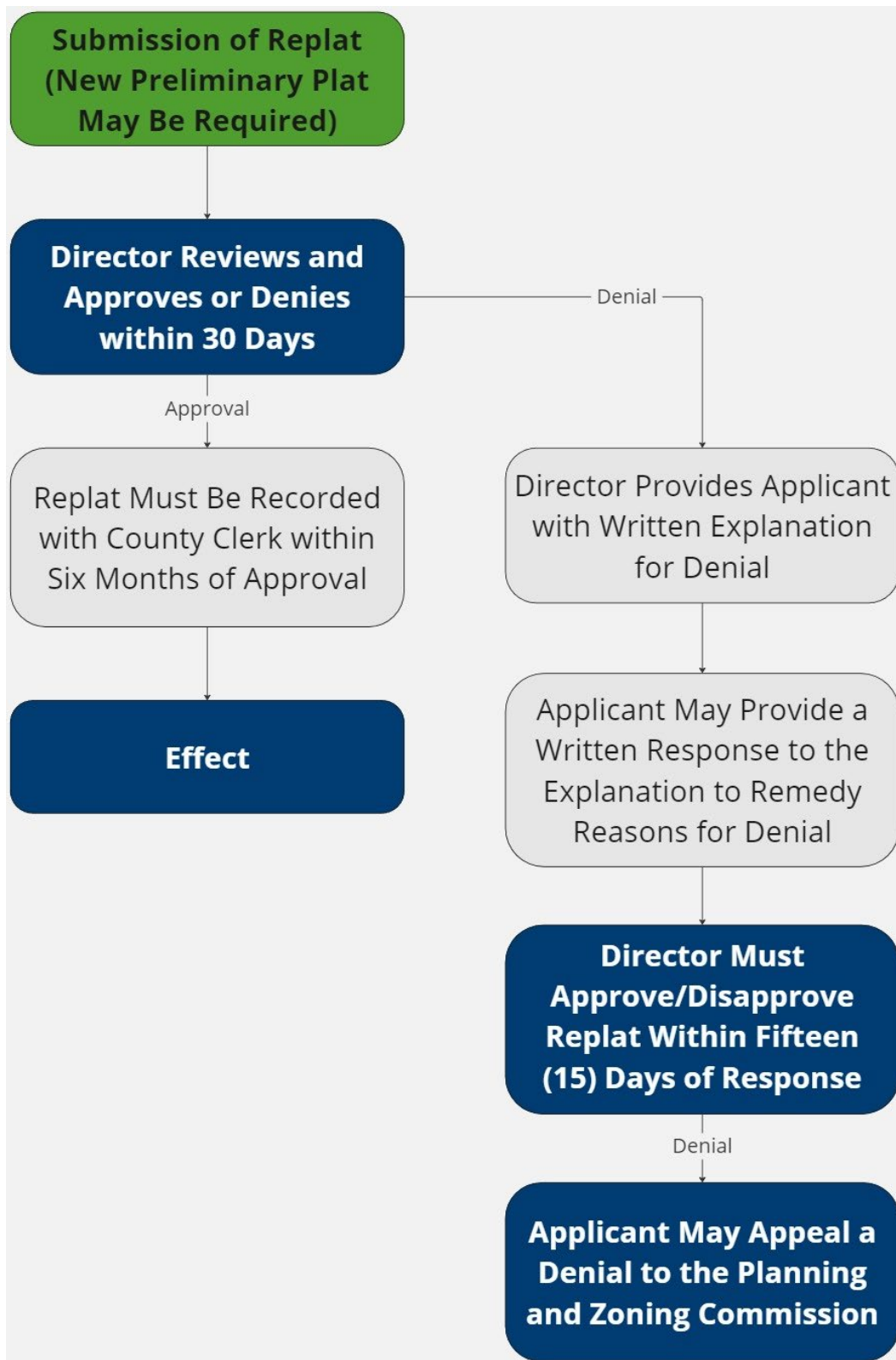
10.404.4.6 Approval, Denial and Conditional Procedures

The application for a replat shall be submitted to the City in the same manner as a final plat, and shall be approved, conditionally approved or denied by the Director of Development Services and in a similar manner as a final plat.

10.404.4.7 Conditions

The Director of Development Services may impose such conditions on the approval of the replat as are necessary to ensure compliance with the standards of approval.

10.404.4.8 Replat Approval Process Flowchart



10.404.5. Amended Plat

10.404.5.1 Applicability

The amended plat process may be used for the following in the city and its extraterritorial jurisdiction:

- (a) Adjust or relocate the boundary or lot lines between one or more adjacent lots on an approved plat, where the number of lots will not increase.
- (b) Join two or more adjacent lots on an approved plat, where the entire plat will not be vacated.
- (c) Correct an error or omission on an approved plat.
- (d) Show monuments set after death, disability, or retirement from practice of the engineer or surveyor charged with responsibilities for setting monuments.
- (e) Show the proper location or character of monuments that have been changed in location, character, or shown incorrectly on an approved plat.
- (f) Correct an error in courses and distances of lot lines between two adjacent lots if:
 - (1) Both lot owners join in the application for amending the plat;
 - (2) Neither lot is abolished;
 - (3) The amendment does not attempt to remove or modify recorded covenants or restrictions or easements;
 - (4) The amendment does not have a material adverse effect on the property rights of the owners in the plat; and
 - (5) Relocate a lot line to eliminate an inadvertent encroachment of a building or other improvement on a lot line or easement.

10.404.5.2 Criteria and Process

10.404.5.2.1. Application Process

A copy of all application materials for an amended plat shall be simultaneously submitted to the Director of Development Services for review in the same manner as for a final plat, or the application shall be deemed incomplete.

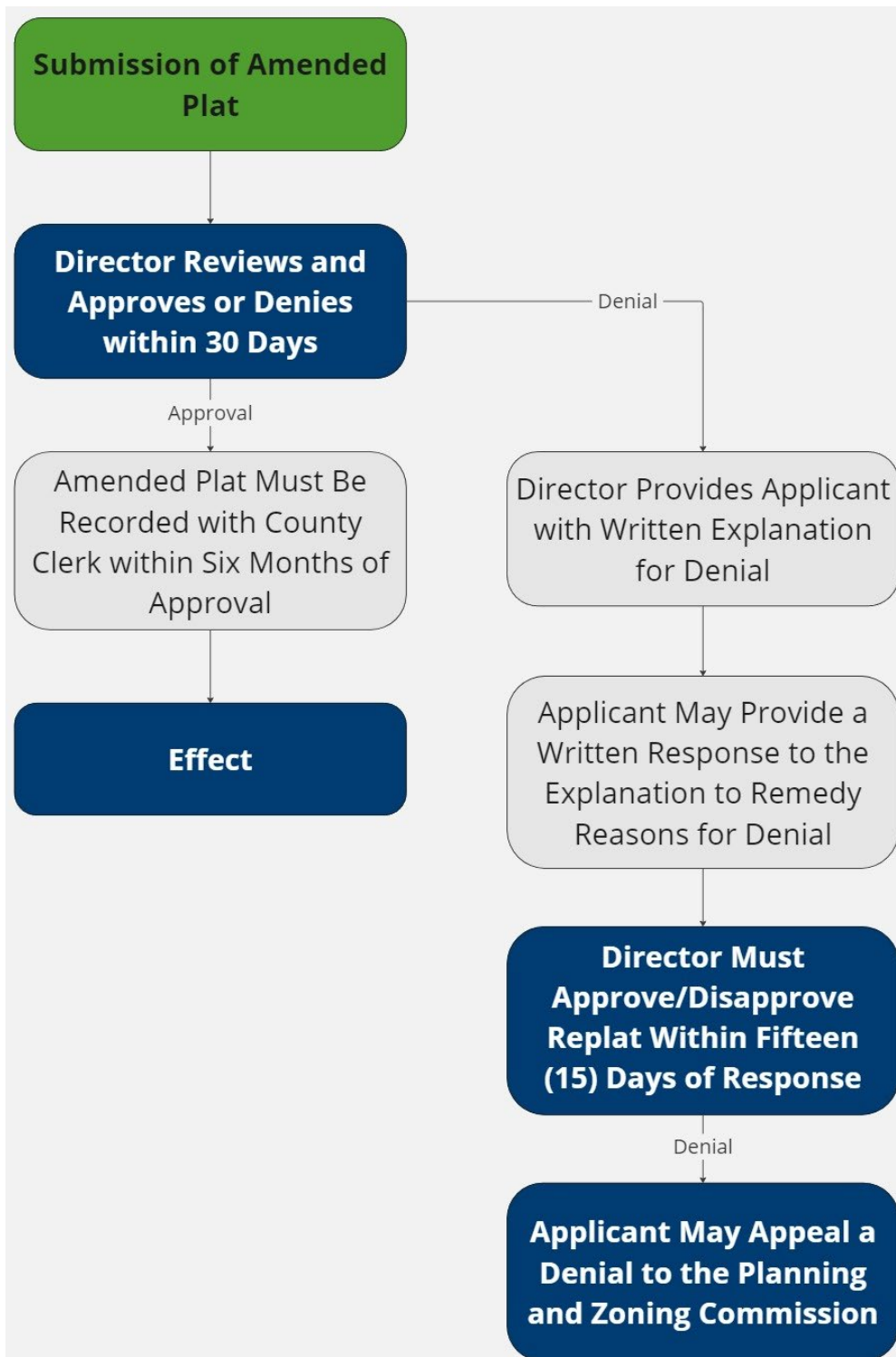
10.404.5.2.2. Approval, Denial, and Conditional Procedures

The application for an amended plat shall be submitted to the City in the same manner as a final plat, and shall be approved, conditionally approved, or denied by the Director and in a similar manner as a final plat.

10.404.5.2.3. Conditions

The Director of Development Services may impose such conditions on the approval of the amended plat as are necessary to ensure compliance with the standards of approval.

10.404.5.3 Amended Plat Approval Process Flow Chart



10.404.6. Plat Vacation

10.404.6.1 Applicability

Plat vacation provides for the vacation of an entire subdivision plat if development will not occur consistent with the approved plat.

10.404.6.1.1. Plat Vacation by Property Owner

The property owner of the tract covered by a plat may vacate, upon approval by the Director of Development Services, the plat at any time before any lot in the plat is sold. The plat is vacated when a signed, acknowledged instrument declaring the plat vacated is approved and recorded in the manner prescribed for the original plat.

10.404.6.1.2. Plat Vacation by all Lot Owners

If some or all of the lots covered by the plat have been sold, the plat, or any part of the plat, may be vacated on the application of all the owners of lots in the plat with approval obtained in the manner prescribed for the original plat.

10.404.6.1.3. City Initiated Plat Vacation

(a) General Conditions

The Director of Development Services, prior to a review of the application, may vacate the plat of an approved or recorded subdivision or addition when:

- (1) Construction on the improvements required for the development have not been completed within two years following the date the plat was approved by the City;
- (2) No lots within the approved plat have been sold within five (5) years following the date that the plat was approved by the City;
- (3) The property owner has not completed the required improvements (see Section 10.405.1) and the City is unable to obtain funds with which to complete construction of public improvements, except that the vacation shall apply only to lots owned by property owner or its successor; or
- (4) The plat has been of record for more than five years and the City determines that the further sale of lots within the subdivision or addition presents a threat to public health, safety or welfare, except that the vacation shall apply only to lots owned by the property owner or its successors.

10.404.6.2 Criteria

The Director of Development Services shall approve the petition for vacation on such terms and conditions as are in accordance with section 212.013 of the Texas Local Government Code (as amended), and as are reasonable to protect the public health, safety, and welfare. As a condition of vacation of the plat, the Director may direct the petitioners to prepare and seek approval of a revised final plat in accordance with these subdivision regulations such that the property is not without a plat.

10.404.6.3 Effect of Action

On the execution and recording of the vacating instrument, the vacated plat shall have no effect. Regardless of the commission's action on the petition, the property owner will have no right to a refund of any monies, fees, or charges paid to the city nor to the return of any property or consideration dedicated or delivered to the city except as may have previously been agreed to by the commission.

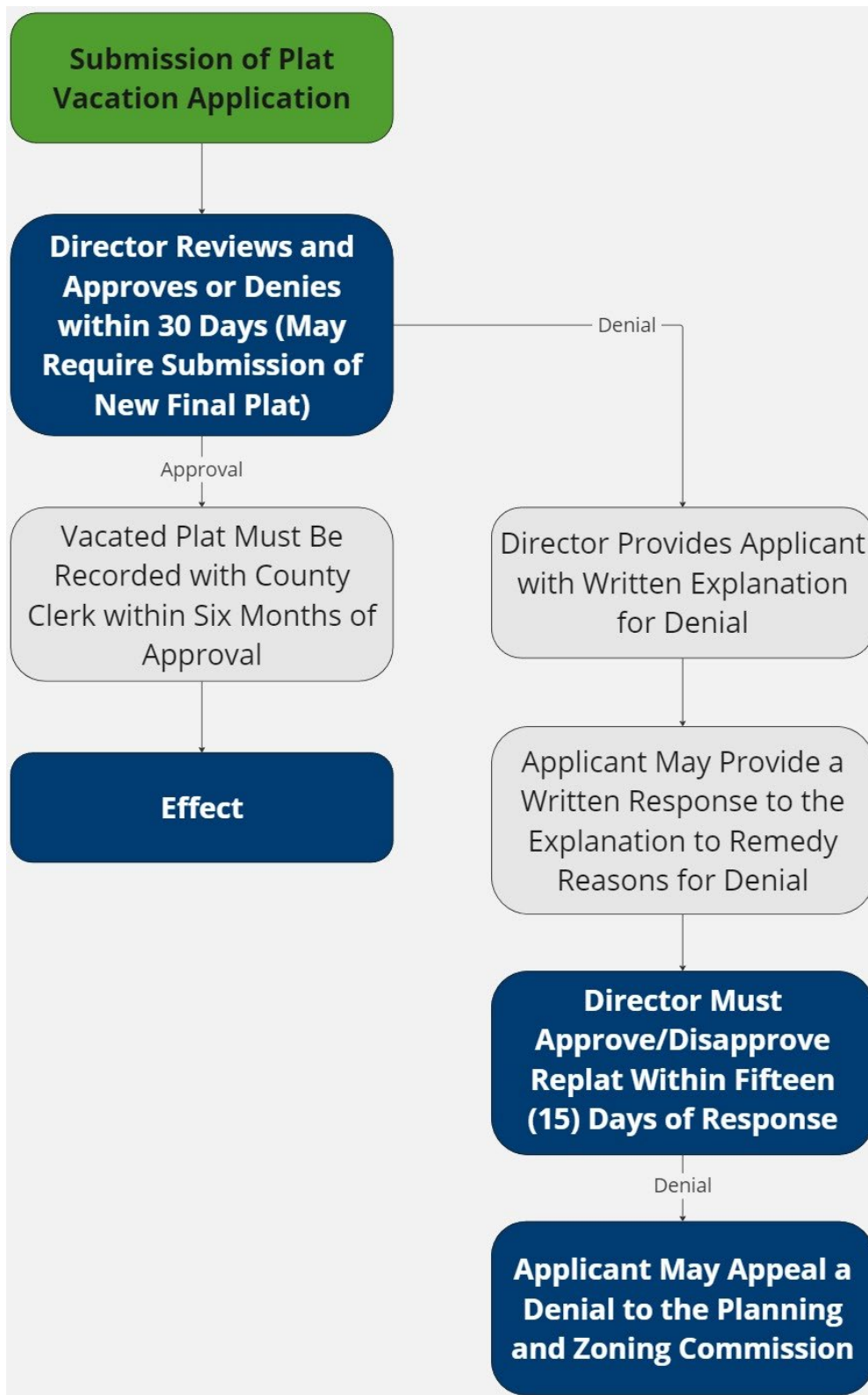
10.404.6.4 Approval, Denial and Conditional Procedures

The application for a vacated plat shall be submitted to the City in the same manner as a final plat, and shall be approved, conditionally approved or denied by the Director of Development Services and in a similar manner as a final plat.

10.404.6.5 Conditions

The Director of Development Services may impose such conditions on the approval of the vacated plat as are necessary to ensure compliance with the standards of approval.

10.404.6.6 Plat Vacation Approval Process Flow Chart



10.405. General Provisions

10.405.1. Required Improvements

10.405.1.1 Required Features

The developer or applicant shall make all of the following improvements.

- (a) Dedicate right-of-way necessary to achieve the width required by applicable, funded transportation-related plans for streets adjoining the property.
- (b) Reserve, but not dedicate, right-of-way for controlled access highways.
- (c) Pave and install curbs and gutters along streets adjoining the property.
- (d) Install sidewalks and pedestrian pathways.
- (e) Install street signs.
- (f) Install street lighting.
- (g) Install development perimeter walls, if walls are required.
- (h) For residential development, provide open space and recreational facilities.
- (i) Install all utilities underground.
- (j) Landscaping, drainage, fire protection, etc.

10.405.1.2 Developer Responsibility

The developer shall construct or provide all applicable public improvements required by this chapter. All improvements which the developer is required to make shall be made at the developer's expense without reimbursement by the City, except as provided otherwise in this UDC. The City may contract with a developer to construct public improvements relating to the development in accordance with Chapter 212, Subchapter C of the Texas Local Government Code, as amended.

10.405.2. Timing and Inspection of Improvements

Unless otherwise stated, a developer cannot begin construction activities in the City's jurisdiction, including clearing and/or rough grading, before first obtaining all City approvals required by this chapter.

10.405.3. Phasing Plan Requirements

Proposals for projects to be developed in multiple phases shall meet all the following requirements unless otherwise approved by the Development Services Director.

- (a) If requested in the original application, a major subdivision may be considered for approval for phased development.
- (b) Phasing plans shall be included in the first submittal and are reviewed by Development Services staff and/or other city staff and evaluated as part of the overall development plan.
- (c) Each phase of a development needs to be "stand-alone" for utilities, fire protection, streets and stormwater management. Phase lines shall follow reasonable and logical boundaries, such as terminating at intersections or following topographical breaks.

- (d) Phases shall be created so each phase consists of at least 15% of the total number of lots in a development.
- (e) Phases shall be constructed in the approved manner to ensure orderly and planned development.
- (f) Phases shall be planned to ensure the efficient construction of adjacent future phases (phases immediately next to the subject phase, sharing a common boundary line), and to ensure that phased development is contiguous.
- (g) Lot numbers shall not be duplicated in different phases of the same subdivision.
- (h) Each proposed phase shall, at a minimum, include the transportation, utility, and other public/private infrastructure shown on the proposed phasing plans, so each phase is independent of later phases.
- (i) Right-of-way and/or easements for public infrastructure servicing the respective phase shall be recorded with the first plat.
- (j) Water and sewer extension permit applications for each individual phase of the project are required after plan approval.
- (k) Lots located in the Extraterritorial Jurisdiction shall be a minimum of one (1) acre in size.
- (l) Lots located in the Extraterritorial Jurisdiction established for special purposes such as common area, open space, parkland, floodplain, drainage, utilities or other similar facilities shall be uniquely named and are not required to meet the minimum lot size.

10.405.4. Construction Plans Submission

10.405.4.1 Submittal

Subdivision improvement construction plans shall be submitted for review and approval by the City Engineer for all development for which public improvements are required.

10.405.4.2 Developer Shall Retain Engineer

The developer shall retain the services of an engineer registered in the state of Texas, whose seal shall be placed on the subdivision improvement construction plans in accordance with the Texas Engineering Practice Act. The engineer shall be responsible for the services described in City Standards. The services performed by the engineer shall be as designated in the latest edition of the "Manual of Professional Practice – General Engineering Services," published by the Texas Society of Professional Engineers, and shall include both design and inspection as defined in this code.

10.405.4.3 Submittal Content

Except as provided in this code, after preliminary plat approval, subdivision improvement construction plans may be submitted to the City Engineer for approval. The subdivision improvement construction plans submittal shall include all of the information specified in the development application.

10.405.4.4 State Review

All subdivision improvement construction plans shall comply with the Texas Accessibility Standards administered by the Texas Department of Licensing and Regulation (TDLR) and the Americans with Disabilities Act of 1990, as amended. The developer shall submit applicable portions of the subdivision improvement construction plans to TDLR for review. Upon the completion of construction, the developer shall request inspection of all pedestrian facilities by the TDLR and pay all necessary fees. The City will not accept the public improvements until the developer provides evidence that the plans have been reviewed and approved by TDLR and that payment of the required inspection fees has been made.

10.405.4.5 Expiration of Approval of Subdivision Improvement Construction Plans

The subdivision improvement construction plans will expire two (2) years from the date of approval by the City Engineer if construction has not commenced. Even after construction has commenced, the approved subdivision improvement construction plans will expire three (3) years from the date of approval. If approved subdivision improvement construction plans expire, the plans shall be resubmitted for review and approval to ensure compliance with the current design and construction standards.

10.405.4.6 Pre-Construction Conference

After the approval of the subdivision improvement construction plans, a pre-construction conference shall be required to commence construction of the public improvements. The conference shall be held with the City Engineer and include the following persons: developer, developer's contractor, developer's engineer, and other parties as determined by the City Engineer.

10.405.5. Construction of Public Improvements

10.405.5.1 Requirement

All public improvements required by these regulations shall be installed and constructed by the developer or his successors in title within two (2) years from the approval of the subdivision improvement construction plans. All improvements shall conform with the provisions of this code and approved plans.

10.405.5.2 Failure to Complete Improvements

Where public improvements are not completely installed and constructed within two (2) years, the City may do the following:

- (a) Exercise any other rights available under the law.

10.405.5.3 Sidewalk Construction

- (a) Sidewalks for Single-Family, Two-Family, and Single Unit Townhouse Lots

Except as provided by the Engineering Design Manual, a developer shall install sidewalks on the public street frontage of single-family lots, on the rear of double frontage lots, on the side of a corner lot, and where shown on the subdivision improvement construction plans.

- (b) Sidewalks for Multi-Unit Townhouse, Multifamily, and Non-Residential lots

A developer shall install sidewalks for multi-unit townhouse, multifamily, and non-residential lots that abut a public street and where shown on the subdivision improvement construction plans. A subdivision shall not be

accepted until the sidewalk has been constructed in accordance with the regulations of this code and has been inspected and approved by the City Engineer.

(c) Deferment of Sidewalk Construction

Sidewalks shall be installed in accordance with this section except under the following circumstances, as determined by the City Engineer:

- (1) Where the existing cross-section of street makes immediate construction of a sidewalk impractical;
- (2) Where a non-residential subdivision abutting an existing street is isolated from any other sidewalk by a distance of twice the frontage of the subdivision; or
- (3) Where construction or reconstruction of the road where a sidewalk is to be placed is imminent and the sidewalk would be destroyed if constructed.

The City may require a cash payment by the developer in lieu of construction of the sidewalk if the Planning and Zoning Commission determines that the sidewalk should not be built within the three (3) year period of the construction plans. The cash payment shall equal the cost of constructing and installing the sidewalk at the time of acceptance of the public improvements. The developer shall pay the cash payment prior to the acceptance of the public improvements by the City.

(d) State Review

All sidewalks shall comply with the Texas Accessibility Standards administered by the Texas Department of Licensing and Regulation (TDLR) and/or with the Americans with Disabilities Act of 1990, as amended, whichever is more restrictive. The developer shall submit its sidewalk plans to TDLR for review and, upon completion of its construction, for inspection. The City will not accept public improvements until the developer provides evidence that the sidewalk plans have been reviewed and approved by TDLR. The developer is responsible for all fees associated with the State plan review and inspection and shall submit to the City evidence of payment of all required inspection fees.

10.405.5.4 Benchmarks

(a) Designation

A permanent benchmark shall be designated with each addition or subdivision. Benchmarks shall be located on public property in a location acceptable to the City Engineer. Benchmarks are considered public improvements and shall consist of a brass disk, approved by the City Engineer, set in a concrete structure of such mass and dimensions and constructed on an unyielding foundation that, in the opinion of the City Engineer, will ensure the integrity of the benchmark.

(b) Installation

Prior to the acceptance of the public improvements, benchmarks shall be installed by the developer. The elevation, horizontal datum, and description of each benchmark installed shall be certified by a surveyor and submitted to the City Engineer. In the event that public improvements are not required, benchmarks shall still be installed by the developer and the certification and description provided to the City Engineer prior to plat recordation.

(c) Modification

The City Engineer may modify the benchmark requirement if he/she determines one of the following:

- (1) The requirement would create needless redundancy of benchmarking because of an established public benchmark exists in the immediate vicinity, is readily accessible, and will not be removed or made inaccessible by construction associated with the addition or subdivision;
- (2) The requirement creates undue hardship on the developer;
- (3) There is no feasible opportunity to install a brass disk in a suitable structure. In this case, the City Engineer may approve a permanent benchmark established in conformance with generally accepted surveying and engineering practices; or
- (4) Lack of development within the subdivision or addition.

10.405.6. Restrictions on Certificate of Occupancy

City staff shall not issue certificates of occupancy for development until staff certifies the developer has installed all improvements in conformance to the requirements of this section and the approved final plat and construction drawings. All improvements shall be functional and under the warranty period for maintenance.

10.405.7. Construction Traffic and Alternative Routes

Construction traffic from the development of new subdivisions and/or site plans shall be required to use a reasonable alternative route until seventy-five percent (75%) of the total certificates of occupancy are issued in the new development boundary as identified with the associated subdivision/site plan. If no reasonable alternative route exists, existing public streets may be used as approved by the City Engineer (e.g., infill projects).

10.405.8. Street Signs

Street name signs conforming to city design standards shall be placed at street intersections. The developer shall install the signs before the city accepts the required improvements. Street signs are included in improvements where fiscal surety may be submitted instead of completed improvements. The developer is required to replace or repair street signs that are damaged during construction.

10.405.9. Street Lights

The property owner or developer shall install street lighting along proposed public and/or private streets, streets, and along existing streets adjoining the property. Development Services and Public

works staff approve street light location and design. Illumination shall conform to lighting regulations in Division B of the Hutto Engineering Design Manual. The developer is required to replace or repair lights that are damaged during construction.

10.406. Assurance for Improvement Completion

10.406.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.406.2. Improvements and Surety Instrument Before Final Plat Recordation

On approval of a final plat by City Council, but before recording, the applicant shall:

- (a) Construct all improvements as required by this Chapter and provide a surety instrument guaranteeing their maintenance as required in this UDC; or
- (b) Provide an improvement agreement accepted by the City, along with a surety instrument in accordance with this UDC, guaranteeing construction of all improvements required by this article and in this code and other applicable regulations.

10.406.3. Completion of Improvements

Before the final plat is recorded, the developer shall:

- (a) Complete all improvements required by this article according to the approved construction plans and subject to the City Engineer's approval and the City's acceptance, except as provided for within this UDC; or
- (b) Construct all sidewalks in common areas and at street corners as shown on the approved final plat and according to the City's regulations or the City's standard details and specifications. Sidewalks shall be constructed and approved for each lot before a certificate of occupancy is issued.

10.406.4. Fiscal Security

A developer shall post fiscal security with the City prior to a request for recordation of the final plat if the public improvements have not been accepted by the City and provided that the subdivision improvement construction plans have been approved by the City Engineer.

10.406.4.1 Amount

The amount of fiscal security posted by the developer shall equal the estimated cost plus ten percent to complete the public improvements that have not been accepted. The developer's engineer shall provide the City Engineer with a sealed opinion of the probable cost for his approval.

10.406.4.2 Types

- (a) A developer is required to post the following as fiscal security:

- (1) A performance bond;
 - (2) A payment bond.
- (b) A developer may also post the following as fiscal security:
 - (1) A letter of credit, approved by the City Attorney.

10.406.4.3 Return of Fiscal Security

The City shall return the fiscal security to the developer when the City accepts the public improvements.

10.406.4.4 Expenditures of Fiscal Security

The City may draw on the fiscal security and pay the cost of completing the public improvements if it determines that the developer has breached the obligations secured by the fiscal security or the three (3) year time period for the installation of the required public improvements has expired. The City shall refund the balance of the fiscal security, if any, to the developer. The developer shall be liable for the cost that exceeds the amount of fiscal security, if any.

10.406.5. Inspection and Acceptance

10.406.5.1 Entry and Inspection

- (a) The City Engineer and other City employees shall have the right to enter upon the construction site for the purpose of conducting inspections. The City Engineer shall conduct inspections of the public improvements during construction to ensure general conformity with plans and specifications as accepted. If the City Engineer finds, upon inspection, that any of the public improvements have not been constructed in accordance with City ordinances, then the developer shall be responsible for making the necessary changes to ensure compliance.
- (b) Upon completion of the public improvements, the developer shall arrange with the City Engineer for a final inspection to determine that the public improvements have been installed in conformity with the approved subdivision improvement construction plans. The developer shall pay all necessary inspection fees prior to the acceptance of the public improvements by the City.

10.406.5.2 Request Acceptance of Improvements

Upon completion of the construction of the public improvements, the developer shall request that the City accept the improvements for maintenance. Concurrent with the request for acceptance of the public improvements for maintenance, the developer shall submit all information required for acceptance of improvements specified in the development application.

10.406.6. Maintenance of Improvements

The developer shall be responsible for the maintenance and repair of all public improvements for two (2) years after acceptance of said public improvements by the City. Prior to acceptance of improvements by the City pursuant to Section 10.406.5, a two (2) year maintenance guarantee, in favor of the City, shall be provided by the developer by means of a warranty bond, subject to approval of the City.

10.407. Construction Standards

10.407.1. Applicability

This section applies to the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.407.2. General

Construction for streets and drainage shall conform to the City of Hutto Standard Details and Divisions B and E of the Hutto Engineering Design Manual.

Construction standards and specifications for electrical and gas utilities shall be in conformance with the standards of the approved utility provider.

10.408. Lot Configuration

10.408.1. Applicability

This section applies to the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.408.2. Lots

10.408.2.1 General Standards

- (a) Size, shape, and location of lots shall be established considering topographic conditions, contemplated uses, and the character of the surrounding area.
- (b) Lot sizes and building setback lines shall conform to the minimum lot area, minimum lot width, and minimum yard standards required in the underlying zoning district.
- (c) Lots that front on more than one street other than corner lots, resulting in the need for a large development perimeter wall facility, shall be minimal or avoided.
- (d) Side lot lines shall be substantially at right angles or radial to street alignments.
- (e) Residential lots that back up to parks or schools shall be minimal or avoided.

10.408.2.2 Lot Width

Lot width at the street right-of-way line at the end of a cul-de-sac or the outside of a sharp curve shall be at least twenty (20) feet to accommodate driveways, drainage facilities, and utilities.

10.408.2.3 Lot Shape

- (a) Lots shall be as rectangular as practicable. Sharp angles between lot lines shall be avoided.
- (b) Width to depth ratio of lots for single household and two household dwelling developments shall be at least one (1) to three (3), as determined by the smallest rectangle enclosing the extreme limits of the lot.

10.408.2.4 Lot Numbering (Not Address Numbering)

- (a) Lots shall be numbered consecutively in each block. Lot numbering may be cumulative throughout the subdivision if the numbering continues from block to block in a uniform manner approved on a preliminary plat.
- (b) Blocks shall be numbered consecutively in the overall plat and/or sections of an overall plat as recorded.
- (c) Required lot sizes, dimensions and building envelopes are in Section 10.203 for all zoning districts.

10.409. Easements

Easements shall be dedicated for dry and wet utilities, drainage ways, and access paths where necessary, and may be required across parts of lots (including side lines) if in the opinion of the city, they are needed.

10.409.1. Utility Easements

All easements shall be dedicated to the City and their locations shall be clearly denoted on plat documents.

- (a) Uniform and continuous easements shall be provided along lot lines for utility services. The City may approve a location other than along a lot line.
- (b) Easements for water, sewer, and storm sewer lines shall be defined by the Hutto Engineering Design Manual.
- (c) Other utility easements (for other than water, sewer and storm sewer lines) shall be a minimum of five feet in width abutting the street lot lines and at least three feet in width when abutting interior lot lines.
- (d) Utility easements shall be located where they will not prevent tree planting in tree lawns.

10.409.2. Emergency Access Easements

Emergency access easements shall be defined by the local fire code as amended. Emergency access easements shall not be divided by lot lines.

10.410. Parkland and Open Space Dedication

10.410.1. Intent

This subsection is intended to ensure the City has enough parkland to meet the recreational needs of its residents.

10.410.2. Applicability

This section applies in the following areas.

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	Yes

10.410.3. Applicability: Overview of Requirements

- (a) A developer of land for residential or non-residential purposes shall provide for Parkland Dedication or pay a Fee in Lieu of Parkland Dedication and pay Parkland Development Fees for public park and/or open space development.
- (b) A portion of land may meet the Parkland Dedication requirements if recommended by the Hutto Parks and Recreation Department based on the requirements of Section 10.410 and conformity with the City of Hutto Parks, Recreation, Open Space and Trails Master Plan, as may be amended (hereinafter referred to as the “Parks Master Plan” for purposes of Section 10.410).
- (c) The parkland dedications and improvements required by Section 10.410 shall be installed, or the Fee in Lieu of and Parkland Development Fees paid, before the approval of the final plat for a subdivision, in conformance to the standards of Section 10.410.

10.410.4. Parkland Dedication

10.410.4.1 Parkland Dedication Plan

- (a) A Parkland Dedication Plan shall be approved prior to the preliminary plat review and/or site plan development. The proposed parkland shall be shown on the preliminary plat and final plat and be included in the dedication statement.
- (b) A Parkland Dedication Plan shall meet the following requirements:
 - (1) Proposed parkland shall meet the land requirements of Section 10.410.4.2 and shall be a minimum of 15 acres.
 - (2) Proposed parkland will meet the requirements and guidelines of Section 10.410.5 and the Parks Master Plan, as amended.
 - (3) The Parkland Dedication Plan shall be approved by the Parks and Recreation Director or designated agents at the conceptual plan stage and approved by the Parks Advisory Board and Parks and Recreation Director prior to the preliminary plat stage and/or site plan development.

10.410.4.2 Parkland dedication; land requirements

- (a) A developer shall dedicate a minimum of at least one thousand (1,000) square feet of parkland for each single household lot or proposed number of dwelling units or pay a Fee in Lieu of Parkland Dedication.

- (b) If an area is replatted before construction of the development, or the number of anticipated lots or dwelling units increases, the developer shall adjust the Parkland Dedication or pay the Fee in Lieu of Parkland Dedication and Parkland Development Fees to provide for the change in lots or dwelling units.

10.410.5. Nature of Proposed Parkland

10.410.5.1 Land eligibility for proposed parkland

- (a) In addition to the requirements of Section 10.410, the following subsections provide the criteria by which the Parks and Recreation Department and Parks Advisory Board will determine acceptance of a Park Dedication Plan.
- (b) The following is broken into two categories to determine land eligibility. Ineligible land may be dedicated for parkland, but ineligible land cannot be counted towards the minimum necessary to meet Parkland Dedication requirements. The Parks and Recreation Department and Parks Advisory Board have the final decision in acceptance as provided for in the Parkland Dedication Plan in accordance with the criteria below:
- (c) Accepted conditionally
 - (1) Detention ponds, retention ponds, and drainage ways.
 - (2) Private community and amenity centers.
 - (3) Golf courses, country clubs, and similar facilities.
- (d) Never accepted
 - (1) Rights-of-way and/or easements of irrigation ditches, laterals and aqueducts, power lines, pipelines or other public or private utilities.
 - (2) Wetlands that are saturated for greater than twenty-five (25%) of the year, swamps, and boggy lands.
 - (3) Entry features, areas devoted to decorative landscaping, green lanes, traffic islands, medians less than one hundred (100) feet wide, tree lawns, and areas following development perimeter walls.
 - (4) Land used for mining or oil or gas wells.

10.410.5.2 Unity

Proposed parkland shall form a single parcel, unless two (2) or more parcels are approved in the Parkland Dedication Plan.

10.410.5.3 Usability

Proposed parkland shall be located outside the one percent (1%) flood plain and be outside of wetlands subject to Federal or State regulatory jurisdiction unless approved in the Parkland Dedication Plan.

10.410.5.4 Shape

- (a) The shape of proposed parkland shall be compact and sufficiently rectangular or round to provide a meaningful, quality open space.

- (b) Proposed parkland and open space areas may not take the form of narrow strips, except corridors in conjunction with the Parks Master Plan, and medians at least one hundred (100) feet wide as approved in the Parkland Dedication Plan.

10.410.5.5 Location

Proposed parkland shall be located in a central location that is within a reasonable walking distance (1,000 feet to 1,500 feet) of residents of the subdivision or planned development, except that proposed parkland may be located outside of the residential development to conform to the Parks Master Plan, to conform to comprehensive or neighborhood plans, to add property to existing parkland, or to combine land dedication efforts with other developments.

10.410.5.6 Access

Proposed parkland shall front on a public street with a residential lane or greater classification to the maximum extent practicable unless otherwise approved in the Parkland Dedication Plan.

10.410.5.7 Topography

The average slope of the portion of dedicated parkland may not exceed the average slope of the entire subdivision or planned development. Slope on the usable portion of dedicated park shall be less than fifteen percent (15%).

10.410.5.8 Improvements by Park Site

The developer shall install public improvements next to the parkland including, but not limited to, curb and gutters, streets, sidewalks, storm drainage facilities, and bridges. All bridges shall be approved by the Public Works Department. Parkland shall have access to water, sanitary sewer, storm sewer, and electrical services unless otherwise provided for in the Parkland Dedication Plan. The developer shall provide convenient pedestrian and vehicular access to parks and open space. In areas of parkland not fronting a public street, access by frequent green links or public paths shall be provided.

10.410.6. Fee in Lieu of Parkland Dedication

- (a) A developer will be required to pay the Fee in Lieu of Parkland Dedication and Parkland Development Fees unless the developer complies with the Parkland Dedication requirements.
- (b) The Fee in Lieu of Parkland Dedication shall be set by ordinance based on the methodology established in the Parks Master Plan.

10.410.7. Parkland Development Fees

- (a) In addition to the Fee in Lieu of Parkland Dedication, a developer shall pay Parkland Development Fees for the cost of parkland improvements.
- (b) The Parkland Development Fees shall be set by ordinance based on the methodology established in the Parks Master Plan.

10.410.8. Parkland Dedication of Fee in Lieu and Parkland Development Fees; procedure

- 10.410.8.1 Parkland Dedication of Fee in Lieu and Parkland Development Fees required before plat recording

Prior to the recording of the final plat, the developer shall execute and record an instrument of conveyance in compliance with Section 10.410 for Parkland Dedication or pay the Fee in Lieu of Parkland Dedication and the Parkland Development Fees.

10.410.8.2 Parkland Dedication by General Warranty Deed

Proposed parkland to be dedicated to the City shall be dedicated by general warranty deed. Evidence of clear title and evidence of payment of all taxes owed on the proposed parkland to be dedicated shall be provided to the City prior to the acceptance of the general warranty deed.

10.410.9. Parks Improvements and Acquisition Account

Money, and the interest on such money, collected as a Fee in Lieu of Parkland Dedication and as Park Development Fees under Section 10.410 shall be deposited into the parks improvement and acquisition account established under section 18.02.010 of the City of Hutto Code of Ordinances and shall be used exclusively for improvement of existing and future parks and for the acquisition of land for future parks, as required by the ordinance. The fees collected under this Section shall not be used for maintaining or operating public parkland or park facilities.

10.410.9.1 Location

Dedicated parkland is ideally located in a central location that is within a reasonable walking distance (1,000 feet to 1,500 feet) of residents of the subdivision or planned development. Dedicated parkland may be located outside of the residential development to conform to comprehensive or neighborhood plans, to add property to existing parkland, or to combine land dedication efforts with other developments.

10.410.9.2 Access

- (a) At least fifty percent (50%) of the perimeter of a park or open space area of no more than ten (10) acres, and at least thirty percent (30%) of the perimeter of a community park or open spaces area of greater than ten (10) acres, shall front on a public street with a residential lane or greater classification. Large parks, greater than twenty (20) acres, or with greater than one thousand five hundred (1,500) feet of street frontage, and linear parks (e.g. greenlinks, rail-to-trail paths, lakefront corridors, riparian corridors, etc.) shall front on a public street with a residential lane or greater classification to the maximum extent practicable.
- (b) Convenient pedestrian and vehicular access to parks and open space shall be provided. In areas of parkland not fronting a public street, access by frequent greenlinks or public paths shall be provided.

10.410.9.3 Topography

The average slope of the portion of dedicated parkland cannot exceed the average slope of the entire subdivision or planned development. Slope on the usable portion of dedicated park shall be less than fifteen percent (15%).

10.410.9.4 Land Not Eligible for Parkland Dedication Requirements

The following are criteria for land ineligible for parkland dedication requirements. Ineligible land can be dedicated for parkland, but it cannot be counted towards the minimum necessary to meet dedication requirements.

- (a) Detention ponds, retention ponds, and drainageways.

- (b) Rights-of-way and/or easements of irrigation ditches, laterals and aqueducts, power lines, pipelines or other public or private utilities.
- (c) Wetlands that are saturated for greater than twenty-five percent (25%) of the year, swamps, and boggy lands.
- (d) Entry features, areas devoted to decorative landscaping, green lanes, traffic islands, medians less than one hundred (100) feet wide, tree lawns, and areas following development perimeter walls.
- (e) Private community and amenity centers.
- (f) Golf courses, country clubs and similar facilities.
- (g) Land used for mining or oil or gas wells.

10.411. Pedestrian and Bicycle Facilities

For pedestrian and bicycle facilities standards refer to Division B, Section 11 of the Hutto Engineering Design Manual.

10.412. Street Classification

10.412.1. Applicability

This section applies in the following areas.

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	Yes

10.412.2. Local Street

A Local street provides direct access to residential and limited commercial properties and is expected to carry less than eight hundred (800) vehicles per day.

- (a) Driveway access to residential units is permitted.
- (b) A Local street shall provide for two through lanes for traffic.
- (c) A Local street shall provide parking on both sides of the roadway.
- (d) On Local streets, no driveway is permitted closer to a corner than fifty (50) feet.
- (e) Bicycle lanes are not permitted.

10.412.3. Collector Street

A Collector is a street that collects traffic from Local streets and directs it toward arterials and has an actual or anticipated traffic flow of two thousand five hundred (2,500) ADT or greater.

- (a) Collector streets are shown in Hutto SOAR 2040, however; they may be required in other locations based on the size and density of development.
- (b) A Collector shall provide access to all types of commercial and industrial uses.
- (c) A Collector shall provide for two (2) through lanes.

- (d) A Collector shall provide for bicycle lanes six (6) feet in width on both sides.
- (e) No driveway access to single-family or two-family dwelling units is permitted.
- (f) Medians may be allowed with approval of City Staff.
- (g) No parking is permitted.

10.412.4. Minor Arterial Street

A Minor Arterial is a street whose main purpose is to serve as a major route that connects neighborhoods to principal arterials and other major destinations. Minor Arterials have an actual or anticipated traffic flow of eighteen thousand (18,000) or greater.

- (a) Minor Arterial streets are shown in Hutto SOAR 2040, however; they may be required in other locations based on the size and density of development.
- (b) Minor Arterials have two (2) through lanes in each direction separated by a median.
- (c) No parking is permitted.
- (d) No driveway access to single-family or two-family dwelling units is permitted.
- (e) Bicycle lanes are not permitted.

10.412.5. Major Arterial Street

A Major Arterial is a street, including Interstate Highway Service Roads, whose main purpose is to serve as a major route into, out of or across the City. Major Arterials have an actual or anticipated traffic flow of thirty-two thousand (32,000) or greater.

- (a) Major Arterial streets are shown in Hutto SOAR 2040, however; they may be required in other locations based on size and density of development.
- (b) Major Arterials have at least three (3) lanes in each direction separated by a median.
- (c) Interstate Highway Service Road standards are established by the Texas Department of Transportation and do not include a bicycle lane within the street Section.
- (d) No parking is permitted.
- (e) No bicycle lanes are permitted on Major Arterials.

10.412.6. Freeway

- (a) A freeway is a street with controlled access and intended to move traffic through or around the City.
 - (1) Service and frontage road standards are established by the Texas Department of Transportation and do not include a bicycle lane within the street section. A landscaped tree lawn at least five (5) feet deep, with a sidewalk at least five (5) feet wide, is required on the far side of the service or frontage road.
- (b) Access to Freeways shall only be provided at designated interchanges. Refer to TxDOT.

10.413. Streets-Improvement Standards

For street-improvement standard details refer to Division B, Section 10 of the Hutto Engineering Design Manual.

10.414. Street Grid, Circulation and Connectivity

10.414.1. Applicability

This section applies in the following areas.

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	Yes

10.414.2. General Alignment

The precise alignment of thoroughfares included in development plans may be varied to allow adjustments that increase the compatibility of the right-of-way with natural or manmade features such as steep slopes, waterways, wildlife habitats, neighborhoods, historic structures, or existing roadways.

10.414.3. Street Arrangement and Internal Connectivity

10.414.3.1 Conformity to Plan

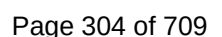
Width and location of streets shall conform to the underlying concept plan, Hutto Mobility Master Plan, Thoroughfare Plan and the Hutto Engineering Design Manual.

10.414.3.2 Connectivity Index

The street network in a residential development shall achieve a connectivity index of at least 1.62 unless the Development Services Director finds it impractical due to topography, existing development, or natural features. The connectivity index shall be calculated by dividing the total number of links by the total number of nodes. Street links on existing adjacent streets that are not part of the proposed subdivision are not included in the connectivity index calculation. See Figure 614.3-1 for how to calculate the connectivity index.

- (a) Links
 - (1) Streets
 - (2) Stub-out streets
 - (3) Standard public access easements
 - (4) Local road connections to collector streets and larger
 - (5) Cul-de-sacs
- (b) Nodes
 - (1) Street intersections
 - (2) Cul-de-sac heads

- Figure 614.3-1 Connectivity Index



10.414.3.4 Blocks

10.414.3.4.1. Block Length

Block lengths shall be determined by the classification of the street adjacent to the block.

Table 614-1: Block Lengths

Street Classification	Minimum Side Length	Maximum Side Length
Local Roads	200 feet	600 feet
Collector Roads	200 feet	800 feet
Minor Arterial Roads	200 feet	900 feet
Major Arterial Roads	Waived	Waived

10.414.3.4.2. Block Depth

Blocks shall have sufficient width to allow two tiers of lots of appropriate depth. Alleys giving access to the rear of lots on a block is strongly encouraged.

10.414.3.4.3. Single Tier Blocks and Double Frontage Lots

- (a) Residential blocks with one tier of double frontage lots are strongly discouraged. Alternative block configurations not relying on single tier blocks or long stretches of double frontage lots to separate residential develop from through traffic and arterials, or placement of higher density multiple household residential developments along arterial streets, is encouraged.
- (b) For residential double frontage lots, there shall be an easement at least ten (10) feet deep abutting a traffic arterial or other disadvantageous use, dedicated to the appropriate governmental entity, with no right of cross access. There shall also be at least ten (10) feet deep tract or easement on the other side of the property line abutting a traffic arterial or other disadvantageous use, for a development perimeter wall and landscaping buffer.

10.414.3.4.4. Block Perimeter

Block perimeters shall be determined by the classification of the street adjacent to the block.

- (a) Local Roads
Maximum Perimeter: The total perimeter of a block abutting Local roads shall not exceed one thousand eight hundred (1,800) feet.
- (b) Collector Roads
Maximum Perimeter: The total perimeter of a block abutting Collector roads shall not exceed one thousand eight hundred (1,800) feet.
- (c) Minor Arterial Roads
Maximum Perimeter: The total perimeter of a block abutting Minor Arterial roads shall not exceed three thousand (3,000) feet.

(d) Major Arterial Roads

Maximum Perimeter: Block perimeter requirements are waived when blocks are located adjacent to Major Arterial roads.

10.414.3.4.5. Mid-Block Greenlinks

Greenlinks at least fifteen (15) feet wide with a sidewalk that is at least five (5) feet wide shall be placed near the center and entirely across blocks that are greater than six hundred (600) feet long, to give convenient pedestrian circulation through the development. Greenlinks shall be landscaped in conformance to landscaping standards for connecting walkways in this code and maintained by the underlying homeowner association.

10.414.3.5 Circulation

- (a) Each subdivision shall provide for the continuation of all arterial streets and freeways as shown on the Mobility Master Plan, Arterial streets shall be located on the perimeter of the residential neighborhood.
- (b) Collector and local streets shall be designed to provide access to each parcel of land within the residential neighborhood and within industrial areas. They shall be planned so that future urban expansion will not require the conversion of collector and local streets to arterial routes.
- (c) Collector streets shall be designed to provide a direct route from other collector or local streets to the arterial streets and freeway systems and to provide access to public facilities within the neighborhood; however, collector streets shall not be aligned in a manner that will encourage their use by through traffic.
- (d) Collector-designated streets shall connect on both ends to an existing or planned collector or higher-level street.
- (e) Permitted alternatives to cul-de-sacs include T-streets, and any similar alternative approved by the City Engineer.

10.414.3.6 Required Subdivision Access Points

- (a) Subdivisions with less than two hundred (200) residential units shall provide vehicular access to four or more existing or planned public streets.
- (b) Subdivisions with two hundred (200) to two hundred and ninety-nine (299) residential units shall provide vehicular access to at least five existing or planned public streets.
- (c) For developments exceeding three hundred (300) units, one additional access point shall be provided for every fifty (50) residential units or portion thereof.
- (d) Development Services staff may reduce the required number of access points due to topography, natural features, or the configuration of adjacent developments.
- (e) Additional access points shall be shown on the plat and construction plans for the development. Construction of streets may be postponed to a later phase of development. The Planning and Zoning Commission may require the construction of any access point when the final plat is approved.

10.414.3.7 Relation to Adjoining Street Systems

To provide connectivity to other neighborhoods, existing streets in adjacent or adjoining areas shall be continued in the new development in alignment therewith. Whenever connections to anticipated or proposed surrounding streets are required by this Section, the right-of-way shall be extended, and the street developed to the property line of the subdivided property or to the edge of the remaining undeveloped portion of a single tract.

(a) Street Jogs

Where offsets in street alignment are, in the opinion of the City Engineer, unavoidable due to natural features or other unique elements of the land, such offsets may be included, provided the distance between center lines is not less than one hundred and twenty-five (125) feet.

(b) Large Lot Subdivision

- (c) If the lots in the proposed subdivision are large enough to suggest potential future re-subdivision, or if part of the parent tract remains unplatted, the subdivision design shall include designated corridors or easements for potential future street openings and access. These designated areas shall be clearly marked on the subdivision plat and reserved for future development, ensuring that all future lots will have adequate access to streets. Partial or Half streets

No partial or half streets shall be platted or constructed. Partial or half streets may be provided only where the City finds a street shall be located on a property line, where the proposed road has a center median.

(d) Dead-End Streets

Dead-end streets shall be prohibited except street stubs to permit extension. Temporary turnarounds shall be required where the street stub exceeds one lot or 100 feet in length, whichever is greater. The developer shall provide a sign at the street stub declaring that the particular street will connect with future development.

(e) Unpaved Street Rights-Of-Way

The portion of the street right-of-way between a private lot line and the curb or pavement edge shall be designed and constructed to meet the requirements of the Hutto Engineering Design Manual.

(f) Access to Public Streets from Private Property

- (1) No person shall cut a curb or gutter section nor pave a street right-of-way without first obtaining a permit from the City and complying with City Codes. Where no curb and gutter street construction is permitted, no person shall construct or pave the borrow ditch street section without first obtaining a permit from the City and complying with City Codes.

(g) Street Connections to Abutting Undeveloped Land

- (h) Street connections shall be spaced at intervals not to exceed six hundred and sixty (660) feet (1/8 mile) along each boundary that abuts potentially developable or redevelopable land. Blocks longer than eight hundred (800) feet

in length shall have a mid-block pedestrian pathway connecting adjacent blocks.

10.415. Driveways and Easements

10.415.1. Applicability

This section applies in the following areas.

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	Yes

10.415.2. Driveway Spacing From Intersections

No driveway is permitted closer to a corner than the driveway separation standard provided in Division B, Section 12 of the Hutto Engineering Design Manual.

10.415.3. Design Requirements And Standards

10.415.3.1 Additional Access

The City Engineer may require more than one access point onto a collector or arterial street for a single parcel during Site Plan review provided that the number and location of access points onto local streets and the additional access points onto collector and arterial streets shall be approved by the highway authority having jurisdiction over the roadway from which access is being taken.

10.415.3.2 Width of Access

The width of access driveways shall be determined by the highway authority having jurisdiction over the roadway from which access is being taken. However, in no case shall an individual driveway width be greater than thirty-five (35) feet. Where a highway authority has not established driveway width requirements and standards the standards and requirements of the Texas Department of Transportation shall apply.

10.415.3.3 Closure or Relocation of Existing Access Points

The City Engineer, in conjunction with the highway authority having jurisdiction over the roadway from which access is being taken, shall have the authority to require the closure or relocation of existing access points where multiple access points to the site are available.

10.415.3.4 Curb Cuts at Intersections

A curb cut for a corner parcel at the intersection of any streets shall be located the maximum practical distance from the center of the intersecting streets, without intrusion into any required buffer. The number and location of the curb cut shall be approved by the highway authority having jurisdiction over the street from which access is being taken. Where a highway authority has not established curb cut requirements and standards, the standards and requirements used by the Texas Department of Transportation shall apply.

10.416. Road Adequacy Standards

10.416.1. Applicability

This section applies in the following areas.

City of Hutto conventional zoned areas	Hutto extraterritorial jurisdiction (ETJ)
Yes	Yes

10.416.2. Purpose and General Policy

- (a) New development within the urban area shall be supported by an adequate roadway network.
- (b) Collector-level and higher streets are an essential component of the City's street network and are necessary to accommodate the continuing growth and development of the City.
- (c) It is necessary and desirable to obtain rights-of-way for off-site, abutting and internal streets to support new development at the time of platting or development of the land.
- (d) There shall be a rough proportionality between the traffic impacts created by a new development and requirements placed on the property owner to dedicate and improve off-site and abutting street rights-of-way.
- (e) The City desires to assure both that development impacts are mitigated through contributions of street rights-of-way and improvements and that a development project contributes no more than its fair share of street costs.
- (f) It is the City's intent to institute procedures to assure that mandatory dedications of street rights-of-way and thoroughfare construction requirements are proportional to the traffic demands created by a new development.

10.416.3. Street Naming

- (a) Proposed street names shall appear on a preliminary plat. Street names become official with the City after the following takes place:
 - (1) The plat is recorded; and
 - (2) Williamson and/or Travis County 911 Addressing accepts the street name.
- (b) The street name changes process and review criteria are described in Section 10.802.19.

Chapter 5. Historic Preservation

10.501. Intent

Historic preservation regulations are intended to:

- (a) Enhance and perpetuate landmarks and districts of historical, cultural, architectural or archeological importance that represent or reflect distinctive and important elements of Hutto's historical, cultural, architectural, archeological, social, economic, and ethnic heritage.
- (b) To promote the preservation and conservation of Hutto's heritage, architecture, and culture.
- (c) Educate elected officials, appointed bodies, City departments, and the public about the heritage of Hutto and the benefits of historic preservation.
- (d) Foster civic pride by recognizing accomplishments of the past.
- (e) Protect and enhance the attractiveness of City neighborhoods to visitors and prospective residents, and support and stimulate the economy.
- (f) Encourage appropriate land uses that respect the historic character and development of significant sites, features, structures and neighborhoods.
- (g) Engage the public in discourse on the preservation of the City, its benefits, and participation in planning for historic preservation.
- (h) Encourage the stabilization, restoration and improvement of property and property values.
- (i) Maintain a generally harmonious outward appearance of historic structures, which are compatible and complementary in scale, form, color, proportion, texture and material.

10.502. Historic Preservation Officer

The Historic Preservation Commission shall appoint a qualified Development Services staff member to serve as Historic Preservation Officer. The Historic Preservation Officer will administer this chapter and advise the Historic Preservation Commission on submitted matters. The Historic Preservation Officer is also responsible for coordinating the City's historic preservation activities when delegated, and maintaining and updating the City's historic resources survey.

10.503. Historic Districts

10.503.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.503.2. Creation of Historic Districts

10.503.2.1 Designation of Historic Districts

- (a) An historic district may be established to preserve property, buildings, structures and areas of exemplary architectural, archaeological, cultural or historic value.
- (b) The process for creating a historic district is the same as for rezoning a property. The original zoning district remains, with a historic overlay (H zone).
- (c) Determination of sites and landmarks appropriate for historic district designation are evaluated using the following criteria:
 - (1) Significance in history, architecture, archaeology or culture.
 - (2) Association with certain events that made a significant contribution to the broad patterns of local, regional, state or national history.
 - (3) Association with the lives of significant persons in the past.
 - (4) Embodiment of the distinctive characteristics of an architectural or engineering type, period or method of construction.
 - (5) Representation of the work of a master designer, builder or craftsman.
 - (6) Representation of an established and familiar visual feature of the community.
 - (7) Possession of archaeological value in that it produced or can be expected to produce data affecting theories of historic or prehistoric interest.

10.503.2.2 Designation of Individual Buildings

- (a) Buildings in a historic district are designated as either contributing or noncontributing.
 - (1) A contributing structure or site adds to the historical integrity or architectural qualities that make the historic district significant. A contributing structure or site helps make a historic district “historic”.
 - (2) A noncontributing structure or site does not add to the historical or architectural qualities of the district either because it was not present during the time of significance, or because of alteration so extensive it is no longer recognizable as having been present during the time of significance. Noncontributing structures and sites are exempt from the certificate of appropriateness review process and from conforming to historic district design requirements (but not other design standards).
- (b) On the designation of properties in a historic overlay district, the designation of contributing and noncontributing structures will be recorded. The record will be considered part of the City’s official zoning map, even if it is not on the main map. Building designation may also be recorded with the county and the tax appraisal office.

10.503.3. Designation of Initial Historic District

Parcels inside the 1911 incorporation boundaries and the site of the Hutto Grain and Gin Co-op are designated as the initial historic district. The historic overlay district will apply to the initial historic district and underlying zoning.

10.503.4. Uses Not Affected by Historic Designation

Historic district designation will not affect the present legal or legal nonconforming use of a property. Uses that requires the demolition, razing, remodeling, or alteration of buildings or structures in a historic district that will affect the character of the district or a landmark are prohibited, except on conformance to the terms of this UDC.

10.504. Certificate of Appropriateness

10.504.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	City of Hutto OT Old Town Zoning District	Hutto Extraterritorial Jurisdiction (ETJ)
No	Yes	No

10.504.2. Process

10.504.2.1 Applicability

Any of the following changes to the exterior of a structure in a historic district or with designated or pending historic designation require a certificate of appropriateness.

- (a) Visible change to the exterior of a designated contributing structure.
- (b) Addition to a designated contributing structure in a historic district.
- (c) Demolition or relocation of a designated contributing structure. The Historic Preservation Commission may require the owner to conform to a salvage plan as a condition for approving a certificate of appropriateness.
- (d) Construction of a new detached structure.

10.504.2.2 Exceptions

The following changes do not require a certificate of appropriateness.

- (a) Work that does not involve a change to material, configuration, dimension, or outward appearance, such as ordinary maintenance and repair, changes in paint color, and replacement of existing materials, will be considered in-kind repair and does not require a certificate of appropriateness.
- (b) Work that is required for a property to come into compliance with federal and state laws pertaining to persons with disabilities.

10.504.3. Applicability Before Inventory and Designation of Contributing Structures and Sites

Changes described above where a certificate of appropriateness is required will be examined on a case-by-case basis, where Development Services staff will make an interim determination of

whether a building or site is contributing or not, until an inventory of contributing and noncontributing sites and structures is conducted and designation made official.

10.504.4. Design Standards

Projects granted a certificate of appropriateness shall meet architectural standards in Section 10.305.

10.505. Violations

10.505.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	City of Hutto OT Old Town Zoning District	Hutto Extraterritorial Jurisdiction (ETJ)
No	Yes	No

10.505.2. Unauthorized Alterations

Failure to obtain a certificate of appropriateness for changes to contributing structures or sites in designated historic districts as required by this section are considered violations of this UDC.

10.505.3. Demolition by Neglect

10.505.3.1 Determination

Allowing a designated contributing structure to deteriorate to the point where a state of demolition by neglect occurs is prohibited. Criteria for determination of demolition by neglect include any of the following:

- (a) The deterioration of a building(s) as specified by the International Property Maintenance Code.

Chapter 6. Stormwater and Drainage Standards

10.601. Applicability

This chapter applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.602. General Drainage Provisions

10.602.1. Design Criteria

All drainage systems shall be designed in accordance with Division E of the Hutto Engineering Design Manual, as amended.

10.602.2. Application

The City's drainage policy shall govern the planning and design of drainage infrastructure within the City limits and within all areas subject to its extraterritorial jurisdiction, as required. Definitions, formulae, criteria, procedures, and data in this manual have been developed to support this policy. If any condition requiring some additional measure of protection is identified during design or construction, the engineer shall make provisions within the design.

10.602.3. General

- (a) Stormwater runoff peak flow rates for the 2, 10, 25, and 100 year frequency storms shall not cause increased adverse inundation of any building or roadway surface.
- (b) Street curbs, gutters, inlets, and storm sewers shall be designed to intercept, contain, and transport all runoff from the 25 year frequency storm.
- (c) The public drainage system shall be designed to convey those flows from greater than the 25 year frequency storm up to and including the 100 year frequency storm within defined public rights-of-way or drainage easements.
- (d) When stormwater detention is provided, stormwater runoff peak flow rates shall not be increased at any point of discharge for the 2, 10, 25, and 100 year storm frequency events.
- (e) Regulation of peak flows to allowable levels, as determined by the provisions of this policy, shall be achieved by storage on-site or off-site or by participation in the City of Hutto's Regional Stormwater Management Program.
- (f) The City of Hutto has adopted the use of an SCS (Soil Conservation Survey) 24-hour storm duration within a type III distribution for use with the SCS method.

10.602.4. Street Drainage

- (a) No lowering of the standard height of street crown shall be allowed for the purposes of obtaining additional hydraulic capacity.
- (b) For non-curbed streets, all flows shall be contained within paralleling roadside ditches.

10.602.5. Drainage System

- (a) Construction plans for proposed reinforced concrete box culverts, bridges, and related structures may be adaptations of the current TXDOT standards. All bridge or culvert structures shall be designed to carry and/or store the upstream runoff from a 25-year storm.
- (b) For bridges and culverts in residential areas, runoff from the 100-year frequency flow shall not produce a headwater elevation at the roadway greater than either 12 inches above the roadway crown elevation or any top of upstream curb elevation, whichever is lower.
- (c) For bridges and culverts in streets other than a residential street, runoff from the 100-year frequency storm shall not produce a headwater elevation at the roadway greater than 6 inches above the roadway crown elevation or 6 inches above any upstream curb elevation, whichever is lower.

- (d) All drainage facilities (including, but not limited to, headwalls, open channels, storm sewers, area inlets, and detention, retention, and water quality controls and their appurtenances) shall comply with the following requirements, unless otherwise noted in this section:
- (1) Storm sewer inlets and gutter transitions shall be designed to avoid future driveways and to avoid conflicts with standard water and wastewater service locations. No utilities shall be allowed to cross under a storm sewer inlet.
 - (2) Drainage channels and detention ponds that are to be maintained by the public shall be contained within drainage lots. Adequate room for access shall be provided for drainage channels and detention ponds. Ramps no steeper than 5 feet horizontal to 1 foot vertical shall be provided at appropriate locations to allow access to drainage channels and detention ponds. The minimum bottom width for any channel with vegetative side slopes shall be 8 feet. An 8-foot wide, 5-inch thick reinforced concrete trickle channel shall be provided in all newly constructed channels and from detention pond inlets to outlets. The area adjacent to trickle channels shall slope at a minimum of 2 percent.
 - (3) Detention ponds shall be designed with adequate area around the perimeter for access and maintenance. Said area shall be a minimum of 7 feet wide for ponds with depths of 5 feet or less (back slopes included), and a minimum of 15 feet wide for ponds over 5 feet deep or with back slopes in excess of 5 feet high. Said area shall not slope more than 5 percent.
 - (4) Rip-rap for slope protection or velocity dissipation shall be formed concrete dissipaters or mortared rock.
 - (5) Storm drains between lots (crossing blocks) shall be avoided as much as possible. When unavoidable, such mains shall be laid along a straight alignment (absent of curves, jogs, and manhole/junction boxes when traversing between lots) with manholes/junction boxes provided at each intersecting street. Storm drains along rear of residential lots (through back yards) shall be avoided. Easements shall be a minimum of 15 feet in width, with an additional 2 feet of easement for every 1 foot of depth over 8 feet. Drainage lots may be appropriate in some cases.
 - (6) All bends, wyes, and pipe size changes in storm sewers shall be prefabricated or shall occur at manholes/junction boxes.
 - (7) Bedding of storm sewer shall be to the top of pipe.
 - (8) Storm drains shall be reinforced concrete pipe (RCP), ASTM C76, minimum Class III, minimum 18 inches diameter. The engineer shall provided load analysis to the Development Services Department as appropriate to demonstrate that class of pipe used is sufficient for the loading conditions. Higher strength pipes shall be used where loading warrant such. Storm drains shall have a minimum of 2 feet of cover in unpaved areas and a minimum of 1.5 feet of over from subgrade in paved areas.

- (9) Junction boxes and manholes shall be reinforced concrete. Junction boxes in lieu of manholes shall be provided where any pipe opening exceeds 37 inches and where the distance from the outside surfaces of any two pipes entering a manhole is less than 1 foot, measured along the inside of the manhole.
- (10) Open Sections
- (A) Definitions
- (i) "Major stream" - drains 5 square miles or more
 - (ii) "Major collector" - drains 20 acres or more
 - (iii) "Minor collector" - drains less than 20 acres
- (B) Minor collectors shall be constructed with underground storm sewers. If it can be established by certified engineering data to the satisfaction of the City Engineer that storm sewers are not physically feasible, open ditches may be used, provided that such ditches are lined with concrete or other permanent materials accepted by the City Engineer. These structures shall be of sufficient cross section and slope as to fully contain design flows and facilitate self-cleaning. Outfalls shall enter major collector drainageways and major streams at grade or be designed and constructed with adequate concrete aprons, energy dissipaters or similar features to prevent erosion.
- (C) Major collector drainageways, detention ponds, and related structures may utilize either existing natural open sections, which may be modified, or newly constructed facilities. If modified or newly constructed facilities are utilized, they shall be lined with permanent materials including, but not limited to, concrete or vegetation.
- (D) Vegetated channels shall have sufficient grade but with velocities that will not be so great as to create erosion. Side slopes shall not be steeper than 3 (horizontal) to 1 (vertical) for channels of 4 feet or less in depth, and steeper than 4 to 1 in all other channels to allow for future growth and to promote slope stability. All slopes shall be hydromulched, sodded, or seeded with approved grass, grass mixtures, or ground cover suitable to the area and season in which they are applied. Seeded side slopes and buttons shall be lined with erosion protection matting.
- (E) Major streams shall not be modified without consent of applicable state and federal agencies, and with authorization from the City Engineer.
- (11) Discharge from storm sewer outfalls shall not cause channel, bluff, or stream bank erosion. If the storm drain discharges to an open drainage facility (as determined by the City), the applicant shall show acceptable nonerosive conveyance to that drainage facility, appropriate energy dissipation at the outfall, and a stable headwall.
- (12) No area within the limits of construction of the development shall allow stormwater to become stagnant. Maximum retention or "drawdown" time for detention ponds shall not exceed 24 hours from the time of peak

storage to the time of complete emptying of the pond, as determined by hydrograph routing or other calculations acceptable to the City. This requirement does not apply to facilities in which retention or “drawdown” time is required to be greater than 24 hours.

- (13) In order to minimize vandalism and deterioration, use of exposed piping and appurtenances and any loose materials (other than access drive rock) shall be avoided or minimized. Use of all such items shall be approved by the City.

10.602.6. Computations

Computations to support all drainage designs shall be submitted to the appropriate City departments for review. The computations shall be in such form as to allow for timely and consistent review, and also to be made a part of the permanent City record for future reference. Computation shall demonstrate that, as a result of the proposed development, there will not be any adverse impact to downstream properties adjacent to the drainage resulting from a 100-year event. The engineer shall state that in a sealed report. All computations submitted shall be certified by an engineer.

10.602.7. Grading

- (a) A comprehensive grading plan shall be included with subdivision construction plans.
- (b) The grading plan shall be designed to ensure all lots will adequately drain upon completion of the subdivision improvements. The engineer will set the elevation of lot corners in conjunction with preparation of the drainage plan. Lot corner elevations shall be shown on the grading plan.
- (c) Where practical, all lots shall be graded from rear to front at which point the drainage shall be intercepted by the street. Alternate grading schemes may be utilized if it can be demonstrated to the satisfaction of the City Engineer that grading from rear to front would be detrimental to trees or other natural features; or it would not be reasonably adaptable to the existing topography because of excessive cuts and fills, or future lot development (i.e. commercial, industrial, or multi-family lots).
- (d) All lots shall be graded at a minimum of 1 percent. Grading of lots with existing slopes of 1 percent or greater will not be required, provided the conditions under 10.701.8.3 above have been satisfied and it is demonstrated to the satisfaction of the City Engineer that there are no existing or proposed features that will prevent the lots from adequately draining.
- (e) Unless otherwise accepted by the City Engineer, surface swales shall be designed and provided along lot lines when more than two lots will be contributing to stormwater runoff at any given point. Side slopes for swales shall not exceed 10:1 (horizontal: vertical) unless otherwise accepted by the City Engineer.
- (f) Minimum finished floor slab elevations shall be shown for all lots. Such elevations shall be a minimum of 2 feet above the ultimate 100 year flood plain.

- (g) Fills shall be placed in maximum 12-inch lifts and adequately compacted. The subdivider shall be responsible for determining any special fill requirements (i.e. FHA requirements).
- (h) Blue tops shall be set at lot corners and other points to ensure grading is accomplished in accordance with the plan.
- (i) Following final grading, all exposed areas shall be permanently stabilized. Earthen areas shall be seeded or sodded, and erosion controls shall remain in place until grass growth reaches 1.5 inches, is of a density where it can be reasonably expected to be self-sustaining, and there are no bare areas in excess of 10 square feet.

10.603. Administration

10.603.1. Designation of Floodplain Administrator

The Development Services Director may appoint the floodplain administrator to administer and implement the provisions of this UDC and other appropriate Sections of 44 CFR (National Flood Insurance Program regulations) pertaining to floodplain management.

10.603.2. Duties and Responsibilities of Floodplain Administrator

Duties and responsibilities of the floodplain administrator include, but are not limited to, the following:

- (a) Maintain and hold open for public inspection records pertaining to the provisions of this UDC.
- (b) Review permit applications to find if proposed building sites, including the placement of manufactured homes, will be reasonably safe from flooding.
- (c) Review, approve or deny applications for development permits required by adoption of this UDC.
- (d) Review permits for proposed development to assure that necessary permits were obtained from federal, state or local governmental agencies (including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334) from which previous approval is required.
- (e) Where interpretation is needed on the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions), the floodplain administrator shall make the necessary interpretation.
- (f) Notify adjacent communities and the state coordinating agency before alteration or relocation of a watercourse, and submit evidence of notification to the Federal Emergency Management Agency.
- (g) Assure that flood-carrying capacity in the altered or relocated part of any watercourse is maintained.
- (h) When base flood elevation data has not been provided in conformance to this chapter, the floodplain administrator shall obtain, review and reasonably use any base flood elevation data and floodway data available from a federal, state or other source, to administer the provisions of this chapter.

- (i) When a regulatory floodway has not been designated, the floodplain administrator will require that new construction, substantial improvements, or other development (including fill) will not be permitted in zones A1-30 and AE on the community's FIRM, unless it is shown the cumulative effect of proposed development, when combined with other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot anywhere in the community.
- (j) Under National Flood Insurance Program 44 CFR Section 1, Section 65.12, a community may approve certain development in zones A1-30, AE, AH, on the community's FIRM that increases the water surface elevation of the base flood by more than one foot, if the community first applies for a conditional FIRM revision through FEMA.

Chapter 7. Water and Wastewater Standards

10.701. Intent

These regulations are intended to establish the minimum basic design standards for water and wastewater systems in the City and its extraterritorial jurisdiction area, but do not address major facilities such as water and wastewater treatment plants. Generally, these systems will be operated and maintained by the City.

All projects shall be built in conformance to these specifications. Variations are subject to approval of the water and wastewater utility. Added standards for specific projects may be established where the service conditions to the tract and related system operation and maintenance needs warrant.

10.702. Applicability

This chapter applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.703. Water System

Design and Construction

- (a) All water systems shall be designed in accordance with Division C of the Hutto Engineering Design Manual, as amended.

10.704. Wastewater System

Design and Construction

- (a) All wastewater systems shall be designed in accordance with Division D of the Hutto Engineering Design Manual, as amended.

Chapter 8. Procedures

10.801. General Rules

10.801.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.801.2. Public Notices

Review Procedures

10.801.2.1 Public Notice Requirements

The purpose of this section is to establish the minimum requirements for notice where required. Unless otherwise specified, notices required under this section shall follow the procedures outlined below:

(a) Published Notice – General

- (1) A distinctive public hearing notice shall be placed by the City at least once in a local official newspaper of general circulation within the City, as designated by the City Council, prior to the meeting, for the purpose of notifying the public of the time and place of such public hearing and the substance of the public hearing agenda item that may be considered or reviewed. Minor clerical errors in the notice shall not invalidate the notice's intent or the public hearing it supports.
- (2) The public hearing notice shall be placed 15 days prior to the public hearing for the Planning and Zoning Commission and City Council meeting dates, respectively. A single notice may cover multiple public hearings if it clearly identifies each hearing and its corresponding details.

(b) Mailed Notice

- (1) In addition to publication, written notice shall be mailed to owners of any property and any Registered Neighborhood/Homeowners Organization, in whole or part, within the distance as set forth in Section 801.2.1.2 of the boundary of the subject property.
- (2) A listing of aforementioned property owners and Registered Neighborhood/Homeowners Organizations consistent with current records of the Williamson County Assessor's Office at the time of application and complete with their mailing addresses shall be provided on address labels to the City by the applicant for use in such mailing.

- (c) Mailed notices shall be mailed 15 days prior to the public hearing for the Zoning Board of Adjustment, Planning and Zoning Commission or City Council meeting date.

10.801.2.2 Distance Requirements for Public Hearings

- (a) Summary of Notice Required

Published, mailed, or signed notice shall be required for development review as shown in the following table:

Table 801-1: Public Hearing Notice Requirements

Procedure	Published	Mailed	Notification Distance	On-site public hearing notification signs placed	Notice Posted on the City Website
Planning Policy					
Comprehensive Plan Text Amendment	X				X
Comprehensive Plan Map Amendment	X				X
Code Amendment	X				X
Annexation					
Voluntary	X	X	200 feet		X
Involuntary	X	X	200 feet		X
Zoning					
Zoning Application	X	X	200 feet	X	X
PUD Development Plan/Rezoning	X	X	200 feet	X	X
Specific Use Permit	X	X	200 feet	X	X
Variances					
Residential Variance	X	X	200 feet	X	X
Commercial Variance	X	X	200 feet	X	X
Historic Preservation					
Certificate of Appropriateness					X

(b) On-Site Public Hearing Notification Sign

When required, a notification sign shall be provided by the City of Hutto, and installed on site by the applicant so that the following are legible from the public right-of-way: the type of request, the present zoning district classification, the proposed zoning district classification, if applicable, and the date and time of the hearing(s). The property owner shall provide an affidavit, including time and date-stamped photographs, attesting to the installation date and the number of signs installed. This affidavit shall be provided to the City at least fifteen days prior to the required public hearing(s). If the proceeding requires a public hearing before both the Planning and Zoning Commission and the City Council, separate photographs and affidavits shall be required for each public hearing.

(1) Property Owner-Initiated Zoning Proceedings

- (A) For all proceedings initiated by or on behalf of the property owner, at least one on-site public hearing notification sign shall be posted on the affected property. The sign shall be located no further than 10 feet from the public right-of-way and be legible from the right-of-way, in accordance with the public notice deadlines in Subsection (a)(1) above.
- (B) The applicant shall post a minimum two-foot by three-foot weatherproof sign on the subject property located along the public right-of-way or other highly visible location as determined by the Development Services Director or assignee. The applicant shall remove such sign at the conclusion of the public hearing process.

(2) City-Initiated Proceedings

For proceedings initiated by the City, it may not be possible or practical to place a sign on the private property subject to the proposed proceedings. Therefore, in City-initiated proceedings, the Development Services Director shall determine the most effective and practical manner of providing reasonable on-site notification of public hearings.

(c) Constructive Notice

Minor defects in the notice, or damage to or removal of an on-site public hearing notification sign, do not invalidate proceedings if a bona fide attempt has been made to comply with notice requirements. Defects in notice provisions that exceed the requirements of Chapter 211 of the Texas Local Government Code, as amended, shall not invalidate any action or proceedings pursuant thereto.

10.801.3. Application Expiration

Applications that remain inactive for 180 consecutive days while under review, without any action from the applicant, shall be considered expired. To resume the review process, the applicant shall submit a new application, including all required documents and fees, in accordance with current regulations.

10.801.4. Compliance

Firms or entities can use, occupy, develop, extend, convert or alter land or structures only if that use, occupancy, or development complies with this UDC and other applicable regulations.

10.801.5. Authorization for Development

Development can begin only with authorization as required by this UDC.

10.801.6. Creation of Nuisances

Nothing in this UDC permits the establishment or maintenance of public or private nuisances.

10.801.7. Previous Violations

This UDC does not validate or legalize any land use or structure established, constructed, developed or maintained that violated a previous land use code, ordinance, regulation, easement, covenant, agreement, plat, deed restriction or other restrictive covenant in effect before the effective date of this UDC.

10.802. Development Review Process

10.802.1. Applicability

- (1) This section applies in the following areas.

Table 802-1: Development Review Process Applicability

Process	City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Annexation	No	Yes
Building Permit and Certificate of Occupancy	Yes	No: Williamson County
Certificate of Appropriateness	Yes: Historic District	No
Demolition Permit	Yes	No: Williamson County
Major Subdivision	Yes	Yes
Plan Amendment	Yes	Yes
Future Land Use Map Amendment	Yes	Yes
Planned Unit Development	Yes	No
Plat Vacation	Yes	Yes
Right-of-Way Construction Permit	Yes	No
Right-of-Way Vacation	Yes	Yes
Short Form Subdivision	Yes	Yes
Sign Permit	Yes	Yes
Site Plan Review	Yes	No
Site Plan: Initial	Yes	No
Special Exception	Yes	No

Street Name Change	Yes	Yes
UDC Amendment	n/a	n/a
Variance	Yes	Yes: subdivisions
Zonin Map Amendment	Yes	No

- (2) The following is a general review structure for this Section. Additional details for each type of application/permit/request may be found in their respective sections or permit applications:

Table 802-2: Application/Permit/Request Review Structure

Type of: Application / Permit / Request	Planning	Engineering	Building	HPC	PZ	CC	ZBA
Administrative Interpretation	Issued	Issued	Issued				A
Annexation	RV					D	
Appeals						Bldg codes, CoA, Sign variance	Administrative decision and interpretations
Building Code Interpretation			D			A	
Building Plan Review			D				
Building Plan Review							
Building Permit			I/D				
Certificate of Appropriateness	RV		RV	D		A	
Certificate of Occupancy/Tenant Change			I/D				
Comprehensive Plan Amendment	RV	RV		R	R	D	
Future Land Use Map Amendment	RV				R	D	
Conditional Certificate of Completion (Commercial)			I/D				
Demolition Permit			I/D	D			

Development Agreement	D					D	
Easement and Right-of-Way Vacation	RV	RV				D	
Legal Lot Determination Letter	D						
Major Subdivision: Final Plat	D	RV			A		
Major Subdivision: Preliminary Plat	RV	RV			D		
Mobile Food Vendor	D				A		
Minor (Short Form) Subdivision: Final Plat	RV	RV			D		
Move-In (Modular Structure) Permit			D				
Plat Vacation	D	RV			A		
Right-of-Way (ROW) Construction Permit		D					
Sign Master Plan	RV		RV		R	D	
Sign Permit	RV		D				
Site Plan Review (incl. inspections)	RV	RV	D				
Specific Use Permit (incl. amendment)	RV		RV		R	D	
Street Name Change	RV					D	
Subdivision Improvements Construction Plan Review & Inspection		I/D				Acceptance	
Temporary Job/Construction Trailer			D				
Temporary Use Permit			D				
Tree Removal Permit	RV		D			D	
Variance– Sign	RV		RV		D	A	
Variance – Site Design	RV						D
Variance) – Subdivision	RV				D		
UDC Amendment	RV				R	D	

Zoning Change Request	RV	RV			R	D	
Zoning Map Amendment	RV				R	D	
Zoning Verification Letter	D						

A=Appeal D=Decision I=Inspection R=Recommendation RV=Review

10.802.2. Universal Development Process Overview

This section provides a general overview of a typical development process.



10.802.3. Annexation

10.802.3.1 Intent

All land in Hutto's current or future extraterritorial jurisdiction area should eventually become part of the City, so it can more effectively guide growth and regulate the quality of the built environment.

10.802.3.2 Applicability

The annexation process is used to annex unincorporated land into the City in accordance with Texas Local Government Code Chapter 43, as amended.

10.802.3.3 Criteria

Annexation and initial zoning requests are evaluated using all of the following criteria:

- (a) The request is consistent with community, neighborhood and other applicable land use and development plans.
- (b) The property is in the extraterritorial jurisdiction (ETJ).
- (c) The property has no Unified Development Code or Williamson County Code violations.
- (d) The annexation request conforms to state law.

10.802.3.4 Process

Refer to development application.

10.802.3.5 Conditions

- (a) Development Services staff and/or City Council may impose conditions on an annexation request, to ensure conformance to this UDC and any community, neighborhood and other applicable land use and development plans.
- (b) A building permit cannot be issued for recently annexed land until City zoning is established.
- (c) Initial zoning is established through a zoning map amendment (rezoning), which shall be processed at the same time as the annexation request. Initial zoning shall conform to Hutto SOAR 2040. Standard rezoning fees will apply.

10.802.4. Building Permit and Certificate of Occupancy

10.802.4.1 Purpose

A building permit is needed when an owner or authorized agent constructs, enlarges, alters, repairs, moves, demolishes, or changes the occupancy of a building or structure or to erect, install, enlarge, alter, repair, remove, convert or replace and electrical, gas, mechanical or plumbing system, the installation of which is regulated by the IFC or ICC or to cause any such work to be done.

10.802.4.2 Applicability

- (a) A building permit application is required for any construction, enlargement, alteration, repair, moving, removal, conversion, demolition, occupancy, equipment, use, and maintenance of buildings or structures except:
 - (1) Moveable cases, counters, and partitions, not over five (5) feet nine (9) inches (1,753 mm) in height.

- (2) Painting, papering, and similar finish work.
- (3) Temporary motion picture, television, and theater stage sets and scenery.
- (4) Play equipment accessory to residential use, including swing sets, jungle gyms, slides and trampolines.
- (5) Antennas and/or their supporting structures other than buildings accessory to residential use, at least ten (10) feet high and below the maximum building height in the underlying zoning district.
- (6) One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed two hundred (200) square feet.
- (7) Fences not over six (6) feet (1,829 mm) high.
- (8) Oil derricks.
- (9) Retaining walls that are not over four (4) feet (1,219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II, or IIIA liquids.
- (10) Water tanks supported directly on grade if the capacity does not exceed five thousand (5,000) gallons (18,925 L) and the ratio of height to diameter or width does not exceed two (2) to one (1).
- (11) Sidewalks and driveways not more than thirty (30) inches (762 mm) above adjacent grade, and not over any basement or story below and are not part of an accessible route.
- (12) Prefabricated swimming pools accessory to a group R-3 occupancy that are less than twenty-four (24) inches (610 mm) deep, do not exceed five thousand (5,000) gallons (18,925 L) and are installed entirely above ground.
- (13) Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
- (14) Window awnings supported by an exterior wall that do not project more than fifty-four (54) inches (1,372 mm) from the exterior wall and do not require additional support of Group R-3 and U occupancies.
- (b) Building permit applications are also required for change of use, occupancy, tenancy, ownership or name of business for a non-residential building or tenant space.

10.802.4.3 Criteria

- (a) Building permit requests are evaluated using all of the following criteria:
 - (1) The project conforms to this UDC, the Building Code, the Fire Code and other applicable regulations.
 - (2) The parcel has no violations of this UDC or other applicable City or state regulations.

- (3) A site plan was approved for the project, if applicable.
 - (4) The site is a legally platted building lot unless it is on a lot located in the 1911 Historic District and has not been altered since the District was created.
- (b) The Development Services Department may accept applications for building permits for individual lots in approved subdivisions as follows:
 - (1) Footing and foundation permits for new construction will be accepted only after the following have occurred;
 - (A) Final grading of drainage easements and the installation of the stormwater drainage system is complete, and the City Engineer has inspected and approved the grading and installation;
 - (B) Construction of the street subgrade and installation of the aggregate base course, or other all-weather surface, for the street serving the project is completed and inspected and approved by the City or county Engineer, and acceptable density tests for subgrade and utility trenches are submitted to and approved by the City Engineer; and
 - (C) Street signs are properly installed at intersections.
- (c) Full building permits for new construction will be accepted only after the following have occurred:
 - (1) Street surfacing, at least through aggregate base course or plant mix bituminous base application, is complete; the City Engineer has inspected and approved the surfacing and density tests for applied material.
 - (2) Public water and sewer systems are completely constructed, and evidence of acceptance by the appropriate water, sewer and fire protection providers is submitted to the City Engineer.
- (d) Building permits will not be issued for proposals violating proposed amendments to this UDC (text or maps) pending before the Commission, from the time of first public notice until final disposition, up to six months from first public notice.
- (e) A building permit will not be accepted for processing on property with a valid application pending for review of a variance, special exception, rezoning, subdivision or general development plan.
- (f) A building permit will not be approved on property with an outstanding property maintenance violation, zoning violation, or other code violation unless the permit is to remedy the violation.

10.802.4.4 Process

Refer to development application.

10.802.4.5 Conditions

A building permit shall not become invalid unless work has commenced within one hundred and eighty (180) days from the issuance date or if a certificate of occupancy is not issued within two (2) years from the issuance date.

10.802.5. Certificate of Appropriateness

A building permit shall still be obtained for projects authorized by a certificate of appropriateness. Historic preservation standards are detailed in Chapter 7 (Historic preservation).

10.802.5.1 Purpose

A certificate of appropriateness is required for certain types of alterations and changes to historic structures and sites to help ensure the achievement of historic preservation goals and objectives.

10.802.5.2 Applicability

- (a) A certificate of appropriateness is required for the following changes to the exterior of a structure with designated or pending historic designation:
 - (1) Visible change to the exterior of a designated contributing structure.
 - (2) Addition to a designated contributing structure in a historic district.
 - (3) Demolition or relocation of a designated contributing structure. The Historic Preservation Commission may require the owner to conform to a salvage plan as a condition for approving a certificate of appropriateness.
 - (4) Construction of a new, detached structure in a historic district.
- (b) Work not involving a change to material, configuration, dimension, or outward appearance will be considered in-kind repair and does not require a certificate of appropriateness.
- (c) Exceptions
 - (1) Work that does not involve a change to material, configuration, dimension, or outward appearance, such as ordinary maintenance and repair, changes in paint color, and replacement of existing materials, will be considered in-kind repair and does not require a certificate of appropriateness.
 - (2) Work that is required for a property to come into compliance with federal and state laws pertaining to persons with disabilities.

10.802.5.3 Criteria

Certificate of appropriateness requests are evaluated using all of the following criteria:

- (a) The structure or site will be used for its historic purpose or be placed in a new use that is permitted under this UDC. The use will require minimal change to the defining characteristics of the structure, property, site and environment.
- (b) The historic character of a structure or site will be kept and preserved. Removal of historic materials or alteration of features and spaces characterizing a structure or property will be avoided.

- (c) The structure and/or site remains as a physical record of its time, place and use. Changes will not create a false sense of historical development, such as adding conjectural features or architectural elements from other structures or properties.
- (d) Most structures and property change over time; changes that acquired historic significance in their own right will be kept and preserved.
- (e) Distinctive features, finishes and construction techniques or examples of craftsmanship characterizing a structure or property will be preserved in the limits permitted by applicable regulations.
- (f) Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires the replacement of a distinctive feature, the new feature shall match the old in design, color, texture and other visual qualities; and, where possible, materials, if they meet other applicable codes and ordinances. Replacement of missing features will be proven by documentary, physical or pictorial evidence.
- (g) Chemical or physical treatments that could damage historic materials are prohibited. Surface cleaning of structures, if appropriate, shall be undertaken using the gentlest method possible.
- (h) New additions, exterior alterations, or related new construction will not destroy historic materials characterizing the structure or property. New work will be differentiated from the old and will be compatible with the massing, size, scale and architectural features to protect the historic integrity of the structure or property and its environment.
- (i) New additions and adjacent or related new construction will be undertaken in a way that the essential form and integrity of the historic structure or property and its environment will be unimpaired if it is removed in the future.
- (j) New construction taking place after the demolition or removal of a structure or property in a historic district will conform to the design guidelines for the district.

10.802.5.4 Process

Refer to development application.

10.802.5.5 Approval Conditions

The Historic Preservation Commission and/or City Council may impose conditions on a general development plan.

10.802.6. Demolition Permit

10.802.6.1 Intent

Development Services staff will review demolition permits to ensure work will take place according to applicable rules.

10.802.6.2 Applicability

A demolition permit is required to tear down any structure.

10.802.6.3 Criteria

Demolition permit requests are evaluated using the following criteria:

- (a) No government agency has designated the structure or site as a historic structure. If it is designated, it shall be shown that the building cannot be saved and that the demolition was authorized subject to federal, state, county or local agency processes and rules.
- (b) The fire department shall review the structure or site to ensure compliance with the Fire Code.

10.802.6.4 Process

Refer to development application.

10.802.6.5 Conditions

- (a) Development Services staff shall observe the site before demolition starts. Utilities shall be disconnected and properly capped, meter sizes notated, with utility company verification given.
- (b) Demolition of buildings shall follow and be regulated by the Texas Asbestos Health Protection Act (TAHPA) EXCEPT single-family dwelling or an apartment complex of four (4) units or less that will continue to be used as a residence or apartment complex of four (4) or fewer units.
- (c) Hazardous materials (including asbestos) shall be removed and disposed of properly. If excessive amounts of asbestos are removed, TCEQ notification is required.
- (d) Fugitive dust mitigation is required at demolition sites.
- (e) Debris shall be removed from the site and recycled or disposed of at a landfill.
- (f) A demolition permit is valid for ninety (90) days from the time of approval. Demolition shall take place over a thirty (30) day period, or ninety (90) days for "green demolition," in which the building is carefully deconstructed, and the bulk of materials are recycled and/or reused.

10.802.7. Plan Amendment

10.802.7.1 Intent

Community, neighborhood and other applicable land use and development plans and other plans are subject to change and revision, to reflect changing conditions in the City and region, good planning practice, and the vision of the City's leaders and citizens.

10.802.7.2 Applicability

A plan amendment is required to change, add to or delete any part of a community, neighborhood or other applicable land use and development plan adopted by the City. A plan amendment may be requested by a property owner or representative if it is more than twelve (12) months since they were last involved in a request before the Zoning Board of Adjustment or Planning and Zoning Commission.

10.802.7.3 Criteria

Plan amendments are evaluated using the following criteria:

- (a) The amendment is consistent with Hutto SOAR 2040.
- (b) The text, map or chart is in need of the amendment.
- (c) The amendment is not contrary to the intent and purpose of the subject plan.
- (d) The amendment is consistent with generally accepted principles of good planning practice.

10.802.7.4 Process

Refer to development application.

10.802.8. Future Land Use Map Amendment

10.802.8.1 Intent

The future land use map designation for a parcel might not permit a use most appropriate for the site, given the goals of community, neighborhood and other applicable land use and development plans, and good land use practice, and is subject to change periodically.

10.802.8.2 Applicability

A future land use map amendment is required to consider a request to change the future land use designation of a parcel. The City may request a future land use map amendment at any time.

10.802.8.3 Criteria

Future land use map amendments are evaluated using all the following criteria:

- (a) The proposed future land use is consistent with, and will not conflict with, the goals of community, neighborhood and other applicable land use and development plans.
- (b) The proposed future land use will not conflict with proposed, permitted or existing land uses in the future land use or zoning maps.
- (c) There is enough physical and social infrastructure to serve the proposed future land use.
- (d) The site and its conditions are suited for and appropriate to the proposed future land use.
- (e) The proposed future land use does not threaten public health, safety, and welfare.
- (f) The proposed future land use does not create a public nuisance or have an adverse impact on surrounding properties or the natural environment.
- (g) The proposed future land use does not threaten scenic, natural or historic resources.
- (h) The proposed future land use addresses a community need.
- (i) The proposed future land use corrects a clerical or administrative error on the future land use map.

- (j) The proposed future land use results in a logical and orderly development pattern.
- (k) The proposed future land use is not merely intended to confer a benefit to the property owner.
- (l) The site is a legal building lot.

10.802.8.4 Process

Refer to development application.

10.802.8.5 Conditions

The Planning and Zoning Commission and/or City Council may impose conditions on a future land use map amendment.

10.802.9. Planned Unit Development (PUD)

10.802.9.1 Intent

The Planned Unit Development (PUD) process and zoning designation allows creativity, innovation and flexibility in land use, density, site planning and design for a parcel, that would result in a project more appropriate and desirable than what would result from strict application of this UDC.

10.802.9.2 Applicability

A PUD plan and PUD development standards are required for a parcel that will be developed as a PUD.

10.802.9.3 Criteria

PUD plans and development standards are evaluated using the following criteria:

- (a) The PUD is consistent with the spirit of the community, neighborhood and other applicable land use and development plans, compatible with the character of adjacent development or recommended land uses, it would not adversely affect property near the site, and it achieves the benefits of improved design.
- (b) The PUD will not adversely affect land with significant historical, cultural, recreational or aesthetic value.
- (c) The PUD will give benefits through providing open space, parks, conservation of environmental features, aesthetic features and harmonious design, and/or energy efficient site design.
- (d) The benefits of preserving land for open space, parks or other public amenities outweigh the potential impact of more intense or dense development on the site.
- (e) The PUD controls external effects on nearby land uses such as traffic movement and congestion, lighting, trash accumulation and litter, noise, air and water pollution, and other factors affecting public health, welfare, safety and convenience.
- (f) The PUD will be served by adequate facilities, including streets, fire protection, water and sanitation.

- (g) The PUD does not have a significantly greater burden on the City's existing infrastructure, public improvements and services than development at a density permitted under the current zoning or suggested under community, neighborhood and other applicable land use and development plans, or that arrangements are made to mitigate impacts.
- (h) PUD architectural design, landscaping, hardscaping and signage parameters shall give evidence of compatibility with adjacent development, internal consistency of design, and conformance to City design standards.

10.802.9.4 Process

Refer to development application.

10.802.9.5 Approval Conditions

The Planning and Zoning Commission and/or City Council may impose conditions on the PUD request.

10.802.9.6 Amendments

- (a) Technical or Engineering considerations may call for minor deviations from the approved PUD. Development Services staff may approve minor deviations if they conform to this UDC and are consistent with the intent of the original PUD approval.
- (b) Changes to approved PUD plans that Development Services staff finds are not minor deviations, including changes to density, permitted use, provision of parks and open space, and imposed conditions, require a new application and approval through the PUD process.

10.802.10. Right-of-Way Construction Permit

10.802.10.1 Intent

A right-of-way construction permit allows the construction of certain improvements in the public right-of-way.

10.802.10.2 Applicability

A right-of-way construction permit is required for the construction of improvements in the public right-of-way.

10.802.10.3 Criteria

Right-of-way construction permit requests are evaluated using the following criteria:

- (a) Conformance to this UDC and applicable building codes and design standards.
- (b) Proof of adequate insurance coverage and provision of a performance bond, as specified in the construction specifications of the City on the date when it is granted.
- (c) Evidence that the contractor who will perform the construction meets the standards of this subsection.
- (d) The City Engineer administers design and material standards for the placement or replacement of pavements, curbs, gutters, sidewalks, inlets, water lines,

wastewater lines or other public facilities included in or disturbed by construction.

10.802.10.4 Process

Refer to development application.

10.802.10.5 Conditions

- (a) The City Engineer may impose conditions on a right-of-way construction permit, including:
 - (1) Restrictions on construction timing that, in their opinion, are reasonable measures to protect the safety and convenience of the general public.
 - (2) Placement of traffic control devices that are, in their opinion, reasonable measures to protect the safety of the general public and workers performing the construction.
- (b) An application for a public-right-of-way construction permit may be denied for the following reasons, which are not subject to appeal:
 - (1) Contents of the application do not fulfill the standards outlined in this article and/or as prescribed in the City right-of-way construction policies and procedures as administered by the City Engineer.
 - (2) The design and/or materials proposed for execution of the construction do not meet the City's design and construction standards.

10.802.11. Easement and Right-of-Way Vacation

10.802.11.1 Intent

An easement or right-of-way vacation permits the vacation of easements and rights-of-way that are no longer needed.

10.802.11.2 Applicability

Subject to review criteria, the City Engineer may grant an easement or right-of-way vacation for an easement or right-of-way of record over which the City has jurisdiction. A right-of-way vacation results in a new lot configuration and requires an amended plat.

10.802.11.3 Criteria

Easement and right-of-way vacation requests are evaluated using all of the following criteria:

- (a) Approval of the vacation request will not leave land adjoining the right-of-way or easement without an established public street or private access easement connecting the land with another public street, or without utility or drainage services.
- (b) Appropriate agencies were notified of the proposed vacation, and none have objected.
- (c) The easement or right-of-way will be divided equally between the lots on each side unless it can be proved that the entire easement or right-of-way was originally taken from one parcel. In that case, the easement or right-of-way will be returned to that parcel. Property owners on each side of the easement or

right-of-way may agree to divide the vacated easement or right-of-way differently but shall sign deeds to transfer ownership after the City Engineer approves the vacation.

10.802.11.4 Process

Refer to development application.

10.802.11.5 Conditions

- (a) The Planning and Zoning Commission and/or City Council may impose conditions on an easement or right-of-way vacation.
- (b) A right-of-way vacation necessitates updating the current and future land use maps for the community, neighborhood, and other relevant development plans affected by the vacated right-of-way. New land use designations will be assigned based on the established rules for interpreting zoning district boundaries.

10.802.12. Major Subdivision (Final Plat)

10.802.12.1 Intent

A major subdivision permits the division of a parcel into two or more lots and/or tracts where public improvements, such as streets, will be required.

10.802.12.2 Applicability

The major subdivision process is used to subdivide legal lots if the subdivision is not eligible for the short-form subdivision process in Section 10.802.14. A subdivision plat is required under Texas Local Government Code Section 212.004.

10.802.12.3 Criteria

Major subdivision requests are evaluated using the following criteria:

- (a) The newly created parcels will meet minimum lot size standards for uses with a significant public benefit, such as a fire station; the Planning and Zoning Commission may waive the minimum lot size and minimum lot width standards if the proposed use meets minimum setbacks and sewage disposal standards.
- (b) The newly created parcels meet minimum access standards.
- (c) The subdivision does not “cut away” a non-conforming use from an adjacent lot to increase its lifespan.
- (d) The subdivision is compatible with existing and permitted land uses in the surrounding area.
- (e) The subdivision preserves and/or enhances the character of Hutto.
- (f) A conceptual plan or preliminary plat is approved for the parcel, if applicable.

10.802.12.4 Process

Refer to development application.

10.802.12.5 Extension

The Director of Development Services may grant up to two (2) one (1) year extensions of the expiration date for major subdivisions.

10.802.13. Major Subdivision (Preliminary Plat)

10.802.13.1 Intent

A major subdivision permits the division of a parcel into two or more lots and/or tracts where public improvements, such as streets, will be required.

10.802.13.2 Applicability

The major subdivision process is used to subdivide legal lots if the subdivision is not eligible for the short-form subdivision process in Section 10.802.14. A subdivision plat is required under Texas Local Government Code Section 212.004.

10.802.13.3 Criteria

Major subdivision requests are evaluated using the following criteria:

- (a) The newly created parcels will meet minimum lot size standards. for uses with a significant public benefit, such as a fire station, the Planning and Zoning Commission may waive the minimum lot size and width standards if the proposed use meets minimum setbacks and sewage disposal standards.
- (b) The newly created parcels meet minimum access standards.
- (c) The subdivision does not “cut away” a non-conforming use from an adjacent lot to increase its lifespan.
- (d) The subdivision is compatible with existing and permitted land uses in the surrounding area.
- (e) The subdivision preserves and/or enhances the character of Hutto.
- (f) A conceptual plan or preliminary plat is approved for the parcel, if applicable.

10.802.13.4 Process

Refer to development application.

10.802.14. Short Form Subdivision (Short Form Final Plat, Minor Subdivision, Amended Plats)

10.802.14.1 Intent

A short form subdivision provides for timely review of proposed land division not discernibly impacting surrounding properties, environmental resources, City character or public facilities; and simple resubdivisions, lot splits, and the platting of existing development and of land proposed for site development where public improvements are not required.

10.802.14.2 Applicability

The short form subdivision process is used for the following land divisions in the City and its extraterritorial jurisdiction:

- (a) Division of existing legal uses with separate utilities, except nonconforming uses. This process cannot be used to divide accessory uses from principal uses or create an opportunity for more principal uses.

- (b) Division of an unplatted parcel into four lots or less, with no new improvements and in conformance to the Mobility Master Plan and Trails Master Plan, may qualify for the short-form subdivision process. Any further subdivision shall be approved through the major subdivision process.
- (c) Divisions of land for schools, public utilities, open space, or other public uses.

10.802.14.3 Criteria

Short form subdivision requests are evaluated using all of the following criteria:

- (a) No new public street will be necessary for each lot to access a public street.
- (b) No off-site improvements to the City's infrastructure will be necessary (except division of land for schools, public utilities, open space, or other public uses).
- (c) No drainage improvements will be necessary.
- (d) The newly created parcels will meet minimum lot size standards in the underlying zoning district. For uses resulting in a significant public benefit, the Planning and Zoning Commission may waive the minimum lot size and minimum lot width standards if the proposed use meets minimum setbacks and sewage disposal standards.
- (e) The newly-created parcels meet minimum access standards.
- (f) Approval will not result in impacts greater than those of existing uses. Impacts from increased traffic to a public use may be offset by the public benefit derived from the use.
- (g) The subdivision does not "cut away" a non-conforming use from an adjacent lot to increase its lifespan.

10.802.14.4 Process

Refer to development application.

10.802.14.5 Extension

The Director of Development Services may grant up to two (2) one (1) year extensions of the expiration date for short form subdivisions.

10.802.15. Sign Permit

10.802.15.1 Intent

A sign permit ensures signs conform to this UDC and provides a record of signage built in the City.

10.802.15.2 Applicability

Sign permits are required for signs outlined in Chapter 3 in the City and extraterritorial jurisdiction.

10.802.15.3 Review Criteria

Sign permit applications are evaluated using the following criteria:

- (a) Proposed signage conforms to this UDC and other applicable codes, and the underlying approved site plan if applicable.
- (b) The parcel does not have any Unified Development Code violations.

- (c) The site is a legal building lot.

10.802.15.4 Process

Refer to development application.

10.802.15.5 Conditions

A sign permit will not be issued for businesses or locations where any signs are displayed in violation of this ordinance, except to replace an illegal sign with a legal sign.

10.802.16. Site Plan Review

Site planning and architectural standards are detailed in Chapter 3.

10.802.16.1 Intent

Formal site plan review ensures that proposed structures, modifications and uses conform to this UDC, and are compatible with nearby properties and consistent with the spirit of any applicable plans.

10.802.16.2 Applicability

- (a) Site plan review is required for:
 - (1) New modular housing.
 - (2) Manufactured home parks.
 - (3) Multiple household development in the MF district.
 - (4) New non-residential structures, or major additions to non-residential structures, unless noted.
 - (5) Freestanding wireless facilities unless noted.
 - (6) Utility substations.
 - (7) Development of perimeter walls.
 - (8) Other uses designated as requiring site plan approval.
- (b) Formal site plan review is not required for:
 - (1) New single household and two household dwellings.
 - (2) Additions to single household and two household dwellings.
 - (3) Establishment of an initial site plan for an existing multi-household or non-residential use legally established without a site plan.
 - (4) Non-habitable structures with no significant external effects on surrounding properties.
 - (5) Attached wireless facilities unless noted.
 - (6) Other projects requiring a building permit, but not requiring formal site plan approval.

10.802.16.3 Criteria

Site plan requests are evaluated using all of the following criteria:

- (a) Consistency with Unified Development Code and Applicable Plans
All aspects of the proposed development are consistent with this UDC and the spirit of any applicable plans, it would not adversely affect property near the site, and it achieves the benefits of improved design.
- (b) Aesthetics
Architectural design, landscaping, and signage conform to this UDC and complement adjacent development.
- (c) Compatibility with Surrounding Uses
The proposed development is compatible with the character of adjacent development uses (compatibility includes but is not limited to size, scale, mass, architectural design, landscaping, and external effects).
- (d) Impact on Existing Infrastructure and Public Improvements
The proposed development does not adversely affect the City's existing infrastructure and public improvements, or that arrangements are made to mitigate impacts.
- (e) Internal Efficiency of Design
The proposed design achieves internal efficiency for its residents and/or visitors, adequacy of recreation, public access, safety and other factors, including but not limited to storm drainage, sewer and water, grades, dust control and matters relating directly to public health and convenience.
- (f) Control of External Effects
The proposed development controls external effects on nearby land uses, movement and congestion of traffic, noise generated, arrangement of signs and lighting to prevent nuisances, landscaping, features to prevent littering or accumulation of trash, and other factors affecting public health, welfare, safety and convenience.
- (g) Adequacy of Traffic and Circulation Plans
Designs and efficiency of the traffic plan, vehicular and pedestrian circulation, adequacy and convenience of parking, design of streets, and linkage of collector streets to the arterial street system are adequate.
- (h) The Site is a Legal Building Lot

10.802.16.4 Process

Refer to development application.

10.802.16.5 Conditions

Development Services staff or the Planning and Zoning Commission may impose conditions on a site plan to ensure conformance to this UDC and resolve existing violations.

10.802.16.6 Amendments

- (a) Technical or engineering considerations may call for minor deviations from approved site plans. Development Services staff may approve minor deviations if they conform to this UDC and are consistent with the intent of the original site plan approval. Deviations include minor changes in architectural façade treatments, landscaping, hardscaping, signage and other elements that do not alter the character or intensity of the development and do not affect conformance to this UDC.
- (b) Changes to approved site plans not considered minor require a new application and approval through the formal site plan review process.
- (c) Changes to existing structures and sites lawfully established without a site plan require the establishment of an initial site plan.

10.802.17. Site Plan: Initial

Site planning and architectural standards are detailed in Chapter 3.

10.802.17.1 Intent

An initial site plan establishes a site plan for a site lawfully developed without a site plan.

10.802.17.2 Applicability

An initial site plan is required when a proposed use is limited to existing structures lawfully constructed without a site plan, or when changes are proposed to structures and sites lawfully developed without a site plan.

10.802.17.3 Criteria

Initial site plan requests are evaluated using the following criteria:

- (a) The site shall be consistent with this UDC, and meet the criteria for legal nonconforming uses and structures if applicable.
- (b) The site does not have any Unified Development Code violations.
- (c) The site is a legal building lot.

10.802.17.4 Process

Refer to development application.

10.802.17.5 Conditions

Development Services staff may impose conditions on an initial site plan to ensure conformance to this UDC and resolve existing violations.

10.802.17.6 Amendments

- (a) Development Services staff may approve minor deviations if they conform to this UDC and are consistent with the intent of the original approval. Deviations include minor changes in architectural façade treatments, landscaping, hardscaping, signage and other elements that do not alter the character or intensity of the development and do not affect conformance to this UDC.

- (b) Changes to approved initial site plans that are not considered minor deviations require approval through the formal site plan process and a new application.

10.802.18. Specific Use Permit

Permitted use and location standards are detailed in Chapter 2 (Land Use Standards).

10.802.18.1 Intent

Some land uses may be appropriate in a certain zoning district or essential for providing a public service. Still, they require special attention to find out if they will have an adverse effect on the surrounding area. Uses permitted by specific use review are not uses by right but uses that may be approved if the applicant shows the proposed use is appropriate at a certain location.

10.802.18.2 Applicability

Specific use permit approval is required for uses this UDC designates as considered subject to special review in a certain zoning district. Designation of a use as a specific use permit does not guarantee that a request will be approved. Expansion of a previously approved specific use permit also requires specific use permit review and approval.

10.802.18.3 Criteria

Specific use permit requests are evaluated using the following criteria:

- (a) The proposed use conforms to this UDC and is consistent with the comprehensive, neighborhood and other applicable land use and development plans.
- (b) The proposed use is compatible with existing and permitted uses in the surrounding area and would not adversely affect property near the site.
- (c) The site is a legal building lot.

10.802.18.4 Process

Refer to development application.

10.802.18.5 Conditions

- (a) The Planning and Zoning Commission and/or City Council may impose conditions on a specific use permit.
- (b) Specific use permit approval does not run with the land and expires with the end of the approved use.

10.802.18.6 Amendments

- (a) Technical or Engineering considerations during construction may call for minor deviations from approved specific use permits. Development Services staff may approve minor deviations if they conform to this UDC and are consistent with the intent of the original specific use permit approval.
- (b) Changes to approved specific use permits that Development Services staff find are not minor deviations, including Planning and Zoning Commission imposed conditions, require approval through the specific use permit process and a new application.

10.802.19. Street Name Change

10.802.19.1 Intent

Some street names may be confusing or inconvenient, or cannot reflect local history or values. The street name change process offers a way to update street names to improve public safety or recognize people or events that played an important role in shaping local history.

10.802.19.2 Applicability

The street name change process is used to change the name of a public or private street.

10.802.19.3 Criteria

- (a) Street name change requests are evaluated using all the following criteria:
 - (1) The existing street name is confusing or inconvenient, or warrants change to acknowledge a person or event that played an important role in the City's history.
 - (2) The proposed street name does not duplicate or cause confusion with other street names in Williamson County and areas of Travis County within 10 miles of the outer extent of the extraterritorial jurisdiction boundary.
- (b) Williamson County 911 Addressing approved the proposed street name.

10.802.19.4 Process

Refer to development application.

10.802.19.5 Conditions

The party initiating the street name request is responsible for the cost of changing street signs.

10.802.20. Unified Development Code Amendment

10.802.20.1 Intent

This UDC is subject to change, to stay in conformance with community, neighborhood and other applicable land use and development plans, good planning practice, and the vision of the City's leaders and citizens.

10.802.20.2 Applicability

- (a) A Unified Development Code amendment is required to change, add or delete rules or language in this UDC.
- (b) Addition of graphics, illustrations, photos and notes intended to describe and clarify concepts presented by this UDC does not require a formal amendment unless they are referenced in this UDC body.

10.802.20.3 Criteria

Unified Development Code amendments are evaluated using the following criteria:

- (a) The text is in need of the amendment.
- (b) The amendment is not contrary to the intent and purpose of this UDC.

- (c) The amendment is consistent with the comprehensive, neighborhood and other applicable land use and development plans.
- (d) The amendment reflects good contemporary planning practice.
- (e) The amendment is integrated into the organizational structure of this UDC.
- (f) The amendment is not solely intended to benefit an individual property owner.

10.802.20.4 Process

Refer to development application.

10.802.21. Variance

10.802.21.1 Intent

An exceptional condition on a parcel, such as topography, shape or other physical properties, may pose practical difficulty to its development. A property owner may request a variance to certain UDC standards when there are exceptional practical difficulties or an unnecessary non-financial hardship in carrying out the strict application of a dimensional or numerical requirement.

10.802.21.2 Applicability

The Zoning Board of Adjustment may grant variances to numerical or dimensional standards in the land use standards and site design standards of this UDC, subject to review criteria in this subsection. The Zoning Board of Adjustment may also consider appeals of Development Services staff decisions or UDC interpretations. The City Council may grant variances to numerical or dimensional standards in the subdivision standards of this UDC, subject to review criteria in this subsection.

10.802.21.3 Criteria

- (a) A variance may be granted if all the following findings are made:
 - (1) There are unique conditions peculiar to the parcel, such as an unusual shape, that do not exist on adjacent parcels.
 - (2) Strict application of this UDC deprives the applicant of rights commonly enjoyed by other land in the area or land with a similar zoning designation.
 - (3) The variance is in harmony with the spirit of this UDC and community, neighborhood and other applicable land use and development plans, and will not adversely affect property near the subject site.
 - (4) Conditions resulting in the request are not self-created by disregard or ignorance of this UDC.
 - (5) The variance does not confer special privilege that this UDC does not permit on other lands, structures or buildings in the same zoning district.
 - (6) The variance is the minimum necessary to grant relief.
- (b) The following types of variances will not be considered.
 - (1) Requests to permit uses normally prohibited or not specifically permitted in a zoning district development plan. A variance is not a

substitute for a zone change, special exception approval, or UDC amendment.

- (2) Requests to change the application of standards approved as conditions of an approved site plan, subdivision, or development plan.
- (c) Reasons that are not grounds for a variance include, but are not limited to, the following:
 - (1) Personal and/or economic hardship.
 - (2) Misrepresentation of property conditions or permitted uses by a seller or agent.
 - (3) Errors made by a surveyor, contractor or builder.
 - (4) Desire to increase visibility; or compensate for a poorly chosen, less trafficked, less accessible or less visible site.
 - (5) Accommodation of corporate, franchise, personal or cultural standards, preferences, policies or traditions.
 - (6) Lowering site development costs.
 - (7) Increasing the profit, income or competitive advantage of the applicant.
 - (8) Additional expense needed to comply with this UDC.
 - (9) Longevity of residence or business operation in the City, or participation in local government, civic organizations, places of worship, or charitable groups.
 - (10) Increase in property value or profit if a variance is approved or decrease if denied.
 - (11) Promise of an increase to the City tax base if a variance is granted.
 - (12) Threats to locate or relocate outside of the City or cancel or scale back a project if a variance is denied.

10.802.21.4 Process

Refer to development application.

10.802.21.5 Conditions

- (a) The Zoning Board of Adjustment and/or the Planning and Zoning Commission may impose conditions on a variance.
- (b) Approved variances run with the land unless there are special approval conditions.
- (c) Variance approval does not set a precedent for future approval of similar variances.

10.802.22. Zoning Map Amendment (Rezoning/Zoning Change/Zoning Change Request)

10.802.22.1 Intent

The zoning designation for a parcel does not always permit the most appropriate use for the site. A property owner may request a zoning map amendment, to change the zoning designation of a parcel.

10.802.22.2 Applicability

A zoning map amendment is required to consider a request to change the zoning of a parcel. A property owner or representative may request a zoning map amendment if it is more than twelve (12) months since they were last involved in a request before the Zoning Board of Adjustment or Planning and Zoning Commission.

10.802.22.3 Criteria

- (a) Zoning map amendment requests are evaluated using the following criteria:
 - (1) The proposed zoning is consistent with Hutto SOAR 2040 and any community, neighborhood and other applicable land use and development plans.
 - (2) The proposed zoning is compatible with existing and permitted uses on properties in the neighborhood.
 - (3) Conditions in the neighborhood have changed to the extent the proposed zoning is necessary.
 - (4) The proposed zoning does not have an adverse impact on surrounding properties or the natural environment.
 - (5) The proposed zoning corrects a clerical or administrative error on the zoning map.
 - (6) The proposed zoning results in a logical and orderly development pattern.
 - (7) The proposed zoning is not merely intended to confer an economic benefit to the property owner.
 - (8) The site is a legal building lot.
- (b) Rezoning of a small parcel, intended to confer a benefit to the property owner by permitting land uses not available to, and possibly incompatible with and detrimental to surrounding properties, is prohibited.

10.802.22.4 Process

Refer to development application.

10.802.22.5 Conditions

The Planning and Zoning Commission and/or City Council may impose conditions on a zoning map amendment. Conditional zoning or contract zoning, where the permitted land use for a lot is restricted to the use the rezoning was sought, is prohibited.

10.803. Vested Development Rights

10.803.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.803.2. Effective Date and Expiration

(a) Vested development right establishment and expiration dates are as follows.

Table 803-1: Vest Development Rights

Process	Date Granted	Permit Expiration
Building permit	Date of complete application submittal	180 days
Certificate of Appropriateness	Date of approval by Historic Preservation Commission	180 days
Final Plat	Date of approval by Director of Development Services	2 years, unless recorded, fiscal surety has been posted, and/or extension has been granted. 1 year extension allowed administratively, then Planning and Zoning Commission approval required.
Preliminary Plat	Date of approval by Director of Development Services	1 year, unless final plat has been filed and/or extension has been granted.
Sign Permit	Date of approval by Development Services Staff	180 days
Site Plan	Date of approval by Development Services Staff, or Planning and Zoning Commission if appealed	1 year
Specific Use Permit	Date of approval by City Council	1 year
Subdivision Improvements Construction Plan	Date of approval by Engineering	1 year, unless fiscal surety has been posted
Variance	Date of approval by Zoning Board of Adjustment or Planning and Zoning Commission	1 year

- (b) If the approved development request is amended, the approval date of the original development request is considered the effective date of vesting.

10.803.3. Minor Administrative Amendments

Minor administrative amendments to approved plans for a development request do not create vested development rights.

10.803.4. Conceptual Plans

Conceptual site plans shown on an approved PUD plan or for adjacent properties on a site plan, are considered non-binding and do not create vested development rights.

10.803.5. Nonconforming Elements on Plans

Elements shown on a site plan, approved PUD plan, or concept plan not conforming with the development regulations in effect when the plan was approved are considered non-binding and do not create vested development rights.

10.804. Internal Review Procedures

10.804.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.804.2. Submittal Requirements

Refer to development applications.

10.805. Nonconforming Uses, Structures, and Lots

10.805.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes, signs only

10.805.2. General

10.805.2.1 Intent

Use and ordinary maintenance of nonconforming uses, buildings and structures may continue, subject to the provisions of this chapter. The right to maintain a nonconforming use, building or structure runs with the land and is not ended by a change in ownership. However, nonconforming uses shall eventually be phased out to meet the intent of this UDC and underlying plans.

10.805.2.2 Nonconforming Status

- (a) It is the property owner's responsibility to establish the legal nonconforming status of the use, building or structure.
- (b) Nonconforming uses are commonly called "grandfathered uses."
- (c) A building or use can become nonconforming if:
 - (1) The zoning regulations change.
 - (2) The zoning district changes.
 - (3) The use or building was first established when the property was outside Hutto, and the property was later annexed.
 - (4) The use or building was first established before Hutto adopted zoning (1983).
 - (5) A street was widened, reducing the size of a lot or causing a structure to be closer to the right-of-way than setback standards permit.

10.805.3. Nonconforming Uses

10.805.3.1 Expansion

- (a) At the time of application, nonconforming nonresidential uses may be expanded no more than twenty percent (20%) larger in gross square footage than the size when initially deemed nonconforming.
- (b) Nonconforming nonresidential uses cannot be re-established on the same lot if they are discontinued for twelve (12) consecutive months or eighteen (18) months over a three (3) year period. A nonconforming use cannot be replaced with a different nonconforming use.

10.805.4. Nonconforming Buildings, Structures and Improvements

10.805.4.1 Alterations in Both Form and Use

Use of a nonconforming building may be changed, and a nonconforming building may be enlarged or modified if alterations conform to this UDC and do not expand the building's nonconforming condition.

10.805.4.2 Architecture

Non-residential buildings that are nonconforming because they do not conform to Unified Development Code architectural standards shall be brought into conformance to the standards as determined by the Director of Development Services if the gross floor area is increased by at least 20%, or the extent of proposed modifications to the building is at least twenty percent (20%) of its assessed valuation.

10.805.4.3 Damage

Nonconforming structures damaged or destroyed by fire, the elements, or other causes to the extent of at least fifty percent (50%) of their assessed valuation shall be demolished or reconstructed in full conformance to this UDC.

10.805.4.4 Site Features

Nonconforming site features, including landscaping and parking, shall be brought into conformance to Unified Development Code standards to the maximum extent practicable if, from the date this UDC was adopted, the gross floor area of buildings on the site is expanded by at least ten percent (10%), or the extent of proposed modifications to the site is at least twenty percent (20%) of its assessed valuation.

10.805.4.5 Wireless Facilities

- (a) Adding equipment for co-locating more wireless providers on an existing nonconforming antenna tower is not considered a nonconforming use expansion if tower height remains unchanged.
- (b) Screening and landscaping shall be brought into conformance with this UDC when equipment is added to a nonconforming antenna tower.

10.805.5. Nonconforming Signs

10.805.5.1 General

- (a) Nonconforming signs shall be brought into conformance to this UDC within ninety (90) days of an expansion of use or building enlargement.
- (b) Development Services staff may recommend removal of nonconforming signs as an approval condition for a development or land use request.

10.805.5.2 Electronic Message Centers

Electronic message center displays shall be reprogrammed so the displayed message is static with no animation and changes only once every sixty (60) seconds or more within thirty (30) days of this UDC's effective date.

10.805.5.3 Alteration

- (a) Nonconforming signs may only be altered, changed in dimensions, moved, raised or replaced if it is brought into conformance with this UDC.
- (b) Nonconforming signs cannot be altered to increase their lifespan (for example, replacement of wood poles with steel poles).

10.805.5.4 Abandoned Signs

Nonconforming signs shall be removed after thirty (30) days of disuse.

10.805.6. Nonconforming and Substandard Lots

10.805.6.1 Development

- (a) Legally created substandard lots not conforming to minimum size or dimensional standards may be developed for structures and uses permitted in the underlying zoning district. However, the development on such lots shall comply with the applicable development standards of this UDC. If the substandard lot restricts conformity with these standards, the property owner shall seek appropriate relief.

- (b) Lots not conforming to minimum size or dimensional standards created illegally or without formal City review and approval are not considered legal building lots, and cannot be developed.

10.806. Enforcement

10.806.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.806.2. Enforcement Methods

This UDC is enforced through:

- (a) The building permit and certificate of occupancy process.
- (b) Imposition of fines, liens, and other actions as outlined in Chapter 1 of the Code of Ordinances.
- (c) Compliance with current adopted ICC and IFC codes.
- (d) Inspection and removal of violations at the violator's expense.
- (e) Criminal liability.
- (f) Injunction.

10.806.3. Inspection

- (a) Development Services staff may inspect any property or structure and order the remedy of any Unified Development Code or Building Code violation.
- (b) Work cannot proceed on any structure or parcel with a Unified Development Code or Building Code violation, except to correct the violation.

10.806.4. Criminal Liability

- (a) Any person (including developers, owners, occupants, or trespassers) convicted of any provision of this UDC is guilty of a class C misdemeanor and shall be fined under the general penalty in Section 1.01.009 of the City of Hutto Code of Ordinances and shall pay all costs and expenses involved in the case.
- (b) Each day of a violation is considered a separate offense.
- (c) The City may take other lawful action to prevent or remedy Unified Development Code or Building Code violations.

10.806.5. Injunction or Other Action

- (a) The City Attorney, acting for the City Council, may file an injunction or other action to restrain a violation of this UDC.

- (b) This UDC will not be construed to hold the City responsible for damage to persons or property by inspection, re-inspection, issue of a building permit, pursuing injunctive relief, or failure to pursue any of these actions.

10.806.6. Enforcement of Standards and Conditions of Development Approval

- (a) These actions may also subject the responsible party to enforcement action.
- (b) Failure to conform to the site plan, landscape plan, building elevations or other approved development documents receiving final approval from the City.
- (c) Failure to conform to conditions on the site-specific development plan for the development.

10.807. Reviewing and Administration Parties

10.807.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.807.2. Development Services Staff

- (a) Duties of Development Services staff include, but are not limited to, the following:
 - (1) Provide ethical stewardship of Hutto's built environment and unique character.
 - (2) Administer, interpret and enforce this UDC, and other plans, policies and rules affecting the City's built and natural environment.
 - (3) Serve as a case manager for development requests.
 - (4) Prepare and update the City's community, neighborhood and other applicable land use and development plans, Unified Development Code, and other planning policy and regulatory documents.
 - (5) Provide technical help with planning and land use issues to City staff and officials.
 - (6) Work with other local government agencies to promote good planning practices and cooperation in regional planning efforts for the benefit of Hutto and its neighboring communities.
 - (7) Promote the benefits of sound land use planning to City residents.
- (b) Other City officers and employees may help Development Services staff implement community, neighborhood and other applicable land use and development plans, and enforce this UDC.

- (c) “Development Services staff” refers to the Development Services Director and/or their designee(s).

10.807.3. Planning and Zoning Commission

Refer to the City Charter.

10.807.4. Zoning Board of Adjustment

10.807.4.1 Intent

The Zoning Board of Adjustment will:

- (a) Consider numerical variance requests for: use, site design, subdivision, and special exceptions, subject to variance approval criteria, recommendation of Development Services staff, and state law.
- (b) Consider administrative appeals that allege error in an order, requirement, decision, or determination made by an administrative official in the enforcement of this UDC.
- (c) Consider special exceptions to the terms of this UDC.
- (d) Consider, in specific cases, a variance from the terms of this UDC if the variance is not contrary to the public interest and, due to special conditions, a literal enforcement of this UDC would result in unnecessary hardship, and so that the spirit of this UDC is observed and substantial justice is done.
- (e) Consider appeals to Development Services staff’s interpretation of this UDC.
- (f) Consider other matters, as authorized by this UDC.

10.807.4.2 Organization

- (a) City Council appoints the five Zoning Board of Adjustment members, each for a two-year term.
- (b) Board members shall elect members to serve a one-year term as chair and vice chair.
- (c) The City will designate a member of the Development Services staff to act as board secretary.
- (d) Board members shall be Hutto residents, but not City employees.

10.807.4.3 Meetings and Records

- (a) The Zoning Board of Adjustment shall hold regular meetings at a predefined time, or at the Chair’s call for consideration of business. The Board decides the meeting time, place and order of business.
- (b) The chairman or vice chairman may administer oaths and compel the attendance of witnesses.
- (c) Three members make a quorum
- (d) Meetings shall be posted in accordance with the Open Meetings Act and open to the public.

- (e) Written records of meetings shall be kept and made available to the public, showing the action on each case.

10.807.4.4 Initiation of Requests

Development Services staff, the City Manager, the City Council and the Planning and Zoning Commission may make a request that requires consideration by the Zoning Board of Adjustment.

10.807.4.5 Appeals

The Zoning Board of Adjustment is a quasi-judicial body. The applicant or City may appeal decisions to the District Court.

10.807.5. Historic Preservation Commission

10.807.5.1 Intent

The Historic Preservation Commission will:

- (a) Adopt rules and procedures for its governance.
- (b) Establish committees as needed.
- (c) Consider and recommend the designation of a historic district or historic landmark.
- (d) Consider and render decisions on certificates of appropriateness and demolition requests in designated historic districts.
- (e) Conduct and administer historic resource surveys.
- (f) Develop public outreach/education/awareness programs.
- (g) Recommend acquisition of endangered historic resources to the City Council when necessary.
- (h) Recommend acceptance of donations of preservation easements.
- (i) Submit an annual report to the City Council and the mayor on the status of preservation in the community and on the work of the Historic Preservation Commission.
- (j) Recommend tax or other financial incentives to encourage the preservation of historic resources.
- (k) Prepare and promote design guidelines for historic landmark districts.

10.807.5.2 Organization

- (a) City Council appoints the five Historic Preservation Commission members, each for a term of two years, except that initial appointments are as follows: three Historic Preservation Commission members for a two-year term, and two Historic Preservation Commission members for a one-year term. Afterward, Historic Preservation Commission members have a two-year term. Historic Preservation Commission member terms shall be staggered, with three members appointed one year and two members appointed the next year.
- (b) Board members shall elect members to serve a one-year term as chair and vice chair.

- (c) The City will designate a member of the Development Services staff to act as the liaison of the Historic Preservation Commission. The liaison may participate in discussions in an advisory capacity but has no right to vote. The liaison will also serve as the local preservation officer and fulfill all duties as may be required under any certified local government agreement with the state historical commission.
- (d) The Mayor fills vacancies with a City Council majority vote to confirm.
- (e) Historic Preservation Commission members shall be Hutto residents, but not City employees. Historic Preservation Commission members shall, to the extent reasonably possible, have a demonstrated outstanding interest in the historic traditions of the City and have experience in the preservation of the historic character of the City. City Council will try, to the extent reasonably possible, to appoint members from the following categories:
 - (1) Architect, planner, or design professional; historian.
 - (2) Licensed real estate broker/appraiser; attorney at law.
 - (3) Archaeologist or member of a related scholarly discipline.
 - (4) Member of the Chamber of Commerce (either the Chamber president or a member designated by the Chamber president).
- (f) Texas Secretary of the Interior Standards for Rehabilitating Historic Buildings, approved by the state historical commission, serves as a guideline for decisions made by the Historic Preservation Commission.

10.807.5.3 Meetings and Records

- (a) The Historic Preservation Commission shall hold regular meetings at a predefined time, or at the chair's call for consideration of business. The Commission decides meeting time, place and order of business.
- (b) Three members make a quorum.
- (c) Meetings shall be posted and open to the public in accordance with the Open Meetings Act.
- (d) Written records of meetings shall be kept and made available to the public, showing the action on each case.

10.807.5.4 Initiation of Requests

Development Services staff, the City Manager, the City Council and the Planning and Zoning Commission may make a request requiring consideration by the Historic Preservation Commission. If the Historic Preservation Commission is requested to consider a Minor Modification, the City Council will make the final determination.

10.807.5.5 Appeals

The Historic Preservation Commission is an administrative body. The applicant or City may appeal decisions to the City Council.

10.808. Interpretation

10.808.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

10.808.2. Interpretation Requests

- (a) A formal request for an interpretation of this UDC shall be submitted in writing to Development Services staff. Development Services staff will evaluate the request, considering:
 - (1) The public purpose of the standard for which an interpretation is required.
 - (2) The impact of proposed interpretation, permitting flexibility in design but prohibiting interpretations lowering the protection given to the public.
 - (3) The interpretation will ensure a just balance between the rights of the landowner and all others affected by that person's land use proposal.
 - (4) The interpretation would not result in any identifiable loss of protection for one group to the benefit of another.
- (b) Development Services staff may consult with other agencies before making an interpretation.
- (c) Development Services staff will maintain a record of all interpretations. Interpretations not in writing are not valid.
- (d) Interpretations do not set precedents and are limited in their application to the property, if any, identified in the interpretation. An interpretation may be appealed to the Zoning Board of Adjustment, using the variance process described in Section 10.802.21.

10.808.3. Conflicts With Other Regulations

If a requirement or process in this UDC conflicts with another applicable local, county, state or federal law, the more restrictive standard applies.

10.808.4. Particular Controls General

If a general provision conflicts with a particular provision in the same or another law, the two will be construed, if possible, so that effect may be given to both. If the conflict between the two provisions is irreconcilable, the particular provisions will prevail and be considered an exception to the general provision.

10.808.5. Metric Units

10.808.5.1 Intent

This UDC may use both English and metric (SI) unit measurements for the convenience of those using this UDC who are more familiar with metric units.

10.808.5.2 Metric vs. English Measurements

This UDC may use English measurements followed by a metric equivalent. If there is a conflict between the figures, the English measurement will control.

10.808.5.3 Rounding and Precision

- (a) Where a rule sets a minimum dimensional requirement, the metric equivalents of the English measure are rounded up.
- (b) Where a rule sets a maximum dimensional requirement, the metric equivalents of the English measure are rounded down.
- (c) Metric equivalent measures are rounded up or down (“hard conversion”) to avoid awkward precision not present in English units. Examples: minimum setback of 10 feet = 3.1 meters (308.4 cm rounded up), maximum setback of 15 feet = 4.6 meters (462.6 cm rounded down).

10.808.6. Illustrations and Text

- (a) Photos are not considered official, adopted parts of this UDC.
- (b) Photos and drawings used in the printed version of this UDC are examples intended to explain certain design concepts. Some features shown in photos and drawings may not conform to other sections of this UDC. If there is a conflict of meaning or implication between the text of this UDC and any heading, drawing, table, figure, or illustration, the text will control.
- (c) Images depicting a business are not considered an official endorsement.

10.808.7. Meaning of Certain Words

- (a) Words used in the present tense include the future unless the context shows otherwise.
- (b) Words used in the singular number include the plural, and vice versa.

10.808.8. Mandatory and Discretionary Terms

- (a) The words “will” and “shall” are the equivalent of “shall,” and imply mandatory rules and actions.
- (b) The word “may” in conjunction with a value or attribute implies permission to a limit; for example, “A freestanding sign may be up to five feet tall” means the same as “A freestanding sign shall be five feet tall or less.” Otherwise, the word “may” is permissive.

10.808.9. Technical and Lay Terms

- (a) Words and phrases will be interpreted according to the common usage of the term.

- (b) Technical words and phrases that may have a peculiar and appropriate meaning in law, planning, and allied fields will be understood according to that meaning.

10.808.10. Lists and Examples

Lists of items or examples using terms such as “including,” “such as,” or similar language are intended to provide examples, not exhaustive lists of all possibilities unless stated.

10.809. Fees

10.809.1. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	Yes

Development review fees are determined by separate ordinances. Fees are not refundable if a request is tabled or denied.

Chapter 9. Definitions

10.901. Applicability

This section applies in the following areas:

City of Hutto Conventional Zoned Areas	Hutto Extraterritorial Jurisdiction (ETJ)
Yes	No

10.902. General Provisions

(a) Usage and Interpretation Rules

For the purpose of this UDC certain terms or words herein shall be interpreted or defined as follows:

- (1) Words used in the present tense include the future tense;
- (2) The singular includes the plural;
- (3) The word “person” includes a corporation as well as an individual;
- (4) The term “shall” is always mandatory; and
- (5) The term “may” is discretionary.

(b) Words and Terms not Expressly Defined

Words and terms not expressly defined herein are to be construed according to the normally accepted meaning of such words or terms or, where no definition appears, then according to their customary usage in the practice of municipal planning and engineering, as determined by the Director of Development Services.

10.903. Land Use Definitions

10.903.1. Agricultural Uses

Agricultural Use

The use of land for agricultural purposes, including husbandry and keeping of farm animals, crop production, horse stables and greenhouses, and other similar uses.

10.903.2. Residential Uses

Assisted Living/Nursing Home

A home operated by a business or non-profit organization where ill or elderly people are provided with lodging and meals, with or without nursing care.

Boarding and Rooming House

A building used to provide lodging for four or more boarders or roomers, with compensation typically taking the form of money, services, or other valuable

considerations. This arrangement does not include immediate family members of the occupant who may be occupying the building. Bed and breakfast inns are not considered boarding and rooming houses.

Dwelling

A structure or part of a structure providing complete, independent living facilities for a household, including permanent provisions for living, sleeping, eating, cooking and sanitation.

Dwelling, Live-Work

A dwelling where limited commercial use is permitted and operated by a member of the household that lives in the dwelling unit.

Dwelling, Manufactured Home

A structure, constructed on or after June 15, 1976, according to the rules of the United States Department of Housing and Urban Development, transportable in one or more sections, which, in the traveling mode, is eight body feet or more in width or 40 body feet or more in length, or, when erected on-site, is 320 or more square feet, and which is built on a permanent chassis and designed to be used as a dwelling with or without a permanent foundation when connected to the required utilities, and includes the plumbing, heating, air conditioning, and electrical systems. All references in this article to manufactured housing or manufactured home(s) shall be referenced to HUD-code manufactured housing unless otherwise specified. This includes mobile homes.

Dwelling, Manufactured Home Park

A parcel of land under single entity ownership that has been planned and improved for the placement of two or more manufactured houses and all streets, service drives, and community areas.

Dwelling, Modular Home

As governed by the definition within the Texas Manufactured Housing Standards Act (Article 5221f-1.), a structure or building module that is transportable in one or more sections on a temporary chassis or other conveyance device, and that is designed to be installed and used by a consumer as a permanent residence on a permanent foundation system. The term includes the plumbing, heating, air-conditioning and electrical systems contained in the structure. The term does not include a Mobile Home or Manufactured Home as defined in the Texas Manufactured Housing Standards Act (Article 5221f, V.A.C.S.).

Dwelling, Multifamily

A building containing five or more separate dwelling units on one lot, including apartments, condominiums, lofts, and adaptive reuse of larger structures.

Dwelling, Attached Single-Family

A dwelling unit that is part of a structure with each dwelling unit attached by a common wall to another and access is from a private entrance, each designed and constructed for occupancy by one household.

Dwelling, Detached Single-Family

A single dwelling unit that is not attached to any other dwelling or building by any means, except an approved accessory dwelling unit per Section 10.204 Permitted Uses. Also called a single-family house.

Dwelling, Zero-Lot Line Single-Family

A single household detached dwelling sited where one wall is on the property boundary, but is not a shared wall with a structure on the adjacent property.

Dwelling, Duplex

A building containing two dwelling units sharing a common wall on a single lot.

Dwelling, Multiplex

A building containing three or four separate dwelling units on one lot, including triplexes and quadplexes.

Accessory Dwelling Unit

A separate dwelling unit, either detached from or attached to the principal dwelling unit. Also known as a mother-in-law apartment.

Household

The person or persons occupying a dwelling unit.

Group Home

A residence for not more than six (6) persons with disabilities and two (2) supervisors. Such entity shall be licensed and comply with Chapter 123 of the Human Resources Code.

Halfway House

Pursuant to Texas Human Resources Code § 42.002, a halfway house is a licensed home for inmates on release from more restrictive custodial confinement or initially placed in lieu of such more restrictive custodial confinement, wherein supervision, rehabilitation, and counseling are provided to mainstream residents back into society, enabling them to live independently. Such placement is pursuant to the authority of the State Department of Corrections.

10.903.3. Commercial and Retail Uses**Adult Oriented Uses**

A business that is the offering or display of live entertainment related to "specified sexual activities" or "specified anatomical areas" as the primary attraction to the premises. This includes but is not limited to: adult bookstores, adult novelty shops, adult video rental, adult photo studios, adult cabarets, nude modeling studios, adult hotels and motels, and adult motion picture theaters.

Banks and Financial Institutions

A Texas Department of Banking charter granted establishment primarily engaged in the provision of bank and financial institution services. Typical uses include banks, savings and loans, credit unions, and similar services. Bank and Financial Institutions do not include check cashing or payday loan establishments, loan or mortgage brokers, stockbrokers, or other financial institutions without a state bank charter. An automatic teller machine is not considered a bank or financial institution.

Campground, Recreational Vehicle Park

Land to be used for temporary living accommodations for recreational, camping, and travel use including, but not limited to, travel trailers, truck campers, camping trailers, and self-propelled motor homes.

Car Wash

A facility for the washing, waxing, or cleaning of automobiles, recreational vehicles, or light duty trucks. A car wash may be full-service or self-service.

Club/Lodge Facility

An establishment providing meeting, recreational, or social facilities for a private or nonprofit association, primarily for use by members and guests. This does not include places of worship or assembly.

Day Care, Child (1-6 Children)

Child Care Home (<6 Children) Regular care occurring in the caretaker's own residence for not more than six (6) children, excluding children who are related to the caretaker but in no case exceeding twelve (12) children at any given time. See Chapter 42 of the Human Resources Code, Regulation of Certain Facilities, Homes, and Agencies that Provide Child Care Services.

Day Care, Child (Greater than 6 Children)

Child Care Home (6+ Children) Regular care occurring in the caretaker's own residence for more than six (6) children, excluding children who are related to the caretaker. See Chapter 42 of the Human Resources Code, Regulation of Certain Facilities, Homes, and Agencies that Provide Child Care Services.

Day Care, Adult (1-4 Persons)

A facility that provides services under an Adult Day Care Program on a daily or regular basis, but not overnight, one (1) to four (4) elderly or handicapped persons who are not related by blood, marriage, or adoption to the owner of the facility. Adult Day Services Centers (also referred to as Adult Day Care Centers) shall be licensed by the Texas Department of Human Services.

Day Care, Adult (Greater than 4 Persons)

A facility that provides services under an Adult Day Care Program on a daily or regular basis, but not overnight, to four (4) or more elderly or handicapped persons who are not related by blood, marriage, or adoption to the owner of the

facility. Adult Day Services Centers (also referred to as Adult Day Care Centers) shall be licensed by the Texas Department of Human Services.

Day Care, Pet

A facility where pets are kept for all or part of a day. Secondary services at pet day care facilities may include obedience classes, training, grooming, and overnight boarding.

Entertainment Facility, Theater

A building or part of a building devoted to showing motion pictures or dramatic, musical, or live performances.

Farm Product Sales

Outdoor sale of food or plant products grown on the premises in an agricultural zoning district; or customarily involving growers from throughout a region selling food or plant products they have grown in a zoning district where the use is permitted.

Food Catering

A business where the principal use is the preparation and storage of food on the premises that is delivered and consumed by the customers off the premises.

Funeral Home

A building used for the preparation of the deceased for burial and display of the deceased and related ceremonies or services related, including cremation and the storage of caskets, funeral urns, funeral vehicles, and other funeral supplies.

Fueling Station

An establishment engaged in primarily the sale of gasoline, petroleum products, and fuels, including renewables.

Recreation Facility, Indoor

An indoor establishment for exercise, relaxation, amusement or sport, and amenities that are secondary to the recreational use, including but not limited to, gymnasiums, health clubs, bowling alleys, pool halls, video arcades, and shoot ranges. This does not include facilities supervised by licensed medical personnel in medical settings, athletic departments in schools, professional sports team facilities, amenity centers, or community centers.

Recreation Facility, Outdoor

A mostly outdoor establishment for exercise, relaxation, amusement or sport, and amenities that are secondary to the recreational use, including but not limited to, miniature golf courses, go-cart tracks, and batting cages. This does not include, amusement parks, facilities in athletic departments of schools, professional sports teams, public parks and playgrounds, amenity center, or community centers.

Kennel

The boarding of dogs, cats, or other household pets, operating either as a business or a legitimate animal rescue operation. Kennels may also incorporate pet day care, dog training facilities, and spaces for events such as conformation shows and agility competitions.

Large Item Sales and Rental: Class 1

Use of a building, land area, or other premises for the display and sale, lease, or rental of any of the following, where most of the inventory is stored outdoors.

- Vehicles that are intended for sale to the general consumer market. This includes automobiles, vans, light trucks, and sport utility vehicles.
- Golf carts, neighborhood electric vehicles (NEVs), and similar vehicles.
- Motorcycles and dirt bikes.
- Personal watercraft, kayaks, canoes and rowboats.
- Small off-road vehicles, including all-terrain vehicles, dune buggies, and four-wheelers.
- Automobile, truck and motorcycle parts, accessories and aftermarket items (stores specializing in the sales of those items).
- Boats.
- Home spas and hot tubs (except indoor sales/display).
- Bulk lumber and bricks, in a screened storage area.
- Landscaping materials, in a screened storage area.
- Small portable buildings, sheds, garages, gazebos, decks, and other prefabricated structures (not manufactured homes and prefabricated metal buildings), as an incidental accessory use.
- Pottery, statues, fountains and similar items, displayed or stored outdoors.
- Accessories related to the above items.

Large Item Sales and Rental: Class 2

Use of a building, land area or other premises for display and sale, lease or rental of any of the following, where most of the inventory is stored outdoors.

- Large vehicles that require a commercial driver license (CDL) to operate or are generally not intended for sale to the general consumer market. This includes flatbed and workbed trucks, buses, tractor trailers, dump trucks, yard trucks, and similar vehicles. Home spas and hot tubs (except indoor sales/display).
- Trailers, tow dollies, and all equipment or machinery designed to be towed by a vehicle. Landscaping materials, in a screened storage area.
- Moving vans, trucks and trailers.

- Construction, land clearing, hauling, earth moving, drilling, aerial lift, and similar heavy equipment.
- Forklifts, bobcats, trenchers, and similar items.
- Air compressors, generators, mobile pumps, and similar items.
- Farming, agricultural and arborist equipment.
- Recreational vehicles, including motor homes, motor coaches, converted buses, travel trailers, fifth wheels, fold down trailers, camper trailers, and similar items.
- Truck caps, lids, campers, camper shells, cargo extensions, cargo covers, tonneau covers, plows, racks, bed liners, and similar items.
- Small portable buildings, sheds, garages, gazebos, decks, and other prefabricated structures (not manufactured homes).
- Prefabricated and above-ground swimming pools.
- Bulk mulch, wood chips, soil, fill dirt, peat, gravel, rocks, sand and similar items.
- Bulk construction materials.
- Scaffolding.
- Pallets.
- Accessories related to the above items.

Lodging, Hotel

A facility providing transient accommodations to the public, where access to overnight-stay rooms is granted through enclosed, interior hallways. Accessory uses may include restaurants, swimming pools, workout rooms, and other amenities.

Lodging, Motel

A facility providing transient accommodations to the public, where access to overnight-stay rooms is granted from exterior balconies or pathways. Accessory uses may include restaurants, swimming pools, workout rooms, and other amenities.

Lodging, Bed and Breakfast

An owner-occupied single household residence used as a lodging establishment.

Nightclub

A type of entertainment facility that includes a dance floor, lightshow, and/or stage for the playing of live music.

Office

A space where professionals, including but not limited to medical and dental practitioners, lawyers, engineers, accountants, and other qualified individuals, conduct professional services. This includes urgent care facilities but not emergency medical services.

Professional and Business Service

An establishment or place of business primarily engaged in the provision of frequent or recurrent needed services of a personal nature. Typical uses include, but are not limited to, barber and beauty shops, nail salons, tailors, dog grooming shops, print shop, copy shops, shoe repair shops, and services of an informational or instructional nature including driving schools, dance studios, martial arts studios, and business.

Restaurant

An establishment engaged in the sale of food and beverages to customers in a ready-to-consume state.

Bar/Tavern

An establishment that serves alcoholic beverages by the drink for on-site consumption and that derives more than seventy-five percent (75%) of the gross revenue from the on-premises sale of alcoholic beverages and does not have a TABC Food and Beverage Permit defining the establishment as a restaurant.

Retail Store (No more than 5,000 square feet)

An establishment under five thousand (5,000 square feet) in floor area engaged in the retail sales or rental of goods or merchandise to the public for personal or household consumption or to services incidental to their sale or rental.

Retail Store (Greater than 5,000 square feet)

An establishment over five thousand (5,000 square feet) in floor area engaged in the retail sales or rental of goods or merchandise to the public for personal or household consumption or to services incidental to their sale or rental.

Personal Loan Services

Check-cashing and personal loan services, pawn shops, and rent-to-own establishments as defined in Section 371.003 of the Texas Financial Code, as amended.

Travel Plaza, Truck Stop

An establishment engaged primarily in the fueling, servicing, repair, or parking of commercial vehicles, including the sale of accessories and equipment for such vehicles. A travel plaza or truck stop may also include, but is not limited to, overnight accommodations, showers, restaurant facilities, and other diversions intended primarily for use of truck crews and interregional travelers.

Veterinary Clinic, Small Animal

A facility, operated under the supervision of a licensed veterinarian, where domestic animals and pets are admitted for examination, observation, diagnosis, and medical treatment.

Veterinary Clinic, Large Animal

A facility, operated under the supervision of a licensed veterinarian, where bovine, equine, swine, fowl, and similar large livestock animals and pets are admitted for examination, observation, diagnosis, and medical treatment.

10.903.4. Industrial Uses

Data Center

An industrial facility primarily engaged in the storing, processing, and distribution of data through on-site, networked computer systems or other electronic devices; including accessory offices for employees and security personnel; either in conjunction with a business not located on the site, or for individual compensation.

Industrial Use, General

Manufacturing operations utilizing partially processed materials to create finished items or parts with a moderate to relatively high value per unit weight including, but not limited to, production of motor and transit vehicles, trailers, modular and manufactured buildings, as well as bottling plants and breweries. This does not include mining and extraction, petrochemical industries, rubber refining, primary metal or related industrial, light industrial, or heavy industrial.

Industrial Use, Heavy

Manufacturing primarily involved in the basic processing and manufacturing of materials or products from extracted or raw materials, or the storage or manufacturing processes utilizing flammable or explosive materials, as well as those with the potential for hazardous conditions. Heavy industrial also includes work processes involving solvents, sanitary waste transfer stations, recycling establishments, junkyards, and transport terminals, such as truck and rail terminals and container storage.

Industrial Use, Light

Manufacturing, predominantly from previously prepared materials, of finished products or parts, including processing, fabrication, assembly, treatment, packaging, incidental storage, sales, or distribution including, but not limited to, the manufacture of electronic instruments, preparation of food products, microbrewing, musical instruments, and pharmaceuticals. This does not include mining and extraction, petrochemical industries, rubber refining, motor vehicle and heavy equipment manufacturing, primary metal or related industries.

Research Laboratory

A facility for scientific research, investigation, testing, or experimentation that does not involve the manufacture or sale of products except as incidental to the main purpose of the laboratory.

Self-Storage Facility

A controlled access and fenced facility containing individual storage units or spaces of varying sizes that are leased for the storage of items (excluding vehicles) and other non-hazardous, non-perishable durable goods.

Trade Use

A business or occupation requiring specialized training in manual or mechanical skills, including, but not limited to, carpentry, plumbing, electrical, heating,

ventilation and air conditioning, and furniture upholstery. A trade use also includes small custom industry, where goods are produced or repaired by hand, using hand tools or small-scale equipment.

Vehicle Minor Repair Facility

A facility where light vehicle maintenance activities such as engine tune-ups, lubrication, brake repair, air conditioning service, tire sales and installation, car washing, detailing, and polishing are conducted.

Vehicle Major Repair Facility

A facility where heavy maintenance activities such as engine overhauls, vehicle painting, body or fender work, and welding are conducted, without the sales of fuel.

Vehicle Storage Facility

A facility that includes secured indoor or outdoor areas, intended for short or long term storage of automobiles, light trucks, motorcycles, recreational vehicles, boats, camper trailers, commercial vehicles and commercial trailers; either in conjunction with a business not located on the site, for compensation.

Warehouse and Distribution Facility

A facility for storage, wholesale, and distribution of manufactured products; including accessory offices, showrooms, or incidental retail sales (no more than 10% of the building gross floor area) but excluding bulk storage of materials that are inflammable, explosive, or that create hazardous or commonly recognized offensive conditions; and where the products, supplies, or equipment that are distributed from the facility are not used or consumed on the premises.

10.903.5. Institutional and Civic Uses

Amenity Center

An establishment providing recreational and meeting facilities for exclusive use of the residents of the residential development or employees of the business or office complex where the business or office is located including, but not limited to, swimming pools, workout rooms, meeting rooms, leasing and sales offices for the development where it is located, and similar amenities.

Aquatic Facility

A facility that contains one or more swimming pools, splash pads and supporting infrastructure.

Athletic Facility

An area, field, building or combination thereof, that is constructed and equipped for use in participatory and/or spectator-oriented sports and athletics. This use includes, but is not limited to, facilities intended for the instruction, practice, and competitive events associated with basketball, volleyball, soccer, tennis, gymnastics, swimming, baseball or football. Accessory uses may include offices, snack bars, limited sales, and locker rooms.

Cemetery

A place or ground used or intended to be used for the burial or entombment of the dead, whether human or animal, including a mausoleum. This does not include crematories or mortuaries.

Community Facility

Publicly owned facility or building primarily intended to serve the community's recreational, educational, cultural, administrative, and entertainment needs including, but not limited to, police and fire stations, government administration buildings, community centers, maintenance facilities, and related accessory uses.

Golf Course

A tract of land laid out with at least nine holes for playing a game of golf and improved with tees, greens, fairways, and hazards. Golf courses may also include a clubhouse with a restaurant, bar, practice area, driving range, and other related accessory structures. This does not include a miniature golf course.

Hospital

A facility, whether or not licensed or required to be licensed by the State of Texas, providing primary health services and medical or surgical care to the persons, primarily inpatients, suffering from illness, disease, injury, deformity, and other abnormal physical or mental conditions, and related facilities.

Park

An open recreation facility or tract of land available to the general public.

Park and Ride Lot (as Principal Use)

Parking facility provided for users of a public transit facility located on the site.

Public Utility Substation

A facility used for collecting, processing, or distributing a public utility commodity. Public utility substations include electrical substations and high-tension power distribution lines, water tanks and pumps, telephone switching offices and exchanges, and similar uses; but not wireless service facilities, storage and equipment yards, and business offices.

Religious Land Use or Assembly

A structure or group of structures intended for regular gatherings of people to attend, participate in or conduct religious services and other related activities and associated accessory uses. Associated accessory uses may include religious instruction classrooms, offices, counseling programs, private school, youth programs, parking, child and adult daycare facilities, summer camps, recreational facilities, caretaker's quarters, temporary food bank, thrift shop, sale of religious items, and cemeteries.

School

A public or private educational facility serving at least six students offering instruction at the elementary, junior, middle, and high school levels in the branches of learning and study required to be taught in the schools of Texas. This also includes colleges and universities. This does not include home schooling of children by parents or tutors at their residence.

10.903.6. Temporary Uses**Construction Equipment Storage Lot**

Temporary use where vehicles, materials, equipment, sorted debris intended for recycling, and fill material accessory to a construction project is kept.

Construction Field Office

Site and structure, usually a portable building, used for temporary offices related to construction activity.

Garage Sale

The sale of used or secondhand items of personal property at a dwelling unit. This term also includes "yard sales," "tag sales," "porch sales," "lawn sales," "rummage sales," "estate sales" or similar sales of tangible personal property at a dwelling unit.

Mobile Food Vendor

A business that operates or sells food for human consumption from a cart, trailer or kitchen mounted on a chassis, with an engine for propulsion, or that remains connected to a vehicle with an engine for propulsion or disconnected from an engine for propulsion.

Model Home / Lot Sales

A dwelling unit temporarily used for display purposes as an example of dwelling units available or to be available for sale or rental in a particular subdivision or other residential development approved by the city. Model homes may also incorporate sales or rental offices for dwellings within the development.

Portable Storage Container

A container designed for temporary storage of personal property, usually delivered and removed by truck or trailer.

Temporary Building

A building or structure intended to provide basic shelter from the elements, usually fabricated away from the site where it is located, designed for placement where there is no permanent foundation, and intended for removal after a short time.

10.903.7. Accessory Uses

Antenna, Radio Hobbyist

Exterior transmitting or receiving device, and its support structure, used in telecommunications that radiates and captures radio signals on frequencies allocated by the Federal Communications Commission for amateur (ham) radio, Citizens Band (CB), and General Mobile Radio Service (GMRS) use; or captures radio signals as part of a hobby. This does not include roof mounted whip antennas or simple wire antennas not supported by a dedicated antenna tower.

Antenna, Non-Residential Use

Exterior transmitting or receiving device, and its supporting structure, used in telecommunications that radiates and captures radio signals used in the day-to-day operation of a non-residential use such as a business, government agency, or other organization. This does not include wireless facilities, speculative towers leased to businesses and services located off-site, and broadcasting.

Donation Drop-Off Box

A container or structure located outside of an enclosed building, used for collection of charitable or for-profit donated items.

Drive-Through Facility

Element of a business where goods or services are passed through exterior windows or mechanical devices to patrons in queued motor vehicles.

Free-Standing Cisterns

A reservoir or tank for storing rainwater.

Home Occupation

An occupation or business activity that results in a product or service for financial gain and is conducted in whole or part in the dwelling unit or accessory building and is clearly an accessory or incidental use and subordinate to the residential use of the dwelling unit. Home occupations do not include businesses conducted in designated live- work residence.

Residential Accessory Structure

Structures such as a shed, carport, or garage that is detached from and incidental to a residential host structure. This does not include accessory dwelling units.

Satellite Dish

Earth station antenna at least two (2) feet in diameter, used for satellite communication services.

Swimming Pool

Manmade water body designed for swimming and bathing. This does not include wading pools (no more than thirty (30) inches deep), spas and hot tubs, or pool sales.

Vending Machine (Outdoors)

Machine with a footprint of at least four (4) square feet located outside of an enclosed building, which dispenses products stored in the machine by insertion of cash, credit or debit card, tokens, or similar objects. This does not include newspaper boxes.

Wind Energy System

A wind-driven turbine (whether roof or tower mounted), and associated control or conversion electronics for the purpose of providing electrical power to a privately owned lot or parcel.

Wireless Facility: Attached

Wireless facility incorporating an antenna mounted on an existing building, silo, smokestack, water tower, utility or power pole, or support structure other than an antenna tower.

Wireless Facility: Concealed

Wireless facility incorporating an antenna with a support structure that screens or camouflages the presence of antennas and/or towers from public view, in a way appropriate to the site's context and surrounding environment including, but not limited to, manmade trees, clock towers, flagpoles, light structures, steeples, and similar objects.

Wireless Facility: Freestanding

Equipment, physical plant and area of the property and/or building used to provide wireless services, including cables and wires, conduits, pedestals, antennas, towers, concealed structures, electronic devices, equipment buildings and cabinets, landscaping, fencing and screening, and parking areas. Also known as a cellular tower, cell site, or CMRS facility.

10.904. General Definitions

Abandonment

The intentional cease of use by the owner or lessee without resuming operation of any utility after ninety (90) days.

Abutting

Adjoined borders that are only separated by common property lines or other public utility.

Access

A method of approaching or entering a property.

Adjacent

Properties that are near each other but not necessarily sharing a direct dividing line. These properties are separated by streets, alleys, or other public use.

Alley

Minor right-of-way, dedicated to public use, giving secondary access to the back or side of abutting properties, and not intended for general traffic circulation.

Anchor Store

Major store in a shopping center, such as a department store, supermarket, or other retail store, prominently located to attract customers who are then expected to patronize other shops in the center.

Antenna Tower

Any freestanding structure primarily designed to support antennas and transmitting and receiving equipment. Examples include but are not limited to monopole, guyed, and lattice towers.

Antenna

Any structure designed for transmitting or receiving radio signals used in telecommunications. Examples include but are not limited to television, radio, data, and communication.

Arcade

A frontage type that is a street facing façade that is contiguous to a street or plaza and is open and unobstructed supporting habitable space. The façade at the sidewalk level remains at the property line.

Arch

A curved structure built where parts support each other by mutual pressure and can sustain (or visually appear to sustain) a load, of the foot, the part from head to toes of the body structure, normally having an upward curve.

Arterial Street

A street designed to provide connections between municipalities or major highways.

Art

An object created primarily for aesthetic purposes and valued for its beauty or expressiveness; specifically, painting, sculpture, drawing, watercolor, graphics, or architecture.

Attic

The interior part of a building contained within a pitched roof structure.

Awning

A roof-like cover that projects from the wall, usually of canvas, mounted outside of a door or window.

Balcony

Platform projecting from the wall of an upper-story wall of the building enclosed by a railing or balustrade, with an entrance from the building and supported by brackets, columns or cantilevered out.

Base Flood

Flood having a one percent (1%) chance of being equaled or exceeded in any given year.

Berm

Earthen mound designed to provide visual interest, screen undesirable views, decrease noise, and control or manage surface drainage.

Block

An area of land entirely bounded and surrounded by streets.

Block Face

The aggregate of all the building Facades on one side of a Block.

Block Length

Distance measured along rear property lines between intersecting streets.

Block Perimeter

A measurement of the linear distance of land around the outside edge of a block, which is a total of the Block Faces for each block. For measurement, the point of origin and end point are the same location

Bond

Form of security including a cash deposit, surety bond, collateral, property or instrument of credit in an amount and form satisfactory to City Council.

Buffer

Open spaces, landscaped areas, fences, walls, berms, or any combination used to physically separate or screen one use or property from another to visually shield or block noise, lights, or other nuisances.

Building

Structure enclosed in exterior walls, built, erected and framed of a combination of materials, whether portable or fixed, having a roof, to form a structure for shelter of persons, animals, or property.

Building Coverage

Area of a lot covered by buildings (principal and accessory) or roofed areas, as measured along the outside wall at ground level, and including all projections, other than open porches, fire escapes, canopy areas and the first two (2) feet of a roof overhang.

Building Envelope

Area on a lot where a building may be built, enclosed by the minimum required front yard, side yard and rear yard.

Building Front

Exterior wall of a building facing an adjacent street right-of-way.

Building Form

Shape and structure of a building as distinguished from its substance or material.

Building Lot

Platted and deeded parcel of land legally approved for development.

Building Mass

Three-dimensional bulk of a building height, width, and depth.

Built Environment

Natural elements of the environment that are changed, built, or made by people.

By-Right

Characterizing an application or use permitted outright and processed administratively, without public hearing.

Canopy Tree

Tree in a grouping or (urban) forest forming a canopy.

Ceiling

Inside lining of a room or canopy overhead.

Central Business District

Blocks 3, 4, 5, and 6 of the Railroad Addition of the City of Hutto Official Revised Map, as approved and adopted April 6, 1954.

Certificate of Appropriateness

Document approving work on local landmarks or properties in historic districts based on consistency with applicable design guidelines or standards.

Character

Attributes, qualities and features making up and distinguishing a place or development project and give it a sense of purpose, function, definition and uniqueness.

Circulation

Systems, structures, and physical improvements for movement of people and goods by streets, highways, sidewalks, and other paved improvements.

City

City of Hutto, Texas.

City Council

City Council of the City of Hutto, Texas.

Civic

The term defining not-for-profit organizations dedicated to arts, culture, education, recreation, government, transit, and municipal parking.

Civic Building

A building operated by not-for-profit organizations dedicated to arts, culture, education, recreation, government, transit, and municipal parking, or for use approved by the City Council.

Co-Development

Two or more wireless service providers working together to develop a single wireless facility.

Co-Location

Locating wireless communications equipment for two or more wireless providers on one structure.

Collector Street

A local street that provides the most direct route to an arterial street.

Commercial

Any activity with the intention of financial profit involving goods or services

Commercial Center or Shopping Center

Development having common ownership, management, maintenance, parking, landscaping, signage, loading areas, access aisles and/or other related improvements, with three or more separate businesses, retail establishments and/or tenant spaces.

Colonnade

Series of columns at regular intervals.

Column

Upright support in a building, usually with a decorated base and capital.

Commercial Development

Land development activity, except that intended only for residential, civic, industrial and/or light industrial use.

Compatibility

Characteristics of different uses or activities or design allowing them to be placed near or next to each other in harmony. Some elements affecting compatibility include height, scale, mass and bulk of structures. Other

characteristics include pedestrian or vehicular traffic, circulation, access and parking impacts. Landscaping, lighting, noise, odor and architecture are other important characteristics affecting compatibility. Compatibility does not mean “the same as,” but rather refers to the sensitivity of development proposals in maintaining the character of existing development.

Comprehensive Plan

The City’s Comprehensive Plan, adopted in accordance with Chapter 213 of the Texas Local Government Code (TLGC), includes all associated studies, recommendations, and maps—most notably the Future Land Use Map— known as Hutto SOAR 2040.

Concept Plan

Generalized plan showing boundaries of a parcel under common ownership, and identifying proposed land use, general lot or parcel layout, community use or public areas, land use intensity, and street alignments.

Condominium

Form of real property ownership combining separate ownership of individual apartments or units with common ownership of other elements such as land or accessory buildings.

Connecting Walkway

Sidewalk or walkway directly connecting a main entrance of a building to a street sidewalk without requiring pedestrians to walk across parking lots, driveways, around buildings, and or around parking lot outlines not aligned to a logical route.

Concrete Masonry Unit (CMU)

Manufactured masonry type known to the industry as CMU, architectural concrete masonry, split face block, split scored block, fluted block, ribbed masonry units and ground face masonry units. These units are manufactured under controlled conditions in a variety of colors and combinations.

Construction Plan

Maps, drawings, plans and specifications showing the proposed location and design of installed subdivision improvements.

Contributing Structure or Site

Structure or site adding to the historical integrity or architectural qualities making a historic district significant. A contributing structure or site helps make a historic district “historic”.

Contiguous

Adjacent property whose property lines is shared or separated by only a street, alley, easement or right-of-way.

Corbel

Bracket supporting a superincumbent object, or receiving the spring of an arch. A common form of corbel consists of courses of stones or bricks, each projecting slightly beyond the next below it.

Cornice

Decorative overhang or molding located at the junction where a roof overhangs exterior walls.

County

Williamson County, Texas or where applicable, Travis County, Texas.

Coverage

Lot area covered by principal and accessory buildings, including the area covered by hanging roofs.

Cul-De-Sac

Street with only one point of access, usually with a circular area or “bulb” at the end to allow vehicles to turn around.

Curb

The edge of the vehicular pavement that may be raised or flush to a Swale. It usually incorporates the drainage system.

Dedication

Transfer of property interests from private to public ownership for a public purpose.

Density

The number of dwelling units within a standard measure of land area.

Demolition By Neglect

Neglect in maintaining, repairing, or securing a building or structure which results in deterioration of an exterior feature, or loss of structural integrity.

Design Guidelines

Guidelines recommended by the Historic Preservation Commission applying to property in an historic landmark district, meant to protect and enhance the historical, cultural, architectural, or archeological character of the district.

Design, Street

Street location, street alignment, street width and grades, easement alignment, easement grades and widths, drainage and sanitary sewer alignment and right-of-way, and designation of minimum lot area, width and length.

Developer

Legal owner of the land to be improved and/or subdivided, or authorized representative of the owner.

Development

Division of a parcel into two or more parcels; construction, reconstruction, conversion, structural alternation, relocation, or enlargement of buildings or structures; use or change in use of buildings or land; and/or extension of use of land or clearing, grading, excavation or other movement of land, for which permission may be required under this code. Includes reconstruction, alteration of the size, or material change in the external appearance of a structure; changes in intensity of land use; alteration of shores or banks of ponds, lakes, creeks or streams; and excavation for construction, moving, alteration, or repair, except ordinary repairs, of any building or other structure, including an accessory structure, greater than 100 sq. ft. in area.

District

Traditional zoning district, special purpose district, or overlay district

Downtown

Area inside the boundaries of the 1911 original incorporated City of Hutto.

Dripline

Outermost limit of branches on a tree, extended straight down to the ground.

Drive

A Thoroughfare that creates a transition between a neighborhood and a natural area, usually along a waterfront, park, or promontory. One side has the neighborhood character of a Thoroughfare, with Sidewalk and building, while the other has the qualities of a Road or parkway, with naturalistic planting and rural details.

Drive Aisle

Lane in a parking lot devoted to the passage of vehicles, as opposed to the parking stalls. This term excludes lanes used only or primarily for queuing and stacking.

Driveway

Private street providing vehicular access to a parking space, garage, dwelling, or other structure.

Dumpster

Large container designed to receive and transport waste. The term encompasses front loader and rear loader containers, and roll-off debris containers. The term is a genericized trademark of the Dumpster brand.

Dwelling Unit

Residential unit designed to accommodate one household.

Easement

Grant by the property owner of a strip of land for stated purposes.

Eave

Roof edge that extends out past the exterior wall line.

Elevation

External faces of a building; also a mechanically accurate, “head-on” drawing of any face (or elevation) of a building or object, without allowance for the effect of the laws of perspective.

Encroach

To break the plane of a vertical or horizontal regulatory limit with a structural element, so that it extends into a Setback, into the Public Frontage, or above a height limit.

Encroachment

Any structural element that breaks the plane of a vertical or horizontal regulatory limit, extending into a Setback, into the Public Frontage, or above a height limit.

Environment

Aggregate of social and physical conditions that influence the life of the individual and/or community.

Erected

Includes the terms “constructed,” “moved,” “located,” or “relocated.”

Extraterritorial jurisdiction (ETJ)

Limits of the city's extra-territorial jurisdiction now or in the future as granted under Chapter 43, Local Government Code, as amended.

Facade

Sides of a building that face a street, drive or other open space.

Fascia

Vertical surface that spans across the top of columns or across the top of a wall.

Fence

Barrier built to enclose or screen a certain area.

Fenestration

Arrangement and design of windows and doors in a building.

Final Plat

Map of a land subdivision prepared in a form suitable for filing of record with necessary affidavits, dedications and acceptances, and with complete bearings and dimensions of all lines defining lots and blocks, streets, alleys, public areas and other dimensions of land.

Flex Space Building

Building designed to be versatile, which may be used in combination with office, research and development, quasi-retail sales, and including but not limited to industrial, warehouse, and distribution uses.

Flood Protection System

Physical structural works intended to modify flooding to reduce the extent of areas in a community subject to a “special flood hazard” and the extent of the depths of associated flooding. Such a system usually includes hurricane tidal barriers, dams, reservoirs, levees or dikes. Specialized flood-modifying works are those constructed in conformance to sound engineering standards.

Floodplain Management

Program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works and floodplain management regulations.

Floor Area Ratio

The amount of gross floor area of principal buildings on a lot or block divided by the total area of the lot or block where the buildings are placed.

Footprint

Ground area covered by a structure, including the foundation and areas enclosed by exterior walls and footings.

Forecourt

A Private Frontage wherein a portion of the Facade is close to the property line and the central portion of the building is set back.

Frontage

Width of a lot or parcel abutting a public right-of-way measured at the property line.

Frontage Line

A lot or property line bordering a Public Frontage (right-of-way). Facades facing Frontage Lines define the public realm and are therefore more regulated than the Elevations facing other Lot Lines.

Gable

Portion at the end of a building between the eaves and the peak of the roof. Roof type determines the gable shape. A typical gable roof forms a triangular shape.

Gallery

A Private Frontage conventional for Retail use wherein the Facade is aligned close to the Frontage Line with an attached cantilevered shed or lightweight colonnade overlapping the Sidewalk.

Garage

Accessory building or part of a main building primarily used for motor vehicle storage. A garage differs from a carport by being enclosed on more than three sides, so a stored or parked vehicle is located entirely inside the building.

Gated Community

Residential neighborhood, subdivision, street or area with controlled entrances for pedestrians, bicycles, and automobiles, usually characterized by a closed perimeter of gates, walls and fences.

Grade (As related to adjacent ground elevation only)

Lowest point of elevation of the existing surface of the ground, in the area between the building and a line 5 ft. from the building.

Grade (As related to slope only)

Slope of a street, other public way or utility line given in percentage; the topographic relief of a parcel of land.

Grading

Disturbing, moving, removing, transferring, or redistributing soil or earthen surfaces.

Green

A Civic Space type for unstructured recreation, spatially defined by landscaping rather than building Frontages.

Greenlink

Small park that provides a pedestrian connection through the middle or end of a block.

Greenway

An Open Space Corridor in largely natural conditions which may include trails for bicycles and pedestrians.

Green Roof

Roof that is partially or completely covered with vegetation and soil, or a growing medium, planted over a waterproofing membrane.

Gross Floor Area (GFA)

Total floor area designed for tenant occupancy and exclusive use, including mezzanines and upper floors (if any), measured from centerlines of joint partitions and exteriors of outside walls.

Groundcover

Plants such as grasses and/or other low-growing plants grown for ornamental value and ability to protect soils from eroding. This term excludes weeds or invasive plant species.

Hedge

A row of closely planted shrubs, bushes, or any kind of plant forming a boundary.

Height, Building

Vertical distance from the average grade level adjoining the building to either the top of a flat roof, the deck lines for a mansard roof, or the average height between eaves and ridge for gable, hip and gambrel roofs.

Height, Antenna Tower

Distance from the finished grade at the antenna tower base to its highest point. Overall antenna tower height includes the base pad, mounting structures and panel antennas, but excludes lightning rods and whip antennas.

Highway

A rural and suburban Thoroughfare of high vehicular speed and capacity.

Historic Landmark

Place with outstanding historical and cultural significance in the state, region, or community. The designation recognizes the historic place, or the buildings, structures, accessory buildings, fences or other appurtenances are of basic and vital importance for cultural preservation and tourism development.

Historic Preservation Officer

City staff member appointed by City Council to serve as staff liaison to the Historic Preservation Commission (HPC).

Historic Significance

Importance given a property or district evaluated to meet designation criteria. Property with a principal structure classified as “noncontributing” is not considered to have historical significance.

Historic Structure

Structure that is:

- Listed individually in the National Register of Historic Places (a listing maintained by the U.S. Department of the Interior) or found by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- Certified or preliminarily found by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district found by the Secretary to qualify as a registered historic district;
- Individually listed on a state inventory of historic places in states with historic preservation programs approved by the Secretary of the Interior; or
- Individually listed on a local inventory or historic places in communities with historic preservation programs that are certified either by an approved state program as decided by the Secretary of the Interior; or the Directly by the Secretary of the Interior in states without approved programs.

Host Structure

Dominant building on a site, in context to an accessory use or structure, or site amenity.

Impervious Cover

Surface or area that does not allow the passage of water through the surface and into the ground.

Improvement

Man-made, immovable item that becomes part of, is placed on or is added to real estate.

Improvement (Context of Subdivision)

Street, alley, barricade, sidewalk, bikeway, pedestrian way, water line system, wastewater system, storm drainage network, public park land, landscaping, or other facility for which the local government may ultimately assume responsibility for maintenance and operation, or which may affect an improvement for which local government responsibility is established.

Infrastructure

Man-made structures that serve the common needs of the population, such as potable water systems; wastewater disposal systems; solid waste disposal sites or retention areas; storm drainage systems; electric, gas or other utilities; bridges; streets; bicycle paths or trails; pedestrian sidewalks, paths or trails; and transit stops.

Irrigation System

Permanent, automatic, underground water system designed to transport and distribute water to landscape plants.

Junk

Scrap, waste, worn-out discarded material, goods or debris collected or stored for destruction, disposal, or some other use. This includes but is not limited to scrap metal, inoperable vehicles and parts, construction material, household wastes, garbage, discarded appliances and furniture, and yard debris.

Landmark

Structure of unusual historical and usually aesthetic interest.

Landscape

Area of land with its component landforms, geology, aquatic features, atmosphere and associated biodiversity, affected by continuing natural processes and often modified by human activities.

Landscaping

Combination of living plants such as trees, shrubs, plants, vegetative ground cover or turf grasses, and structural features such as walkways, fences, benches, works of art, reflective pools, fountains or the like. Landscaping also

includes irrigation systems, mulches, topsoil use, soil preparation, re-vegetation or the preservation, protection and replacement of existing trees.

Landscape Area

Areas on the site that are not covered by buildings, structures, paving or impervious surface. Landscape areas consist of only landscaping.

Legal Lot

Lot recorded in the official county records pursuant to and in conformance to the subdivision regulations in effect when it was created.

Letter of Credit

Letter from a bank or other reputable creditor acceptable to the city that guarantees that if a subdivider or developer fails to fulfill any improvement requirements, at the city's request funds will be provided to the city to complete the specified improvements.

Living Screen Material

Composed of plantings, typically hedges, capable of establishing an opaque effect to screen the desired use/object from view.

Loading Space

Off-street space for parking of a vehicle while loading or unloading merchandise or materials.

Local Street

Minor street designed only to provide access.

Loggia

Gallery open or with a colonnade along one side.

Lot

Designated parcel having fixed boundaries, legally established by plat or subdivision, abutting a dedicated right-of-way, private street or private drive.

Lot Line

Recorded boundary line defining a lot or parcel.

Masonry

Construction composed of small units of bricks or blocks made from stone, clay, concrete, tile and similar materials, and stone and cement-based products that match the appearance of natural stone. Masonry units are usually joined by cement mortar mixture. In the context of this code, masonry does not include EIFS and tilt-up/precast concrete panels, but does include cement stucco and fiber-cement siding (hardy board).

Master Sign Plan

Means a unified sign plan that a developer or property owner creates for a specific area or development that establishes unique sign standards for all sign types and elements including design and area specifications in lieu of the standards in Chapter 3 of this UDC.

Mechanical Commercial Use

Any of these uses:

- Class 1 and 2 large item sales, as defined in Chapter 2.
- Businesses whose primary function is the sale, rental, servicing, repair, cleaning, fueling and modification of motorized vehicles and/or items powered by liquid and gas fuel powered engines, and related parts and accessories.
- Businesses whose primary function is the sale, rental, servicing, repair, cleaning, and modification of products and raw materials primarily intended for use by the construction industry, landscape contractors and skilled mechanical trades.
- Wholesale businesses not catering to the public.
- Retail businesses where 20% or more of the business trading or floor area is outdoors or not in a fully enclosed building.

Mixed Use

A building that contains residential in addition to non-residential uses permitted by right.

Mobile Food Vendor

A vendor who operates or sells food for human consumption from a cart, trailer or kitchen mounted chassis, with an engine for propulsion, or that remains connected to a vehicle with an engine for propulsion or while disconnected from an engine for propulsion.

Natural Features

Trees, springs, water bodies, view corridors, open spaces, and other regions of key environmental importance.

Natural State

Substantially the same conditions of the land that existed before development, including but not limited to the same type, quality, quantity and distribution of soils, ground cover, vegetation and topographic features.

Neighborhood

Area of the city characterized by residential land uses bounded by physical (such as river, major street, back of access) and/or political features (such as voting districts, subdivision boundaries).

Nonconforming Use

Use, building or structure established legally but now not conforming to this code.

Nuisance

A use or operation that produces noise, vibration, glare, emissions, or other harmful effect upon neighboring properties in excess of the limits allowed.

Off-Site Improvement

Required improvement outside of the property being developed.

On-Street Parking

Designated permanent parking areas in the public right-of-way.

Open Space

Land intended to remain undeveloped; it may be for Civic Space.

Ordinary Maintenance and Repair

Work intended to correct deterioration, decay, or damage, including repair or damage caused by fire or other disaster and does not result in a change in the existing appearance and materials of a property, nor significantly extends its lifespan. Examples of this work include, but are not limited to

- Caulking or reglazing windows.
- Minor repairs to windows, doors, siding, gutters, trim, and similar features.
- Replacement of existing mechanical equipment.
- Repairing or repaving of flat concrete work in side and rear yards.
- Repairing or repaving of existing front yard paving, concrete work and walkways, if the material is the same or similar in appearance.
- Roofing, foundation and/or chimney work, if no change in appearance occurs.

Orient

To bring in relation to, or adjust to, the surroundings, situation or environment; to place with the most important parts facing in certain directions; to set or arrange in a determinate position.

Owner

Person having the right of legal title or beneficial interest in or a contractual right to buy a parcel of land. For providing notices required by this code, the owner is the person who last paid taxes on any parcel as identified by county property tax records.

Parapet

Low wall or railing built along the edge or roof or a floor.

Parcel

Legally described area of land consisting of one or more lots, depending on the context where the term is used.

Park

A Civic Space type that is a natural preserve available for unstructured recreation.

Parking Lot

Off-street parking area or vehicular use area.

Paved Area

Area surfaced with asphalt, concrete or similar all-weather surface, not including gravel.

Pedestrian Shed

An area that is approximately ¼ mile in radius which translates into a comfortable 5-minute walk for most pedestrians. It is generally used as a neighborhood unit size to provide access to most daily needs and may be centered on a Common Destination.

Pedestrian Way

Right-of-way dedicated to public use that cuts across a block to allow pedestrian access to adjacent streets and properties.

Permanent Foundation

Exterior wall and necessary support columns or piers designed to support a building for the usable life of that structure. The exterior wall of a permanent foundation shall conform to foundation standards of the building code.

Person

Includes the words individual, partnership, firm, corporation, association, governmental body and other legal entities, or their agent.

Pilaster

Square column, partly built into, but partly projecting from a wall.

Planned Unit Development (PUD)

Residential, manufactured housing, or commercial subdivision, guided by a total design plan where certain zoning or subdivision regulations, other than use regulations, may be waived or varied to allow flexibility and creativity in site and building design and location, in conformance to general guidelines.

Planning and Zoning Commission

Planning and Zoning Commission of the City of Hutto, Texas.

Planter

The element of the Public Frontage which accommodates street trees, whether continuous or individual.

Plaza

A Civic Space type designed for Civic purposes and Commercial activities, generally paved and spatially defined by building Frontages.

Porous Pavement

Durable surface allowing easy passage of water through interstices or pores. Porous pavement includes segmental unit pavers, Turfstone™, Turfblock™, and similar concrete products.

Portico

Colonnade or covered ambulatory at the entrance to a building.

Preliminary Plat

Map of a proposed land subdivision showing the character and proposed layout of the property in sufficient detail to show the subdivision's suitability.

Primary Building

Building or structure on a lot used to accommodate the primary permitted use, the use possibly occurring in more than one building or structure.

Principal Building

The main building on a Lot, usually located toward the Frontage. (See building form standards).

Principal Entrance

The main point of access for pedestrians into a building.

Private Frontage

The privately held area between the Frontage Line (property line) and the Principal Building Facade.

Property Line

Line bounding a parcel that divides one parcel from another or from a street or other public or private space (same as "lot line").

Public Facilities

Transportation systems or facilities, parks and recreation and/or natural area program systems or facilities, water systems, wastewater systems, storm drainage systems, fire, police and emergency systems or facilities, electric utilities, gas utilities, cable facilities or other public utilities.

Public Frontage

The area between the Curb of the vehicular lanes and the Frontage Line.

Public Use

Uses intended to be conducted in a facility or on land owned by and operated for public use by a public agency or by city, county, state or federal governments.

Public Way

The surface of, and the space above and below, a public street, road, highway, freeway, land path, right-of-way or place, alley court, boulevard, parkway, or other easement now or hereafter held by the City (including any street as defined, which is acquired by eminent domain) for the purpose of public travel and shall include other easements or rights-of-way now or hereafter held by the City or in which the City has an interest including any easements or rights-of-way acquired by eminent domain) which shall, with their proper use and meaning, entitle the City and a utility to use thereof for the purpose of installing facilities, and other property as may ordinarily be necessary and pertinent to a utility system.

Quoin

Selected pieces of material marking the building corner. In stone, the quoins consist of blocks larger than those used in the rest of the building, and cut to dimension. In brickwork, quoins consist of groups or masses of brick laid together, and in a certain imitation of quoins of stone. With EIFS (Exterior Insulation Finish System), quoins are trim details with the appearance of corner stones.

Rearage Road

Minor street or access road next to an arterial route, at the rear of a parcel, intended to control access to an arterial route, connect contiguous parcels, and give access to parcels without curb cuts on the arterial route.

Reconstruction

The reproduction of a building to the extent it completely replaces the previously existing structure.

Reflective Surface

Material or device with the effect of intensifying reflected light, such as highly polished metal, scotch light, day glow, glass beads, and luminous paint.

Regulating Plan

A Map or set of maps that shows the details of the , Civic/open spaces, and Special Requirements if any, including lots and blocks and street designations within the Old Town District or any Smart Code District.

Restoration

Restoring a building as closely as possible to its original site during a specific time in history.

Reveal

Side of an opening for a window, doorway, or the like, between the door frame or window frame and the outer surface of the wall, or where the opening is not filled with a door.

Right-Of-Way

Strip of land occupied or intended for occupancy by street, walkway, railroad, electric transmission line, or oil or gas pipeline, water main, sanitary or storm sewer main, or for other similar purpose or use.

Right-Of-Way, Public

Right of way permitting the public to travel over it, such as a street, sidewalk, or footpath.

Roof Pitch

The amount of slope of the roof in terms of angle or other numerical measures.

Sash

Window framework where glass panes are set.

Sense Of Place

Collection of elements in the built and natural environment adding up to a feeling that a certain geographic area or community is a special place, distinct from anywhere else. Sense of place is a factor making an environment familiar and psychologically comfortable.

Services

Programs and employees necessary to provide adequate operation and maintenance of its public facilities and infrastructure, including educational, health care, social and other programs necessary to support the programs, public facilities and infrastructure required by this code, the Code of Ordinances, policies and administrative manuals, or state or federal law.

Setback

Distance measured perpendicular (90°) from a property line or right-of-way line to a building Facade or Elevation that is maintained clear of permanent structures, with the exception of permitted Encroachments. A setback is separate and distinct from, but is usually included within, a yard, as that term is defined in this Code.

Shopfront

A Private Frontage conventional for commercial use, with substantial glazing and an awning, wherein the Facade is aligned close to the Frontage Line with the building entrance at Sidewalk grade.

Shopping Center

See “Commercial center or shopping center”.

Sidewalk

The paved section of the Public Frontage dedicated exclusively to pedestrian activity.

Sign

Device or structure used to advertise, identify or direct attention to an object, person, institution, business, product, service, event or location by any way;

including words, designs, symbols, fixtures, colors, illumination, images and forms.

Sign, Attached

Sign partially or wholly supported by a building wall or roof.

Sign Face Area

Area of the smallest rectangle enclosing the extreme limits of the sign message, frame, box, and other areas intended to highlight or draw attention to the sign message. Back-to-back faces separated by at least a 30° angle are counted separately in measuring sign area.

Sign Height

Distance from the sidewalk grade to the top of the sign.

Slope

Vertical change in grade divided by the horizontal distance over where that vertical change occurred. Slope is usually given as a percentage.

Solar Power

The conversion of sunlight into electricity or energy either directly through photovoltaics or indirectly through concentrated solar power.

Special Requirements

Provisions in the OT and FBC Districts and/or the associated designations on a Regulating Plan or other map for those provisions.

Stoop

A Private Frontage wherein the Facade is aligned close to the Frontage Line with the first Story elevated from the Sidewalk for privacy, with an exterior stair and landing at the entrance.

Story

A habitable level within a building, excluding an Attic or raised basement. The part of a building from one floor to the next floor above or to the ceiling if there is no floor above.

Street Line

Line limiting the right-of-way of the street with the property line of lots fronting on the streets.

Street Tree

Tree in the public right-of-way or tree lawn bordering the streets or trails of the city.

Structure

Combination of materials forming a construction for use, occupancy or ornamentation.

Subdivision (Noun)

Parcel divided or proposed for division into two or more lots, tracts, or parcels.

Subdivision (Verb)

Legally dividing a parcel of land into two or more smaller lots, tracts, or parcels.

Swale

A low or slightly depressed natural area for drainage.

Textured Pavement

Pavement in the form of brick, paver blocks, or textured and colored concrete.

Thoroughfare

A way for use by vehicular and pedestrian traffic and to provide access to Lots and Open Spaces, consisting of Vehicular Lanes and the Public Frontage.

Time Of Significance

Time when a property attained the significance for which it now meets the designation criteria for an historic landmark district designation.

Tract

Parcel not indented for residential, commercial, or industrial occupancy. Tracts are intended as sites for subdivision entry features, commonly owned landscape areas, commonly owned private open space, utility substations, detention and retention ponds, and similar features.

Transparency

Building wall length occupied by functioning doors and/or windows.

Tree

Self-supporting woody plant species which normally grows to an overall height of at least 15 ft.

Tree Lawn

Area between the street and the sidewalk, or where no sidewalk exists, the area inside a 10 ft. distance away from the edge of the street. Also known as a “grass plot,” “boulevard strip,” “planting strip,” “nature strip” or “devil’s strip”.

Urbanism

Collective term for the condition of a compact, Mixed-Use settlement, including the physical form of its development and its environmental, functional, economic, and sociocultural aspects.

Vested Development Right

Right to undertake and complete development and use of property.

Waterway

Natural or man-made channel conducting storm water from a two-year storm event at a depth of 8" or more and at a rate of at least 15 cu. ft. per second or more. Street pavement is not considered a waterway.

Watershed

Area from which stormwater drains into a given basin, river or creek.

Wayfinding Sign

Refers to non-commercial directional signs and information systems that are usually created by local government entities to guide people through a city or a region to major destinations, districts, and locations. Signs may be placed on private property or in the right-of-way.

Where Possible

That the proposal shall conform to a rule unless the applicant shows it is not physically possible because of topography, sight line rules, existing trees, utilities, drainage standards, access standards or other physical constraints.

Wireless Service

Telecommunications services including cellular telephone, personal communications service (PCS), specialized mobile radio (SMR), enhanced specialized mobile radio (ESMR), paging, wireless broadband Internet service (excluding Wi-Fi), and similar services.

Xeriscape

Plants not requiring supplemental irrigation for survival once established.

Yard

Open area on a building lot along the lot lines. A yard shall be unobstructed from the lowest level to the sky, except certain permitted obstructions.

Yard, Front

Area on a parcel between a structure and the right-of-way or private street boundary line. For a corner lot, any yard extending along the full length of a street line is considered the front yard.

Yard, Rear

Area on a parcel between a structure and the property boundary opposite of the front lot line. For a corner lot, there is only one rear yard, placed to the rear of the building.

Yard, Side

Area on a parcel between a structure, front yard and rear yard. For a corner lot, there is only one side yard, placed to the side of the building perpendicular to the building front façade, which is next to another property and not the right-of-way or private street.

Appendix A. Landscape Plant List

10.101. Landscaping Plant List

The following plant list, maintained by the Director of Development Services, includes species approved for use under the landscape ordinance. Selections are based on key performance factors such as adaptability to local climate and soil conditions, drought, heat, and cold tolerance, disease resistance, and long-term viability. The applicant or their team should further consider light, soil volume, visual appeal and other contextual elements of the planting location to select the correct plant materials for the project.

Below are the plants considered most desirable for planting areas within the City of Hutto. Native cultivars and dwarf varieties are permitted. For details regarding exceptions or substitutions, refer to the landscape ordinance. Additional planting materials may be considered and approved by the Director of Development Services.

10.101.1. Canopy Trees

Bur Oak (*Quercus macrocarpa*)
Cedar Elm (*Ulmus crassifolia*)
Chinkapin Oak (*Quercus muehlenbergii*)
Eastern Black Walnut (*Juglans nigra*)
Kentucky Coffeetree (*Gymnocladus dioica*)
Live Oak (*Quercus virginiana*)
Lacey Oak (*Quercus laceyi*)
Post Oak (*Quercus stellata*)
Pecan (*Carya illinoensis*)

10.101.2. Ornamental Trees

Bigtooth Maple (*Acer grandidentatum*)
Eastern Redcedar (*Juniperus virginiana*)
Eastern Redbud (*Cercis canadensis*)
Elderberry (*Sambucus nigra* ssp. *canadensis*)
Eve's Necklance (*Sophora affinis*)
Flameleaf Sumac (*Rhus lanceolata*)
Fragrant Sumac (*Rhus aromatica*)
Gum Bumelia (*Sideroxylon lanuginosum*)
Honey Mesquite (*Prosopis glandulosa*)
Mexican Buckeye (*Ungnadia speciosa*)
Mexican Plum (*Prunus mexicana*)
Mexican Redbud (*Cercis canadensis* var. *mexicana*)

Possumhaw Holly (*Ilex decidua*)
Red Buckeye (*Aesculus pavia*)
Roughleaf Dogwood (*Cornus drummondii*)
Rusty Blackhaw Viburnum (*Viburnum rufidulum*)
Texas Persimmon (*Diospyros texana*)
Texas Redbud (*Cercis canadensis* var. *texensis*)
Western Soapberry (*Sapindus saponaria* var. *drummondii*)
Yaupon Holly (*Ilex vomitoria*)

10.101.3. Native Shrubs

Agarita (*Mahonia trifoliolata*)
Aromatic Sumac (*Rhus aromatica*)
Autumn Sage (*Salvia greggii*)
Barbados Cherry (*Malpighia glabra*)
Buttonbush (*Cephalanthus occidentalis*)
Cenizo (*Leucophyllum frutescens*)
Chile Pequin (*Capsicum annuum* var. *glabriusculum*)
Compact Cherry Laurel (*Prunus caroliniana* 'Compacta')
Coralberry (*Symphoricarpos orbiculatus*)
Drift Rose (*Rosa Hybrida* 'Drift')
Dwarf Yaupon Holly (*Ilex vomitoria*)
Fall Aster (*Symphyotrichum oblongifolium*)
Flame Acanthus (*Anisacanthus quadrifidus*)
Elbowbush (*Forestiera pubescens*)
Mexican Oregano (*Lippia graveolens*)
Oregano (*Origanum vulgare*)
Prostrate Rosemary (*Salvia rosmarinus* 'Prostratus')
Southern Dewberry (*Rubus trivialis*)
Turks Cap (*Malvaviscus arboreus*)
Texas Lantana (*Lantana urticoides*)
White Mistflower (*Ageratina havanensis*)

10.101.4. Grasses, Sedges, Rushes

Bamboo Muhly (*Muhlenbergia dumosa*)

Big Bluestem (*Andropogon gerardii*)
Big Muhly (*Muhlenbergia lindheimeri*)
Blue Grama (*Bouteloua gracilis*)
Bushy Bluestem (*Andropogon glomeratus*)
Common Rush (*Juncus effusus*)
Eastern Gamagrass (*Tripsacum dactyloides*)
Grassleaf Rush (*Juncus marginatus*)
Gulf Muhly (*Muhlenbergia capillaris*)
Horsetail Reed (*Equisetum hyemale*)
Inland Sea Oats (*Chasmanthium latifolium*)
Little Bluestem (*Schizachyrium scoparium*)
Mexican Feathergrass (*Nassella tenuissima*)
Pine Muhly (*Muhlenbergia dubia*)
Plains Bristlegrass (*Setaria vulpiseta*)
Prairie Wildrye (*Elymus canadensis*)
Sedge (*Carex*, all)
Sideoats Grama (*Bouteloua curtipendula*)
Switchgrass (*Panicum virgatum*)
Tall Dropseed (*Sporobolus compositus*)
Texas Rush (*Juncus texanus*)
Texas Sedge (*Carex texensis*)
Torrey's Rush (*Juncus torreyi*)
Virginia Wildrye (*Elymus virginicus*)
Webberville Sedge (*Carex perdentata*)

10.101.5. Flowers

American Germander (*Teucrium canadense*)
Black-eyed Susan (*Rudbeckia hirta*)
Blue Curls (*Phacelia congesta*)
Blue Mistflower (*Conoclinium coelestinum*)
Butterfly Weed (*Asclepias tuberosa*)
Canada Goldenrod (*Solidago canadensis*)
Cardinal Flower (*Lobelia cardinalis*)

Cutleaf Daisy (*Engelmannia peristenia*)
Fall Obedient Plant (*Physostegia virginiana*)
False Dayflower (*Tinantia anomala*)
Firewheel (*Gaillardia pulchella*)
Flame Acanthus (*Anisacanthus quadrifidus* var. *wrightii*)
Four Nerve Daisy (*Tetranneuris scaposa*)
Frostweed (*Verbesina virginica*)
Gayfeather (*Liatris mucronata*)
Giant Coneflower (*Rudbeckia maxima*)
Globe Amaranth (*Gomphrena haageana*)
Golden Groundsel (*Packera obovata*)
Golden-Wave (*Coreopsis basalis*)
Gray Goldenrod (*Solidago nemoralis*)
Gulf Penstemon (*Penstemon tenuis*)
Halberdleaf Hibiscus (*Hibiscus laevis*)
Heartleaf Skullcap (*Scutellaria ovata*)
Illinois Bundleflower (*Desmanthus illinoensis*)
Lanceleaf Coreopsis (*Coreopsis lanceolata*)
Lemon Beebalm (*Monarda citriodora*)
Marsh Fleabane (*Pluchea odorata*)
Meadow Garlic (*Allium canadense* var. *mobile*)
Mealy Blue Sage (*Salvia farinacea*)
Mexican Bush Sage (*Salvia leucantha*)
Mexican Hat (*Ratibida columnifera*)
Mexican Honeysuckle (*Justicia spicigera*)
Missouri Violet (*Viola sororia*)
Narrowleaf Mountain Mint (*Pycnanthemum tenuifolium*)
Peppergrass (*Lepidium virginicum*)
Pink Evening Primrose (*Oenothera speciosa*)
Plains Coreopsis (*Coreopsis tinctoria*)
Prairie Goldenrod (*Solidago nemoralis*)
Prairie Paintbrush (*Castilleja purpurea*)
Prairie Verbena (*Glandularia bipinnatifida*)

Purple Coneflower (*Echinacea purpurea*)
Rock Rose (*Pavonia lasiopetala*)
Sleepy Daisy (*Xanthisma texanum*)
Spiderwort (*Tradescantia occidentalis*)
Swamp Milkweed (*Asclepias incarnata*)
Swamp Sunflower (*Helianthus angustifolius*)
Tahoka Daisy (*Machaeranthera tanacetifolia*)
Texas Bluebells (*Eustoma exaltatum* ssp. *russellianum*)
Texas Bluebonnet (*Lupinus texensis*)
Texas Lantana (*Lantana urticoides*)
Texas Prairie Parsley (*Polytaenia texana*)
Winecup (*Callirhoe involucrata*)
White Avena (*Geum canadense*)
Whiteleaf Mountain Mint (*Pycnanthemum albescens*)
White Prairie Rose (*Rosa foliolosa*)
Winecup (*Callirhoe involucrata*)
Yarrow (*Achillea millefolium*)

10.101.6. Xeric Accents

Prickly Pear (*Opuntia engelmannii* var. *lindheimeri*)
Red Yucca (*Hesperaloe parviflora*)

10.101.7. Vines

Alamo Vine (*Merremia dissecta*)
Bracted Passionflower (*Passiflora affinis*)
Coral Honeysuckle (*Lonicera sempervirens*)
Heartleaf Peppervine (*Ampelopsis cordata*)
Pearl Milkweed Vine (*Matelea reticulata*)
Southern Dewberry (*Rubus trivialis*)
Texas Wisteria (*Wisteria frutescens*)
Trumpet Vine (*Campsis radicans*)
Virginia Creeper (*Parthenocissus quinquefolia*)

10.101.8. Groundcovers

Bigfoot Water Clover (*Marsilea macropoda*)
Carolina Ponysfoot (*Dichondra carolinensis*)
Horseherb (*Calyptocarpus vialis*)
Mint (*Mentha spicata*)
Prostrate Oregano (*Origanum vulgare humile*)
Silver Ponysfoot (*Dichondra argentea*)
Texas Frogfruit (*Phyla nodiflora*)
Wooly Stemodia (*Stemodia lanata*)
Yellow Puff (*Neptunia lutea*)

10.101.9. Lawn Grass

Buffalograss (*Bouteloua dactyloides*)
Blue Grama (*Bouteloua gracilis*)
Curly Mesquite (*Hilaria belangeri*)

10.102. Plants Not Allowed

The following is a list of plant materials considered invasive or otherwise nuisance plants in the City of Hutto and their use should be avoided.

10.102.1. Nuisance Plants

Arizona Ash (*Fraxinus velutin*)
Bamboo (all running types)
Bradford Pear (*Pyrus calleryana* 'Bradford')
Chinese Tallow (*Triadica sebifera*)
Hedera (all)
Johnson Grass (*Sorghum halepense*)
Ligustrum (all)
Nandina (all)
Privet (all)
Photinia (all)
Pyracantha (all)
Saint Augustine

HUTTO ENGINEERING DESIGN MANUAL

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DIVISION A

GENERAL REQUIREMENTS & PROCESS

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Section 1. GENERAL REQUIREMENTS

1.1. PURPOSE

- (a) These standards are hereby adopted as the “Engineering Design Manual,” which shall be in full force and effect from and after the effective date of adoption of the Engineering Design Manual.
- (b) The purpose of the Engineering Design Manual is to protect the health, safety, and welfare of the public by establishing standard engineering practices and minimum engineering construction and design criteria for the City of Hutto (City), Texas, and its extraterritorial jurisdiction (ETJ). These standards shall be used by the Engineering Department, Department of Public Works and other City Departments, Consulting Engineers employed by the City, and Engineers for private developments in the City of Hutto and its extra-territorial jurisdiction as well as for plat approval, issuance of building permits, issuance of earthwork permits, approval of construction plans, site plan approval, and for other construction within public rights-of-way and easements. All projects shall meet applicable state and federal requirements.

1.2. INTERPRETATION

- (a) In the interpretation and application of the provisions of these regulations, it is the intention of the City that the principles, standards, and requirements provided for herein shall be minimum requirements for the design of both public and municipal capital projects in the City and its ETJ. The Engineer of Record (Engineer) is expected to meet all City, State, and Federal ordinances and regulations. The Engineering Design Manual contains City-specific criteria. Where other City, State, Federal, or other jurisdiction regulations are more restrictive than the Engineering Design Manual, such other ordinances or regulations shall govern.
- (b) The City has adopted various ordinances, master plans, policies, and documents that address requirements not explicitly included in the Engineering Design Manual. The Engineer is responsible for requesting additional City requirements, such as corridor specific or Planned Unit Development (PUD) master plans, which may not be addressed in this manual. The Engineer is responsible for understanding and complying with the City’s various ordinances and master plans.

1.3. ENFORCEMENT

- (a) The City’s Engineering Design Manual is issued by the Engineering Department. The Engineering Department is hereby authorized to enforce the provisions of the Engineering Design Manual. The standards and any updates will be available on the City’s website.
- (b) The Engineering Design Manual shall be in full force and effective immediately upon being filed with the City Secretary. Projects will be required to comply with all requirements. The Engineering Design Manual includes the various design criteria which are considered minimum requirements for the design of adequate public

facilities within the City. The Engineer shall bear the sole responsibility for meeting the Engineering Standard of Care for all aspects of the design and providing a design that is required by the site-specific conditions and intended use of the facilities while, at a minimum, meeting the City's design and construction requirements.

1.4. UNDERGROUND UTILITY LINES

Utilities are to be located in public rights-of-way or easements as shown in the Utility Assignments details. The City Engineer shall determine the location of utilities where special circumstances prevent the standard assignments from being used.

1.5. GENERAL NOTES

All construction plans shall contain the applicable General Notes per the City's Website.

1.6. STANDARD DETAILS

All construction plans shall contain the applicable details per the City's Website.

1.7. PLATS

All plats shall use all applicable portions of the Standard Owner's Certificate shown in the UDC. Plats shall graphically show all easements to be dedicated or indicate that easements will be dedicated by separate instrument.

1.8. BENCHMARKS

1.8.1. HORIZONTAL CONTROL

The plat shall identify no less than two (2) perimeter monuments, either found or set, upon which plan coordinate values have been determined and shown in the coordinate system required by this manual. The coordinate positions shown shall be tied to at least two (2) of the City's control monuments and these shall be indicated on the plat. If coordinate positions are derived independently from the City's control network, the method used to establish stated positions shall be indicated in the plat and the metadata submitted as well.

1.8.2. VERTICAL CONTROL

Elevations shall be referenced to the datum specified in this manual.

1.9. RECORD DRAWINGS

1.9.1. RECORD DRAWINGS

"As-Built Drawings" are required to be submitted for all projects to be accepted by the City of Hutto. Record drawings shall indicate all supplied material to make the system(s) operational. Record drawings are a final record of what was actually installed and shall include all deviations or changes from the approved plans. Record drawings shall reflect the same degree of precision and detail as the original plans. During the construction phase of the project, the Contractor/Developer of the project shall maintain one set of full-size plans for record drawings at the construction site. The contractor's superintendent or authorized representative shall update the plans with record information on an as needed basis. This information shall include the final locations of all new

materials incorporated into the work and all existing improvements encountered during construction as well as the actual depths of utilities at a spacing not to exceed one hundred (100) feet. Upon completion of construction, the record information shall be provided to the City. As-built changes to the text: invert elevations, dimensions, notes, etc., will be lined out with the record drawing text placed near it. Do not alter, modify or erase the original approved construction drawing text. Record drawings shall be submitted in both “.pdf” and “.dwg” format for all projects that include any public infrastructure to be accepted, owned, and/or maintained by the City.

1.10. VARIANCE REQUESTS

A formal request for any variance to the requirements of this design manual may be submitted in writing to the City Engineer for consideration. A variance to the requirements of this manual, standard details, general notes and related documents may not be granted unless the variance:

- (a) Is not detrimental to public welfare;
- (b) Does not adversely impact the public facility(s) in question;
- (c) Is supported by a signed and sealed engineering analysis performed by a Professional Engineer licensed in the State of Texas;
- (d) Is not based solely on financial interests;
- (e) Preserves the aesthetics of the community;
- (f) Does not adversely impact the life expectancy and maintenance costs of the infrastructure;
- (g) Does not create a potential danger to life and/or property;
- (h) Does not create threats to public safety, increase public expense or create a nuisance;
- (i) Does not conflict with state or federal laws or regulations;
- (j) Does not conflict with any City Ordinance or requirement other than the requirements of this manual or the related standard details and general notes;
- (k) Does not increase the susceptibility of the proposed or existing facility, its contents or surrounding property to damage;
- (l) Does not result in increased flood heights, create erosive velocities, increase the frequency or duration of flooding, or create other adverse impacts to other property unless the adverse impact is approved by the affected property owner and the City Engineer, and documentation of this approval is provided on a form approved by the City Attorney;
- (m) Preserves or expands natural floodplain, greenbelts and associated buffer areas of aesthetic and/or environmental value;
- (n) Preserves adequate buffer distances to development and infrastructure from areas of potential flooding or erosion;
- (o) Does not decrease the safety of access to the property or facilities for ordinary and emergency vehicles;

- (p) Is the only available and suitable location for the proposed facility;
- (q) Does not increase the cost of providing governmental services, including maintenance and repair of public infrastructure for streets, bridges, storm sewer and channels, water, sanitary sewer, gas, electrical, telephone and other public facilities;
- (r) Does not impede or interfere with the preservation of the historical character of any structures or sites listed on the National Register of Historic Places or the State Inventory of Historical Places; and,
- (s) Is the minimum variance necessary to afford relief.

Section 2. PLANS AND SPECIFICATIONS

2.1. PLANS AND SPECIFICATIONS

The plans and specifications for projects shall be signed and sealed by a licensed professional engineer licensed in Texas. Water and wastewater facilities and street and drainage facilities shall be on plan and profile sheets. Plans shall either be accompanied by a separate specifications document or shall clearly reference the specifications within the drawings. Additionally, plans shall clearly reference and demonstrate compliance with the City of Hutto Standards, City of Hutto Unified Development Code (UDC), or other applicable design guidance. The City of Hutto standard details are available on the City's webpage. The engineer signing and sealing the plans shall be responsible for the applicability of the information contained in this manual to the design of the project. The engineer shall also be responsible for the applicability and accuracy of the information furnished in their design. Acceptance by the City of the study or plans for construction shall not be construed to relieve the engineer of any responsibility nor release the project from complying with all rules and regulations. The plans and specifications shall be presented in a manner which provides for a timely and efficient review.

Section 3. CONSTRUCTION

3.1. AUTHORIZATION

A project will not be authorized to start construction until the formal issuance of a subdivision or site development permit. The contractor shall schedule a pre-construction meeting with the City prior to the commencement of construction. The scheduling of this meeting requires the submittal of all preconstruction paperwork. Incomplete packages will not be accepted. A site/subdivision may request an early Grading Permit prior to the issuance of a subdivision or site development permit for early grading and erosion controls in accordance with this manual and the UDC.

3.2. CHANGES

During the construction of a project, if the contractor or design engineer desires to make formal changes to the approved plans, the design engineer of record shall submit the proposed revisions to the City Engineer for review and approval prior to the commencement of any revised work in accordance with this manual and the UDC.

3.3. QUALITY CONTROL AND CONSTRUCTION MATERIAL TESTING REQUIREMENTS

3.3.1. REFERENCES AND REQUIREMENTS

- (a) All construction material testing shall be performed by an independent testing laboratory, certified by the appropriate agency for the field of testing being conducted and supervised by a Licensed Texas Professional Engineer in good standing. All testing shall be performed in accordance with generally accepted standards, including:
 - (1) Rules and Regulations published by the Texas Commission on Environmental Quality (TCEQ)
 - (2) American Society of Testing Materials (ASTM)
 - (3) American Concrete Institute (ACI)
 - (4) The Asphalt Institute
 - (5) Texas Department of Transportation Standard Specifications
- (b) Testing laboratories shall be hired by the project owner or project engineer and contracts shall avoid conflicts of interest.
- (c) For City projects, the costs of initial tests may be borne by the City or may be a part of the construction contract. When initial tests indicate noncompliance with the contract documents, the cost of subsequent retesting and laboratory technician time shall be borne by the contractor. The costs of inspections or testing performed exclusively for the contractor's convenience or information shall be borne by the contractor.

- (d) The City shall be copied on all testing reports for public projects. Testing reports shall be completed and submitted to the City within a week of the test and signed by a licensed Texas Professional Engineer in good standing.
- (e) It is the responsibility of the contractor to provide written notification forty-eight (48) hours ahead of construction activity to the City inspector to allow for scheduling for testing.
- (f) All retests of failed densities shall be taken at one (1) density per every two hundred (200) feet of the failed test area.
- (g) Moisture content on all soil density tests shall be within plus or minus three percent (3%) to achieve a passing test for PI less than twenty (20), and plus three (3) minus zero (0) for PI higher than twenty (20), unless approval is granted by the City Engineer based upon site-specific testing.
- (h) Independent testing laboratories are not authorized to revoke, modify, or release any requirement of the specifications, and they may not approve or accept any portion of work on a project. When it appears that the material furnished or work performed fails to meet the contract document requirements, the testing laboratory shall promptly inform the City, in writing or by electronic mail, of such deficiencies.

3.4. FINAL ACCEPTANCE

A project will not be considered for final acceptance by the City of Hutto until the following items are completed.

- (a) A final walkthrough is conducted, and all subsequent punch list items are satisfactorily completed. Final walkthroughs will not be conducted until all dry utilities are completed.
- (b) Record drawings are submitted to the City of Hutto.
- (c) An Engineer's Concurrence Letter is submitted to the City of Hutto.
- (d) A two (2) year warranty bond in the amount of one hundred percent (100%) of all public infrastructure construction costs for the project is submitted to the City of Hutto.
- (e) Acceptance letters from all other applicable entities (Travis County, Williamson County, Utility Districts, etc.) or letters indicating all outstanding items for acceptance have been completed.
- (f) Copy of the contractor's final pay application for all associated public infrastructure constructed with the project.
- (g) Documentation verifying that all applicable items have been inspected by TDLR or a registered accessibility specialist (RAS) and that the project is in compliance with the requirements of the Texas Architectural Barriers Act (TABAA) and/or Public Rights-of-Way Access Guidelines (PROWAG) as applicable.
- (h) All retests of failed densities shall be taken within five (5) linear feet of the failed test.

- (i) Moisture content on all soil density tests shall be within plus or minus two percent (2%) to achieve a passing test unless approval is granted by the City Engineer based upon site-specific testing.
- (j) Independent testing laboratories are not authorized to revoke, modify, or release any requirement of the specifications, and they may not approve or accept any portion of work on a project. When it appears that the material furnished or work performed fails to meet the contract document requirements, the testing laboratory shall promptly inform the City, in writing or by electronic mail, of such deficiencies.
- (k) Deed recorded maintenance plan for post-construction stormwater structural control(s) per City ordinance 24.08.014, as applicable.

3.5. CONSTRUCTION PLANS

3.5.1. GENERAL

- (a) Construction plans for water and/or wastewater installation, drainage, and other improvements associated with development shall be submitted to the Development Services Department for acceptance.
- (b) If the provider of service is a Municipal Utility District (MUD), Water Control and Improvement District (WCID) or private utility corporation, then prior approval by the service provider is also required.
- (c) Plans submitted shall show approved easements and/or permits on highway and/or railroad crossings.
- (d) A signature on the plans by the City Engineer or their respective designee constitutes acceptance of the plans.
- (e) Plans associated with a site development shall have the approval of Williamson County Emergency Services District # 3 (WESD) and the City Engineer.
- (f) All Construction Plans will include the following items:
 - (1) Engineer's dated signature and seal of a Professional Engineer licensed in the State of Texas on each plan sheet.
 - (2) Date of plans and revisions.
 - (3) North arrow and scale shall be shown. The standard horizontal scale shall be 1" = 50', 40', 20', or 10' (plan view) with respective vertical scale 1" = 5', 4' or 2', or 1' (profiles). Scales used on each plan and profile sheet shall be the same. For sheets other than plan and profile, a horizontal scale of 1" = 50', 40', 20', or 10' may be used as appropriate. The City Engineer may require a larger scale be used for plan and profile sheets, or a large-scale blowup of a particular area.
 - (4) A general location map.
 - (5) Standard Applicable City Construction notes.

- (6) Indicate on cover sheet all required permit numbers such as development permit, Texas Department of Transportation (TxDOT) permit, railroad crossing permit, etc. The project name shall be along the top right-hand border, reading from the bottom of the sheet to the top of the sheet.
- (7) Volume and page number of recorded easements and any temporary working space/easements.
- (8) Size, pipe material and location of main with respect to easements, rights-of-way, and property lines.
- (9) Property lines and dimensions, legal description, lot and block numbers, right-of-way dimensions, curbs, sidewalks, pavements, power poles, trees, and other plan metric features, locations, and street names.
- (10) Water and wastewater plans shall include the location, vertical and horizontal, size and material of all existing water and wastewater mains, lines, and services. The direction of flow in the wastewater mains shall also be indicated.
- (11) Water and wastewater plans shall include the location, vertical and horizontal, size and description of other utilities where they may conflict with water or wastewater mains, or other service lines shall be shown in both the plan and the profile.
- (12) Curve data for roads, property lines, and water and wastewater lines.
- (13) Final plat recording or land status report.
- (14) The Street address for all existing structures shall be shown on the lot(s) where the structures are located.
- (15) Any and all other City requested information, either by City staff or through the City website.
- (g) The following items may be required prior to plan acceptance, including but not limited to the following:
 - (1) TxDOT permit
 - (2) Railroad permit
 - (3) Gas Company permit
 - (4) Easement Acquisition, with volume and page or document number shown on plans
 - (5) County Approval
 - (6) Water District Approval
 - (7) MUD approval
 - (8) Texas Department of Health (TDH) approval
 - (9) Texas Commission on Environmental Quality approval

- (10) Non-occupancy letter
- (11) Service Extension Approval

3.6. FINAL INSPECTION & ACCEPTANCE OF PROJECTS

3.6.1. PRECONSTRUCTION INSPECTION PROCEDURE

A City construction inspector will be assigned to each project. Prior to the assignment, the following items shall be submitted:

- (a) Two (2) sets of signed plans are required including one set of 11" x 17" drawings and one full-sized, as well as a digital copy. Also required are two (2) copies of signed contracts (lump sum contracts should include water and wastewater quantities on a developer's or consulting engineer's letterhead), two (2) sets of cut sheets with one (1) copy of field notes and two (2) copies of any permits listed on the front sheet of the plans.
- (b) One (1) copy of the bid tabulation (if the project is bid out) will be required with the above-listed items for all service extensions submitted for construction. All of these required items shall be submitted at the same time. For reviews occurring during the construction phase, three (3) copies of the revised plans are required.
- (c) Prior to the commencement of any construction, the developer or their design engineer shall convene a pre-construction conference between the City, themselves, the Contractor, other utility companies, any affected parties, a testing lab representative, and any other entity the City may require. To set up a Pre-Construction Conference, the developer or their design engineer should contact the Construction Supervisor or another appropriate office. All required documents listed on the preconstruction request form shall be provided to the City, any missing information will delay the pre-construction conference.
- (d) One (1) copy of the signed plans and contracts shall be submitted to the appropriate office at least three (3) working days before the Preconstruction Conference. It shall include the name and phone number of the contact person listed above.
- (e) The contractor shall call the Texas One Call Center for information on existing buried utilities.

3.6.2. CITY ACCEPTANCE

- (a) To obtain final City acceptance of a project, final quantities and cost information, along with the consulting engineer's concurrence for the acceptance form and all other required documents on the final Subdivision or CIP check list, shall be submitted. By ordinance, all subdivision construction is subject to a construction inspection fee. Any outstanding fees, based on final cost figures, shall be paid prior to the pre-construction conference.
- (b) If landscaping and vegetation items are outstanding, a conditional acceptance letter may be issued with the posting of a performance bond. When all work is completed, and all necessary information is provided, a final acceptance letter will be issued.

- (c) If the project includes a lift station, the City cannot accept the subdivision.
- (d) To schedule an after-hours inspection, submit the after-hours inspection request form to the Construction Supervisor:

I am requesting an after-hours inspection(s) for the below-referenced permit. I understand the fee is \$50.00 per hour, per inspector, with a two (2) hour minimum, payable upon inspection request approval. If the inspection exceeds the two (2) hour minimum, a further fee of \$50.00 per hour will be charged in one (1) hour increments the next business day after the inspection. AFTERHOURS INSPECTION APPROVAL IS SUBJECT TO INSPECTOR AVAILABILITY. If the inspection is disapproved, the re-inspection shall be scheduled through a second Inspection Request. Information on the status of the after-hours inspection will only be released to the Permit Holder.

3.7. SURVEY REQUIREMENTS FOR ALL PROJECTS

3.7.1. SUBMITTALS

- (a) For work performed through an engineering service contract with the City, deliver an electronic copy of all field books in a “.tif” or “.pdf” format and an electronic file in standard ASCII format (Point Number, Northing, Easting, Elevation, and Description).
- (b) Both mylar and electronic copies of all contract deliverables are required. Deliverables for a specific contract will be decided on a case-by-case basis.
- (c) For right-of-way drawings identifying or describing acquisition of new or additional rights-of-way, additional documents to be submitted are:
 - (1) Overall map of rights-of-way with individual drawings of the parcels to be acquired and/or new right-of-way identified on overall maps. The overall map and the individual maps shall be on 11” X 17” mylar and shall be signed and sealed by a Texas Registered Professional Land Surveyor. The individual parcels shall be identified by a unique label to enable correlation between the Overall map, individual maps and the metes and bounds description.
 - (2) A Field Note Description (metes and bounds) of all individual parcels.
 - (3) Abstract information and copies of instruments used (i.e., deed) in preparation of the right-of-way maps.
 - (4) Computer printout of parcel coordinate computations and area calculations.
 - (5) An electronic copy of the Overall map and Individual maps in a “.dwg” format compatible with AutoCAD2013 or the current version utilized by the City of Hutto.
 - (6) Other requirements as may be listed in the design contract.

3.7.2. QUALITY ASSURANCE

- (a) Field surveying used in the development of construction drawings, calculations, and preparation of right-of-way maps and field note descriptions shall be performed by or under the direct supervision of a Texas Registered Professional Land Surveyor (hereafter known as a professional surveyor).
- (b) All surveys shall comply with the latest revision of the Professional Land Surveying Practice Act of the State of Texas and the Texas Board of Professional Land Surveying General Rules of Procedures and Practice.
- (c) Field notes, descriptions and right-of-way maps shall have the imprinted or embossed seal of the responsible Professional Surveyor and shall be dated and signed by the Professional Surveyor.
- (d) All surveyors, when establishing horizontal control, shall transcribe onto the pages of a standard Survey Field Book, all angles, distances and observations, at the time of measurement, with an accompanying sketch. When establishing vertical control, the surveyor shall use differential leveling methods and transcribe the vertical data onto the pages of said standard Survey Field Book, with an accompanying sketch.
- (e) Unless otherwise approved by the City of Hutto, all surveys will meet or exceed the current minimum requirements of the Manual of Practice for Land Surveying in the State of Texas, latest revision, for Category 7, Condition II, Horizontal Control Survey and a Category 8, Condition II, Vertical Control Survey, as promulgated by the Texas Society of Professional Surveying.

3.7.3. FIELD WORK

- (a) For engineering contracts funded by or under contract to the City, fieldwork shall be recorded in field books supplemented with total station database or global positioning system printouts as applicable. All surveys shall be referenced to the City of Hutto Construction Standards unless a specific exemption has been granted.
- (b) The horizontal control line shall be monumented at its beginning, end, and at angle points with markers of a semi-permanent nature, such as iron rods, spikes, PK or MAG nails or other lasting identification. Make reference drawings for each control monument showing ties to planimetric features to allow easy recovery. Set markers at a maximum of one thousand (1,000) feet on long lines.
- (c) The existing right-of-way monuments or property corners that are found shall be plainly shown on the plans and located by station and distance, right or left from the horizontal control line. Those monuments that were used to determine the control line shall be identified as “control points,” and their relationship to the control line and to existing and proposed right-of-way lines shall also be shown. Make ties of found right-of-way monuments and property corners to the control line according to the existing Hutto Construction Standards.
- (d) For vertical control, set temporary benchmarks (TBM) within two hundred (200) feet of the beginning and end of the project and at intervals not to exceed one thousand (1,000) feet throughout the project.

- (e) Show centerlines and angles of intersections of side streets with the main roadway centerline station.
- (f) Record topographic features within the public right-of-way, proposed right-of-way, any contiguous easements to the right-of-way, and any construction right-of-way of the project and on intersecting streets for a distance of thirty (30) feet beyond the intersection of the right-of-way lines. Identify all visible underground structures, such as inlets, manholes, and junction boxes, with size, depth, and type.
- (g) Cross sections shall be taken at intervals of no greater than one hundred (100) feet unless otherwise approved by the City. Record elevation of driveways at the intersection of the driveway centerline with existing or proposed right-of-way line. For levels recorded in field books, record rod readings or elevations as the numerator and distance right or left of the base or centerline as the denominator. Data collectors of a total station or global positioning system can be used to acquire necessary elevations at required intervals. GPS survey technology will not be approved for use in surveys for any design or construction purposes where vertical accuracy greater than 0.08 feet is required. GPS survey technology and procedures will not be approved for use in establishing vertical control for project benchmarks.
- (h) For acquisition of new or additional rights-of-way:
 - (1) Set iron rods or permanent markers at the intersections of the proposed right-of-way and property lines of parcels to be acquired.
 - (2) Identify monuments, corners, angle points, points of curve (PCs), points of intersection (PIs), points of tangency (PTs), and other points as either "found" or "set." Describe each point, such as a 5/8-inch iron rod, 3/4-inch iron pipe, axle, concrete marker, disk, or other item of permanent nature.
 - (3) Locate improvements, buildings, fences, permanent signs, and other structures within the parcel or within ten (10) feet of the proposed right-of-way that will influence the value of the parcel to be acquired.

3.7.4. CALCULATIONS

- (a) Calculate coordinates of proposed right-of-way parcels, control points, found or set monuments, curve data, lengths, stations and offsets to monuments, and proposed improvement features. Calculate areas, cross sections, and volumes associated with construction drawings.
- (b) Computer printouts of the coordinate calculations should be submitted to the City with field books and database printout files.

3.7.5. CONSTRUCTION DRAWINGS

- (a) Found existing right-of-way monuments or property corners shall be plainly shown on the drawings and located by station and distance, right or left from the control line, or construction centerline. Monuments used to establish the control line shall be identified as Control Points, and their relationship to the construction centerline and to the proposed or existing right-of-way lines shall be shown. If the project is dimensioned from a control line, such as construction or design baseline, which is

different than the control line referenced in paragraph 2.07, it shall be established and monumented in accordance with the requirements of paragraph 2.07. Coordinates for traverse control points and all points of curve, points of tangency, and points of intersection along the design baseline shall be shown and expressed in grid values to facilitate addition to the City's GIS system.

- (b) Show location and identification of existing City survey monuments, right-of-way monuments, and found property corners by station and distance, right or left of control line or design centerline or by bearing and distance to remote points. Show swing ties set for control or centerline control.
- (c) Show and identify the location of survey monuments and temporary benchmarks used for elevation control. List the TBM located closest to that particular sheet in a station/offset, description and elevation format.
- (d) Show centerline angles of the intersection of side streets with the main roadway centerline. Where bearings are used, identify the source of bearings and show bearings on both the control line and project centerline when they are not on the same line.
- (e) Identify locations of manholes, angle points, bends, etc., for proposed wastewater, storm sewers, water lines, and pavement features such as radius returns and centerlines of boulevard openings. Show relationship of proposed improvements to the right-of-way line.
- (f) For bridges, overpasses and underpasses show top of pavement elevations at gutter line and centerline for the following locations:
 - (1) Construction joints
 - (2) Armor or expansion joints
 - (3) Intervals between bents that correspond to the increments used for dead load deflection calculations.
- (g) For bridges and grade separations, drawings shall incorporate layout sheets which identify proposed centerline and curve information plus:
 - (1) Surface coordinates for control points so that an inverse between coordinates reflects a surface distance. Identify the origin of coordinate system used.
 - (2) Show coordinates of centerline or control line at PIs.
 - (3) Show coordinates of curb lines at their intersection with the centerline of bents and abutments for irregular structures.

3.7.6. RIGHT-OF-WAYS MAPS

- (a) Show true "x," "y" values (i.e., grid) on monuments based on the Texas State Plane Coordinate System control and the scale factor used to determine the "x," "y" values. Distances shown shall be surface distances and plainly marked as such. Show ties to the POC or POB of each right-of-way parcel from the survey

monuments using the Texas State Plane Coordinate System bearings and surface distances.

- (b) Distances on proposed right-of-way lines shall be continuous from the beginning to the end of the job. Show either a straight line or arc distance across intersecting streets.
- (c) Where a parcel is taken from a larger tract, show ownership, dimensions, distances, and area of the remainder of the tract based on record information.
- (d) Identify the evidence used to decide the final placement or establishment of the proposed right-of-way line, such as angle points, or corner monuments, as either "set" or "found". The description of each point used shall be shown on the drawing as identified in the field survey.
- (e) Coordinate values of "x," "y" shall be shown for PCs, PTs, and PIs of curves on the proposed right-of-way lines. Curve data shall include the following: delta, radius, arc length, chord length, and chord bearing.
- (f) Coordinate values of "x," "y" shall be given on the POB of at least one tract in each block. Where the proposed right-of-way is to be acquired from a large tract of land, coordinate values should be given for the POB of field note description of the large tract.
- (g) Other information to be shown on right-of-way maps:
 - (1) Improvements such as buildings, fences, permanent signs, and other structures located on the property or within 10 feet outside the right-of-way line that will influence the value of the parcel to be acquired.
 - (2) Abstract information used in preparation of the right-of-way map.
 - (3) Williamson Central Appraisal District identification numbers.

3.7.7. DOCUMENTS

- (a) Where new construction will damage, destroy, or alter existing survey markers, include in the contract specifications a requirement for installation of replacement survey markers by a Texas Registered Professional Land Surveyor.
- (b) Maps and metes and bounds shall have the Professional Surveyor's seal imprinted or embossed on them and shall have the Professional Surveyor's signature and date affixed to the instrument.

3.7.8. SURVEY REQUIREMENTS FOR ALL PROJECTS WITHIN CITY OF HUTTO

- (a) The secondary benchmark horizontal positions shall be certified by a Texas Registered Professional Land Surveyor and shall meet or exceed the current minimum requirements of Category 7, Condition II Horizontal Control Survey as per the Manual of Practice for Land Surveying in the State of Texas, latest revision, as promulgated by the Texas Society of Professional Surveying. All horizontal information shall be referenced to the City Primary Control Monument System and expressed in grid values to facilitate addition to the City's GIS system.

- (b) All secondary benchmark locations shall be referenced to existing monuments of the City Construction Standards, showing a reference line expressed as a bearing in units of degrees, minutes and seconds (DDD mm ss). All distances shall be grid distances expressed in units of feet and all coordinates shall be expressed as grid and referenced to the Texas State Plane Coordinate System, South Central Zone, North American Datum of 1983, current adjustment.
- (c) Secondary benchmarks shall be constructed of a brass disc, 3 inches in diameter, set in concrete as approved by the City of Hutto.
- (d) A separate data sheet shall be drafted clearly identifying the location of the secondary benchmark including a complete description showing at least three (3) references. The data sheet shall show the X and Y coordinates along with the elevation and adjustment data. The X and Y coordinates shall be expressed as true grid coordinates. A sample data sheet is provided at the end of this Chapter. An electronic copy of the data sheet will also be provided to the City. All survey data sheets shall be signed and sealed by a registered professional surveyor with contact information listed.
- (e) The construction plans shall clearly identify the location of the secondary benchmark to be installed and shall include a complete description, coordinates and elevation, with adjustment data, of the secondary benchmark.

Section 4. GIS AND AUTOCAD STANDARDS

4.1. GIS AND AUTOCAD STANDARDS & DATA REQUIREMENTS

4.1.1. GIS COORDINATE SYSTEM & PROJECTIONS

All GIS information shall be provided in the following coordinate system:

- (a) Coordinate system: NAD 1983 State Plane Texas South Central
- (b) FIPS 4204 Feet
- (c) Geographic Coordinate System: GCS_North_American_1983
- (d) Datum: D_North_American_1983
- (e) WKID: 2278
- (f) Grid Units
- (g) Projection: Lambert Conformal Conic

4.1.2. MINIMUM INFORMATION REQUIREMENTS

GIS files shall contain, at minimum, the information provided below for construction plans and plats. Additional layers or information may be required based on the complexity of the project and the work completed. These additional layers will be identified and requested by either the Engineering Department or the GIS department.

- (a) *Parcels* – lot lines and easements
- (b) *Platted Subdivision* – outlined boundary
- (c) *Street Centerlines* – Street ROW centerline
- (d) Waterlines Distribution Layout and Attributes
 - (1) Size (numeric field)
 - (2) Material (text field)
 - (3) Date Constructed (date field)
- (e) Water points and Attributes
 - (1) Hydrants
 - (A) Type (text field)
 - (2) Valves
 - (A) Size – (numeric field)
 - (3) Blow off Valves
 - (A) Size – (numeric field)
- (f) Meter Boxes
 - (1) Single or Double meter (numeric field)

- (g) Reducers
 - (1) Size (numeric field)
- (h) Wastewater lines (and Force mains) - Collection layout and Attributes
 - (1) Size (numeric field)
 - (2) Material (text field)
 - (3) Date constructed (date field)
- (i) Wastewater points and Attributes
 - (1) Manholes
 - (A) Size of pipes (numeric field)
 - (B) Material (text field)
 - (C) Invert Elevation (numeric field)
 - (D) Inflow Protector (0 or 1)
 - (2) Lift stations
 - (3) Depth (numeric field)
 - (4) Clean outs
 - (5) WACS
 - (6) FM Air Relief Valves
- (j) Storm Sewer lines and Attributes
 - (1) Size (numeric field)
 - (2) # of pipes (numeric field)
 - (3) Shape (text field)
 - (4) Material (text field)
 - (5) Date constructed (date field)
 - (6) Flowline elevation (numeric field)
- (k) Storm Sewer points and Attributes
 - (1) Manholes
 - (A) Material (text field)
 - (B) Date constructed (date field)
 - (C) Invert Elevation (numeric field)
 - (2) Inlets
 - (A) Type (text field)
 - (B) Invert Elevation (numeric field)

- (3) Outfall
 - (A) Material (text field)
 - (B) Destination
- (l) Pavement outline
- (m) Side Walks
- (n) Light Poles

4.1.3. CITY OF HUTTO GIS LAYERS

The City maintains a diverse database of current information. These files are available for download and to be used as a reference. The address to these files is provided below:

<http://copgisweb.ci.Hutto.tx.us/web/gis-data.htm>

4.2. AUTOCAD DRAWING FILE (VERSION 2013 OR LATER) GUIDELINES

4.2.1. LAYER REQUIREMENTS

As-built construction drawings are to be provided with the construction information provided in layers according to the order shown in the table below. Additional layers may be added, as necessary.

Table 4-1 Layer Symbology for Construction Plans:

	LAYER	LAYER NAME	DESCRIPTION
1		CL	Centerline
2		ROW	Right of Way
3		LOT	LINE_PRO Lot Lines/Reserves (Proposed)
4		BOUNDARY	Boundaries
5		BMARK	City of Hutto Benchmark
6		LOTNOS	Lot Numbers/Block Names
7		SUBDIVNM	Subdivision Names / Section Numbers
8		STREETNM	Street Names
9		WLINES_PRO	Water Lines (Proposed)
10		FHYD_PRO	Fire Hydrants (Proposed)
11		WVALVES_PRO	Water Valves (Proposed)
12		WTEXT_PRO	Water Line Text (Proposed)
13		SSLINES_PRO	Wastewater Lines (Proposed)
14		SSMH_PRO	Wastewater Manholes (Proposed)

15	SSFM_PRO	Wastewater Force Main (Proposed)
16	LS_PRO	Lift station (Proposed)
17	SSTEXT_PRO	Wastewater Text (Proposed)
18	STORMLINE_PRO	Storm Sewer Lines (Proposed)
19	STORMMH_PRO	Storm Sewer Manholes (Proposed)
20	STORMIN_PRO	Storm Sewer Inlets (Proposed)
21	STORMCVT_PRO	Storm Sewer Culverts (Proposed)
22	STORMTEXT_PRO	Storm Sewer Text (Proposed)
23	DITCH	Drainage Ditch
24	TOPO	Topography
25	UTIL_PRO	Utilities (Proposed)
26	LAKES	Lakes/Ponds etc.
27	STREAM	Creeks, Bayous, Rivers etc.
28	CANAL	Canals
29	RR	Railroad
30	CITYLIM	City Limits Line
31	COUNTYLN	County Lines
32	ETJ	ETJ Lines
33	NOTES	Notes/ Miscellaneous Text
37	UTIL_EXI	Utilities (Existing)
35	LOTLINE_EXI	Lot Lines/Reserves (Existing)
36	WLINES_EXI	Water Lines (Existing)
37	FHYD_EXI	Fire Hydrants (Existing)
38	WVALVES_EXI	Water Valves (Existing)
39	WTEXT_EXI	Water Line Text (Existing)
40	SSLINES_EXI	Wastewater Lines (Existing)
41	SSMH_EXI	Wastewater Manholes (Existing)
42	SSFM_EXI	Wastewater Force Main (Existing)
43	LS_EXI	Lift station (Existing)
44	SSTEXT_EXI	Wastewater (Existing)

45	STORMLINE_EXI	Storm Sewer Lines (Existing)
46	STORMMH_EXI	Storm Sewer Manholes (Existing)
47	STORMIN_EXI	Storm Sewer Inlets (Existing)
48	STORMCVT_EXI	Storm Sewer Culverts (Existing)
49	STORMTEXT_EXI	Storm Sewer Text (Existing)
50	SIGN_EXI	Street Sign (Existing)
51	SIGN_PRO	Street Sign (Proposed)
52	SIGNTXT	Street Sign Text
53	STLIGHT_PRO	Street Lights (Proposed)
54	STLIGHT_EXI	Street Light (Existing)
55	STLIGHTTXT	Street Light Text (Proposed)

4.2.2. SHOP DRAWINGS AND SUBMITTALS

Once the engineering report, plans and specifications have been accepted, at least one (1) complete set of digital submittals and construction plans shall be provided to the City. These submittals shall contain complete detailed information and drawings for all lift station equipment and components.

Section 5. WATER AND WASTEWATER UTILITIES

5.1. SERVICE PROVIDERS WITHIN CITY LIMITS

- (a) The following utilities provide water service within City Limits:
 - (1) Jonah SUD
 - (2) Manville Water Supply Corporation
- (b) Any development within the CCN boundaries for these utilities shall be approved by the provider prior to the City of Hutto's approval of the construction plans.

5.2. SERVICE EXTENSION REQUESTS

An approved Service Extension Request (SER) is required by all developments prior to submitting a preliminary plat. An SER does not reserve capacity in the system but acknowledges the City's ability to serve the development. Capacity reservation agreements per the City policies and procedures and fee schedule shall be completed to reserve capacity.

5.2.1. DEVELOPMENT SIZE

SER shall identify the legal tract to be served by utilities and the maximum number of living unit equivalents to be provided by each land use within the tract boundary.

5.2.2. LAND USE

All areas to be developed shall have a land use in conformance with the City of Hutto approved Land Use Map.

5.2.3. DEVELOPMENT TIMELINE

SER shall provide development timelines for the development including any phasing.

5.2.4. SYSTEM CAPACITY DETERMINATION

The City Engineer will determine existing facilities that are in place and any remaining capacity after considering all existing services connected to the system. Any additional system improvements required to serve the development shall be determined by the City Engineer.

5.3. CAPITAL IMPROVEMENTS PLAN

5.3.1. DEVELOPMENT AGREEMENTS FOR OVERSIZING

Development agreements for oversizing may be required per the Service Extension Request if the developer is seeking reimbursement or credit.

5.4. GOVERNING STANDARDS AND SPECIFICATIONS

All proposed public improvements shall be in compliance with the following standards and specifications:

- (a) City of Hutto Standards and Specifications
- (b) TCEQ Compliance

- (c) PROWAG
- (d) TABA

5.5. REQUIRED PERMITS & DOCUMENTATION

Approved permits from the following agencies, as applicable, shall be provided prior to City approval of construction plans:

- (a) TxDOT
- (b) Williamson County ESD
- (c) Williamson County
- (d) Travis County
- (e) Union Pacific Railroad
- (f) Easements
- (g) SUD Approval
- (h) WSC Approval
- (i) MUD Approval
- (j) TCEQ Approval

Section 6. TRAFFIC IMPACT ANALYSIS REQUIREMENTS

6.1. THRESHOLD FOR REQUIREMENT AND TIMING OF TIA

- (a) A Traffic Impact Analysis (TIA) shall be approved prior to the application for a subdivision or plat approval, Site Plan approval, planned unit development (PUD), or other procedure for which the proposed development generates traffic exceeding fifty (50) trips in the highest peak hour or five hundred (500) daily trips either on a typical weekday or weekend day, based on the latest edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. Internal capture and pass-by trip reductions may be taken per the Trip Generation Manual when determining whether a development exceeds the five hundred (500) daily trip threshold.
- (b) If specific land uses for the development are not specified or known at the time of subdivision or plat application, the daily trip generation rate for the most intensive land use permitted (based on the property's proposed zoning or designation on the future land use map) shall be used to compute the estimated average daily trips.
- (c) The City Engineer has the authority to require a TIA based on site-specific conditions, anticipated impacts, or any other reason even if the proposed development is projected to generate less than the daily trips listed above. The City Engineer also has the authority to waive the requirement for a TIA based on site-specific conditions.
- (d) For properties proposing to add, remove, or modify driveway access on TxDOT facilities, TxDOT may require a TIA regardless of whether the above thresholds are met for the City to require a TIA.

6.2. TIA SCOPE

When a TIA is required, the scope of the analysis shall be determined during a scoping meeting with the City Engineer and TxDOT (as applicable). The scoping meeting may be scheduled before or after an initial pre-application meeting. No application requiring a TIA may be made until the scope of the required analysis has been determined. The City Engineer may involve representatives of or request assessments from other agencies and departments. The elements to be determined during the scoping session shall include the following:

- (a) **Definition of Impact Area**
The points of access and key streets and intersections that may be affected by development of the subject tract constitute the impact area. Traffic recorder and turning movement assessment locations shall be determined.
- (b) **Period of Analysis**
Periods of analysis shall include the morning peak hour, evening peak hour, and if deemed necessary by the City Engineer, the midday peak hour, weekend peak hour, or special event ingress/egress (such as for a concert venue or similar facility that attracts and/or discharges large numbers of vehicles over a short period of time).

- (c) Analysis Scenarios
Scenarios for analysis include existing conditions, opening year conditions without proposed development, and opening year conditions with proposed development.
- (d) Process
Process for determining trip generation and distribution including trip generation category, diversion assumptions, distribution assumptions, and capacity analysis.
- (e) Growth Rate Assumption
The rate of growth assumed for background traffic growth.
- (f) Future Development
Planned developments in the area that have been approved or are under review.

6.3. TIA REPORT REQUIREMENTS

The TIA report shall include all study elements agreed upon in the scoping meeting. A full TIA study shall include the following elements (at a minimum):

- (a) Existing Condition Survey
 - (1) Street System Description
The street system shall be described including geometric features, lane use traffic control, signage, sight distances, adjacent uses and curb cuts, and peak capacity based on the current cross-section.
 - (2) Traffic Volumes
Existing traffic volumes shall be provided for the impact area including both ADT (average daily traffic) and “design” peak hour volumes. ADT shall be derived from the latest available counts collected within the previous twelve (12) months. Peak hour volumes shall be obtained from field counts. Data shall be adjusted for daily and season variations using a methodology approved by the City Engineer. Turning movement counts for the peak hour shall be provided for critical intersections. Peak hour periods shall be as determined at the scoping meeting.
 - (3) Volume to Capacity (v/c) Ratio
Provide the existing v/c ratio for adjacent streets that will be studied as part of the TIA.
 - (4) Capacity Analysis
Existing capacity of signalized and unsignalized intersections
 - (5) Other
Other items may be required at the discretion of the City Engineer depending upon the type and scale of the project. These may include but are not limited to queue length analysis, pedestrian counts, crash data, traffic speeds (both

50th and 85th percentile), stopping sight distance, and intersections sight distance.

(b) Future without Development

- (1) A capacity analysis is to be provided for the opening year at key intersections and roadway segments where appropriate without the proposed development but including any other planned developments. The analysis shall be based upon the Highway Capacity Manual or other methodologies approved in advance by the City Engineer.

(c) Future with Development

- (1) Projections of the daily and peak hour traffic generation of the project shall be made using the latest edition of the ITE Trip Generation Manual unless the City Engineer determines that locally derived data will provide more accurate forecasts. Data from similar facilities may be used where the information is not available from ITE.
- (2) The projected trips shall be distributed onto the road network as agreed in the scoping meeting.

(d) Capacity analysis for the opening year at key intersections and roadway segments where appropriate.

- (1) Intersection sight distance analysis for all proposed driveway locations.
- (2) Evaluation of the need and length of turning lanes (both right and left turn lanes) for all proposed driveway locations.
- (3) Special analysis as may be required to determine warrants for signalization, stopping sight distance, gap analysis, turning radius requirements, queue length analysis, turning lane analysis, curb cut locations, or similar requirements.

(e) Mitigation Plan

Where the analysis indicates that the project will create deficiencies in the impact area, improvements shall be recommended which shall include projected cost estimates. The design of improvements shall be in accordance with the specifications of the City Engineer and, where appropriate, TxDOT. The mitigation plan shall also include any dedications necessary to comply with the City Code. Where the final approval authority for any procedure determines that a mitigation plan is not adequate to address the traffic impacts of the project, it may serve as a basis for denial of the permit or subdivision plat.

6.4. MITIGATION REQUIREMENTS

- (a) The TIA shall identify improvements necessary for all study intersections to operate at Level of Service (LOS) C or better in the opening year, including development traffic. Should a study intersection operate at a LOS D or worse in the opening year, without development traffic, then the improvements identified shall reduce the

intersection delay (including development traffic) to a value less than or equal to the delay without development traffic. The TIA shall also identify roadway capacity analysis by projecting average annual daily traffic (AADT) for each internal and adjacent roadway and comparing against the thresholds established for each classification of roadway. AADT calculations shall be based on existing daily traffic counts for the roadway, daily trip generation produced by background projects, and daily trip generation produced by the subject project.

- (b) For signalized and all-way stop-controlled intersections, the intersection delay and LOS should be computed using the average for all vehicles traveling through the intersection, encompassing all vehicle approaches and/or movements. For two-way stop-controlled intersections, the intersection delay and LOS should be computed using the delay of the worse-performing stop-controlled approach.
- (c) Delay calculations should be made utilizing the methodology contained in the latest version of the Highway Capacity Manual.

6.5. SUBMISSION AND REVIEW PROCEDURES

An initial TIA shall be approved prior to the first subdivision application for the development. An updated TIA shall be approved prior to each Final Plat submitted for approval and shall be generally consistent with the initial TIA. The initial TIA shall be updated whenever a subdivision plat or Site Plan is modified to authorize more intensive development.

6.6. TIA REVIEW & APPROVAL PROCESS

- (a) The City shall evaluate the adequacy of the TIA prepared by the applicant. Based upon such evaluation, the City shall determine (1) whether the application may be approved in the absence of dedication of rights-of-way or construction of improvements to each affected thoroughfare and (2) the extent of the applicant's obligations to make such dedications or improvements. The City shall condition the approval of the subdivision application on one or more of the following performances by the applicant:
 - (1) Delay or phasing of development until thoroughfares with adequate capacity or intersection improvements are constructed.
 - (2) A reduction in the density or intensity of the proposed development sufficient to assure that the road network has adequate capacity to accommodate the additional traffic to be generated by the development.
 - (3) The dedication or construction of thoroughfares or traffic control improvements needed to mitigate the traffic impacts generated by the proposed development.
- (b) Deferral of Obligation

Upon request of the applicant or property owner, the obligation to dedicate or improve thoroughfare rights-of-way or to make intersection improvements imposed on an application may be deferred to a later stage of the development process. As a condition of deferring the obligation to dedicate rights-of-way for or to improve

thoroughfares, which deferral shall be in the sole discretion of the City, the City shall require the developer to execute a subdivision improvement agreement specifying the amount and timing of the rights-of-way dedication or improvements to thoroughfares.

(c) Cash contributions

In lieu of the obligation to dedicate or improve thoroughfares or make traffic control improvements to achieve road adequacy, the applicant may propose to make equivalent cash contributions based upon the development project's proportionate share of the costs of improvements, which the City in its sole discretion may accept in satisfaction of road adequacy standards in this Section. Any funds accepted by the City shall be earmarked for construction of the improvements for which the contribution was made.

(d) Options

Whenever the proposed development's share of the costs of a thoroughfare or traffic control improvement needed to mitigate traffic generated by the development is less than one hundred (100%), the City in its sole discretion may do the following:

- (1) Participate in excess costs; or
- (2) Aggregate the costs of improving the multiple thoroughfares or intersections identified in the TIA and require improvements to only some of the thoroughfares or intersections affected by the development.

HUTTO ENGINEERING DESIGN MANUAL

DIVISION B

TRANSPORTATION & MOBILITY

DIVISION CONTENTS

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Section 7. GENERAL

7.1. APPLICABLE MANUALS

Street design elements not specifically addressed in the *Engineering Design Manual* or City Code and associated City requirements should be designed in accordance with the latest edition of:

- (a) *A Policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO Green Book).
- (b) *Roadway Design Manual*, Texas Department of Transportation (TxDOT).
- (c) Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, TxDOT.
- (d) Roadside Design Guide, AASHTO.
- (e) Texas Manual on Uniform Traffic Control Devices (TMUTCD), TxDOT.
- (f) Highway Illumination Manual, TxDOT.
- (g) Guide for the Development of Bicycle Facilities, AASHTO.
- (h) *Urban Bikeway Design Guide*, National Association of City Transportation Officials (NACTO).
- (i) Load Resistance Factor Design (LRFD) Bridge Design Specifications, AASHTO.
- (j) *Texas Accessibility Standards (TAS)*, Texas Department of Licensing and Regulation (TDLR).
- (k) Public Rights-of-Way Accessibility Guidelines (PROWAG), U.S. Access Board.

7.2. WAIVERS & VARIANCES

Design deviations or exceptions may be considered by the City Engineer. A design deviation is not required when values are greater than the minimum standards in the *Engineering Design Manual* or other applicable requirements. A request for a design deviation or exception shall be submitted by the Engineer in writing to the City Engineer with supporting documentation. Approval of a design deviation or exception is at the sole discretion of the City Engineer.

7.3. EASEMENT AND RIGHT-OF-WAY REQUIREMENTS

- (a) An easement is defined as a right or privilege in real property. For the purpose of the *Engineering Design Manual*, easements may be required for public improvements in accordance with the City Code or utility provider requirements for construction, maintenance, and operations. For streets, easements may also be required for sight visibility, access, sidewalks and trails and traffic control. The City and public utility have the right of ingress and egress of an easement for the purpose of constructing, inspecting and maintaining their respective public improvement.

- (b) Right-of-way (ROW) is an area on, below, or above a public street, sidewalk, alley, drainage facility, or utility easement in which the municipality (city, county, or state) owns and maintains. For the purpose of the *Engineering Design Manual*, ROW is the area occupied, or intended to be occupied, by a public street or alley. Median and appropriate roadside features outside the paved portion of the street shall be within the ROW. All roadside signs, traffic signals, and city-maintained illumination systems shall be fully located within the ROW.
- (c) Easements and ROW for public improvements shall be provided for in accordance with the City Code and applicable City requirements. ROW shall also be provided for future thoroughfares in accordance with the City Code and the City's Thoroughfare Plan.

Section 8. GENERAL ROADWAY DESIGN REQUIREMENTS

8.1. ACCESSIBILITY STANDARDS AND REQUIREMENTS

All plans and specifications for construction shall be in accordance with the Americans with Disabilities Act (ADA), Texas Accessibility Standards (TAS), and Public Right-of-Way Accessibility Guidelines (PROWAG). If the accessibility standards conflict with each other, the more restrictive standards shall govern.

8.2. SUBSURFACE UTILITY ENGINEERING

Projects requiring excavation and/or trenching will be required to provide subsurface utility engineering (SUE) quality levels C and D, at a minimum. It is the responsibility of the Engineer to coordinate utility conflicts with public and private utility providers. Additional SUE may be required depending on the complexity of the project.

8.2.1. SUE PROVIDER REQUIREMENTS

SUE Provider Requirements – SUE shall be managed by an engineer, geologist, or land surveyor licensed in the State of Texas and work shall be conducted by well-trained, experienced, and capable individuals using state-of-the-art designating equipment, vacuum excavation, or comparable nondestructive locating equipment as well as surveying, data recording equipment, and software systems, as necessary.

8.2.2. SUE QUALITY LEVEL ATTRIBUTES

SUE Quality Level (QL) attributes are described in the current edition of *Standard Guidelines for Collection and Depiction of Existing Subsurface Utility Data*, CI/ASCE 38-02 by American Society of Civil Engineers (ASCE). Accordingly, QL C and QL D shall be conducted for all projects requiring excavation. QL A and QL B shall be conducted in areas with congested utilities, areas where utility information is sparse, or where a specific utility of high importance is being crossed (i.e., gas line). Descriptions of the four SUE QLs are as follows:

- (a) *Quality Level A* – Precise horizontal and vertical location of utilities obtained by the actual exposure and subsequent measurement of subsurface utilities, usually at a specific point. This work shall be performed to obtain precise horizontal and vertical locations of subsurface utilities.
- (b) *Quality Level B* – Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities. This work shall be performed to obtain horizontal location of subsurface utilities.
- (c) *Quality Level C* – Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to Quality Level D.
- (d) *Quality Level D* – Information derived from existing records or oral recollections.

8.2.3. ADDITIONAL FIELD WORK

Additional SUE field work shall be required as conditions change from initial SUE field exploration.

8.3. RIGHT-OF-WAY EXCAVATION

- (a) Excavation is an activity that cuts, penetrates, or bores under any portion of the public ROW that has been improved with a paved surface for street, sidewalk, surface drainage, or related public infrastructure purposes. This includes, but is not limited to, cutting, tunneling, jacking and boring, backfilling, restoring, and repairing the public infrastructure to a condition as good as or better than it was before. Trench repair shall be in accordance with the City of Hutto Construction Standards.
- (b) Excavation that requires an existing City Street to be open cut that has been constructed, reconstructed, or resurfaced in the preceding five-year period will not be allowed. Alternative methods of installing the proposed facilities or drainage structures across the street to avoid disturbing the roadway surface within this time period shall be pursued.

8.4. COMPUTER PROGRAMS

All design files must be compatible with the latest version of Autodesk AutoCAD software.

Section 9. ACCESS MANAGEMENT

Access management is to limit and consolidate access along major roadways while ensuring that the supporting roadway network can safely and efficiently provide the necessary access. The goals of access management are accomplished by applying the following principles:

- (a) Limit direct access to major roadways;
- (b) Locate signals to favor through movements;
- (c) Preserve the functional area of intersections;
- (d) Limit the number of conflict points;
- (e) Separate traffic conflicts;
- (f) Remove turning vehicles from through traffic lanes;
- (g) Use non-traversable medians to manage left-turn movements; and,
- (h) Provide a supporting street and internal circulation system.

This section supplements the access standards and requirements in the City Code. The standards are intended to provide access to land while preserving traffic operations and safety. Property owners are encouraged to meet with City staff to discuss specific requirements and local site conditions associated with obtaining access to a site.

9.1. ADMINISTRATION

9.1.1. PERMITS

- (a) A permit is required to construct, add, alter, enlarge, repair, relocate, or demolish access on a public street abutting private property in the City in accordance with the City Code.
- (b) TxDOT is the permitting authority for access to state highways in the City and ETJ. A TxDOT permit with co-authorization by the City is required for access to a state highway in the City in accordance with TxDOT requirements.
- (c) A permit may be required for access to a public street in the ETJ in accordance with county requirements.
- (d) A TIA may be required with a permit application to justify access and evaluate traffic operations and safety.
- (e) Access to public and private school facilities requires coordination with City staff prior to permit application. The location of a school facility has an impact to the street system that requires analysis of access and traffic circulation.

9.1.2. CONSTRUCTION

- (a) Driveways shall be constructed in accordance with the Construction Standards.

- (b) Drainage shall not be altered or impeded with access improvements. When drainage structures are required, the size and other design requirements shall be approved by the City.
- (c) The City has the right to inspect all access improvements to ensure that it is proceeding in accordance with the provisions in the City Code and this manual.

9.2. DRIVEWAYS

9.2.1. GENERAL

- (a) Adequate sight distance shall be provided for a vehicle making a left or right turn exiting the driveway.
- (b) All driveways shall comply with ADA, TAS, and PROWAG requirements regardless of the presence of adjacent sidewalks.
- (c) Where a driveway is constructed, and sidewalks exist, sufficient sidewalks shall be removed and constructed to meet the new driveway approach.
- (d) The angle of the driveway from the public street shall be 90 degrees.
- (e) Drainage inlets shall be located a minimum of 10 feet from curb returns.
- (f) Fixed objects, including gates, posts, and private signs, will not be allowed in the driveway within the ROW.

9.2.2. WIDTH

- (a) Driveway width is measured at the property line and at the end of the interior curb returns.
- (b) The maximum width of a one or two-family residential driveway is 20 feet, while the minimum width is 12 feet.
- (c) The maximum width of a commercial, industrial, and multifamily driveway is 36 feet, while the minimum width is 15 feet.
- (d) All driveways require curb returns in accordance with the Standard Construction Details.
- (e) Increased driveway width and/or curb returns may be considered to accommodate large vehicle types or directional medians in the driveway with sufficient engineering support.

9.2.3. LOCATION

- (a) Driveways shall be located based on existing driveways, existing and future streets, spacing requirements, and access needs.
- (b) Driveways shall not be permitted where backing maneuvers onto a public street is required except for local residential streets.
- (c) Driveways in a right turn lane transition or storage area shall not be permitted.

- (d) No cut through a left-turn lane transition or storage area median shall be permitted for left-turn movements to a driveway.
- (e) Driveways and curb returns shall not interfere or be closer than 5 feet from municipal facilities such as street illumination, signal poles, fire hydrants, utility poles, drainage structures, and other public improvements.
- (f) When a parcel fronts on two different streets, the driveway must be placed on the street with the lower functional classification
- (g) Driveways shall not be located within 20 feet of a crosswalk.
- (h) Driveways shall not be located within 100 feet of a railroad grade crossing gate arm or stop sign or alter or be within supplemental safety measures established with a quiet zone.
- (i) The driveway location requirements mentioned in this manual are to be considered as minimums. All driveways shall be placed such that sufficient sight-distance is provided per the AASHTO Green Book.

9.2.4. SPACING

- (a) Spacing is measured from the closest driveway pavement edge to the nearest driveway or street pavement edge or crosswalk.
- (b) Spacing between driveways is measured from the driveway edge to the edge of the adjacent driveway. Spacing between driveways and intersections is measured from the edge of the driveway to the edge of the pavement.
- (c) On Local streets, no driveway is permitted closer than 50 feet to a corner, measured edge to edge.
- (d) On Collector streets, no driveway is permitted closer than 75 feet to a corner, measured edge to edge.
- (e) On Minor Arterial streets, no driveway is permitted closer than 120 feet to a corner measured edge to edge.
- (f) On Major Arterial streets, no driveway is permitted closer than 200 feet to a corner, measured edge to edge.
- (g) If the frontage of a development site is insufficient to comply with the driveway spacing, the driveway must be situated as far as practical from any of the intersections described above, and this must be clearly noted in the submittals for City approval.

Table 9-1: Minimum Driveway Spacing

Posted Speed of Abutting Road (mph)	Land use	Minimum Spacing (ft)
≤ 30	Residential	25
	Non-Residential	200
35	All	250
40	All	305
45	All	360
≥ 50	All	425

- (h) Alignment of driveways with opposing streets is discouraged unless approved by the City Engineer. When such a design is proposed, the driveway approach shall be constructed to match the layout and cross-section of the opposing street.
- (i) If justified by a TIA, full or partial median openings for driveways may be considered and spaced according to local site, street, and intersection conditions.

9.2.5. CROSS AND SHARED ACCESS

Cross and Shared Access – Cross access is achieved when property owners agree to allow adjacent properties to cross their property to access a driveway. Shared access is achieved when adjacent property owners agree to share a single driveway that access both adjacent properties. Cross and shared access minimizes the number of driveways and conflict points and improves traffic flow between properties and on the street. Cross and/or shared access is required when the placement of driveways on adjacent parcels would prohibit one or more parcels from constructing a driveway that meets the requirements of this manual.

9.2.6. THROAT LENGTH

Driveway through length is important for safe and efficient traffic operations on site and the adjacent street. The throat length needs to be of sufficient length so that vehicles may enter, exit, and circulate on site without interference of traffic on the street.

- (a) Driveway throat length is measured from the pavement edge of the street to the first conflict point in the driveway.

The minimum throat length is shown in **Table 9-1**. Additional throat length may be required with a TIA based on site circulation.

Table 9-2: Minimum Driveway Throat Length

Parking Spaces per Driveway	Throat Length (ft)			
	Multi-family or Commercial Uses		Industrial Land Uses	
	No Median Opening	Median Opening	No Median Opening	Median Opening
Less than 25	25	25	25	25
25-50	25	40	25	40
51-100	25	40	40	40
101-200	40	80	40	60
More than 200	100	150	40	100

9.2.7. GRADES

The change in grade between the driveway apron slope and street pavement cross slope is important to ensure a smooth turning maneuver. An abrupt change may cause unexpected slowing in the street travel and vehicles damaging the street surface.

- (a) Driveway grades shall not exceed 10%.
- (b) The changes in driveway grades with a vertical curve shall not exceed 10% for residential driveways and 8% for all other driveways. Changes in grade along designated fire lanes shall not exceed 6%.
- (c) The length of vertical curves shall be designed in accordance with TxDOT's *Roadway Design Manual*.
- (d) Driveway elevations at the right-of-way boundary shall be a minimum of 6 inches higher than the elevation of the street gutter.

9.3. MEDIANS

9.3.1. GENERAL

- (a) A median is the portion of the street separating opposing or directional travel lanes. Medians are desirable for streets with four or more lanes and should be provided for major arterial and minor arterial roadways. Standard medians are raised but can also be depressed or flush adjacent to the travel way depending on site location and design.
- (b) Raised medians may be used for pedestrian safety, intersection corner islands, and traffic calming. Raised medians shall be paved with concrete riprap.
- (c) Depressed medians may be used for stormwater management including volume management, water quality improvement, and peak flow reduction.
- (d) Flush medians may be used in limited locations where contrasting texture or color is in place or flexibility to allow for increased left-turn storage is necessary.

Flush medians can be traversed and do not prevent the median from being crossed. Flush medians shall meet pavement requirements specified in this manual.

- (e) Medians may be used to keep existing trees or other topographic features that meet appropriate clear zone requirements.
- (f) If new trees are placed in the median, they shall be located to maintain the sight distance specified in this manual.
- (g) Where medians are intended to include stormwater management and landscaping, consideration shall be provided for the impact of ponding, irrigation, and other factors that may impact the street pavement structure. Vertical moisture barriers shall be required. A header curb may be placed to create a moisture barrier and should be a minimum of 18 inches tall or extend at least 2 inches below the proposed roadway base layer.
- (h) Sight distance shall be provided for all medians as specified in this manual.
- (i) No improvement or obstruction shall be in a median other than those allowed by the City Code.

9.3.2. OPENINGS

- (a) Median openings are classified as either full or directional. A full median opening allows for all turning movements from the street and adjacent street or driveway access connection, as well as all crossing movements. Directional median openings accommodate specific movements, such as left-turn entry only, left-turn exit only, U-turn only, or a combination of movements.
- (b) All median openings on State highways are subject to review and approval by TxDOT and shall be designed in accordance with the TxDOT *Roadway Design Manual* and TxDOT *Access Management Manual* at a minimum.
- (c) Full median openings should be provided at all signalized intersections and generally at all unsignalized intersections of arterial and collector streets.
- (d) Full median openings for local streets and driveway access require justification through a TIA, at the sole expense of the requestor, addressing the following:
 - (1) Demonstrate all reasonable access and traffic needs for median opening.
 - (2) Directional median opening should be investigated as the first option.
 - (3) Proposed median will not cause a degradation in level of service or safety at adjacent and opposing street intersections and driveways.
 - (4) Location and design must meet spacing and turn lane requirements and acceptable design standards for expected traffic speeds, volumes, and adjacent intersection traffic control.
 - (5) Demonstrate adequate emergency vehicle access.

- (e) Median openings shall be constructed to pavement requirements specified in this manual.
- (f) Median openings shall have a maximum longitudinal grade break (algebraic difference) of 4%.
- (g) Median openings shall be at least 20 feet wider than the width of the driveway, street, or access point throat which they are serving. Regardless of driveway width, the minimum length of a full median opening shall be 60 feet and shall accommodate all the turning maneuvers of the design vehicle for which the driveway is designed. The minimum length of a full median opening shall be of sufficient length so that concurrent turning maneuvers from exclusive left-turn lanes serving the driveways on each side of the roadway do not conflict with each other. The maximum length of a full median opening shall be limited so that the median opening serves only a single driveway on each side of the roadway. Turning movements of the design vehicle shall be shown in the plan submittal.
- (h) The median nose shall accommodate the turning movements of the design vehicle.

Section 10. ROADWAY FACILITY DESIGN

10.1. GENERAL

Streets, intersections, alleys, and access shall be designed in accordance with the *Engineering Design Manual* and in conformance with the City Code, Thoroughfare Plan, and Comprehensive Plan. Streets and the street network should be designed in relation to existing and planned streets, public safety, quality of life, topographical and environmental features, and adjacent land uses. All streets should be designed with appropriate accommodations for pedestrians and bicycles. To achieve this intent, bicycle and pedestrian facilities that are physically separated from vehicles shall be designed and constructed wherever feasible. Painted bicycle facilities on the street shall only be designed and constructed in retrofit situations where existing conditions are constrained and do not make it feasible to construct physically separated bicycle and pedestrian facilities.

Improvements to state highways shall be designed in accordance with the policies and procedures established by TxDOT. It is the Engineer's responsibility to comply with, communicate, and properly permit all work with TxDOT.

10.2. STREET PRINCIPLES

The City's street principles are based on code, city council approval, and community goals. The following principles guide the design and implementation of streets in Hutto.

10.2.1. STREET CLASSIFICATIONS

The classification of streets defines the role each element of the street network plays in serving travel modes, traffic volumes, and land use. Streets serve two primary travel needs: access and mobility. Street classification is based on the City's Thoroughfare Plan and should be considered in improving the existing street network.

- (a) Freeway – Freeways connect the City's street network to the regional transportation network; oftentimes these roadways are a part of the regional transportation network themselves.
- (b) Major Arterial – Major Arterials are intended to carry traffic across the City. They transport heavy amounts of traffic for large distances.
- (c) Minor Arterial – Minor arterial roads are intended to connect neighborhoods and activity nodes. Minor arterial roads form the basis of the network used for intra-local traffic.
- (d) Collectors – Collector roads move vehicles through neighborhoods and between neighborhoods. Collector roads are the interface between the local street network and the arterial street network. Collector roads are often the connecting point between neighborhoods and areas of commercial activity. For this reason, care should be taken to accommodate multimodal traffic.

- (e) **Local Streets** – Local streets form the basis of the street network and serve as the direct interface between development and the transportation network. Local streets move vehicles through a neighborhood. These streets should be especially accommodating to pedestrians. Local streets are not specified on the Thoroughfare Plan as they are intended to be identified as needed in the development process.

10.2.2. STREET DESIGN IN CONTEXT

The *Engineering Design Manual* establishes the minimum standards for the street classifications; however, the design of “context-sensitive”, “complete”, and “green” streets is supported by the Comprehensive Plan to enable safe mobility of pedestrians, bicyclists, motorists, and public transportation. Alternative designs may be considered in accordance with the City Code and in coordination with the City Engineer.

10.2.3. STREET DESIGN STANDARDS

- (a) **Design Vehicle** - Turning movements shall be checked for the appropriate design vehicle shown in **Table 10-1** using turning template software or the turning templates in AASHTO’s *A Policy on Geometric Design of Highways* unless otherwise directed by the City Engineer. See **Table 10-3** for minimum corner radii.

Table 10-1: Design Vehicle

Street Classification	Passenger (P)	Single Unit (SU)	Intermediate Semitrailer (WB-40)	Intermediate Semitrailer (WB-62)	Intermediate Semitrailer (WB-67)
Local Street	X	X	-	-	-
Collector	-	X	X	-	-
Arterial	-	-		X	X
1. Design vehicle must be approved by the City Engineer.					

- (b) **Design Speed** - One of the primary design criteria for a new facility is the design speed. The proper design speed selection is influenced by the character of terrain, the density and type of adjacent land use, the classification and function of the roadway, the traffic volumes expected to use the roadway and by economic and environmental considerations. It is important to recognize and treat individual roadways based on their specific characteristics. The design speeds specified in **Table 10-2** shall be used for each of the street classifications, unless otherwise directed by the City Engineer.
- (c) This manual is intended to provide design criteria for urban streets with a design speed of 40 mph or less. The designer shall refer to the TxDOT *Roadway Design Manual* for highways with a design speed of 45 mph or greater.

10.3. CROSS-SECTIONAL ELEMENTS

Table 10-2: Street Design Standards

Street Classification	Major Arterial	Minor Arterial	Collector	Local
Right-of-way (min)	134'	110'	70'	55'
Curb & Gutter	2'	2'	2'	2'
Pavement (min)	96'	62'	38'	30'
Lanes	6	4	2	2
Lane Width	12'	12'	11'	15'
Median (min)	24'	14'	-	-
Average Daily Traffic (ADT)	> 32,000	> 18,000	> 2,500	< 800
Parking Allowed	No	No	No	One Side
Sidewalk/SUP	10'; Both	10'; Both	6'; both	5'; Both
Roadside Width (min)	5'	5'	5'	5'
Minimum Grade	0.6%	0.6%	0.6%	0.6%
Maximum Grade	4%	6%	8%	8%
Centerline Radius (min)	1040'	765'	510'	335'
Design Speed (min)	45 mph	40 mph	35 mph	30 mph

10.3.1. PAVEMENT CROSS SLOPE

All streets shall have a cross-slope of 2%. The cross-slope can vary where there is a transition into or out of a maximum 2% straight grade across the entire street width or street intersections. When super-elevation is approved, the maximum allowable slope is 6%. Super-elevation must be designed in accordance with *A Policy on Geometric Design of Highways and Streets*.

10.3.2. CURB AND GUTTER

All urban streets shall be designed with standard 2 feet curb and gutter. The gutter is not included in the pavement, lane, and bike lane widths but is a portion of the parking lane. A standard curb without gutter may be used with a median when stormwater is draining away from the curb.

10.3.3. PAVEMENT WIDTHS

Pavement widths are based on the street classification, number of lanes, lane widths, and shoulder widths. Additional pavement width may be necessary to accommodate turn lanes, parking, on-street bike lanes, marked buffers, and shoulders.

10.3.4. LANE WIDTHS

Lane widths should be 12 feet for Major Arterials and Minor Arterials and 11 feet for Collectors. Local Street lane widths should be 15 feet to accommodate parking. Lane widths may be required to be increased due to adjacent land uses and/or anticipated large vehicles such as trucks and buses.

10.3.5. ROADSIDE WIDTHS

Roadside width is measured from the back of curb or edge of pavement without curb to the end of ROW and may include sidewalks, shared-use paths, separated bike lanes, utilities, public transportation accommodations, and stormwater improvements.

10.3.6. MEDIAN WIDTHS

Medians are required for Major Arterials and Minor Arterials and measured from the face of curb to the face of curb. Medians may also be provided to restrict access or channelize traffic. Median design standards are in **Section 9**.

10.3.7. SHOULDER WIDTHS

Shoulders are required for uncurbed rural streets. Refer to TxDOT's *Roadway Design Manual* for shoulder criteria.

10.3.8. PARKING

On-street parking is allowed on Local Streets per the IFC. Parking widths should be 8 – 9 feet and include the gutter. On-street parking is not allowed within 20 feet of an intersection or 30 feet of a marked crosswalk.

10.3.9. SIDEWALKS

Sidewalk width shall be 10 feet for arterials, 6 feet for collectors, and 5 feet for local streets. Sidewalk design standards are prescribed in **Section 10**.

10.3.10. STREET TREES

- (a) Safety shall be the foremost consideration in the placement and selection of plant material in the City's right-of-way. The focus of these guidelines is the prevention of traffic hazards that can be created by the placement of landscaping which restricts the sight distance or creates roadside obstacles. The following addresses acceptable criteria for landscaping and planting on roadsides, within the median, and at intersections. All dimensions specified for trunk diameter and height will include plants at maturity unless it is stated otherwise on the Drawings.
- (b) Trees shall be set back 2.5 feet from roadway back of curb and 2 feet from the edge of sidewalk, measured from the edge of sidewalk to edge of mature trunk.

- (c) A minimum clearance height of 8 feet above the street level must be provided and maintained for all existing and newly planted trees if adjacent to a sidewalk. However, if the limbs of trees overhang the curb line or edge of the travel lane of any street, a minimum clearance height of 14 feet is required.
- (d) Trees must be placed at least 10 feet from streetlights, 5 feet from wet utilities, and 4 feet from dry utilities unless approved in writing by the City Engineer. Acceptance of plans not clearly calling out any deviation or variance from this requirement is not considered written approval.
- (e) All plantings, except ground covers with no more than 12 inches in height, shall be located greater than 75 feet from the end of the median nose.
- (f) Ground covers with no more than 12 inches in height and trees with a mature trunk diameter of 6 inches or less are recommended in the area from a point 75 feet to 150 feet from the nose of the median. All trees shall be maintained to provide an 8-foot minimum foliage clearance height. A minimum 15 feet spacing (center-to-center) shall be provided for all trees.
- (g) Only small trees and low growing shrubs no greater than 2 feet in height are permitted within 150 feet of a school crossing to assure pedestrian safety by not restricting the sight visibility of motorists.
- (h) Only low growing shrubs no greater than a height of 2 feet and small trees are permitted within 250 feet of a railroad crossing to assure adequate sight visibility.
- (i) Landscaping shall not restrict visibility to traffic control devices such as signs and traffic signals.
- (j) No landscaping of any type shall obstruct vision within the intersection sight triangle as defined in this section of the manual. These requirements will apply to any material from a height of 2 feet to a clearance height of 8 feet above the top of curb including, but not limited to, full grown trees, full-grown shrubs, fences, structures, any signs except traffic control signs, etc.
- (k) Any new trees to be planted shall be from the Plant List as outlined in the UDC.

10.4. ROADWAY DESIGN STANDARDS

10.4.1. HORIZONTAL GEOMETRIC DESIGN

- (a) The minimum centerline radius is a function of design speed, superelevation, and the vehicle side friction factor. Side friction is the force that keeps a vehicle from sliding off the roadway.
- (b) The minimum horizontal radii are shown in **Table 10-2** and are in accordance with the guidelines in the 2018, 7th Edition of *A Policy on Geometric Design of Highways and Streets*.

10.4.2. VERTICAL GEOMETRIC DESIGN

- (a) The minimum and maximum allowable street grades for the City of Hutto are shown in **Table 10-2**.
- (b) Vertical curves are utilized in roadway design to affect gradual change between tangent grades and will result in a design which is safe, comfortable in operation, pleasing in appearance, and adequate for drainage. Vertical curve alignment shall also provide stopping sight distance (SSD) in all cases. SSD is a function of design speed, perception-reaction time, and deceleration rate. *A Policy on Geometric Design of Highways and Streets* shall be used to calculate SSD.
- (c) A vertical curve is required when two longitudinal street grades intersect at a point of vertical intersection, and the algebraic difference between those two grades is greater than 1%. Where the algebraic difference is less than or equal to 1% for residential streets and alleys and less than or equal to 1% for all other roadway classifications, vertical curves are not required. *A Policy on Geometric Design of Highways and Streets* shall be used to determine the minimum acceptable length of crest and sag curves.
- (d) A minimum of 10 feet of vertical clearance shall be provided for all roadway crossings over pedestrian and bicycle facilities.
- (e) All divided streets shall be profiled such that the ultimate median curb lines have a maximum elevation differential of 3 inches per 20 feet of median width. This is necessary to accommodate the installation of future median openings and turn lanes. Spot elevations and pavement cross-slope transitions for future lanes shall be included in the plans to verify median cross-slopes. In areas where there is no future need for a median opening, the Engineer may justify the use of a greater differential between median curb elevations.

10.4.3. CLEAR ZONES

A clear zone shall be provided for all streets in accordance with TxDOT's *Roadway Design Manual*.

10.4.4. TRANSITIONS

Transitions shall be designed in accordance with AASHTO's current minimum design requirements and the *TMUTCD* based on the street classification and design speed established in **Table 10-2**.

10.5. INTERSECTION REQUIREMENTS

10.5.1. GENERAL

The main objectives in the design of an intersection are to facilitate the safety, convenience, and efficiency of the motor vehicles, bicycles, and pedestrians traveling through it.

- (a) Consideration for a roundabout intersection versus a traditional signalized or stop-controlled intersection should be made by performing an intersection control evaluation (ICE) during preliminary planning. Intersection options and strategies considered should reduce the severity of potential conflicts and strategically optimize function for all intersection users including vehicles, pedestrians, and bicyclists.

- (b) Through lanes shall line up across intersections with no offset.
- (c) Create natural transitional paths and operating characteristics of drivers and vehicles.
- (d) Smooth transitions shall be provided for changes in direction.
- (e) Grades shall be relatively flat.
- (f) Necessary sight distance shall be provided to enable drivers to prepare for and avoid potential conflicts meeting the requirements prescribed in this section.
- (g) On arterial and collector streets, intersections shall be evenly spaced to the maximum extent possible. Such an arrangement enhances the coordination of signals, increases driver comfort, and improves traffic operations.
- (h) Accommodations should be made for all existing and future pedestrian, bicycle, and public transportation movements.

10.5.2. GEOMETRY

- (a) All intersections should be between 80 degrees and 100 degrees for a minimum of 100 feet.
- (b) Roadway alignment shall remain tangent upstream and downstream of an intersection for a minimum distance equal to the corresponding turn lane length (including taper) or 200 feet for arterial and collector streets and 100 feet for local streets, whichever is greater. Additional turn lane guidance is provided in this section.
- (c) Minimum curb radius shall be determined based on the street classification of intersecting streets. **See Table 10-3.**

Table 10-3: Intersection Curb Radius

Street Classification Intersection	Curb Radius
Arterial – Arterial	50'
Arterial – Collector	35'
Collector – Collector	25'
Local – Collector	20'
Local – Local	15'

- (d) Curb return profiles shall not exceed 2% in the vicinity of barrier-free ramps. Residential, collector and arterial street profiles shall be limited to a maximum of 2% at the approach to collector street intersections.
- (e) Grading contours within and approaching major intersections shall not be less than 0.5% nor greater than 2% to accommodate the pedestrian crosswalk. When grading through an intersection, the minor roadway profile shall tie into the

major roadway cross-slope while at the same time transition to match cross-slope with the major roadway profile grade. Intersection pavement details with spot elevations and pavement cross-slope transitions shall be called out for all intersections involving collector and arterial roadways. Gutter slope shall be a minimum of 0.5%.

- (f) Pedestrian accommodations within intersections shall conform with all applicable requirements prescribed in this section.
- (g) Drainage inlets shall be installed to capture stormwater prior to entering arterial intersections with arterial, collector, and local streets.
- (h) Local Streets that have offset intersections must have a minimum of 200 feet distance from centerline to centerline. Closely spaced offset intersections should be avoided on arterial and collector streets. For offset intersections, pedestrian crossings shall not be located within the minimum distance street length.

10.5.3. Sight Distance

Motorists should have an unobstructed view of roadways they are traveling and crossing. The minimum sight distance is related directly to design speed and to the distance traversed during braking, perception, and reaction times, or the stopping sight distance.

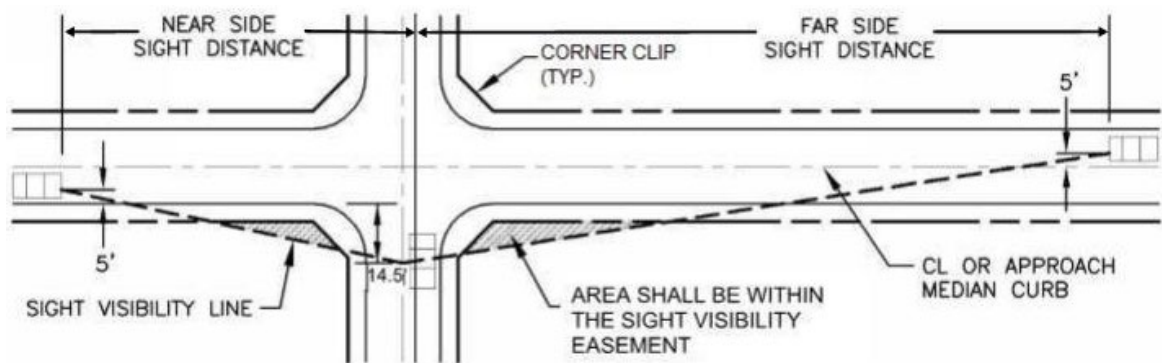
10.5.4. Intersection Sight Distance

Intersection sight distance (ISD) is the sight distance at an intersection that allows a driver approaching an intersection to observe the action of vehicles on the far side (right) and near side (left) of the crossing street. The necessary sight visibility line is based on the type of traffic control at the intersection and the design speed of the two roadways. **Figure 10-1** shows the sight visibility line at a standard intersection.

- (a) The necessary sight distance applies to all street and alley intersections.
- (b) ISD shall be determined in accordance with A Policy on Geometric Design of Highways and Streets.
- (c) Sight visibility lines shall be shown on construction plans for intersections where the necessary ISD cannot be provided within the ROW.
- (d) Sight visibility easements shall be required on the plat for areas outside the ROW to achieve the necessary ISD.
- (e) Traffic control shall not be installed on new streets for the sole purpose of not meeting necessary sight distance.
- (f) No fence, wall, screen, sign, structure, foliage, hedge, tree, bush, shrub, berm, driveway, parking, drive aisle, or any other obstruction, either man-made or natural, shall be erected, planted, or maintained in a position that will obstruct or interfere with a driver's clear line of sight within a sight visibility easement.

- (g) The City has the right to prune or remove any vegetation within public ROW, including within the sight visibility easement to abate a safety hazard and/or a nuisance.
- (h) Vision at all street intersections shall be clear at elevations between 2 and 8 feet. above the average gutter elevation within the sight visibility easement and meet the minimum requirements in *A Policy on Geometric Design of Highways and Streets*.
- (i) In the case where the street contains existing horizontal curvature, the intersection sight distance must be measured along the horizontal curve.
- (j) Corner Clips – Corner clips may be required by TxDOT at intersections with state highways.

Figure 10-1: Intersection Sight Distance and Sight Visibility Line



10.6. ROUNDABOUTS

10.6.1. GENERAL

A roundabout is a circular intersection traffic control device with the following characteristics:

- (a) Traffic flows counterclockwise around a center island.
- (b) Entering traffic yields to circulating traffic.
- (c) Channelized approaches separate, slow and deflect traffic into a desired entry path.
- (d) Appropriate geometric curvature and curbs control the speed of vehicles.

10.6.2. TERMS AND DEFINITIONS

The following terms and definitions apply to **Section 10.6**:

- (a) *Accessible Pedestrian Crossings* – Pedestrian crossings provided at roundabouts must be usable by all pedestrians, including the visually impaired, wheelchairs, strollers and pedestrians walking bicycles.
- (b) *Bicycle Path Diversion* – Bicycle treatments at roundabouts provide bicyclists the option of traveling through the roundabout either by riding in the travel lane as a vehicle, or by exiting the roadway and, if available, using a shared-use path, depending on the bicyclist's preference and/or level of comfort.

- (c) *Capacity* – The maximum hourly flow rate at which persons or vehicles reasonably can be expected to traverse a point, e.g., intersection, or uniform segment of a lane or roadway during a given period under prevailing roadway, traffic, and control conditions.
- (d) *Central Island* – The raised area in the center of a roundabout, around which traffic circulates. The central island is typically circular in shape but can be modified to accommodate alternative lane configurations, e.g., exclusive lefts with spiral-shaped central islands and truck-turning movements.
- (e) *Circulatory Roadway* – The travel way portion of the roundabout used by vehicles to travel in a counterclockwise fashion around the central island. The minimum width is generally equal to the widest roundabout entry.
- (f) *Detectable Warning Strip* - Placed perpendicular to the travel way in pedestrian crossing ramps and on refuge splitter islands.
- (g) *External Truck Apron* - May be necessary at outside curb radii to accommodate the excess swept path of larger design vehicles. The stepped curb height is normally 4 inches. The concrete surface is to be the same as the truck apron in depth and color. External Truck Aprons should not pass through crosswalks.
- (h) *Entry Radius* - The smallest curb radius on the right-hand side of the travel way, before or at the yield line. It is not the same as the entry path radius or deflection.
- (i) *Entry Width* - Width at the roundabout entrance, measured perpendicular to curb face. Must be sized to accommodate the design vehicle yet not be overly wide at single-lane roundabouts.
- (j) *Exit Width* - Width at the roundabout exit, measured to curb face. The exit width should be as wide as the circulatory roadway, then tapered downstream.
- (k) *Flare Length* - The distance over which the approach widens from a normal lane width to the entry width is the flare length. It affects roundabout capacity and can be used effectively to add capacity to convert a single-lane approach to a multi-lane entry.
- (l) *Inscribed Circle Diameter* - Measure of the outer diameter of a roundabout or its footprint. It is a function of entry and exit lanes, alignment of approaches and angle between approach legs. It is also governed by the size of the design vehicle and property constraints, especially with compact single-lane roundabouts.
- (m) *Landscape Buffer* - Placed between the curb and sidewalk to separate vehicular and pedestrian traffic and to help direct pedestrians to cross only at the designated crossing locations and to provide space for sign placement. Landscaping can improve intersection aesthetics and contribute to traffic calming, provided it is placed outside or below the required intersection and

stopping sight limits. The buffer must be detectable by people of all mobilities.

- (n) *Landscaped Central Island* - A central non-traversable area, usually mounded and landscaped. Sightlines must be maintained around the outside but blocked through the middle using the height of mounding, often 3 to 6 feet, with landscaping.
- (o) *Pedestrian Crossing* - In most cases it is a two-stage crossing using the splitter island width as a refuge. The proximity is normally one to two car lengths (25 to 40 feet on exits if staggered) upstream of the yield line and distal from the exit splitter island bullnose.
- (p) *Sidewalk/Shared-Use Path* - It is common to provide a shared-use path at the perimeter of the roundabout to provide both pedestrians and bicyclists with off-road accommodation. Standard sidewalks are provided in lieu of a shared-use path when bicycle traffic is expected to use the roadway through the roundabout.
- (q) *Splitter Island* - Separates opposing entering and exiting movements. Using a right-hand curvature, it directs drivers to circulate counterclockwise and provides refuge area for pedestrians when it is at least 6 feet wide where pedestrians cross.
- (r) *Spiral (spiral lane transition)* - A spiral is a geometric feature of the truck apron needed for some multi-lane roundabout configurations with exclusive left-turn lanes. The spiral transitions left-turning vehicles from the inside to the outside circulating lane to allow vehicles to exit without changing lanes within the circulatory roadway (not to be confused with a highway curve spiral).
- (s) *Truck Apron* - A traversable area for trucks necessary for single-lane roundabouts to avoid a very wide circulatory road or small central island.

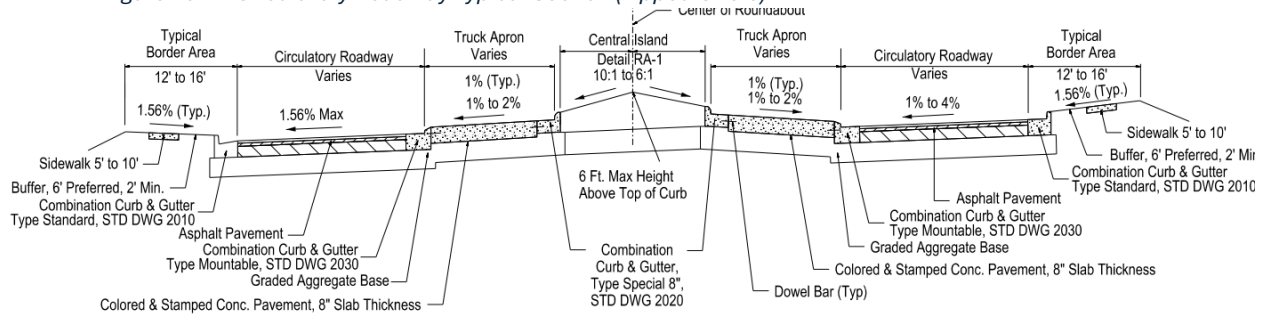
10.6.3. DESIGN CONSIDERATIONS

- (a) Roundabout design is a principles-based, performance-driven design process where the critical elements of circle size, circle location and alignment of approaches are guided by safety and operational performance criteria. Operational analysis determines the required lane configuration which is then followed by geometric design. Safety performance can be achieved through a geometric speed control that minimizes potential for entry-circulating crashes and reinforces priority to circulating traffic. Approach geometry and a visibility package of signs, markings and landscaping should build driver expectation of speed reduction and yield on entry.
- (b) Curb and/or Curb and Gutter shall be provided on the outside of the circulatory roadway and on all approaches at a minimum distance equal to the length of the splitter island to help approaching drivers recognize the need to reduce their speed, prevent corner-cutting, and to confine vehicles to the intended

design path. Curb and/or curb and gutter shall be provided for a minimum distance of 50 feet. past the edge of the circulatory roadway on the exit leg.

- (c) Splitter islands shall extend a minimum of 50 feet from the edge of the inscribed circle. The desirable length of a splitter island is 100 feet for urban design (30mph to 35mph) and 150 to 200 feet for rural or suburban conditions (>45mph).
- (d) Vertical and grading design best practices for the purpose of constructability and grade control, require establishing additional alignments and profiles of the edge of pavement. This produces optimal grade control for retrofit designs. Developing a grading surface that closely follows existing topography, or the natural grade of the intersection, often results in tipping the circle. Tipping the circle, as **Figure 10-2** shows, requires a gradual transition from sloping in on the high side to sloping out on the low side. The preferred maximum cross-slope of the low side should be 2 percent to prevent truck roll-overs.

Figure 10-2: Circulatory Roadway Typical Section (Tipped Circle)



10.6.4. CATEGORIES AND DESIGN PARAMETERS

- (a) Categories of roundabouts include Mini-roundabouts, Single-Lane and Multi-Lane configurations. The differences are mainly in circle size, with minis being the most compact while the largest circles, multi-lane designs, have at least two circulating lanes and multi-lane approaches or exits. Mini-roundabouts have traversable central islands while multi-lane roundabouts have large central island areas suitable for landscaping and place-making. This section presents each category of roundabout and the associated geometric design parameters. It is critical to receive concurrence from the City Engineer on the design and check vehicles for the intersecting roadways. The design and check vehicles' AutoTURN® swept paths will dictate the minimum circle diameter.
- (b) Mini-roundabouts with traversable central islands are applicable in urban environments with speeds less than or equal to 35 mph. Placement of mini-roundabouts in higher-speed environments is feasible, but approach splitter islands must provide the compensating speed reduction that the circle size cannot afford. Longer raised splitter islands (> 100 feet) with reverse curvature, curbs, and other features (e.g., advance signing, pavement

markings, reflecting delineators, or illumination) are applicable in locations with approach speeds 35 mph and greater.

- (c) Mini-roundabouts have a raised fully traversable central island. A mini-roundabout can be a low-cost alternative to all-way stop control for improving intersection capacity and safety without the need for acquiring additional right-of-way. The suitability of a mini-roundabout depends on:
 - (1) Traffic Volumes < 15,000 ADT (summation of ADT for each roadway or total ADT entering the intersection).
 - (2) Truck Volumes < 5%.
- (d) It is desirable to accommodate a school bus in the travel way of a mini-roundabout, but where circles are compact, e.g., 6 feet in diameter, it may not be feasible, subject to AutoTURN® swept path allowances. In such cases, it is preferable to form the central island to a smoother transition to avoid a bump when the school bus wheels mount the central island.
- (e) Mini-roundabouts are typically defined by an inscribed circle diameter (ICD) of between 70 to 100 feet. The fully traversable central island and splitter islands allow larger vehicles to pass over the central island making left turns. Details of a mini-roundabout can be seen in **Figure 10-3**. This standard for mini-roundabouts is intended to be used where circulatory roadway paving is asphalt or concrete and approach speeds are 35 mph or less.
- (f) Due to the smaller circle size, geometric entry path deflection at mini-roundabouts is more challenging, therefore, approach curvature typically governs entry speed, along with left offset of alignment for improved entry path deflection can be achieved through approach curvature (chicanes) and/or longer splitter islands. These features also contribute to recognition of the roundabout ahead so that drivers may decelerate in advance of the entry point. The majority of traffic should be able to pass through the mini-roundabout while staying within the circulatory roadway.
- (g) Signing and Marking – Mini-roundabouts shall be in accordance with **Figure 10-6**, which shows the City's required placement of signs and pavement markings for the mini-roundabout.

Figure 10-3: Mini-Roundabout: Geometric Design (See Figure 10-6 for 'Inset A')

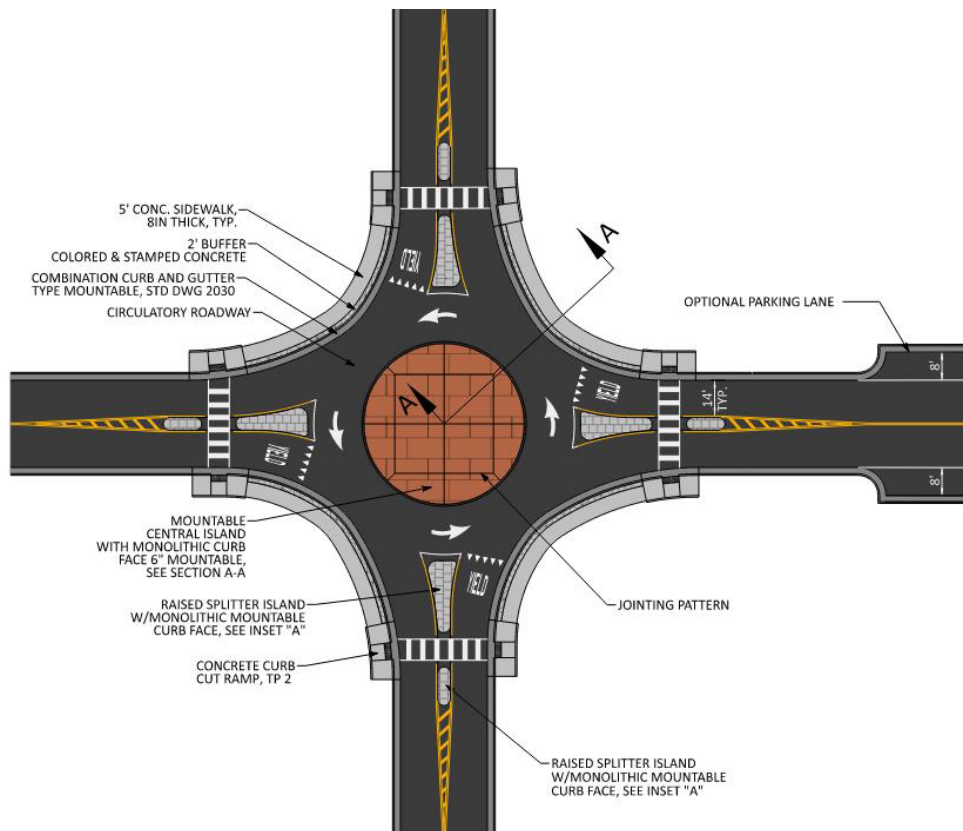


Figure 10-4: Mini-Roundabout: Typical Cross-section

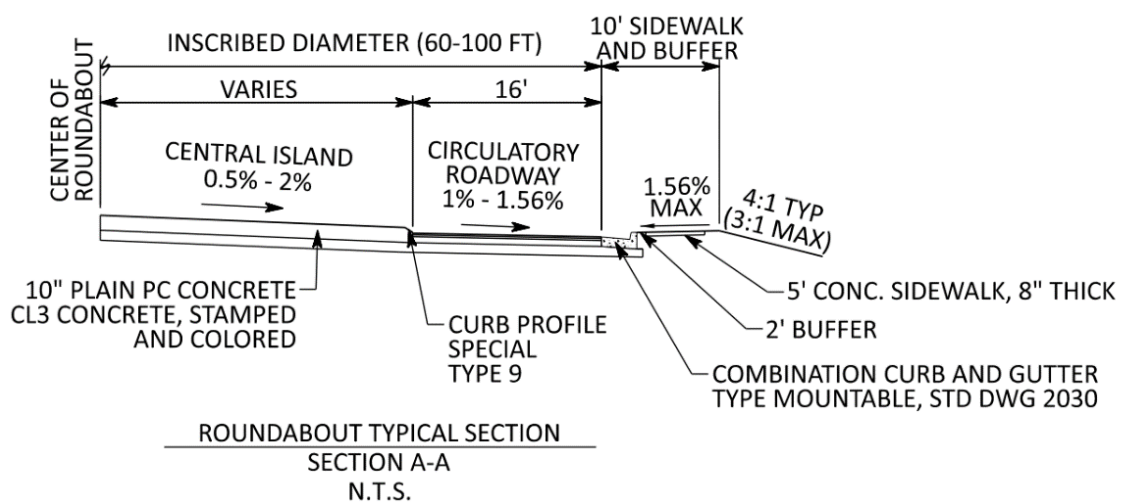


Figure 10-5: Mini-Roundabout: Splitter Island Parameters

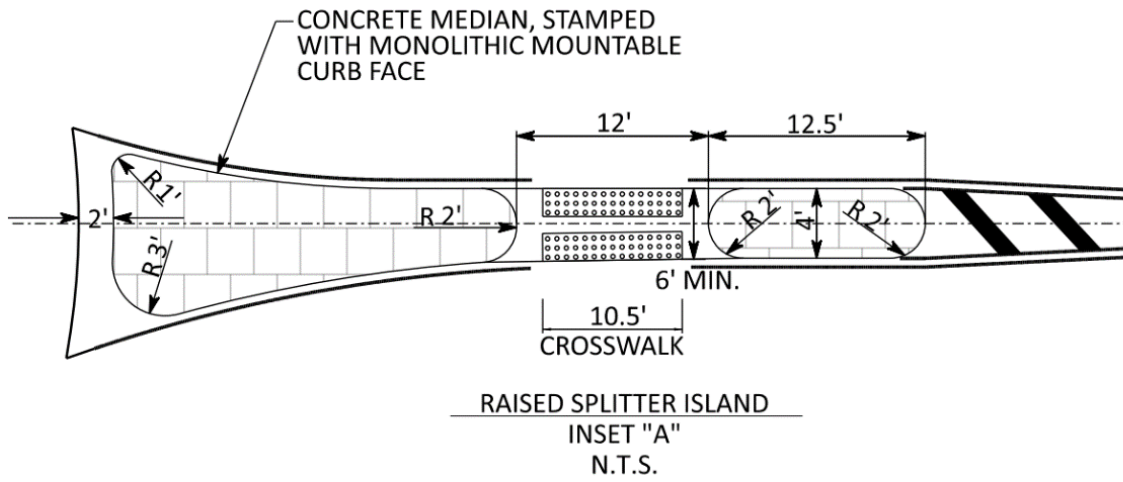
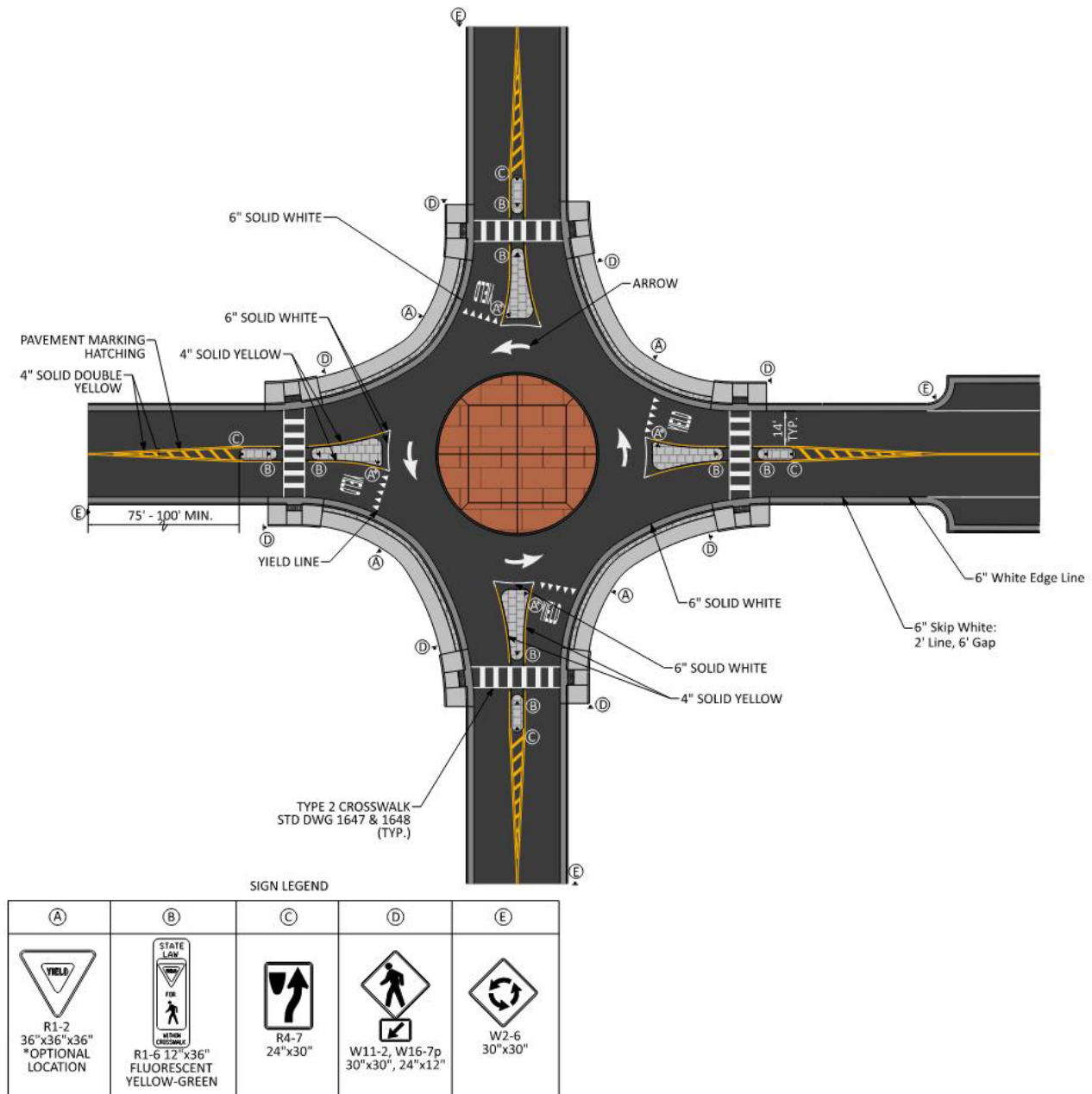


Figure 10-6 – Mini-Roundabout – Signing and Marking

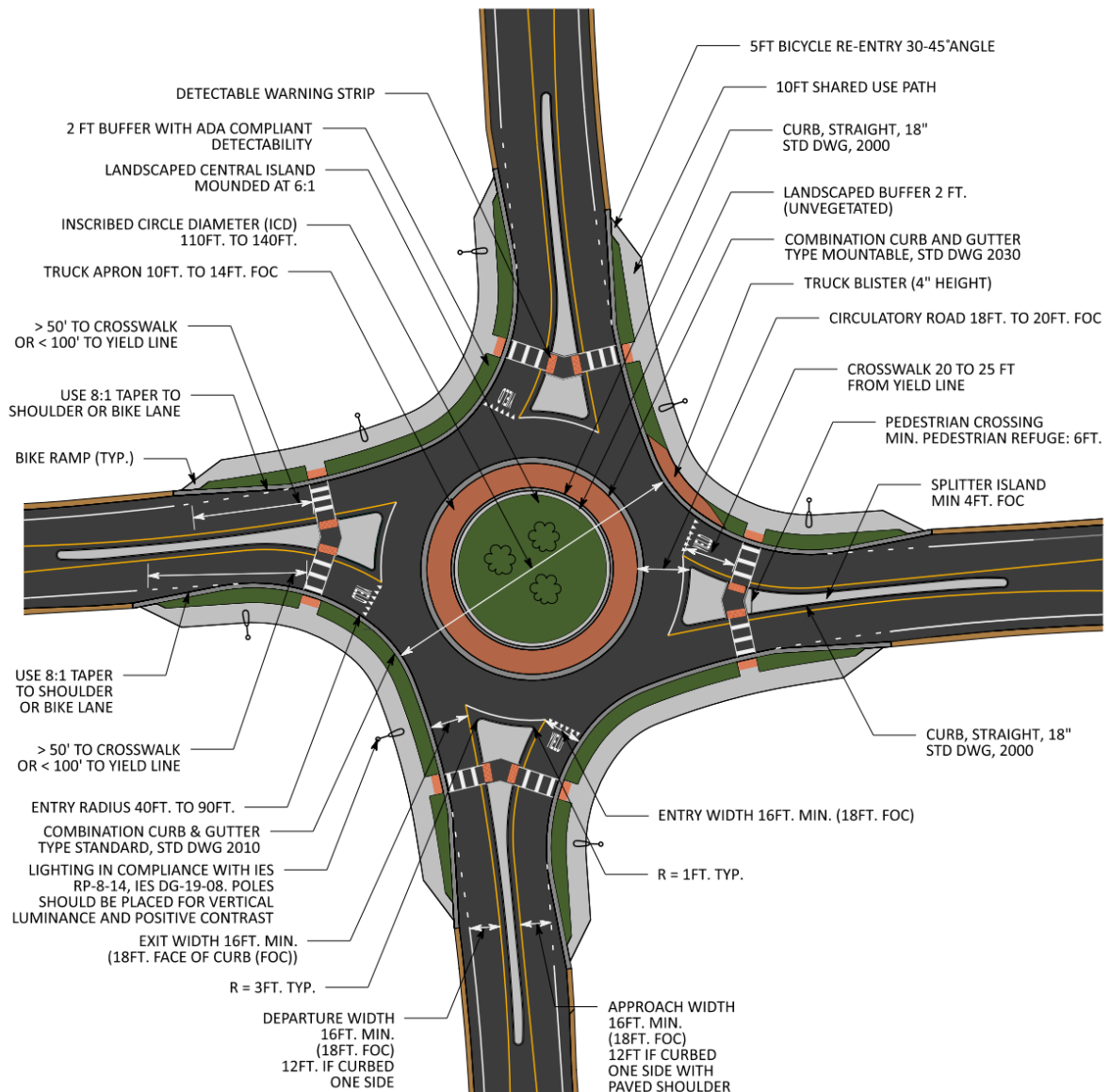


- (h) Single-lane roundabouts have single-lane entry at all legs and one circulating lane. Single-lane roundabouts can include right-turn bypass lanes. Although they may be compact with a very small raised central island, they are distinguished from mini-roundabouts by their non-traversable central island and larger inscribed circle diameter, typically within the range of 110 to 140 feet. The geometric design features include raised, curbed splitter islands with appropriate entry path deflection, a raised non-traversable central island, crosswalks, and a truck apron vertically separated from the

circulatory roadway by a mountable curb. **Figure 10-7** illustrates the City's specifications and preferences regarding geometric design for a single-lane roundabout. Additionally, single-lane roundabouts require traffic control devices, which can be found in **Figure 10-8**.

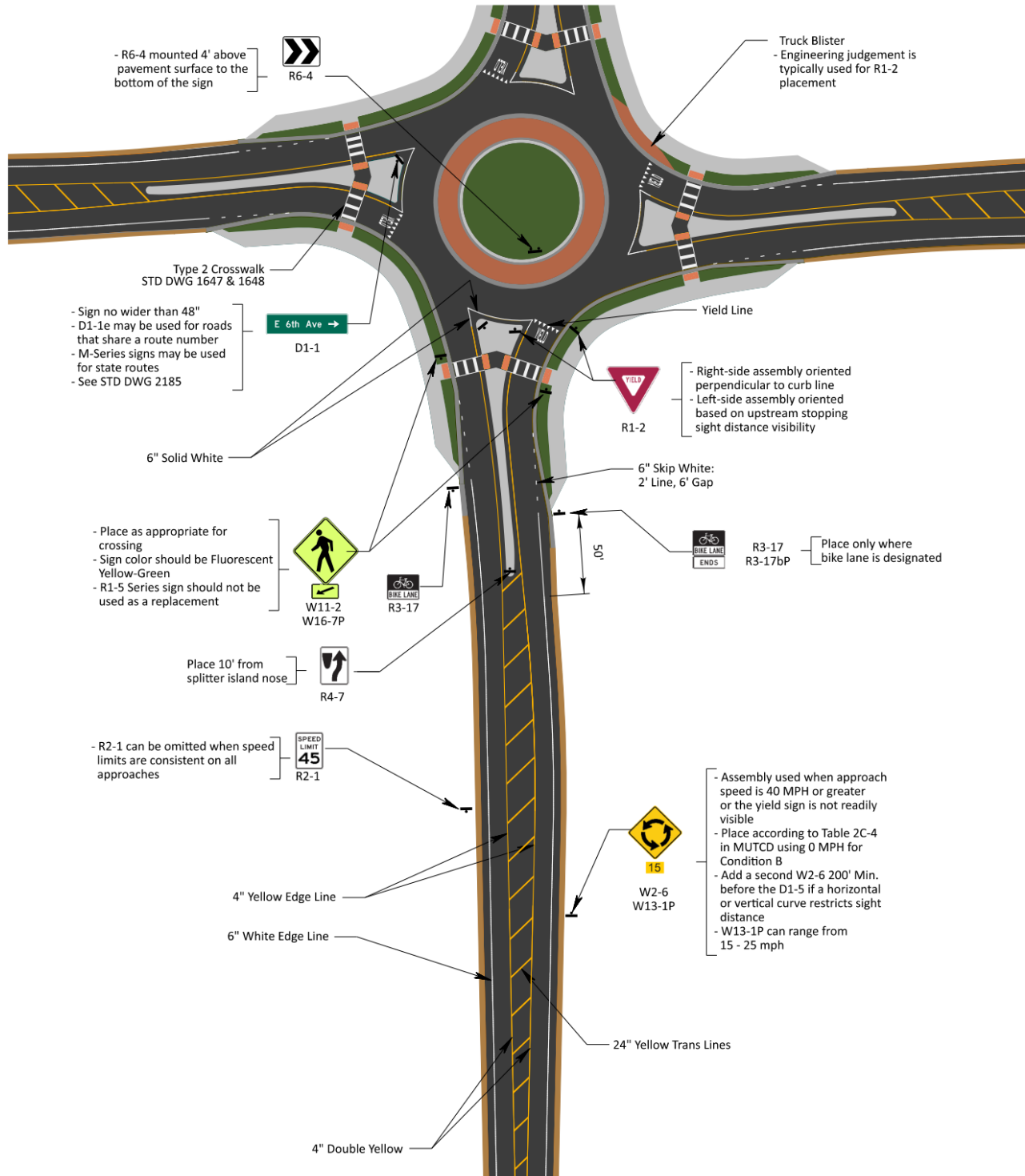
- (i) The design of a single-lane roundabout should have enough entry path deflection (geometric speed control) to create balanced speeds through the roundabout. The left offset of the approach alignment contributes to reduced speeds in advance of the entry line; this is especially important for compact roundabouts.

Figure 10-7: Single-lane Roundabout – Physical Characteristics



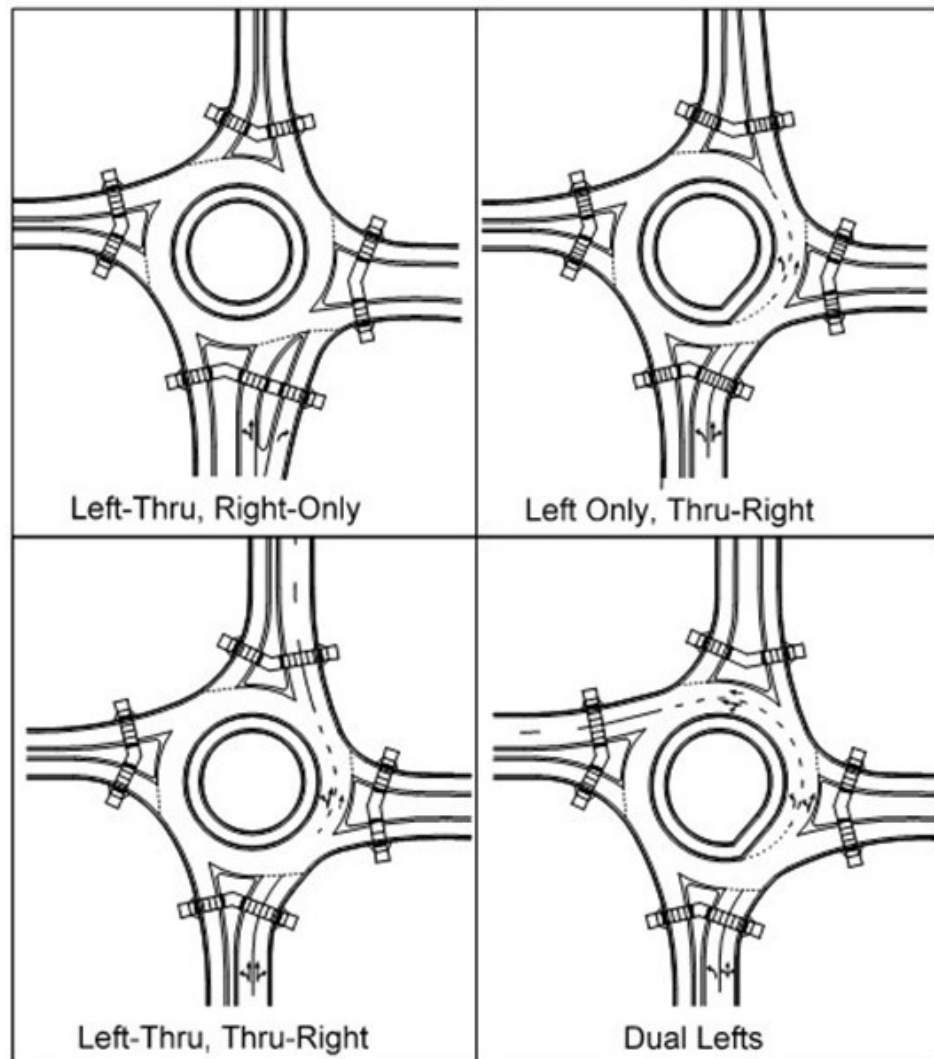
- (j) Signs shall be mounted outside any areas traversable by vehicles. **Figure 10-8** displays signage for one approach of a typical single-lane roundabout. Other approaches should be treated similarly.

Figure 10-8: Single-Lane Roundabout – Signing and Marking



- (k) Multi-lane roundabouts have at least one entry with two or more lanes and two or more corresponding circulating lanes. In some cases, the roundabout may have a different number of lanes on one or more approaches (e.g., two-lane entries on the major street and one-lane entries on the minor street). Multi-lane roundabouts may have single-lane approaches that flare from one to two or more lanes. **Figure 10-9** illustrates alternative lane configurations for two-lane entries.

Figure 10-9: Lane Configuration Options for Two-lane Entry

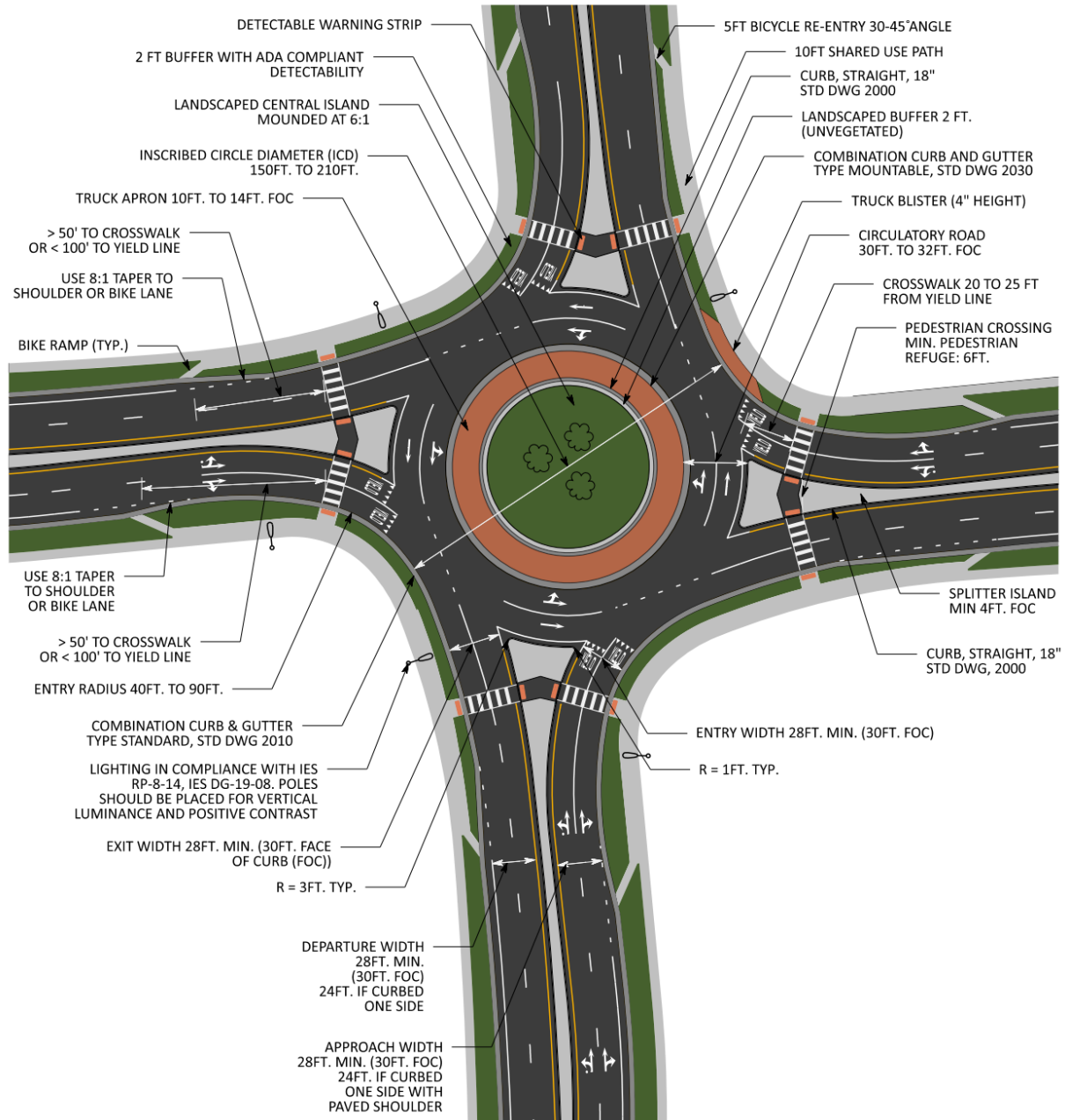


- (l) The choice of lane configuration depends on the proportion of turning movements and their directions. The optimal two-lane configuration will have the least number of conflict points between entering and circulating traffic. Therefore, the lane configuration consisting of Left-Thru, Right-Only is optimal for safety while the other lane configuration versions may provide improved capacity but with measurable safety trade-off. Multi-lane roundabout lane

configuration shall be justified through traffic analysis performed by the engineer of record.

- (m) Driver decisions are more complex for multi-lane roundabouts. These decisions include choosing the correct lane when entering, lateral positioning while circulating and correct lane for exiting. If a multi-lane roundabout design is warranted at build year plus ten (10) years, then a single-lane roundabout or expandable roundabout may be used for the initial ten years. Alternatively, it can be designed as a multi-lane roundabout, but striped and signed as a single-lane roundabout when initially opened to traffic. Interim and ultimate lane configuration roundabout analysis may result in a preferred method of using future expandable design. Due to increased driver safety and lane discipline, The City's preference is to propose raised curbing, rather than striping the expandable design.

Figure 10-10: Multi-Lane Roundabout – Physical Characteristics



- (n) Multi-lane roundabouts also accommodate passenger cars and buses traveling side by side. The circulatory roadway lane widths are usually 12 to 14 feet wide to accommodate school and transit buses staying in the lane. Large trucks do not need to travel in-lane in multi-lane roundabouts; moreover, when designs are enlarged for large trucks in lane, this has been shown to decrease safety for all users. The geometric design features are illustrated on **Figure 10-10**. When possible, restrict the use of full multi-lane designs by using exclusive left-turn lanes and single-lane exits. In such cases, raised truck apron curbs are required for spiral designs. Additionally, multi-lane roundabouts require traffic control devices that can be found on **Figure 10-15**.
- (o) The design of a multi-lane roundabout should have adequate geometric speed control to create balanced speeds through the roundabout. The use of left offset approach alignment contributes to reduced speeds in advance of the roundabout entry.
- (p) Two passenger cars entering simultaneously shall have natural paths that keep the vehicles in lane. When the entry lanes of a multi-lane roundabout are not aligned correctly, overlap of vehicle paths can occur. This could result in reduced entry capacity and sideswipe conflicts from drivers not maintaining the correct lane upon entering or exiting the roundabout. See **Figure 10-11** for an example of poor path alignment. **Figure 10-12** shows the appropriate entry and exit lane alignment to minimize path overlap.

Figure 10-11: Example of Poor Path Alignment Source: NCHRP 1043

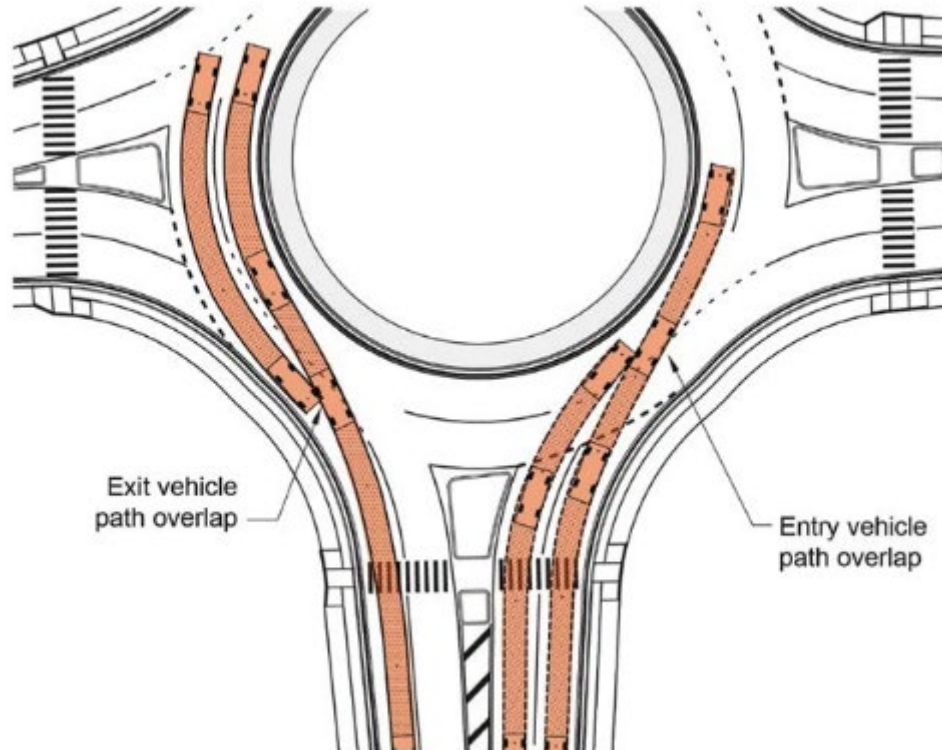
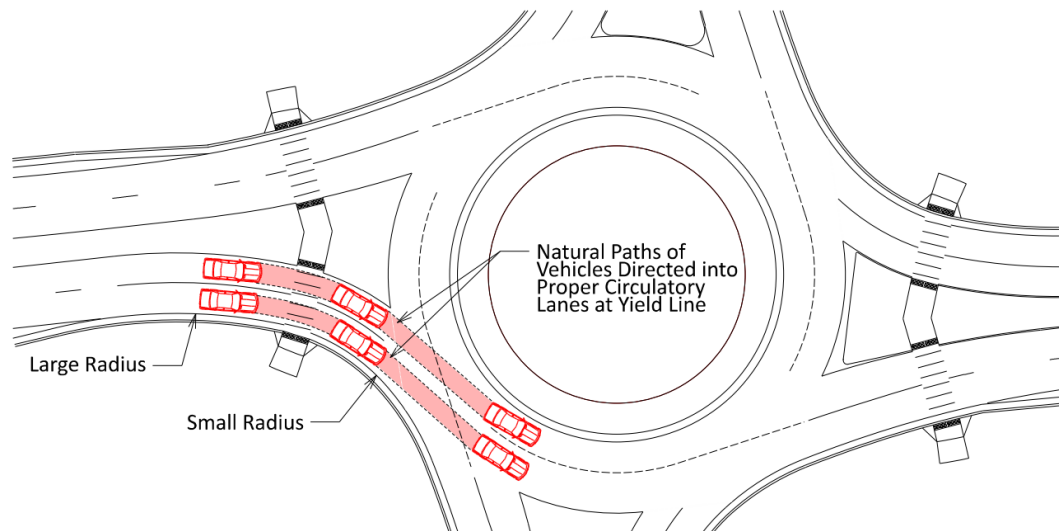
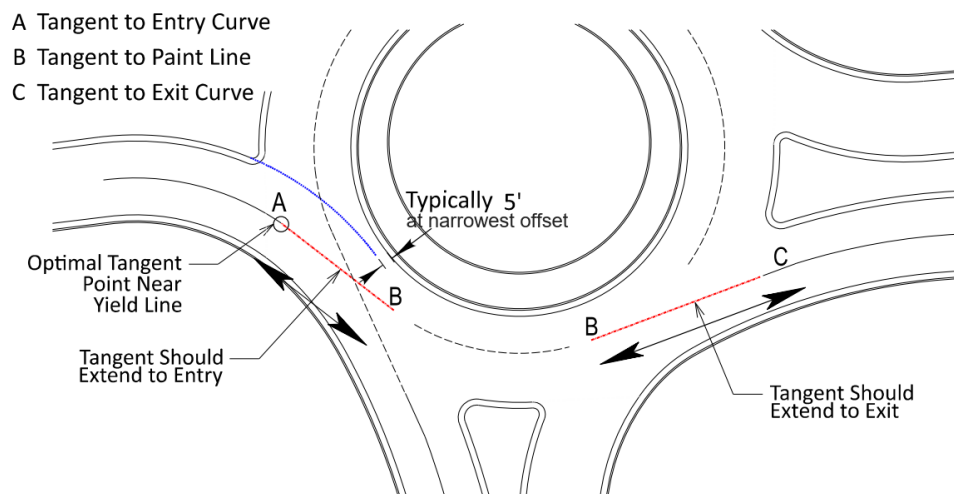


Figure 10-12: Entry Design to Minimize Path Overlap



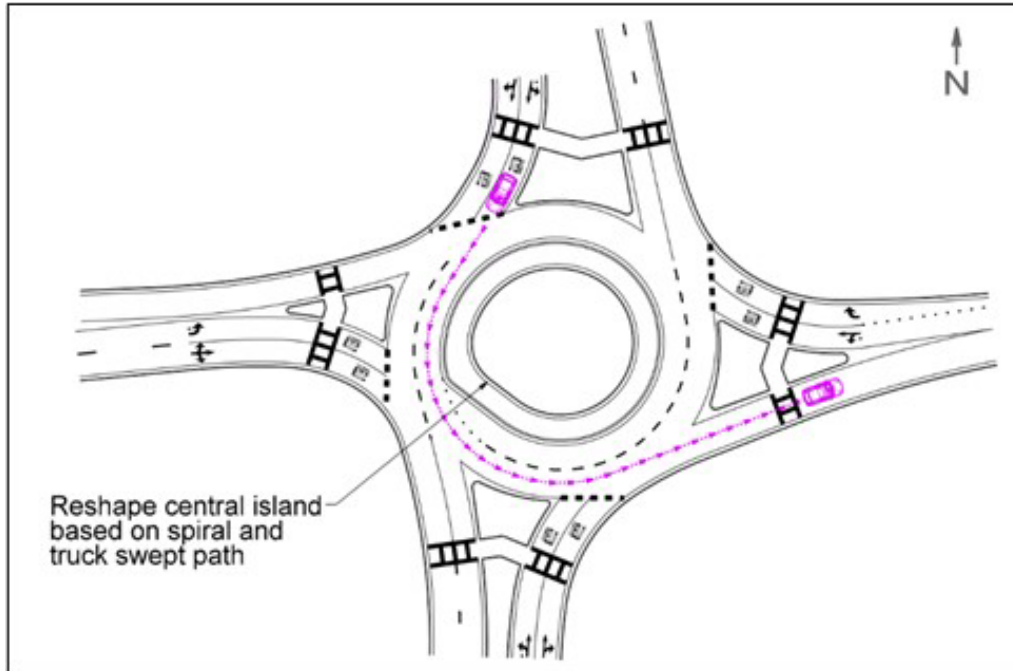
- (q) **Figure 10-13** provides the linework checks to verify the development of natural parallel entry and exit paths. The blue line is an extension of the splitter island curve. When the curve enters the circle at an offset of 5 feet to the central island edge of the pavement, then path overlap is generally avoided. Checking for overlapping entry paths requires measurement of the tangents between reversing curves. The entry to the circulating tangent should measure between 30 and 50 feet. The exit tangent should measure between 40 and 60 feet.

Figure 10-13: Method for Checking Path Overlap



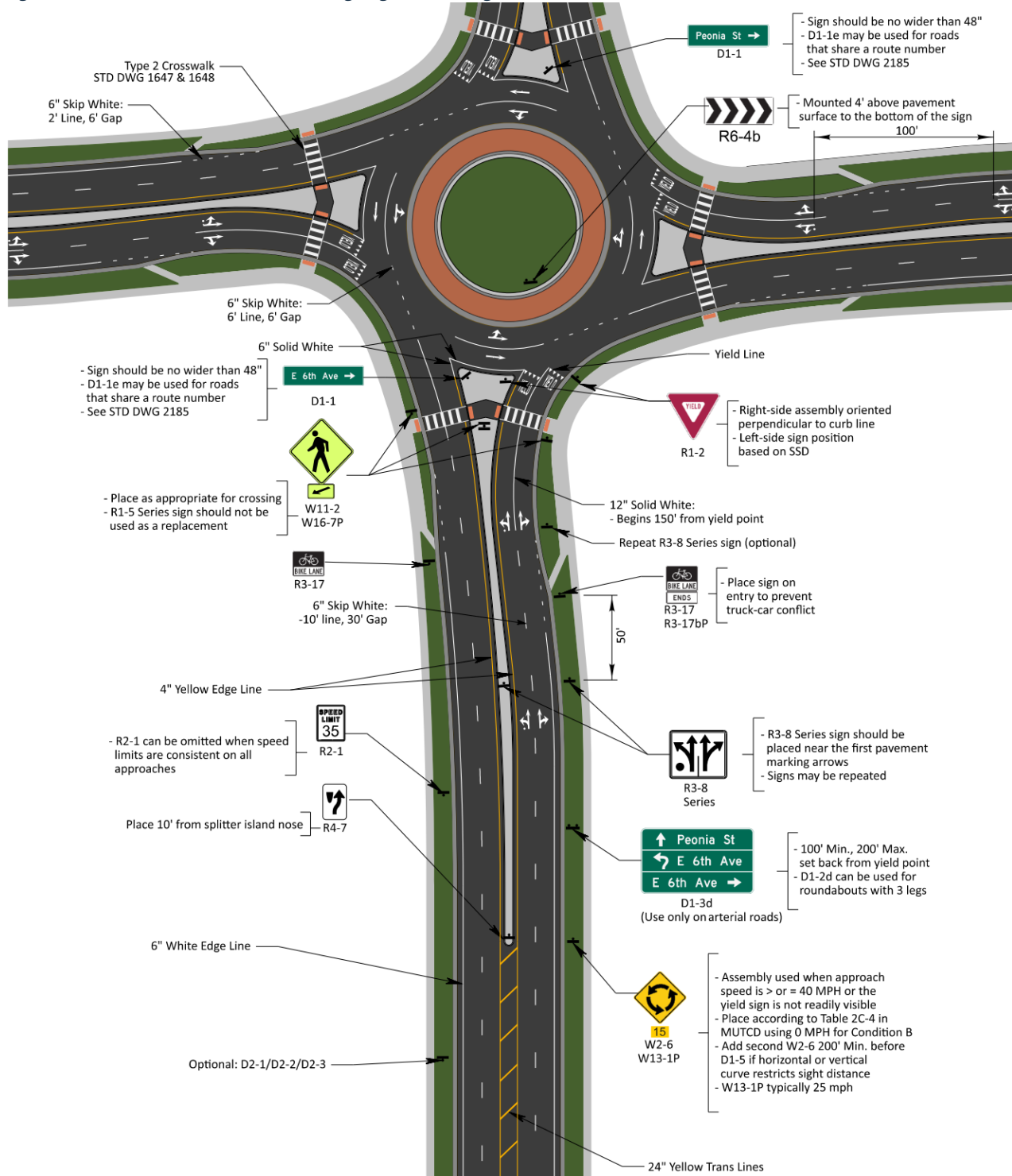
- (r) Spiral (spiral lane transition) – A spiral is a geometric feature of the truck apron needed for some multi-lane roundabout configurations with exclusive left-turn lanes. The spiral transitions left-turning vehicles from the inside to the outside circulating lane to allow vehicles to exit without changing lanes within the circulatory roadway (not to be confused with a highway curve spiral).
- (s) Spiral circulatory geometry is commonly used when a dedicated left-turn lane is implemented at a multi-lane roundabout. **Figure 10-14** shows an example of a spiraled movement. Spirals can also be applied for any 2x1 lane configuration roundabout where the single circulating lane spirals to the portion of the roundabout where a resulting two lanes are located within the circulatory. Benefits of using spirals in roundabouts consist of:
 - (1) Guiding the circulating vehicle to the outer lane of the two-lane circulatory.
 - (2) Where adjacent driveways are located close to the roundabout, or a heavy right turn movement is common at the adjacent downstream intersection.
 - (3) Reduces the size of the conflict zone, the area where entering vehicles interact with circulating/conflicting vehicles.
 - (4) Reinforce yield behavior for the outer lane entering driver that is yielding at the two-lane entry because the spiral makes it more apparent that the circulating vehicle will cross the entry path of this entering lane.

Figure 10-14: Spiral Design Example



- (t) Signs shall be mounted outside any areas traversable by vehicles. **Figure 10-15** displays signage for one approach of a typical multi-lane roundabout. Other approaches should be treated similarly.

Figure 10-15: Multi-Lane Roundabout – Signing and Marking



- (u) **Geometric Design Criteria** – Prior to commencing the conceptual design phase of any roundabout project, a Roundabout Design Criteria Table is required to be submitted to the City, along with the conceptual design submittal package. The table shall include all elements listed in the following example table with typical values. The design criteria must be reviewed and approved by the City, prior to advancing a concept design or submitting any design plans for review.

Table 10-4: Example Single and Multi-lane Urban/Suburban Roundabout Design Criteria

	Design Element	Design Criteria
General Design Requirements	Geometric Design Speed (Entries)	Single-Lane – < 25mph; Multi-lane < 28mph
	Inscribed Circle Diameter (Mini)	70' – 100'
	Inscribed Circle Diameter (Single-Lane)	110' – 140'
	Inscribed Circle Diameter (Multi-Lane)	150' – 190'
	Design Vehicle	Per road classification • Collector and Local Roads: WB-50 • Arterial Roads: WB62
	Check Vehicles	WB-67
	Design Vehicle Tracking	1.0' Clearance from wheel path to face of curb
	Check Vehicle Tracking (oversize vehicles)	- Assumes trucks straddle lanes on entry, circulating, and exit - 0' clearance from wheel path to face of curb
	Longitudinal Grades	0.5% Min - 5.0% Max
	Cross Slopes	1.0% - 3.0% (1.5% Typical)
Entry Design	Entry Radius	50' – 100'
	Entry Width (F-F)	16' – 21' Single-Lane 28' – 32' Multi-Lane
	Approach Width (F-F)	16' Minimum when curb on both sides
	View Angle (sight to the left)	75 Degree Minimum
	Tangent between Approach Curves	50' Minimum
	Entry tangency (for path overlap check)	26' – 50'
Exit Design	Exit Radius	200' – 800' Typical (100' Minimum)
	Exit Width	18' – 20' Single-Lane 28' – 32' Multi-Lane

	Exit Tangency (for path overlap check)	26' Minimum 40' to 60' desirable
Circulatory Roadway Design	Circulatory Roadway Width (F-F)	17' – 20' Single-Lane 28' – 32' Multi-Lane
	Buffered Lane Design	2' – 4' Multi-Lane
	Truck Apron Width	10' – 14'
	Truck Apron Height	3"
	Truck Apron Slope	1.0%
Splitter Island Design	Splitter Island Length	<= 35 mph design speed = 50' Minimum >35 mph design speed = 100' Minimum
	Crosswalk Pedestrian Refuge Width	6.0' Minimum (back of curb to back of curb)
	Distance from entrance to crosswalk	20'-25' at entry 40' Max at exit
	Raised Crosswalks	Context Specific
	Crossing Accommodation	Crosswalk Signing and Marking – Single-Lane Additional RRFB – Multi-Lane

- (v) Diameters are provided for general guidance. Site constraints, site context, and differing design and accommodation vehicles may result in roundabout ICDs outside of the limits shown herein. When pedestrian facilities are present, select values on the lower end of the provided range. A separate operational analysis should accompany the design to confirm lane configurations and capacity needs for the proposed roundabout design.

10.6.5. DESIGN PERFORMANCE

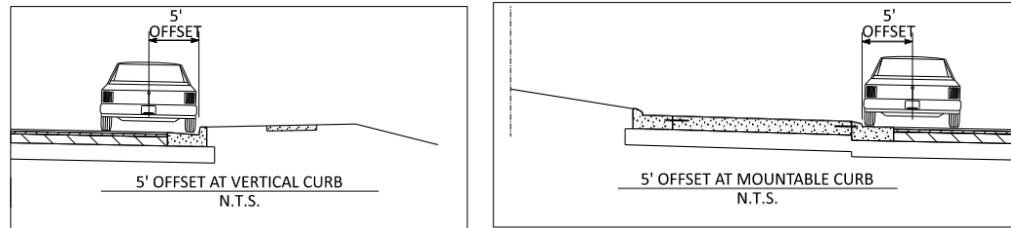
- (a) All roundabout geometric designs proposed on City roadways shall be submitted to the City, prior to public hearing, design approval, right-of-way, and advertisement stages of the project development process, regardless of the entity administering the project. These include roundabouts to be constructed on existing and proposed subdivision streets.
- (b) A roundabout design submittal package of Design Performance Checks, as detailed in the following sections, is required for geometric concept design validation prior to the development of preliminary plans.
- (c) The design performance checks package approval is required before preliminary design commences and again at subsequent project stages if changes to the horizontal geometric design take place after concept design is approved. The geometric design check specifications and requirements are documented in the following sections.
- (d) A dimensioned general layout drawing showing Overview and Horizontal Design.

- (e) Inscribed circle diameter, circulatory roadway width, entry and exit widths, splitter island lengths, raised/flush, truck apron widths including these features:
 - (1) Pedestrian crossing locations/width, composition, raised/flush, markings.
 - (2) Bicycle lane/approach and termination point.
 - (3) A typical cross-section of the circle central island (mounded), apron, roadway and apron composition, width, slope and curb standard.
- (f) Pavement markings (directional arrows, yield lines, edge lines, etc.).
- (g) Intersection Lighting pole locations (preferred).
- (h) Signing (one sign string including guide signs and overhead lane designation signs on multi-lane roundabouts).
- (i) Location of nearest development entrances to outer inscribed diameter and nature of land use.
- (j) Proximity of roundabout to traffic signal or other intersections.

10.6.6. DESIGN SPEED

- (a) Geometric design speed diagrams for each approach, entry, circulating and exit are required. Roundabouts shall be designed to promote geometric speed control per theoretical fastest path speeds in accordance with NCHRP 1043, Section 9.4. Left offset of the approach alignment increases the space for the approach curve to be well-developed for entry speed reduction. Geometric entry speeds, measured according to NCHRP 1043, shall be less than 25mph along the fastest through movement path for single-lane roundabouts and less than 28mph for the fastest through path for multi-lane roundabout entries.
- (b) Approach roadway design speeds and fastest theoretical paths to be shown and fast path radii to be annotated on the design checks submittal diagrams. Guidance on developing fast paths for Mini and Single-lane Roundabouts can be found in **Figure 10-17**. Guidance on developing fast paths for Multi-Lane Roundabouts can be found in **Figure 10-18**.
- (c) Geometric entry path deflection is best represented by a continuous spline (a curve with constantly changing radii) because this most closely approximates how a vehicle traces its fastest path through a roundabout. A spline also allows analysts to draw the smoothest, most natural vehicular path. It is drawn from a starting point approximately 165 feet in advance of the entry line, with an offset of 5 feet from curbs, 5 feet from a centerline, and 3 feet from other pavement markings (such as a painted median or two-way left-turn lane) These are shown in **Figure 10-16** below. The critical entry path radius, referred to as R1, occurs over the spline for 65 to 80 feet, near the yield point, where the tightest radius exists.

Figure 10-16: Offsets from Curbs



- (d) In most cases, speed control on entry is the most important fastest path criteria for all roundabout configurations. In addition, if a location has a significant pedestrian count (greater than 25 pedestrians per hour), steps should be taken to facilitate lower vehicle speeds at all pedestrian conflict areas (including exit speeds from the roundabout). when checking exit speeds, both the predictive method (based on the R3 exit path radius) and NCHRP 1043 equation 9.7 (which accounts for acceleration from R2 to R3) should be checked.
- (e) R1, R2, and R3 paths should follow a natural spline. Geometric entry speed is usually governed by R1 radius but may be governed by R5 radius in some cases. On designs that cannot achieve deflection using central island and approach alignment offset to the left of centerline, add reverse curves on the approach splitter island, separated by a short tangent of 50 to 100 feet. approach curve radii to be sized using AASHTO Table 3-13, low-speed urban design to avoid needing superelevation. **Table 10-5** outlines the recommended radii for roundabouts. Use NCHRP 1043, Section 9.4.3, for estimating predicted speeds associated with fast path radii. The Radius values in the table, when applied with normal cross-slope, are associated with geometric design speeds of 22 mph to 28mph, as the desirable ‘fast-path’ values for single-lane and multi-lane roundabouts, respectively.

Table 10-5: Recommended Radii for Fast Paths

Splined Fast Path Radius	Recommended Radius for Mini-Roundabout (FT)	Recommended Radius for Single-Lane Roundabout (FT)	Recommended Radius for Multi-Lane Roundabout (FT)
R1 Entry	100 to 165	120 to 165	175 to 220
R2 Circulating	70 to 100	70 to 120	70 to 170
R3 Exit	90 to 150	120 to 300*	120 to 300*
R4 Left-Turn	Central Island Radius +5 FT	Truck Apron Radius +5 FT	Truck Apron Radius +5 FT
R5 Right-Turn	50 to 90	70 to 100	70 to 170

*Where pedestrian use of an exit crosswalk is frequent (greater than 25 pedestrians per hour), adjust exit radii to reduce the R3 to less than 200 feet, except on multi-lane designs.

Figure 10-17: Mini- and Single-Lane Roundabout – Geometric Design Speeds

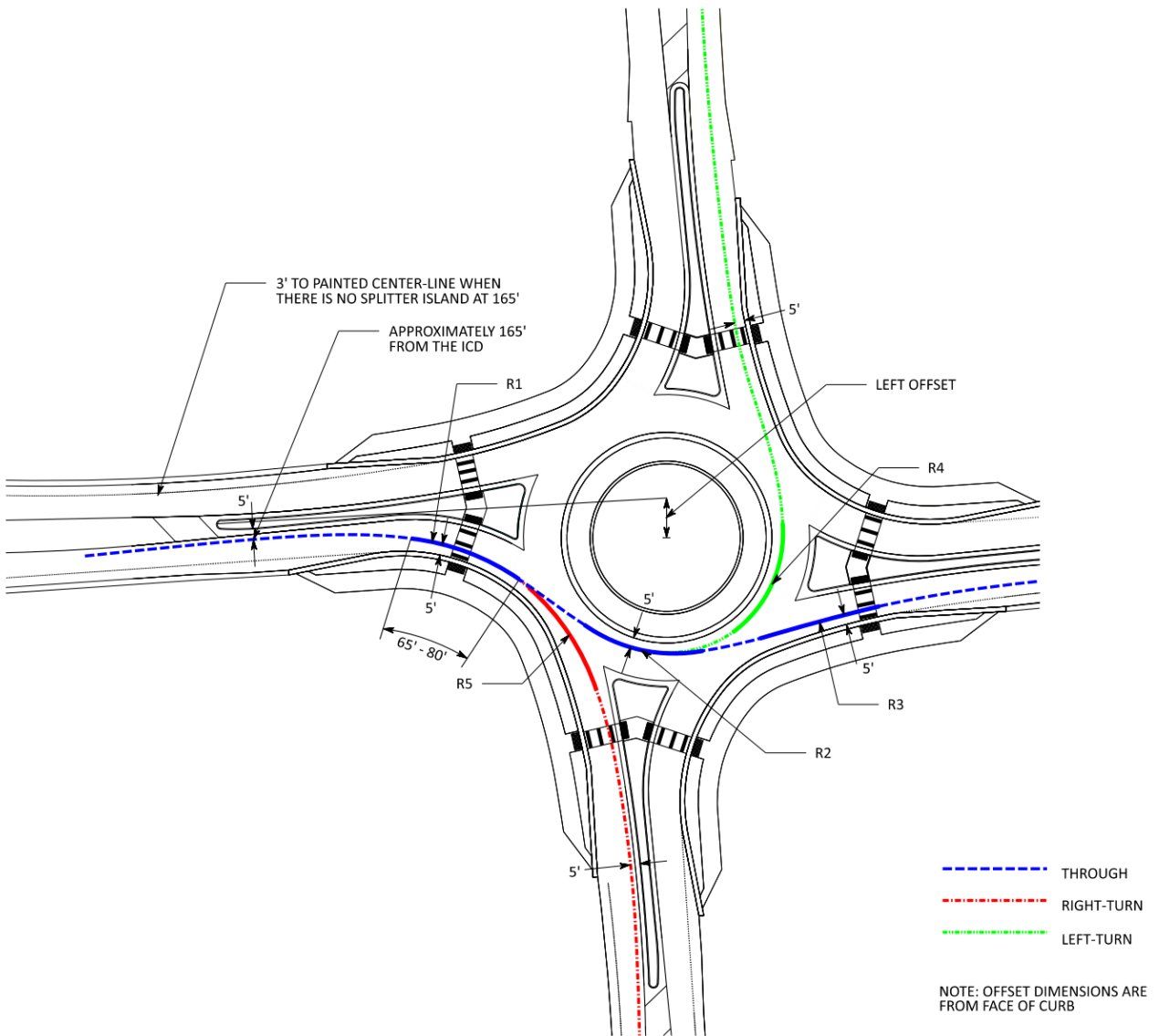
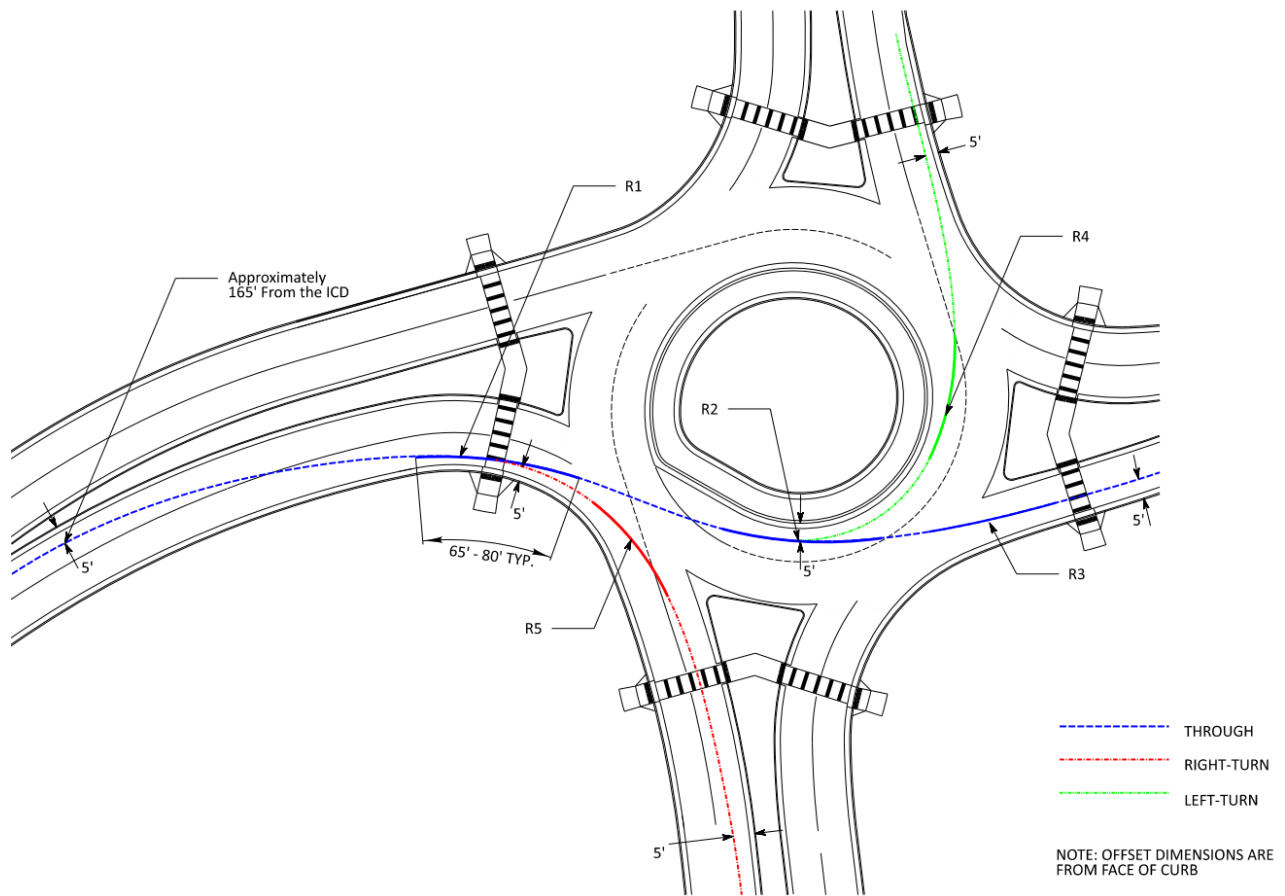


Figure 10-18: Multi-Lane Roundabout – Geometric Design Speeds



10.6.7. DESIGN VEHICLES

- (a) Truck swept-path diagrams shall be developed using AutoTURN® or similar software with a depiction of the design and check vehicle(s) are required for all the turning movements to validate the width of lanes and the circulatory roadway. Validate the width of the central island truck apron and entry and exit widths using 1 foot from face of curb as the shy distance to vehicle wheels. The truck cab of a design vehicle should stay on pavement when running swept-path analysis, with all tires maintaining 1 foot from face of curb. Vehicles, such as buses and fire trucks, should not mount the central island truck apron. Coordinate with the City Engineer for approval on design vehicles for subject intersections.
- (b) The smaller ICD of the mini-roundabout restricts their usage dependent on the chosen design vehicle. Guidance on the minimum ICD allowed for certain vehicles to make a left-turn or U-turn is presented in **Table 10-6**. These values are generally for guidance and do not supersede the requirements of Design Memo 9.04 Turning Radii. Additionally, the splitter island should be mountable as needed based on the swept paths of the chosen design vehicle.
- (c) Example of a truck movement through a mini-roundabout is shown in **Figure 10-19**.
- (d) Larger trucks may need to use the truck apron as an overrun area. Right turning trucks are not to use the truck apron. Where entry, exit, or circulating width becomes excessive for right turns, consider using an outer edge external truck apron. The external truck apron should not pass through crosswalks. Minimum right-turn radii for chosen design vehicles are presented in **Table 10-7**.

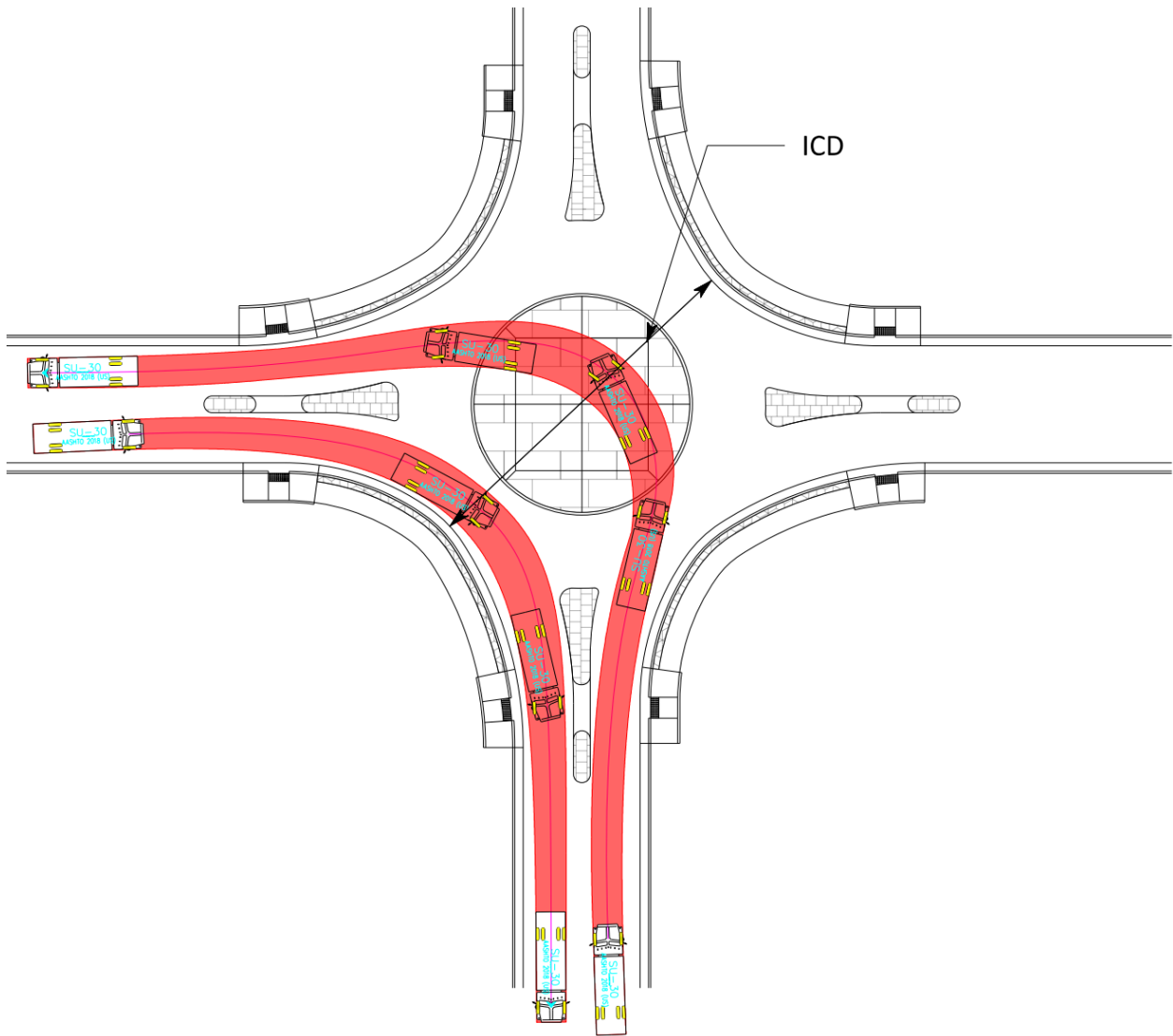
Table 10-6: Mini-Roundabout ICD Requirements for Vehicle U-turns and Left-Turns (LT)

Inscribed Circle Diameter	Design Vehicles Accommodations			
	SU-30	B-40 (City Bus)	Fire Truck	WB-62
60	LT-Only	No	LT-Only	No
65	LT-Only	LT-Only	LT-Only	No
70	LT-Only	LT-Only	Yes	No
80	LT-Only	LT-Only	Yes	LT-Only
90	Yes	Yes	Yes	Yes
100	Yes	Yes	Yes	Yes

Table 10-7: Minimum Right Turn Radii for Design Vehicles

Minimum Right Turn Radius	
SU-30	30 FT
B-40	25 FT
DL-27 & Fire Truck	16 FT
WB-62, WB-67TX WB-67	Determined by AutoTURN®

Figure 10-19: Min-Roundabout – Truck Swept Paths

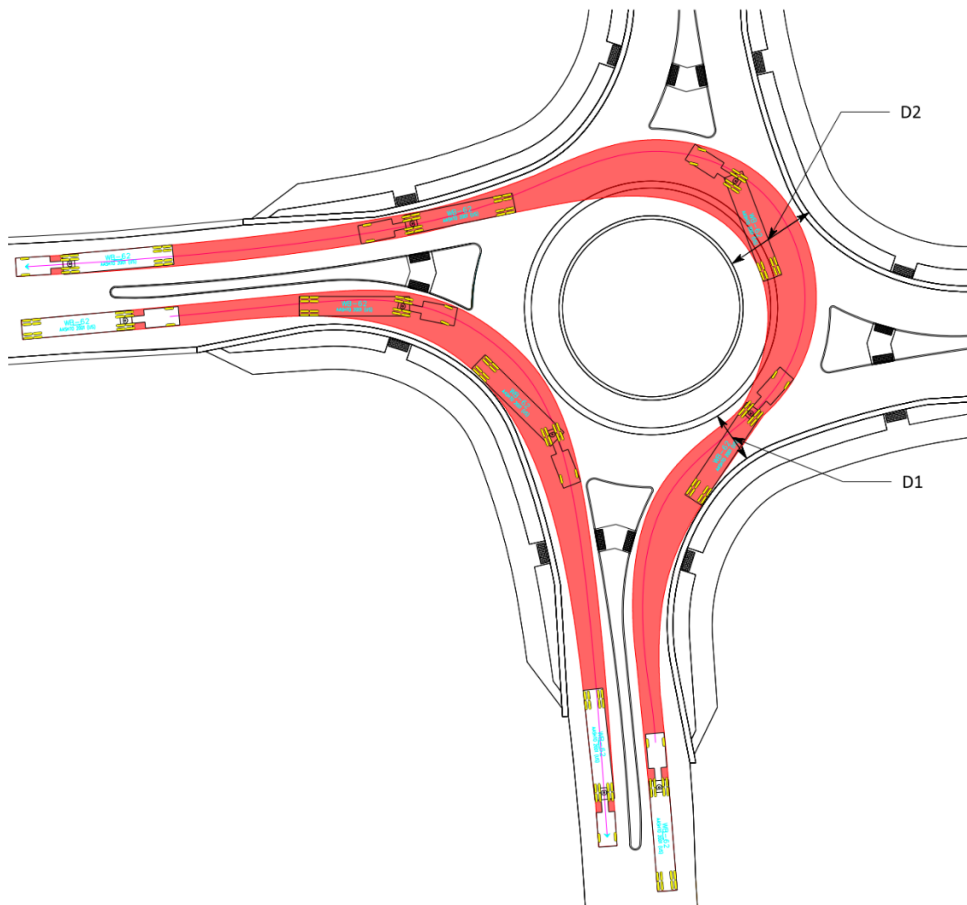


- (e) **Figure 10-20** presents an example of a left and right turning movement through a single-lane roundabout. D1 is a measurement from the edge of pavement of the width of the circulating lane. D2 is a measurement from the face of curb of the circulating lane plus the truck apron. Recommended values of D1 and D2 are presented in **Table 10-8**.

*Table 10-8: Left Turning Width Required for Single-Lane Roundabouts
(‘D1’ and ‘D2’ in feet – See Truck Swept Path Figure 10-20)*

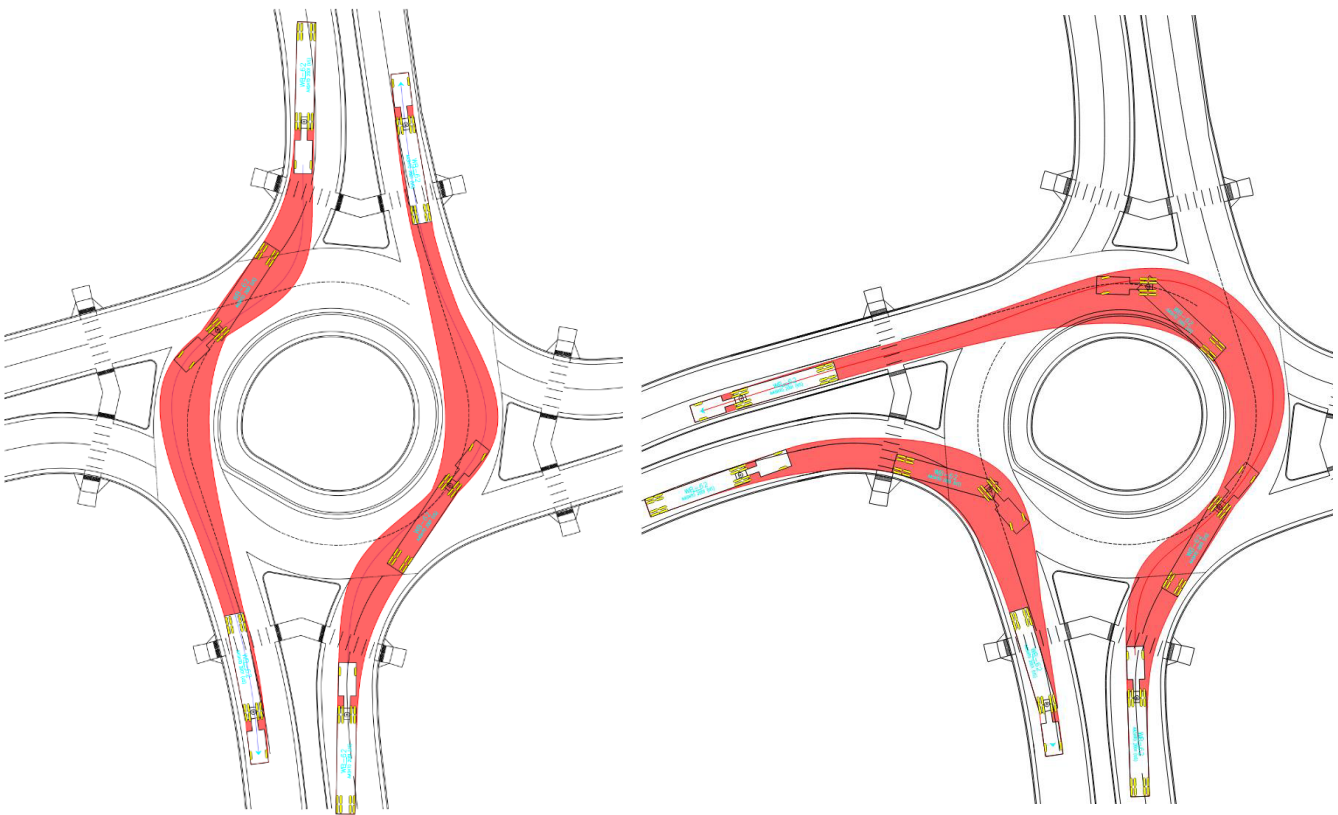
Inscribed Circle Diameter	Design Vehicle				
	D1 (EOP)			D2 (FOC)	
	SU-30	City Bus	Fire Truck	WB-62	WB-67
110	14*	15	14	32	39
120	14*	15	14	30	36
130	14*	14	14*	27	33
140	14*	14	14*	26	30

Figure 10-20: Single-Lane Roundabout – Truck Swept Paths



- (f) Multi-lane roundabout design vehicle considerations need to consider the swept paths on entry, on exit and in the circulatory roadway. The design vehicle may straddle lanes whereby the design vehicle is assumed to use the entire curb-to-curb width for entering, circulating and exiting as needed. **Figure 10-21** shows example through and turning movements for a multi-lane roundabout. The following are design vehicle and check vehicle requirements:
- (1) CITY BUS-40, and fire rescue trucks are to track in lane on approach entry, circulating and exiting. The circulatory roadway must accommodate a passenger car and bus in-lane (side-by-side) (see NCHRP 1043 Exhibit 10-39).
 - (2) WB-50 and WB-62 may use the central island truck apron for over tracking on left turning movements.
 - (3) Right turning trucks are not to use the truck apron. Where entry, exit, or circulating widths become excessive for right turns, consider using an external truck apron. External truck aprons should not pass through crosswalks.

Figure 10-21: Multi-Lane – Truck Swept Paths

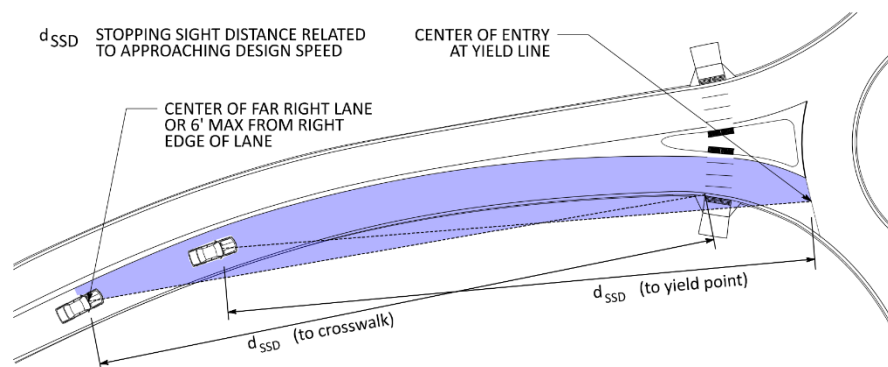


10.6.8. SIGHT DISTANCES

- (a) Stopping sight, intersection sight and view angle diagrams accounting for vertical approach grades, stopping sight and horizontal stopping sight, intersection sight distances, sight triangles and view angles. Sight distances must account for the height of the eye and the height of objects. This is for the purpose of user safety and to establish limits to planting schemes/landscaping for mounded central islands and splitter islands. For additional information refer to NCHRP 1043, Section 9.5.

Stopping sight distances shall be calculated based on approach speed and AASHTO Chapter 3.2 Sight Distance. The approach stopping sight distance (**Figure 10-22**) should be drawn from the yield line or the crosswalk as applicable.

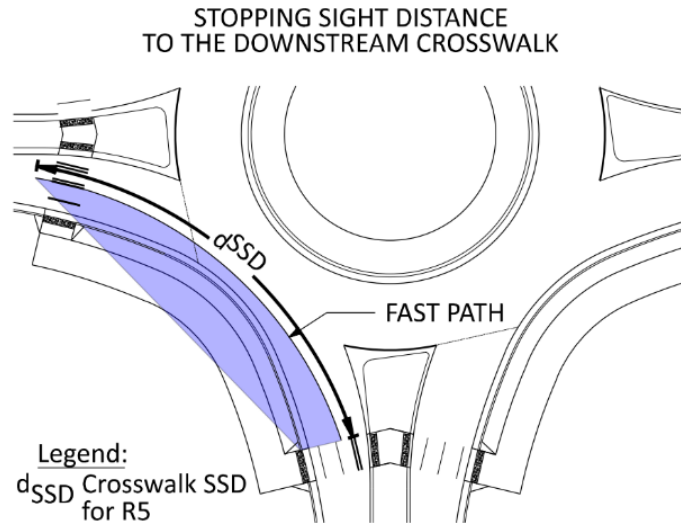
Figure 10-22: Approach Stopping Sight Distance



* SSD VALUES BASED ON APPROACH POSTED SPEED AND AASHTO CHAPTER 3.2 SIGHT DISTANCE

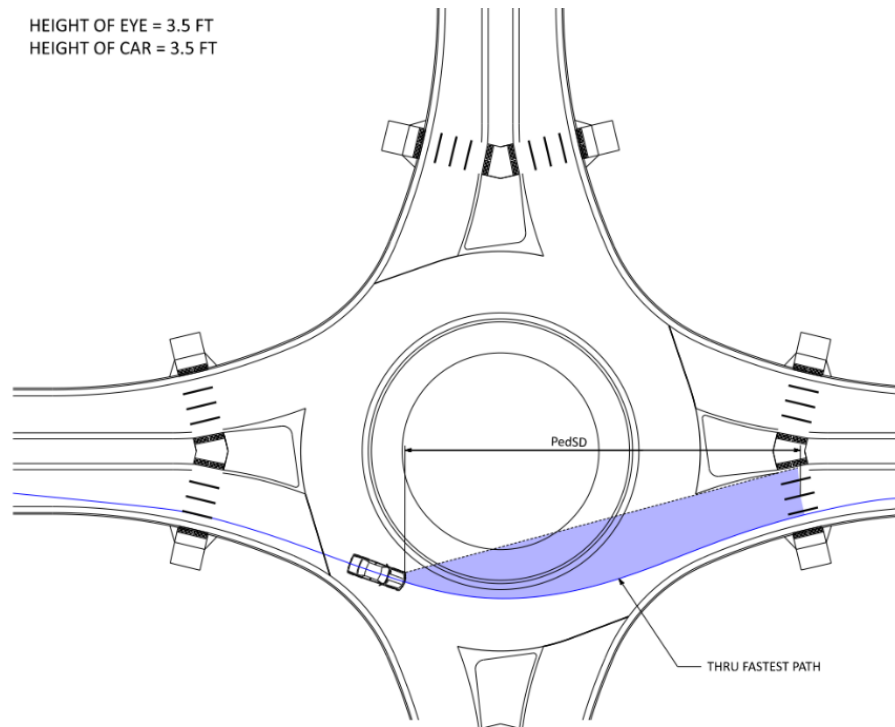
- (b) Stopping sight distance to the downstream crosswalk shall be calculated using the measured speed for the right turn (R5) along the right turn fast path. This is shown in **Figure 10-23**. Stopping sight distance should be checked from the downstream crosswalk along the thru fast path to ensure that a vehicle making the through movement can see a pedestrian crossing and vice versa. This check should use the R1 entering speed.

Figure 10-23: Stopping Sight Distance to the Downstream Crosswalk



- (c) **Figure 10-24** illustrates the required sight distance check to ensure that a pedestrian can see a driver entering the roundabout, making a through movement and driving a fast path alignment through the roundabout. Providing the minimum sight distance allows the pedestrian to cross at normal walking speeds with adequate time to clear the crosswalk before the advancing vehicle arrives.

Figure 10-24: Stopping Sight Distance to Exiting Crosswalk



NOTE:
- PEDESTRIAN SIGHT DISTANCE TO BE CALCULATED USING THE EQUATION BELOW AND MEASURED ALONG THE THRU FAST PATH.
- VERTICAL CHECKS ARE TO USE A EYE HEIGHT OF 3.5 FT. AND A CAR HEIGHT OF 3.5 FT.

$$PedSD = 1.47S \left(\frac{L}{S_p} + t_s \right)$$

Where:

PedSD = Pedestrian Crossing Sight Distance (ft)

S = Design Speed (mph)

L = Crossing Distance (ft)

S_p = Average Pedestrian Walking Speed (ft/s), default = 3.5 ft/s

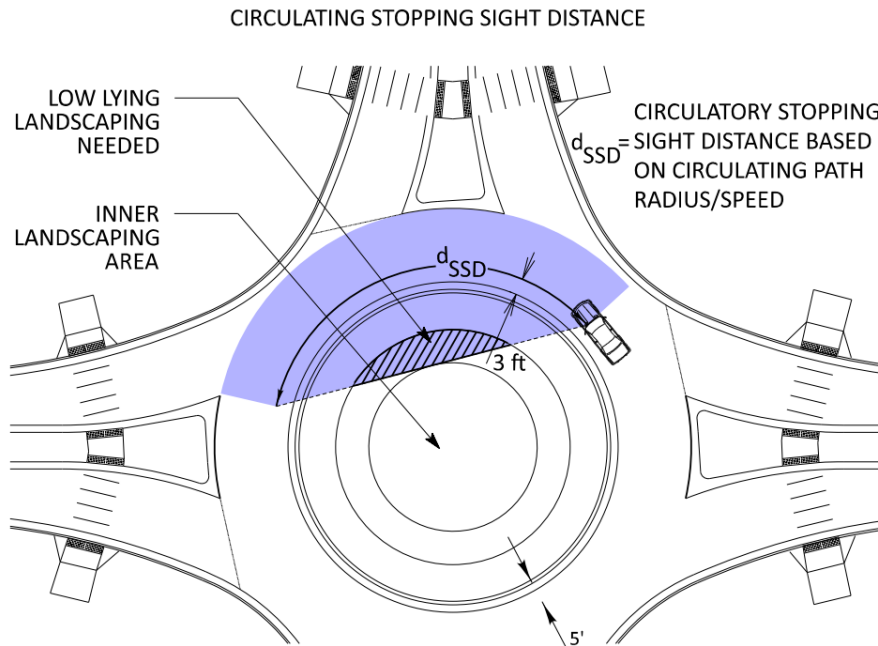
t_s = Pedestrian Start-Up and End Clearance Time (s), default = 3.0s

SOURCE: GDOT PEDESTRIAN STREETScape GUIDE, UPDATE 1.2 (2021)

- (d) Circulating stopping sight distance can be used to determine which areas within the central island require low lying landscaping and which areas do not have limitations on planting heights. The circulating stopping sight distance is calculated using the R2 circulating speed and follows a path that is a 3-foot offset from the edge of pavement of the circulating roadway or 5 feet from the

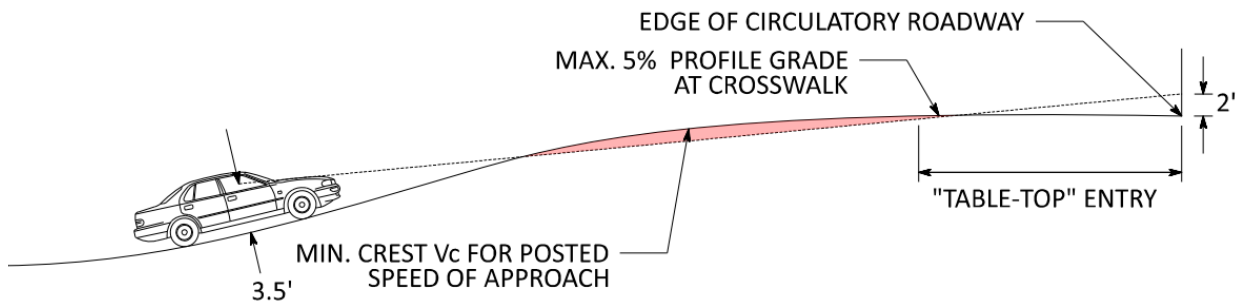
face of curb, seen in **Figure 10-25**. This shape can then be rotated around the circle.

Figure 10-25: Circulating Stopping Sight Distance



- (e) Vertical sight distance checks shall be performed and submitted, using a driver eye height of 3.5 feet and an object height of 2 feet. An example of this is shown in **Figure 10-26**.

Figure 10-26: Vertical Sight Distance



- (f) The intersection sight distance shall be checked by offsetting the yield line of the entering approach and the upstream approach by 50 feet. In addition, the circulating intersection sight distance should be checked as shown in **Figure 10-27**.

- (g) The view angle of the entering vehicle is checked to ensure that a driver at the yield line, turning their head no more than 105 degrees, can see any oncoming entering or circulating vehicles. **Figure 10-28** illustrates the vehicle positions to check sight to the left.

Figure 10-27: Intersection Sight Distance

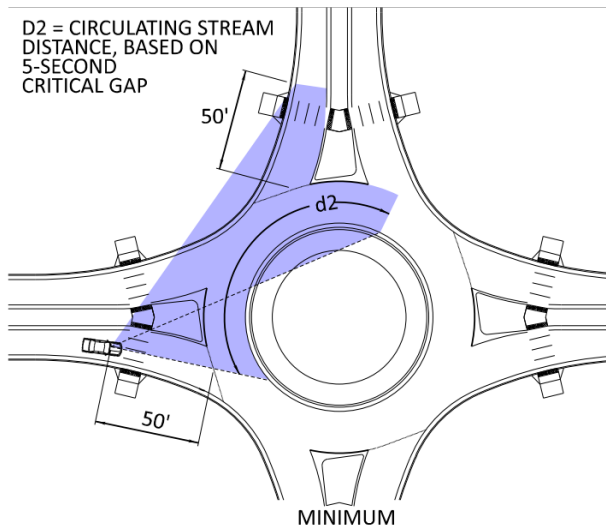
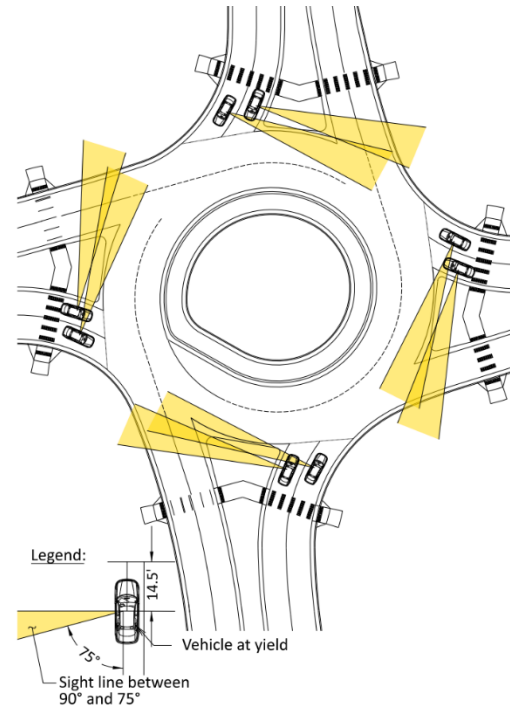


Figure 10-28: Entering Vehicle Sight Angle



10.7. TURN LANES

- (a) When Required: Single-turn lanes shall be provided for all intersections and driveways that connect at a median opening. Turn lanes shall be required:
- (1) At all driveway or street intersections with a daily entering traffic volume of 500 vehicle trips or 50 vehicle peak hour trips.
 - (2) At all driveway or street intersections on the state highway system at the option of TxDOT.
 - (3) Based on other factors such as street classification, travel speeds, sight distance, truck traffic, crash history, and other site conditions.

(b) Left-Turn Lanes

- (1) Storage Length – Left-turn storage lengths shall be sized to store the number of vehicles expected to queue in the lane during an average peak period. Left-turn storage length shall be designed in accordance with TxDOT's *Roadway Design Manual*. Additional length may be required based on traffic volumes or TIA storage requirements.
- (2) Width – Single left-turn lanes on arterials and larger classifications shall be 11 feet in width. Dual left-turn lanes on arterials shall be a minimum of 10 feet in width. All other left-turn lanes shall be a minimum of 11 feet in width.
- (3) Cross Slope – The cross slope of left-turn lanes shall match the cross slope of the adjacent through lane.
- (4) Taper Lengths – Single left-turn lane taper lengths shall be designed in accordance with TxDOT's *Roadway Design Manual*. Left-turn lane tapers shall be designed using either:
 - (A) Symmetrical reverse curves of at least 250 feet minimum radius; or
 - (B) Asymmetrical reverse curves where the leading reverse curve is twice the radius of the following reverse curve, and the leading reverse curve has a minimum radius of at least 300 feet.
- (5) Median openings may be provided at intersections or at intervals for major developed areas. Spacing between median openings must be adequate to allow for the introduction of left-turn lanes and signal detection loops to operate without false calls.

(c) Right-Turn Lanes

- (1) Placement
 - (A) Upstream Right-Turn Lanes – A minimum tangent section of 30 feet shall be provided between the preceding driveway or cross-street curb return and the taper of a right-turn lane.
 - (B) Continuous Right-Turn Lanes – Where several successive driveways require exclusive right turn lanes, and the driveway spacing is not adequate to avoid encroachment of the right-turn lane on another driveway, a continuous right-turn lane shall be used.
- (2) Storage Length – Right-turn storage lengths shall be sized to store the number of vehicles expected to queue in the lane during an average peak period. Right-turn storage length shall be designed in accordance with TxDOT's *Roadway Design Manual*. Additional length may be required based on traffic volumes or TIA storage requirements.

- (3) Width – Right-turn lanes on arterials shall be 11 feet in width. All other right-turn lanes shall be a minimum of 10 feet in width.
- (4) Taper Lengths – Single right-turn lane taper lengths shall be designed in accordance with TxDOT's *Roadway Design Manual*. Right-turn lane tapers shall be designed using either:
 - (A) Symmetrical reverse curves of at least 250 feet minimum radius; or
 - (B) Asymmetrical reverse curves where the leading reverse curve is twice the radius of the following reverse curve, and the leading reverse curve has a minimum radius of at least 300 feet.
- (d) **Two-Way Left-Turn Lanes**
 Paved flush medians are also commonly used on urban streets. They are typically used for a marked median and continuous two-way left-turn lanes. Two-way left-turn lanes are typically used for low speed, low volume roadways with closely spaced driveways. The minimum standard width for a two-way left-turn lane shall be designed in accordance with TxDOT's *Roadway Design Manual*.

10.8. ALLEYS

Alleys are minor roadways used primarily for vehicular service access to the back or sides of properties otherwise abutting on a street. The requirements for alleys are provided in the City Code. Proposed alleys will be privately owned and maintained unless agreed to in writing by the City. Minimum pavement widths for alleys are shown in **Table 10-9**. The minimum curb radius for alleys intersecting streets is 15 feet to allow for solid waste and emergency vehicle access. Parking shall be prohibited on both sides of an alley that is less than 26 feet wide to allow for 12 feet of access.

Table 10-9: Alley Design Standards

Alley Location	Minimum Pavement Width
Business and Industrial Areas	20'
Residential Areas	12'
Residential Areas with Rear Entry Garages	22'

10.9. RAILROAD CROSSINGS

Early identification of rail crossings and coordination with railroad owners may be required during plan development. Railroad agreements that include details for crossing replacements, roadway typical section, and cost assignment should be executed as early as possible in plan development.

10.10. EXISTING STREET MODIFICATIONS

- (a) All subdivisions shall have access to an adequate perimeter or approach street. An adequate perimeter or approach street is one that has a minimum pavement width of at least 22 feet and a pavement structure that meets the City's pavement design requirements of this manual for the construction and ultimate traffic volumes of the development. When the existing pavement width is less than 22 feet and/or does not meet pavement design requirements within this manual, the Developer shall be responsible for reconstructing and/or widening the existing pavement.
- (b) The limits of the reconstruction and/or widening shall be based on a TIA submitted by the Developer. The TIA shall include construction traffic, the ultimate traffic volumes of the development, and the timing and proposed plan for reconstruction and/or widening of the existing pavement. If the City determines that the Developer needs to reconstruct or widen existing roadways outside of the area being developed, the City shall inform the Developer of these limits.
- (c) The pavement transitions at the beginning and ending of the proposed widening shall follow the lengths shown in **Table 10-10**. The Developer shall remove a minimum of 2 feet of the existing pavement from the pavement edge for construction of the widened pavement section. If the existing roadway to be widened has a parabolic cross slope (or varied cross slopes), or the cross slope is nonexistent, the developer shall ensure the new cross slope of the widened section meets a minimum of 2% but does not exceed a maximum of 4% cross slope. If widening an existing pavement section to one side creates two different cross slopes, the maximum algebraic difference between these two cross slopes is 1%. If this difference is greater than 1%, additional level-up or reconstruction of the existing roadway section will need to ensure it will minimize this difference.

Table 10-10: Minimum Transition Lengths

Posted Speed	Formula	Minimum Transition Lengths (L)								
(S)		W = 2'	W = 3'	W = 4'	W = 5'	W = 6'	W = 7'	W = 8'	W = 9'	W = 10'
30	$L = \frac{W(S^2)}{60}$	30'	45'	60'	75'	90'	105'	120'	135'	150'
35		41'	61'	82'	102'	123'	143'	163'	184'	204'
40		53'	80'	107'	133'	160'	187'	213'	240'	267'
45	L = W x S	90'	135'	180'	225'	270'	315'	360'	405'	450'
50		100'	150'	200'	250'	300'	350'	400'	450'	500'
55		110'	165'	220'	275'	330'	385'	440'	495'	550'
60		120'	180'	240'	300'	360'	420'	480'	540'	600'

Section 11. PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian facilities shall be designed to promote pedestrian safety and efficiency, minimize conflicts with motorized and non-motorized vehicle traffic, minimize tripping hazards and protruding objects, and accommodate accessibility needs of all pedestrians. Pedestrian facilities are important transportation modes that shall be incorporated into transportation projects. All pedestrian facilities must conform to current Federal, State, and Local ADA requirements and to the criteria in this section. For the purposes of this section, pedestrian facilities include sidewalks, shared-use paths, trails, hike and bike routes, and barrier-free ramps.

11.1. DESIGN GUIDELINES

- (a) Facilities shall comply with the latest edition of the following standards:
 - (1) Americans with Disabilities Act Accessibility Guidelines (ADAAG), U.S. Access Board.
 - (2) Proposed Accessibility Guidelines for Pedestrian Facilities in Public Right-of-Way (PROWAG), U.S. Access Board.
 - (3) Architectural Barriers Act Accessibility Guidelines; Outdoor Developed Areas, U.S. Access Board.
 - (4) Texas Accessibility Standards (TAS), Texas Department of Licensing and Regulation (TDLR).
 - (5) Urban Bikeway Design Guide, National Association of City Transportation Officials (NACTO).
 - (6) Texas Manual on Uniform Traffic Control Devices (TMUTCD), TxDOT.
 - (7) Bikeway Selection Guide, FHWA.
 - (8) Separated Bike Lane Planning and Design Guide, FHWA.
- (b) The following denotes maximum grades for pedestrian facilities:
 - (1) All pedestrian facilities shall have a typical 1.5% cross-slope and a maximum 2% cross-slope.
 - (2) Pedestrian facilities contained in the ROW must not exceed the general grade of the roadway.
 - (3) Pedestrian facilities not contained in the ROW or that exceed the general grade of the road, and exceed 5% running slope, must follow the following ramp provisions:
 - (A) Ramp running slope must not be greater than 8%
 - (B) The maximum rise for any ramp run is 2.5 feet. Landings are required at the top and bottom of each ramp run.
 - (C) Landings must be a minimum of 5 feet by 5 feet with maximum 2% cross slope in all directions

- (D) Handrails are required on ramps with a ramp rise greater than 6 inches. Handrails should be a minimum of 36 inches in height for pedestrians and 42 inches in height for facilities that accommodate bicycles.
- (4) The running slope of the pedestrian access route contained in a street crossing must not exceed 5%.
- (5) When pedestrian access routes are contained within pedestrian street crossings with yield or stop control, the cross slope of the pedestrian access route must be 2% maximum. When pedestrian access routes are contained within pedestrian street crossings without yield or stop control, the cross slope of the pedestrian access route shall be 5% maximum. Pedestrian street crossings without yield or stop control are crossings where there is no yield or stop sign, or where there is a traffic signal that is designed for the green phase. At pedestrian street crossings without yield or stop control, vehicles can proceed through the intersection without slowing or stopping. Curb ramp slopes shall not exceed 8.33%, and the flares adjacent to the curb ramps shall not exceed a 10% slope.
- (6) Drop-off barriers should be provided for steep slopes adjacent to sidewalks if the sidewalk is elevated relative to the adjacent roadway or next to an open drainage ditch. Depending upon the height of the embankment, the slope of the adjacent roadside, and the conditions at the bottom of the slope, barriers or rails are recommended if any of the following situations occur within 2 feet of the edge of the sidewalk:
 - (A) Slopes between 1V:3H and 1V:2H, with a drop of 6 feet or greater;
 - (B) Slopes of between 1V:3H and 1V:2H, adjacent to a parallel body of water or other substantial obstacle; slopes of between 1V:2H and 1V:1H, with a drop of 4 feet or greater; or
 - (C) Slopes of 1V:1H or steeper, with a drop of 1-foot or greater.
- (c) Accessible ramps for sidewalk crossings at all street intersection corners, at all crosswalks, and across any stop control on-residential or multi-family driveways shall be constructed in accordance with **Section 11**.
- (d) Poor lighting conditions can lead to an increase in severe and fatal pedestrian crashes. Provide pedestrian lighting at street crossings and as required by the utility provider.

11.2. SIDEWALKS

- (a) Sidewalk – A sidewalk is defined as the paved area designated for pedestrian use which is generally located between the curb of the roadway and the adjacent property line.

(b) Requirements

- (1) Sidewalks shall be constructed on all streets as required by the City Code.
- (2) Sidewalks shall meet minimum width requirements as specified on **Table 10-2**.
- (3) Sidewalks shall be constructed as a lot is improved other than locations specified in this manual.
- (4) Sidewalks shall be constructed for all common, drainage, and utility lots, and any other lot where there would be no building improvement to the area adjacent to the sidewalk at the time of subdivision street construction.
- (5) Curb ramps shall be constructed at all intersections at the time of subdivision street construction. Sidewalks shall also be constructed along the intersection curb radius to connect curb ramps at the time of subdivision street construction.
- (6) A curb ramp shall be provided adjacent to public mailboxes when parking is permitted along the adjacent curb.
- (7) Perpendicular and/or directional ramps are required for pedestrians crossing each street at an intersection, including elbow (or knuckle) intersections.
- (8) Curb ramps must include a detectable warning surface and shall be constructed in accordance with the City's design standards.
- (9) Careful attention to drainage design should avoid ponding water and collecting sediment on the lower landings of curb ramps.
- (10) Curb ramps shall not be used as roadway/sidewalk drains and should not be used in drainage channels.
- (11) For existing roadways to be reconstructed, each roadway should be evaluated for existing or potential pedestrian usage to determine if sidewalks are needed and/or the possibility of constructing shared-use paths for pedestrians and bicyclists.
- (12) Marked crosswalk locations should be investigated for appropriate inclusion in the plans. Typically, marked crosswalks are placed at intersections with a "stop" condition when warranted.
- (13) An accessible detour must be maintained when construction activities that affect pedestrian facilities occur.
- (14) No ground box, valve, manhole, meter, or similar utility appurtenance, including concrete aprons, shall be located within sidewalks.

(c) Geometry

- (1) Sidewalks shall be constructed in accordance with the City's design standards. At no time shall there be any less than a 4-foot clearance between any two obstructions within a sidewalk, and the area must be passable by a standard wheelchair.
- (2) Sharp angles in sidewalks to avoid conflicts with other infrastructure or items shall be avoided. If conflicts exist, then the sidewalk shall be designed to meander.
- (3) Meandering Sidewalks – Meandering sidewalks shall have a minimum 200-foot. radius.
- (4) When the sidewalk width is less than 5 feet, passing spaces shall be provided at intervals of 200 feet maximum. Passing spaces shall be 5 feet. by 5 feet minimum.
- (d) Sidewalks shall be concrete in accordance with the [City's design standards](#).
- (e) All street bridges shall have a sidewalk constructed on each side of the bridge. The sidewalk shall be a minimum of 6 feet wide with a parapet wall providing a minimum of 2 feet behind the curb of the roadway. A standard pedestrian bridge rail protecting the sidewalk shall be provided on the outside edge of the bridge.
- (f) When new bridges are built as a part of the construction or reconstruction of a divided arterial, and a pedestrian crossing for a hike and bike trail is needed, a sidewalk shall be built as a part of the embankment design underneath the bridge structure for the width of the trail required plus 2 feet. The bridge structure should provide a minimum clearance of 10 feet above the sidewalk for pedestrian access.
- (g) All culvert crossings shall have a sidewalk constructed across and on each side of the culvert. The sidewalk shall have a standard pedestrian handrail.

11.3. MID-BLOCK CROSSINGS

Mid-block crossings should be installed where pedestrian traffic is anticipated and encouraged, and where there is a significant pedestrian desire line. Designers should study both existing and projected pedestrian volumes in assessing warrants for midblock crossings to account for demand.

- (a) Mid-block crossings must be designed in accordance with all portions of this manual.
- (b) No mid-block crosswalks will be allowed unless supported by a traffic engineering study and approved.
- (c) Mid-block crossings shall not be placed within 200 feet of a stop- or signal-controlled intersection.
- (d) Mid-block crossings shall be installed with bump outs at a minimum but preferably with elevated pedestrian tables on relatively flat grades. Consideration should be given to providing adequate street lighting. Designers shall ensure

adequate stopping sight distance. The intersection shall be designed at a 90-degree angle to the roadway.

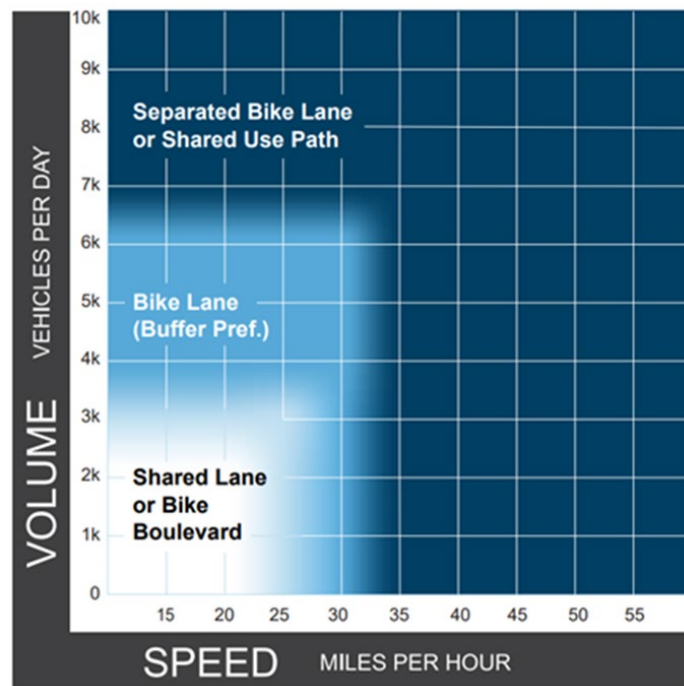
- (e) Advance signing and crosswalk markings shall be designed in accordance with the *TMUTCD*. Yield lines should be set back between 20 and 50 feet to provide multiple cars with the opportunity to see pedestrians at the crossing. Yield Here to Pedestrians signs shall be placed at the yield lines on both sides of the road. Crosswalk pavement markings shall consist of solid white lines that are 24 inches in width, 10 feet in length, and placed longitudinally with the road.
- (f) Median refuge islands are typically raised islands located along the center of a roadway. Median islands shall provide a pedestrian refuge width of 6 feet minimum that reduces pedestrian crossings to one direction of traffic at a time. Curb extensions at mid-block crossings narrow a street by extending the sidewalk or widening the landscaping strip. Curb extensions improve pedestrian safety by shortening the street crossing distance for pedestrians. Pedestrians crossing at curb extensions give better visibility to motorists since they are closer to the edge of the travel lane.

11.4. BICYCLE FACILITIES

Accommodating bicycles is an important consideration for projects under development. The City has an approved Hike and Bike Trail Plan that was adopted as part of the Major Thoroughfare Plan. The latest edition of the *AASHTO Guide for the Development of Bicycle Facilities* and *NACTO Urban Bikeway Design Guide* provides information on the development of bike facilities to enhance and encourage safe bicycle travel and guidance to help accommodate bicycle traffic.

- (a) All bike facilities shall follow the current edition of the *TMUTCD* for pavement marking and signage.
- (b) The recommended bicycle facilities based on vehicle volume and roadway design speed are shown in **Figure 11-1**.

Figure 11-1: Recommended Bicycle Facility



11.4.1. Types of bicycle facilities include the following:

- a. Shared Lane or Bike Boulevard – used by both bicyclists and motorized vehicle traffic and have pavement markings which indicate they are shared.
 - (1) Shall only be used in locations with vehicle volumes 3,000 ADT or lower and speeds 30 mph or less and that do not have sufficient space for a separated bicycle facility
 - (2) Shared lane width shall be 14 feet maximum, 13 feet minimum, measured from the lane stripe to the edge of the gutter pan
 - (3) If the shared lane width is greater than 14 feet, a 5 feet bike lane should be provided instead.
- (b) Bike Lane – designated by a lane stripe, pavement markings, and signage. Striped bicycle lanes promote areas reserved for bicyclists.
 - (1) Bike lanes shall only be used in locations with vehicle volumes of 7,000 ADT or lower and speeds of 35 mph or less. A buffered bike lane is recommended for higher-speed locations.
 - (2) Bike lane width shall be 5 feet minimum, measured from the lane stripe to edge of the pavement or curb. If the curb includes a gutter, the bike lane width shall be 4 feet minimum measured from the lane stripe to the edge of the gutter.

- (3) Bike lane width of 6 to 7 feet is desirable adjacent to parallel parking to allow the bicyclist to avoid riding in the door zone.
 - (4) Drainage grates located in the bike lane should be designed to prevent bicycle tires from catching in the grate pattern
 - (5) Consideration should be given to providing physical separation for bike lanes unless proven unfeasible.
- (c) Buffered Bike Lane – separated from the adjacent motor vehicle lane or parking lane by a striped buffer area that may include chevrons, diagonal lines, or wide pavement marking stripes.
- (1) Buffered bike lanes shall only be used in locations with vehicle volumes of 7,000 ADT or lower.
 - (2) Bike lane width, exclusive of the buffer, shall be 5 feet minimum, measured from the lane stripe to edge of the pavement or curb. If the curb includes a gutter, the bike lane width shall be 4 feet minimum measured from the lane stripe to the edge of the gutter.
 - (3) Buffer width shall be a minimum of 2 feet for speeds of 45 mph or less, and 3 feet for 50 mph or greater. If the buffer is 3 feet wide, diagonal hatching shall be marked. If the buffer is wider than 3 feet, chevron hatching shall be marked.
 - (4) Buffers can be striped between travel lanes and bike lanes, between bike lanes and parking lanes, or both.
 - (5) Flexible delineator posts may be used with buffered bike lanes.
- (d) Separated (Protected) Bike Lane – physically separated from the adjacent motor vehicle traffic by vertical elements in the street buffer. Vertical elements separating the bike lane from the travel lane may include continuous raised medians, concrete curbing, concrete barriers, parked vehicles, or planters. Separated bike lanes may also be raised to sidewalk level. Separated Bike Lanes are the preferred bicycle facility type and should be considered and provided unless otherwise approved by the City Engineer.
- (1) Separated bike lane width shall be 6 feet minimum.
 - (2) A minimum shy space of 2 feet on both sides should be provided for parking, intermittent (e.g., signs, streetlights, utility poles), and continuous (e.g., walls, railings, fences, barriers) vertical objects.
 - (3) Separated bike lanes shall have a minimum design speed of 15 mph.
 - (4) If designed at the sidewalk level, the use of different pavement types, integral concrete coloring, markings, and/or buffers may be necessary to keep bicyclists and pedestrians separated.

11.5. SHARED USE PATHS

Shared-Use Paths **are** physically separated from motorized vehicular traffic, either by a landscaped buffer or a barrier, and may have an independent alignment. Shared-Use Paths must accommodate pedestrian facilities and must be designed in accordance with this manual.

11.5.1. Types of Shared Use Paths include the following:

(a) Shared-Use Path–Trails

- (1) Width – Trails are designed for two-way travel. The minimum width of a trail shall be 10 feet. In constrained scenarios, a reduced width may be used as approved with the following parameters:
- (2) 10-foot – Bicycle Traffic is expected to be low, and pedestrian usage is only occasional.
- (3) 8-foot – A physical constraint, such as an environmental feature, bridge abutment, or utility structure requires a narrowed path for a short distance (<300 feet) or a short spur connecting to a main trail.
- (4) Surface Material – The standard trail surface material is reinforced Portland cement concrete. Alternatively, an asphalt or compacted gravel surface may be permitted as approved.
- (5) Clear Space – The minimum horizontal clear space width is 2 feet to allow clearance from lateral obstructions such as bushes, signage, large rocks, above-ground utilities, bridge piers, abutments, and poles. The clear space shall have a recoverable cross slope of no steeper than 1V:6H on both sides of the trail.
- (6) Design Speed – The design speed for trails shall be 18 mph, except in designated parks, where the design speed shall be 10 mph. The design speed can fluctuate depending on the context of the trail, the user types expected, the trail terrain, and other trail characteristics. Trails can be designed for lower speeds in constrained scenarios, as approved by the City.
- (7) Vertical Clearance – Vertical clearance to obstructions shall be 10 feet or as required by the City.
- (8) Grade – Trails must follow grade requirements in accordance with this manual. For trails there are circumstances in which full compliance with the grade requirements may not be practical due to physical or regulatory constraints. Physical constraints would include existing terrain or infrastructure, ROW availability, notable natural features, or any similar existing physical constraint. The following grades shall be provided when physical or regulatory constraints exist.

Table 11-1: Maximum Running Slope and Segment Length When Physical or Regulatory Constraints Exist

Running Slope of Trail Segment		Maximum Length of Segment
<i>Steeper Than</i>	<i>But Not Steeper Than</i>	
1:20 (5%)	1:12 (8.33%)	200'
1:12 (8.33%)	1:10 (10%)	30'
1:10 (10%)	1:8 (12%)	10'

- (9) Signage and Striping – Appropriate signage and markings shall follow the *TMUTCD*. Standard regulatory signage shall be retroreflective and follow Part 9 of the *TMUTCD* standards. Refer to the *TMUTCD* for allowable trail signage dimensions. Signs shall be placed in accordance with the guidance in Part 9 of the *TMUTCD*.
- (10) Lighting – Lighting options should be considered at the following locations:
 - (A) Near connections to transit stops, schools, universities, shopping, or employment areas.
 - (B) Under vehicular bridges, underpasses, tunnels, and urban trail bridges.
 - (C) Locations with limited visibility and sight distance.
 - (D) Trail intersections with streets or other trails.
 - (E) Trailheads.
- (b) Shared-Use Path – Sidepaths

Sidepaths are a specific type of hike and bike trail that are designed to follow roadway corridors rather than have an independent alignment. They are particularly useful when roadway width is limited and providing an on-street bike facility is not possible. Sidepaths are designed for two-way travel, and, in addition to bicyclists, users may include inline skaters, skateboarders, scooter users, and pedestrians.

 - (1) Width – The minimum width of a shared use path shall be 10 feet. A reduced width of 8 feet may be used for short distances in constrained areas with any of the following conditions:
 - (A) Bicycle traffic is expected to be low during peak days.
 - (B) Pedestrian use of the facility is not expected to be more than occasional.
 - (C) Horizontal and vertical alignments provide frequent, well-designed passing and resting opportunities.
 - (D) The path will not be regularly subjected to maintenance vehicle loading conditions that would cause pavement edge damage.
 - (E) Constraints, such as bridge abutments, utility structures, and environmental constraints, physically limit a wider sidepath.

- (2) Offset - The desired distance between a sidepath and adjacent roadway edge (uncurbed) is 10 feet, 6 feet minimum. The desired distance between a sidepath and face-of-curb is 6 feet, 2 feet minimum. When 5 feet cannot be provided on higher-speed facilities (>45 mph), consideration should be given to installing a barrier.
- (3) Clear Space – The minimum horizontal clear space width is 2 feet to allow clearance from lateral obstructions such as bushes, signage, large rocks, above-ground utilities, bridge piers, abutments, and poles. The clear space shall have a recoverable cross slope of no steeper than 1V:6H on both sides of the sidepath.
- (4) Signage and Striping – Appropriate signage and markings per the *TMUTCD* should be included at each driveway and street intersection to alert motorists of bicycle travel. Driveway volumes should be assessed on a case-by-case basis to design for minimizing conflicts between bicycle facility users and motor vehicles. Consider using color and other design details to send messages to motorists entering the driveways that they must be alert to users from both directions.
- (5) Lighting – Lighting options should be considered.
- (6) Intersections – At signalized intersections and supported by a TIA, consider prohibiting right turns on red at sidepath crossings to reduce conflicts between drivers and bicyclists and consider providing a leading pedestrian interval at crossings to accommodate higher levels of path use.
- (7) Termination – Each end of a sidepath should directly connect to an on-street bike facility, another trail or path, or to a bicycle-compatible local street. Where no interconnecting bikeway exists, advanced signage should be installed informing roadway users that the path ends and bikes may use full lane. Additional signage can be provided that directs bicyclists to interim facilities along alternate routes.

11.6. TRAFFIC CONTROL

Traffic control devices are signs, markings, signals, and other devices used to regulate, warn, or guide traffic on a street, pedestrian facility, bikeway, or private road open to public travel. The *TMUTCD* shall be used as the standard for all traffic control devices. Refer to TxDOT Traffic Standards for design requirements and specifications not specified in this guide.

11.6.1. SIGNS

The functions of signs are to provide regulations, warnings, and guidance information for road users. Signs should be used only where justified by engineering judgment or studies as provided in the *TMUTCD* or authorized by [City Code](#). Regulatory signs that require approval from the City

Council by the [City Code](#), such as speed zones and parking regulations, shall be authorized prior to installation.

- (a) Speed Limits – Speed limits on City streets are set by State statute. Speed limit signs shall be installed at points of change from one speed limit to another and at entrances to new subdivisions from major streets. Changes in the state-mandated speed limits shall only be established based on an engineering study and approval by City Council.
- (b) Street Name – Street Name signs should be installed at all public and private street intersections. Refer to City of Hutto Standard Construction Details for Street Name sign detail. Custom street names signs, posts, or anchors different from the City standard shall not be allowed.
- (c) Object Markers for Ends of Roadways – Street end markers shall be used to mark the end of a roadway in other than construction areas. A minimum of three markers shall be used and spaced to limit public travel beyond the end of the roadway. Refer to Standard Construction Details for Street End Marker Detail.

11.6.2. MARKINGS

Markings provide guidance and information on the roadway for road users. Markings include pavement and curb markings, delineators, colored pavements, channelizing devices, and islands.

- (a) Line Pavement Markings – Center, lane, edge, and stop line markings should be installed on all arterial and minor collector streets and intersections. Markings may also be required on local streets as recommended by a TIA or based on site and access conditions.
- (b) Crosswalk Markings – Crosswalk markings should be limited to locations where there is a need to provide guidance for pedestrians and alert road users of a designated pedestrian crossing point. Continental style crosswalk pavement markings shall be utilized for all marked crosswalks.

11.6.3. SIGNALS

Signals include traffic control signals, hybrid beacons, flashing beacons, emergency-vehicle signals, and in-roadway lights.

- (a) Traffic Control Signals – The selection and use of traffic control signals should be based on an engineering study as provided in the *TMUTCD*. Provisions for a traffic control signal associated with new development may be required based on a TIA and City Code. Spacing between traffic control signals is dependent on desired vehicle speed, coordinated signal system operations, traffic control and safety needs.
- (b) Other Signals – The selection and use of other signals should be based on an engineering study as provided in the *TMUTCD*.

11.6.4. TEMPORARY TRAFFIC CONTROL

Temporary traffic control (TTC) is required when the normal function of the street and/or ROW is impacted as part of construction, utility work, maintenance operations, and the management of

traffic incidents. A TTC zone shall be installed to effectively guide all road users through the area with consideration for road user safety, worker safety, and the efficiency of the street.

- (a) Agency Jurisdiction – TCP shall be approved by the responsible roadway agency, such as TxDOT or county, prior to implementation.
- (b) Traffic Advisory – TCP that requires a partial or full road closure or other impacts that may cause delays to the public shall be coordinated with the City at least 10 business days in advance of the activity for proper traffic advisory. All work in the roadway requires an approved traffic control plan and a minimum of 7 days advance notification to the inspector and public using a message board. For all street closures, contact the City Inspector.
- (c) TTC Devices - All TTC devices (signs, markings, and signals) shall conform to the *TMUTCD* and TxDOT Work Zone Standards. All TTC devices shall be in good condition and removed when the TTC condition is no longer in place.
- (d) Traffic Control Plan

A traffic control plan (TCP) describes the TTC measures to be used for facilitating road users through a TTC zone. TCP shall be site and activity specific and may range in scope from being very detailed to referencing typical applications contained in the *TMUTCD* and TxDOT Traffic Control Plan Standards.

- (1) TCP shall be prepared by a trained and/or certified individual that is knowledgeable in the fundamentals of TTC and activity to be performed. The training and/or certification can be achieved through approved organizations such as American Traffic Safety Services Association (ATSSA) or by a Professional Engineer and noted in the TCP.
- (2) TCP shall be included in all construction plans and permit documents.
- (3) Modifications to TCP may be necessary based on changes in conditions or a determination of better methods.
- (4) The implementing agency or contractor is responsible for the TCP and shall provide a 24-hour contact person with a phone number that may be contacted if the TTC devices need to be replaced/restored due to damage caused by weather or other causes. This person shall be able to respond and correct any deficiencies.

11.6.5. SCHOOL AREAS

A school route plan should be prepared with a new school and as part of the associated TIA to determine the school area traffic control needs including school zones, reduced speed zones, and designated pedestrian crossings.

- (a) School Speed Limit Beacon – A school speed limit beacon shall be required for reduced speed zones on arterials, major collectors, and multi-lane streets.

- (b) Crosswalks – Crosswalks should be marked at intersections on established routes in accordance with the *TMUTCD*.

11.7. TRAFFIC CALMING

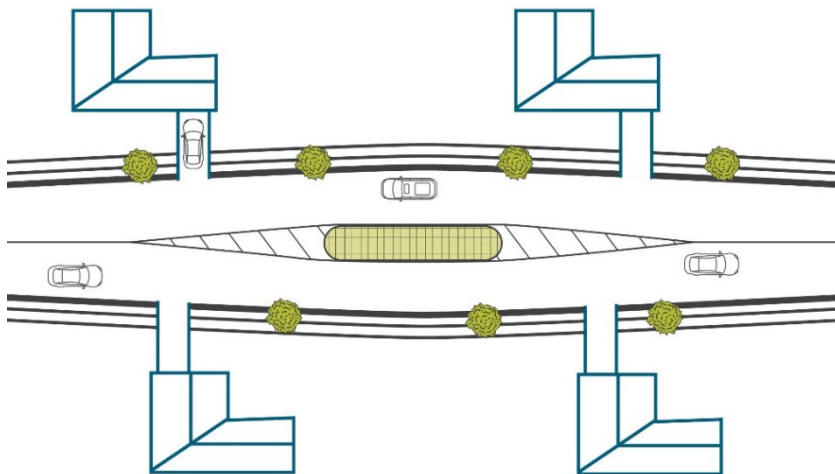
- (a) Traffic calming is a practice employed to help reduce the speed of travel on a street, which can improve safety for all users. This section focuses on physical measures available for use in Hutto. Traffic calming may be employed to help encourage vehicular operations at a target speed for a given street. There are many general considerations that need to be addressed when designing any traffic calming measure such as:
 - (1) Grades – Maximum and minimum grades are put into place in order to minimize vehicle damage, loss of vehicle control, and reduce potential road or property maintenance due to problems such as poor drainage that could arise from traffic calming measures. An example of a minimum grade is raised crosswalks or raised intersections having at least a 1% cross slope for drainage purposes. Maximum grade must be considered when looking at implementing a vertical deflection on a sloped road.
 - (2) Long Wheelbase and Emergency Vehicles – Knowledge of emergency vehicle routes and primary street usage must be acquired before implementing certain traffic calming measures because of the large turning radii of these vehicles and the need to quickly respond to emergencies. All traffic calming measures will be primarily focused on residential streets. An option to accommodate large vehicles is using a mountable rolled curb around the perimeter of the horizontal measure.
 - (3) Ease of Passage for Other Street Users – Any traffic calming measure which sacrifices the safety and general use of the street to any user should not be implemented. Compatibility of street calming measures to other street users can often be accomplished easily.
- (b) When operating speeds are higher than target speeds, there are several methods to calm traffic or reduce speed, most of which revolve around narrowing the street or perceived narrowing of the street. These often involve more abrupt horizontal or vertical movements on the street than the design speed for the street. This is not an exhaustive list of traffic calming options. The Engineer should determine the best solution for each individual location to ensure appropriate context and implementation.
- (c) Design of these devices should follow national guidance and meet *TMUTCD* requirements. The following resources are available online:

- (1) ITE Traffic Calming Measures
- (2) NACTO Urban Engineering Criteria Manual
- (3) FHWA Traffic Calming e-Primer
- (d) The following physical traffic calming measures are available for use in Hutto, when approved:
 - (1) Median Islands.
 - (2) Pinchpoint/choker.
 - (3) Bulb-outs.
 - (4) Lane shift/chicane.
 - (5) Signs and markings.

11.7.1. MEDIAN ISLANDS

The portion of a divided roadway separating the opposing traffic flows. A median may be traversable or non-traversable.

Figure 11-2: Median Island Illustration (Source: Delaware Department of Transportation)



- (a) Travel Way and Option Width – Median islands should be 2 feet to 6 feet when raised according to AASHTO Urban Collector Street Standard. The single-lane width next to the median island should not exceed 12 feet. Any raised median island should be 16 feet to 23 feet in length at an intersection or mid-block
- (b) Turning Requirements – Medians eliminate local street straight-through and left-turn traffic across non-local streets.
- (c) Curb Requirements – 4 to 9 inches vertical curb (1-foot offset required with curb of 6 feet or more).
- (d) Parking Considerations – If a mid-block crosswalk is combined with a raised median island, parking may be permitted if the sight line is an appropriate distance

from the crosswalk. Bicycle lanes can be placed beside curbs where parking is not permitted.

- (e) Access Considerations –The length should be controlled by the location of the median island to allow access to driveways and other streets.
- (f) Residential Lot Considerations – Medians have the potential to restrict direct access to residential lots that are in the vicinity of a median.

11.7.2. PINCHPOINT/CHOKER

A pinchpoint is a curb extension that is applied at a mid-block location between intersections that restricts motorists from operating at high speeds. Additional width may be necessary to accommodate turns. Pinchpoints are an effective way to shorten pedestrian crossing distances at mid-block locations.

Figure 11-3: Pinchpoint Illustration (Source: National Association of City Transportation Officials (NACTO))



- (a) Travel Way and Option Width – Normally, center island narrowings are about one car length: 6 feet wide and 20 feet long.
- (b) Turning Requirements – Turning maneuvers are typically not an option in the presence of pinchpoints. Only through traffic is affected by this traffic calming measure.
- (c) Curb Requirements – Pinchpoints can be considered either normal extensions of the existing curb or channelizing islands as defined in the *TMUTCD* and parallel design manuals.
- (d) Parking Considerations – On streets with parking deficiencies, pinchpoints sheltering angle parking bays might increase parking supply. Alternatively, pinchpoints could create a potential loss of on-street parallel parking.
- (e) Access Considerations – Pinchpoints are easily negotiable by large vehicles (such as fire trucks).

- (f) Residential Lot Considerations – Pinchpoints may provide additional area for landscaping, improving the appearance of a residential neighborhood. Pinchpoints may reduce the quantity of on-street parking, which could potentially limit the access of adjacent residential properties.

11.7.3. BULB-OUT

Bulb-outs (neckdowns, intersection narrowings, safe crosses, etc.) are curb extensions that reduce roadway width curb to curb at either midblock or intersection locations. Midblock treatments narrow the travel lane but do not provide additional sidewalk width. These types of intersection treatments reduce vehicle speeds by tightening curb radii and improve pedestrian safety by shortening the crossing distance.

Figure 11-4: Bulb-Out Illustration (Source: National Association of City Transportation Officials (NACTO))



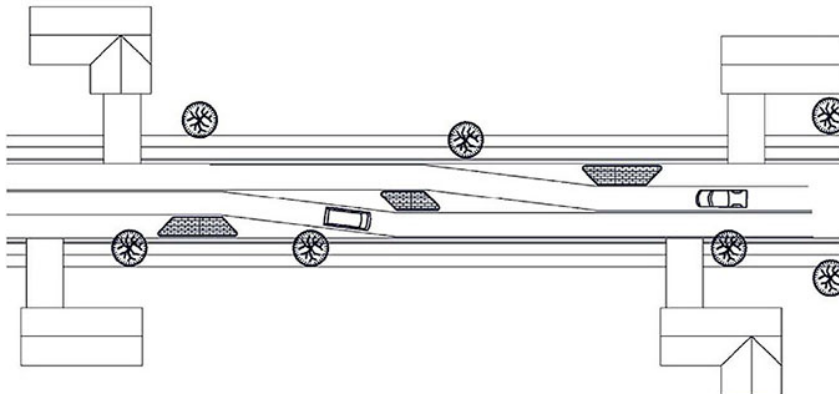
- (a) Travel Way and Option Width – Bulb-outs are typically constructed to have a width of 6 to 8 feet. Bulb-outs should also be offset from the through traffic lane by 1.5 feet.
- (b) Turning Requirements – Through and left-turn movements are easily negotiable by large vehicles. However, right-turning vehicles are slowed down by bulb-outs.
- (c) Curb Requirements – Bulb-outs are generally constructed by a reconstruction of existing curbs.
- (d) Parking Considerations – Bulb-outs create a potential for loss of on-street parking. However, bulb-outs can also create protected on-street parking bays.
- (e) Access Considerations – Bulb-outs are typically not appropriate along a primary access route to a commercial or industrial site if an adequate turning radius cannot be provided. The number of large turning vehicles and the total traffic volume on the receiving street are both factors when a corner extension is considered.

- (f) Residential Lot Considerations – Bulb-outs provide an opportunity for landscaping as well as standing space on a sidewalk area. Bulb-outs may also require the removal of some on-street parking adjacent to residential lots.

11.7.4. LANE SHIFT/CHICANE

A lane shift horizontally may be designed with striping or curb extensions that deflects a vehicle's path.

Figure 11-5: Lane Shift Illustration (Source: Delaware Department of Transportation)



- (a) Travel Way and Option Width – Usually when approaching a curb extension, each lane should be 10 feet wide or if local policy authorizes, 8 feet wide. However, the departing lane must always be 10 feet wide. Mid-block curb extensions require a minimum width of 9 feet for each lane.
- (b) Turning Requirements – Turning maneuvers are typically not an option in the presence of lane shifts. Only through traffic is affected by this traffic calming measure.
- (c) Curb Requirements – Curb extensions are most useful when they continue past the intersection and in the opposing direction. A 16-foot offset is necessary if curb extensions are used diagonally across from each other at intersection corners. Curb extensions are 16 to 23 feet in length, except when they act as bus stops. Curb extensions that are used for bus stops must be able to hold all buses. Mid-block curb extensions should also contain room for crosswalks and shifts in elevation; the minimum requirement is 23 feet long. Finally, design considerations should be made for emergency operations, service vehicles and transit vehicles depending on the community's needs.
- (d) Parking Considerations – Lane shifts provide the ability to create extra parking for parking bays.
- (e) Access Considerations – Lane shifts can be appropriate along a primary access route to a commercial or industrial site.

- (f) Residential Lot Considerations – Lane shifts may require removal of some on-street parking which may also reduce the accessibility of any adjacent residential lots.

11.7.5. SIGNS & MARKINGS

All signing and pavement markings used for traffic calming are to follow the *TMUTCD*. Best practices are available online in the ITE *Traffic Calming Measures* and NACTO *Urban Design Guide*.

Section 12. ROADWAY LIGHTING AND OVERHEAD UTILITIES

12.1. GENERAL

- (a) Streetlights in the City of Hutto may be owned and operated by the City, TxDOT, or Oncor. Prior to designing any streetlight system, the Design Engineer shall confirm maintenance responsibilities with the City Engineer and the various entities responsible for maintenance of streetlights. The City Engineer has sole discretion as to whether any lighting system is to be maintained by the City, TxDOT, or Oncor.
- (b) The Developer of a new street within the City shall furnish and install street lighting along all streets including cul-de-sacs and at all intersections. Street lighting that will not be maintained by TxDOT shall be in conformance with this manual, and where technical criteria is not covered by this manual, shall be in conformance with TxDOT's Highway Illumination Manual. Street lighting that will be maintained by TxDOT shall be in conformance with TxDOT's Highway Illumination Manual and the requirements of this manual, whichever are more stringent.
- (c) Provide new, unused materials. Luminaires, foundations, ground boxes, and conduit materials and installation methods shall comply with the applicable articles of the National Electrical Code (NEC), this manual, Oncor requirements, National Electrical Manufacturers Association (NEMA), Underwriters Laboratories (UL), and American Association of State Highway and Transportation Officials (AASHTO) criteria.
- (d) An illumination plan for all streets within the Plat shall be filed with the Construction Plans. The plan shall show the proposed location of the streetlights and any electrical facilities, including service locations, within the street ROW or public utility easements. The illumination plans shall include a photometric layout and appropriate calculations to demonstrate that the design criteria in this section have been met.
- (e) The street lighting facilities shall be complete and operational prior to acceptance of the public improvements.
- (f) The proposed streetlight design shall be as approved by the City Engineer and Oncor (or other electric utility company, if applicable).
- (g) All poles shall be identical along an entire continuous street or throughout a subdivision with public roadways. LED luminaires shall be utilized for all lights; high pressure sodium (HPS) luminaires are not permitted.
- (h) All streetlight systems maintained by the City or TxDOT shall be metered.

12.2. DESIGN REQUIREMENTS

Streetlight wattage and spacing for the roadway classifications are summarized below in **Table 12-1** and shall be used as the basis of design. A photometric exhibit shall be submitted concurrently

with the street lighting design. **Table 12-2** provides the minimum design criteria for illumination and uniformity ratio for all streets.

Table 12-1: Streetlight Spacing and Heights

Street Classification	Wattage (EQ LED)	Luminaire Height (ft)	Maximum Spacing Allowed (ft)
Local	100	25	300
Collector	150	30	300
Arterial	250	40	250

Table 12-2: Driveway Spacing Standards on Streets Without Median

Street Classification	Residential*		Commercial/Industrial**	
	Average Illuminance (min, fc)	Uniformity Ratio (max, avg: min)	Average Illuminance (min, fc)	Uniformity Ratio (max, avg: min)
Local	0.2	6:1	0.6	3:1
Collector	0.4	4:1	0.9	3:1
Arterial	0.6	4:1	1.2	3:1

**Residential land uses include residential development, or a mixture of residential and commercial development, characterized by few pedestrians and low parking demand at night. This includes single-family homes, townhouses, small apartments, and regional parks.*

***Commercial/Industrial land uses are characterized by heavy vehicular and pedestrian traffic and heavy demand for parking during peak periods. This includes densely developed apartment areas, hospitals, civic facilities, and neighborhood recreational centers.*

12.3. ORNAMENTAL STREET LIGHTS

- (a) Ornamental streetlights include luminaire poles or LED luminaire fixtures that are not considered to be standard fixtures by Oncor (if Oncor maintained lighting system) or TxDOT (if TxDOT or City maintained lighting system).
- (b) Ornamental streetlights shall not be utilized in Oncor maintained lighting systems without the approval of Oncor and the City Engineer.
- (c) Ornamental streetlights shall not be utilized in TxDOT maintained lighting systems without the approval of both TxDOT and the City Engineer.
- (d) Ornamental streetlights shall not be utilized in City maintained lighting systems without the approval of the City Engineer.
- (e) If ornamental streetlights are desired by a third party, the City, TxDOT, and/or Oncor may require that the third party accept maintenance responsibility for the non-standard components.

Section 13. TRAFFIC SIGNAL REQUIREMENTS

13.1. APPLICATION

The following guidelines are applicable for signals that will be maintained by the City of Hutto. Traffic signals that will be maintained by other entities (including but not limited to TxDOT and/or Williamson County) shall be designed per the requirements of those entities.

13.2. TRAFFIC SIGNAL SYSTEM DESIGN GUIDELINES

13.2.1. Phase Numbering – Conventional Intersections

- (a) For major streets that run north/south: Ø2 shall be the northbound through movement.
- (b) For major streets that run east/west: Ø2 shall be the eastbound through movement.
- (c) The remaining phases for through movements shall be numbered in a clockwise order starting with Ø2 using the even number phases.
- (d) Phases for left-turn movements shall be numbered using odd numbers (Ø1, Ø3, Ø5, and Ø7) in clockwise order, with Ø1 being the left-turn movement that opposes the Ø2 through movement.
- (e) For minor street split phase intersections, normal phasing applies except that Ø3 shall be used for the side whose through movement is typically Ø8 (i.e., Ø3 and Ø4 are used for the split phases).
- (f) For major street split phase intersections, normal phasing applies except that Ø1 shall be used for the side whose through movement is typically Ø6 (i.e., Ø1 and Ø2 are used for the split phases).
- (g) If all approaches to the intersection are exclusive, the split phasing rules above would apply, but the phase sequence shall be changed to Ø1 → Ø3 → Ø2 → Ø4.
- (h) The following overlaps shall be utilized for intersections with Flashing Yellow Arrows (FYA). The FYAs shall be wired in “non-compact mode” with the flashing yellow arrow output separated from the opposing pedestrian phase yellow output.
 - (1) Ø1 FYA – Overlap A – Ø1 protected and Ø2 opposing through phase.
 - (2) Ø3 FYA – Overlap B – Ø3 protected and Ø4 opposing through phase.
 - (3) Ø5 FYA – Overlap C – Ø5 protected and Ø6 opposing through phase.
 - (4) Ø7 FYA – Overlap D – Ø7 protected and Ø8 opposing through phase.
- (i) For locations in which twice a cycle operation is going to be used, then Ø1x shall be used to designate the second service of a phase within a cycle (i.e. Ø17 is the second service of Ø7 in a cycle).

13.2.2. Phase Numbering – Diamond Intersections

- (a) For diamond interchanges, the phase numbering shall be as follows:
 - (1) Northbound or Eastbound Arterial: Ø2.
 - (2) Eastbound or Southbound Frontage Road: Ø4 + Ø12 (OLK).
 - (3) Southbound or Westbound Arterial: Ø6.
 - (4) Westbound or Northbound Frontage Road: Ø8 + Ø16 (OLN).
 - (5) Northbound or Westbound Left Turn: Ø1.
 - (6) Southbound or Eastbound Left Turn: Ø5.
- (b) Inside Overlaps
 - (1) Ø1 left-turn side shall be OLI (OLA – used for FYA).
 - (2) Through movement on Ø1 side shall be OLB (traditionally called OLA in standard TTI sequence).
 - (3) Ø5 left-turn side shall be OLL (OLC – used for FYA).
 - (4) Through movement on Ø5 side shall be OLD (traditionally called OLB in standard TTI sequence).

13.2.3. General Design Features

- (a) Traffic signals shall be installed on mast arms. Span wire installations are not permitted.
- (b) All corners of intersections shall be illuminated with 250 W EQ LED luminaires installed either on traffic signal poles or on illumination poles already existing at the intersection.
- (c) All pedestrian signals, curb ramps, and other traffic signal infrastructure elements (as applicable) shall be compliant with the requirements of the Americans with Disabilities Act (ADA) and Public Right-of-Way Accessibility Guidelines (PROWAG).
- (d) All traffic signal heads shall be mounted horizontally a minimum of 19 feet vertically above the roadway surface and have 12-inch diameter LED lenses with vented aluminum backplates and reflective borders.
- (e) Controller cabinets shall be ground-mounted utilizing the TxDOT statewide concrete pedestal controller foundation. Controller cabinets shall utilize NEMA TS-2 Type 1 Configurations.
- (f) Vehicle detection shall be provided on all intersection approaches. Presence and advance detection shall be provided on all intersection approaches that have posted speed limits greater than or equal to 40 mph. Presence detection shall be provided on all other intersection approaches. Detection shall be provided using either VIVDS (video) or radar detection. Loop detectors or other forms of detection installed in the pavement are not permitted.

- (g) Internally lit street name (ILSN) signs shall be installed for all intersection approaches. Unless otherwise stated below, ILSNs shall be single-sided and mounted on a separate steel arm (at a 24-foot nominal mounting height). Double-sided ILSNs shall be utilized where the street name changes on each side of the cross street. In such a case, the street name for the leg on the driver's left should be displayed on the "back" side of the ILSN on the driver's left, and the street name for the leg on the driver's right should be displayed on the "front" side of the ILSN on the driver's right. Should a 24-foot (or taller) pole be infeasible due to site-specific conditions, then all ILSNs shall be single-sided and mounted to the mast arm. The design of the ILSN shall be approved by the City.
- (h) All pedestrian signal heads shall include countdown indications.
- (i) All push buttons shall be APS (accessible pedestrian signal) type with audible feedback.
- (j) Battery backup units (BBUs) shall be provided for all traffic signals. BBU cabinets shall be mounted to the side of controller cabinets.
- (k) One (1) pan-tilt-zoom (PTZ) camera and necessary appurtenances shall be provided at each signalized intersection. At interchanges, one (1) camera shall be provided on each side.
- (l) All traffic signal poles and foundations shall conform to the latest TxDOT standard details and specifications. All poles, mast arms, ILSN arms, and luminaire arms shall be steel and powder-coated brown (using specific color parameters provided by the City).
- (m) Electric service meters shall be steel pole or pedestal type per the latest TxDOT standard details. All service feeds shall be underground. Photocells for lighting and internally lit street name sign circuits shall be inside/mounted to the service enclosure.
- (n) Enforcement lights shall be provided for each phase of the traffic signal. Lights shall be placed in a location and display a color approved by the City.

13.2.4. Conduits

- (a) All conduits shall be Schedule 80 PVC.
- (b) All conduits extending to the signal controller shall be 3 inches in diameter. A minimum of two (2) 3-inch conduits and one (1) 2-inch conduit shall be provided to each traffic signal pole foundation. The 3-inch conduits shall be used for the signal, detection, and CCTV cables. The 2-inch conduit shall be used for luminaire and ILSN cables or reserved for future use. A minimum of one (1) 2-inch conduit shall be provided to each pedestrian pole.
- (c) A separate 2-inch conduit shall be provided for power wire.
- (d) All unused conduit runs shall have 1,500-pound test mule tape installed.

- (e) All conduits shall be of correct size to accommodate three times the amount of wiring (measured by adding the cross-sectional areas of the wires).

13.2.5. Wiring

- (a) Wiring for signal heads, pedestrian signals, push buttons, and illuminated signs shall be provided with either 7C #14 stranded signal cable IMSA 19-1 or equivalent, 5/C #14 signal cable IMSA 19-1 or equivalent, or 2/C #12 signal cable IMSA 19-1 or equivalent.
- (b) Luminaires shall be wired with 3 THHN 1/C #12 luminaire cables.
- (c) Cables for luminaires and illuminated signs shall bypass the controller and be connected directly into the meter pedestal.
- (d) The power cable shall be red, black, white, and green (or clearly marked with appropriately colored marking tape) and shall be placed in a separate conduit.
- (e) Cables for cameras and vehicle detection shall be consistent with the cable recommended by the manufacturer.
- (f) A minimum #8 wire shall be utilized for grounding in all conduits.
- (g) All conductors and cables shall be insulated. Bare cables are not permitted.

13.3. CONDUIT SYSTEMS

13.3.1. FUTURE SIGNALS

- (a) Where no traffic signal exists at an intersection of any two arterials, collectors, or combination thereof, conduits shall be placed underneath the roadway prior to the placement of any new pavement section. For example, at an intersection of an arterial and collector roadway, prior to the construction of a 4th leg to the intersection, empty conduits shall be installed prior to the placement of the additional pavement. However, this section does not create a requirement to install conduits under existing sections of pavement.
- (b) A minimum of three (3) 3-inch SCH 80 PVC conduits shall be placed under the pavement at a depth specified in TxDOT's latest details and/or specifications. TxDOT Type D ground boxes, with an apron if appropriate, shall be installed at both termination points of the conduits in accordance with the details.

13.3.2. FUTURE COMMUNICATION

A minimum of two (2) 4-inch SCH 40 PVC conduits shall be installed along arterial roadways for the purpose of future communications. Where the conduit is installed under pavement, SCH 80 PVC shall be utilized in lieu of SCH 40 PVC. TxDOT Type D (with apron as applicable) ground boxes shall be installed at intervals not exceeding 500 feet in addition to on both sides of intersections with collector and arterial roadways.

13.4. APPROVED PRODUCTS

- (a) All products furnished and installed for traffic signals shall be listed on the latest version of TxDOT's Material Producer List (MPL).
- (b) The City reserves the right to require the use of specific makes/models for various traffic signal components to ensure compatibility within the City's pre-existing systems or to ensure consistency in maintenance needs.
- (c) Any manufacturer provided equipment that is needed to program or properly maintain controllers, detection systems, audible pedestrian systems, preemption systems, or similar systems including communication cables and technical materials such as manuals are to be turned over to the City.

13.5. SIGNAL ACTIVATION

- (a) The City shall be notified a minimum of 14 days in advance of the desired date of traffic signal activation to allow sufficient time to complete an inspection of the traffic signal.
- (b) Traffic signal activations shall only occur on Tuesdays, Wednesdays, or Thursdays during non-peak hours (9:00 AM to 3:00 PM). The City may further restrict hours as it deems appropriate based on site-specific circumstances, including but not limited to proximity to a school, special events, etc.
- (c) All construction must be completed per the plans prior to activation of the traffic signal, including but not limited to punch list items, signs and pavement markings, and pedestrian elements. Pre-existing stop or yield signs shall be removed concurrently with the activation of the traffic signal.
- (d) All detection equipment must be set up and working prior to activation of any traffic signal.
- (e) The City will provide the Contractor with a traffic signal timing plan. The Contractor shall be responsible for inputting the provided plan into the controller. The Contractor shall request the timing plan from the City a minimum of ninety (90) days prior to the planned activation of the traffic signal.
- (f) Portable changeable message signs (PCMS) shall be placed on each intersection approach at least seven (7) days prior to full activation of a traffic signal and shall remain in place for at least seven (7) days after the traffic signal is fully activated. The following messages should be utilized:

PCMS message for at least seven (7) days prior to full signal activation:

Phase 1 TRAFFIC

SIGNAL

1500 FT (replace with actual distance)

Phase 2 BEGINS

TUESDAY (replace with actual date)

NOV 10 (replace with actual date)

PCMS message for at least seven (7) days after full signal activation:

Phase 1 TRAFFIC

SIGNAL

1500 FT (replace with actual distance)

Phase 2 PREPARE

TO

STOP

Section 14. PAVEMENT DESIGN

14.1. GENERAL

- (a) All new City streets, alleys, and rehabilitation of existing streets shall be designed and constructed in accordance with the latest editions of the City Construction Standards and Specifications, and all applicable codes and standards.
- (b) The following specifies standard requirements for the pavement, subgrade, and subsurface design for roadways and alleys within the City. These standards are not intended to replace the professional judgment of the Geotechnical Engineer for any specific project. The standards may need to be expanded or modified on a case-by-case basis as determined necessary and appropriate by the Geotechnical Engineer, and as approved by the City.
- (c) Service life has been defined as the anticipated number of years that a pavement will be functionally and structurally acceptable with only routine maintenance. Flexible pavements shall be designed for a 20-year service life. Rigid pavements shall be designed for a 30-year service life.

14.2. GEOTECHNICAL INVESTIGATION AND REPORT

- (a) All roadways and alleys (CIP and Development) shall have a geotechnical investigation and subgrade design performed meeting the following requirements. A custom pavement design to achieve a 20-year design life will be required for all flexible pavements.
- (b) The Geotechnical Engineer shall use the traffic parameters as shown in **Table 14-3**. If a Traffic Impact Analysis (TIA) has been performed and the traffic parameters are greater than the parameters shown in **Table 14-3**, then the greater traffic parameters shall be used. Adequate consideration must be given to heavy loads such as transit or school buses, fire trucks, solid waste trucks, and construction traffic. A review should be made of existing and/or planned bus routes, fire stations in the vicinity, schedule of solid waste and/or recycling trucks, etc. It is critical to increase traffic projections to account for the addition of construction traffic during the development of the design traffic for the roadway, either as added daily trucks, increased percentage of trucks or added ESALs.
- (c) Results of the geotechnical investigations, engineering analyses, and recommendations shall be presented in a Geotechnical Report for Roadways ("Report"). The Report and any subsequent re-evaluations and/or supplemental reports shall be signed and sealed by a Licensed Professional Engineer in the State of Texas, trained and qualified to provide geotechnical engineering analysis and pavement, subgrade, and subsurface design recommendations.

- (d) The Report shall address all items listed in the Geotechnical and Design Report for Roadways Checklist (“Checklist”). The Checklist shall be filled out completely and submitted with the Report. The Report shall include the description of the project, location of the project, roadway type and classification, grading plan and summary, discussion of utilities within the Project limits, and discussion of traffic input data used, including construction traffic. Any “N/A” response on the Checklist shall include a written explanation and adequate justification as deemed necessary. Additionally, the Summary of Pavement Design Form shall be filled out completely and submitted with the Report.
- (e) The City’s review of the Report will be conducted as a means to verify if the pavement, subgrade, and subsurface design has been performed in general conformance to the City’s requirements and shall not be considered a detailed technical review of the design for adequacy, accuracy, or completeness. The Geotechnical Engineer performing the subsurface investigation and pavement/subgrade design shall remain responsible for the technical adequacy, accuracy, and completeness of the design and shall not be relieved of any responsibility for such as a result of the City’s review.
- (f) The information and recommendations contained in the Report and any subsequent re-evaluation and/or supplement reports must be accepted in writing prior to Release of Construction.
- (g) The geotechnical investigation and pavement design shall follow the procedures as shown in **Table 14-1**, as warranted, developed by the Texas Department of Transportation. Refer to the TxDOT website for a full list of applicable test procedures related to geotechnical investigation and testing of materials related to pavement design.

Table 14-1: Geotechnical Test Procedures

Geotechnical Test Procedures	
Test Method	Description
Tex-100-E	Surveying and Sampling Soils for Highways
Tex-103-E	Determining Moisture Content in Soil Materials
Tex-104-E	Determining Liquid Limits of Soils
Tex-105-E	Determining Plastic Limit of Soils
Tex-106-E	Calculating the Plasticity Index of Soils
Tex-107-E	Determining the Bar Linear Shrinkage of Soils
Tex-110-E	Determining Particle Size Analysis of Soils
Tex-112-E	Admixing Lime to Reduce Plasticity Index of Soils
Tex-117-E	Triaxial Compression for Disturbed Soils and Base Materials
Tex-121-E	Soil-Lime Testing
Tex-124-E	Determining Potential Vertical Rise
Tex-125-E	TxDOT K-value
Tex-128-E	Determining Soil pH
Tex-145-E	Determining Sulfate Content in Soils – Colorimetric Method
Tex-146-E	Conductivity Test for Field Detection of Sulfates in Soil
ASTM D1883	California Bearing Ratio (CBR)
ASTM D2166/D2166M-16 or AASHTO T208	Unconfined Compressive Strength
ASTM D4546	Standard Test Methods for 1-D Swell or Collapse of Soils
ASTM D4602–93	Falling Weight Deflectometer (FWD)
ASTM D4602–93	Heavy Weight Deflectometer (HWD)
ASTM D6951/D6951M – 09	Dynamic Cone Penetrometer
AASHTO T 222-78	Plate Load Test for K-Value
ASTM D4429-09	Plate Load Test for CBR
AASHTO T 307-99	Resilient Modulus

14.3. EXISTING SURFACE/SUBSURFACE INVESTIGATION

14.3.1. FIELD INVESTIGATION

- (a) Borings shall be drilled on the center of the proposed roadway, or within the proposed roadway widening, at 500-foot spacing (or less) or as needed to determine the subgrade variation between known geologies. Borings shall alternate between each roadway direction to a depth of at least 15 feet below the finished subgrade or until competent rock is encountered, whichever is shallower. Where existing roadways exist, borings shall be taken within the limits of the existing roadway. A minimum of two (2) borings should be performed on each project regardless of alignment length. All borings should

be performed within the limits of the proposed pavement unless otherwise approved by the City.

- (b) Continuous sampling shall be conducted in the upper 10 feet and every 5 feet thereafter, including split-spoon sampling of granular soils and thin wall tube sampling of cohesive soils. Coring intact rock shall not be required for pavement design unless the City specifies, or the Geotechnical Engineer believes coring is warranted.
- (c) Bulk samples of each soil type encountered shall be collected for Laboratory Investigation.
- (d) Geotechnical investigation must address heavily treed areas where such trees are to be planted or removed, as tree roots can significantly alter moisture conditions of the soil underlying the pavements when roots encroach the right-of-way and result in expansive, soil-related movements. The removal of nearby trees can also affect the moisture state of the underlying soils. The Engineer should consider additional borings in these areas.

14.3.2. LABORATORY INVESTIGATION

- (a) Selected samples representative of each soil type are required to be tested to determine grain size characteristics, Atterberg limits, in-situ moisture, and potential vertical rise (PVR). Other engineering properties shall be determined, as deemed appropriate, by the Geotechnical Engineer or as requested by the City.
- (b) Each subgrade soil type obtained from the field shall be tested to determine the soil resilient modulus by California Bearing Ratio (CBR) or other subgrade strength testing methods listed below.
- (c) Soils with a Liquid Limit (LL) greater than 40 and plasticity index (PI) greater than 20 shall be considered expansive for purposes of this manual and shall require subgrade treatment. Each soil type requiring subgrade treatment shall be tested for total soluble sulfate content and organic content. A pH-lime series test shall be conducted on those soils with soluble sulfate content less than 7,000 ppm and an organic content less than 1% to determine the percent of lime by weight to stabilize the subgrade soils. Soils containing soluble sulfates of greater than 7,000 ppm should not be lime stabilized, cement stabilized, or stabilized with any other pozzolan due to the risk of sulfate-induced heave and should consider alternate subgrade treatment methods in accordance with TxDOT's Guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures.
- (d) The estimated Potential Vertical Rise (PVR) for roadways shall be determined using TxDOT test procedure Tex-124-E, Potential Vertical Rise of Natural Subgrade Soils, and the results shall be included in the Report. An appropriate surcharge load (if any), active zone, and moisture conditions should be considered in estimating the PVR values. Boring depths shall be sufficient to determine the active zone for the expansive soil. Other methods of

determining swell may be utilized if detailed in the pavement design report and if approved.

- (e) A soil resilient modulus (M_r) shall be determined by geotechnical engineering analysis, or back-calculated from deflection data, or estimated based upon other soil strength or characteristic properties and correlated to the resilient modulus. Variations such as in-situ moisture content, changing geological formations and strata, and sample depth relative to the final design grade will impact the results of field or laboratory testing and should be taken into consideration during the determination of subgrade support for design. If correlations are used to determine the soil resilient modulus from other soil strength parameters (e.g. California Bearing Ratio, shear strength, etc.), the correlation shall be disclosed with appropriate backup information provided in the geotechnical report.

The following is a list of common procedures used for developing design moduli. However, it is the responsibility of the Geotechnical Engineer to select the appropriate method(s) for determining the design modulus:

- (1) Field Testing
 - (A) Non-Destructive Testing (NDT):
 - (i) Falling Weight Deflectometer (FWD): ASTM D4602-93 (2015).
 - (ii) Heavy Weight Deflectometer (HWD): ASTM D4602-93 (2015).
 - (B) Dynamic Cone Penetrometer: ASTM D6951/D6951M – 09 (2015).
 - (C) Plate Load Test for K-Value: AASHTO T 222-78.
 - (D) Plate Load Test for CBR: ASTM D4429-09.
- (2) Direct Laboratory Testing
 - (A) Resilient Modulus: AASHTO T 307-99.
- (3) Indirect Laboratory Testing
 - (A) California Bearing Ratio (CBR): ASTM D1883-16 or AASHTO T193.
 - (B) TxDOT K-value: Tex-125-E.
 - (C) Texas Triaxial Classification: Tex-117-E.
 - (D) Unconfined Compressive Strength: ASTM D2166/D2166M-16 or AASHTO T208.
- (f) A Subgrade Verification Letter is required to be provided by the Geotechnical Engineer following rough cuts. This letter shall state if the subgrades encountered during construction are consistent with the subgrades anticipated in the geotechnical report.
- (g) A geotechnical re-evaluation will be required if the following situations occur or as deemed necessary:

- (1) If more than two months occur between the end of initial grading and beginning of liming operations or otherwise approved.
 - (2) When conditions have changed significantly between initial grading and liming operations.
 - (3) Subgrade Verification Letter states material encountered during construction varies from the surrounding bore results (e.g., soft pockets of sand or clay).
 - (4) If public infrastructure is being placed on undocumented fill.
 - (5) When the Contractor and/or owner have not properly maintained moisture content during each phase of construction.
- (h) If required, the re-evaluation shall include additional field and laboratory testing to either confirm recommendations are still acceptable or to determine how to rectify the non-conforming condition prior to construction of the pavement section.
 - (i) If tree species that are not approved by the City as street trees are within 10 feet of the limits of the treated subgrade, a moisture/root barrier extending to an appropriate depth based on the site-specific geological conditions is required, and the Geotechnical Engineer shall recommend the depth of the barrier.
 - (j) If existing trees are removed within the limits of the treated subgrade, the Geotechnical Engineer shall address mitigation of this condition in the Report.

14.4. SUBSURFACE DESIGN

- (a) Provide modifications to subsurface layers to limit the effective Plasticity Index (Pleff) to the following criteria:

- | | | |
|-----|------------------------------|--------------------|
| (1) | Freeways and Arterials | $P_{leff} \leq 30$ |
| (2) | Collectors and Local Streets | $P_{leff} \leq 40$ |

This method calculates the Effective PI as a weighted average of the PI of the different soil strata within the upper 15 feet of the subgrade, based on PI tests according to TxDOT Tex-106E. Weight Factors of 3, 2, and 1 are typically used for the top 5 feet, the middle 5 feet, and the bottom 5 feet, respectively. Pleff is determined by the following equation:

$$P_{leff} = \frac{\sum (F_i \times D_i \times P_{li})}{\sum (F_i \times D_i)} \quad (\text{Eq. 14-1})$$

Where:

F_i = Weight Factor;

D_i = Depth of Soil Stratum within Particular Weight Factor Region; and

P_{li} = Plasticity Index of Soil Stratum within Particular Weight Factor Region.

- (b) Provide modifications to subgrade layers per this manual to limit the Potential Vertical Rise (PVR), considering a 15-foot depth below the proposed pavement surface elevation, to the following performance criteria:
 - (1) Freeways and Arterials PVR $\leq$ 2.0
 - (2) Collectors and Local Streets PVR $\leq$ 3.0
- (c) A PVR calculation spreadsheet can be downloaded from the TxDOT website. When using the spreadsheet, the pavement design thicknesses resulting from FPS21 shall be included as the top layer with an assumption of no swell (i.e., inputs for liquid limit, moisture content, percent passing the No. 40, and PI are all set to zero).

14.5. SUBGRADE DESIGN

Subgrade improvement is required whenever the geotechnical investigation indicates the presence of in-situ soils with effective plasticity index (Pleff) and/or potential vertical rise (PVR) values exceeding those specified in this manual and shall be designed to reduce these parameters to acceptable values. Limits of subgrade improvement shall extend 3 feet behind the back of curb. The Geotechnical Engineer is responsible for identifying when subgrade improvement is required, and which improvement alternatives should be considered. The Geotechnical Report shall include these recommendations to improve the subgrade, if necessary.

14.5.1. LIME TREATMENT

Lime stabilization of at least 8 inches of subgrade is required when the soil investigation indicates that more than 2 feet of expansive subgrade soil (inclusive of the moisture conditioned subgrade) with P.I. greater than 20 exists underneath the expected pavement section. The Geotechnical Engineer shall determine the target lime content in accordance with TxDOT's test procedure Tex-121-E. The application rate of lime shall be determined based on laboratory testing and shall be the lowest percentage of lime that provides a pH of 12.4 or greater using TxDOT's test procedure Tex-121-E and provides a targeted PI of 20 or less or the percentage of lime that provides the lowest PI per test procedure Tex-106-E. Lime series testing prior to application is required. Any change in field material will require additional lime series tests. The Geotechnical Engineer shall determine the treatment depth and application rate. "Structural credit" for lime treated layers may be granted for layer thicknesses of at least 8 inches or more. Unconfined compression testing using TxDOT's test procedure Tex-121-E, Part 1 is required and must provide at least 50 psi for structural credit. In no case shall the lime be less than 20 pounds per square yard for 8 inches of lime treated subgrade.

14.5.2. CEMENT TREATMENT

Cement treated subgrade is discouraged when admixing highly expansive clay soil and must be approved if it is used for stabilization. If used, consideration could be made to using it in combination with lime. This section should not discourage or limit the use of cement to treat granular, low plasticity soils, subbases, and/or recycled pulverized mixtures of asphalt and flexible base.

14.5.3. REMOVE AND REPLACE

Remove and replace subgrade improvement method consists of removal of weak or highly expansive subgrade materials and replacement with engineered fill. Remove and replace can be effective to remove weak subgrade materials and/or to reduce PVR and effective PI to acceptable values. In highly expansive geologic formations that extend to great depth, the required removal/replacement depth to meet PI and PVR criteria can exceed several feet, in which case removal/replacement to the desired depth may not be economically feasible, but any amount of removal and select fill replacement yields better long-term performance than none at all. Replacement fill should consist of engineered fill meeting recommendations of the Geotechnical Engineer. In general, engineered fill should meet $4 \leq PI \leq 20$ and $LL < 40$ to reduce potential for volume change.

14.5.4. MOISTURE TREATMENTS

Moisture treatment is discouraged and shall not be used unless approved by the City Engineer.

14.5.5. GEOGRID

Geogrid design can be considered to assist with mitigating environmental cracking. Stabilization with geogrid base reinforcement designed for “structural credit” will be considered based on the geotechnical engineering report. The geotechnical engineer shall provide sufficient documentation that justifies the magnitude of structural credit that can be taken depending on the type of geogrid utilized. Otherwise, no structural credit will be allowed. The City has final approval of accepting a reasonable amount of structural credit.

14.6. FLEXIBLE PAVEMENT DESIGN

- (a) The FPS21 software program, (or the latest TxDOT FPS version) shall be used for the design of flexible pavement. FPS21 is a mechanistic-empirical design procedure that provides for multiple pavement design strategies. Refer to the Flexible Pavement Design System FPS21: User’s Manual and the TxDOT Pavement Design Guide for documentation concerning this software and methodology for developing pavement strategies.
- (b) All pavement design shall be in accordance with the City’s Technical Specifications, Standard Details, and General Notes unless otherwise approved. All pavement sections must be designed using the Pavement Design Input Values contained in **Table 14-2** and **Table 14-3**, at a minimum. It is the Geotechnical Engineer’s responsibility to ensure those input values are applicable based on actual conditions.
 - (1) The section shall be based on a Geotechnical Engineer’s recommendation and must be based on a 20-year design life.
 - (2) All flexible pavement layer thicknesses shall be rounded up to the nearest inch, with the exception of surface asphalt course which shall be rounded to the nearest half-inch.
 - (3) A minimum of 3-inch hot mix asphalt is required for all flexible pavement sections.

- (c) A printout of the FPS21 design inputs and outputs must be included in the Report. A mechanistic and a triaxial check must be performed and the results must be printed and attached to the Report.
- (d) The Geotechnical Engineer may design full depth hot mix asphalt sections for projects including widenings, turn lanes, and fast track operations. Full depth HMAC sections must be designed in accordance with all requirements of this Manual and using the Pavement Design Input Values contained in **Table 14-3**.

Table 14-2: Typical Pavement Design Input Values for Flexible Pavements – All Classifications

Design Input	
Pavement Design Life	20 years
Time To First Overlay	20 years
Time Between Overlays	10 years
Subgrade Modulus High PI (≥ 41)	4 ksi*
Subgrade Modulus Moderate PI (21-40)	9 ksi*
Subgrade Modulus Low PI (≤ 20)	18 ksi*

*Maximum

Table 14-3: Pavement Design Input Values for Flexible Pavements – By Classification

Design Input	Street Classification					
	Major Arterial	Minor Arterial	Collector (4-Lane)	Collector (3-Lane)	Collector (2-Lane)	Local Streets
Initial ADT (vehicles)	22,000	14,500	12,000	7,500	2,800	550
Final ADT (vehicles)	48,000	32,000	24,000	15,000	5,000	1,000
Growth Rate	4.00%	4.00%	3.50%	3.50%	4.00%	4.00%
% Trucks	9%	9%	9%	8%	5%	3%
Truck Factor	0.92	0.84	0.62	0.62	0.53	0.4
# of Lanes	6	5	4	3	2	2
Directional Distribution	0.5	0.5	0.5	0.5	0.5	0.5
Lane Distribution	0.7	0.8	0.8	0.8	1	1
Initial Serviceability Index	4.2	4.2	4.2	4.2	4.2	4.2
Terminal Serviceability Index	2.5	2.5	2.5	2.5	2	2
Confidence (%)	95%	95%	95%	95%	90%	80%
Design Lane ESAL	7,500,000	5,000,000	3,000,000	1,500,000	500,000	100,000

14.7. Minimum Pavement Design

Proposed pavement designs must meet at least the minimum of one of the designs in **Table 14-4** or **Table 14-5**. These pavement sections are considered minimums for all projects and must be analyzed and proven to meet or exceed the requirements as outlined in Section 14. This analysis shall be provided in the geotechnical report for review and approval by the City prior to use. If a higher performing pavement design is required to meet the criteria as outlined in Section 14, the higher performing design shall be used. Under no circumstances shall a lesser-performing pavement design be used than the minimum designs provided.

Table 14-4: Minimum Roadway Flexible Pavement Design

Minimum Roadway (Urban/Rural) Flexible Pavement Design									
Classification	Local Roadway			Collector Roadway			Arterial Roadway		
Plasticity Index (2)	≤ 20	20-35	35-55	≤ 20	20-35	35-55	≤ 20	20-35	35-55
Soil Classification	Clayey Sand	Lean Clay	Fat Clay	Clayey Sand	Lean Clay	Fat Clay	Clayey Sand	Lean Clay	Fat Clay
HMA Surface	2"	2"	2"	2"	2"	2"	2"	2"	2"
Prime Coat / One Course Underseal	YES	YES	YES	YES	YES	YES	YES	YES	YES
Flexible Base (3)	12"	12"	14"	14"	14"	16"	20"	20"	22"
Lime Treat Subgrade	-	8"	8"	-	8"	8"	-	8"	10"

Table 14-5: Minimum Roadway Rigid Pavement Design

Minimum Roadway (Urban/Rural) Rigid Pavement Design									
Classification	Local Roadway			Collector Roadway			Arterial Roadway		
Plasticity Index (2)	≤ 20	20-35	35-55	≤ 20	20-35	35-55	≤ 20	20-35	35-55
Soil Classification	Clayey Sand	Lean Clay	Fat Clay	Clayey Sand	Lean Clay	Fat Clay	Clayey Sand	Lean Clay	Fat Clay
CRCP	6"	6"	8"	6"	6"	8"	11"	11"	11"
HMA Bond Breaker	1"	1"	1"	1"	1"	1"	1"	1"	1"
Flexible Base	6"	8"	8"	8"	10"	10"	12"	12"	12"
Lime Treat Subgrade	-	-	8"	-	-	8"	-	6"	10"

Notes for Table 14-4 and Table 14-5

- (1) Materials shall be in accordance with City of Hutto Standards and Specifications.
- (2) For PI > 55 additional pavement structure is necessary and shall be reviewed and approved as part of the Geotechnical Report.
- (3) Should solid rock be encountered prior to the depth necessary for 12" of base material underneath 2" HMA, a substitute pavement design may be allowed. Substitute pavement design shall have a base thickness no less than 8" and existing material shall be excavated to the exposed solid rock layer. No significant amount of existing material shall be left remaining between the base layer and the rock layer.

14.8. RIGID PAVEMENT DESIGN

Should Rigid Pavements be selected as a recommendation for the City's consideration and acceptance, a Geotechnical Engineering Report for Roadways shall be prepared. All rigid pavement sections shall be prepared using a design life of at least 30 years. *Existing Surface/Subsurface Investigation* shall be included as part of the Report and pertinent traffic input information from **Table 14-3**, extrapolated to 30 years, shall be utilized in the rigid pavement design. The report shall clearly present all assumptions utilized in the Consultant's design as well as the program utilized to develop the recommended sections. The American Concrete Paving Association (ACPA) program StreetPave 12, or the latest available version, is recommended for use.

Section 15. STRUCTURAL DESIGN REQUIREMENTS

15.1. PURPOSE AND SCOPE

15.1.1. RESPONSIBILITY

- (a) The Engineer shall bear the sole responsibility for meeting the engineering standard of care for all aspects of the design and providing a design that is required by the site-specific conditions and intended use of the facilities.
- (b) The structural design must be signed and sealed by an engineer competent in structural engineering licensed in the State of Texas. The engineer is responsible for all engineering and recognizes that specific site circumstances or conditions may require improvements that exceed minimum standards contained in the City's *Engineering Design Manual*. The engineer is responsible for evaluating and applying appropriate standards and specifications.
- (c) The engineer shall rely on the geotechnical investigation recommendations as minimum design criteria. If in the engineer's judgment, the structural design needs to be based upon more conservative geotechnical design criteria, the engineer shall provide the more conservative design.

15.1.2. STRUCTURES

For the purpose of this section of the *Engineering Design Manual*, structures shall include the following items, but not be limited to bridges, foundations, retaining walls, screening walls, headwalls and wing walls, culverts, slopes and embankments, creek and channel structures, aerial crossings, and other civil structures

15.1.3. PERMITTING

Refer to [City Code](#) for Wall permitting requirements.

15.1.4. INSPECTION

Inspections of structures shall be performed in accordance with this manual. Inspection for structures not performed directly by the City shall be performed by a third-party and include a certification letter signed and sealed by a Professional Engineer licensed in the State of Texas stating that the structure was constructed in general compliance with the City-approved plans and specifications. Any structure outside the public right-of-way and any structure constructed with non-City funds, whether inside the public right-of-way or not, shall require third-party inspection.

15.1.5. TXDOT STANDARD SHEETS

If TxDOT standard sheets pertaining to structures are utilized, the engineer shall ensure the loading, geometry, and allowable soil pressures are applicable to the standard design selected. The engineer shall ensure that interruptions to the structure (e.g., wall stem or footing reinforcement altered by openings, utilities, geometric changes, or curved sections of the wall, etc.) do not compromise the design and performance of the structure. Consideration shall be given to the site-specific geotechnical requirements and whether a TxDOT standard design is applicable. No TxDOT standard sheets shall be modified unless the engineer designs, draws, signs, and seals the

modified standard. If TxDOT standard sheets are not applicable, a custom structural design shall be provided.

15.1.6. AESTHETICS

Aesthetic treatments shall not interfere with the functionality of the structure and must be approved by the City Engineer.

15.1.7. STRUCTURAL PLAN REQUIREMENTS

- (a) Construction drawings and technical specifications shall be prepared and submitted to the applicable City departments in accordance with the Construction Standards and Specifications Manual, and the Plan Review Development Checklist and Plan Submittal Process.
- (b) If applicable, wall quantities and limits of payment shall be submitted in accordance with the City's technical specifications.
- (c) Calculations pertinent to the design of all structures shall be submitted to the City along with the construction drawings and will be filed for record purposes by the City. The Engineer remains responsible for the design of the structure(s).

15.2. CODE REQUIREMENTS

- (a) At a minimum, all structures shall be designed using the current standards as adopted by the City and shall meet all applicable local, state, and federal standards. For other standards not adopted by the City, the latest version of that standard shall be utilized.
- (b) The design and construction of roadway bridges and bridge-class culverts shall be provided in accordance with the requirements of the current edition of the *Standard Specifications for Highway Bridges* as published by the American Association of State and Highway Transportation Officials (AASHTO) and supplemented using TxDOT standards and guidelines as applicable.
- (c) Specifications for bridge construction shall be in accordance with TxDOT's current edition of *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges*.
- (d) All bridge railing shall be in accordance with TxDOT's current edition of the *Bridge Railing Manual* and shall meet the specifications outlined in the *Manual for Assessing Safety Hardware* (MASH). All railing shall be appropriately rated railing based on site and design conditions. Guardrail, end treatments, or other features associated with bridge construction shall be in accordance with AASHTO's *Policy on Geometric Design of Highways and Streets*, AASHTO's *Roadside Design Guide*, and current TxDOT standards. All bridge railing shall meet applicable sight distance requirements.
- (e) For all bridges and bridge class culverts adjacent to or in conjunction with roadways, sight triangle exhibits shall be submitted to the City for review and approval.

- (f) For any structure, the City or the Engineer may require the quality of materials and construction to be higher than the minimum requirements as stated in the codes based on structure usage or site conditions.

15.3. EXCAVATION SUPPORT

- (a) Trench excavation protection shall be used for the installation of linear drainage or utility facilities that result in trenches deeper than 5 feet. Such trench protection includes vertical or sloped cuts, benches, shields, support systems, or other systems providing the necessary protection in accordance with Occupational Safety Health Administration (OSHA) Standards and Interpretations, [29 CFR 1926, Subpart P, Excavations](#).
- (b) Temporary special shoring shall be used for installations of walls, footings, and other structures that require excavations deeper than 5 feet. Temporary special shoring shall be designed and constructed to hold the surrounding earth, water, or both out of the work area. Options may include, but not be limited to, vertical or sloped cuts, benches, shields, support systems, or other systems to provide the necessary protection in accordance with the approved design. Unless a complete design for temporary special shoring systems is included in the plans, the contractor is responsible for the design of the temporary special shoring system. The Contractor must submit to the City, for informational purposes only, the design calculations and details sealed by a Professional Engineer licensed in the State of Texas before constructing the shoring. The design of the shoring must provide protection in accordance with Occupational Safety Health Administration (OSHA) Standards and Interpretations, [29 CFR 1926, Subpart P, Excavations](#).

15.4. GEOTECHNICAL PERFORMANCE SPECIFICATIONS

- (a) Field investigation, geotechnical testing, and geotechnical engineering shall be performed in accordance with the standard of care taking into account local experience and conditions. The geotechnical recommendations shall establish the minimum design criteria upon which the Engineer can rely.
- (b) A permit must be obtained prior to performing any boring within the City's ROW.
- (c) The complexity of geological conditions and the type, length, and width of the structure shall determine the number and locations of test holes required. The following should be considered by the engineer in coordination with the geotechnical engineer: depth of test hole, location of proposed grade relative to existing grade, channel relocations and/or channel widening, scour, foundation loads, and foundation types.
- (d) Test holes shall be located in an accessible area. Identify test hole locations on the plans.
- (e) Provide a complete soil and bedrock classification and log record for each test hole, including all pertinent information to complete the standard log. Location and surface elevation shall be shown on the boring logs.

- (f) Perform the appropriate field and laboratory tests necessary to determine the soil properties for geotechnical design criteria. The geotechnical engineer shall consider both the short-term and long-term conditions.
- (g) Ground water elevations shall be included as part of the data acquisition. Site conditions may require the installation of piezometers to establish a true groundwater surface elevation and a method of monitoring water surface fluctuations.
- (h) Minimum boring requirements are specified below. Based on the Geotechnical Engineer's experience and engineering judgment, if competent rock is encountered, the minimum boring depths specified below may be reduced with approval.
 - (1) Slopes and Embankments including Bridge Approaches – Obtain soil borings for cuts greater than 10 feet or embankments taller than 10 feet. The exploration shall include the following:
 - (A) The soil under future embankments – Advance borings to a depth at least equal to the embankment height or 20 feet, whichever is greater, unless a greater depth is recommended by the Geotechnical Engineer.
 - (B) Soil in proposed cuts – Advance borings to a depth of at least 15 feet below the bottom of the proposed cut, unless a greater depth is recommended by the Geotechnical Engineer.
 - (2) Bridges
 - (A) In general, drill test holes shall penetrate a minimum of 15 feet into proposed bearing strata. Where depth of bearing strata becomes impractical, the City may determine minimum bore depth.
 - (B) Test holes shall be drilled near each abutment and bent location of the proposed structure plus a sufficient number of intermediate holes to determine depth and location of all significant soil and rock strata.
 - (C) A site inspection by the driller or logger shall be performed to evaluate site accessibility and special equipment needs.
 - (D) Grade Separations – If the borings indicate soft surface soils (fewer than 10 blows per foot), additional borings and testing shall be required for the design of the bridge approach embankments.
 - (E) Retaining Walls – Walls greater than 3 feet in height must meet all requirements of this section and be designed by a Professional Engineer licensed in the State of Texas. Obtain soil borings for walls greater than 3 feet in height.

- (F) Obtain a minimum of two soil borings for retaining wall design. For walls longer than 200 feet, borings shall be obtained at a maximum spacing of 200 feet unless site conditions or the Engineer requires alternate spacing. A greater spacing may be allowed only if recommended in writing by the Geotechnical Engineer.
- (G) Fill Walls – For spread footing walls and Mechanically Stabilized Earth (MSE) walls, the depth of the boring shall be at least equal to the wall height depending on the wall type. The minimum boring depth is 10 feet below the bottom of the proposed wall unless rock is encountered. Extend borings at least 5 feet into rock for fill walls unless additional depth is recommended by the Geotechnical Engineer.
- (H) Cut Walls – For drilled shaft walls, tied-back walls, and soil and rock nail walls, the depth of the boring shall be based on the proposed ground line. Cantilever drilled shaft walls require the depth of boring to extend to the anticipated depth of the shaft below the cut, which is typically between one and two times the wall height unless additional depth is recommended by the Geotechnical Engineer. Borings for soil nails, tiebacks, and rock nailed walls shall be advanced through the material that is to be nailed. The minimum boring depth is 15 feet below the bottom of the proposed wall. Borings for proposed cut walls may need to penetrate bearing strata significant distances depending on the depth of the cut and wall height.
- (I) Additional testing and modeling shall be provided for taller walls, walls on slopes, or walls on soft founding strata as necessary or as recommended by the Geotechnical Engineer to completely evaluate wall stability.

15.5. BRIDGE DESIGN

- (a) The Engineer shall be responsible for selecting the appropriate bridge foundation. The Engineer shall consider the following factors in that selection:
 - (1) Design Load – The magnitude of the design load and existing geotechnical conditions dictate the required size of the foundation.
 - (2) Geotechnical Engineering Recommendations – The strength and depth of subsurface formations determine the type of foundation chosen. In general, drilled shafts are well suited to areas with competent soil and rock, and are the preferred foundation type subject to concurrence from the Geotechnical Engineer. Alternative foundation types require approval in writing.

- (3) Corrosive Conditions – Salts, chlorides, and sulfates are detrimental to foundations. Where these conditions exist, the Engineer shall take preventative measures. Use sulfate-resistant concrete as applicable.
- (b) Disregard surface soil in the design of drilled shaft foundations. The disregarded depth is the amount of surface soil that is not included in the design of the foundation due to potential erosion from scour, future excavation, seasonal moisture variation (shrinkage and swelling), lateral migration of waterways, disturbed material or fill, and recommendations of the geotechnical investigation.
- (c) Drilled shaft capacity relies upon penetrating a specific stratum at a specified depth. The plans shall provide a note instructing the contractor and field personnel of the penetration requirement. The plans shall identify the specific type of material to be penetrated and the minimum penetration depth. The plan may allow for the drilled shaft to be shortened if the founding stratum is encountered at a shallower depth, and it requires the shaft to be lengthened if the founding stratum is not encountered at the expected elevation.
- (d) When the founding stratum is present at or near the surface, the Engineer shall consider the load-carrying capacity along with the stability of the superstructure on the foundation. For these conditions, a minimum drilled shaft length shall be specified on the plans, and the drilled shaft will not be allowed to be shortened from the plan length, but it may be lengthened if the founding stratum is not encountered at the expected elevation.
 - (1) For evaluating scour, TxDOT guidelines in Evaluating Scour at Bridges (HEC-18) shall be used.
 - (2) Bridge foundation scour analysis is required. However, abutments shall be protected against potential scour through the use of flexible revetment, where possible or hard armoring.
 - (3) Design bridge foundations to withstand the scour depths for either the fully developed 100-year flood or smaller flood if it will cause scour depths deeper than the fully developed 100-year flood.
 - (4) Check the bridge foundations against the scour depth associated with the 500-year flood. This flood event is considered an extreme event and the factor of safety on the bridge foundations shall be greater than or equal to 1.

15.5.0. BRIDGE RAILINGS

In addition to other requirements specified in this manual, the following bridge railing criteria shall be met:

- () The face of railing shall be a minimum of 2 feet beyond edge of outside travel lane.
- (a) Where no sidewalk is present, shoulders shall be flush with the roadway slab.

- (b) Separation rails shall be provided on all principal and minor arterial bridges.
Separation rails shall not be required on collectors or local streets, or on culverts where the sidewalk is not located adjacent to the back of curb.

15.5.1. PEDESTRIAN BRIDGES

Pedestrian bridges shall be designed in accordance with this manual and the current edition of the LRFD Guide Specifications for the Design of Pedestrian Bridges and the AASHTO *Guide for the Development of Bicycle and Pedestrian Facilities* and shall meet the following additional criteria:

- (a) Loading – Design loads shall be in accordance with the applicable codes outlined in this section and shall include but not be limited to construction loads and surcharge loads from slopes, structures, and specified use (e.g., bicycle, pedestrian, and/or maintenance vehicle traffic).
- (b) Plans – Cast-in-place bridge foundations shall be designed for a specified pre-cast bridge structure. The foundation plans and shop drawings for the pre-cast bridge structure shall be submitted for review and approval.
- (c) Hydraulics – Refer to **Division E** for design flood, freeboard, and flood study requirements associated with pedestrian bridge design.
- (d) Maintenance – Maintenance considerations of railing for pedestrian bridges that do not contain the fully developed 100-year flood with freeboard shall be specified in the plans.

15.6. RETAINING WALL DESIGN

The Engineer is responsible for ensuring that the type of retaining wall selected for a given location is appropriate. The retaining wall selection process shall consider the following:

- (a) Height – Walls shall be measured from the top of wall footing to the top of the wall (not the top of the retained fill). An engineered design by a Professional Engineer licensed in the State of Texas is required for all walls 3 feet in height or taller (designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift and designed for a factor of safety of 1.5 against lateral sliding and overturning in accordance with the International Residential Code). For a wall that has a variable height where part of the wall is under 3 feet and part of the wall is over 3 feet, an engineering design will be necessary for the entire wall. For commercial and multi-family applications, all walls will require an engineering design regardless of height. Furthermore, if any wall has embedded posts, poles, or other structures anchored directly into the wall structure, wall design must also take into consideration the additional loadings due to these structures (axial, lateral, wind, etc.) The structural design shall be provided in accordance with the geotechnical recommendations and minimum design criteria provided in this manual.
- (b) Geometry – Determine applicability of wall type – cut, cut/fill, or fill – based on geometry, site constraints, existing and proposed topography, and wall alignment and location. Identify available ROW and any necessary ROW or easements to accommodate the proposed improvements and the access

necessary to accommodate access for maintenance. Identify location and type of existing and proposed utilities and drainage structures.

- (c) Economics – Evaluate the total installed cost of the wall and consider long-term maintenance requirements. Identify necessary excavation requirements (including shoring), required utility adjustments and costs, project schedule, construction phasing requirements, and these effects on the wall design and construction.
- (d) Global Stability – The Engineer is responsible for the global stability design of the wall. Evaluate all walls to ensure that the minimum applicable factors of safety are met, if not exceeded depending on the Engineer's judgment. Walls shall not be placed on slopes if avoidable.
- (e) Passive Resistance to Sliding – The Engineer shall follow the Geotechnical Engineer's guidance for use of passive resistance. If there is a slope in front of the wall, passive resistance shall be neglected.
- (f) Constructability – Determine whether walls are near water or subject to inundation or groundwater. Identify access limitations for equipment both during and after construction. Ensure adequate horizontal and vertical clearances are provided.
- (g) Drainage – Design the wall to prevent the build-up of hydrostatic pressure behind the wall. If conditions warrant such as, but not limited to, the inability to include a drainage system or situations of rapid drawdown, the City may require the wall design to withstand full hydrostatic pressure load. The wall design shall consider potential deleterious short- and long-term effects of water inundation including scour and rapid draw down.
- (h) Loading – Design loads shall be in accordance with the *Engineering Design Manual*, including construction loads and surcharge loads from slopes, structures, and vehicles.

15.7. SLOPE STABILITY DESIGN CRITERIA

All slopes exceeding 8 feet in height with a steepness of 3H:1V or greater, regardless of soil type, cut, or fill, shall be evaluated for global stability for both the short-term and the long-term conditions. Additionally, any known areas of existing fill, deleterious material, or soft soils which have a height over 4 feet or slope angle greater than 6H:1V shall be evaluated for global stability for both the short-term and the long-term conditions. Specific site conditions may require evaluation for additional types of slope failure, such as bearing capacity, settlement, shear, and undercutting. Calculations pertinent to the analysis shall be submitted with the construction drawings when required by the City.

- (a) Use the following data to analyze global stability of a slope:
 - (1) Geometry (cross section and loading conditions).
 - (2) Location of the water table.
 - (3) Soil/rock stratigraphy.

- (4) Soil/rock properties (unit weight, Atterberg Limits, undrained and drained shear strength).
- (b) For global stability of a slope, minimum factors of safety must be met for long-term and short-term stability.

15.8. HEADWALLS AND WINGWALLS

- (a) Refer to **Section 15.1.5** for use of TxDOT standard sheets.
- (b) All headwalls and wingwalls shall be reinforced concrete. Wingwalls shall be either straight (parallel), flared, or tapered. Approach and discharge aprons shall be provided for all culvert headwall designs.

15.9. CULVERTS

Refer to **Section 15.8** for headwall and wingwall requirements. Refer to **Section 15.1.5** for use of TxDOT standard sheets.

15.10. DROP STRUCTURES

Refer **Division E** for hydraulic design requirements of vertical and sloping drop structures.

15.11. AERIAL CROSSING

Elevated crossings create special design problems in which no set of circumstances is duplicated from one design to another. Elevated crossings for water and wastewater mains should be avoided and may only be considered upon approval.

- (a) Two methods of elevated crossings acceptable for consideration by the Engineer are either:
 - (1) Attaching the water or wastewater main to a roadway bridge.
 - (2) Designing a specific pier foundation/utility bridge for the support of the water or wastewater main crossing.
- (b) The following basic criteria must be addressed by the Engineer for all crossings attached to a bridge:
 - (1) Increased loading effects on the bridge created by a full main and its supports.
 - (2) Proposed elevation of the main shall meet low chord bridge requirements and be 2 feet above the 100-year water surface elevation to prevent damage to the main.
- (c) Elevated crossings should be designed in accordance with AASHTO's current editions of *Load and Resistance Factor Design (LRFD) Bridge Design Specifications* and *Standard Specifications for Highway Bridges*. In addition, the Ductile Iron Pipe Association (DIPRA) publication *Design of Ductile Iron Pipe on Supports* provides guidance on the design of elevated crossing pipe structures. Stream subsection velocities and impact loading must be considered.

- (d) Elevated crossing and pier foundation design and construction plans should be coordinated with appropriate erosion control plans for bank protection where the main enters and exits the creek.
- (e) Stream velocity and impact loading shall be designed in accordance with the requirements of the current edition of the *Standard Specifications for Highway Bridges* as published by the AASHTO.

15.12. NON-BRIDGE CONSTRUCTION INSPECTION AND CERTIFICATION

Inspections of non-bridge structures shall be performed during construction and reports provided to the City. The inspections and reports shall be performed at the following stages of construction (at a minimum):

- (a) Sub-base/Pre-pour:
 - (1) Drilled shaft drilling and concrete placement (if applicable).
 - (2) Forming of footing, grade beam, placement of reinforcement (if applicable).
 - (3) Wall Construction.
 - (4) Drainage system construction (if applicable).
 - (5) Final completion.
- (b) Inspector shall certify that construction inspections were performed at the prescribed stages of construction in accordance with **Section 15.13**. The inspection reports and final certificate of compliance shall be submitted to the City and include the following:
 - (1) Specific reference to the City-approved plans and specifications.
 - (2) Specific reference to the address and/or legal description for the construction location.
 - (3) Specific reference to the name and date of the project-specific geotechnical engineering report.
 - (4) A certification letter signed and sealed by a Professional Engineer licensed in the State of Texas, that includes a statement that the structure was constructed in general compliance with the geotechnical design criteria identified in the plans and specifications and the City-approved construction plans and specifications.

15.13. BRIDGE CONSTRUCTION INSPECTION AND CERTIFICATION

Inspector shall certify bridge construction inspections were performed at the prescribed stages of construction in accordance with the Bridge Construction Inspection and Certification checklist. The inspection reports and final certificate of compliance shall be submitted to the City.

15.14. NATIONAL BRIDGE INVENTORY (NBI) REQUEST

For NBI Requests, the TxDOT Austin District Bridge Engineer or District Bridge Inspection Coordinator must be contacted, and the request must have the following information:

- (a) Title Sheet (indicating the CSJ, if applicable, and project location).
- (b) Project Layout (for multiple NBI numbers).
- (c) Structure Layout (indicating Begin & End stations of bridge, name of feature crossed and facility carried, existing NBI # if applicable.)
- (d) Detail Sheet indicating Design Load (if not shown on structure layout).

Section 16. RIGHT-OF-WAY USE, UTILITY LOCATIONS AND GRADING PERMIT REQUIREMENTS

16.1. GENERAL

- (a) These standards describe the general requirements for the use of public rights-of-way and public easements and the supporting documents required for permit approval by the City of Hutto. These standards also address the location requirements for franchise utilities and the requirements for placing fill or grading private property.
- (b) The Hutto Public Works Department shall approve and permit all activity within the public rights-of-way and public easements, and all lot fill and grading within the Hutto city limits or extraterritorial jurisdiction.
- (c) Construction plans for private improvements, within public rights-of-way and public easements or that connect to or affect the public infrastructure shall be approved by the City of Hutto subject to the requirements of this manual and are subject to review and approval using the process defined in this manual.
- (d) Permit fees shall be assessed in accordance with the latest Fee Schedule adopted by the Hutto City Commissioners and applicable State and Federal law.
- (e) In exercising its police powers necessary to protect the health, safety and welfare of the public, the City has priority over all other uses of the ROW. The City reserves the right to, among other things, lay water, sewer, drainage, and other pipelines or cables and conduits, and to do underground and overhead work, and attachments, restructuring, or changes in Street facilities across, along, over, or under a public Street, alley or ROW occupied by an agency or ROW User, and to change the curb, sidewalks, or the grade of Streets.
- (f) All transmission, distribution and collection structures, lines, equipment, trees and other facilities erected by a ROW user within the City shall be so located as to cause minimum interference with the proper use of the ROW, and to cause minimum interference with the rights and reasonable convenience of property owners who join any of said streets. The City reserves the right, in the Permit or otherwise, to restrict or determine the route (pathway) and/or spatial location, whether horizontal, vertical or depth, of any facility and/or structure or improvement in the ROW. The City reserves the right to reserve space for future utilities.
- (g) The ROW User shall be responsible for storm water management, erosion control and excavation safety measures that comply with City, state and federal guidelines. Requirements shall include, but not limited to, construction fencing around any excavation that will be left overnight, silt fencing in erosion areas until reasonable vegetation is established and barricade fencing around open holes.

- (h) The City shall take reasonable precautions, but is under no obligation, to protect non-City owned facilities during the course of roadway maintenance and improvements. The City will make reasonable efforts to notify known users within 2 feet of back of curb of planned roadway maintenance or improvements that may impact their facilities. It is the responsibility of the installer/owner of the facilities to protect their facilities and to remove or adjust the location of their facilities as appropriate.

16.2. RIGHT-OF-WAY USE PERMITS

- (a) Any disturbance within the roads, streets, right-of-way and easements of the City requires a right-of-way use permit. Such disturbances include digging or excavating anywhere within the right-of-way, installation, replacement or repair of lines, conduits and franchise utilities, erection of utility poles, installation of lights, transformers, switches and other appurtenances, installing, removing or repairing curbs, gutters, sidewalks, driveway aprons, irrigation systems, planting trees or other improvements.
- (b) A right-of-way use permit is not required for street construction projects undertaken by the City pursuant to a contract between the City and its contractor; for projects permitted under other City permits or for those uses that the Director of Public Works finds to be minor in nature.
- (c) In the event of an emergency that demands immediate action to protect the public health, safety or welfare, when a permit cannot be reasonably or practically obtained beforehand, emergency actions may proceed provided that notification be provided to the office of the Director of Public Works, 512-759-4023, or during non-business hours to the emergency line, 512-759-4016.
- (d) Before the issuance of a right-of-way use permit, the applicant, his agent, or contractor shall:
 - (1) Furnish evidence of insurance or self-insurance for public liability and property damage issued by an insurance company, authorized to transact business in the State of Texas. If a valid certificate is on file with the City, subsequent applications may reference the certificate on file.
 - (2) Issue a statement holding the City harmless and free of liability, to the extent allowed in Chapter 283 of the Texas Local Government Code, from work performed under the authority of the permit. If a valid certificate is on file with the City, subsequent applications may reference the certificate on file.
 - (3) Post an assurance bond or other method of guarantee acceptable to the City to ensure that the work covered by the permit will be completed in accordance with the latest edition of this manual.

- (4) Submit a Traffic Control Plan for review if the work involves a lane closure of more than four hours, however, all lane closures require traffic control in accordance with the TMUTCD.
- (5) Prepare plans and specifications for the proposed work to be performed. If required, these plans should show the subject area and adjacent areas, the existing conditions, the proposed work, and any changes to the existing conditions.
- (6) Adhere to the State of Texas, Underground Facility Damage Prevention and Safety Act. Prior to any excavation, the Dig Safely guidelines shall be followed, including calling a notification center in advance of excavation (Call-Before-You-Dig – 811).
- (7) The applicant for the permit, his agent, or the contractor shall protect from damage, utility conduits, sewer conduits, water conduits, lawns, shrubbery, trees, fences, structures, or other property encountered in his work. The applicant shall not trespass upon private property. It is the applicant's responsibility to determine the boundary between public right-of-way and private property. Prior to entering upon private property, the applicant shall secure written permission from the property owner or owners affected.
- (8) The applicant, his agent, or the contractor shall always ensure the safety of the traveling public. He shall provide, install, and maintain traffic control devices as prescribed by the Texas Manual on Uniform Traffic Control Devices and, when required, will also take other measures of precaution as directed by the Department of Public Works. The Public Works Inspector will inspect all work locations for installations of traffic control devices. The Public Works Inspector has the authority to stop work if the traffic control does not conform to the requirements of the Texas Manual on Uniform Traffic Control Devices.
- (9) The Department of Public Works shall inspect all work within the right-of-way of dedicated streets, dedicated drainage ways, or public easements. The Director of Public Works shall have the authority to revoke the permit whenever it is clear that the plans, details, and specifications are not being followed. All work and materials used shall be in accordance with the requirements of this manual and the City of Hutto Standard Details.
- (10) Except in an emergency, no major thoroughfare or collector street shall be closed on weekdays during the hours of 6:30 AM to 9:00 AM and 4:00 PM to 7:00 PM without approval. Every day of the week, all roadways shall be open to traffic by sunset on the same day as the construction. All lane closures require forty-eight (48) hour notification of the Police and Fire Departments prior to closing.

Message boards should be placed at least 7 days in advance and notified to the construction inspector.

- (11) Permittee shall dispose of all material removed from the ROW and any waste created by permittee in compliance with all state, federal and local laws and requirements. Temporary storage of material over 48 hours may be placed in a pile no higher than thirty inches (30”).
- (12) Except in the case of an emergency, whenever excavation is required in the ROW adjacent to an occupied property, the ROW User shall notify the property owner of the activity through the use of a door hanger, which shall include the following information:
 - (A) Permit number.
 - (B) Identity of the Contractor and the ROW User, including a 24-hour emergency contact name and phone number and phone number to obtain more information regarding the project.
 - (C) The anticipated duration of the construction work.
- (e) Every permittee and ROW user shall prosecute its work diligently and in a good, safe, and workmanlike manner, and shall safeguard and protect the public, using the street or ROW where the work is being performed, from accidents or damage by placing barriers, lights and other sufficient safeguards around all cuts, openings and excavation. All materials, implements and tools stored upon the premises and used in connection with the excavation shall be stored in a safe and non-hazardous manner.
- (f) The City reserves its right, as provided herein, to revoke or suspend any permit, without refund of the permit fee, in the event of a breach by the permittee of the terms and/or conditions of the permit, this Manual and/or any other City ordinance. A breach of the terms of the permit shall include, but not be limited to any of the following:
 - (1) The violation of any provision of the permit.
 - (2) The failure to meet insurance, surety bond or indemnification requirements.
 - (3) The failure to complete the work as specified in the permit.
 - (4) The failure to correct a condition indicated on an order issued pursuant to City ordinances.
 - (5) Repeated traffic control violation.
 - (6) Failure to protect facilities or repair facilities damaged in the ROW.
 - (7) Any safety violation or other action that threatens the health, welfare and/or safety of the public as solely determined by the City.

- (g) A permit shall only be valid for the area of the ROW specified within the permit. No permittee may cause any work to be done outside the area specified in the permit, except as provided herein. Any permittee who determines that an area is greater than that which is specified in the permit must apply for and receive a new ROW permit.
- (h) After obtaining the permit and prior to commencing the work, the permittee shall notify the assigned construction inspector. Work shall be completed within the time specified in the permit, unless an extension of time is granted by the City. No work shall commence until erosion control measures (e.g. silt fence) and advance warning signs, markers, cones and barricades are in place.
- (i) Any request for a permit to excavate street pavement shall include a description of the proposed work and proposed restoration of the area, as well as a statement of clear and convincing evidence as to why alternate procedures cannot or should not be used in lieu of excavating a street. All pavement cuts and repairs shall be performed by a contractor with experience in street repair work and performed in accordance with the City of Hutto Repair Details and City specifications or, if unusual conditions are encountered, the City Engineer may require new standards for compaction, backfill and pavement restoration. Any damage to the pavement outside the removal area shall also be repaired subject to the approval of the Department of Public Works.
- (j) A permittee or ROW user shall maintain its repairs in the ROW for one (1) year from the completion date of any repair. In case the pavement or the surface of the street, alley, or ROW in, over or near any excavation should become depressed, cracked or broken at any time or fails in any way at any time after the excavation has been made and during the one (1) year warranty, the ROW User shall be responsible for repair of the failure.
- (k) Open trenches may be temporarily backfilled for the convenience of the permittee or the public safety. Traffic bearing plates can be used temporarily for pavement areas.
- (l) All excess water and mud shall be removed from the trench prior to backfilling. Any backfill placed during a rainy period or at other times, where excess water cannot be prevented from entering the trench, will be considered temporary and shall be removed as soon as weather permits. All disturbed base material or any base that has been undermined shall be removed and discarded. Compaction of all backfill shall be ninety-five (95) percent of maximum density with a moisture content of 0% to +2% of optimum moisture content as determined by ASTM D698 under or near paved surfaces, future paved surfaces or otherwise as determined by the City. Backfill under and within 1 foot of pavement shall meet or exceed the quality of existing materials.
- (m) All earth, materials, sidewalk, pavement, utilities, conduits, crossing, irrigation, landscaping, monuments, manhole covers, valve covers, meter box lids or

improvements of any kind, which are owned or possessed by the City, and damaged, disturbed, or removed by a ROW user shall be fully repaired promptly by the ROW user, at its sole expense, to the reasonable satisfaction of the ROW Manager.

- (n) After any excavation, the ROW user shall, at its expense, restore the ROW, trench envelope, pavement structure and the surrounding area, to at least the same condition that it was prior to the excavation. The restoration shall be made in accordance with specifications set forth herein, and the repair shall endure without failure for one (1) year from the completion date of any repair.
- (o) In the event the ROW user fails to restore the ROW in the manner and to the condition required herein, or fails to satisfactorily and/or timely complete all restoration, the City may, at its option, serve written notice upon the ROW user that, unless within five (5) business days after serving of such notice a satisfactory arrangement can be made for the proper restoration of the ROW by the ROW user, the City may take over the work and prosecute same to completion, by contract or otherwise, at the sole expense of the ROW user, and ROW user, and its surety, shall be liable to the City for any and all cost incurred by the City by reason of such prosecution and completion. Nothing contained herein shall limit any other remedies available to the City.
- (p) If any excavation cannot be backfilled immediately, the ROW user shall securely and adequately cover the excavation and maintain proper barricades, safety fencing and/or lights as required, from the time of the opening of the excavation until the excavation is surfaced and opened for travel.
- (q) No trench shall be opened in any paved area of the right-of-way for the purpose of laying pipes, conduits or ducts more than 200 feet in advance of the pipe, conduit or ducts being placed in the trench, other than with the prior written consent of the Director of Public Works. No trench shall be opened in any non-paved right-of-way for the purpose of laying pipes, conduits or ducts more than 500 feet in advance of the pipe, conduit or ducts being placed in the trench, other than with the prior written consent of the Director of Public Works. In all areas of the right-of-way, all trenches shall be closed prior to the end of the business day.
- (r) Before a permit shall be issued, the applicant shall execute and deliver to the City, to be kept on file with the City, a good and sufficient bond of performance or assurance in accordance with the requirements of **Section 16.3**.
- (s) Utility and other street crossings under pavement shall not be installed within 2 feet of the bottom of the subgrade. Utilities should traverse 2 feet under City infrastructure unless granted permission by the City.

16.3. INSURANCE AND BONDING REQUIREMENTS

- (a) A ROW user must obtain and maintain insurance in the amounts reasonably prescribed by the City with an insurance company licensed to do business in the State of Texas. A person shall furnish the City with proof of insurance at

the time of the request for permits. The City reserves the right to review the insurance requirements and to reasonably adjust insurance coverage and limits when the City Manager determines that changes in statutory law, court decisions, or the claims history of the industry or the person require adjustment of the coverage. For purposes of this section, the City will accept certificates of self-insurance issued by the State of Texas or letters written by the person in those instances where the State does not issue such letters, which provide the same coverage as required herein. However, for the City to accept such letters the ROW user must demonstrate by written information that it has adequate financial resources to be a self-insured entity as reasonably determined by the City, based on financial information requested by and furnished to the City. The City's current insurance requirements are described below. If a certificate of insurance is on file from a previous application and has not expired, the valid certificate may be referenced on subsequent applications.

- (b) The ROW user shall furnish, at no cost to the City, copies of certificates of insurance evidencing the coverage required by this chapter to the City. A ROW user shall immediately advise the City Attorney of actual or potential litigation that may develop may affect an existing carrier's obligation to defend and indemnify.
- (c) An insurance certificate shall contain the following required provisions:
 - (1) Name the City of Hutto and its officers, employees, board members and elected representatives as additional insured for all applicable coverage.
 - (2) Provide 30 days' notice to the City for cancellation, non-renewal, or material change.
 - (3) Provide that notice of claims shall be provided to the City Manager by certified mail or other approved by the City.
 - (4) The policy clause "Other Insurance" shall not apply to the City if the City is insured under the policy.
 - (5) The permit applicant shall pay premiums and assessments. A company that issues an insurance policy has no recourse against the City for payment of a premium or assessment. Insurance policies obtained by a permit applicant must provide that the issuing company waives all rights of recovery by way of subrogation against the City in connection with damage covered by the policy.
 - (6) The following insurance requirements shall be the minimum required for work within the public rights-of-way of Hutto.

<u>TYPE</u>	<u>AMOUNT</u>
1. Worker's Compensation AND Employers Liability	Statutory \$100,000/500,000/100,000
2. Commercial General (public) Liability insurance including coverage for the following:	
a. Premises operations	Combined single limit for
b. Independent contractors	bodily injury and property
c. Products/completed operations	damage of \$500,000 per
d. Personal injury	occurrence or its equivalent.
e. Advertising injury	
f. Contractual liability	
g. Medical payments	
h. Underground hazard*	
i. Explosion and collapse hazard*	
j. Fire legal liability*	
k. City's property in Contractor's care, custody, or control*	
* Optional, depending on the exposure of the contracted work.	
3. Comprehensive Automobile Liability insurance, including coverage for loading and unloading hazards for:	
a. Hired vehicles	Combined single limit for
b. Non-owned vehicles	bodily injury and property
c. Owned/leased vehicles	damage of \$500,000 per
	occurrence or its equivalent.
(d) Before a permit shall be issued, the applicant shall execute and deliver to the City, to be kept on file with the City, a good and sufficient bond of performance or assurance, to be approved by the City and conditioned that the person making the application shall promptly adjust, pay and settle all legitimate claims for damages that may result by reason of carelessness or negligence in the manner of performing such work or by reason of any defects therein caused or arising from careless, negligent or imperfect construction thereof, and to hold the City, its council members, officers, employees, volunteers, agents, and representatives, free and harmless from liability on all such claims for damages to the performance or assurance bond which shall cover the cost of repairs in or upon the street, sidewalk or other public place where the work is to be done that may become necessary by reason of such cut or excavation having been made. The bond shall be maintained until the City accepts the work after the expiration of the one (2) year maintenance period. With respect to the ROW user's obligation to comply with the requirements	

for a performance/assurance bond, the City may allow the ROW user to self-insure such obligation upon production of evidence that is satisfactory to the City.

- (e) The amount of the required performance/assurance bond shall be as follows:
 - (1) Work requiring street/sidewalk or pavement excavation or excavation within 5 feet of pavement – 120% of the original construction cost

16.4. GRADING PERMITS

- (a) A grading permit is required to change the lines and grades of a parcel if more than 25% of the parcel is adjusted in elevation by greater than six inches (6") if the flow of water onto or off of the site is impacted. Construction equipment may be stored at the site, but no construction activity is allowed until a grading permit is obtained.
- (b) A complete site plan, including proposed paving, drainage facilities and grading, shall be submitted for approval. Other pertinent information, such as landscaping, parking areas, monument sign locations and driveways, shall also be shown on the plans. Detailed information shall be provided which shows existing and proposed site elevations and drainage patterns. This information shall consist of contours, point elevations, grades, drainage arrows, slopes, and cut/fill calculations in enough detail to demonstrate both existing conditions and the work intended to be performed.
- (c) For grading plans that will increase or redirect drainage runoff, drainage calculations shall be provided and improvements made to allow no negative impact to off-site facilities.
- (d) All finished grades shall be compacted to a minimum of 95% standard proctor density. Adequate ground cover or re-vegetation shall be provided immediately. Alternately, a permanent silt fence shall remain in place and maintained until re-vegetation/re-growth takes place.
- (e) All plans and calculations shall be prepared and sealed by a Texas Registered Professional Engineer.
- (f) Permit requests should be submitted to the Permitting Department with the correct fee for plan review. The fee is based on the valuation of work to be performed in accordance with the latest adopted fee schedule.
- (g) The contractor and/or property owner is responsible for complying and coordinating with all other applicable local, state and federal regulations, including but not limited to the City's adopted storm water management ordinance.

16.5. PUBLIC AND PRIVATE UTILITY LOCATIONS

- (a) New installations of public and private utilities (i.e. CATV, telephone, gas, etc.) shall be installed in the utility easements when available. New installations within the right-of-way shall not be located within 4 feet of the back of curb on curb-

and-gutter streets unless they are 3 feet or greater below grade nor between the edge of pavement and the roadside ditch on open ditch streets. New installations are defined as utilities installed after December 31, 2003.

- (b) The minimum horizontal and vertical separation between private utilities and any public utility shall be 18 inches.
- (c) The location of jack and bore pits shall be shown on permit applications. Jack and bore pits shall be at least 3 feet from the back of curb or edge of pavement.
- (d) Public and private utility depths within the public right-of-way shall not be less than the utility depths requirements of the Typical Easement Installation Details shown below.
- (e) Public and private utilities along open ditch roadways shall be installed in utility easements adjacent to the public right-of-way when the easements are available. Franchise utilities along open ditch roadways shall not be less than 2 feet below the flow line of any ditch under any circumstances and, wherever possible, shall be installed between the outside bank of the ditch and the right-of-way line.
- (f) Public and private utilities crossing under street pavement shall not be installed within 2 feet of the bottom of the subgrade.
- (g) Public and private utilities in easements shall be installed in accordance with the Typical Easement Installation Details shown below. Rear lot easements that do not include sanitary sewers may be reduced in width to 14 feet.

HUTTO ENGINEERING DESIGN MANUAL

DIVISION C

WATER SYSTEMS

DIVISION CONTENTS

- **SECTION 17** – WATER DISTRIBUTION
- **SECTION 18** – WATER SERVICE LINES
- **SECTION 19** – FIRE PROTECTION
- **SECTION 20** - WATER SYSTEM CONSTRUCTION PLAN INFORMATION AND SUBMITTAL REQUIREMENTS
- **SECTION 21** – RECLAIMED WATER SYSTEMS

Section 17. WATER DISTRIBUTION

17.1. GENERAL

The following information is intended to assist engineers in the design and construction of water facilities. The information herein is to provide minimum standards for the City of Hutto requirements only. Sound engineering judgement shall be provided to determine if these minimum requirements must be exceeded for a particular engineering design. All water design and construction must comply with the requirements of the State of Texas, when there is a conflict between State requirements and those contained herein, the more restrictive shall govern.

17.1.1. SERVICE EXTENSION APPLICATION REQUIREMENTS

Service Extension Request (SER) forms shall be utilized when requesting a service extension. Other forms may apply.

17.1.2. SERVICE EXTENSION GUIDELINES FOR PROCESSING

- (a) All properties not within the full-purpose city limits of Hutto are within the City of Hutto Certificate of Convenience and Necessity (CCN) area for water must request annexation. An annexation request shall be submitted with the service extension application.
- (b) All properties not within the City of Hutto CCN area for water must submit their project to the City Council for consideration prior to any SER processing.
- (c) All properties not within the City of Hutto ETJ, City of Hutto approved wastewater service area, or flowing directly to the Hutto ETJ or service area must submit their project to the City Council for consideration prior to any SER processing.
- (d) Any City cost participation must be approved by a separate agreement. Approved SER applications are not a reservation of capacity nor an agreement to cost participate. Approved SER applications are strictly an acknowledgment of the intent to serve.
- (e) Approved SERs are valid for one hundred and eighty (180) days from the date of the letter. Upon expiration a new application shall be submitted, and new fees shall be paid.

17.1.3. DEVELOPER RESPONSIBILITY

The developer shall install water lines necessary to properly serve each non-drainage lot of the project and to ensure that existing and/or new water facilities can supply the required demand at the desired pressure for both domestic use and fire protection. The developer shall bear all costs for extending water service from existing City water lines that have sufficient capacity to serve the project. For the orderly extension of water lines as established in the Water Master Plan, maintained by the City Engineer, the Developer shall install water lines to the boundaries of the project for future connection by development of the abutting land. All water lines and service connections shall conform to the current City Construction Standards, Texas Commission on

Environmental Quality Regulations, requirements of the Texas Department of Health and the fire insurance standards of the State Board of Insurance.

17.1.4. FEES

Impact fees, tap fees, and water meter deposits must be paid to the City of Hutto prior to the issuance of a building permit.

17.1.5. UPSIZING

- (a) The developer may be required to upsize or extend proposed water lines in accordance with the City's overall Water Master Plan or approved Service Extension Request. The City may, at its sole discretion, participate with a developer in the cost of oversized facilities based upon, but not limited to the following factors:
 - (1) The approved utility budget for the current year.
 - (2) The ability of the specific utility to fund any future costs.
 - (3) The degree to which the project conforms to and accomplishes the five-year CIP priorities.
 - (4) The degree to which the project accomplishes the utility Master Plan.
 - (5) The impact to the system operations.
- (b) Any cost participation contract shall be approved by the City Council prior to the approval of the Final Plat. Cost participation shall be based upon the cost differential between the actual construction cost of the master plan line size and the minimum size required to serve the development. When a project is included in the current five (5) year CIP, the approved cost participation contract shall provide that the payment be scheduled during the same fiscal year as the CIP project that would have accomplished the project and after the date of notice of acceptance by the City.

17.1.6. PARK SITE CONNECTIONS

The developer shall extend service to all park sites within the development or fronted by a water main installed by the project unless the park is otherwise sufficiently served. The service shall terminate with a meter stop and meter box. The service shall be a minimum two (2) inch diameter per City standard details. Services and meters with diameters greater than two (2) inches may be required upon review by the City Engineer.

17.1.7. ROW AND EASEMENTS

- (a) All proposed water mains and services shall be installed within public ROW or municipal utility easements dedicated to the City. All easements shall be recorded in the Official Property Records of Williamson County prior to approval of construction plans.
- (b) The easement widths provided in this section are necessary to meet the minimum requirements for operation and maintenance activity. Additional easement width may be required by City staff due to site topography or limitations on easement

access. Easement widths shall comply with **Table 17-1**. Where easement width is controlled by depth, as measured by ground level to pipe flowline, easement width shall be rounded up to the nearest five (5) feet.

Table 17-1. Minimum Easement Width for Water Mains and Reclaimed Water Mains

Nominal Diameter	Easement Width (Feet)
12-inch or less	The greater of 15' or Twice the Depth
16-inch to 18-inch	The greater of 20' or Twice the Depth
24-inch to 30-inch	The greater of 25' or Twice the Depth
36-inch to 42-inch	The greater of 30' or Twice the Depth
48-inch or larger	The greater of 35' or Twice the Depth

- (c) Easements parallel to lot lines shall be wholly contained on one lot and not cross lot lines.
- (d) Minimum vertical clearance above all easements to structures, eaves, awnings, signs, overhead utilities, etc. shall be twenty-five (25) feet to allow for future operation and maintenance activity.
- (e) Easements dedicated adjacent to retaining walls shall be provided with additional width as necessary to ensure that special shoring to maintain wall integrity is not required for future excavation of the utility.
- (f) All municipal utility easements must be accessible by ROW or dedicated access easement. Access path must be navigable by City light-duty utility vehicles and wastewater cleaning equipment.
- (g) Fences, guardrails, or other impediments to access may not be constructed within or across City easements.
- (h) A gate meeting City requirements shall be provided where new municipal utility easements cross existing fences.
- (i) Private plumbing may cross a City easement for the purpose of connecting to the City water system. Said crossings must be perpendicular to the easement or no more than thirty (30) degrees from the perpendicular. Private plumbing shall not be permitted to run parallel to and within the easement boundaries.
- (j) All easement instruments and exhibits shall be in a format acceptable to the City.
- (k) The developer shall be responsible for one hundred percent (100%) of the cost to acquire easements for all off-site facilities.

17.1.8. COMPLIANCE WITH SPECIFICATIONS

Construction of distribution mains, transmission mains, and water services within the City's service area shall be compliant with City of Hutto Construction Standards and Specifications, as amended.

17.2. CAPACITY REQUIREMENTS

The developer shall provide all water lines necessary to properly serve each entire subdivision, addition or site development project, and ensure that existing and/or new water facilities can supply the required demand, including fire protection.

17.2.1. FLOW DEMANDS

- (a) Average Day Demand = 200 gallons/day/LUE
- (b) Peak Day Demand = 530 gallons/day/LUE
- (c) Peak Hour Demand = 900 gallons/day/LUE

17.2.2. FIRE FLOW REQUIREMENTS

Fire flow (reference adopted City codes, as amended) requirements will be determined in accordance with the Fire Code as adopted by Williamson County Emergency Services District No. 3 and associated rules.

17.2.3. WATER LINE SIZING

- (a) Minimum main size shall be eight (8) inches unless the City Engineer approves a smaller size because of unique circumstances. All water mains shall be profiled.
- (b) Mains shall be limited to eight (8-), twelve (12-), sixteen (16-), twenty-four (24-), thirty (30-), thirty-six (36-) and forty-two (42-) inch diameters. Larger sizes may be approved on a project-specific basis.
- (c) Computer modeling is preferred for sizing water mains. However, for water mains less than twelve (12) inches in diameter, other engineering calculation methods may be accepted. The largest size, as determined by comparing the service area's peak hour demand and peak day plus fire flow demand, shall be used. All computer models must be submitted for approval and in a format compatible with Autodesk's InfoWater Pro. Models created by other software packages must be submitted as an EPANET Input file (.inp).
- (d) The maximum allowable velocity for Peak Hour Demand shall not exceed five (5) feet per second (fps).
- (e) The maximum allowable velocity shall not exceed eight (8) fps during maximum day demand plus fire flow demand.

17.2.4. ELEVATED STORAGE

If determined by the City Engineer that additional elevated storage is required, the elevated storage requirement is two hundred (200) gallons per LUE.

17.2.5. PRESSURE

- (a) Pressure zones are set by City Operations and shall be indicated on the plan set.
- (b) Minimum static pressure shall be thirty-five (35) pounds per square inch (psi), and maximum static pressure shall be one hundred (100) psi unless otherwise approved by the City Engineer.

- (c) Minimum operating pressure is fifty (50) psi at the highest elevation meter location using average day demand.

17.3. SYSTEM LAYOUT AND PLACEMENT

17.3.1. STANDARD ASSIGNMENT

Standard assignment for water mains shall be per the standard details or in a municipal utility easement on the high side of the street according to natural topography unless otherwise accepted by the City Engineer. The latter requirement may be relaxed if it is demonstrated that there are one or more compelling reasons to assign a main on the low side of a street (i.e., numerous crossings are avoidable, maintenance is facilitated, etc.) outside of the municipal water easement or in another location.

17.3.2. HORIZONTAL AND VERTICAL BENDS

- (a) All water mains shall be designed to have a minimum zero point one percent (0.1%) slope.
- (b) The maximum bend angle allowed is forty-five (45) degrees unless unavoidable and approved by the City Engineer.
- (c) The maximum deflection angles of pipe joint are typically restricted to five percent (5%) or eighty percent (80%) of the manufacturer's recommendation, whichever is less. Otherwise, horizontal bends will be required.
- (d) A minimum offset of five (5) feet is required between buried bends. Mechanical joint adapters may be used to closely couple fittings where required by site conditions.
- (e) All fittings shall be mechanically restrained and thrust blocked.

17.3.3. FITTINGS AND APPURTENANCES

- (a) All PVC and ductile iron pipe shall use ductile iron fittings.
- (b) Fittings must have a pressure rating equal to or greater than the connecting piping.
- (c) All ductile iron fittings shall be encased in polyethylene wrap.

17.3.4. EXISTING FACILITY CROSSINGS

Approval letters for all crossings of TxDOT ROW, railroad ROW, gas lines, and petroleum lines shall be provided prior to approval.

17.3.5. EXTENSIONS TO THE PERIMETER

For the orderly extension of water lines as established in the Water and Wastewater Master Plan, maintained by the City Engineer, the developer shall install water mains to their property as well as to the boundaries of their development for future connection by the development of the abutting land.

17.4. DESIGN REQUIREMENTS FOR DISTRIBUTION & TRANSMISSION LINES

17.4.1. REGULATORY STANDARDS

All water plans and specifications shall meet TCEQ Chapter 217, TCEQ Chapter 290, City of Hutto standards, and other regulatory agencies under the jurisdiction and, if applicable, be submitted to those agencies for necessary approval. Where a conflict exists between these standards, the stricter requirement shall apply.

17.4.2. BACKFLOW PREVENTION

- (a) Backflow prevention devices shall be provided at the following locations to protect the public water system from cross-contamination:
 - (1) Commercial property water service line
 - (2) Dedicated irrigation lines
 - (3) Fire lines
 - (4) Multi-residential units
- (b) Backflow prevention devices shall be reduced pressure zone backflow prevention assemblies. Double check assemblies in an underground vault are acceptable for backflow prevention at fire line connections. Backflow prevention assemblies shall be installed behind the meter at the transition to private plumbing. Backflow preventers shall be located at the property line or outside municipal utility easements or public utility easements and be accessible to City staff in perpetuity.

17.4.3. TRENCHLESS CROSSINGS

- (a) Crossings of existing City of Hutto roadways shall be by trenchless construction methods. The following trenchless construction methods shall be acceptable for City facilities:
 - (1) Horizontal Auger Boring
 - (2) Microtunneling
 - (3) Tunneling
 - (4) Horizontal Directional Drilling
- (b) Designer shall be responsible for determining the minimum wall thickness and diameter of steel encasement pipe or tunnel liner plate as required for any specific application and shall in no case be less than that shown in the City of Hutto standard detail. Spacers shall be installed per manufacturer's guidelines but in no case shall the distance between spacers be greater than shown in the City of Hutto's standard details. Casing thicknesses for crossings of railroad ROW shall be as required by the AREMA Manual for Railway Engineering.

17.4.4. THRUST RESTRAINT

All bends, valves and other fittings shall be mechanically or integrally restrained. In addition to being restrained, all bends, valves, and other fittings shall also be secured with concrete thrust blocking. All joints within steel encasement shall be mechanically restrained or fused.

17.5. CONNECTIONS TO WATER MAINS

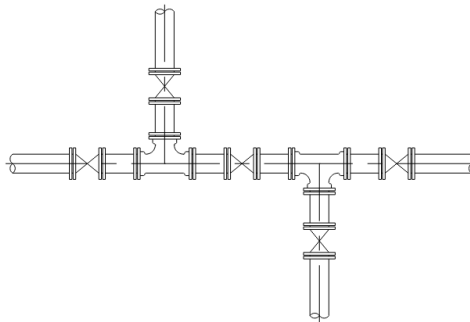
17.5.1. EXISTING WATER MAINS

- (a) Connections to existing water mains shall be made as a cut-in connection with a tee. Valves shall be provided on all legs of the tee.
- (b) Tapping sleeve and valves shall be used for connections to existing water mains when required by the City Engineer. Taps are restricted to one (1) standard pipe size smaller than the tapped pipe. All taps shall be made using a stainless-steel full circle tapping sleeve.

17.5.2. CROSSING WATER MAINS

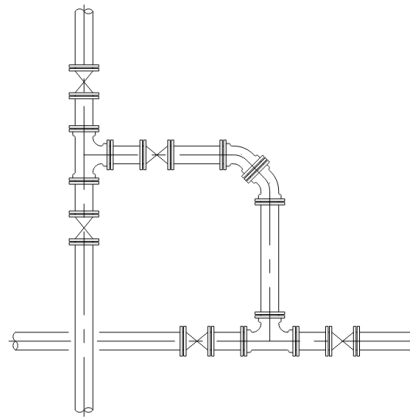
- (a) A cross or tee shall be used when connecting crossing water mains. Crossing connections to critical infrastructure may require tees with an intervening valve to be installed at the City Engineer's discretion.

Figure 17-1: Tees with Intervening Valve Connection



- (b) Type-D connections may be allowed when tees with an intervening valve are required but not feasible due to site constraints.

Figure 17-2: Type-D Connection



17.6. DEAD-ENDS

17.6.1. LOOPING REQUIREMENTS

- (a) Looped water systems shall be provided, and dead-end water mains shall be avoided. Should a looped water system be deemed not feasible, a variance must be explicitly approved by the City Engineer to allow any new or proposed dead-end water mains.
- (b) A looped system shall not connect to the same main. An alternate main should be used whenever possible.

17.6.2. FLUSHING

- (a) Automatic flush valves and meters shall be required at approved permanent dead ends.
- (b) Blowoffs shall be installed at the end of phased water lines if there is not a hydrant installed at that location. Gate valve shall be installed ten (10) feet upstream from the dead end and no service lines shall be installed between the valve and the dead end.

17.7. DEPTH OF COVER & SEPARATION DISTANCE

17.7.1. MINIMUM COVER

The minimum cover shall be at least forty-eight (48) inches below the proposed ground elevation. Depth of cover within TxDOT ROW must comply with TxDOT standards.

17.7.2. MAXIMUM DEPTH OF COVER

The maximum depth of cover shall be ninety-six (96) inches below grade unless approved by the City Engineer for the specific materials, application and conditions.

17.7.3. CLEARANCE TO UTILITIES

- (a) The separation between water and wastewater mains must comply with the following:

Table 17-2: Water and Wastewater Main Separation Cases

Case	Protection Requirement
Parallel pipes within nine feet, where the collection system pipe is above a water supply pipe	Collection system pipe must be encased for all portions within nine feet of the water line, encasement must be sealed at both ends, spacers at a maximum of five feet intervals, and the encasement must be at least two nominal sizes larger than the collection pipe
Parallel pipes within nine feet, where the collection system pipe is below the water supply pipe	Collection pipe must be constructed using 150 psi pressure class pipe Or Collection pipe must be encased as above
Crossing pipes within nine feet, where the collection pipe is above the water supply pipe	Collection system pipe must be encased as above
Crossing pipes within nine feet, where the collection pipe is below the water supply pipe	Collection pipe must be constructed using 150 psi pressure class pipe Or Collection pipe must be encased as above
Manhole within nine feet of a water supply pipe	All portions of the manhole within nine feet of the water line must be encased in cement stabilized sand per TCEQ regulations

- (b) New water mains or services shall be encased in a steel casing pipe where they cross wastewater mains with less than nine (9) feet of separation.
- (c) The horizontal separation distance from a water main of sixteen (16) inches in diameter or smaller to a storm drain shall be five (5) feet (preferred) and three (3) feet (minimum).
- (d) Water mains shall be installed with a minimum of eighteen (18) inches of vertical clearance from storm drains.
- (e) Water main crossings under storm drain pipe of diameter forty-eight (48) inches or greater, box culverts of width forty-eight (48) inches or greater, or multiple barrel storm drains shall be steel encased. Steel encasement shall extend a minimum of five (5) feet beyond the outer walls of the storm drain crossing.
- (f) Water mains shall be installed with a minimum of twenty-four (24) inches of vertical clearance from other utilities.

17.7.4. RETAINING WALLS

Water crossings under retaining walls shall be steel encased. Steel encasement shall extend a minimum of five (5) feet beyond the footing and back face of the wall. Casing shall extend five (5) feet beyond tiebacks or other reinforcement (geogrid, rock nails, etc.).

17.8. BEDDING AND BACKFILL REQUIREMENTS

Bedding and backfill shall comply with the current City of Hutto Construction Standards and Specifications.

17.9. VALVES

17.9.1. VALVE LOCATIONS

Isolation valves, drain valves, combination air release and vacuum valves, and other valve types shall be located as noted below. Valves shall not be located in the street gutter, between the banks of channels or creeks, within concrete curb, or within concrete trails or sidewalks.

17.9.2. DRAIN VALVES

- (a) Drain valves shall be required for all water mains sixteen (16) inches and larger.
- (b) Drain valves shall be placed at all low points.
- (c) Drain valves shall be located outside the high bank of drainage channels and creeks.
- (d) Drain valves in developed areas shall be fire hydrants. Alternative configurations may be required by the City Engineer in undeveloped areas or floodplains.

17.9.3. COMBINATION AIR RELEASE AND VACUUM VALVES

- (a) Combination air release and vacuum valves shall meet the standards set forth in AWWA M51.
- (b) The design engineer is responsible for determining when air/vacuum release valves are required.
- (c) On water mains twelve (12) inches in diameter and larger, automatic air release valves will be placed at all high points and at the down-slope side of all valve locations. Automatic air/vacuum and vacuum release valves shall be approved on a case-by-case basis.

17.9.4. ISOLATION VALVES

- (a) Isolation valves shall be installed on all legs of the intersection of water mains. For example, two water mains intersecting at a tee shall be provided with three isolation valves, one on each leg.
- (b) Valves shall be spaced so that no more than thirty customers will be without water during a shutout. For lines smaller than twenty-four (24) inches, typical spacing shall be five hundred (500) linear feet in high-density areas and one thousand two hundred (1,200) linear feet in residential areas, with maximum spacing of one thousand five hundred (1,500) linear feet. Water mains twenty-four (24) to thirty (30)

inches shall be valved at intervals not to exceed two thousand (2,000) linear feet. For lines thirty-six (36) inches and larger, valve spacing will not exceed two thousand five hundred (2,500) linear feet.

- (c) There shall be a gate valve restrained on the lead for each fire hydrant at the connection to the main per City of Hutto Standard Details.
- (d) All isolation valves thirty-six (36) inches and smaller shall be resilient seated gate valves. Isolation valves larger than thirty-six (36) inches shall be double disc gate valves. Butterfly valves may be used for isolation valves thirty-six (36) inches and larger with prior approval by the City Engineer.

17.9.5. PRESSURE REDUCING VALVES

- (a) The developer shall be responsible for installing a mainline Pressure Reducing Valve (PRV) per City details at pressure zone boundaries.
- (b) PRV configurations must be in accordance with City of Hutto Standard Details.
- (c) PRV vaults shall be installed behind the curb in an area not subject to vehicular, bicycle, or pedestrian traffic. The location must be outside drainage swales, channels, creeks, depressions, or ponds and accessible to City maintenance vehicles.
- (d) A system isolation valve must be installed on the low-pressure side of the PRV within one hundred (100) feet of the vault. A hydrant must be installed between the isolation valve and the vault for flow testing.
- (e) If the maximum static pressure exceeds eighty (80) psi, a PRV shall be required on the property owner's side of the water meter and should be shown on the plan view.

17.10. ALLOWABLE MATERIALS

17.10.1. PIPE MATERIALS FOR SIXTEEN (16) INCHES AND SMALLER

The following materials are allowed for pipes sixteen (16) inches and smaller:

- (a) AWWA C900 PVC DR14 (or less), integrally colored blue.
- (b) Ductile Iron Pipe encased in polyethylene wrap.
- (c) AWWA C906 HDPE Ductile Iron Pipe Size, DR11 (or less), colored black with blue striping, with approval by the City Engineer.

17.10.2. PIPE MATERIALS FOR TWENTY-FOUR (24) INCHES AND LARGER

The following materials are allowed for pipes twenty-four (24) inches and larger:

- (a) AWWA C900 PVC DR14 (or less), integrally colored blue.
- (b) Ductile Iron Pipe encased in polyethylene wrap.
- (c) AWWA C906 DR11 (or less) Ductile Iron Pipe Size HDPE, integrally colored black with blue striping.
- (d) AWWA C200 Steel Pipe.

17.11. TESTING OF INSTALLED PIPE

All water mains, valves, services, and other related appurtenances shall be tested per TCEQ requirements and City of Hutto standards and specifications prior to acceptance.

17.12. ABANDONMENT OF FACILITIES

If a new project will abandon existing facilities, the plans shall provide for the appropriate abandonment of these facilities.

17.12.1. MAINS

Abandonment of mains in easements or ROW shall consist of cutting the main at locations identified in the construction drawings and completely filling the interior of the main with a pumpable grout or slurry per City specifications. Mains shall be removed when they conflict with proposed infrastructure or when required as a condition of the City, TxDOT, or railroad permit.

17.12.2. VALVES

Valve abandonment in place shall only be permitted if the associated main is no longer in service. Valves to be abandoned shall have the valve box, riser, and valve stem extension (if present) removed to a minimum of eighteen (18) inches below grade. The remainder of the valve box riser shall be filled with pumpable grout or flowable fill to the top of the riser.

17.12.3. SERVICE LINES

All water service lines, including fire lines, to be abandoned and not transferred to a new distribution line shall be disconnected at the corporation stop. Corporation stop shall be closed and plugged. Concrete blocking shall be installed over the plug. All other valves and appurtenances on the service line shall be removed.

17.13. STANDARD PRODUCTS LIST

Water products and materials shall be on the City's standard products list, or obtained prior approval from the City Engineer before submittal.

Section 18. WATER SERVICE LINES

18.1. ALLOWABLE MATERIALS

- (a) Service piping less than four (4) inch diameter shall be SDR-9 polyethylene tubing as accepted by the City Engineer.
- (b) Service piping of diameter four (4) inches and larger shall be ductile iron pipe or AWWA C900 DR14 (or less) PVC as accepted by the City Engineer.

18.2. PIPE SIZES

- (a) The minimum size of service lines shall be as follows:

Dwelling Units	Minimum Line Size
1-2	1.5"
3-6	2"
7-11	4"
12-75	6"
More than 75	8"

- (b) Individual meter services will not be taken from transmission lines. Transmission lines are generally considered to be sixteen (16) inches in diameter or larger. Exceptions must be approved by the City Engineer at the time of plan submittal. A Professional Engineer shall submit a letter with this request.

18.3. METERS

18.3.1. METER CALCULATIONS

Meter sizing calculations shall be provided for all multi-family, commercial and industrial development. All calculations must use the City's standard calculation tool.

18.3.2. INSTALLATION OF METERS TWO (2) INCHES AND SMALLER

City shall provide and install meters two (2) inches and smaller in accordance with the City's current Construction Standards and Details.

18.3.3. INSTALLATION OF METERS LARGER THAN TWO INCH

The contractor shall coordinate with the City of Hutto Utility Billing for ordering meters larger than two (2) inches in diameter. The contractor shall be responsible for the installation of these meters in accordance with the City's current Construction Standards and Details.

18.3.4. COMBINED FIRE/DOMESTIC METERS

- (a) Any requested fire/domestic meters must show average and peak domestic demand as well as required fire flow per City Fire Code.
- (b) Combined fire/domestic meters will only be permitted if the domestic demand meets the minimum requirements for a three (3) inch water meter. If domestic

demand does not require a three (3) inch meter, fire and domestic shall be provided by separate metered services.

18.3.5. METERS PER CONNECTION

Water services shall be constructed in accordance with the City's Standard Details. More than two (2) meters on a single service line will be considered on a case-by-case basis.

18.3.6. METER LOCATION

Water meter boxes shall be set in the right-of-way abutting the property line for meters two (2) inches and below. For larger meters, meter vaults shall be placed in a utility easement outside the ROW near the property line. The easement must extend a minimum of five (5) feet beyond the extent of the meter vault, and access shall not be restricted to the vault by means of fencing or any other obstacle. Meter boxes and vaults shall not be installed in sidewalks, drive aisles, parking areas, or other areas of vehicular traffic.

18.4. EASEMENTS

Easements for service lines shall comply with **Section 17.1.7.**

Section 19. FIRE PROTECTION

19.1. WILLIAMSON COUNTY ESD NO. 3 REQUIREMENTS

All subdivisions and developments shall meet the requirements of WCESD No. 3.

19.2. THREADING PATTERN

Threading must be suitable for use with WCESD No. 3 fire protection equipment.

19.3. FLOW REQUIREMENTS

The latest edition of the International Fire Code as adopted by the City of Hutto shall be applicable for estimating the minimum required fire flow at any facility.

19.4. FIRE LINE METER AND BACKFLOW REQUIREMENTS

All fire lines shall be metered and have a gate valve at the connection to the City main. A backflow preventer shall be installed on the fire line inside the property line and outside public or municipal utility easement boundaries. The backflow preventer shall be accessible for inspection by City personnel in perpetuity.

19.5. MODELING REQUIREMENTS

Modeling for compliance with fire flow requirements shall follow **Section 17.2.3(c)**.

19.6. FIRE HYDRANTS

19.6.1. PLACEMENT

- (a) Fire hydrants shall be provided at all intersections of two (2) or more streets and between intersections as necessary per the required spacing in **Section 19.6.2**.
- (b) Hydrants shall be installed as near to the street intersections as possible while remaining outside the curb return. Offset from intersections shall be a minimum of five (5) feet before the point of curvature or five (5) feet after the point of tangency. Fire hydrants shall not be installed within curb ramps, curb ramp wings, or curb ramp landings.
- (c) Hydrants shall be placed on the same side of the street as the water main ("short side"). Hydrants shall not be placed with leads that cross the roadway ("long side") unless required by site constraints.
- (d) Hydrants shall not be placed within nine (9) feet in any direction from any wastewater or reclaimed water main, lateral, or service, regardless of construction.
- (e) Fire hydrants shall be installed on both sides of all divided roads/highways. Roads/highways where opposing lanes of traffic are separated by a vertical obstruction shall be considered a divided road/highway.
- (f) Fire hydrants shall be designed so as not to interfere with sidewalks, sidewalk ramps, trash receptacles, street lights, and signal pole foundations. To avoid

sidewalks, ramps, and other features, fire hydrants placed near a street corner should be located outside the curve radius and a minimum of four (4) feet from ramps.

19.6.2. REQUIRED SPACING

Fire hydrants shall be placed at a maximum of five hundred (500) foot intervals along residential streets and a maximum of three hundred (300) foot intervals along collector or arterial class streets. Specific fire hydrant locations within a commercial, industrial, or multi-family site shall be coordinated with Williamson County Emergency Services District 3 (WCESD). Consideration shall be given to accessibility and functionality of position when locating fire hydrants, and such consideration could shorten the above stated spacings as required by the City Engineer. Fire hydrants shall be in conformance with AWWA specifications.

19.6.3. CUL-DE-SACS

Refer to **Section 17.6** Dead-Ends.

19.6.4. FLOW TESTING

All fire hydrants shall be tested in accordance with NFPA 291 prior to acceptance.

Section 20. WATER SYSTEM CONSTRUCTION PLAN INFORMATION AND SUBMITTAL REQUIREMENTS

20.1. PLAN VIEW INFORMATION

20.1.1. ALLOWABLE SCALES

A scale bar with appropriate labeling shall be shown on all sheets. The standard horizontal scale shall be 1" = 50', 40', 20', or 10' (plan view) with respective vertical scale 1" = 5', 4' or 2', or 1' (profiles). The scales used on each plan and profile sheet shall be the same. For sheets other than plan and profile, a horizontal scale of 1" = 50', 40', 20', or 10' may be used as appropriate. The City Engineer may require a larger-scale be used for plan and profile sheets, or a large-scale blowup of a particular area.

20.1.2. FLOODPLAIN LIMITS

Ultimate 100-year flood plain limits shall be shown as determined by Atlas 14.

20.1.3. CONNECTIONS

For proposed connections to water mains or facilities to be constructed by others, identify the project by name and the design engineer.

20.1.4. STATIONING

- (a) Station numbers for water mains shall be identified for beginning points, ending points, points of curvature, points of tangency, points of reverse curve, points of intersection, valves, fire hydrants, other appurtenances and grade breaks.
- (b) Station numbers shall be identified for the water mains where they cross any other utility.

20.1.5. DETAILS

Details of appurtenances shall be shown. Provide all applicable City of Hutto standard details. Unused details shall not be shown on the plan set. No more than eight details originally produced at ANSI Letter size or four originally produced at ANSI Tabloid size shall be provided on detail sheets.

20.1.6. EASEMENTS

Plans submitted must show approved easements and/or permits on highway and/or railroad crossings. Easements with volume and page or document number shown on plans.

20.1.7. PROPERTY INFORMATION

Plans submitted must show property lines, addresses, and owner information for adjacent properties. Provide block and lot information for all new subdivisions.

20.2. PROFILE VIEW INFORMATION

Profile views are required for all water mains. Profile views shall provide all the information listed below.

20.2.1. REQUIRED PROFILES

- (a) Existing ground and finished grade if not under pavement.
- (b) Existing ground, proposed street finished grade, and proposed street subgrade if under pavement.
- (c) Lines to indicate pipe flowline and crown.
- (d) Existing and proposed pipeline crossings.

20.2.2. STATIONING, FLOWLINES AND ELEVATIONS

- (a) Station numbers and elevations for starting points, ending points, grade breaks, valves, fire hydrants and intermediate points every one hundred (100) feet.
- (b) Station numbers and elevations of all utility and storm drain crossings.
- (c) Flow line or top of pipe elevations for all pipe connections.

20.2.3. PIPE LABELING

- (a) Identify pipe size, percent grade and pipe material to be used including American Society of Testing and Materials (ASTM) and/or AWWA designation. If an alternate material is to be allowed, both should be listed (for example, "PC 250 DIP or AWWA C900 DR14 PVC").
- (b) Rock riprap, concrete trench caps, or other similar features shall be shown and labeled.

20.2.4. THRUST RESTRAINT LENGTHS

Length of required restraints for all fittings shall be shown.

20.2.5. FITTINGS

Provide station, bend type and change in direction in decimal degrees for all fittings.

20.2.6. RETAINING WALLS

Retaining walls, including geogrid, straps, tiebacks, and all other components, shall be shown.

20.2.7. DRAINAGE CROSSINGS

Label pipe size, materials, and clearance to water lines for all storm drains, culverts, and other drainage crossings.

20.2.8. ENCASEMENT

- (a) Label(s) for encasement material, diameter, length, and installation method (by open cut, trenchless construction, microtunnel, etc.).
- (b) Station numbers for starting points and ending points.

Section 21. RECLAIMED WATER SYSTEMS

21.1. GENERAL

The following information is intended to assist engineers in the design and construction of reclaimed facilities. Information herein is to provide minimum standards for the City of Hutto requirements only. Sound engineering judgement shall be provided to determine if these minimum requirements must be exceeded for a particular engineering design.

21.1.1. DEVELOPER RESPONSIBILITY

The developer shall install reclaimed water lines necessary to properly serve proposed reclaimed water systems where required by City ordinance. The developer shall bear all costs for extending reclaimed water service from existing City reclaimed water lines that have sufficient capacity to serve the project. The Developer shall install reclaimed water lines to the boundaries of the project for future connection by development of the abutting land to provide for the orderly extension of the reclaimed water system. All reclaimed water lines and service connections shall conform to the current City Construction Standards and Texas Commission on Environmental Quality Regulations.

21.1.2. ROW AND EASEMENTS

ROW and easements for reclaimed water mains and services shall be as provided for water in **Section 17.1.7.**

21.1.3. CROSS CONNECTION

No physical connection shall be made between reclaimed water piping and potable water or wastewater piping.

21.2. CAPACITY REQUIREMENTS

21.2.1. RECLAIMED WATER MAIN SIZING

Reclaimed water mains shall be sized in accordance with the approved master plan. If the master plan is not available or does not cover the site, the sizing must be based on engineering analysis of the initial and future demand of reclaimed water user(s). Sizing calculations must be submitted with the construction drawings.

- (a) Minimum reclaimed water main size shall be six (6) inches.
- (b) Reclaimed water mains shall be limited to six (6-), eight (8-), twelve (12-), sixteen (16-), twenty-four (24-), thirty (30-), thirty-six (36-) and forty-two (42-) inch diameters. Larger sizes may be approved on a project specific basis.
- (c) Computer modeling is preferred for sizing reclaimed water mains. However, for water mains less than twelve (12) inches in diameter, other engineering calculation methods may be accepted.
- (d) Velocity for reclaimed water mains shall be maintained between two (2) and eight (8) fps.

21.2.2. PRESSURE

- (a) Pressure zones are set by City Operations and should be indicated on the plan set.
- (b) Minimum static pressure shall be thirty-five (35) pounds per square inch (psi), and maximum static pressure shall be one hundred (100) pounds per square inch (psi) unless otherwise approved by the City Engineer.

21.3. SYSTEM LAYOUT AND PLACEMENT

21.3.1. STANDARD ASSIGNMENT

Standard assignment for reclaimed water mains shall be in a Municipal utility easement adjacent to the ROW on the low side of the street according to natural topography unless otherwise accepted by the City Engineer. The latter requirement may be relaxed if it is demonstrated that there are one or more compelling reasons to assign a main outside of the municipal utility easement or in another location.

21.3.2. HORIZONTAL AND VERTICAL BENDS

Horizontal and vertical bends shall be provided as required for water mains in **Section 17.3.2.**

21.3.3. FITTINGS AND APPURTENANCES

All PVC and ductile iron pipe shall use ductile iron fittings.

21.3.4. EXISTING FACILITY CROSSINGS

Approval letters for all crossings of TxDOT ROW, railroad ROW, gas lines, and petroleum lines shall be provided prior to approval.

21.3.5. EXTENSIONS TO THE PERIMETER

For the orderly extension of reclaimed water lines as established in the Water and Wastewater Master Plan, maintained by the City Engineer, the developer shall install water mains to their property as well as to the boundaries of their development for future connection by the development of the abutting land.

21.4. DESIGN REQUIREMENTS FOR RECLAIMED WATER MAINS

21.4.1. REGULATORY STANDARDS

Public Reclaimed water mains and service lines shall be designed in accordance with TCEQ Chapter 210 and the requirements of this manual. Where there is a conflict between TCEQ requirements and the provisions of this manual, the stricter requirement shall apply.

All on-site private reclaimed water piping shall be purple and comply with City of Hutto plumbing code, as amended.

21.4.2. BACKFLOW PREVENTION

Backflow prevention devices shall be provided on all reclaimed water services to protect the system from potential cross contamination.

21.4.3. THRUST RESTRAINT

Thrust restraint for reclaimed water mains shall be as provided for water mains in **Section 17.4.4.**

21.5. CONNECTIONS TO RECLAIMED WATER MAINS

21.5.1. EXISTING RECLAIMED WATER MAINS

Connections to existing reclaimed water mains shall be as provided for water mains in **Section 17.5.1.**

21.5.2. CROSSING RECLAIMED WATER MAINS

Requirements for crossing reclaimed water mains shall be as provided for water mains in **Section 17.5.2.**

21.6. DEAD-ENDS

21.6.1. LOOPING REQUIREMENTS

- (a) Dead-end reclaimed water mains should be avoided.
- (b) A looped system should not connect to the same main. An alternate main should be used whenever possible.

21.6.2. FLUSHING

- (a) Blowoffs shall be installed at the end of all reclaimed water mains. A gate valve shall be installed ten (10) feet upstream from the dead end and no service lines shall be installed between the valve and the dead end.
- (b) Blowoffs for fecal coliform sampling may be required by the City Engineer for systems serving residential irrigation, public parks, school yards, athletic fields, or other similar uses.

21.7. DEPTH OF COVER & SEPARATION DISTANCE

21.7.1. MINIMUM COVER

Minimum cover for reclaimed water mains shall be as provided for water mains in **Section 17.7.1.**

21.7.2. MAXIMUM DEPTH OF COVER

Maximum depth of cover for reclaimed water mains shall be as provided for water mains in **Section 17.7.2.**

21.7.3. CLEARANCE TO UTILITIES

- (a) Reclaimed water piping shall be installed with a minimum horizontal clearance of nine (9) feet to water piping. Where this cannot be achieved, the reclaimed water main must comply with TCEQ Chapter 290 rules or have a variance approved by the TCEQ before submittal to the City.
- (b) Reclaimed water piping shall be installed with a minimum horizontal clearance of three (3) feet to wastewater piping. Reclaimed water piping must be at or above the level of the wastewater piping. Where this cannot be achieved, the reclaimed water

main must comply with TCEQ Chapter 290 rules or have a variance approved by the TCEQ before submittal to the City.

- (c) Reclaimed water piping crossings of wastewater lines shall comply with TCEQ Chapter 210 rules or have a variance approved by the TCEQ before submittal to the City.

21.8. BEDDING AND BACKFILL REQUIREMENTS

Bedding and backfill shall comply with the current City of Hutto Construction Standards and Details.

21.9. VALVES

21.9.1. VALVE LOCATIONS

Valves for reclaimed water mains shall be as provided for water mains in **Section 17.9.1.**

21.9.2. DRAIN VALVES

Drain valves for reclaimed water mains shall be as provided for water mains in **Section 17.9.2.**

21.9.3. COMBINATION AIR RELEASE AND VACUUM VALVES

Combination air release and vacuum valves for reclaimed water mains shall be as provided for water mains in **Section 17.9.3.**

21.9.4. ISOLATION VALVES

- (a) Isolation valves shall be installed on all legs of the intersection of reclaimed water mains. For example, two reclaimed water mains intersecting at a tee shall be provided with three (3) isolation valves, one on each leg.
- (b) Valve spacing shall be no greater than five hundred (500) linear feet in high-density areas and one thousand two hundred (1,200) linear feet in residential areas. Reclaimed water mains twenty-four (24) inches to thirty (30) inches shall be valved at intervals not to exceed two thousand (2,000) linear feet. For lines thirty-six (36) inches and larger, valve spacing will not exceed two thousand five hundred (2,500) linear feet.
- (c) All isolation valves thirty-six (36) inches and smaller shall be resilient seated gate valves. Isolation valves larger than thirty-six (36) inches shall be double disc gate valves.

21.9.5. VALVE BOXES

All valve boxes and lids shall be square with “Reclaimed Water” cast into the lid.

21.9.6. SIGNS

All above grade hose bibs, hydrants, drain valves, faucets or similar appurtenances shall have an affixed sign with a minimum size of eight (8) inches by eight (8) inches stating “Reclaimed Water, Do Not Drink” in both English and Spanish. If the appurtenance is installed within a manhole, vault or meter box the sign may be affixed to the inside wall.

21.9.7. COATINGS

All exposed piping, valves, and other appurtenances shall be integrally colored purple or coated purple in compliance with City of Hutto specifications.

21.10. ALLOWABLE MATERIALS

21.10.1. PIPE MATERIALS FOR SIXTEEN (16) INCHES AND SMALLER

The following materials are allowed for reclaimed water pipes sixteen (16) inches and smaller:

- (a) AWWA C900 PVC DR14 (or less), integrally colored purple.
- (b) Ductile Iron Pipe with purple polyethylene encasement.
- (c) AWWA C906 HDPE Ductile Iron Pipe Size, DR11 (or less), colored black with purple striping, with approval by the City Engineer.

21.10.2. PIPE MATERIALS FOR TWENTY-FOUR (24) INCHES AND LARGER

The following materials are allowed for pipes twenty-four (24) inches and larger:

- (a) AWWA C900 PVC DR14 (or less), integrally colored purple.
- (b) Ductile Iron Pipe with purple polyethylene encasement.
- (c) AWWA C906 DR13 (or less) Ductile Iron Pipe Size HDPE, integrally colored black with purple striping.
- (d) AWWA C200 Steel Pipe.

21.11. TESTING OF INSTALLED PIPE

All reclaimed water mains, valves, services, and other related appurtenances shall be tested per the TCEQ and City of Hutto standards and specifications prior to acceptance.

21.12. ABANDONMENT OF FACILITIES

Abandonment for reclaimed water facilities shall be as provided for water facilities in **Section 17.12.**

21.13. STANDARD PRODUCTS LIST

Reclaimed water products and materials shall be on the City's standard products list or obtain prior approval from the City Engineer before submittal.

21.14. RECLAIMED WATER SERVICE LINES

21.14.1. ALLOWABLE SERVICE LINE MATERIALS

Service lines materials for reclaimed water shall be as provided for water service lines in **Section 18.1.**

21.14.2. SERVICE LINE SIZING

The engineer shall provide service line and meter sizing calculations. Service line and meter sizes shall comply with City of Hutto sizes. Where line and meter sizes are between allowable sizes, the Engineer shall select the larger size.

21.14.3. METERING

All reclaimed water services shall be metered.

21.14.4. INSTALLATION OF METERS TWO (2) INCHES AND SMALLER

The City shall provide and install meters two (2) inches and smaller in accordance with the City's current Construction Standards and Details.

21.14.5. INSTALLATION OF METERS LARGER THAN TWO (2) INCHES

The contractor shall coordinate with the City of Hutto Utility Billing for ordering meters larger than two (2) inches in diameter. The contractor shall be responsible for the installation of these meters in accordance with the City's current Construction Standards and Details.

21.14.6. METERS PER CONNECTION

Reclaimed water services shall be constructed in accordance with the City's Standard Details. No more than one meter shall be allowed per service line.

21.14.7. METER LOCATION

Reclaimed water meters shall be located as required for water meters in **Section 18.3.6**.

21.14.8. METER BOXES AND VAULTS

Meter boxes and vaults shall be square or rectangular and have "Reclaimed Water" cast into the lid.

21.14.9. EASEMENTS FOR SERVICE LINES

Easements for service lines shall comply with **Section 17.1.7**.

21.15. CONSTRUCTION PLAN INFORMATION

21.15.1. PLAN VIEW INFORMATION

Plan view information for reclaimed water shall be as provided for water systems in **Section 20.1**.

21.15.2. PROFILE VIEW INFORMATION

Profile views are required for all reclaimed water lines six (6) inches in diameter and above. All other information for water lines, as required in **Section 20.2**, shall be provided for reclaimed water.

HUTTO ENGINEERING DESIGN MANUAL

DIVISION D

WASTEWATER SYSTEMS

DIVISION CONTENTS

- **SECTION 22** – WASTEWATER UTILITIES
- **SECTION 23** – WASTEWATER SERVICE LINES
- **SECTION 24** – LIFT STATIONS AND FORCE MAINS
- **SECTION 25** - WASTEWATER SYSTEM CONSTRUCTION PLAN INFORMATION AND SUBMITTAL REQUIREMENTS

Section 22. WASTEWATER UTILITIES

22.1. GENERAL

The following information is intended to assist engineers in the design and construction of wastewater facilities. Information herein is to provide minimum standards for the City of Hutto requirements only. Sound engineering judgment shall be provided to determine if these minimum requirements must be exceeded for a particular engineering design. All wastewater design and construction must comply with the requirements of Texas Administrative Code Title 30 Chapters 217 and 290. When there is a conflict between Chapter 217, Chapter 290, or the requirements contained herein, the more restrictive shall govern.

22.1.1. ON-SITE SEWAGE FACILITIES (OSSF)

- (a) Where an approved public wastewater collection main or outfall line is less than one-half mile from the property boundary, connection to the public wastewater system shall be required and a public wastewater collection system shall be installed throughout the development, except where the City Council determines that such connection would require unreasonable expenditure of funds when compared with alternate methods of sewage disposal. Where alternate sewage disposal is permitted, the plans for such system must be approved by the Williamson County OSSF Department prior to approval of the final plat by the Planning and Zoning Commission.
- (b) Lots or properties served by a public water supply and using individual OSSF's for sewage disposal shall have a minimum lot size of one (1) acre.
- (c) Lots or properties served by an individual water supply and using individual OSSF's for sewage disposal shall have a minimum lot size of two (2) acres.

22.1.2. SERVICE EXTENSION APPLICATION REQUIREMENTS

Service Extension Request (SER) forms shall be utilized when requesting a service extension. Other forms may apply.

22.1.3. SERVICE EXTENSION GUIDELINES FOR PROCESSING

- (a) All properties not within the full-purpose city limits of Hutto are within the City of Hutto Certificate of Convenience and Necessity (CCN) area for water must request annexation. An annexation request shall be submitted with the service extension application.
- (b) All properties not within the City of Hutto CCN area for water must submit their project to the City Council for consideration prior to any SER processing.
- (c) All properties not within the City of Hutto ETJ, City of Hutto approved wastewater service area, or flowing directly to the Hutto ETJ or service area must submit their project to the City Council for consideration prior to any SER processing.
- (d) Any City cost participation must be approved by a separate agreement. Approved SER applications are not a reservation of capacity nor an agreement to cost

participate. Approved SER applications are strictly an acknowledgment of the intent to serve.

- (e) Approved SERs are valid for one hundred and eighty (180) days from the date of the letter. Upon expiration, a new application shall be submitted, and new fees shall be paid.

22.1.4. DEVELOPER RESPONSIBILITY

The Developer shall install all onsite and offsite wastewater mains, laterals, and service lines necessary to serve each lot in a subdivision, addition, or site development project. For the orderly extension of wastewater lines as established in the City's Water and Wastewater Master Plan, maintained by the City Engineer, the Developer shall install wastewater mains to the boundaries of their development for future connection by the development of the abutting land.

22.1.5. UPSIZING

- (a) All wastewater mains shall be sized to provide necessary service to the tract per **Section 22.2**. The City may require oversizing of certain mains in accordance with the approved Service Extension Request. The City may, at its sole discretion, participate with a developer in the cost of oversized facilities based upon, but not limited to the following factors:
 - (1) The approved utility budget for the current year.
 - (2) The ability of the specific utility to fund any future costs.
 - (3) The degree to which the project conforms to and accomplishes the five-year CIP priorities.
 - (4) The degree to which the project accomplishes the utility Master Plan.
 - (5) The impact to the system operations.
- (b) Any cost participation contract shall be approved by the City Council prior to the approval of the Final Plat. Cost participation shall be based upon the cost differential between the actual construction cost of the master plan line size and the minimum size required to serve the development. When a project is included in the current five-year CIP, the approved cost participation contract shall provide that the payment be scheduled during the same fiscal year as the CIP project that would have accomplished the project and after the date of notice of acceptance by the City.

22.1.6. PARK SITE CONNECTIONS

All park and open space areas shall be provided with a wastewater service meeting the standards of this manual. Services or mains serving regional or master-planned City parks must be approved by the City of Hutto Parks Department.

22.1.7. ROW AND EASEMENTS

- (a) All proposed wastewater mains, laterals, and services shall be installed within public ROW or utility easements dedicated to the City. All easements shall be

recorded in the Official Property Records of Williamson County prior to approval of construction plans.

- (b) The easement widths provided in this section are necessary to meet the minimum requirements for operation and maintenance activity. Additional easement width may be required by City staff due to site topography or limitations on easement access. Easement widths shall comply with **Table 22-1**. Where easement width is controlled by depth, as measured by ground level to pipe flowline, easement width shall be rounded up to the nearest five (5) feet.

Table 22-1. Minimum Easement Width for Wastewater and Force Mains

Nominal Diameter	Easement Width (Feet)
12-inch or less	The greater of 15' or Twice the Depth
16-inch to 18-inch	The greater of 20' or Twice the Depth
24-inch to 30-inch	The greater of 25' or Twice the Depth
36-inch to 42-inch	The greater of 30' or Twice the Depth
48-inch or larger	The greater of 35' or Twice the Depth

- (c) Easements parallel to lot lines shall be wholly contained on one lot and not cross lot lines.
- (d) Minimum vertical clearance above all easements to structures, eaves, awnings, signs, overhead utilities, etc. shall be twenty-five (25) feet to allow for future operation and maintenance activity.
- (e) Easements dedicated adjacent to retaining walls shall be provided with additional width as necessary to ensure that special shoring to maintain wall integrity is not required for future excavation of the utility.
- (f) All easements must be accessible by ROW or dedicated access easement. Access path must be navigable by City light-duty utility vehicles and wastewater cleaning equipment.
- (g) Fences, guardrails, or other impediments to access may not be constructed within or across City easements.
- (h) Private plumbing may cross a City easement for the purpose of connecting to the City water or wastewater system. Said crossings must be perpendicular to the easement or no more than thirty (30) degrees from the perpendicular. Private plumbing shall not be permitted to run parallel to and within the easement boundaries.
- (i) All easement instruments and exhibits shall be in a format acceptable to the City.
- (j) The developer shall be responsible for one hundred percent (100%) of the cost to acquire easements for all off-site facilities.

22.1.8. COMPLIANCE WITH SPECIFICATIONS

Construction of wastewater or force mains within the City's service area shall be compliant with City of Hutto Construction Standards and Specifications, as amended.

22.2. CAPACITY DETERMINATIONS

22.2.1. GENERAL

Wastewater flow capacity determinations shall be calculated as listed below. These calculations must be submitted as part of the signed and sealed engineering report submitted with all preliminary plat, subdivision construction plan, and site development applications.

22.2.2. FLOW DETERMINATION

- (a) One living unit equivalent (LUE) shall be assumed to produce an average dry-weather wastewater flow (ADWF) of two hundred and forty-five (245) gallons/day. A living unit equivalent shall be assumed to be one single-family household.
- (b) Wastewater flows for non-residential uses shall be determined on a case-by-case basis in conjunction with information supplied by the design engineer.
- (c) Peak dry weather flow (PDWF) is the peak wastewater flow from the LUEs that are contributing to the sewer system, excluding inflow from surface water or infiltration of ground water. The PDWF is derived from the formula:

(Eq. 22-1)

$$Q_{PDWF} = \left[\frac{18 + (0.0206 \times F)^{0.5}}{4 + (0.0206 \times F)^{0.5}} \right] \times F$$

Where,

$$F = 245 \frac{\text{gal.}}{\text{day}} \times \text{No. of LUEs}$$

- (d) In sizing sewers, external contributions are accounted for by including seven hundred and fifty (750) gallons per acre per day served for inflow and infiltration. Strict attention shall be given to minimizing inflow and infiltration (I/I).
- (e) The Peak Wet Weather Flow (PWWF) is obtained by adding I/I to the PDWF. In designing for an existing facility, flow measurement shall be used in lieu of calculations for the pre-existing developed area.
- (f) Gravity sewer mains fifteen (15) inches in diameter and smaller shall be designed such that the PDWF does not exceed sixty-five percent (65%) of the capacity of the pipe flowing full.
- (g) Gravity sewer mains fifteen (15) inches in diameter and smaller shall be designed such that the PWWF does not exceed eighty-five percent (85%) of the capacity of the pipe flowing full.
- (h) Gravity sewer mains larger than fifteen (15) inches shall be designed such that the PWWF shall not exceed eighty percent (80%) of the capacity of the pipe flowing full.

22.3. DESIGN REQUIREMENTS FOR WASTEWATER MAINS

22.3.1. WASTEWATER PIPE SLOPE & VELOCITY

- (a) All velocity calculations for gravity wastewater shall be based on Manning's formula with a Manning's roughness coefficient ("n factor") of zero point zero one three (0.013).
- (b) The minimum slope calculated using the PDWF shall not be less than two (2) feet per second.
- (c) The maximum slope calculated using the PWWF shall not exceed ten (10) feet per second.
- (d) The following slopes are the minimum and maximum slopes that shall be provided for all gravity wastewater mains:

Table 22-2 Wastewater Pipe Slopes

Size of Pipe (inches)	Minimum Slope (%)	Maximum Slope (%)
8	0.335	8.40
12	0.200	4.88
15	0.150	3.62
18	0.115	2.83
24	0.080	1.93
30	0.060	1.43
36	0.045	1.12
≥42	*	*

**For pipe diameter forty-two (42) inches and greater, the slope is determined by Manning's formula to maintain a velocity greater than two (2) ft/sec and less than ten (10) ft/sec when flowing full*

22.3.2. EXISTING AND PROPOSED FACILITY CROSSINGS

- (a) Crossings of TxDOT facilities shall be designed in accordance with City criteria and the Utility Accommodation Rules of the Texas Administrative Code. Where there is a conflict, the more restrictive rule shall take precedence.
- (b) All crossings of City of Hutto Roadways shall be performed by trenchless methods such as horizontal auger boring, microtunneling, hand tunneling, or other generally accepted methods.
 - (1) The designer shall be responsible for determining the minimum wall thickness and diameter of the steel encasement pipe or tunnel liner plate as required for any specific application and shall in no case be less than that shown in the City of Hutto standard detail.
 - (2) Spacers shall be installed per manufacturer's guidelines but in no case shall the distance between spacers be greater than shown in the City of Hutto's standard details.

- (3) Casing thicknesses for crossings of railroad ROW shall be as required by the AREMA Manual for Railway Engineering.
- (c) Where open-cut installation of wastewater mains and appurtenances are permitted, the excavation shall be backfilled with controlled low strength material to the bottom of the roadway base course.
- (d) Crossings of railroad facilities shall be designed in accordance with City criteria and railroad requirements. Where there is a conflict, the more restrictive rule shall take precedence.

22.3.3. SANITARY SEWER BEDDING AND BACKFILL REQUIREMENTS

Bedding and backfill shall be provided in accordance with City of Hutto Standard Details and Specifications. The Engineer of Record shall use geotechnical data to calculate pipe deflection and provide encasement with controlled low strength material where necessary to avoid deflection greater than allowable by City and TCEQ standards.

22.3.4. LOCATION OF SANITARY SEWERS

- (a) Pipe installed within new roadways shall be installed per the City of Hutto's standard utility assignment details. All deviations from standard assignments must be submitted as a formal request for exception.
- (b) Pipe installed within utility easements of width twenty-five (25) feet or less shall be installed in the centerline of the easement.
- (c) Pipe installed within utility easements of width greater than twenty-five (25) feet shall be installed offset from easement centerline such as to allow for construction traffic adjacent to the excavation.
- (d) Manhole covers should not be located in concrete sidewalks, curbs or valley gutters.

22.4. DEPTH OF COVER AND SEPARATION DISTANCE

22.4.1. MINIMUM COVER

The minimum depth of cover from the top of the pipe to the finished grade shall be forty-eight (48) inches, minimum in areas that are not within existing or planned streets, roads, or other traffic areas. The minimum depth below proposed streets, existing streets, roads or other traffic areas shall be at least sixty-six (66) inches, minimum from top of pipe to finished grade.

22.4.2. MAXIMUM DEPTH

The engineer shall strive to keep wastewater mains at depths no greater than twelve (12) feet from finished grade to the flowline. The maximum permitted depth within roadways is twenty (20) feet from the finished grade to the flowline.

22.4.3. CLEARANCE TO UTILITIES

- (a) Separation distance between wastewater mains and water or reclaimed water mains shall be in accordance with the following:

Table 22-3: Water and Wastewater Main Separation Cases

Case	Protection Requirement
Parallel pipes within nine feet, where the collection system pipe is above a water supply pipe	Collection system pipe must be encased for all portions within nine feet of the water line, encasement must be sealed at both ends, spacers at a maximum of five feet intervals, and the encasement must be at least two nominal sizes larger than the collection pipe
Parallel pipes within nine feet, where the collection system pipe is below the water supply pipe	Collection system pipe must be constructed using 150 psi pressure class pipe Or Collection pipe must be encased as above
Crossing pipes within nine feet, where the collection pipe is above the water supply pipe	Collection system pipe must be encased as above
Crossing pipes within nine feet, where the collection pipe is below the water supply pipe	Collection system pipe must be constructed using 150 psi pressure class pipe Or Collection pipe must be encased as above
Manhole within nine feet of a water supply pipe	All portions of the manhole within nine feet of the water line must be encased in cement stabilized sand per TCEQ regulations

- (b) New wastewater mains or services shall be encased in a steel casing pipe where they cross existing water mains with less than nine (9) feet of separation.
- (c) Wastewater mains shall be installed with a minimum horizontal clearance of five (5) feet and a minimum vertical clearance of eighteen (18) inches from storm drain lines or infrastructure. Wastewater crossings under storm drain pipes of diameter forty-eight (48) inches or greater, box culverts of width forty-eight (48) inches or greater, or multiple barrel storm drains shall be steel encased. Steel encasement shall extend a minimum of five (5) feet beyond the outer walls of the storm drain crossing.
- (d) Wastewater mains shall be installed with a minimum horizontal clearance of five (5) feet and a minimum vertical clearance of twenty-four (24) inches from all other utilities.

22.4.4. RETAINING WALLS

Wastewater crossings under retaining walls shall be steel encased. Steel encasement shall extend a minimum of five (5) feet beyond the footing and back of the wall structure. Casing shall extend a minimum of five (5) feet beyond tiebacks or other reinforcement (geogrid, rock nails, etc.).

22.5. HORIZONTAL ALIGNMENT

- (a) Curved wastewater mains are prohibited.
- (b) Changes in direction at manholes shall be no greater than ninety (90) degrees.
- (c) Mains should be laid as straight as possible between street intersections.
- (d) Mains should be laid in accordance with City of Hutto standard utility assignments.

22.6. ALLOWABLE MATERIALS

Materials for gravity wastewater mains shall comply with the requirements below.

22.6.1. GRAVITY WASTEWATER MAINS DIAMETER EIGHT (8) INCHES TO TWENTY-FOUR (24) INCHES

Gravity wastewater mains with twenty-four (24) inch diameters and below shall be constructed of ASTM D3034 SDR26 PVC, integrally colored green.

22.6.2. PRESSURE RATED GRAVITY WASTEWATER MAINS DIAMETER EIGHT (8) INCHES TO TWELVE (12) INCHES

Gravity wastewater mains with twelve (12) inch diameters and below that must be rated for one hundred and fifty (150) PSI of pressure (minimum) to meet TCEQ water separation requirements shall be constructed of ASTM D2241 SDR26 PVC, integrally colored green.

22.6.3. PRESSURE RATED GRAVITY WASTEWATER MAINS DIAMETER EIGHTEEN (18) INCHES TO TWENTY-FOUR (24) INCHES

Gravity wastewater mains with eighteen (18) to twenty-four (24) inch diameters that must be rated for one hundred and fifty (150) PSI of pressure (minimum) to meet TCEQ water separation requirements shall be constructed of AWWA C900 DR25 (or better) PVC, integrally colored green.

22.6.4. GRAVITY WASTEWATER MAINS DIAMETER THIRTY (30) INCHES OR GREATER

Gravity wastewater mains with thirty (30) inches or greater diameters may be constructed of ASTM F679 PS115 PVC, integrally colored green, or ASTM D3262 "Fiberglass" Reinforced Sewer Pipe with pipe stiffness forty-six (46) PSI or greater.

22.6.5. PRESSURE RATED GRAVITY WASTEWATER MAINS DIAMETER THIRTY (30) INCHES OR GREATER

Gravity wastewater mains with thirty (30) inches or greater diameters that must be rated for one hundred and fifty (150) PSI of pressure (minimum) to meet TCEQ water separation requirements may be constructed of AWWA C900 DR25 (or better) PVC, integrally colored green, or ASTM D3754 PN150 "Fiberglass" Reinforced Sewer Pressure Pipe with pipe stiffness forty-six (46) PSI or greater.

22.6.6. ALLOWABLE PIPE SIZES

- (a) Gravity wastewater mains shall have a minimum pipe diameter of eight (8) inches.
- (b) Gravity wastewater mains shall be limited to the following pipe sizes: eight (8-), twelve (12-), fifteen (15-), eighteen (18-), twenty-four (24-), thirty (30-), thirty-six (36-) and forty-two (42-) inch. Larger sizes may be approved on a case-by-case basis.

22.7. MANHOLES

22.7.1. ALLOWABLE MATERIALS

- (a) Portland cement concrete manholes with corrosion-resistant lining shall be permitted for wastewater mains with a diameter of less than twenty-four (24) inches.
- (b) Polymer concrete manholes shall be required for all wastewater mains twenty-four (24) inches and greater.
- (c) Polymer concrete manholes shall be required for force main discharge manholes, siphons, drop connections, and other areas with high corrosion potential.

22.7.2. LOCATIONS

Manholes shall be required at the following locations:

- (a) Intersections of mains.
- (b) Changes in grade.
- (c) Changes in alignment.
- (d) Changes in pipe size or material.
- (e) Force main connections into a gravity wastewater main.
- (f) Point of connection for commercial developments requiring a water meter greater than two (2) inch diameter.
- (g) Point of connection of service lines to mains twenty-four (24) inch diameter and larger.
- (h) Dead-ends.
- (i) Lines to be extended by future projects or development.

22.7.3. MANHOLE SPACING

Spacing between manholes shall not exceed five hundred (500) feet for lines smaller than twenty-four (24) inches. Spacing between manholes shall be as approved by the City of Hutto for lines larger than twenty-four (24) inches.

22.7.4. MANHOLE DIAMETER

- (a) Minimum inside diameter for manholes shall be as indicated in the following table:

Table 22-4 Wastewater Pipe Slopes

Wastewater Main Diameter (inches)	Manhole Inside Diameter (inches)
8, 12, 15	48
18, 24	60
30, 36	72
42	84

- (b) Larger diameter manholes may be required to accommodate changes in direction or multiple connections to a manhole. A minimum of seven (7) inches of clear distance on the inside wall of the manhole shall be provided between penetrations for connections.

22.7.5. MANHOLE CONNECTIONS

- (a) Pipe connections at manholes shall be provided with a minimum slope between inlet and outlet inverts of two point five percent (2.5%).
- (b) All pipe connections, including drop connections, shall match crown-to-crown where feasible.

22.7.6. DROP CONNECTIONS

- (a) Drop connections at manholes with vertical offset between pipe in and pipe out of two (2) feet or less shall be constructed per City of Hutto Standard “Drop Manhole Type B Detail.”
- (b) Drop connections at manholes with vertical offset between pipe in and pipe out of two (2) feet or more and less with no more than ten (10) feet between finished grade and flowline out constructed per City of Hutto Standard “Drop Manhole Type A Detail.”
- (c) Drop connections at manholes with vertical offset between pipe in and pipe out of two (2) feet or more with more than ten (10) feet between finished grade and flowline out shall be internal drop connections. Internal drop manholes shall have a diameter no less than one (1) foot greater than required by **Section 22.7.4.**

22.7.7. VENTILATION

Manhole venting shall be provided per TCEQ Chapter 217 requirements.

22.7.8. COATINGS

The interior of all portland cement concrete wastewater manholes shall have a corrosion-resistant coating in compliance with City of Hutto standard details.

22.7.9. MANHOLE COVERS

- (a) Portland cement concrete manholes installed within pavement shall be equipped with cast iron or ductile iron manhole covers as required by City of Hutto standard WW-02.

- (b) Portland cement concrete manholes installed outside pavement shall be equipped with cast iron or ductile iron manhole covers as required by City of Hutto standard WW-03.
- (c) All polymer concrete manholes shall be equipped with composite manhole covers with encapsulated magnets for detection by metal detectors. All composite manhole covers shall be bolted and gasketed.
- (d) All manholes outside pavement or in FEMA Special Flood Hazard Areas shall be equipped with bolted and gasketed manhole covers and meet TCEQ standards.

22.8. TESTING OF INSTALLED PIPE AND MANHOLES

All wastewater infrastructure shall be tested per TCEQ requirements and City of Hutto standards and specifications prior to acceptance.

22.9. ABANDONMENT OF FACILITIES

If a new project will abandon existing facilities, the plans shall provide for the appropriate abandonment of these facilities.

22.9.1. MAINS

Abandonment of mains in easements or ROW shall consist of cutting the main at locations identified in the construction drawings and completely filling the interior of the main with a pumpable grout or slurry per City specifications. Mains shall be removed when they conflict with proposed infrastructure or when required as a condition of the City, TxDOT, or railroad permit.

22.9.2. MANHOLE

The abandoned manholes shall be removed to a level not less than two (2) feet below grade (the entire cone section should be removed). Inlets and outlets should be securely plugged and the structure filled with stabilized sand or granular material that is no greater than one and one half (1-1/2) inch maximum size. See standard detail for wastewater manhole abandonment. Manholes shall be abandoned per City of Hutto Standard "Wastewater Manhole Abandonment Detail."

22.9.3. SERVICE LINES

Abandonment of service lines in easements or ROW shall consist of cutting the service at locations identified in the construction drawings and completely filling the interior of the service with a pumpable grout or slurry per City specifications. Services shall be removed when they conflict with proposed infrastructure or when required as a condition of the City, TxDOT or railroad permit.

22.9.4. ABANDONMENT OF LIFT STATIONS

Abandonment of lift stations shall consist of removing all pumps, motors, couplings, valves, and controls from the dry well and all appurtenances above finished grade. Both the wet well and dry well shall be cut down four (4) feet below grade, filled with cement stabilized sand, and covered with top soil to grade. The associated force main shall be properly abandoned. This includes cutting and plugging both ends and/or grouting main as appropriate. The area shall be re-vegetated and the City notified prior to abandonment.

Section 23. WASTEWATER SERVICE LINES

23.1. DIAMETER

Service lines shall be sized per the City Plumbing Code, as amended, but in no case shall the diameter for service lines be less than six (6) inches.

23.2. ALLOWABLE PIPE MATERIALS

Gravity wastewater services shall be constructed of ASTM D3034 SDR26 PVC, integrally colored green, unless a pressure rating of one hundred and fifty (150) PSI or greater is required to meet TCEQ w/ww separation requirements. Services that require a pressure rating of one hundred and fifty (150) PSI will be constructed of ASTM D2241 SDR26 PVC, integrally colored green.

23.3. SLOPES

23.3.1. MINIMUM SLOPE

Wastewater services shall be provided with a minimum slope of one percent (1%).

23.3.2. MAXIMUM SLOPE

Wastewater services shall be provided with a maximum slope per City of Hutto standard details. Where wastewater main depth prevents installation of a service line with the depth of cover required at the property line by City of Hutto standard details, a wastewater deep service per City of Hutto details shall be provided.

23.4. EASEMENTS

Easements for service lines shall comply with **Section 22.1.7.**

Section 24. LIFT STATIONS AND FORCE MAINS

24.1. GENERAL REQUIREMENTS

24.1.1. TCEQ COMPLIANCE

All lift stations must comply with TCEQ Chapter 217 rules and the provisions of this manual.

24.1.2. LIFT STATION TYPES

All wastewater lift stations shall be submersible type.

24.2. ENGINEERING REPORT

An engineering report signed and sealed by a Professional Engineer licensed in the State of Texas with cost-benefit analysis, basin maps, and calculations listed below must be submitted with all proposed lift station construction plans.

24.2.1. COST-BENEFIT ANALYSIS

A consultant or developer proposing to construct a lift station and force main system shall submit a net present value analysis of the cost of constructing gravity wastewater mains as compared to the cost of the lift station and force main system. The analysis must demonstrate that the cost of installing the lift station and force main system with operational and maintenance expenses is less than the cost of the gravity wastewater mains. Lift stations will not be permitted where an acceptable gravity wastewater route exists, and the results of the analysis demonstrate that gravity wastewater mains have a lower net present value versus the lift station and force main system.

24.2.2. TIMELINE FOR RETURN

The net present value analysis must consider thirty years of operational and maintenance costs.

24.2.3. OPERATION AND MAINTENANCE COSTS

Operational and maintenance (O&M) costs must include the following items:

- (a) Power cost at current Oncor market rates at the time of submittal.
- (b) Replacement of emergency generator after twenty years of service.
- (c) Yearly operational and maintenance costs for generators.
- (d) Pump maintenance and refurbishment costs at fifty percent (50%) of the original cost every five (5) years.
- (e) Replacement of cathodic protection system at twenty(20) years (as applicable).
- (f) Replacement of isolation and check valves at twenty (20) years of service.
- (g) Replacement of air release or combination air release/vacuum valves every ten (10) years of service.
- (h) Replacement of electrical, instrumentation, and control equipment every ten (10) years of service.

24.2.4. CAPACITY FOR FULL CATCHMENT AREA

Lift stations shall be designed to consider the potential for future expansion in the full catchment area. Lift station designs shall incorporate a wet well sized for the ultimate capacity of the catchment area.

24.2.5. FLOW DEVELOPMENT

Wastewater flows shall be calculated for proposed and ultimate development in the catchment area per **Section 22.2.2**. LUEs for areas outside the development shall be calculated for uses identified on the City of Hutto Future Land Use Map, as amended.

24.2.6. MINIMUM SIZE FOR ACCEPTANCE

- (a) Wet wells shall be a minimum of seventy-two (72) inches in diameter, larger as necessary to accommodate submersible pumping equipment, piping, supports, storage volume, mixers, aerators, and transducer equipment.
- (b) Wet wells shall have depths no less than six (6) feet depth below the lowest influent flowline.
- (c) Public lift stations shall serve multiple properties and have pumps of minimum five (5) horsepower. All lift stations requiring pumps below this threshold shall be owned and maintained by a homeowner's or property owner's association.

24.3. REQUIRED CALCULATIONS

24.3.1. FIRM CAPACITY

Firm capacity of the lift station must exceed the PWWF calculated per **Section 22.2.2**. with the largest pump out of service.

24.3.2. CYCLE TIMES

- (a) Minimum pump cycle times for all lift stations:

Table 24-1 Minimum Pump Cycle Times

Motor Horsepower	Minimum Cycle Time (minutes)
<50	12
50-100	20
100-250	30
>250	45

- (b) Volume between “pump on” and “pump off” elevations of the pump cycle shall be determined by the following criteria:

(Eq. 24-1)

$$V = (t * q) / 4$$

Where,

V = active volume, gallons

t = minimum cycle time in minutes

q = pump capacity in gpm

24.3.3. DETENTION TIME

- (a) Calculate the detention time (T_d) in the wet well for Average Dry Weather Flow (ADWF) using the following equation:

(Eq. 24-2)

$$T_d = t_f + t_e$$

Where,

$t_f = V \div i$ = time to fill the wet well in minutes

$t_e = V \div (q - i)$ = time to empty the wet well in minutes

V = Volume of the wet well between pump on and off elevations
in gallons

q = pump capacity in gpm

i = ADWF

- (b) Odor control is required if detention times exceed one hundred and eighty (180) minutes.

24.3.4. NET POSITIVE SUCTION HEAD

The Net Positive Suction Head required ($NPSH_R$) by the pump selected shall be compared with the net positive suction head available ($NPSH_A$) in the system at the eye of the impeller. The engineer shall consult the pump manufacturer for the $NPSH_R$ required values for that pump and compare them with calculated values for the $NPSH_A$ available.

- (a) $NPSH_A$

Calculate $NPSH_A$ available using the equation below.

(Eq. 24-3)

$$NPSH_A = P_B + H_S - P_v - H_{fs}$$

Where,

P_B = barometric pressure in feet absolute, use 33.4 feet

H_S = minimum static suction head, in feet

P_v = vapor pressure of fluid in feet absolute, use 1.4 feet

H_{fs} = friction loss in suction, in feet (including entrance and minor losses)

(b) $NPSH_R$

The $NPSH_R$ required reported by the pump manufacturer shall be a minimum of five (5) feet below the calculated $NPSH_A$ available.

24.3.5. BUOYANCY

The lift station design shall include a complete analysis of buoyant forces on the entire lift station structure.

24.3.6. SYSTEM CURVES

- (a) Data points for the system capacity curve shall be provided in tabular form and graphed with pump head capacity curve on the same graph.
- (b) System head loss curves will be graphed with both minimum and maximum static head for all Hazen-Williams coefficient values.
- (c) Pump output in gpm shall be clearly shown on the system curve for each pump and combination of pumps.
- (d) System capacity curves shall be plotted for Hazen-Williams coefficient values of C-100 and C-140.

24.3.7. WATER HAMMER

Calculate surge pressures and compare to the pressure rating of the force main pipe to determine the need for a surge relief valve.

(Eq. 24-4)

$$p = \frac{a \times v}{2.31 \times g} + \text{operating pressure (psi)}$$

$$a = \frac{4660}{\sqrt{\frac{E_W \times D_i}{E_P \times t_P}}}$$

Where,

a = elastic wave speed (ft/s)

E_W = water bulk modulus (300,000 psi)

D_i = force main pipe inner diameter (inches)

E_P = force main material modulus of elasticity (psi)

t_P = force main pipe wall thickness (inches)

24.3.8. FATIGUE ANALYSIS FOR PVC FORCE MAINS

A cyclic fatigue life analysis must be provided for all proposed PVC force mains per the PVC Pipe Association's "Force Main Design Guide for PVC Pipe."

24.4. SITE REQUIREMENTS

24.4.1. SITE DEDICATION BY DEVELOPER

The site and its access shall be dedicated to the City as a lift station lot. Transfer of deed is required prior to acceptance.

24.4.2. SITE ACCESS

The lift station site shall be accessible by an access road meeting the following requirements:

- (a) Minimum paved width of six (6) feet centered in an easement with width no less than twenty-five (25) feet.
- (b) Road surface constructed of portland cement or hot mix asphalt concrete with pavement structure design in accordance with the requirements for residential local roadways.
- (c) Maximum longitudinal slope of ten percent (10%).
- (d) Maximum grade break of three percent (3%).
- (e) Minimum centerline radius of no less than fifty (50) feet.
- (f) Turnarounds meeting International Fire Code requirements for fire apparatus access roads.
- (g) Surface elevated above the water level caused by a twenty-five (25) year, twenty-four (24) hour rainfall event.

24.4.3. FEMA SPECIAL FLOOD HAZARD AREA

The lift station site shall be graded such that the entire site is a minimum of two (2) feet above the base flood elevation identified on the FEMA Flood Insurance Rate Map, as amended. In areas outside FEMA-delineated Special Flood Hazard Areas, the lift station site shall be a minimum of two (2) feet above the calculated 100-year elevation.

24.4.4. SITE PAVING

- (a) The entire lift station site shall be paved with concrete pavement. Pavement thickness, base thickness, and subgrade shall be per the recommendations provided in the Geotechnical Report for the site-specific soil and load conditions. Design shall be signed and sealed and consider loading by the AASHTO HL93 design vehicle.
- (b) Site paving shall be provided with a minimum two percent (2%) transverse slope.

24.4.5. SITE SECURITY

- (a) The lift station shall be designed to restrict access by any unauthorized personnel to all mechanical and electrical equipment.
- (b) Site shall be provided with an intruder resistant fence with minimum height of eight (8) feet around the entire perimeter. The fence shall be constructed of masonry or precast concrete panels. Fencing shall be setback a minimum of five (5) feet from the property line.
- (c) A double eight (8) foot or single fifteen (15) foot sliding gate shall be provided for access. Gate shall be installed with minimum twenty-five (25) foot offset from edge of roadway pavement.

24.4.6. PARKING

The lift station site must be designed with a minimum of one (1) parking space with a minimum width of ten (10) feet and a length of twenty-five (25) feet inside the limits of the intruder-resistant fence.

24.4.7. TURNAROUND REQUIREMENTS

Site paving shall be designed with a turnaround inside the intruder resistant fence. Turnaround must comply with the dimensional requirements of the International Fire Code for fire apparatus turnarounds.

24.4.8. INFLUENT MANHOLE

Collection system lines draining to the lift station shall be routed to a single manhole within the lift station site ("influent manhole") no greater than fifty (50) feet from the wet well. The influent manhole shall collect these flows and discharge to the wet well via a single gravity wastewater main sized to handle full development of the lift station collection basin. The influent manhole must be located within the paved access road or site paving and accessible by sewer vacuum cleaning trucks.

24.4.9. ODOR CONTROL

The lift station must be designed to minimize potential odor. If detention times are greater than one hundred and eighty (180) minutes during all phases of development, the City may require odor control equipment to be installed.

- (a) Odor control equipment, if required, must be located within the intruder-resistant fence.
- (b) Odor control equipment shall be located in an area where it can be easily removed or serviced.

24.4.10. POTABLE WATER SOURCE

Lift station must be provided with a water source to permit cleaning of the wet well and equipment. Source shall be a minimum three-fourths (3/4) inch diameter freeze-proof hose bib with vacuum breaker at least two (2) feet higher than adjacent grade and greater than twenty (20) feet from the outer wall of the wet well. Supply line to the hose bib shall be equipped with a reduced pressure zone backflow preventer at the property line.

24.5. DESIGN REQUIREMENTS

24.5.1. WET WELL DESIGN

- (a) The wet well shall be constructed of polymer concrete from the City of Hutto approved products list.
- (b) One (1) or more lockable aluminum or 316 stainless steel hatch covers with anti-slip top surface shall be installed for access to the wet well, pumps, floats, and level control devices. All hatches shall be equipped with an aluminum fall protection safety grate.
- (c) Provide removable aluminum handrails around wet well and dry vault openings. Removable guardrails must slide into sleeves embedded in the concrete slabs. 316 stainless d-ring designated as tie-off points per OSHA 1910 loading standards shall also be provided for fall protection when railings and safety gratings must be removed to remove equipment or for wet well cleaning.
- (d) Valves are prohibited within the wet well.
- (e) All pipe penetrations into the wet well will be sealed with ASTM C923 connectors or link-seal. All hardware will be 316 stainless steel.
- (f) The floor of the wet well shall have a minimum slope of 2:1 vertical: horizontal from the intake to the walls.
- (g) Wet wells shall be provided with a “gooseneck” type passive ventilation constructed of 316 stainless steel with #16 316 stainless steel mesh on the outlet to prevent insect and bird intrusion. The mesh shall be installed behind a companion flange or other manner to allow for replacement. The vent shall be sized for the maximum pumping rate of the station (all pumps running) for ultimate buildout with air velocity no greater than six hundred (600) fpm. The minimum air ventilation pipe size is four

(4) inch diameters. The vent outlet shall be at least two (2) feet above the base flood elevation.

24.5.2. PUMP LEVELS

Pumps shall automatically operate with lead and lag configuration for each pump.

- (a) All "pump on" levels shall have a minimum separation of one (1) foot between levels.
- (b) All "pump off" levels shall be at least six (6) inches above the top of the pump casing.
- (c) All "pump off" levels shall be staged with a minimum separation of one (1) foot between levels.
- (d) High-level alarm shall be set at least six (6) inches above the highest "pump on" level and at least one (1) foot below the flowline of the lowest influent line into the wet well.

24.5.3. PUMPING EQUIPMENT

- (a) All lift stations shall contain a minimum of three pumps and shall be capable of handling peak flows with one pump out of service. Lift stations with two pumps for small service areas may be considered on a case-by-case basis.
- (b) All pumps must be mounted on schedule 40 316 stainless steel rails designed to resist corrosion in sewage applications. The rail system must be of adequate length to extend from the lower guide holders on the pump discharge connection to six (6) inches below the top of the wet well. Guiderrails must be at minimum two (2) inch diameter for pumps two through forty HP and three (3) inch diameter above forty HP. All supports, brackets, fittings, fasteners, and other components of the guide rail system shall be 316 stainless steel.
- (c) Impellers must be of the enclosed, non-clogging, dynamically balanced type capable of passing three (3) inch diameter spherical solids. Vortex or recessed impellers may be required for stations serving schools or other uses prone to rags or stringy solids.
- (d) Pump duty point shall be within seventy-five percent (75%) to one hundred and fifteen percent (115%) range of the pump's Best Efficiency Point for 1-pump running and at firm capacity.
- (e) Lift station must have a motorized monorail or jib crane installed to allow for removal of pumps, check valves, and isolation valves. Monorail or jib crane must be capable of lifting one point five (1.5) times the weight of the heaviest pump or valve (whichever is greater) with sufficient reach to all pumps and valves and deposit them on a vehicle parked within the lift station for hauling to an offsite maintenance facility.
- (f) All motors shall be premium efficiency with a minimum one point one five (1.15) service factor and inverter-duty rated.

- (g) Pumps and pumping equipment shall be on the City's standard products list, or prior approval from the City Engineer shall be obtained before submittal.

24.5.4. STATION PIPING

- (a) All pumps shall have their own discharge pipe feeding into one common header. Discharge pipe shall be sized such that velocity within the vertical riser is five to eight fps when pumps are operating at full speed.
- (b) Connections from pump discharge piping to the common header will be made with a wye fitting. Discharge header piping will be mounted three (3) feet above grade to pipe centerline or three (3) feet above the vault floor, as measured to the pipe centerline, with minimum two (2) foot clearance from top of pipe to the vault cover slab.
- (c) Pump discharge piping and station discharge header shall be constructed of ductile iron. The Interior and exterior of all ductile iron piping within the wet well shall be coated with a one hundred percent (100%) solids epoxy coating system.
- (d) All pipe supports within the wet well shall be constructed of 316 stainless steel or other stainless steel alloys with greater corrosion resistance to wastewater gases than provided by 316 SS.
- (e) Provide discharge pressure gauges on each pump discharge pipe and on the common discharge header. Pressure gauge shall be 316 stainless steel, liquid filled, and rated for three times the discharge pressure at firm pumping capacity. Each pressure gauge shall be connected to the station piping with 316 stainless tubing and 316 stainless steel ball valve. Each gauge must be equipped with a 316 SS diaphragm seal.

24.5.5. STATION VALVES

- (a) All valves shall be installed above grade or within an underground concrete vault. The minimum pressure rating for all valves shall be two hundred and fifty (250) psi.
- (b) A flanged, non-slamming check valve shall be installed on the discharge side of each pump followed by an isolation valve. Check valves shall be swing type with either an external lever or external position indicator to show open and closed positions.
- (c) Isolation valves shall be installed on the downstream side of check valves and emergency bypass connections. Isolation valves shall be flanged AWWA C517 eccentric plug valves with full port openings or AWWA C509/C515 resilient wedge gate valves with rising stem. A restrained flanged coupling adapter must be installed between the check valve and isolation valve.
- (d) The common discharge header must be provided with a connection for emergency bypass. Emergency bypass connection shall be sized for PWWF with maximum velocity of eight (8) fps, minimum four (4) inch diameter, and be equipped with a bauer fitting. Bypass shall be provided with a 316 stainless steel plug.

- (e) A combination air/vacuum release valve (CAV) shall be mounted on the common header using a weld-o-let or flange-o-let. All other piping and fittings in the CAV assembly shall be 316 stainless steel. CAV shall be rated for raw wastewater and be provided with minimum two (2) inch inlet, flush ports, and either a PVC or 316 stainless steel body. A stainless-steel ball valve shall be installed between the CAV and discharge header. The air release discharge pipe shall be a minimum of one (1) inch PVC Sch. 80 and discharge into the wet well. Discharge pipe shall be installed at a two percent (2%) slope and solidly secured to the concrete floor/slab and routed such that it does not present a tripping hazard.
- (f) Surge relief valves shall be rated for raw wastewater service and sized for firm pumping capacity. Opening setting shall not exceed five PSI above normal operating pressure of the system at header when firm pumping capacity flow is being discharged. Surge relief pipe shall be routed back to the wet well. Engineering report must include analysis and reference information detailing how the valve was selected.
- (g) Valve vaults, when provided, shall have a floor drain that discharges to the wet well. The drain line shall include a 316 stainless steel flap valve on the outlet and a "P" trap with a trap seal device to prevent gas from entering the vault.
- (h) All connections between dissimilar metals will be isolated to prevent galvanic corrosion.

24.5.6. FORCE MAIN

- (a) The following pipe materials will be accepted for buried force mains:
 - (1) AWWA C906 HDPE DR11 (or less) Ductile Iron Pipe Size.
- (b) The following pipe materials will be accepted for above grade force main piping:
 - (1) AWWA C151 Ductile Iron Special Thickness Class 53, Flanged.
- (c) Force mains shall be a minimum four (4) inch diameter. All force mains shall be profiled.
- (d) Force mains shall be laid at least four (4) feet below finished grade.
- (e) Force mains shall be limited to the following pipe sizes: eight (8-), twelve (12-), fifteen (15-), eighteen (18-), twenty-four (24-), thirty (30-), thirty-six (36-) and forty-two (42-) inch. Other diameters may be approved on a case-by-case basis.
- (f) Force mains shall be designed to have velocities greater than two fps with one pump running at full speed and between three and five fps at firm capacity. Force mains served by lift stations with three or more pumps must be sized to have flow velocities between five and eight feet per second with all pumps running.
- (g) Force mains shall be designed to have average flush time no greater than one hundred and eighty (180) minutes.
- (h) Force main profile shall be designed to minimize peaks and valleys along the force main profile to limit the need for combination air vacuum valves (CAVs). All high

points shall be provided with CAVs of diameter two (2) inches or greater. Valve placement and sizing shall be per AWWA Manual of Water Supply Practices M51.

- (i) Provide isolation valves per Section 24.5.5.2 at a maximum spacing of one thousand (1,000) linear feet along the force main to facilities testing and future repairs.
- (j) All force main piping and bends shall be fused. All bends shall be thrust blocked with concrete.

24.5.7. ELECTRICAL EQUIPMENT

- (a) Electrical service shall be 277/480-volt, 3-phase, and 4-wire, unless otherwise approved by the City Engineer. Minimum service size shall be two hundred (200) amps. All enclosures shall be 304 stainless steel rated NEMA 4X with lever type door closures. Pump control enclosure shall be double door type with all 480V equipment on the right side and all 120V equipment on the left side. Single-phase systems are not allowed.
- (b) All electrical equipment shall be installed a minimum of two (2) feet above the base flood elevation within the intruder resistant security fence.
- (c) The electrical service rack shall be protected by a galvanized steel canopy with a minimum seven (7) foot vertical clearance, five (5) foot horizontal clearance from the front face of the rack, and four (4) foot horizontal clearance from the back face of the rack.
- (d) Lift stations with capacities below five (5) million gallons a day (MGD) shall have soft starters for all motors.
- (e) Lift stations with capacities above five (5) MGD shall have variable frequency drives for all motors.
- (f) Provide task lighting over all electrical panels and a pole mounted area light at the wet well. Area light shall be sited clear of the monorail or jib crane reach.

24.5.8. EMERGENCY PROVISIONS

- (a) All lift stations shall be provided with onsite emergency backup generators and automatic transfer switch. Generators shall be natural gas engine powered when the lift station site is located within two hundred (200) linear feet of a natural gas line with sufficient capacity to serve the generator.
- (b) Natural gas generators shall meet the requirements below.
 - (1) Generator and automatic transfer switch sized to maintain firm capacity with thirty percent (30%) spare capacity.
 - (2) Equipped with a UL2200 listed level two sound attenuated enclosure, providing a sound level of seventy-five (75) dB(A) at one hundred percent (100%) load at twenty-three (23) feet using acoustic insulation and acoustic-lined hoods.

- (3) Designed to operate with ambient temperatures from negative twenty (-20) to positive fifty (+50) Celsius and relative humidity from zero (0) to ninety-five (95) percent without damage or degradation of performance.
 - (4) Manufacturers shall be on the City's standard products list or obtain prior approval from the City Engineer before submittal.
- (c) Diesel engine generators shall meet the requirements below.
 - (1) Generator and automatic transfer switch sized to maintain firm capacity with thirty percent (30%) spare capacity.
 - (2) Equipped with a UL2200 listed level two (2) sound attenuated enclosure, providing a sound level of seventy-five (75) dB(A) at one hundred percent (100%) load at twenty-three (23) feet using acoustic insulation and acoustic-lined hoods.
 - (3) Designed to operate with ambient temperatures from negative twenty (-20) to positive fifty (+50) Celsius and relative humidity from zero (0) to ninety-five (95) percent without damage or degradation of performance.
 - (4) Equipped with diesel fuel tanks integrated into the base of the generator unit by the original equipment manufacturer with double-wall containment and sized to provide for minimum twelve hours of run time at one hundred (100%) load.
 - (5) Manufacturers shall be on the City's standard products list or obtain prior approval from the City Engineer before submittal.
- (d) A second electric feed to provide emergency backup power may be considered on a case-by-case basis. The second electric feed must be served by a separate substation with a reserved capacity agreement approved by the Electric Utility prior to construction plan approval.

24.6. CONTROL & INSTRUMENTATION

24.6.1. GENERAL

Primary level control for all lift stations shall be provided by a submersible level transmitter with backup float switches for low-level and high-level alarms.

24.6.2. PUMP CONTROL PANEL

- (a) Pump control panels must NEMA 4X, 316 stainless steel with lever type door enclosures.
- (b) Pump control panel shall have hand off auto (HOA) switches for all pumps to permit local and remote operation.
- (c) Submersible level transducer for primary pump control must be weighted to prevent the transducer from being suctioned into the pump intake. Transducer must be fastened to a full length 316 stainless steel stranded cable for removal from the ground surface.

- (d) Backup level control shall be one high level float and one low level float. Both floats, when either is activated, shall disengage primary transmitter control and provide alarms to SCADA and provide local horn and beacon alarms. Low level float shall provide alarms and turn all pumps off, regardless of HOA position. Pumps shall remain in backup control until manually reset locally. Floats shall be 316 stainless steel containing a mercury free switch and flexibly supported by a PVC jacketed, heavy-duty cable. The float shall be mounted to a stainless steel cable, and the cable shall be attached to a 316 stainless steel weight.
- (e) All equipment in the control panel shall be protected by a transient voltage surge protector and lightning arrestor mounted on din rail inside the panel.

24.6.3. SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEMS

- (a) All lift stations must include an audiovisual alarm system that transmits all alarm conditions through a Supervisory Control and Data Acquisition (SCADA) system.
- (b) SCADA system shall be remotely accessible by City personnel via fiber connection. Radio connections will not be permitted.
- (c) Programmable logic controllers (PLCs) shall be on the City's standard products list or obtain prior approval from the City Engineer before submittal.
- (d) SCADA Integration must be performed by Contractors pre-approved by the City.

Section 25. WASTEWATER SYSTEM CONSTRUCTION PLAN INFORMATION AND SUBMITTAL REQUIREMENTS

25.1. PLAN VIEW REQUIREMENTS

25.1.1. ALLOWABLE SCALES

North arrow and scale shall be shown on all sheets. Standard horizontal scale shall be 1" = 10', 20', 40', or 50' with respective vertical scale of 1" = 1', 2', 4', or 5'. The City Engineer may require a larger-scale be used for plan and profile sheets or larger-scale blowups.

25.1.2. PROPERTY AND TOPOGRAPHIC INFORMATION

All plan sheets shall include the following information:

- (a) Proposed pipe size, material, and location with respect to easements, rights-of-way, and property lines.
- (b) Pipes with nominal diameter eighteen (18) inches and larger shall be represented by two lines corresponding to the outer diameter of the pipe.
- (c) Horizontal location, size, and material of all existing water mains, wastewater mains, and other utility lines.
- (d) Property lines, legal descriptions, lot and block numbers, and property owner for all properties along the main.
- (e) Key maps for all plan and profiles that exceed three sheets.
- (f) Dimensions for right-of-way width, easement width, sidewalk/trail width, and roadway width from back-of-curb to back-of-curb.
- (g) Railroad track, power poles, utility vaults, junction boxes, trees, survey monuments, retaining walls, culverts, bridges, street names, and other plan features.

25.1.3. FLOODPLAIN LIMITS

All plan sheets shall depict the latest FEMA Special Flood Hazard Area boundaries, as adopted and amended.

25.1.4. CONNECTIONS

Connections to the existing wastewater system shall be labeled with the permit number and name of the existing facility.

25.1.5. STATIONING

Station numbers shall be provided on plan sheets for the following points:

- (a) Beginning and ending points
- (b) Points of curvature, tangency and intersection
- (c) Manholes
- (d) Cleanouts

- (e) Service connections
- (f) Other appurtenances

25.1.6. DETAILS

Details of appurtenances shall be shown. Provide all applicable City of Hutto standard details. Unused details shall not be shown on the plan set. No more than eight details originally produced at ANSI Letter size or four originally produced at ANSI Tabloid size shall be provided on detail sheets.

25.1.7. EASEMENTS

All plan sheets shall include all existing and proposed easements with the recordation number from Williamson County Real Property Records.

25.2. PROFILE VIEW REQUIREMENTS

25.2.1. REQUIRED PROFILES

- (a) Existing ground and finished grade if not under pavement.
- (b) Existing ground, proposed street finished grade, and proposed street subgrade if under pavement.
- (c) Lines to indicate pipe flowline and crown.
- (d) Existing and proposed pipeline crossings.
- (e) Parallel storm sewer mains with top and bottom of pipe shown as dashed.

25.2.2. STATIONING, FLOWLINES, AND ELEVATIONS

- (a) Existing ground and finished grade if not under pavement.
- (b) Station numbers and elevations for starting points, ending points, intermediate points every one hundred (100) feet, and all appurtenances (as applicable) such as isolation valves, air-release valves, manholes, and cleanouts.
- (c) Station numbers and elevations of all utility crossings.
- (d) Flow line elevations for all pipe connections at manholes and junction boxes.

25.2.3. PIPE LABELING

- (a) Identify pipe size, percent grade and pipe material to be used including American Society of Testing and Materials (ASTM) and/or AWWA designation. If an alternate material is to be allowed, both should be listed (for example, “ASTM D3034 SDR26 PVC or AWWA C900 DR25 PVC”).
- (b) Rock riprap, concrete trench caps, or other similar features shall be shown and labeled.

25.2.4. THRUST RESTRAINT LENGTHS

All fittings are to be restrained. Unless it is not possible, all fittings are to also be thrust blocked. Provide a table for thrust restraint lengths.

25.2.5. FITTINGS

Provide station, bend type and change in direction in decimal degree for all fittings.

25.2.6. RETAINING WALLS

Height, material, and footing extents of all existing and proposed walls

25.2.7. DRAINAGE CROSSINGS

Label pipe size, materials, and clearance to wastewater lines for all storm drains, culverts, and other drainage crossings.

25.2.8. ENCASEMENT

- (a) Label(s) for encasement material, diameter, length, and installation method (by open cut, trenchless construction, microtunnel, etc.).
- (b) Station numbers for starting points and ending points.

HUTTO ENGINEERING DESIGN MANUAL

DIVISION E

DRAINAGE, WATER QUALITY & STORMWATER SYSTEMS

DIVISION CONTENTS

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Section 26. DRAINAGE POLICY

26.1. GENERAL

This manual represents the application of accepted principles of stormwater drainage engineering and is a working supplement to basic information obtainable from standard drainage handbooks and other publications on drainage. The policy statements of this section provide the underlying principles by which all drainage facilities shall be designed. The application of the policy is facilitated by the technical criteria contained in the remainder of the manual.

26.2. APPLICATION

The City's drainage policy shall govern the planning and design of drainage infrastructure within the corporate limits of the City and within all areas subject to its extraterritorial jurisdiction, as required. Definitions, formulae, criteria, procedures and data in this manual have been developed to support this policy. If any condition requiring some additional measure of protection is identified during design or construction, the engineer shall make provisions within the design.

26.3. STREET DESIGN

26.3.1. GENERAL

Street curbs, gutters, inlets and storm sewers shall be designed to intercept, contain and transport all runoff from the 25-year frequency storm. Additionally, the public drainage system shall be designed to convey those flows from greater than the 25-year frequency storm up to and including the 100-year frequency storm within defined public rights-of-way or drainage easements.

26.3.2. CAPACITY

No lowering of the standard height of street crown shall be allowed for the purposes of obtaining additional hydraulic capacity. For non-curbed streets all flows shall be contained within paralleling roadside ditches.

- (a) 50-Year (Conveyance system and inlet design)
- (b) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)

*Note: If contributing drainage area is greater than or equal to two hundred (200) acres, design Level of Protection shall be for 25-year event.

26.4. DRAINAGE SYSTEMS

26.4.1. GENERAL

- (a) Stormwater runoff peak flow rates for the 2-, 10-, 25- and 100-year frequency storms shall not cause increased adverse inundation of any building or roadway surface.
- (b) When stormwater detention is provided, stormwater runoff peak flow rates shall not be increased at any point of discharge for the 2-, 10-, 25- and 100-year storm frequency events.

- (c) Regulation of peak flows to existing (pre-project) levels, as determined by the provisions of this manual, shall be achieved by storage on-site, off-site, or participation in the Stormwater Management Program.
- (d) Construction plans for proposed reinforced concrete box culverts, bridges and related structures may be adaptations of the current Texas Department of Transportation (TxDOT) Standards when approved.
- (e) For bridges and culverts in residential and other than residential streets, runoff from the 100-year frequency flow shall not produce a headwater elevation at the roadway greater than six (6) inches above the roadway crown elevation or six (6) inches above any top of upstream curb elevation, whichever is lower.
- (f) All drainage facilities (including but not limited to headwalls, open channels, storm sewers, area inlets, detention, retention, and water quality controls and their appurtenances) shall comply with the following requirements, unless otherwise noted in this manual.
 - (1) Storm sewer inlets and gutter transitions shall be designed to avoid future driveways and to avoid conflicts with standard water and wastewater service locations. No utilities shall be allowed to cross under a storm sewer inlet.
 - (2) Drainage channels and detention ponds that are to be maintained by the public (City) shall be contained within drainage lots.
 - (3) Adequate room for access shall be provided for drainage channels and detention ponds. Ramps no steeper than five (5) feet horizontal to one (1) foot vertical (5:1) shall be provided at appropriate locations to allow access to drainage channels and detention ponds. The minimum bottom width for any channel with vegetative side slopes shall be eight (8) feet. An eight (8) foot wide, five (5) inch thick reinforced concrete trickle channel shall be provided in all newly constructed channels and from detention pond inlets to outlets. The area adjacent to trickle channels shall slope at a minimum of two percent (2%).
 - (4) Detention ponds shall be designed with adequate room around the perimeter for access and maintenance. Said area shall be a minimum of seven (7) feet wide for ponds with depths of five (5) feet or less (back slopes included) and a minimum of 15 feet wide for ponds over five (5) feet deep or with back slopes in excess of five (5) feet high. Said area shall not slope more than five percent (5%).
 - (5) Rip-rap for slope protection or velocity dissipation shall be formed concrete dissipators or mortared rock.
 - (6) Storm drains between lots (crossing blocks) shall be avoided as much as possible. When unavoidable, such drainage shall be laid along a straight alignment (absent of curves, jogs and manholes/junction boxes when traversing between lots) with manholes/junction boxes provided at each intersecting street. Storm drains along rear of residential lots (through back yards) shall be avoided.

- (7) Drainage easements shall be a minimum of fifteen (15) feet in width with an additional two (2) feet of easement for every foot of depth greater than eight (8) feet. In some cases, drainage lots may be appropriate.
- (8) All bends, wyes and pipe size changes in storm sewers shall be prefabricated or shall occur at manholes. All bends and wyes in storm boxes shall be prefabricated or shall occur at junction boxes.
- (9) Bedding of storm drains shall be per City of Hutto Standard details.
- (10) Storm drains shall be reinforced concrete pipe (RCP) or reinforced concrete box (RCB), ASTM C 76, minimum class III at least eighteen (18) inches in diameter. The engineer shall provide load analysis for review as appropriate to demonstrate that the class used is sufficient for the loading conditions. Higher strength pipes shall be used where loadings warrant such. Minimum cover shall be per City of Hutto Standard details. Standard assignment for storm drains shall be per City of Hutto Standard details.
- (11) Junction boxes and manholes shall be reinforced concrete. Junction boxes in lieu of manholes shall be provided where any pipe opening exceeds thirty-seven (37) inches and where the distance from the outside surface of any two pipes entering a manhole is less than one (1) foot, measured along the inside of the manhole.
- (12) Open Sections
 - (A) Definitions
 - (i) Major Stream: Drains five (5) square miles or more
 - (ii) Major Collector: Drains twenty (20) acres or more
 - (iii) Minor Collector: Drains less than twenty (20) acres
 - (B) Minor collectors shall be constructed with underground storm sewers. If it can be established by certified engineering data to the satisfaction of the City Engineer that storm sewers are not physically feasible, open ditches may be used, provided that such ditches are lined with concrete or other permanent materials accepted by the City Engineer. These structures shall be of sufficient cross section and slope to fully contain design flows and facilitate self-cleaning. Outfalls shall enter major collector drainageways and major streams at grade or be designed and constructed with adequate concrete aprons, energy dissipaters or similar features to prevent erosion.
 - (C) Major collector drainage ways, detention ponds and related structures may utilize either existing natural open sections which may be modified, or newly constructed facilities. If modified or newly constructed facilities are utilized, they shall be lined with permanent materials including, but not limited to, concrete or vegetation.

- (i) Vegetated channels shall have sufficient grade to achieve a minimum permissible velocity for the two-year storm event of two (2) feet per second but a maximum velocity for the 100-year storm event of six (6) feet per second. Side slopes shall not be steeper than three (3) (horizontal) to one (1) (vertical) (3:1) for channels three (3) feet or less in depth and no steeper than 4:1 in all other channels to allow for future growth and to promote slope stability. All slopes shall be hydro mulched, sodded or seeded with approved grass, grass mixtures or ground cover suitable to the area and season in which they are applied. Seeded side slopes and buttons shall be lined with erosion protection matting.
 - (ii) Major streams shall not be modified without consent of applicable state and federal agencies and authorization from the City Engineer.
- (13) Discharge from storm sewer outfalls shall not cause channel, bluff, or stream bank erosion. If the storm drain discharges to an open drainage facility (as determined by the City), the applicant must show acceptable non-erosive conveyance to that drainage facility, appropriate energy dissipation at the outfall and a stable headwall.
- (14) No area within the limits of construction of the development shall allow stormwater to become stagnant. Maximum retention or “draw-down” time for detention ponds shall not exceed twenty-four (24) hours from the time of peak storage to the time of complete emptying of the pond, as determined by hydrograph routing or other calculations acceptable to the City. This requirement does not apply to facilities in which retention or “draw-down” time is required to be greater than twenty-four (24) hours.
- (15) In order to minimize vandalism and deterioration, use of exposed piping and appurtenances and any loose materials (other than access drive rock) shall be avoided or minimized. Use of all such items shall be approved by the City.

26.4.2. MINOR SYSTEMS

- (a) Minor Underground Storm Sewers (less than two hundred (200) acres contributing area):
 - (1) 25-Year (Hydraulic grade line (HGL) at or below top of curb and manhole rims)
 - (2) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)

Note: Underground storm sewers are mandatory for contributing area less than sixty (60) acres.
- (b) Minor Channels (sixty (60) to two hundred (200) acres contributing area):
 - (1) 25-Year (At least one (1) foot of freeboard)
 - (2) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)

- (c) Minor Channel Crossings (Culverts):
 - (1) 25-Year (Design Storm)
- (d) Minor Channel Crossings (Bridges):
 - (1) 25-Year (At least one (1) foot of freeboard below bottom of low chord)

26.4.3. TEMPORARY SYSTEMS

- (a) Temporary Ditches (less than two hundred (200) acres contributing area):
 - (1) 5-Year (At least one (1) foot of freeboard)
 - (2) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)

26.5. INTERMEDIATE SYSTEMS

- (a) Intermediate Underground Storm Sewers (two hundred (200) to five hundred (500) acres contributing area):
 - (1) 25-Year (HGL at or below top of curb and manhole rims)
 - (2) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)
- (b) Intermediate Channels (two hundred (200) to five hundred (500) acres contributing area):
 - (1) 25-Year (Design objective is three (3) feet of freeboard with a one (1) foot minimum, when necessary)
 - (2) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)
- (c) Intermediate Channel Crossings (Culverts):
 - (1) 25-Year (Design Storm)
 - (2) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)
- (d) Intermediate Channel Crossings (Bridges):
 - (1) 25-Year (At least one (1) foot of freeboard below bottom of low chord)
 - (2) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)

26.5.2. MAJOR SYSTEMS

- (a) Major Underground Storm Sewers (less than five hundred (500) acres contributing area):
 - (1) 25-Year (HGL at or below top of curb and manhole rims)
 - (2) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)

- (b) Major Channels (less than five hundred (500) acres contributing area):
 - (1) 25-Year (Design objective is three (3) feet of freeboard with a one (1) foot minimum, when necessary)
 - (2) 100-Year (Water surface elevation below top of banks)
- (c) Major Channel Crossings (Culverts):
 - (1) 50-Year (Design Storm)
 - (2) 100-Year (Measures shall be taken to ensure that street ponding remains below habitable living space)
- (d) Major Channel Crossings (Bridges):
 - (1) 50-Year (At least one (1) foot of freeboard below bottom of low chord)
 - (2) 100-Year (Water surface elevation below bottom of low chord and measures shall be taken to ensure that street ponding remains below habitable living space)

Note: All newly constructed storm sewer lines will require video inspection, delivered to the City inspector for review. No paving operations can begin until the City inspector has approved storm sewer video inspections.

26.6. FLOODPLAIN DELINEATIONS

Floodplain delineations in this manual are referred as “Ultimate” for city and “FEMA” for federal requirements.

26.6.1. CITY OF HUTTO (ULTIMATE)

- (a) In all cases where a flood plain delineation is required, its determination shall be based on the projected full development of all properties contributing to the point of consideration. It is the responsibility of the design engineer to determine, based on the most accurate information available, what the fully developed drainage area is.
- (b) The design engineer may elect to utilize a floodplain delineation previously approved by the City Engineer, assuming the same is still applicable under present requirements and criteria. In so doing, the engineer does not remove him/herself from the responsibility for the report's accuracy.
- (c) For purposes of this manual, a drainage area of 50 acres or greater is required within a contributing watershed to create a “floodplain”. For areas of flow with less than 50 acres of contributing area, no floodplain shall be defined; however, with regards to the drainage criteria contained in this manual, any concentrated flow necessitates the dedication of a drainage easement.
- (d) The limits of drainage easements shall be the ultimate one hundred (100) year floodplain or the ultimate twenty-five (25) year plus 1-foot freeboard whichever is greater.

26.6.2. FEMA MAP REVISIONS (C/LOMR)

- (a) The Federal Emergency Management Agency (FEMA) maintains Flood Insurance Rate Maps (FIRMs) that depict floodplain and floodway boundaries. The floodplain and floodway boundaries depicted on FIRMs are based on existing conditions of development in the contributing area.
- (b) FEMA reviews and approves or denies all revisions or amendments to FIRMs. FEMA revises or amends FIRMs by approval of a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR). FEMA establishes the process and fees necessary for review of an application for a LOMA or LOMR.
- (c) FEMA reviews the impact of a proposed site development and offers or denies conditional assurance that a FIRM may be changed by the proposed development. FEMA offers this assurance by a Conditional Letter of Map Amendment (CLOMA) or Conditional Letter of Map Revision (CLOMR). The CLOMA or CLOMR is a conditional statement that the FIRM may be changed if (1) the development is constructed as proposed in the CLOMA/CLOMR application, and if (2) a complete LOMA/LOMR is submitted after construction of the proposed development.

26.6.3. CITY OF HUTTO & FEMA FLOODPLAIN DELINEATIONS

All FEMA floodplain models within Williamson County have been updated based on NOAA Atlas 14 precipitation frequencies. These models are available from the County and should be used for preparation of a LOMR.

- (a) If the floodplain depicted on the FIRM is required to be changed due to updated analysis of the floodplain under existing conditions, then the following requirements are applicable:
 - (1) Prior to recordation of a final plat, the applicant must provide to the City evidence of receipt by FEMA of an application for a LOMR.
 - (2) Prior to acceptance of the construction of a subdivision or issuance of building permits, the applicant must provide to the City evidence of final acceptance by FEMA of the LOMR submitted above.
- (b) If the floodplain depicted on the FIRM is required to be changed due to land development activities that alter existing conditions, then the following requirements are applicable:
 - (1) Prior to approval of a final plat, the applicant must provide to the City evidence of receipt by FEMA of an application for a CLOMR.
 - (2) Prior to the recordation of a final plat, the applicant must provide to the City evidence of the CLOMR submitted above.
 - (3) If the final plat is approved before it is determined that a CLOMR is necessary or desired, then prior to release of subdivision construction plans, the applicant must provide to the City a letter of acknowledgment by FEMA of receipt of a complete application for a CLOMR.

- (4) Prior to final acceptance of the construction of the subdivision or issuance of building permits, the applicant must provide to the City evidence of final acceptance by FEMA of the CLOMR submitted above, and a letter of acknowledgment by FEMA of a complete application for a LOMR.
- (c) The applicant shall bear the cost of engineering services required to develop the application, respond to review comments, and obtain final approval of LOMRs and CLOMRs. The applicant shall bear the cost of any fees associated with review and disposition of LOMRs and CLOMRs that are established by FEMA.

26.7. FLOOD HAZARD REDUCTION

This section of the manual applies to areas of special flood hazard within the jurisdiction of the city. For design, permitting, and regulatory requirements, refer to Chapter 6, Article 6.06 Flood Damage Prevention in the City of Hutto Code of Ordinances.

Section 27. DETERMINATION OF STORM RUNOFF

27.1. DESIGN RAINFALL

- (a) The stormwater runoff (peak discharge) shall be determined for each inlet, pipe, roadside ditch, channel, bridge, culvert, outfall, or other designated design point by using the standards in this section.
 - (1) Stormwater runoff peak flow rates for the 2-, 10-, 25- and 100-year frequency storms shall not cause increased adverse inundations of any building or roadway surface.
 - (2) Flooding of surrounding property from streets is controlled by limiting curb buildup to the top of curb for a 25-year storm. Conveyance for the 100-year storm must be made within the defined right of way and easements.
 - (3) When stormwater detention is provided, stormwater runoff peak flow rates shall not be increased from the pre-development peak rate at any point of discharge for the 2-, 10-, 25- and 100-year storm frequency events.
 - (4) Regulation of peak flows to allowable levels, as determined by the provisions of this policy, shall be achieved by storage on-site, storage off-site, or by participation in the stormwater management program.
 - (5) For areas up to two hundred (200) acres served by storm sewer or roadside ditch, peak discharges will be based on the Rational Method. For areas larger than 200 acres, a hydrograph methodology using HEC-HMS shall be used. When the runoff from two or more drainage areas is to be combined, the same methodology must be used for both areas and the methodology should be appropriate for both. If the modeling is associated with establishing a flood-prone area for purposes of a FEMA submittal, the models to be used must meet FEMA requirements.

- (b) When analyzing an area for channel design purposes, urbanization of the full watershed without detention ponds shall be assumed. Zoning maps future land use maps, and master plans should be used as aids in establishing the anticipated surface character of the ultimate development. The selection of design runoff coefficients and/or percent impervious cover factors are explained in the following discussions of runoff calculations.
- (c) In the event the engineer desires to incorporate the flow reduction benefits of existing upstream detention ponds, the following field investigations and hydrologic analysis shall be provided:
- (d) A field survey of the existing physical characteristics of both the outlet structure and the ponding volume. Any departure from the original Engineer's design must be accounted for. If a dual use for the detention pond exists, (e.g., storage of materials or equipment, landscape plantings reducing storage capacity, etc) then this too should be accounted for.
- (e) A comprehensive hydrologic analysis which simulates the attenuation of the contributing area ponds. This should not be limited to a linear additive analysis but rather a network of hydrographs which considers incremental timing of discharge and potential coincidence of outlet peaks.
- (f) In designing a storm sewer system within a residential subdivision, full development of adjoining and interior tracts without detention must be assumed.
- (g) In designing a storm sewer system within a commercial or multifamily subdivision, stormflows can, with City approval, reflect the flow reduction anticipated by the design of future detention ponds. This applies exclusively to the flows generated by those properties contained within the subdivision. Provisions for conveyance of the one percent (1%) annual chance (100-year) undetained flows within the right-of-way or drainage easements still apply.
- (h) In the event the Engineer desires to incorporate the flow reduction benefits of existing upstream detention ponds, the following field investigations and hydrologic analysis shall be provided.
- (i) A field survey of the existing physical characteristics of both the outlet structure and the ponding volume. Any departure from the original design must be accounted for. If a dual use for the pond exists (e.g., storage of equipment, landscaping, etc.) then this too should be accounted for.
- (j) A comprehensive hydrologic analysis which simulates the attenuation of the contributing area ponds. This should not be limited to a linear additive analysis but rather a network of hydrographs which considers incremental timing of discharge and potential coincidence of outlet peaks.

27.2. RATIONAL METHOD

- (a) The Rational Method is based on the direct relationship between rainfall and runoff, and is expressed by the following equation:

(Eq. 27-1)

$$Q_p = C \times I \times A$$

Where:

Q_p is defined as the peak runoff in cubic feet per second. Actually, Q_p is in units of inches per hour per acre. Since this rate of in/hr/ac differs from cubic feet per second by less than one (1) percent (1 in/hr/ac = 1.008 cfs), the more common units of cfs are used.

C is the coefficient of runoff representing the ratio of peak runoff rate " Q_p " to average rainfall intensity rate " I " for a specified area " A ".

I is the average intensity of rainfall in inches per hour for a period of time equal to the time of concentration (t_c) for the drainage area to the point under consideration.

A is the area in acres contributing runoff to the point of design.

- (b) The following basic assumptions are associated with the Rational Method:
 - (1) The storm duration is equal to the time of concentration.
 - (2) The computed peak rate of runoff at the design point is a function of the average rainfall rate during the time of concentration at that point.
 - (3) The return period or frequency of the computed peak flow is the same as that for the design storm.
 - (4) The necessary basin characteristics can be identified, and the runoff coefficient does not vary during a storm.
 - (5) Rainfall intensity is constant during the storm duration and spatially uniform for the area under analysis.

27.2.2. RUNOFF COEFFICIENT (C)

- (a) The proportion of the total rainfall that will reach the drainage system depends on the imperviousness of the surface and the slope and ponding characteristics of the area. Impervious surfaces, such as asphalt pavements and roofs of buildings, will be subject to approximately one hundred percent (100%) runoff (regardless of the slope). On-site inspections and aerial photographs may prove valuable in estimating the nature of the surfaces within the drainage area.
- (b) The runoff coefficient " C " in the Rational Formula is also dependent on the character of the soil. The type and condition of the soil determines its ability to absorb precipitation. The rate at which soil absorbs precipitation generally decreases as the rainfall continues for an extended period of time. The soil infiltration rate is influenced by the presence of soil moisture (antecedent precipitation), the rainfall intensity, the proximity of the ground water table, the degree of soil compaction, the porosity of the subsoil, and ground slopes.
- (c) It should be noted that the runoff coefficient " C " is the variable of the Rational Method which is least susceptible to precise determination. A reasonable coefficient must be chosen to

represent the integrated effects of infiltration, detention storage, evaporation, retention, flow routing and interception, all of which affect the time distribution and peak rate of runoff. The runoff coefficients for composite analysis can be obtained from **Table 27-1**.

Table 27-1: Rational Method Runoff Coefficients (C) for Composite Analysis

Character of Surface	Return Period						
	2 years	5 years	10 years	25 years	50 years	100 years	500 years
DEVELOPED							
Asphaltic	0.73	0.77	0.81	0.86	0.9	0.95	1
Concrete	0.75	0.8	0.83	0.88	0.92	0.97	1
Grass Areas (Lawns, Parks, Etc.)							
<i>Poor Condition *</i>							
Flat, 0-2%	0.32	0.34	0.37	0.4	0.44	0.47	0.58
Average, 2-7%	0.37	0.4	0.43	0.46	0.49	0.53	0.61
Steep, over 7%	0.4	0.43	0.45	0.49	0.52	0.55	0.62
<i>Fair Condition **</i>							
Flat, 0-2%	0.25	0.28	0.3	0.34	0.37	0.41	0.53
Average, 2-7%	0.33	0.36	0.38	0.42	0.45	0.49	0.58
Steep, over 7%	0.37	0.4	0.42	0.46	0.49	0.53	0.6
<i>Good Condition ***</i>							
Flat, 0-2%	0.21	0.23	0.25	0.29	0.32	0.36	0.49
Average, 2-7%	0.29	0.32	0.35	0.39	0.42	0.46	0.56
Steep, over 7%	0.34	0.37	0.4	0.44	0.47	0.51	0.58
Character of Surface	Return Period						
	2 years	5 years	10 years	25 years	50 years	100 years	500 years
UNDEVELOPED							
<i>Cultivated</i>							
Flat, 0-2%	0.31	0.34	0.36	0.4	0.43	0.47	0.57
Average, 2-7%	0.35	0.38	0.41	0.44	0.48	0.51	0.6
Steep, over 7%	0.39	0.42	0.44	0.48	0.51	0.54	0.61
<i>Pasture/Range</i>							
Flat, 0-2%	0.25	0.28	0.3	0.34	0.37	0.41	0.53
Average, 2-7%	0.33	0.36	0.38	0.42	0.45	0.49	0.58
Steep, over 7%	0.37	0.4	0.42	0.46	0.49	0.53	0.6

<i>Forest/Woodlands</i>							
Flat, 0-2%	0.22	0.25	0.28	0.31	0.35	0.39	0.48
Average, 2-7%	0.31	0.34	0.36	0.4	0.43	0.47	0.56
Steep, over 7%	0.35	0.39	0.41	0.45	0.48	0.52	0.58
<i>Fair Condition **</i>							
Flat, 0-2%	0.25	0.28	0.3	0.34	0.37	0.41	0.53
Average, 2-7%	0.33	0.36	0.38	0.42	0.45	0.49	0.58
Steep, over 7%	0.37	0.4	0.42	0.46	0.49	0.53	0.6
<i>Good Condition ***</i>							
Flat, 0-2%	0.21	0.23	0.25	0.29	0.32	0.36	0.49
Average, 2-7%	0.29	0.32	0.35	0.39	0.42	0.46	0.56
Steep, over 7%	0.34	0.37	0.4	0.44	0.47	0.51	0.58

Assumptions:

1. Composite "C" value for developed conditions ($C_{DEV} = IC_1 + (1-I)C_2$) where:
 - I = Impervious cover percentage (decimal value)
 - C_1 = "C" value for impervious cover
 - C_2 = "C" value for pervious cover
2. Maximum allowable impervious cover values may be limited by land use type

Notes:

- * Grass cover less than fifty percent (50%) of the area
- ** Grass cover on fifty (50) to seventy-five (75) percent of the area
- *** Grass cover greater than seventy-five percent (75%) of the area

Source: 1. Rossmiller, R.L. "The Rational Formula Revisited.

27.2.3. TIME OF CONCENTRATION

The time of concentration is the time for surface runoff to flow from the most remote point in the watershed to the point of interest. This applies to the most remote point in time, not necessarily the most remote point in distance. Runoff from a drainage area usually reaches a peak at the time when the entire area is contributing. However, runoff may reach a peak prior to the time the entire drainage area is contributing if the area is irregularly shaped or if the land use characteristics differ significantly within the area. Sound engineering judgment should be used to determine a flow path representative of the drainage area and in the subsequent calculation of the time of concentration. The time of concentration at any point in a storm drainage system is a combination of the sheet flow (overland), the shallow concentrated flow and the channel flow, which may include storm drains. The minimum time of concentration for any drainage area shall be five (5) minutes. Additionally, the minimum slope used for calculation of sheet and shallow flow travel time components should be 0.005 feet per foot (0.5%). The preferred procedure for estimating time of concentration is the NRCS method as described in NRCS's Technical Release 55 (TR-55). This method is outlined below. The overall time of concentration is calculated as the sum of the sheet, shallow concentrated and channel flow travel times; note that there may be multiple shallow concentrated and/or channel segments depending on the nature of the flow path.

(Eq. 27-2)

$$T_c = T_{t(sheet)} + T_{t(shallow\ concentrated)} + T_{t(channel)}$$

(a) Sheet Flow

Sheet flow is shallow flow over land surfaces, which usually occurs in the headwaters of streams. Sheet flow occurs for only relatively short distances, especially in urbanized conditions. Sheet Flow travel time for undeveloped and developed conditions shall be calculated based on the surface characteristics. Sheet flow distances shall not exceed one hundred (100) feet, except where adequate justification has been provided by the Engineer. Sheet Flow travel time for developed conditions shall be calculated based on the anticipated surface characteristics of the contemplated development, and the expected and/or existing surface characteristics of any contributing areas outside of the contemplated development. In some heavily urbanized drainage areas, sheet flow may essentially be non-existent in the headwater area. The NRCS TR-55 method employs **Equation 27-3**, which is a modified form kinematic wave equation, for the calculation of the Sheet Flow travel time.

(Eq. 27-3)

$$T_{t(sheet)} = 0.42(nL)^{0.8} / \{(P_2)^{0.5}(s)^{0.4}\}$$

Where,

$T_{t(sheet)}$ = Sheet flow travel time in minutes

L = Length of the reach in ft.

n = Manning's n (see Table 27-2)

P_2 = 2-year, 24-hour rainfall in inches

s = Slope of the ground in ft/ft

(b) Shallow Concentrated Flow

After a maximum length, as discussed above, sheet flow collects in swales, small rills, and gullies and develops into shallow concentrated flow. Typically, shallow concentrated flow is not within well-defined channels and will have depths of zero point one (0.1) to zero point five (0.5) feet. The portion of the total time of concentration due to shallow concentrated flow can be computed from **Equations 27-4 and 27-5**. These two equations are based on the solution of Manning's Equation with different assumptions for n (Manning's roughness coefficient) and r (hydraulic radius, feet). For unpaved areas, n is 0.05, and r is 0.4; for paved areas, n is 0.025, and r is 0.2.

(Eq. 27-4)

$$\text{Unpaved } T_{t(shallow\ concentrated)} = L / \{(60)(16.1345)(s)^{0.5}\}$$

(Eq. 27-5)

$$\text{Paved } T_{t(\text{shallow concentrated})} = L / \{ (60)(20.3282)(s)^{0.5} \}$$

Where,

$T_{t(\text{shallow concentrated})}$ = Shallow Concentrated Flow travel time in minutes

L = Length of the reach in ft.

s = Slope of the Shallow Concentrated Flow path in ft/ft

(c) Channel or Storm Sewer Flow

- (1) The velocity in an open channel or a storm drain not flowing full can be determined by using Manning's Equation. Channel velocities can also be determined by using backwater profiles. For open channel flow, average flow velocity shall be determined by assuming a bank-full condition. Note that the channel flow component of the time of concentration may need to be divided into multiple segments in order to represent significant changes in channel characteristics. The details of using Manning's equation and selecting Manning's "n" values for channel flow can be obtained from **Table 27-1**. A coefficient of roughness of 0.013 should be used for concrete pipes (see Section 30.1.1. for storm drain design parameters).
- (2) For storm drain flow under pressure conditions (hydraulic grade line is higher than the lowest crown of a storm drain) **Equations 27-6** should be applied:

(Eq. 27-6)

$$V = Q/A$$

Where:

V = Average Velocity, ft/s

Q = Design discharge, cfs

A = Cross-sectional area, ft²

Table 27-2: Manning's "n" for Sheet (Overland) Flow

Manning's "n" ¹	Surface Description
0.015	Concrete (rough or smoothed finish)
0.016	Asphalt
0.05	Fallow (no residue)
Cultivated Soils	
0.06	Residue Cover ≤ 20%
0.17	Residue Cover > 20%
Grass	
0.15	Short-grass prairie 100% vegetated ground cover with areas of heavy vegetation (parks, green-belts, riparian areas etc.) dense under-growth
0.24	Dense grasses ²
0.41	Bermudagrass
0.13	Range (natural)
Woods³	
0.4	Light underbrush
0.8	Dense underbrush

Notes:

1. The Manning's n values are a composite from information compiled by Engman (1986)
2. Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures
3. When selecting n, consider cover to a height of about zero point one (0.1)feet. This is the only part of the plant cover that will obstruct sheet flow.

Source: City of Austin, Watershed Engineering Division

27.2.4. RAINFALL INTENSITY (I)

- (a) Rainfall intensity (I) is the average rainfall rate in inches per hour and is selected on the basis of design rainfall duration and design frequency of occurrence. The design duration is equal to the time of concentration for the drainage area under consideration. The design frequency of occurrence is a statistical variable which is established by design standards or chosen by the Engineer as a design parameter.
- (b) The selection of the frequency criteria is necessary before applying any hydrologic method. Storm drainage improvements in Hutto must be designed to intercept and carry the runoff from a four percent (4%) Annual Chance (25-year) frequency storm, with the one percent (1%) Annual Chance (100-year) frequency storm conveyed within defined public rights-of-way or drainage easements.

- (c) The rainfall intensity used in the Rational Method shall be based on the design frequency selected and design duration determined by the Engineer, subject to the approval of the City Engineer, and shall be determined from the NOAA Atlas 14, Volume 11 precipitation frequency estimates.
- (d) The time of concentration of the runoff will be used to determine the rainfall intensity component of the Rational Method Formula. The rainfall intensity shall be computed as follows:

(Eq. 27-7)

$$I = b / (T_c + d)^e$$

Where:

I = Rainfall intensity (in/hr)

T_c = Time of Concentration (min)

b, d, e = Coefficient per Table 27-3

Table 27-3: Design Annual Exceedance Probability (Design Annual Recurrence Interval)

Coefficient	50% (2-year)	20% (5-year)	10% (10-year)	4% (25-year)	2% (50-year)	1% (100-year)	0.2% (500-year)
e	0.8148	0.8056	0.7991	0.7918	0.7871	0.7824	0.7714
b	62.5086	76.3206	88.5362	106.2714	120.8178	136.6644	180.1476
d (min)	12.3059	12.5221	12.8753	13.4408	13.9176	14.6225	17.3300

27.2.5. DRAINAGE AREA (A)

The size (acres) of the watershed needs to be determined for application of the Rational Method. The area may be determined through the use of topographic maps, supplemented by field surveys where topographic data has changed or where the contour interval is too great to distinguish the direction of flow. The drainage divide lines are determined based on existing topography, but could be altered by proposed street layout, lot grading, structure configuration and orientation, and many other features that result from the urbanization process.

27.3. NATURAL RESOURCES CONSERVATION SERVICE METHOD FOR CALCULATION OF PEAK FLOWS

- (a) The Natural Resources Conservation Service (NRCS) hydrologic method is widely used by engineers and hydrologists for analyses of small urban watersheds. This method is based on extensive analytical work using a wide range of statistical data concerning storm patterns, rainfall-runoff characteristics and many hydrologic observations in the United States. The

NRCS method can be applied to urban drainage areas of any size. The primary parameters required to calculate a runoff hydrograph with the method include the rainfall depth, rainfall distribution, runoff curve numbers, time of concentration, and drainage area.

- (b) The Hydrologic Engineering Center - Hydrologic Modeling System (HEC-HMS) computer programs include the ability to apply the NRCS method and may be downloaded from the US Army Corps of Engineers website at <http://www.hec.usace.army.mil/>.

27.3.2. TWENTY-FOUR-HOUR STORM RAINFALL DISTRIBUTIONS

The City of Hutto has adopted the use of an SCS (Soil Conservation Survey) twenty-four (24) hour storm duration within a type III distribution for use with the SCS method.

27.3.3. NATURAL RESOURCES CONSERVATION SERVICE RUNOFF CURVE NUMBERS

- (a) The NRCS has developed an index, the runoff curve number (CN), to represent the combined hydrologic effect of soil type, land use, agricultural land treatment class, hydrologic condition, and antecedent soil moisture. These watershed factors have the most significant impact in estimating the volume of runoff, and can be assessed from soil surveys, site investigations and land use maps.
- (b) The CN is an indication of the potential runoff for a given antecedent soil moisture condition, and it ranges in value from zero (0) to one hundred (100). The NRCS runoff CN's are grouped into three (3) antecedent soil moisture conditions -- Antecedent Runoff Condition (ARC) I, ARC II and ARC III. Values of runoff curve numbers for all three (3) conditions may be computed following guidelines in Part 630, Chapter 10, of the National Engineering Handbook. ARC I is the dry soil condition and ARC III is the wet soil condition. ARC II is normally considered to be the average condition. The ARC was previously referred to as the Antecedent Moisture Condition (AMC) in older NRCS publications.
- (c) However, studies of hydrologic data indicate that ARC II is not necessarily representative of the average condition throughout Texas. Instead, investigations have shown that the average condition ranges from ARC I in west Texas to between ARC II and ARC III in east Texas. The NRCS curve number values given in **Table 27-4** are for an ARC II. If it is desired to change to an ARC I or III, the adjustments given in Part 630, Chapter 10 of the National Engineering Handbook should be used. Justification must be provided for the selection of an ARC other than ARC II.
- (d) The NRCS has classified more than four thousand (4,000) soils into four (4) hydrologic groups, identified by the letters A, B, C, and D, to represent watershed characteristics.
 - (1) Group A (Low runoff potential)

Soils having a high infiltration rate even when thoroughly wetted and consisting chiefly of deep, well-drained to excessively drained sands or gravels.

(2) Group B

Soils having a moderate infiltration rate when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse texture.

(3) Group C

Soils having a slow infiltration rate when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water or soil with moderately fine to fine texture.

(4) Group D (High runoff potential)

Soils having a very slow infiltration rate when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface and shallow soils over nearly impervious material.

- (e) **Table 27-4** lists the CN's for the four (4) soil groups under various land uses, land treatment and hydrologic conditions. CN's for future (fully developed) conditions should be based on estimated maximum future impervious cover and/or any maximum allowable impervious cover for land uses as prescribed in the Hutto Unified Development Code, if applicable. When calculating future (fully developed) peak runoff rates, it is recommended that the undeveloped CN and the maximum impervious cover be used as input parameters. In order to determine the soil classifications in the Hutto area, the NRCS Soil Survey of Williamson or Travis County, Texas, should be used. Digital versions of these soil datasets are available online at: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/>.

Table 27-4: NRCS Runoff Curve Numbers (CN's) for Urban Areas and Agricultural Lands (assuming ARC II condition)

Cover Description		CN for Hydrologic Soil Group			
Cover Type and Hydrologic Condition	Average % Impervious Area ¹	A	B	C	D
Fully developed urban areas (vegetation established)					
<i>Open Space (lawns, parks, golf courses, cemeteries, etc.)²</i>					
Poor condition (grass cover <50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
<i>Impervious Areas</i>					

Paved parking lots, roofs, driveways, etc. (excluding right of way)		98	98	98	98
<i>Streets and Roads</i>					
Paved; curbs and storm drains (excluding right of way)		98	98	98	98
Paved open ditches (including right of way)		83	89	92	93
Gravel (including right of way)		76	85	89	91
Dirt (including right of way)		72	82	87	89
<i>Urban Districts</i>					
Commercial and business (includes Multi-family and Industrial)	85	89	92	94	95
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)		77	86	91	94
Residential districts by average lot size					
1/8 acre or less (townhouses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Agricultural lands					
<i>Pasture, grassland, or range-continuous forage for grazing³</i>					
Poor		68	79	86	89
Fair		49	69	79	84
Good		39	61	74	80
<i>Meadow-continuous grass, protected from grazing and generally mowed for hay</i>		30	58	71	78
<i>Brush - brush-weed-grass mixture with brush the major element⁴</i>					
Poor		48	67	77	83
Fair		35	56	70	77

Good		30 ⁷	48	65	73
<i>Woods - grass combination (orchard or tree farm)⁵</i>					
Poor		57	73	82	86
Fair		43	65	76	82
Good		32	58	72	79
<i>Woods⁶</i>					
Poor		45	66	77	83
Fair		36	60	73	79
Good		30 ⁷	55	70	77
Farmsteads - buildings, lanes, driveways and surrounding lots		59	74	82	86

Notes

1. The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connect to the drainage system; impervious areas have a CN of ninety-eight (98) and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using methods in NRCS TR-55 Urban Hydrology for Small Watersheds
2. CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type
3. Poor: less than fifty percent (50%) ground cover or heavily grazed with no mulch
Fair: fifty (50) to seventy-five (75) percent ground cover and not heavily grazed
Good: greater than seventy-five percent (75%) ground cover and lightly or only occasionally grazed
4. Poor: less than fifty percent (50%) ground cover
Fair: fifty (50) to seventy-five (75) percent ground cover
Good: greater than seventy-five percent (75%) percent ground cover
5. CN's shown were computed for areas with fifty percent (50%) woods and fifty percent (50%) grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture
6. Poor: Forest litter, small trees and brush are destroyed by heavy grazing or regular burning
Fair: Woods are grazed but not burned, and some forest litter covers the soil
Good: Woods are protected from grazing & litter and brush adequately cover the soil
7. Actual CN is less than thirty (30); use CN = 30 for runoff computations

Source: NRCS TR-55: Urban Hydrology for Small Watersheds

27.3.4. TIME OF CONCENTRATION

- (a) Refer to **Section 27.2.3.** of this manual for the procedure for estimating time of concentration for the NRCS method. Three (3) types of flow (sheet flow, shallow concentrated flow, and channel flow) are considered.
- (b) In hydrograph analysis, the time of concentration can be defined as the time from the end of excess rainfall to the point of inflection on the falling limb of the hydrograph. The time of concentration determines the shape of the runoff hydrograph. Times of concentration are required for the existing and developed conditions to adequately model the impact of the development on stormwater runoff. The methodology presented in TR-55 provides a

reasonable approach for the estimation of time of concentration. The lag time, defined as the time between the center of mass of excess rainfall to the runoff peak, is typically used in the HEC-HMS implementation of the NRCS methodology. The lag time can be estimated with **Equation 27-8**:

(Eq. 27-8)

$$T_{lag} = (0.6)(T_c)$$

- (c) In general, times of concentration for the developed condition should be calculated based on conservative assumptions that consider the expected increased hydraulic efficiency. Times of concentration should be representative of the overall drainage area, not simply based on the longest flow path. Sheet flow lengths should be carefully examined and properly justified. Additionally, the minimum slope used for calculation of sheet and shallow concentrated flow travel time components should be 0.005 feet per foot (0.5%).

Section 28. STREET FLOW

28.1. GUTTER FLOW

- (a) Whenever storm runoff, other than limited sheet flow, moves across a traffic lane, a serious and dangerous impediment to traffic flow occurs. Cross flow is allowed only in case of superelevation of a curve or overflow from the higher gutter on a street with cross fall. No more than three (3) cubic feet per second for the 25-year storm shall be allowed to cross flow from the higher elevation to the lower elevation.
- (b) As the storm water flow approaches an arterial street or tee intersection, an inlet is required if more than three (3) cubic feet per second (cfs) for the 25-year storm shall enter the intersection. For a cul-de-sac with a slope greater than seven percent (7%), no more than three (3) cfs for the 25-year storm shall be allowed to enter the bulb of the cul-de-sac. In both situations the inlet cannot be placed inside the curb return.
- (c) Concrete valley gutters are useful in diminishing the deterioration of pavements, at intersections where slope across the intersection is less than one point two percent (1.2%).
 - (1) At the intersection of two (2) arterial streets, a valley gutter cannot be used.
 - (2) At the intersection of two (2) collector streets or local streets, a valley gutter shall be installed when slope across the intersection is less than one point two percent (1.2 %).
 - (3) At an intersection of two (2) different types of streets, the valley gutter may be used across the smaller street only.
 - (4) Do not install manholes or valve boxes in a valley gutter.
- (d) To ensure scouring velocities for low flows, the gutter shall have a minimum slope of 0.004 feet per foot (0.4 percent).
- (e) Minimum clear widths must be maintained for each roadway type as referenced in **Table 28-1**.
- (f) Flow in gutters on straight crown pavements is normally assumed to be uniform, with Manning's Equation being used to determine the flow. However, because the hydraulic radius assumption in the Manning's Equation is not able to adequately describe the hydraulic characteristics of the gutter cross section, modification of the equation is necessary to accurately compute the flow. The modified Manning's Equation is:

(Eq. 28-1)

$$Q_o = 0.56 \left(\frac{z}{n} \right) S_o^{1/2} Y_o^{8/3}$$

Where,

Q_o = Gutter discharge, cfs

z = Reciprocal of the crown slope, ft/ft

S_o = Street or gutter slope, ft/ft

n = Roughness coefficient

Y_o = Depth of flow in gutter, fee

- (g) For a concrete pavement gutter, an n value equal to 0.016 is recommended. For gutters with small slope less than one percent (1%) where sediment may accumulate, an n value of 0.02 is recommended.

Table 28-1: Minimum Clear Widths for Roadway Design Due to Gutter Flow

Roadway Type	Proposed Usage	Minimum Clear Width (Feet)
1. Local Street	a. Residential	8
	b. Commercial/Industrial	8
2. Collector	a. Minor	8
	b. Commercial/Industrial	12
	c. Major	24
	4 Lanes	24
	5 Lanes	12 (each way)
	4 Lanes Divided	12 (each way)
3. Arterial	6 Lanes Divided	12 (each way)
	a. 4 Lanes, Undivided	24
	b. 3 Lanes, One way	12
	c. 4 Lanes, One way	24
	d. 4 Lanes, with continuous left turn lane	24
	e. 4 Lanes, Divided	12 (each way)
	f. 6 Lanes, Divided	12 (each way)
	g. 8 Lanes, Divided	24 (each way)

28.1.1. PARABOLIC CROWNS

- (a) Flows in the gutter of a parabolically crowned pavement are calculated from a variation of Manning's Equation, which assumes steady flow in a prismatic open channel. However, this equation is complicated and difficult to solve for each design case.
- (b) To provide a means of determining the flow in the gutter, generalized gutter flow equations for combinations of parabolic crown heights, curb splits and street grades of different street widths have been prepared. All of these equations have a logarithmic form.

Note: The street width used in this section is measured from face of curb to face of curb.

(c) *Streets Without Curb Split*

Curb split is the vertical difference in elevation between curbs at a given street cross section. The gutter flow equation for parabolic crown streets without any curb split is:

(Eq. 28-2)

$$\log Q = K_0 + K_1 \log S_0 + K_2 \log y_0$$

Where,

Q = Gutter flow, cfs

S_0 = Street grade, ft/ft y_0 = Water depth in the gutter, feet

K_0, K_1, K_2 = Constant coefficients shown in Table 3-2 for different street widths

Table 28-2: Coefficients for Equation 28-2, Streets Without Curb Split

Street Width* (ft)	Coefficients		
	K_0	K_1	K_2
30	2.85	0.5	3.03
36	2.89	0.5	2.99
40	2.85	0.5	2.89
44	2.84	0.5	2.83
48	2.83	0.5	2.78

*Note: Street width is measured from face of curb to face of curb (FOC-FOC)

(d) *Streets With Curb Split (Higher Gutter)*

The gutter flow equation for calculating the higher gutter flows is as follows:

(Eq. 28-3)

$$\log Q = K_0 + K_1 \log S_0 + K_2 \log y_0$$

Where,

Q = Gutter flow, cfs

S_0 = Street grade, ft/ft

y_0 = Water depth in the gutter, feet

C_s = Curb split, feet

K_0, K_1, K_2 , = Constant coefficients shown in Table 3-3 for different street widths

Table 28-3: Coefficients for Equation 28-3, Streets with Curb Split-Higher Gutter

Street Width (ft)	Coefficients				Curb Split Range (ft)
	K_0	K_1	K_2	K_3	
30	2.85	0.5	3.03	-0.131	0.0-0.6
36	2.89	0.5	2.99	-0.14	0.0-0.8
40	2.85	0.5	2.89	-0.084	0.0-0.8
44	2.84	0.5	2.83	-0.091	0.0-0.9
48	2.83	0.5	2.78	-0.095	0.0-1.0
60	2.85	0.5	2.74	-0.043	0.0-1.2

Source: City of Austin, Watershed Engineering Division

(e) *Streets with Curb Split (Lower Gutter)*

The gutter flow equation for the lower gutter is:

(Eq. 28-4)

$$\log Q = K_0 + K_1 \log S_0 + K_2 \log y_0 + K_3 (CS)$$

Where,

Q = Gutter flow,

cfs S_0 = Street grade in ft/ft

y_0 = Water depth in the gutter in feet

CS = Curb split in feet

K_0, K_1, K_2, K_3 = Constant coefficients shown in Table 3-4 for different street widths

Table 28-4: Coefficients for Equation 30-4, Streets with Curb Split-Higher Gutter

Street Width (ft)	Coefficients				Curb Split Range (ft)
	K_0	K_1	K_2	K_3	
30	2.7	0.5	2.74	-0.215	0.0-0.6
36	2.74	0.5	2.73	-0.214	0.0-0.8
40	2.75	0.5	2.73	-0.198	0.0-0.8
44	2.76	0.5	2.73	-0.186	0.0-0.9
48	2.77	0.5	2.72	-0.175	0.0-1.0
60	2.8	0.5	2.71	-0.159	0.0-1.2

Source: City of Austin, Watershed Engineering Division

- (f) All the crown heights for different street widths are calculated by the following equation:

(Eq. 28-5)

$$\text{Crown Height (feet)} = 0.5 + [(W*30)/120]$$

Where,

W = street width, feet

- (g) The gutter flow equation presented for parabolic crowns with split curb heights is based on a procedure for locating the street crown. The procedure allows the street crown to shift from the street center line toward the high one fourth ($\frac{1}{4}$) point of the street in direct proportion to

the amount of curb split. The maximum curb split occurs with the crown at the one fourth ($\frac{1}{4}$) point of the street. The maximum allowable curb split for a street with parabolic crowns is 0.02 feet per foot of street width.

Example: Determination of Crown Location

Given: 0.4 feet Design split on 30-foot-wide street

$$\text{Maximum curb split} = 0.02 \times \text{street width} = 0.02 \times 30 \text{ feet} = 0.6 \text{ feet}$$

$$\text{Maximum Movement} = \frac{1}{4} \text{ street width for 30-foot street} = \frac{1}{4} \times 30 \text{ feet} = 7.5 \text{ feet}$$

$$\text{Split Movement} = (\text{Design split} \times W / \text{Maximum Split} \times 4)$$

$$= (0.4 \times 30 / 0.6 \times 4) = 5 \text{ feet}$$

- (h) Curb splits that are determined by field survey, whether built intentionally or not, should be considered when determining the capacity of the curb flow.
- (i) Special consideration should be given when working with cross sections which have the pavement crown above the top of curb. When the crown exceeds the height of the curb the maximum depth of water is equal to the height of the curb, not the crown height. It should be noted that a parabolic section where the crown equals the top of curb will carry more water than a section which has the crown one (1) inch above the top of curb.

29.1. GENERAL

- ## 29.2. INLET CLASSIFICATIONS

- ### (1) Inlets in Sumps

Curb Opening	Type S-1
Grate*	Type S-2
Combination (Grate and Curb Opening) *	Type S-3
Area Inlet Without Grate	Type S-4
Area Inlet With Grate	Type S-5

- (2) Inlets on Grade

Curb Opening	Type G-1
Grate*	Type G-2
Combination (Grate and Curb Opening) *	Type G-3

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29.3. STORM INLET HYDRAULICS

29.3.1. INLETS IN SUMPS

The capacity of inlets in sumps must be known in order to determine the depth and width of ponding for a given discharge.

(a) Curb Opening Inlets (Type S-1) and Area Inlet Without Grate (Type S-4).

- (1) Unsubmerged curb opening inlets (Type S-1) and area inlets without grates (Type S-4) in a sump function as rectangular weirs with a coefficient of discharge of 3.0. Their capacity shall be based on the following equation:

(Eq. 29-1)

$$Q = 3.0h^{1.5}L$$

Where,

Q = Capacity of curb opening inlet or of area inlet, cfs

h = Head at the inlet, feet, $= a + Y_0$

L = Length of opening through which water enters the inlet, feet

- (2) Curb opening inlets and area inlets in sumps have a tendency to collect debris at their entrances. For this reason, the calculated inlet capacity shall be reduced by ten percent (10%) to allow for clogging.

(b) Grate Inlets (Type S-2) and Area Inlet with Grate (S-5).

- (1) An area inlet with a grate (Type S-5) in a sump function as an orifice with a coefficient of discharge of 0.60. Therefore, the orifice equation becomes:

(Eq. 29-2)

$$Q = 4.82Ah^{0.5}$$

Where,

Q = Capacity, cfs

h = Depth of flow at inlet, feet

A = Area of grate opening, square feet

- (2) Area inlets with grates in sumps tend to clog from debris which becomes trapped by the inlet. For this reason, the calculated inlet capacity of a grate inlet shall be reduced by fifty percent (50%) to allow for clogging. Since the clogging problems require maintenance, grate inlets in sumps are discouraged.

(c) Combination Inlets (Type S-3)

The capacity of a combination inlet (Type S-3) consisting of a grate and curb opening in a sump shall be considered to be the sum of the capacities. When the capacity of the gutter is not exceeded, the grate inlet accepts the major portion of the flow.

- (1) Combination inlets in sumps tend to clog and collect debris at their entrances. For this reason, the calculated inlet capacities shall be reduced by their respective percentages indicated previously (ten (10) percent for the curb opening and fifty (50) percent for the grate).
- (d) *Recessed Inlets in Sumps* (Type S-1(R) and Type S-3(R))

Recessed inlets can be either curb opening or combination types. The clogging factors shall remain the same for recessed or non-recessed inlets.

29.3.2. INLETS ON GRADE WITH GUTTER DEPRESSION

- (a) Curb Opening Inlets on Grade (Type G-1) 
 - (1) Because the inlet is on a slope and there is no grate to catch debris, most of the debris will be carried downstream; therefore, no reduction for clogging is necessary.
- (b) Grate Inlets on Grade (Type G-2).
 - (1) The depression of the gutter at a grate inlet decreases the flow past the outside of the grate. The effect is the same as that caused by the depression of a curb inlet. The bar arrangements for grate inlets greatly affect the efficiency of the inlet.
 - (2) To determine the capacity of a grate inlet on grade, the appropriate vendor catalog should be checked.
 - (3) Grate inlets have a tendency to trap debris such as leaves, and paper being carried by the gutter flows. This causes traffic problems from ponding water and requires maintenance. A reduction factor of thirty percent (30%) to allow for clogging should be applied.
- (c) Combination Inlets on Grade (Type G-3)
 - (1) Combination inlets (curb opening plus grate) have greater hydraulic capacity than curb inlets or grate inlets of the same length. Combination inlets are the most efficient of the three (3) types of inlets on grade presented in this manual. The basic difference between a combination inlet and a grate inlet is that the curb opening receives the carry-over flow that passes between the curb and the grate. The reduction factor for clogging of this type of inlet shall be zero percent (0%) for the curb opening and thirty-five percent (35%) for the grate inlet.
- (d) Recessed Inlets on Grade (Type G-1R and Type G-3R)

Capacities for recessed inlets on grade shall be calculated as zero point seven five (0.75) times the capacity for non-recessed inlets. The clogging factors shall remain the same for the various types of inlets.

Section 30. STORM DRAINS

30.1. GENERAL

The following rules are to be observed in the design of storm drain system components to be located in public right-of-way or public drainage easements in order to promote proper operation and to minimize maintenance of those systems:

- (a) Select pipe size and slope so that the velocity of flow will increase progressively or at least will not appreciably decrease at inlets, bends or other changes in geometry or configuration.
- (b) Do not discharge the contents of a larger pipe into a smaller one even though the capacity of the smaller pipe may be greater due to a steeper slope.
- (c) For all pipe junctions other than a manhole, the angle of intersection between any two flow paths shall not be greater than forty-five (45) degrees. This includes discharges into box culverts and channels.
- (d) No proposed pipe having a diameter greater than fifty percent (50%) of the minimum dimension of an existing box culvert shall be allowed to discharge into that box culvert. Exceptions must be justified by structural engineering analysis.
- (e) Pipe shall be reinforced concrete.
- (f) The 25-year hydraulic grade line shall remain six (6) inches below the theoretical gutter flow line of inlets.
- (g) The 100-year hydraulic grade line shall remain at or below the theoretical right-of-way elevations.

30.1.1. DESIGN PARAMETERS

- (a) Storm drains should operate with velocities of flow sufficient to prevent deposition of solid material. The controlling velocity is near the bottom of the conduit and is considerably less than the mean velocity. Storm drains should be designed to have a minimum velocity of two point five (2.5) feet per second (fps) during the 25-year design storm.
- (b) Maximum velocities in conduits are important because of the possibility of excessive erosion of the storm drainpipe material. **Table 30-1** lists the maximum velocities allowed.

Table 30-1: Maximum Velocity in Storm Drains

Type	Maximum Permissible Velocity
Storm Drains (inlet laterals)	No limit
Storm Drains (trunk)	15 fps

- (c) Pipes that are to become an integral part of the public storm sewer system shall be concrete and have a minimum diameter of eighteen (18) inches. The coefficient of roughness is 0.013 for use in Manning's Equation.

30.1.2. FLOW IN STORM DRAINS

All storm drains shall be designed by the application of the Continuity Equation and Manning's Equation either through the appropriate charts and nomographs or by direct solution of Equations 30-8 and 30-9:

(Eq. 30-1)

$$Q = AV$$

(Eq. 30-2)

$$Q = \left(\frac{1.49}{n} \right) AR^{2/3} S^{1/2}$$

Where,

Q = Pipe Flow, cfs

A = Cross-sectional area of flow, ft²

V = Velocity of flow, ft/sec

n = Coefficient of roughness of pipe

R = Hydraulic radius = A/W_p , ft

S = Friction slope in pipe, ft/ft

W_p = Wetted perimeter, ft

30.1.3. HYDRAULIC GRADIENT

In storm drain systems flowing full, all losses of energy are a function of resistance of flow in pipes or by interference with flow patterns at junctions. These losses must be accounted for by their accumulation along the system from its tailwater elevation at the outlet to its upstream inlet. The purpose of determining head losses is to include these values in a progressive calculation of the hydraulic gradient. In this way, it is possible to determine the hydraulic gradient line which will exist along the storm drain system. The hydraulic gradient line shall be computed and plotted for all sections of a storm drain system flowing full or under pressure flow. The determination of friction loss and minor loss are important for these calculations.

- (a) Friction loss is the energy required to overcome the roughness of the pipe and is expressed as:

(Eq. 30-3)

$$h_f = \left(\frac{29n^2}{R^{1.33}} \right) \left(\frac{V^2}{2g} \right) L$$

Where,

h_f = Friction loss, ft

n = Manning's Coefficient

L = Length of pipe, ft

R = Hydraulic radius, ft

V = Velocity of flow, ft/sec

g = Acceleration due to gravity, 32 ft/sec²

- (b) In addition to **Equation 30-3**, **Table 30-2** can be used to determine the friction slope and applied in **Equation 30-3**.

(Eq. 30-3)

$$h_f = S_f L$$

Where,

h_f = Friction loss, feet

S_f = Friction slope, feet = $(Q/C)^2$

L = Length of pipe, feet

C = Full flow coefficient from Table 5-3

Q = Discharge, cfs

Example:

Given: Discharge $Q = 24$ cfs, diameter $D = 24$ inches, the length of pipe $L = 300$ feet and $n = 0.013$

Find: The friction loss H_f

First, from Table 30-7 for $D = 24$ inches and $n = 0.013$, the full flow coefficient $C = 226$.

Second, the friction slope $S_f = (Q/C)^2 = 0.011$

The friction loss $H_f = S_f L = 3.3$ feet

Table 30-3: Full Flow Coefficient Values for Circular Concrete Pipe

D Pipe Diameter (inches)	A Area (square feet)	R Hydraulic Radius (feet)	Value of C* for			
			n = 0.010	n = 0.011	n = 0.012	n = 0.013
8	0.349	0.167	15.8	14.3	13.1	12.1
10	0.545	0.208	28.4	25.8	23.6	21.8
12	0.785	0.25	46.4	42.1	38.6	35.7
15	1.227	0.312	84.1	76.5	70.1	64.7
18	1.767	0.375	137	124	114	105
21	2.405	0.437	206	187	172	158
24	3.142	0.5	294	267	245	226
27	3.976	0.562	402	366	335	310
30	4.909	0.625	533	485	444	410
33	5.94	0.688	686	624	574	530
36	7.069	0.75	867	788	722	666
42	9.621	0.875	1308	1189	1090	1006
54	15.904	1.125	2557	2325	2131	1967
60	19.635	1.25	3385	3077	2821	2604
66	23.758	1.375	4364	3967	3636	3357
72	28.274	1.5	5504	5004	4587	4234
78	33.183	1.625	6815	6195	5679	5242
84	38.485	1.75	8304	7549	6920	6388
90	44.17	1.875	9985	9078	8321	7681
96	50.266	2	11850	10780	9878	9119
102	56.745	2.125	13940	12670	11620	10720
108	63.617	2.25	16230	14760	13530	12490
114	70.882	2.375	18750	17040	15620	14420
120	78.54	2.5	21500	19540	17920	16540
126	86.59	2.625	24480	22260	20400	18830
132	95.033	2.75	27720	25200	23100	21330
138	103.87	2.875	31210	28370	26010	24010
144	113.1	3	34960	31780	29130	26890

* $C = (1.486/n)AR^{0.667}$

Source: American Concrete Pipe Association, Concrete Pipe Design Manual

- (c) From the point at which stormwater enters the drainage system at the inlet until it discharges at the outlet, it encounters a variety of hydraulic structures such as manholes, bends, enlargements, contractions and other transitions. These structures will cause head losses which are called "minor head losses."
- (d) The minor head losses are generally expressed in a form derived from the Bernoulli and Darcy-Weisbach Equations:

(Eq. 30-4)

$$h = KV^2/2g$$

Where,

h = velocity head loss, feet

K = coefficient for head loss

- (e) The following are minor head losses of hydraulic structures commonly found in a storm drainage system.

(1) Junction Losses

Equation 30-5 is used to determine the head loss at a junction of two (2) pipes, with the various conditions of the coefficient K_j given in **Table 30-4**.

(Eq. 30-5)

$$h_j = (V_2^2 - K_j V_1^2)/2g$$

Where,

V_1 = Velocity for inflowing pipe, ft/sec.

V_2 = Velocity for outflowing pipe, ft/sec.

K_j = Junction or structure coefficient of loss.

(2) Bend Losses

The minor head loss at a bend results from a distortion of the velocity distribution, thereby causing additional shear stresses within the fluid. The bend loss is considered to be that in excess of the loss for an equal length of straight pipe. The equation to compute the bend loss is:

(Eq. 30-6)

$$h_b = K_b V^2/2g$$

The coefficient K_b varies with the angle of the bend. **Table 30-4** below shows the different K_b coefficients used in bend losses.

Table 30-4: Junction or Structure Coefficient of Loss

Cases	Reference Figure	Description of Condition	Coefficient K_j
A	5-10	Manhole on Main Line with 45° Branch Lateral	0.5
B	5-10	Manhole on Main Line with 90° Branch Lateral	0.25
C	5-11	45° Wye Connection or cut-in	0.75
D	5-11	Inlet or Manhole at Beginning of Main Line or Lateral	1.25
E	5-11	Conduit on Curves for 90°* Curve radius = diameter Curve radius = (2 to 8) diameter Curve radius = (8 to 20) diameter	0.50 0.40 0.25
F	5-11	Bends where radius is equal to diameter 90° bend 60° bend 45° bend 22.5° bend Manhole on line with 60° Lateral Manhole on line with 22.5° Lateral	0.50 0.43 0.35 0.20 0.35 0.75

*Where bends other than 90 degrees are used, the 90 degree bend coefficient can be used with the following percentage factor applied: 60° Bend - 85%; 45° Bend - 70%; 22.5° Bend - 40%

Source: City of Austin Drainage Criteria Manual. Department of Public Works. Austin, Texas. January 1977.

(3) Transition Losses

The head losses resulting from sudden and gradual changes in the cross section or flow direction are included in this category. Four (4) transition losses are discussed here.

(A) Sudden Enlargement

Table 30-5 shows the coefficients used in the different cases for head losses due to a sudden enlargement.

(B) Gradual Enlargement

Table 30-6 shows the coefficients for calculating the head loss based on the angle of the cone transition.

(C) Sudden Contraction

Table 30-7 illustrates the values of coefficients in determining the head loss due to a sudden contraction.

(D) Gradual Contraction

The head losses due to a gradual contraction are determined by the following equation with a constant head loss coefficient.

(Eq. 30-12)

$$h_{gc} = 0.04V^2/2g$$

Where,

V= velocity for smaller pipe

Table 30-5: Values of K for Determining Loss of Head Due to Sudden Enlargement in Pipes, from the Formula $H = K (V^2/2g)$

d_2/d_1	Velocity, V, fps										
	2	3	4	5	6	7	8	10	12	15	20
1.2	0.11	0.1	0.1	0.1	0.1	0.1	0.09	0.09	0.09	0.09	0.09
1.4	0.26	0.26	0.25	0.24	0.24	0.24	0.24	0.23	0.23	0.22	0.22
1.6	0.4	0.39	0.38	0.37	0.37	0.36	0.36	0.35	0.35	0.34	0.33
1.8	0.51	0.49	0.48	0.47	0.47	0.46	0.46	0.45	0.44	0.43	0.42
2	0.6	0.58	0.56	0.55	0.55	0.54	0.53	0.52	0.52	0.51	0.5
2.5	0.74	0.72	0.7	0.69	0.68	0.67	0.66	0.65	0.64	0.63	0.62
3	0.83	0.8	0.78	0.77	0.76	0.75	0.74	0.73	0.72	0.7	0.69
4	0.92	0.89	0.87	0.85	0.84	0.83	0.82	0.8	0.79	0.78	0.76
5	0.96	0.93	0.91	0.89	0.88	0.87	0.86	0.84	0.83	0.82	0.8
10	1.00	.99	.96	.95	.93	.92	.91	.89	.88	.86	.84
	1.00	1.00	.98	.96	.95	.94	.93	.91	.90	.88	.86

V = velocity in smaller pipe

d_2/d_1 = ratio of diameter of larger pipe to diameter of smaller pipe

Source: Brater, E.F. and H.W. King. Handbook of Hydraulics, 1976

Table 30-6: Values of K for Determining Loss of Head Due to Gradual Enlargement in Pipes from the Formula $H = K (V^2/2g)$

d_2/d_1	Angle of cone*													
	2°	4°	6°	8°	10°	15°	20°	25°	30°	35°	40°	45°	50°	60°
1.1	0.01	0.01	0.01	0.02	0.03	0.05	0.1	0.13	0.16	0.18	0.19	0.2	0.21	0.23
1.2	0.02	0.02	0.02	0.03	0.04	0.09	0.16	0.21	0.25	0.29	0.31	0.33	0.35	0.37
1.4	0.02	0.03	0.03	0.04	0.06	0.12	0.23	0.3	0.36	0.41	0.44	0.47	0.5	0.53
1.6	0.03	0.03	0.04	0.05	0.07	0.14	0.26	0.35	0.42	0.47	0.51	0.54	0.57	0.61
1.8	0.03	0.04	0.04	0.05	0.07	0.15	0.28	0.37	0.44	0.5	0.54	0.58	0.61	0.65
2	0.03	0.04	0.04	0.05	0.07	0.16	0.29	0.38	0.46	0.52	0.56	0.6	0.63	0.68
2.5	0.03	0.04	0.04	0.05	0.08	0.16	0.3	0.39	0.48	0.54	0.58	0.62	0.65	0.7
3	.03	.04	.04	.05	.08	.16	.31	.40	.48	.55	.59	.63	.66	.71
	.03	.04	.04	.06	.08	.16	.31	.40	.49	.56	.60	.64	.67	.72

*Angle of cone is twice the angle between the axis of the cone and its side

V = velocity in smaller pipe

d_2/d_1 = ratio of diameter of larger pipe to diameter of smaller pipe

Source: Brater, E.F. and H.W. King. Handbook of Hydraulics, 1976

Table 30-7: Values of K for Determining Loss of Head Due to Sudden Contraction in Pipe From the Formula $H = K(V^2/2g)$

d_2/d_1	Velocity, V in feet per second										
	2	3	4	5	6	7	8	10	12	15	20
1.1	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.5
1.2	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.09
1.4	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.18
1.6	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.25	0.25
1.8	0.34	0.34	0.34	0.34	0.34	0.34	0.33	0.33	0.32	0.32	0.31
2	0.38	0.38	0.37	0.37	0.37	0.37	0.36	0.36	0.35	0.34	0.33
2.2	0.4	0.4	0.4	0.39	0.39	0.39	0.39	0.38	0.37	0.37	0.35
2.5	0.42	0.42	0.42	0.41	0.41	0.41	0.4	0.4	0.39	0.38	0.37
3	0.44	0.44	0.44	0.43	0.43	0.43	0.42	0.42	0.41	0.4	0.39
4	0.47	0.46	0.46	0.46	0.45	0.45	0.45	0.44	0.43	0.42	0.41
5	0.48	0.48	0.47	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.42
10	0.49	.48	.48	.48	.48	.47	.47	.46	.46	.45	.43
	0.49	.49	.48	.48	.48	.47	.47	.47	.46	.45	.44

V = velocity in smaller pipe

d_2/d_1 = ratio of diameter of larger pipe to diameter of smaller pipe

Source: Brater, E.F. and H.W.King. *Handbook of Hydraulics*, 1976

30.1.4. MANHOLES & JUNCTION BOXES

Manholes or junction boxes with manholes provide very important access points for maintenance purposes. Due to equipment restraints, every point within the storm drain must be a maximum of two hundred fifty (250) feet from an access point for storm drains thirty (30) inches in diameter or smaller. For storm drains greater than thirty (30) inches in diameter, manholes shall be placed so that there is a maximum distance of three hundred (300) feet to an access point. Inlets and storm drain outfalls may be considered as access points for maintenance purposes. Access points must provide a maintenance path within the storm drain that has no more than one horizontal bend, with that bend having a deflection of no more than forty-five (45) degrees in the direction of the maintenance path, and no vertical bend with a deflection of greater than five (5) degrees. Storm drain slope adjustments of less than five (5) degrees are not subject to this requirement. The following design requirements should also be met.

- (a) Manholes or junction boxes with manholes shall be located where two or more laterals intersect the main line within five (5) feet of each other.
- (b) Manholes or junction boxes with manholes shall be placed at locations where changes in pipe size occur.

- (c) Manholes or junction boxes shall be constructed at locations of laterals, changes in grade or alignment of pipes.
- (d) The riser should have a manhole ring with a locking or bolted cover and with an inside diameter of thirty (30) inches for maintenance access.
- (e) The inside wall of a junction box must be a minimum of the outside diameter of the pipe, plus six (6) inches on each side of the pipe. If the pipe is at a skew to the junction box wall, additional distance is required.
- (f) When an upstream conduit is smaller than the downstream conduit, it is preferable to match conduit soffits, unless the upstream conduit needs to miss a conflict such as a utility or minimum conduit cover.

30.1.5. DEPTH OF COVER

The design of storm drains for areas that will or could receive vehicular traffic or that will be subject to other loading must be supported by structural engineering calculations or references to structural engineering standards.

30.1.6. STORM DRAIN OUTFALLS INTO OPEN CHANNELS

- (a) The outfall of a storm drain system should be to an existing or proposed channel. The discharge velocity from the outfall should not cause erosion to the existing or proposed channel. Velocity controls should be used when erosion is possible of the existing or proposed channel. The outfall of the storm drain should be positioned in the existing or proposed channel in the downstream direction to reduce turbulence and erosion. The design engineer should meet with the City Engineer to discuss a solution, if a defined channel does not exist for the discharge of the outfall.
- (b) Should the discharge from an outfall cross a sidewalk area, discharge will not be allowed over the sidewalk. A channel section will be provided under the sidewalk.
- (c) The velocity at the end of the outlet structure should be a maximum of six (6) ft/sec. Sandy soils may require a discharge velocity less than six (6) ft/sec. The design engineer should be aware of the types of soils at the outfall location and design accordingly.
- (d) Energy dissipation at the outlet may be required to prevent erosion of the channel bottom and banks. The use of baffle blocks, USBR Type VI impact basin, Contra Costa Basin, and mortared rock riprap aprons may be used to reduce the velocity of the discharge from the storm drain conduit.

Section 31. OPEN CHANNELS

31.1. GENERAL

- (a) Open channels for use in a major drainage system have significant advantages related to cost, capacity, multiple use for recreational and aesthetic purposes and potential for detention storage. Disadvantages include right of way needs and maintenance costs. Careful planning and design are needed to minimize the disadvantages and to increase the benefits.

(b) The general classifications for open channels are: (1) Natural channels, which include all watercourses that have been carved by nature through erosion; and (2) New or altered channels, which are constructed or existing channels that have been significantly altered by human effort. New or altered channels can be lined with grass, concrete, mortared rocks or other materials. The channels should be designed for the 25-year storm with provisions for the 100-year storm within dedicated easements or right of way.

(1) NATURAL CHANNELS

The ideal natural channel has the following benefits:

- (A) Velocities are usually low, resulting in longer concentration times and lower downstream peak flows.
- (B) Maintenance needs are usually low because the channel is somewhat stabilized.
- (C) The channel provides a desirable green belt and recreational area, adding significant social benefits.

(2) NEW OR ALTERED CHANNELS

Grass channels are the most desirable of the various types of new channels for the following reasons:

- (A) The grass can stabilize the body of the channel.
- (B) The grass consolidates the soil mass of the bed.
- (C) The grass controls the movement of soil particles along the channel bottom.

Concrete-lined channels are designed to protect the channel body from the erosive potential of high velocities. In addition to concrete-lined channels, other methods to combat erosive velocities in channels may be available and should be submitted to the City Engineer for review.

(3) SECTION 404 PERMIT

When a project to modify a natural channel is proposed, the design engineer should check the requirements of Section 404, Permits for Dredged or Fill Material, of the Clean Water Act. If required, a permit should be obtained from the U.S. Army Corps of Engineers by the design engineer.

31.1.1. OPEN CHANNEL HYDRAULICS

- (a) An open channel is a conduit in which water flows with a free surface. The classification of open channel flow is made according to the change in flow depth with respect to time and space.
- (b) Flow in an open channel is said to be "steady" if the depth of flow does not change or if it can be assumed to be constant during the time interval under consideration. The flow is "unsteady" if the depth changes with time.
- (c) Open channel flow is said to be "uniform" if the depth of flow is the same at every section of the channel. A uniform flow may theoretically be steady or unsteady, depending on whether the depth changes with time. The establishment of unsteady uniform flow requires that the water surface fluctuates with time while remaining parallel to the channel bottom. Since it is impossible for this condition to occur within a channel, steady uniform flow is the fundamental type of flow treated in open channel hydraulics.
- (d) Flow is "varied" if the depth of flow changes along the length of the channel. Varied flow may be either steady or unsteady. Since unsteady uniform flow is rare, the term "unsteady flow" is used to designate unsteady varied flow exclusively.
- (e) Varied flow may be further classified as either "rapidly" or "gradually" varied. The flow is rapidly varied if the depth changes abruptly over a comparatively short distance; otherwise, it is gradually varied. Rapidly varied flow is also known as a local phenomenon; an example of which is the hydraulic jump.
- (f) With these varying conditions, open channel hydraulics can be very complex, encompassing many different flow conditions from steady uniform flow to unsteady rapidly varied flow. Most of the problems in stormwater drainage involve uniform, gradually varied or rapidly varied flow situations. In this Section, the basic equation and computational procedures for uniform, gradually varied and rapidly varied flows are presented.

(1) Uniform Flow

For a given channel condition of roughness, discharge and slope, there is only one (1) possible depth for maintaining a uniform flow. This depth is referred to as normal depth. The Manning's Equation is used to determine the normal depth for a given discharge.

$$Q = \left(\frac{1.49}{n} \right) A R^{2/3} S^{1/2}$$

Where,

Q = Total discharge, cfs

n = Roughness coefficient

A = Cross-sectional area of channel, ft²

R = Hydraulic radius of channel, feet ($R=A/P$)

S = Slope of the frictional gradient, ft/ft

P = Wetted perimeter, feet

Uniform flow is more often a theoretical abstraction than an actuality. True uniform flow is difficult to find in nature or to obtain in the laboratory. The Engineer must be aware of the fact that uniform flow computations provide only an approximation of what will occur but that such computations are usually adequate and useful and, therefore, necessary for planning.

(A) Gradually Varied Flow

- (i) The most common example of gradually varied flow in urban drainage systems occurs in the backwater of bridge openings, culverts, storm sewer inlets and channel constrictions. Under these conditions, gradually varied flow will be created, and the flow depth will be greater than normal depth in the channel. Backwater techniques would need to be applied to determine the water surface profile.
- (ii) Calculations of water surface profiles can be accomplished by using standard backwater methods or acceptable computer routines, which take into consideration all losses due to changes in velocity, drops, bridge openings and other obstructions in open channels.
- (iii) There are several acceptable methods for backwater calculations. The most common hand calculation method for prismatic channels and irregular-uniform channels is the Standard Step Method. The most widely used backwater analysis computer program is HEC-2, developed by the U.S. Army Corps of Engineers. This program can compute water surface profiles for natural and new channels.

(B) Rapidly Varied Flow

Rapidly varied flow is characterized by abrupt changes in the water surface elevation for a constant flow. The change in elevation may become so abrupt that the flow profile is virtually broken, resulting in a state of high turbulence.

Some common causes of rapidly varied flow in urban drainage systems are side-spill weirs, weirs and spillways of detention basins.

31.1.2. MANNING'S ROUGHNESS COEFFICIENTS

(a) Existing And Natural Channels

- (1) Because several primary factors affect the roughness coefficient, a procedure has been developed to estimate this value, n . By this procedure, the value of n may be computed by:

(Eq. 31-2)

$$n = (n_0 + n_1 + n_2 + n_3 + n_4) m$$

- (2) Where n_0 is a basic n value for a straight, uniform, smooth channel in the natural materials involved, n_1 is a value added to n_0 to correct for the effect of surface irregularities; n_2 is a value for variations in shape and size of the channel cross section; n_3 is a value for obstructions; n_4 is a value for vegetation and flow conditions; and m is a correction factor for meandering of the channel. Proper values of n_0 to n_4 and m may be selected from **Table 31-1** according to the given conditions.
- (3) In selecting the value of n_1 , the degree of irregularity is considered smooth for surfaces comparable to the best attainable for the materials involved; minor for good dredged channels, slightly eroded or scoured side slopes of canals or drainage channels; moderate for fair to poor dredged channels, moderately sloughed or eroded side slopes of canals or drainage channels; and severe for badly sloughed banks of natural streams, badly eroded or sloughed sides of canals or drainage channels, and unshaped, jagged and irregular surfaces of channels excavated in rock.
- (4) In selecting the value of n_2 , the character of variations in size and shape of cross section is considered gradual when the change in size or shape occurs gradually; alternating occasionally when large and small sections alternate occasionally or when shape changes cause occasional shifting of main flow from side to side; and alternating frequently when large and small sections alternate frequently or when shape changes cause frequent shifting of main flow from side to side.
- (5) The selection of the value of n_3 is based on the presence and characteristics of obstructions such as debris deposits, stumps, exposed roots, boulders and fallen and lodged logs. One should recall that conditions considered in other steps must not be reevaluated or double-counted in this selection. In judging the relative effect of obstructions, consider the following: the extent to which the obstructions occupy or reduce the average water area, the obstruction characteristics (sharp-edged or angular objects induce greater turbulence than curved, smooth-surfaced objects) and the position and spacing of obstructions transversely and longitudinally in the reach under consideration.

Table 31-1: Computation of Composite Roughness Coefficient For Excavated and Natural Channels
 $n = (n_0 + n_1 + n_2 + n_3 + n_4)m$

Channel Conditions		Values
n_0 - Material Involved	Earth	0.020
	React	0.025
	Fine Gravel	0.024
	Coarse Gravel	0.028
n_1 - Degree of Irregularity	Smooth	0.000
	Minor	0.005
	Moderate	0.010
	Severe	0.020
n_2 - Relative Effect of Channel Cross Section	Gradual	0.000
	Alternating Occasionally	0.005
	Alternating Frequently	0.013
n_3 - Relative Effect of Obstructions	Negligible	0.000
	Minor	0.013
	Appreciable	0.025
	Severe	0.050
n_4 - Vegetation	Low	0.008
	Medium	0.018
	High	0.038
	Very High	0.075
m - Degree of Meandering	Minor	1.000
	Appreciable	1.150
	Severe	1.300

Source: Chow, V.T. *Open Channel Hydraulics*, 1959.

- (6) In selecting the value of n_4 , the degree of effect of vegetation is considered in the following way:

(A) Low

For conditions comparable to the following

- (i) Dense growths of flexible turf grasses or weeds, of which Bermuda and blue grasses are examples, where the average depth of flow is two (2) to three (3) times the height of vegetation

- (ii) Supple seedling tree switches, such as willow, cottonwood or salt cedar where the average depth of flow is three (3) to four (4) times the height of the vegetation.

(B) Medium

For conditions comparable to the following

- (i) Turf grasses where the average depth of flow is one (1) to two (2) times the height of vegetation
- (ii) Stemmy grasses, weeds or tree seedlings with moderate cover where the average depth of flow is two (2) to three (3) times the height of vegetation and brush growths, moderately dense, similar to willows one (1) to two (2) years old, dormant season, alongside slopes of a channel with no significant vegetation along the channel bottom, where the hydraulic radius is greater than two (2) feet.

(C) High

For conditions comparable to the following:

- (i) Turf grasses where the average depth of flow is about equal to the height of vegetation

(ii) Dormant season

Willow or cottonwood trees eight (8) to ten (10) years old, intergrown with some weeds and brush, where none of the vegetation is in foliage, where the hydraulic radius is greater than two (2) feet

(iii) Growing season

Bushy willows about one (1) year old intergrown with some weeds in full foliage alongside slopes, no significant vegetation along channel bottom, where hydraulic radius is greater than two (2) feet.

(D) Very High

For conditions comparable to the following:

- (i) Turf grasses where the average depth of flow is less than half ($\frac{1}{2}$) the height of vegetation

(ii) Growing season

Bushy willows about one (1) year old, intergrown with weeds in full foliage alongside slopes, or dense growth of cattails along channel bottom, with any value of hydraulic radius up to ten (10) or fifteen (15) feet

(iii) Growing season

Trees intergrown with weeds and brush, all in full foliage, with any value of hydraulic radius up to ten (10) or fifteen (15) feet.

- (7) In selecting the value of m , the degree of meandering depends on the ratio of the meander length to the straight length of the channel reach. The meandering is considered minor for ratios of one (1.0) to one point two (1.2), appreciable for ratios of one point two (1.2) to one point five (1.5), and severe for ratios of one point five (1.5) and greater.
- (8) In applying the above method for determining the n value, several things should be noted. The method does not consider the effect of suspended and bed loads. The values given in **Table 31-1** were developed from a study of some forty (40) to fifty (50) cases of small and moderate channels. Therefore, the method is questionable when applied to large channels whose hydraulic radii exceed fifteen (15) feet. The method applies only to unlined natural streams, floodways, and drainage channels and shows a minimum value of 0.02 for the n value of such channels. The minimum value of n in general, however, may be as low as 0.012 in lined channels and as low as 0.008 in artificial laboratory flumes.

(b) New Or Altered Channels

The Manning's Roughness Coefficients (n) for new or altered channels are shown in **Table 31-2**.

31.1.3. DESIGN REQUIREMENTS

Channel design involves the determination of the channel cross-section required to accommodate a given design discharge. The design requirements for open channels are discussed in the sections below and apply to channels or waterways that are proposed to be modified or constructed.

(a) Grass-Lined Channels And Waterways

Key parameters in grass-lined channel or waterway design include permissible velocity, roughness coefficient, side slope, curvature, bottom width, and freeboard. The grass species selected shall be suitable for permanent application based upon the anticipated operation and maintenance of the channel or waterway.

(1) Velocity

The maximum permissible velocity for the 100-year storm is six (6) feet per second and includes all transitions to or from channels and waterways with similar or different materials. In all cases, the velocity for the 100-year storm must be non-erosive. The minimum permissible velocity for the 2-year storm is two (2) feet per second.

(2) Roughness Coefficient

The roughness coefficients selected shall be based on the degree of retardance of vegetation. **Table 31-2** provides minimum Manning's Coefficients for channel design. The roughness coefficient shall be adjusted to reflect the relationship between the depth of flow and the typical height of the design vegetation, especially for shallow depths of flow, as well as other factors affecting channel conveyance.

(3) Slope

The flow line slope of the channel shall be a minimum of two percent (2%) unless the velocity for the 2-year storm flow is greater than two (2) feet per second, in which case the channel slope may be a minimum of one percent (1%). Compliance with this requirement must take into account the variation in channel flow due to distributed inflows to the channel. A reinforced concrete pilot channel must be used if the channel slope is less than one percent (1%). The pilot channel must be at least four (4) feet wide, two (2) inches deep, and be capable of withstanding vehicular loading. Any grass-lined portion of the channel bottom must have a slope of at least two percent (2%) from that portion to the concrete-lined pilot channel. However, no open channel flow line slope may be less than zero point five percent (0.5%).

(4) Side Slopes

Side slopes shall be four (4) to one (1) (4:1) or flatter for channels over three (3) feet deep and three (3) to one (1) (3:1) or flatter for channels less than or equal to three (3) feet deep.

(5) Curvature

The center line curvature shall have a minimum radius of twice the top width of the 100-year storm flow.

(6) Bottom Width

The minimum flat bottom width of the channel is three (3) feet.

(7) Freeboard

All grass-lined channels shall be designed to convey the one hundred (100) year storm event. The freeboard for the channel shall be the velocity head for the one hundred (100) year storm or one foot, whichever is greater.

(b) Concrete-Lined Channels

Concrete-lined channels may be needed in channel reaches where the velocities are excessive or where the channel characteristics require such use.

(1) Velocity

In concrete-lined channels the probability of achieving supercritical flow is greatly increased. The designer must take care to insure against the possibility of unanticipated hydraulic jumps forming in the channel in considering the 25- and 100-year storms. Flow with a Froude number equal to one (1) is unstable and should be avoided. If supercritical flow does occur, then freeboard and superelevation must be determined. In addition, all channels carrying supercritical flow shall be continuously lined with reinforced concrete.

(2) Roughness Coefficient

Table 31-2 provides the Manning's Coefficients for concrete-lined channels.

(3) Freeboard

Adequate channel freeboard shall be provided for the 100-year storm in reaches flowing at critical depth by **Equation 31-3** or using the energy grade line, whichever is less.

(Eq. 31-3)

$$H_{FB} = 2.0 + 0.025V(d)^{1/3}$$

Where,

H_{FB} = Freeboard height, ft

V = Velocity, ft/sec

d = Depth of flow, ft

Freeboard shall be in addition to superelevation, standing waves and/or other water surface disturbances. Concrete side slopes shall be extended to provide freeboard. Freeboard shall not be obtained by the construction of levees.

(4) Superelevation

Superelevation of the water surface shall be determined at all horizontal curves which deviate more than forty-five (45) degrees off the projected centerline. An approximation of the superelevation at a channel bend can be obtained from the following equation:

(Eq. 31-4)

$$h = V^2 T_w / g r_c$$

Where,

h = Superelevation, ft

V = Flow velocity, ft/sec

T_w = Top width of channel, ft

r_c = Centerline radius of curvature, ft

g = Acceleration due to gravity, ft/sec²

The freeboard shall be measured above the superelevation water surface.

(5) Side Slope

Since concrete lined channels do not require slope maintenance, the side slopes may be as steep as vertical with appropriate structural methods applied.

(6) Slope

The flow line slope of the channel shall be no less than zero point five (0.5) percent and must also be sufficient to produce a velocity for the two (2) year storm flow of at

least two (2) feet per second. Compliance with this requirement must take into account the variation in channel flow due to distributed inflows to the channel.

(c) Other Channels

Channels composed of materials other than vegetation or concrete shall be designed so that sediment deposition does not occur for the 2-year storm (except for channel drop structures and energy dissipators as approved by the City) and velocities for the 100-year storm are not erosive, using methods as approved by the City Engineer.

31.1.4. CHANNEL DROP STRUCTURES

The function of a drop structure is to reduce channel velocities by allowing for flatter upstream and downstream channel slopes.

The flow velocities in the upstream and downstream channels of the drop structure need to satisfy the permissible velocities allowed for channels. The design parameters for the sloping channel drop and the vertical channel drop are given below.

(a) SLOPING CHANNEL DROP

- (1) *Approach Apron*- A minimum ten (10) foot long riprap apron should be constructed immediately upstream of the drop to protect against the increasing velocities and turbulence which result as the water approaches the sloping portion of the drop structure. The same riprap and bedding design should be used as specified for the portion of the drop structure immediately downstream of the drop.
- (2) *Chute*- The chute shall have roughened faces and shall be no steeper than two (2) to one (1) (2:1). The length, L, of the chute depends upon the hydraulic characteristics of the channel and drop. For a unit discharge, q, of thirty (30) cubic feet per second per foot, L would be about fifteen (15) feet, that is, about one-half ($\frac{1}{2}$) of the q value. The L should not be less than ten (10) feet, even for low q values. Placed
- (3) *Downstream Apron*- The length of the downstream apron shall be sized according to **Table 30-15** and shall be constructed of reinforced concrete or riprap depending on structural requirements.

Table 31-2: Minimum Roughness Coefficients of New or Altered Channels

Type of Channel and Description	Manning's Coefficients
1. Grass Lined	
a. Bermuda (with regular mowing)	0.040
b. St. Augustine (with regular mowing)	0.045
c. Native grasses and vegetation not	0.060
2. Concrete	
a. Concrete lined (rough finish)	0.020
b. Concrete lined (smooth finish-culverts)	0.015
c. Concrete rip-rap (exposed rubble)	0.025
3. Gabion	0.035
4. Rock-cut	0.025

Source: 1. Chow, V.T. *Open Channel Hydraulics*. 1959. / 2. WRC Engineering, Inc. *Boulder County Storm Drainage Criteria Manual*. 1984.

Table 31-3: Length of Downstream Apron

Maximum Unit Discharge, q (cfs/ft)	Length of Downstream Apron, L_b (ft)
0-14	10
15	15
20	20
25	20
30	25

Source: City of Austin, Watershed Engineering Division.

(b) VERTICAL CHANNEL DROPS

- (1) The design criteria for the vertical channel drop is based upon the height of the drop and the normal depth and velocity of the approach and exit channels. The channel must be prismatic throughout, from the upstream channel through the drop to the downstream channel.
- (2) The steepest allowable side slope for the riprap stilling basin is four (4) to one (1) (4:1). The riprap should extend up the side slopes to a depth equal to one (1) foot above the normal depth projected upstream from the downstream channel. The

maximum fall allowed at any one drop structure is four (4) feet from the upper channel bottom to the lower channel bottom.

(3) A description of the drop structure and the design procedure, going from upstream to downstream, is given below.

(A) Approach Channel

The upstream and downstream channels will normally be grass lined trapezoidal channels.

(B) Approach Apron

A minimum ten (10) foot long riprap apron is provided upstream of drop to protect against the increasing velocities and turbulence which result as the water approaches the vertical drop.

(C) Chute Apron

The riprap stilling basin is designed to force the hydraulic jump to occur within the basin and is designed for essentially zero scour.

31.1.5. ENERGY DISSIPATORS

- (a) Energy dissipators are used to dissipate excessive kinetic energy in flowing water that could promote erosion. An effective energy dissipator must be able to retard the flow of fast-moving water without damage to the structure or to the channel below the structure.
- (b) Impact-type energy dissipators direct the water into an obstruction that diverts the flow in many directions and in this manner dissipates the energy in the flow. Baffled outlets and baffled aprons are two (2) impact-type energy dissipators.
- (c) Other energy dissipators use the hydraulic jump to dissipate the excess head. In this type of structure, water flowing at a higher than critical velocity is forced into a hydraulic jump, and energy is dissipated in the resulting turbulence. Stilling basins are this type of dissipator, where energy is diffused as flow plunges into a pool of water.
- (d) Generally, the impact-type of energy dissipator is considered to be more efficient than the hydraulic jump-type. Also, the impact-type energy dissipator results in smaller and more economical structures.
- (e) The design of energy dissipators is based on the empirical data resulting from a comprehensive series of model structure studies by the U.S. Bureau of Reclamation, as detailed in its book Hydraulic Design of Stilling Basins and Energy Dissipators, 1984. Two (2) impact-type energy dissipators are briefly explained here.

(1) Baffled Apron (U.S. Bureau Of Reclamation Type IX)

- (A) Baffled aprons are used to dissipate the energy in the flow at a drop. They require no initial tailwater to be effective, although channel bed scour is not as deep and is less extensive when the tailwater forms a pool into which the flow discharges. The chutes are constructed on a slope that is two (2) to one (1) (2:1) or flatter and extends below the channel bottom. Backfill is placed

over one (1) or more bottom rows of baffles to restore the original streambed elevation. When scour or downstream channel degradation occurs, successive rows of baffle piers are exposed to prevent excessive acceleration of the flow entering the channel. If degradation does not occur, the scour creates a stilling pool at the downstream end of the chute, stabilizing the scour pattern.

(B) The general rules of hydraulic design of a baffled apron are as follows:

(i) Design Discharge

The chute should be designed for the full capacity expected to be passed through the structure. The maximum unit discharge may be as high as sixty (60) cfs per foot for the 100-year storm.

(ii) Chute Entrance

The flow entering the chute should be well distributed laterally across the width of the chute. The velocity should be below the critical velocity, the critical velocity in a rectangular channel, $V_c = (gq)^{1/3}$.

(iii) Chute Design

The chute is usually constructed on a 2:1 slope. The upstream end of the chute floor should be joined to the horizontal floor by a curve to prevent excessive vertical contraction of the flow. The upstream face of the first row should be no more than one (1) foot (vertically) below the high point of the chute.

(C) Based on the results of U.S. Bureau of Reclamation experiments, the greatest tendency to overtop the training walls occurs in the vicinity of the second and third rows of baffles. To prevent this overtopping, a partial baffle (1/3 to 2/3 of the width of a full baffle) should be placed against the training walls in the first row. This will place a space of the same width adjacent to the walls in the second row. Alternate rows are then made identical (i.e., rows 1, 3, 5, 7, etc., are identical; rows 2, 4, 6, 8, etc., are identical). Four (4) rows of baffles are necessary to establish the expected flow pattern at the base of the chute.

(D) The height of the training walls on the chute should be three (3) or more times the baffle height, measured normal to the chute floor. Several rows of baffle piers are usually constructed below the channel grade to establish full control of the flow. At least one (1) row of baffles should be buried in the backfill which is used to restore the original bottom topography.

(i) *Heights and Spacing of Baffle Pier*- Baffle pier height, H , should be about eight tenths (0.8) D_c to nine tenths (0.9) D_c . D_c is the critical depth in a rectangular channel and determined by:

$$D_c = (q^2/g)^{1/3}$$

- (E) Baffle pier widths and spaces should be equal, up to 1.5H but no less than H. The slope distance between rows of baffle piers should be 2H, twice the baffle height.

(2) Baffled Outlet

Baffled outlets are used to dissipate the discharge energy from flow in a pipe. They are normally used at outlets from detention ponds or storm drainage systems. The baffles are intended to decrease the discharge velocities and subsequent erosion of the receiving system.

31.1.6. STRUCTURE AESTHETICS

The design of hydraulic structures in the urban environment requires an approach not encountered elsewhere because appearance must be an integral part of the design. The treatment of the exterior appearance should not be considered of minor importance.

(a) Parks

Hydraulic structures should not detract from the pleasures enjoyed in an urban park. Furthermore, parks and green belts may later be developed in an urban area in which the structure will play a dominant environmental role.

(b) Play Areas

An important consideration is that drainage structures often are an attraction for neighborhood children. It is almost impossible to make drainage works inaccessible to children, and therefore what is constructed should be made as safe as is reasonably possible. Hazards to children's safety should be avoided whenever possible.

(c) Concrete Surface Treatment

The use of textured concrete presents a pleasing appearance and removes form marks. Exposed aggregate concrete is also attractive but may require special control of the aggregate used in the concrete.

(d) Rails and Fences

The use of rails and fences along concrete walls provides a pleasing topping to an otherwise stark wall yet provides a safety measure against the hazard of falling from an unprotected wall.

31.1.7. SUPPLEMENTAL SECTION

(a) ALTERNATIVE NEW CHANNEL DESIGN

The following is a description of the cross-sectional characteristics of an alternative channel design to be applied at the engineer's discretion but is in no way a requirement.

- (1) A pilot channel designed to carry the 10-year storm shall be calculated with Manning's "n" values in accordance with **Table 30-14**. This channel is designed to separate the more frequent 10-year storm via an unobstructed pilot channel. Side slopes of the pilot channel shall not exceed 3:1 slope gradient and shall have a bottom width of no less than six (6) feet. The remaining cross-sectional area is designed to convey the additional storm flows up to the 100-year storm. This upper platform will accommodate vegetation with minimal maintenance requirements.
- (2) The ultimate 100-year floodplain shall be contained within overbanks on each side of the pilot channel. These overbanks shall be a minimum width of ten (10) feet and have a slope gradient not to exceed 6:1. The overbanks shall be stabilized with the seeds of grasses, native wildflowers and native woody species appropriate to riparian habitat and with blanket products. In calculating Manning's "n" values for the overbanks, reference must be made to **Tables 30-14 and 30-15** with the following assumptions:
 - (A) Heavily wooded and brushy overbanks; and
 - (B) Bank irregularities, which can be reasonably expected from occasional, moderate erosion.

Section 32. CULVERTS AND BRIDGES

32.1. GENERAL

The function of a drainage culvert or bridge is to pass the design storm flow without causing excessive backwater or overtopping of the structure and without creating excessive downstream velocities. The designer shall keep energy losses and discharge velocities within allowable limits when selecting a structure that will meet these requirements. The design storm flow shall be determined by the hydrologic methods as set forth in **Section 2** of this Manual. **The system shall accommodate the runoff from a 100 year frequency storm meeting the limitations for overflows at bridges and culverts set forth in Section 1.2.4C. and 1.2.4D. of this Manual**

- (a) For bridges and culverts in residential areas, runoff from the 100-year frequency flow shall not produce a headwater elevation at the roadway greater than either twelve (12) inches above the roadway crown elevation or any top of upstream curb elevation, whichever is lower.
- (b) For bridges and culverts in streets other than a residential street, runoff from the 100- year frequency storm shall not produce a headwater elevation at the roadway greater than six (6) inches above the roadway crown elevation or six (6) inches above any upstream curb elevation, whichever is lower.

32.2. CULVERT HEADWALLS & ENDWALLS

32.2.1. GENERAL

The normal functions of properly designed headwalls and endwalls are to anchor the culvert to prevent movement due to hydraulic and soil pressures, to control erosion and scour resulting from excessive velocities and turbulence, and to prevent adjacent soil from sloughing into the waterway opening. All headwalls shall be constructed of reinforced concrete and may be either straight-parallel, flared or warped. They may or may not require aprons, as determined by site conditions. Headwalls should be aligned with the direction of the receiving flow when discharging into a waterway. Precast headwalls and endwalls may be used if all other criteria are satisfied; generally precast headwalls/endwalls are available for smaller culverts (18 and 24 inches diameter).

32.2.2. CONDITIONS AT ENTRANCE

The operating characteristics of a culvert may be completely changed by the shape or condition at the inlet or entrance. Therefore, design of culverts must involve consideration of energy headlosses that may occur at the entrance. Entrance head losses may be determined by Equation 32-1:

(Eq. 32-1)

$$H_e = K_e(V_2^2 - V_1^2)/2g$$

Where,

H_e = Entrance head loss

K_e = Entrance loss coefficient as shown in Table 32-1

V_2 = Velocity of flow in culvert, ft/sec

V_1 = Velocity of flow approaching culvert, ft/sec

g = Acceleration due to gravity, ft/s²

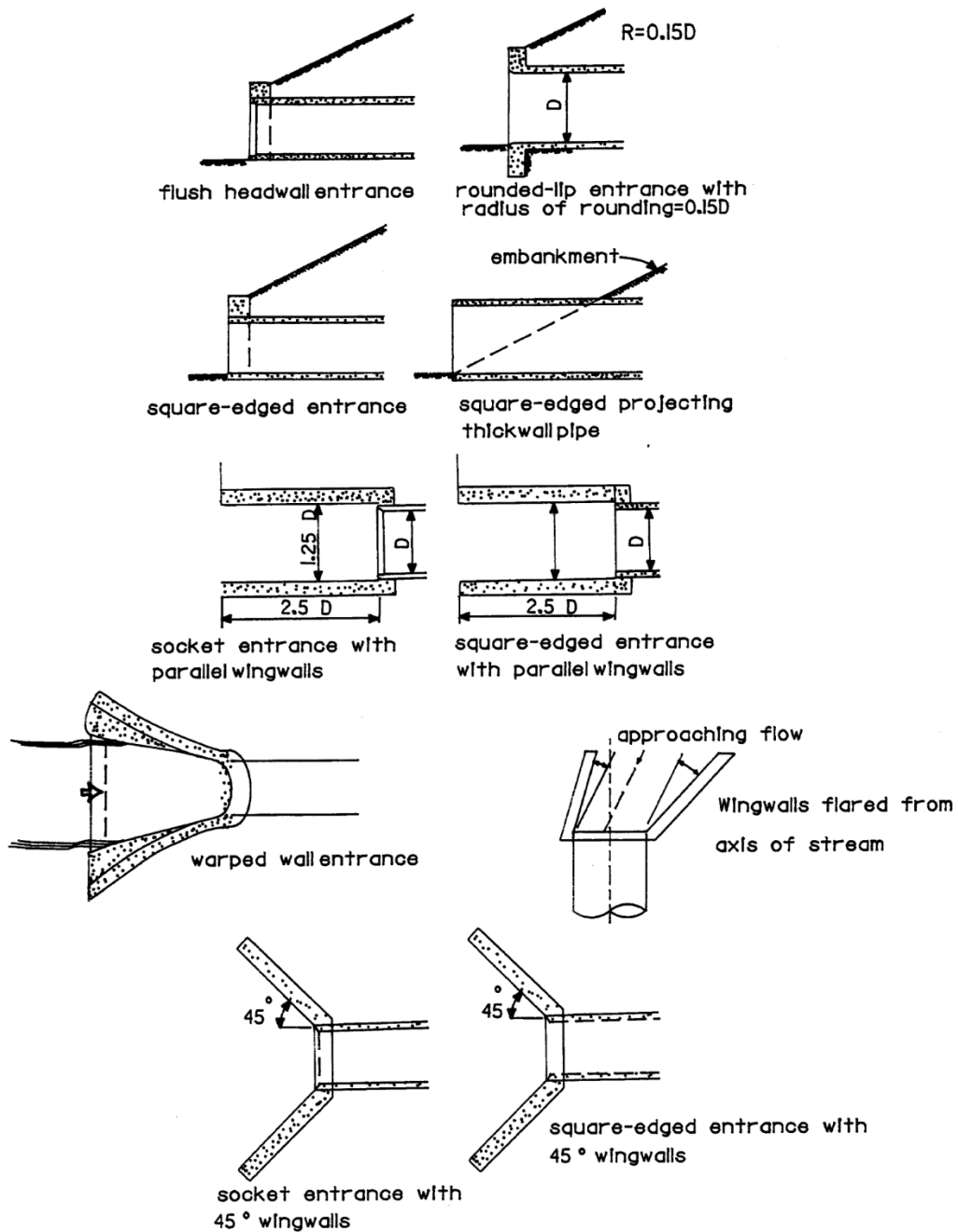
32.2.3. TYPES OF HEADWALL

The common types of headwall entrances are shown in Figure 32-1, but are not limited to the designs shown there. The following guidelines can be used in the selection of the type of headwall. Approach velocities are measured immediately upstream of the headwall under normal operating conditions.

- (a) Parallel Headwall
 - (1) Approach velocities are low (below six (6) feet per second).
 - (2) Backwater pools are permitted.
- (b) Flared Headwall
 - (1) Approach velocities are between six (6) and ten (10) feet per second.
 - (2) Ample right of way or easement is available.

- (3) The wings of flared walls should be located with respect to the direction of the approaching flow, not the culvert axis as in Figure 32-1.
- (c) Warped Headwall
 - (1) Approach velocities are between eight (8) and twenty (20) feet per second.
 - (2) Warped headwalls are effective with aprons to accelerate flow through the culvert.

Figure 32-1: Common Types of Headwall Entrances



Source: City of Austin, Watershed Management Division

32.2.4. LOSS COEFFICIENTS

The entrance loss coefficients for culvert(s) should be determined from Table 32-1 and entered into the HEC-RAS Culvert Data Editor. Typical exit loss coefficients for culverts range from 0.3 to 1.0, but are normally set at 1.0. Field survey data and construction drawings should be used to determine the remaining culvert geometric data required by HEC-RAS.

Table 32-1: Culvert Entrance Loss Coefficients

Type of Structure and Configuration of Entrance	Entrance Coefficient (K_e)
Pipe Culverts	
Projecting from Fill (No Headwall or Wingwalls)	
Grooved Edge	0.25
Square Edge	0.50
Sharp Edge, Thin walls (CMP)	0.90
Headwall (No Wingwalls)	
Grooved Edge	0.20
Rounded Edge (0.15D radius)	0.15
Rounded Edge (0.25D radius)	0.10
Square Edge (Cut Concrete and CMP)	0.40
Headwall with 45° Wingwalls	
Grooved Edge	0.20
Square Edge	0.35
Headwall with Parallel Wingwalls Spaced 1.25D Apart	
Grooved Edge	0.30
Square Edge	0.40
Beveled Edge	0.25
Sloping Entrance (No Headwall or Wingwalls)	
Mitered to Conform to Slope	0.70
Flared-End Section	0.50
Concrete Box Culverts	
Headwall Parallel to Embankment (No Wingwalls)	
Square Edge on Sides of Opening	0.50
Rounded on 3 Edges to Radius of 1/12 Barrel Dimension	0.20
Wingwalls at 30° to 75° to Barrel Axis	
Square Edged at Crown	0.40
Crown Edge Rounded to Radius of 1/12 Barrel Dimension	0.20
Wingwalls at 10° to 30° to Barrel	
Square Edged at Crown	0.50
Wingwalls Parallel (Extensions of Culvert Walls)	
Square Edged at Crown	0.70
RCP: Reinforced Concrete Pipe CMP: Corrugated Metal Pipe	

NOTE: The entrance loss coefficients are used to evaluate the culvert or sewer capacity operating under outlet control.

Source: WRC Engineering, Inc. Boulder County Storm Drainage Criteria Manual, 1984.
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32.2.5. DEBRIS FINS

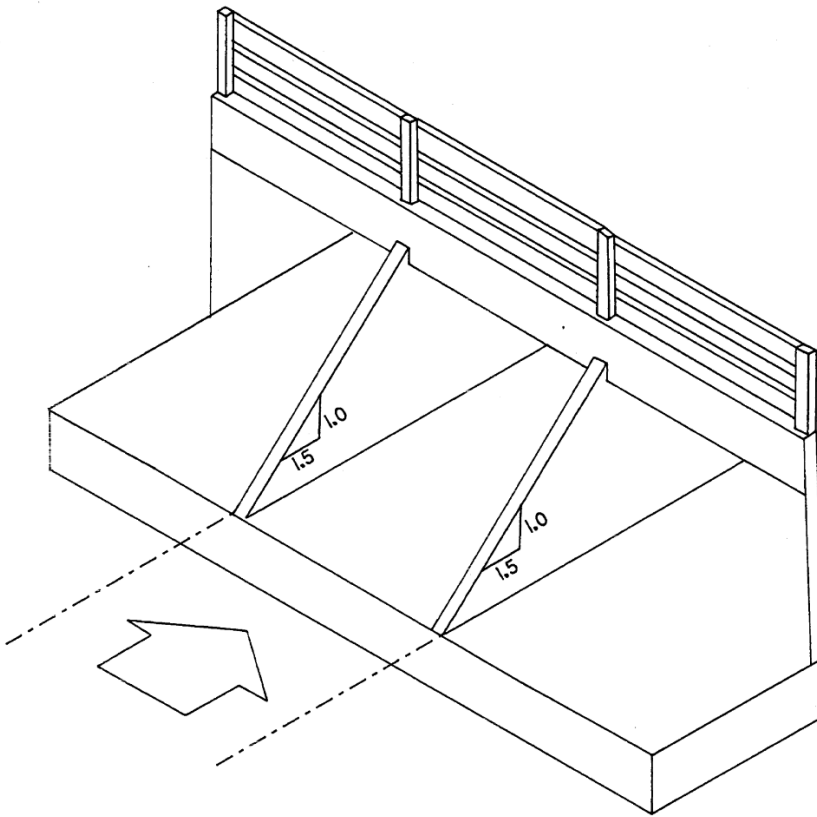
For conditions where more than one (1) box culvert is required, the upstream face of the structure shall incorporate debris deflector fins to prevent debris buildup. For multiple-pipe situations, installations of debris fins may be used but are not required. The debris fin is an extension of the interior walls of a multiple-box culvert.

- (a) The wall thickness shall be designed to satisfy structural requirements and reduce impact and turbulence to the flow.
- (b) A debris fin is constructed to the height of the culvert.
- (c) A fin length of one point five (1.5) times the height of the box culvert is required.
- (d) Since the debris fins are subject to the same erosive forces as bridge piers, care must be taken in the design of the footing. A toewall at the upstream end of the debris fin and the apron is recommended.
- (e) Figure 32-2 depicts the conceptual design for debris deflector fins. It should be noted that alternate types of wingwalls can be used other than the parallel shown.

32.2.6. TRASH RACKS & SAFETY END TREATMENTS

If trash racks or safety end treatments are to be used, appropriate clogging factors must be applied. TxDOT provides some guidance for the selection of clogging factors. "Design of Small Dams" by US Bureau of Reclamation (1987) suggests a trash rack clogging factor of fifty percent (50%).

Figure 32-2: Conceptual Design of Debris Fins



Source: City of Austin, Watershed Management Division

32.3. CULVERT DISCHARGE VELOCITIES

- (a) High discharge velocities from culverts can cause eddies or other turbulence which could damage unprotected downstream properties and roadway embankments. To prevent damage from scour and erosion in these conditions, culvert outlet protection is needed. This outlet protection is based on the discharge velocity (see Table 32-2).

Table 32-2: Culvert Outlet Protection Requirements

Velocity	Outlet Protection Requirements
Below six (6) ft/sec	Riprap protection. (Four (4) inch minimum thickness) or alternate approved material.
Above six (6) ft/sec	Structurally reinforced apron, six (6) inch minimum thickness with toe wall.

- (b) Riprap armoring is preferred. However, if site conditions necessitate a concrete apron, the minimum apron length which provides transition from a culvert outlet to an open channel shall be calculated from **Equation 32-2**:

(Eq. 32-2)

$$L = 0.2VD$$

Where,

L = Apron length, feet

V = culvert discharge velocity, ft/sec

D = height of box culvert or diameter of pipe culvert, feet

32.4. SELECTION OF CULVERT SIZE AND FLOW CLASSIFICATION

Laboratory tests and field observations show that there are two (2) major types of culvert flow:

- (a) Flow with Inlet Control

Under inlet control, the cross-sectional area of the barrel, the inlet configuration or geometry, and the amount of headwater are the factors affecting capacity. Under inlet control conditions, the slope of the culvert is steep enough so that the culvert does not flow full and the tailwater does not affect the flow.

- (b) Flow with Outlet Control

Outlet control involves the additional consideration of the tailwater in the outlet channel and the slope, roughness and length of barrel.

32.4.2. CULVERT HYDRAULICS

- (a) Inlet Control Condition

- (1) Inlet control for culverts may occur in two (2) ways.

- (A) Unsubmerged

The headwater is not sufficient to submerge the top of the culvert opening and the culvert inlet slope is supercritical. The culvert inlet acts like a weir (Condition A, Figure 32-4).

- (B) Submerged

The headwater submerges the top of the culvert but the pipe does not flow full. The culvert inlet acts like an orifice (Condition B, Figure 32-4).

- (2) The discharge capacity for several culvert materials, shapes, and inlet configurations under inlet control conditions are presented in the nomographs of the Federal Highway Administration. The nomographs are recommended for use in all inlet-control culvert calculations.

(b) Outlet Control Condition

(1) There are three (3) types of outlet control culvert flow conditions:

(A) Submerged Upstream & Downstream

The headwater submerges the culvert opening, and the culvert outlet is submerged by the tailwater. The culvert will flow full (Condition A, Figure 32-4).

(B) Submerged Upstream

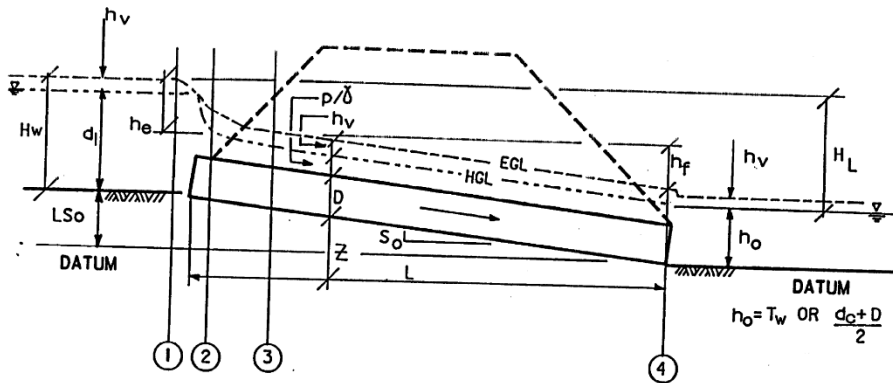
The headwater submerges the culvert opening, but the culvert outlet is not submerged by the tailwater (Condition B or C, Figure 32-4).

(C) **Unsubmerged**

The headwater is insufficient to submerge the top of the culvert opening. The culvert slope is subcritical and the tailwater depth is lower than critical depth for the culvert (Condition D, Figure 32-4).

(2) The capacity of a culvert for outlet control is calculated using Bernoulli's Equation, which is based on the conservation of energy principle. In the application of this equation, an energy balance is determined between the headwater at the culvert inlet and the tailwater at the culvert outlet. This balance is a function of inlet losses, friction losses and velocity head (see Figure 32-3). Refer to the publications of the Federal Highway Administration for design calculations.

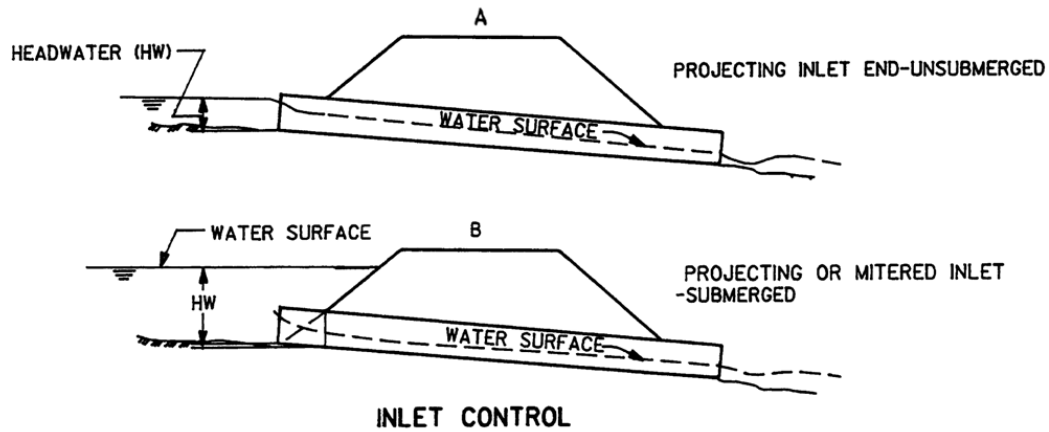
Figure 32-3: Hydraulics of a Culvert Under Outlet Control Condition (Source: Boulder County, Storm Drainage Criteria Manual, 1984)



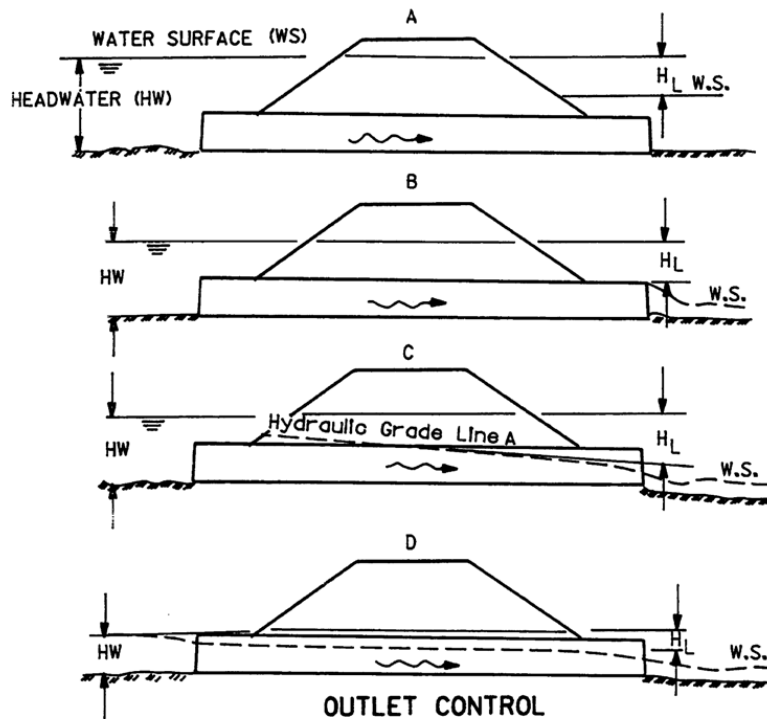
DEFINITION OF TERMS:

L = CULVERT LENGTH	P/γ = PRESSURE HEAD
S _o = CULVERT SLOPE	HGL = HYDRAULIC GRADE LINE
H _w = HEADWATER DEPTH	EGL = ENERGY GRADE LINE
h _v = VELOCITY HEAD	T _w = TAILWATER DEPTH
h _e = HEADLOSS AT THE ENTRANCE	h _f = FRICTION LOSS IN CULVERT
z = DISTANCE FROM DATUM LINE	d _i = APPROACH DEPTH
D = CULVERT DIAMETER OR RISE	

Figure 32-4: Inlet and Outlet Control Types



INLET CONTROL IS ONE OF THE TWO MAJOR TYPES OF CULVERT FLOW. CONDITION A WITH AN UNSUBMERGED CULVERT INLET IS PREFERRED TO THE SUBMERGED END. SLOPE, ROUGHNESS AND LENGTH OF CULVERT BARREL ARE NOT A CONSIDERATION.



OUTLET CONTROL INVOLVES THESE FACTORS: CROSS-SECTIONAL AREA OF BARREL, INLET 'GEOMETRY', PONDING, SLOPE, ROUGHNESS, TAILWATER, AND LENGTH OF CULVERT BARREL.

Source: Boulder County, Storm Drainage Criteria Manual

(c) Depths of Tailwater and Headwater

- (1) In culverts flowing with outlet control, tailwater is an important factor in computing both the headwater depth and the hydraulic capacity of a culvert. Thus, in many culvert designs, it becomes necessary to determine tailwater depth in the outlet channel.
- (2) Much engineering judgment and experience are needed to evaluate possible tailwater conditions during storms. A field inspection should be made to check on downstream controls and to determine water stages. Tailwater is often controlled by a downstream obstruction or by water stages in another stream.
- (3) An approximation of the depth of flow in a natural stream (outlet channel) can be made by using Manning's equation in the channel with normal flow condition (see *Section 31.1.1, "Uniform Flow"*). If the water surface in the outlet channel is established by downstream controls, a backwater analysis is required (see *Section 31.1.1, "Gradually Varied Flow"*).
- (4) A series of nomographs for various culvert materials and shapes have been developed by the Federal Highway Administration and the various pipe manufacturers. The nomographs include those for inlet control conditions, outlet control conditions and the critical depth for pipes of different shapes. Refer to the publications of the Federal Highway Administration for required designs.

32.4.3. DESIGN PROCEDURES

The Federal Highway Administration has published guidance for the hydraulic design of culverts. Their guidance includes design methodology, check lists, design charts, and tables which shall be used to perform culvert designs that meet the City's performance criteria.

32.5. HYDRAULIC CONSIDERATIONS IN BRIDGE DESIGN

32.5.1. GENERAL

Section 32.1 of this Manual states the City's position concerning storm water overtopping bridge structures. The current policy for overtopping of residential streets is a maximum of twelve (12) inches for the 100-year frequency storm, and for any street other than residential, the allowable maximum is six (6) inches for the 100-year frequency storm. Several hydraulic parameters should be considered in bridge design. Among these considerations should be, but should not be limited to, the following:

- (a) Channel transitions into and out of the bridge opening
- (b) Overall length and height of bridge
- (c) Cross-sectional opening of bridge
- (d) Location of the bridge opening relative to the main channel
- (e) Bridge alignment relative to general flow of main channel (i.e., "skewed" crossing)
- (f) Number of crossings or bridge openings

- (g) Other obstructions to flow (i.e., piers, abutments, deck width and clearances)
- (h) Design flows for bridge opening to pass
- (i) Any freeboard requirements for channel design

32.5.2. TYPES OF FLOW FOR BRIDGE DESIGN

Three (3) types of flow caused by bridge construction on a flood plain are shown in Figure 32-5. The three (3) flow types are described below:

(a) **Type I Flow**

Type I, or subcritical flow, is the type usually encountered in practice. The normal water surface is above critical depth at all points (see Item A of Figure 32-5). The backwater expression for Type I flow is obtained by applying the conservation of energy principle between cross-sections 1 and 4.

(b) **Type IIA Flow**

For Type IIA flow (see Item B of Figure 32-5), normal water surface in the unconstricted channel remains above critical depth in the constriction. Once critical depth is penetrated, the water surface upstream from the constriction, and thus the backwater, becomes independent of conditions downstream (even though the water surface returns to normal stage at cross-section 4).

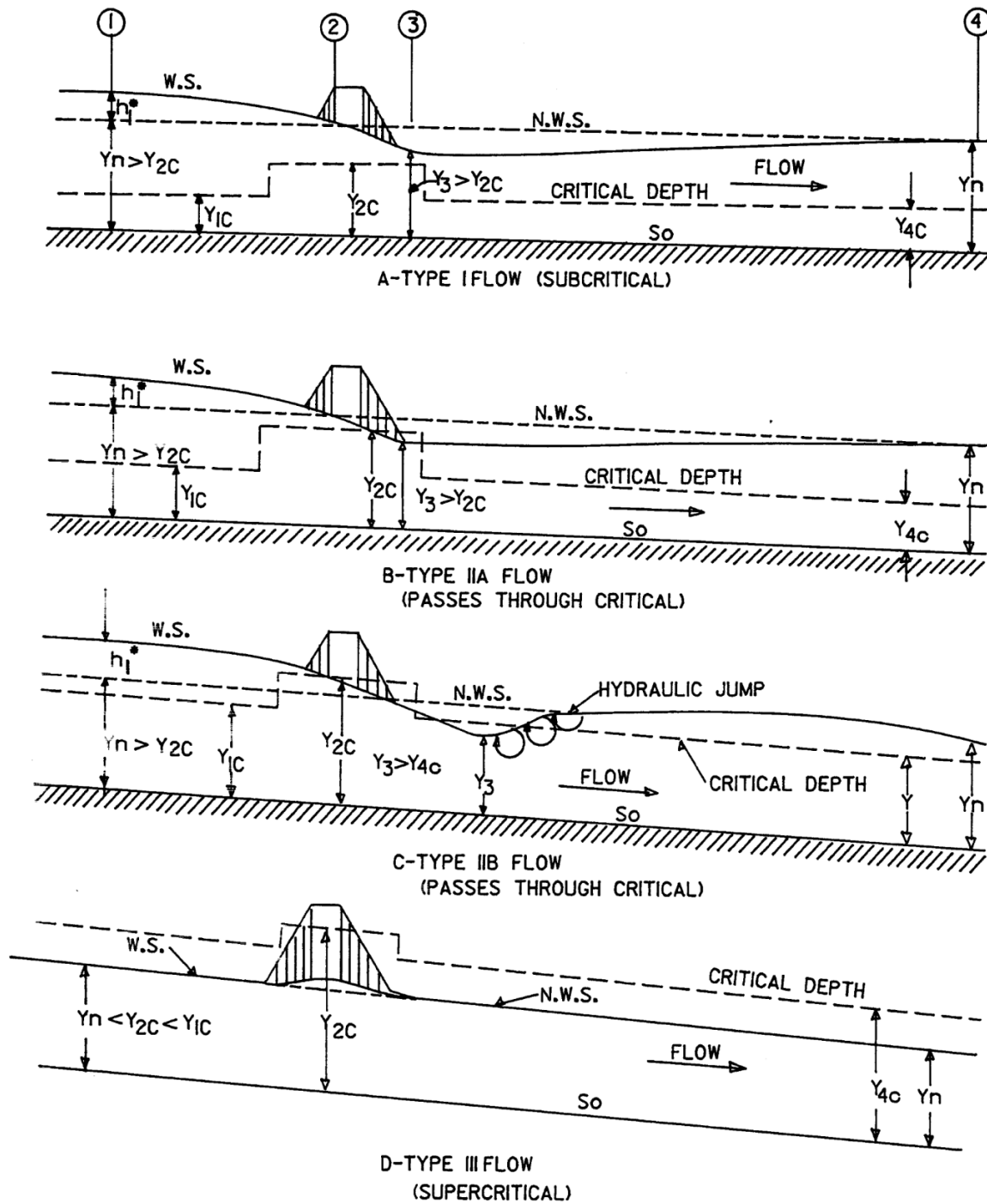
(c) **Type IIB Flow**

The water surface for Type IIB flow (see Item C of Figure 32-5) starts out above both normal water surface and critical depth upstream, passes through critical depth in the constriction and then returns to normal. The return to normal depth can be rather abrupt, taking place in the form of a poor hydraulic jump, since normal water surface in the stream is above critical depth.

(d) **Type III Flow**

In Type III Flow the normal water surface is below critical depth at all points and the flow throughout is supercritical (see Item D of Figure 32-5). This is an unusual case requiring a steep gradient, but such conditions do exist, particularly in mountainous regions. Theoretically, backwater should not occur for this type, since the flow throughout is supercritical. It is more than likely that an undulation of the water surface will occur in the vicinity of the constriction.

Figure 32-5: Types of Flow for Bridge Design



Source: Federal Highway Administration, "Hydraulics of Bridge Waterways,"
Hydraulic Design Series No. 1, Second Edition, September, 1973.

32.5.3. MODELING HYDRAULIC CONDITIONS

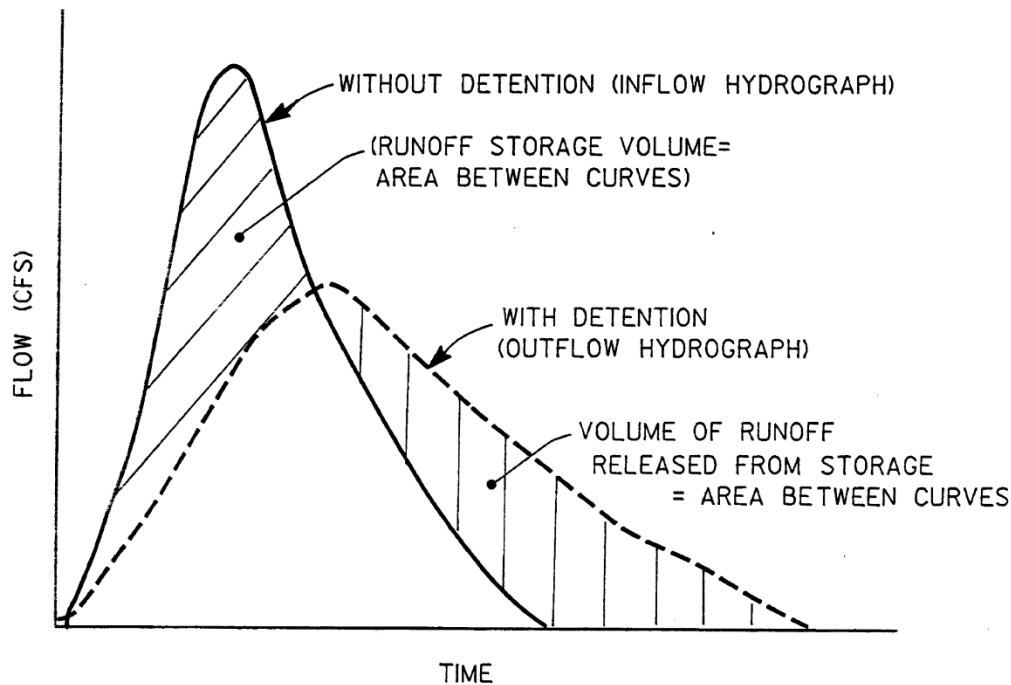
The most commonly used backwater program for modeling hydraulic conditions at existing or proposed bridge crossings is the U.S. Army Corps of Engineers HEC-RAS Water Surface Profiles Program. The normal and special bridge routines contained within the program are widely used. A thorough discussion of the application of these bridge routines are presented in the HEC-RAS User's Manual. HEC-RAS software is available from the U.S. Army Corps of Engineers Hydrologic Engineering Center

Section 33. **STORMWATER MANAGEMENT**

33.1. GENERAL

- (a) Stormwater Management (SWM) programs aimed at controlling increased urban runoff generated by development are a top priority in urban planning. More frequent flooding, increased rates and volumes of runoff, increased stream channel erosion and degradation, increased sedimentation and increased water pollution are all problems intensified by development. SWM facilities such as detention, retention, extended detention, infiltration, and sedimentation ponds have proven to significantly reduce downstream flooding, reduce sediment and pollutant loads, and provide debris removal which can benefit water quality.
- (b) The basic concept of SWM for peak rates of runoff is to provide temporary storage of stormwater runoff. Runoff is then released at a controlled rate which cannot exceed the capacities of the existing downstream drainage systems, or the predeveloped peak runoff rate of the site, whichever is less.
- (c) The solid lined hydrograph shown in Figure 33-1 represents a storm runoff event without SWM, while the dashed line hydrograph depicts the same event with SWM. The peak flow of the undetained hydrograph could exceed the capacity of the downstream conveyance system and thereby cause surcharging and flooding problems. With the introduction of the SWM facility, the solid lined hydrograph is spread over a longer time and its peak is reduced. The area between the two (2) curves to the left of their intersection represents the volume of runoff, temporarily stored or detained in the SWM facility.
- (d) The City approaches the control of excess flows through the application of both on-site and regional SWM. Essentially, the distinction between the two approaches is that on-site is generally limited to site specific criteria, while regional incorporates a basin wide hydrologic analysis.

Figure 33-1: Concept of Detention Pond (Source: City of Austin, Watershed Management Division)



33.2. REGIONAL STORMWATER MANAGEMENT PROGRAM

33.2.1. GENERAL

- (a) The Regional Stormwater Management Program (RSMP) provides for the planning, design and construction of “regional” drainage improvements, using fees paid by the owners of those developments. The RSMP uses a watershed-wide approach to analyze potential flooding problems, identify appropriate mitigation measures, and select site locations and design criteria for regional drainage improvements. These improvements include detention and retention ponds, waterway enlargement and channelization, and improved conveyance structures. The RSMP allows developers to participate in the program (in lieu of constructing on-site controls) if the resulting use of regional drainage improvements will produce no identifiable adverse impact to other properties due to increased runoff from the proposed development. Reference Article 24.10, Chapter 24 of the City of Hutto Code of Ordinances, 2023 edition for additional information on stormwater management requirements.
- (b) The fees charged for participation in the RSMP are non-refundable and are based upon the size of the development, and the proposed land use. The fees are deposited in a dedicated fund.
- (c) The benefits afforded by the RSMP include the following:
 - (1) A higher level of confidence in the hydrologic analysis is obtained because each pond's interrelationship within a given basin can be readily determined. This is accomplished by establishing a hydrologic data base watershed master plan of the

entire basin and then using this to determine the most hydrologically efficient location for SWM facilities. This procedure takes into consideration the interrelated nature of tributary subareas within a watershed.

- (2) Adequate maintenance is more likely due to the City's vested interest and responsibility in the RSMP.
- (3) The cost of construction and the total land required can be considerably less than that needed for comparable on-site SWM
- (4) The expanded land area required for regional ponds lends itself to other uses (e.g., parks, nature areas, organized sports, etc.).

33.2.2. PARTICIPATION GUIDELINES

Participation in the regional stormwater management program shall be determined according to Article 24.10.002, Chapter 24 of the City of Hutto Code of Ordinances, 2023 edition. After a development is accepted for participation, fees shall be paid in accordance with the following (see Appendix A 1.004 of the City's Code of Ordinances for the Stormwater Management Fee schedule)

- (a) Single Family and Duplex Subdivisions
Fees shall be paid prior to approval of construction plans.
- (b) Multi-Family Site Development
For multi-family site development (includes triplexes, fourplexes, apartments and condominiums), payment must be made upon building permit approval.
- (c) Commercial and Industrial Development
For commercial and industrial subdivisions, payment shall be made upon building permit approval.

33.3. STORMWATER MANAGEMENT PONDS

33.3.1. GENERAL

Stormwater Management ponds may be of two basic types: on-site and regional. In general, on-site ponds are those which are located off-channel and provide stormwater management for a particular project or development. Regional ponds are designed to provide stormwater management in conjunction with other improvements on a watershed-wide basis. SWM ponds may be further classified as retention or detention ponds and may incorporate water quality Best Management Practices (BMPs) such as sedimentation, infiltration, or filtration. The performance and safety criteria in this Section apply to all ponds which provide management of peak rates of stormwater runoff regardless of type.

33.3.2. PERFORMANCE CRITERIA FOR STORMWATER MANAGEMENT PONDS

- (a) A flow routing analysis using detailed hydrographs must be applied for all SWM pond designs. Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS) method must be used.

- (b) Stormwater management ponds are used to reduce flood risk and mitigate peak flows to pre-development conditions so downstream water elevations do not increase. The timing of the hydrograph released from the detention facility must be checked against the timing of the flow rate in the first open watercourse to prevent increase(s) in the peak flow rate in the receiving watercourse. For SWM ponds constructed in-line on an existing watercourse, the creation of the basin shall not increase flood elevations in the channel upstream of the new development boundaries.
- (c) Regional ponds are designed to provide stormwater management in conjunction with other improvements on a watershed-wide basis. Regional stormwater ponds may also incorporate water quality Best Management Practices (BMPs) such as sedimentation, infiltration, or filtration. The performance and safety criteria in this Section apply to all ponds which provide management of peak rates of stormwater runoff regardless of type.

Minimum performance criteria for local or regional ponds are provided in the following sections. Variance requests should be coordinated with the Engineering Department and shall be determined on a project-by-project basis. The determination shall be based on a preliminary engineering study prepared by the Engineer.

(1) Performance Criteria For SWM Ponds

On-site SWM ponds are classified as either small or large, as follows: On-Site SWM

POND CLASS DRAINAGE AREA

Small <25 acres

Large 25-64 acres

- (i) For design purposes, any pond with a drainage area larger than sixty-four (64) acres shall be classified as regional pond.
- (ii) On-site ponds shall reduce outflow rates to the undeveloped or existing two (2) year, five (5) year, twenty-five (25) year, and one hundred (100) year frequencies, twenty-four (24) hour storm.

- (B) Regional SWM ponds are classified as small and large, based on the following criteria:

REGIONAL SWM IMPOUNDED

POND CLASS VOLUME, AC-FT

Small 0-150

Large >150

- (i) Any regional pond with a height of dam over fifteen (15) feet shall be classified as a large regional pond.
- (ii) Regional ponds shall reduce outflow rates to the undeveloped or existing two (2) year, five (5) year, twenty-five (25) year, and one hundred (100) year frequencies, 24 hour storm.

- (iii) For ponds with drainage areas greater than 20 acres, ponds shall be designed such that the one hundred (100) year frequency, 6-hour storm can be detained without overtopping the berm elevation.

(2) Safety Criteria For Detention Ponds

- (A) All ponds shall meet or exceed all specified safety criteria. Use of these criteria shall in no way relieve the Engineer of the responsibility for the adequacy and safety of all aspects of the design of the SWM pond.
- (i) The spillway, embankment, and appurtenant structures shall be designed to safely pass the design storm hydrograph with the freeboard shown in Table 33-1. All contributing drainage areas, including on-site and off-site areas, shall be assumed to be fully developed. Any orifice with a dimension smaller than or equal to twelve (12) inches shall be assumed to be fully blocked. For all spillways (especially enclosed conduits), the ability to adequately convey the design flows must take into account any submergence of the outlet, any existing or potential obstructions in the system and the capacity of the downstream system. For these reasons, enclosed conduit spillways connecting directly to other enclosed conduit systems are discouraged. If used, they must be justified by a rigorous analysis of all enclosed conduit systems connected to the spillway.

Table 33-1: Detention Pond Freeboard Criteria

Detention Pond Class	Design Storm Event	Freeboard to Top of Embankment (ft)
On-site: Small	25 year	0.5
Large	25 year	1.0
Regional: Small	100 year	2.0
Large	100 year	*

**Design storm event and required freeboard for large regional ponds shall be determined by a dam break analysis based on the principles outlined in Title 30, Part 1, Chapter 299 of the Texas Administrative Code. The dam break analysis shall be submitted to the Engineering Development Services Department for approval.*

- (ii) If an embankment is classified as a dam pursuant to Title 30, Part 1, Chapter 299 of the Texas Administrative Code, all design criteria found in Title 30, Part 1, Chapter 299 of the Texas Administrative Code must be met, as evidenced by certification by an engineer licensed in the State of Texas.

- (B) The minimum embankment top width of earthen embankments shall be as follows:

TOTAL HEIGHT OF EMBANKMENT, FT	MINIMUM TOP WIDTH, FT
0-5	7
5-15	15

**To be determined on a case-by-case basis by the City Engineer.*

- (C) The constructed height of an earthen embankment shall be equal to the design height plus the amount necessary to ensure that the design height will be maintained once all settlement has taken place. This amount shall in no case be less than five (5) percent of the total fill height. All earthen embankments shall be compacted to ninety-five (95) percent of maximum density.
- (D) Earthen embankment side slopes shall be no steeper than four (4) horizontal to one (1) vertical (4:1). Slopes must be designed to resist erosion, to be stable in all conditions, and to be easily maintained. Earthen side slopes for regional facilities shall be designed based on appropriate geotechnical analyses.
- (E) Detailed hydraulic design calculations shall be provided for all SWM ponds. Stage-discharge rating data shall be presented in tabular form with all discharge components, such as orifice, weir, and outlet conduit flows, clearly indicated. A stage-storage table shall also be provided. In all cases, the effects of tailwater or other outlet control considerations should be included in the rating table calculations.
- (F) When designing ponds in series (i.e., when the discharge of one becomes the inflow of another), the engineer must submit a hydrologic analysis which demonstrates the system's adequacy. This analysis must incorporate the construction of hydrographs for all inflow and outflow components.
- (G) No outlet structures from detention, filtration and/or sedimentation ponds, parking detention or other concentrating structures shall be designed to discharge concentrated flow directly onto arterial or collector streets. Such discharges shall be conveyed by a closed conduit to the nearest existing storm sewer. If there is no existing storm sewer within three hundred (300) feet, the outlet design shall provide for a change in the discharge pattern from concentrated flow back to sheet flow, following as near as possible the direction of the gutter.
- (H) Storm runoff may be detained within parking lots. However, the Engineer should be aware of the inconvenience to both pedestrians and traffic. The location of ponding areas in a parking lot should be planned so that this condition is minimized. Stormwater ponding depths (for the 100-year storm) in parking lots are limited to an average of eight (8) inches with a maximum of twelve (12 inches). Maximum depths shall be permitted only in overflow parking areas not typically used in daily business.
- (I) All pipes discharging into a public storm sewer system shall have a minimum diameter of eighteen (18) inches and shall be constructed of reinforced concrete. In all cases, ease of maintenance and/or repair must be assured.

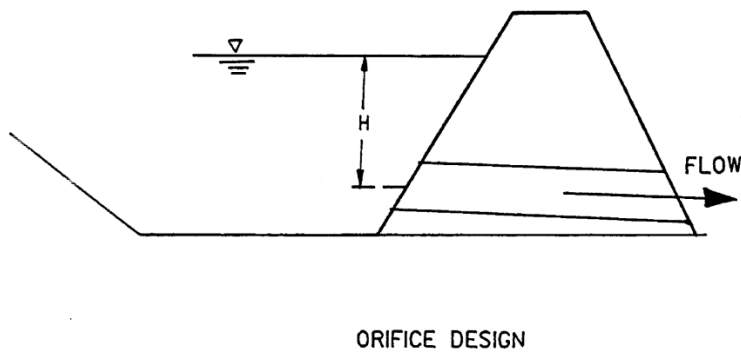
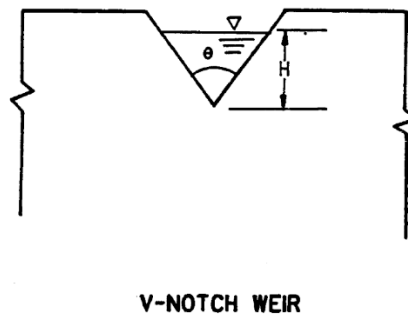
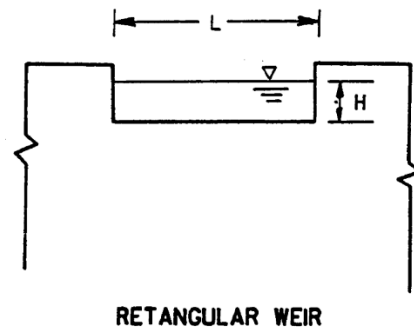
- (J) All concentrated flows into a SWM pond shall be collected and conveyed into the pond in such a way as to prevent erosion of the side slopes. All outfalls into the pond shall be designed to be stable and non-erosive.

33.3.3. OUTLET STRUCTURE DESIGN

There are two basic types of outlet control structures (see Figure 33-2):

- (a) Orifice flow
- (b) Weir flow (rectangular and V-notch weirs are the most common types)

Figure 33-2: Outlet Control Structure Types (Source: City of Austin, Watershed Management Division)



- (c) Generally, if the crest thickness is more than sixty (60) percent of the nappe thickness, weir should be considered broad-crested. The coefficients for sharp-crested and broad-crested weirs vary. The respective weir and orifice flow equations are as follows:

(1) Rectangular Weir Flow Equation

(Eq. 33-1)

$$Q = CLH^{2/3}$$

Where,

Q = Weir discharge, cubic feet per second

C = Weir Coefficient

L = horizontal length, feet

(2) H = Head on weir, feet V - notch Weir Flow Equation

(Eq. 33-2)

$$Q = 4.28C_e \tan(\Theta/2) H^{2.5}$$

Where,

Q = Weir discharge, cubic feet per second

C_e = Weir Coefficient, $25^\circ < \Theta < 100^\circ$

Θ = Angle of the weir notch at the apex (degrees)

H = Head on Weir, feet

(3) Orifice Flow Equation

(Eq. 33-2)

$$Q = C_o A (2gH)^{0.5}$$

Where,

Q = Orifice Flow, cubic feet per second

C_o = Orifice Coefficient (use 0.6)

A = Orifice Area, square feet

g = Gravitation constant, 32.2 feet/sec²

H = Head on orifice measured from centerline, feet

- (d) Analytical methods and equations for other types of structures shall be approved by the Engineering Department prior to use. In all cases, the effects of tailwater or other outlet control considerations should be included in the rating table calculations.

33.3.4. STORMWATER MANAGEMENT POND MAINTENANCE AND EQUIPMENT ACCESS REQUIREMENTS

Maintenance of publicly owned facilities will be the responsibility of the City. Maintenance of private facilities is the responsibility of the property owner or the community association and must be specified in the maintenance schedule submitted to the City. Refer to Article 24.08.014 of the City of Hutto's Code of Ordinances for the SWM pond owner's obligations related to long-term maintenance of post-construction stormwater structural controls. The relevant design criteria are included below.

- (a) Ponds that are to be maintained by the public shall be contained within drainage lots or easements.
- (b) For adequate maintenance access, ramps meeting the following criteria shall be provided.
 - (1) Slope no steeper than five (5) feet horizontal to one (1) foot vertical (5:1)
 - (2) Minimum width of twelve (12) feet
 - (3) Clear distance of fifteen (15) feet from the bottom of the ramp to any interior slope
- (c) On-site storm water management features must be privately owned and shall be maintained by the community association or property owner.
- (d) A maintenance schedule for both publicly owned and privately owned facilities must be submitted to the Engineering Department and approved by the City Engineer prior to approval of construction plans. The City of Hutto will have the right to do periodic inspections of privately owned and maintained detention facilities to confirm that the maintenance schedule is being implemented.

Section 34. EROSION AND SEDIMENT CONTROL

34.1. GENERAL

The purpose of this section is to provide a resource for the design, installation, inspection, and maintenance of the most commonly used erosion and sediment control Best Management Practices (BMP's)

- (a) Contractors shall install and maintain erosion and sediment controls in a careful and proper manner. Minor adjustments should be anticipated to assure proper performance. Intensive maintenance and extensive use of vegetation, mulch, and other ground covers may be required to achieve optimum performance. When erosion and sediment controls are removed after final stabilization of the site, it is important to also remove or stabilize any accumulated sediment.
- (b) Periodic inspection and maintenance are vital to the performance of erosion and sediment control measures. To ensure proper functionality of the control measures, all temporary erosion and sediment controls shall be inspected as follows, and any accumulated sediment at controls must be removed when the depth reached is six (6) inches.
 - (1) Weekly intervals, or
 - (2) Once every fourteen (14) calendar days and within twenty-four (24) hours of the end of a storm event of less than zero point five (0.5) inches.
- (c) However, more frequent inspections may be warranted when environmentally sensitive features are located on or immediately adjacent to the site and when adverse weather events are forecasted. If not properly maintained, some practices may cause more damage than they prevent. A qualified individual shall be assigned responsibility for inspection and maintenance of erosion and sediment controls.
- (d) This section includes guidance for minimum design criteria for sizing BMP's once calculations of storm water runoff and conveyance capacity have been determined. Always evaluate the consequences of a measure failing when considering which control measure to use, as failure of a measure may be hazardous or damaging to both people and property. For example, a large sediment basin failure can have disastrous results; and low points along dikes can cause major gullies to form on a fill slope. It is essential to provide inspections to determine if BMPs are properly installed and functioning, and to ensure that problems are corrected as soon as they develop.

34.2. EROSION AND SEDIMENT CONTROL POLICY

- (a) The City of Hutto Erosion and Sedimentation Control policy shall govern the planning, design, installation, maintenance and inspection of temporary and permanent erosion and sedimentation controls associated with development/construction within the City. This policy is the official criteria required by the TPDES MS4 Phase II permit, and as such strives to comply with all federal and state mandates associated with the permit.
- (b) Erosion and sediment BMPs are required for all construction (conducted with or without a permit) and all other activities for which land clearing, trenching, or grading is a part. It is the

intent of City of Hutto policy to closely parallel the requirements set forth in the Texas Pollution Discharge Elimination System (TPDES) Construction General Permit (TXR150000), the City of Hutto's MS4 Phase II Permit and any applicable updates to NPDES or TPDES.

- (c) The policy objectives are to:
 - (1) Ensure Municipal Separate Storm Sewer System (MS4) Phase II Permit & TPDES Construction General Permit compliance.
 - (2) Minimize the erosion and transport of soil resulting from development/construction activities.
 - (3) Minimize sedimentation in streams, creeks, lakes, waterways, storm drains, etc.
 - (4) Protect and improve the quality of surface water and maintain and improve the quality and quantity of recharge to groundwater supplies.
 - (5) Minimize flooding hazards and silt removal cost associated with excessive sediment accumulation in storm drains and waterways.
 - (6) Preserve and protect existing vegetation to the greatest extent possible, particularly native plant and wildlife habitats.
 - (7) Provide for revegetation of sites to minimize the negative environmental impacts of construction activity.

34.2.2. TEMPORARY SOIL STABILIZATION PRACTICES

- (a) Temporary controls shall be used during construction to prevent the erosion of soil and sedimentation of waterways until restoration is complete. Temporary controls shall be used in accordance with the City of Hutto Construction Standards. Temporary controls shall be removed from the site once final stabilization has been achieved.

Brush berms, silt fences, sedimentation basins, stabilized construction entrances/exits, and similar recognized techniques shall be employed during and after construction to prevent point source sedimentation loading of downstream facilities. Such installations shall be to the satisfaction of the City Engineer. Additional measures may be required during and after construction if, in the opinion of the City Engineer, they are warranted.

34.2.3. FINAL STABILIZATION CONTROLS

The subdivider/developer shall restore and permanently stabilize all areas within public rights-of-way and public easements that have been disturbed as a result of construction activities. Such areas shall be returned to pre-disturbed conditions or better.

- (a) All such areas shall be dressed with topsoil and vegetated by seeding or sodding as appropriate. Where the City Engineer determines that future maintenance is materially impaired or erosion is a distinct possibility, the developer shall be required to use concrete or similar permanent cover in lieu of vegetation. Erosion control matting (either pre-seeded or seeded after placement) may also be required if the City Engineer determines that such protection of slopes is required to ensure that seeding or soil will not wash off the slopes.
- (b) New open areas or facilities within the public rights-of-way or public easements shall be covered with a minimum of four (4) inches of topsoil prior to the application of grass seed. Grass seed shall be applied in accordance with Table 34-1.

Table 34-1: Reseeding Standards

Time of Year	Seeding Requirements
October to February	Seeding shall be with a combination of one (1) pound of unhulled Bermuda grass and seven (7) pounds of winter rye per one thousand (1,000) square feet with a purity of ninety-five percent (95%) with ninety percent (90%) germination.
March to September	Seeding shall be done with the addition of winter fescue (Kentucky 31) at a rate of one hundred (100) lbs./acre. Grass shall be common Bermuda grass, hulled, minimum eighty-two percent (82%) pure live seed.

- (c) Seedlings shall be watered until uniform growth is established. During the first two (2) months after application of the seed, the planted area shall be irrigated or sprinkled at ten (10) day intervals in a manner that will not erode the topsoil but at a rate sufficient to thoroughly soak the soil to a depth of six (6) inches. More frequent irrigation may be necessary based on weather conditions.
- (d) Restoration shall be considered acceptable when the grass has grown to a height of at least one-half (1/2) inch and covers ninety percent (90%) of the area with bare spots no greater than ten (10) square feet.
- (e) The City Engineer may grant a variance for right-of-way public easement restoration as related to the City's construction acceptance process provided equivalent permanent stabilization measures formally agreed upon by the subdivider/developer and the City are in place prior to the City final acceptance. Examples of such equivalent measures are as follows:
 - (1) Installation of additional silt fence near areas which may be prone to erosion as identified by City Engineer or designated staff. All additional silt fence will be

maintained by the subdivider/developed and will put forth all possible efforts to restore that right-of-way. At the time of right-of-way restoration and final inspection by the City Engineering Department, the silt fence will be removed.

- (2) A geotextile soil retention blanket placement within affected areas as defined by City Engineer or designated staff.
- (3) Additional rock berms located near potential drainage erosion areas as defined by City Engineer or designated staff.

34.3. PLANS AND REGULATORY COMPLIANCE

- (a) Implementation of an effective erosion and sediment control plan requires a project management approach where responsibility is assigned during each phase to assure proper design, installation, maintenance, inspection, and when necessary, repair or replacement of controls during construction. The project owner/developer, engineer and contractor are all integrally involved in this process from start to finish. In addition, an understanding by the responsible individuals of the complete process required to design and implement erosion and sediment controls will assist them in preparing appropriate plans, expedite the review and approval process, result in fewer on-site changes and problems, and provide the appropriate degree of protection for the environment.
- (b) The following sections present the minimum requirements for the planning, design, construction, operation and maintenance of erosion and sediment control facilities. A design professional may select an appropriate BMP control method, or combinations of methods or structures, and is responsible for both the adequacy and implementation of an effective erosion and sediment control plan (ESCP). Following the end of construction activities, the developer/owner, contractor and engineer are responsible for ensuring proper erosion and sediment control until all areas are stabilized.

34.3.2. EROSION AND SEDIMENT CONTROL PLAN

All projects disturbing natural conditions are required to plan, design, and implement BMPs to minimize erosion and sedimentation to the extent practicable. All activities requiring a permit shall submit an ESCP that identifies, addresses and minimizes to the City's Engineering Department's satisfaction, all potential sources of sediment and other construction-related pollution. Refer to the City of Hutto's Code of Ordinances, Article 24.08.012 – Construction Activity Discharges for additional information.

34.3.2.1 ESCP Requirements

- (a) All site plan applicants and site clearing and grading applicants shall submit to the city an ESCP for review and approval prior to the commencement of construction. The ESCP shall be included in the engineering construction plans.
 - (1) A person shall include with their construction or site development plans an ESCP for the property for which the land disturbing activity is proposed.
 - (2) Additionally, if applicable, off-site borrow areas, spoil areas and construction staging areas shall be considered as part of the development site and shall be included in the plan.

- (b) It is the responsibility of the engineer to design BMPs that address site specific conditions using appropriate design criteria for the City of Hutto. The source of the design criteria shall be referenced in the ESCP.
- (c) The ESCP shall include sufficient information to evaluate the environmental characteristics of the affected areas, the potential impacts of the proposed grading on water resources, and the effectiveness and acceptability of measures proposed to minimize soil erosion and off-site sedimentation.
- (d) At a minimum, the ESCP shall include the following:
 - (1) The existing topography and improvements as well as proposed improvements;
 - (2) Drainage flow arrows;
 - (3) The limits of construction (LOC);
 - (4) Scale, project and sheet title, and north arrow on each plan sheet;
 - (5) Total disturbed area;
 - (6) Storm drainage features, including existing and proposed bridges, storm drains, culverts, outfalls, etc.;
 - (7) Location and type of all proposed temporary erosion and sediment control practices;
 - (8) Location and type of all proposed permanent erosion and sediment control practices;
 - (9) Design details for all erosion and sediment control practices; and
 - (10) Any additional information or data deemed appropriate by the City.
- (e) Methods of reducing erosion and sedimentation – the following design considerations are necessary:
 - (1) Limit the size of disturbed areas to the greatest extent possible.
 - (2) Stabilize and disturbed areas as soon as possible.
 - (3) Controls are required to intercept silt from all disturbed areas.
 - (4) Minimize the extent of sediment leaving the project site.
 - (5) Reduce the concentration of stormwater runoff and promote street flow to the extent possible.
 - (6) Phase erosion and sediment control plans to accommodate changes in drainage patterns that occur during development.
 - (7) Reduce the silt leaving the construction site on the wheels of construction vehicles by providing vehicle washing areas and/or established construction entrances and exits.
 - (8) Preserve and protect existing vegetation to the greatest extent possible.

- (9) Consider the natural topography and soil condition in an attempt to limit the erosion potential.
- (f) A Licensed Professional Engineer with competence in this area as required by Texas Engineering Practice Act, Section 137, shall sign, seal and date the ESCP and engineering computations.

34.3.2.2 Procedures during Construction

Proper installation, maintenance, and inspection of the approved control methods during construction are the final steps in assuring effective control of erosion and sedimentation. Implementation requires the combined efforts of the project engineer, contractor, owner, city inspectors, and, when needed, reviewers working together to achieve the best feasible control.

- (a) Responsibilities
 - (1) The contractor is responsible for installing, inspecting and maintaining all BMPs according to the approved erosion and sedimentation controls (and SWP3 as appropriate).
 - (2) The contractor (and inspector) is responsible for reporting any identified problem areas to the design engineer for recommended additions or revisions to the ESCP.
 - (3) The design engineer is responsible for modifying the plan as needed to minimize erosion and sedimentation to the greatest extent practicable.
 - (4) The owner, contractor and design engineer are responsible for installing and maintaining BMPs in a manner that complies with all applicable Federal, State and Local regulations.
- (b) Temporary Stabilization
 - (1) Portions of a site that have been disturbed, but where no work will occur for more than twenty-one (21) days shall be temporarily stabilized as soon as practicable, and no later than fourteen (14) days, except when precluded by seasonal arid conditions or prolonged drought. A written request to the City Engineer shall be submitted for approval of exceptions.
 - (2) Temporary stabilization shall consist of providing a protective cover, designed to reduce erosion on disturbed areas. Temporary stabilization may be achieved using temporary seeding, soil retention blankets, hydro-mulches, and other techniques that cover one hundred percent (100%) of the disturbed areas until either final stabilization can be achieved or until further construction activities take place.
 - (3) Perimeter controls such a silt fence, vegetated buffer strips, or other similar perimeter controls are intended to act as controls when stabilization has not occurred. Perimeter controls may remain in place during temporary stabilization.
- (c) Final Stabilization
 - (1) Final stabilization may consist of soil cover as vegetation, geo-textiles, or mulch.

- (2) For stabilizing vegetated drainage ways, sod, or seeded soil retention blankets shall be used. Hydro mulch will not be allowed in vegetated swales, channels, or other drainage ways.
- (3) The plan for final stabilization shall be coordinated with permanent controls in the ESCP and with a landscaping plan if applicable.

34.3.2.3 Revisions to Controls

Most erosion and sediment controls will normally require some minor adjustments or additions during construction. These are known as “field revisions” and will not require a plan revision if approved by the Engineer and the inspector. Significant modifications to the controls or the SWP3, however, will require a plan revision and resubmittal to the City for review and approval.

34.3.3. TCEQ REQUIREMENTS

The TCEQ Stormwater General Permit for Construction Activities (CGP TXR150000) provides the requirements for the discharge of stormwater associated with construction activities that disturb one (1) or more acres of soil. The following sections discuss the general requirements, but the developer should refer to the TCEQ general permit for additional information.

- (a) One of the requirements of the CGP TXR150000, for any development, redevelopment and construction, is to develop and implement a Stormwater Pollution Prevention Plan (SWP3) for land disturbances equal to or greater than one acre or less than one acre if part of a larger common plan of development or sale. The purpose of the SWP3 is to provide guidelines for minimizing sediment and other pollutants that may originate on the site, from flowing into municipal storm systems, or jurisdictional waters during construction. The plan shall address the principal activities known to disturb significant amounts of ground surface during construction. A Notice of Intent (NOI) or Construction Site Notice (CSN) shall be submitted to the City’s Engineering Department prior to the start of construction activity.
- (b) The stormwater management controls included in the SWP3 shall focus on providing control of pollutant discharge practical approaches that use readily available techniques, expertise, materials, and equipment.
- (c) An Erosion and Sediment Control Plan is required for all development that disturbs one quarter (1/4) acre or more and shall meet TCEQ requirements for stormwater permits.

34.3.3.2 Stormwater Pollution Prevention Plan (SWP3)

- (a) All regulated construction site operators must develop a SWP3 according to the provisions of the general permit prior to requesting authorization. Operators must implement that SWP3 prior to commencing construction activities.
- (b) A SWP3 must describe the implementation of practices that will be used to minimize to the extent practicable the discharge of pollutants in stormwater associated with construction activity and non-stormwater discharges, in compliance with the terms and conditions of the permit.

- (c) A SWP3 must also identify any potential sources of pollution that have been determined to cause, have a reasonable potential to cause, or contribute to a violation of water quality standards or have been found to cause or contribute to the loss of a designated use of surface water in the state from discharges of stormwater from construction activities and construction support activities. Where potential sources of these pollutants are present at a construction site, the SWP3 must also contain a description of the management practices that will be used to prevent these pollutants from being discharged into surface water in the state or waters of the U.S.

(1) Plan Review and Making Plans Available

The SWP3 must be retained on-site at the construction site or, if the site is inactive or does not have an on-site location to store the plan, a notice must be posted describing the location of the SWP3. The SWP3 must be made readily available at the time of an on-site inspection to: the executive director; a federal, state, or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; local government officials; and the operator of a municipal separate storm sewer receiving discharges from the site. If the SWP3 is retained off-site, then it shall be made available as soon as reasonably possible. In most instances, it is reasonable that the SWP3 shall be made available within 24 hours of the request.

(2) Revisions and Updates to SWP3s

The permittee must revise or update the SWP3, including the site map, within seven (7) days of when any of the following occurs:

- (A) A change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants and that has not been previously addressed in the SWP3;
- (B) Changing site conditions based on updated plans and specifications, new operators, new areas of responsibility, and changes in BMPs; or
- (C) Results of inspections or investigations by construction site personnel authorized by the permittee, operators of a municipal separate storm sewer system receiving the discharge, authorized TCEQ personnel, or a federal, state or local agency approving sediment and erosion plans indicate the SWP3 is proving ineffective in eliminating or significantly minimizing pollutants in discharges authorized under this general permit.

(3) Contents of SWP3

The SWP3 must be developed and implemented by primary operators of small and large construction activities and include, at a minimum, the information described in Part III, Section F of the general permit and must comply with the construction and development effluent guidelines in Part IV of the general permit. Below is a summary of the requirements but should not be considered an exhaustive list.

- (A) A site or project description.
 - (B) A description of the BMPs that will be used to minimize pollution in runoff. The description must identify the general timing or sequence for installation and implementation.
 - (C) A description of any stormwater control measures that will be installed during the construction process to control pollutants in stormwater discharges that may occur after construction operations have been completed must be included in the SWP3.
 - (D) Other Required Controls and BMPs.
 - (E) Documentation of Compliance with Approved State and Local Plans.
 - (F) Maintenance Requirements.
 - (G) Observation and Evaluation of Dewatering Controls Pursuant to Part IV.C of the general permit.
 - (H) Inspections of All Controls
 - (I) The SWP3 must identify and ensure the implementation of appropriate pollution prevention measures for all eligible non-stormwater components of the discharge, as listed in Part II.A.3. of the general permit.
 - (J) The SWP3 must include the information required in Part III.B. of the general permit.
 - (K) The SWP3 must include pollution prevention procedures that comply with Part IV.D. of the general permit.
- (4) Waste and Hazardous Material Controls
- (A) Covered containers shall be provided for waste construction materials and daily trash. Hazardous material shall be stored in a manner that prevents contact with rainfall and runoff.
 - (B) Onsite storage of fuel is not allowed.
 - (C) The SWP3 shall require federal, state, and local reporting of any spills and releases of hazardous materials greater than the regulated Reportable Quantity (RQ) and reporting to the City of Hutto Engineering Department and Public Works Department of all spills and releases to the storm drainage system.
 - (D) All trash enclosures must drain to wastewater connections.
 - (E) Minimize exposure of sanitary waste by positioning portable toilets so that they are secure and will not be tipped or knocked over, and so that they are located away from surface water in the state and stormwater inlets or conveyances.

34.3.3.3 TCEQ Site Notices

Site notice forms are available for permittees under the CGP TXR150000, and can be found on the TCEQ's Stormwater General Permit for Construction Activities website or on the TCEQ Forms Search page by searching the applicable form number below.

(a) Large Construction Site Notice for Primary Operators (TCEQ Form 20961)

Large construction sites disturb more than five acres or are part of a larger common plan of development that disturbs more than five acres. Primary operators of large construction sites will fill out this notice. Primary operators will then post this notice at the construction site in a location where it is safely and readily available for viewing by the general public and local, state, and federal authorities

(b) Large Construction Site Notice for Secondary Operators (TCEQ Form 20962)

Large construction sites disturb more than five acres or are part of a larger common plan of development that disturbs more than five acres. Secondary operators of large construction sites will fill out this notice. Secondary operators will then post this notice at the construction site in a location where it is safely and readily available for viewing by the general public and local, state, and federal authorities

(c) Small Construction Site Notice (TCEQ Form 20963)

Small construction sites disturb at least one but less than five acres or are part of a larger common plan of development or sale that disturbs between one and five acres. Operators of small construction sites will fill out this notice. Operators will then post this notice at the construction site in a location where it is safely and readily available for viewing by the general public and local, state, and federal authorities.

(d) Small Construction Site Notice: Low Potential for Erosion (TCEQ Form 20964)

Small construction sites disturb at least one but less than five acres and are NOT part of a larger common plan of development or sale that will disturb five or more acres. Operators of small construction sites with low potential for erosion will fill out this notice. Operators will then post this notice at the construction site in a location where it is safely and readily available for viewing by the general public and local, state, and federal authorities.

34.3.3.4 Notice of Intent (NOI)

For construction activities disturbing five (5) or more acres (or part of a larger plan disturbing five (5) or more acres), a Notice of Intent (NOI) must be submitted to the TCEQ and the MS4 Operator. The NOI form shall require, at a minimum, the following information:

- (a) The TPDES CGP authorization number for existing authorizations under the general permit, where the operator submits an NOI to renew coverage within ninety (90) days of the effective date of the general permit;
- (b) The name, address, and telephone number of the operator filing the NOI for permit coverage;

- (c) The name (or other identifier), address, county, and latitude/longitude of the construction project or site;
- (d) The number of acres that will be disturbed by the applicant;
- (e) The estimated construction project start date and end date;
- (f) Confirmation that the project or site will not be located on Indian Country lands;
- (g) Confirmation if the construction activity is associated with an oil and gas exploration, production, processing, or treatment, or transmission facility;
- (h) Confirmation that the construction activities are not associated with the construction of a facility that is licensed for the storage of high-level radioactive waste by the United States Nuclear Regulatory Commission under 10 CFR Part 72;
- (i) Confirmation that a SWP3 has been developed in accordance with all conditions of this general permit, that it will be implemented prior to commencement of construction activities, and that it is compliant with any applicable local sediment and erosion control plans; for multiple operators who prepare a shared SWP3, the confirmation for an operator may be limited to its obligations under the SWP3 provided all obligations are confirmed by at least one operator;
- (j) Name of the receiving water(s);
- (k) The classified segment number for each classified segment that receives discharges from the regulated construction activity (if the discharge is not directly to a classified segment, then the classified segment number of the first classified segment that those discharges reach); and
- (l) The name of all surface waters receiving discharges from the regulated construction activity that are on the latest EPA-approved CWA § 303(d) List of impaired waters or Texas Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d) as not meeting applicable state water quality standards.

34.3.3.5 Notice of Termination (NOT)

- (a) Each operator that has submitted an NOI for authorization of large construction activities under the general permit must apply to terminate that authorization following the conditions described in the NOT section of the general permit.
- (b) The NOT must be submitted to TCEQ, and a copy of the NOT provided to the operator of any MS4 receiving the discharge (with a list in the SWP3 of the names and addresses of all MS4 operators receiving a copy), within thirty (30) days after any of the following conditions are met:
 - (1) Final stabilization has been achieved on all portions of the site that are the responsibility of the operator;
 - (2) A transfer of operational control has occurred; or
 - (3) The operator has obtained alternative authorization under an individual TPDES permit or alternative TPDES general permit.
- (c) Compliance with the conditions and requirements of the general permit is required until the NOT is submitted and approved by TCEQ. The NOT form shall require, at a minimum, the following information:

- (1) If authorization for construction activity was granted following submission of an NOI, the permittee's site-specific TPDES authorization number for a specific construction site;
 - (2) An indication of whether final stabilization has been achieved at the site and a NOT has been submitted or if the permittee is simply no longer an operator at the site;
 - (3) The name, address, and telephone number of the permittee submitting the NOT;
 - (4) The name (or other identifier), address, county, and location (latitude/longitude) of the construction project or site; and
 - (5) A signed certification that either all stormwater discharges requiring authorization under this general permit will no longer occur, or that the applicant is no longer the operator of the facility or construction site, and that all temporary structural erosion controls have either been removed, will be removed on a schedule defined in the SWP3, or have been transferred to a new operator if the new operator has applied for permit coverage. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.
- (d) For Small Construction Sites and Secondary Operators at Large Construction Sites, authorization to discharge under the general permit terminates immediately upon removal of the applicable TCEQ construction site notice. Compliance with the conditions and requirements of the permit is required until the TCEQ construction site notice is removed. The construction site notice cannot be removed until final stabilization has been achieved.

34.4. BMP SELECTION & DESIGN REQUIREMENTS:

- (a) The purpose of this section is to provide information and guidance regarding the selection, design, and use of Best Management Practices (BMPs) in the construction of storm water facilities. BMPs are measures that function to keep pollutants from entering the storm water or remove pollutants from storm water. In general, BMPs can be categorized as either structural or nonstructural. Structural BMPs are constructed facilities designed to reduce runoff and/or passively treat urban storm water runoff before it enters the receiving waters. Nonstructural BMPs consist of pollution prevention BMPs and source control BMPs. Both structural and nonstructural BMPs are used for erosion control during and after construction.
- (b) The selection of the most appropriate BMPs for a given site or basin is largely dependent on whether development is in place or has yet to occur. In areas with existing development, nonstructural BMPs are encouraged because retrofitting structural controls in a developed area can be expensive. Structural controls are more appropriate for new development and significant redevelopment, where they can be integrated into the planning of the infrastructure.

34.4.2. BECAUSE NON-POINT SOURCE POLLUTION IS VARIED IN NATURE AND IMPACT, NO INDIVIDUAL BMP MAY FIT ALL SITUATIONS. A SELECTION OF BMPS SHOULD BE TAILORED

TO FIT THE NEEDS OF PARTICULAR SOURCES AND CIRCUMSTANCES. AN EFFECTIVE STRATEGY FOR MINIMIZING STORM WATER POLLUTION LOADS IS TO USE MULTIPLE BMPS (STRUCTURAL, NONSTRUCTURAL, AND SOURCE CONTROLS). MULTIPLE BMPS AND COMBINING BMPS IN SERIES CAN PROVIDE COMPLEMENTARY WATER QUALITY ENHANCEMENT THAT MINIMIZES POLLUTANT LOADS BEING TRANSPORTED TO THE RECEIVING WATERS. BEST MANAGEMENT PRACTICES SELECTION

34.4.2.1 Temporary Controls

- (a) Temporary erosion and sediment control BMPs are installed before and during construction. These measures are not to be removed until vegetation is established and the construction area is stabilized. Erosion control measures should be installed at a site to prevent erosion from occurring. Often the most effective erosion control measures are reducing the limits of clearing and grading and phasing a construction project so that a minimum volume of soil is exposed at any one time.
- (b) There are a variety of methods that can be used to slow down runoff velocities, direct water to stabilized areas, and provide surface protection to limit erosion. The following methods should be considered.
 - (A) Interceptor Swale
 - (B) Diversion Dike
 - (C) Pipe Slope Drain
 - (D) Polyacrylamide (PAM) Soil Stabilizers
 - (E) Outlet Stabilization
 - (F) Level Spreader
 - (G) Subsurface Drain
 - (H) Temporary Vegetation
 - (I) Blankets and Matting
 - (J) Hydraulic Mulch
 - (K) Sod
 - (L) Dust Control
- (c) When erosion occurs, sediment control BMPs are necessary to capture stormwater runoff and remove sediment. These BMPs enhance water quality by settling or filtering runoff, primarily by allowing sediment to settle out of the stormwater. Typically, devices should be installed along the contour or with a constant top elevation. This will prevent runoff concentrating at a low spot within the barrier. Where larger volumes of runoff need to be captured, sediment traps and basins can be installed.
- (d) Sediment control devices should be designed based on the volume of flow they will receive. A sample list of sediment control BMPs is shown below.

- (A) Construction Exit
 - (B) Silt Fence (Interior and Exterior)
 - (C) Triangular Filter Dike
 - (D) Berms (Rock Berms, High Service Rock Berms, Brush Berms, & Sand Bag Berms)
 - (E) Vegetative Buffer Strips
 - (F) Inlet Protection
 - (G) Sediment Trap
 - (H) Sediment Basin
 - (I) Filter Rolls
 - (J) Dewatering Operations
 - (K) Spill Prevention
 - (L) Utility Line Crossings
 - (M) Concrete Washout
- (2) Temporary detention/sedimentation structures must be designed to withstand the force and velocity from a 10-year frequency storm without failing. Larger storms shall be bypassed via stabilized conveyances. Those devices that employ sedimentation must provide the storage volume for the runoff from a 2-year, 24-hour storm under compacted site conditions. The sedimentation basins must be designed such that drawdown time is seventy-two (72) hours via surface skimmers. The design must include consideration for overflows to ensure that the device and its detention pool remain intact.
 - (3) Detention/sedimentation structures should not be sited in natural drainage channels, draws or ravines that are directly connected to off-site drainage features like creeks, rivers, ponds or recharge features. In particular, this means that silt fences should not be used to control concentrated or channelized flow and sedimentation basins shall not be constructed in natural draws because failures of the earthen retaining system are often catastrophic to the downstream receiving waters.
 - (4) Many temporary erosion and sediment control practices can be designed and installed to later function as permanent facilities.
 - (e) Information about designing these facilities, as well as installation and maintenance, can be found in the TCEQ's Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices RG-348 Manual. See also the City of Hutto's Temporary Erosion and Sediment Control Guidelines (City Standard No. CH-ESC-01).

34.4.2.2 Permanent Practices

- (a) Permanent structural erosion and sediment control devices are intended to remain on a site after construction. It is the responsibility of the engineer to design BMPs that address site specific conditions using appropriate design criteria for the City of Hutto. The source of the design criteria shall be referenced in the ESCP.

- (1) The following are several permanent erosion and sediment control features that can be installed at a construction site based on need, and all prevent future sediment runoff.
 - (A) Diversions
 - (B) Grass-lined Swales
 - (C) Level Spreaders
 - (D) Stone Riprap
 - (E) Detention or Retention Ponds
 - (F) Gabions
 - (G) Subsurface Drains
 - (H) Land Grading
 - (I) Grade Stabilization Structure (Paved Chute or Flume)
- (2) Low Impact Development (LID) features, such as preserving and recreating natural landscape features, minimizing effective imperviousness, and employing processes of infiltration, filtration, storage, evaporation and detention of stormwater runoff should be considered during design of the development site. Structural LID practices mimic natural features to convey, treat, and infiltrate stormwater runoff. A variety of structural LID measures exist, including:
 - (A) Rain Gardens and Bioretention facilities
 - (B) Porous Pavement
 - (C) Rainwater Harvesting
 - (D) Vegetated Filter Strips
 - (E) Vegetated Swales
 - (F) Green Roofs
 - (G) Constructed Wetlands and Wet Ponds
 - (H) Proprietary Systems
- (b) These controls can be structural or permanent surface stabilization. Permanent controls are designed for less frequent (larger) design storms than temporary measures to ensure that they remain effective throughout their life. Velocities exiting the stormwater controls must be non-erosive and should be designed for the 25-year, 24 hour storm event. Flows from larger storm events (25-year and 100-year) should remain within rights-of-way or drainage easements.
- (c) Examples factors that shall be considered when evaluating and selecting permanent controls for a development include:

- (1) Effect of the development on runoff volumes and rates
- (2) Potential pollutants from the development
- (3) Size of drainage area treated by the BMP
- (4) Effectiveness of the BMP on potential pollutants from the development
- (5) Natural resources on the site
- (6) Configuration of site (existing waterways, topography, etc.)
- (d) Permanent vegetation must be established throughout the areas disturbed by construction to prevent post-construction erosion.
 - (1) Vegetation should be selected based upon the proposed land use, desired aesthetic or landscaping, and ecoregion.
 - (2) Maintenance of the final site should be considered when selecting vegetation material.
 - (3) The use of native species is preferred.
 - (4) Vegetation can be established by means of seeding, sodding, sprigging, seed drilling, or soil retention blankets.
 - (5) Permanent vegetation installation should occur within seven days after the completion of construction activities, or after each phase of construction.
 - (6) Construction inspections should be performed by a design professional of record or a certified inspector with specific training and experience on erosion and sediment control device construction.

34.4.3. MAINTENANCE REQUIREMENTS

- (a) Maintenance of sediment control devices are integral to their performance. Contractors are required to periodically remove sediment buildup from erosion and sediment control BMPs to allow them to continue functioning properly. Damaged BMPs must be repaired or replaced upon discovery. Otherwise, sediment can wash out from facilities and cause damage downstream.
- (b) Maintenance of erosion and sediment control facilities is also vital to their functionality. Sediment must be periodically removed from the facilities so that washouts do not occur. In addition, damaged or destroyed facilities must be repaired or replaced upon discovery.
- (c) The Responsible Official (designated city employee) will monitor stormwater discharges from these activities to evaluate the adequacy of the temporary erosion and sedimentation control measures. The Responsible Official may require the person performing the activity to use additional controls if the Responsible Official determines that the controls used by the person are inadequate to protect water quality.

- (d) Detailed instructions on maintenance for each of the recommended erosion and sediment control devices can be found in the TCEQ's Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices RG-348 Manual.
- (e) Refer to Article 24.08.014 of the City of Hutto's Code of Ordinances for the owner's obligations related to long-term maintenance of post-construction stormwater structural controls. Excerpts from the code are included below.
 - (1) All owners or operators of a new development or redeveloped site shall have a maintenance plan for all stormwater structural controls. The maintenance plan must be filed in the real property records of the county in which the property is located, addressing maintenance requirements for any structural controls installed on-site. Operation and maintenance performed shall be documented and retained on-site, such as at the offices of the owner or operator and made available for review by the City.
 - (2) All owner(s) of structural controls shall be required to have a maintenance plan with the city including a schedule of maintenance activities and plans for certified inspections to assess the functionality of the structural control(s).

34.4.4. INSPECTIONS

- (a) To maintain the effectiveness of erosion and sediment control devices, regular inspection is essential. Generally, inspection and maintenance can be categorized as either "routine" or "as needed".
 - (1) **Routine Activities**
Are performed regularly (e.g., monthly) to ensure that the devices are in good working order. Routine inspection is an efficient way to prevent potential nuisance situations from developing and reduce the need for repair or maintenance. Routine inspection also reduces the chance of degrading the quality of the effluent by identifying and correcting potential problems regularly. Property maintenance personnel should be instructed to inspect erosion and sediment control devices during their normal routines.
 - (2) **As-Needed Inspection**
As-needed inspection/maintenance of all practices should be performed after any event or activity that could cause damage, particularly after every large storm event.
- (b) Routine and as-needed inspections consist of technical and non-technical activities as summarized below:
 - (1) Inspect the general conditions of the inspect erosion and sediment control practice and areas directly adjacent.
 - (2) Maintain access to the site including the inlets, side slopes (if applicable), forebay (if one exists), device area, outlets, emergency spillway, etcetera.
 - (3) Examine the overall condition of vegetation.

- (4) Eliminate any possibility of public hazards (vector control, unstable public access areas).
 - (5) Check the conditions of inflow points, pretreatment areas (if they exist), and outlet structures.
 - (6) Inspect and maintain the inlet and outlet regularly and after large storms.
 - (7) Ensure that the pretreatment areas meet the original design criteria.
 - (8) Check the encroachment of undesirable plants in vegetated areas. This could require more frequent inspections in the growing season.
 - (9) Inspect water quality improvement components. Specifically, check the stormwater inflow, conveyance, and outlet conditions.
 - (10) Inspect hydrologic functions such as maintaining sheet flow where designed, ensuring functional pretreatment, maintaining adequate design storage capacity, and verifying proper operation of outlet structures.
 - (11) Check conditions downstream of the inspect erosion and sediment control device to ensure that flow is properly mitigated below the facility (e.g., excessive erosion or sedimentation).
- (c) In every inspection, whether routine or as needed, the inspector should document whether the inspect erosion and sediment control device is performing correctly and whether any damage has occurred to it since the last inspection. Ideally, the inspector will also identify what should be done to repair the inspect erosion and sediment control device if damage has occurred. Documentation is very important in maintaining an efficient inspection and maintenance schedule, providing evidence of ongoing inspection and maintenance, and detecting and reporting any necessary changes in overall management strategies.
- (d) Refer to Article 24.08.014 of the City of Hutto's Code of Ordinances for the owner's obligations related to inspection of post-construction stormwater structural controls. Excerpts from the code are included below.
- (1) Owner(s) of stormwater structural controls that discharge or connect to the city's storm drainage and flood mitigation utility or discharge into waters of the United States within the city limits must conduct, at a minimum, a certified inspection of each structural control every three years.
 - (2) The certified inspection report must be prepared by a state-licensed engineer.
 - (3) The City may choose to provide a pre-formatted inspection report to be used for each inspection.
- (e) The inspection report must be submitted to the city's stormwater program for review. The owner of a structural control(s) must submit a certified inspection report for each structural control by December 31st once every three (3) years.

Section 35. DRAINAGE PLAN MINIMUM PLAT AND CONSTRUCTION REQUIREMENTS

35.1. REPORT REQUIREMENTS

A Drainage Report/Drainage Impact Analysis must be approved prior to submittal and approval of the Construction Plan. At a minimum, the drainage report must include the following items.

- (a) EXECUTIVE SUMMARY
 - (1) SECTION 1: INTRODUCTION
 - (A) Project Name and Purpose
 - (B) Project Limits
 - (C) Project Objectives
 - (D) Assumptions and Constraints
 - (E) Prior Studies if any
 - (F) Exhibits
 - (i) Vicinity Map/Project Location/Aerial Map
 - (2) SECTION 2: EXISTING CONDITIONS
 - (A) Location and Topography
 - (B) Land Use
 - (C) FEMA Floodplains
 - (D) Right-of-Way
 - (E) Pipelines and Utilities
 - (F) Survey Datum
 - (G) Exhibits
 - (i) Typical Roadway Section (Existing and Proposed) for roadway projects
 - (3) SECTION 3: HYDROLOGY AND HYDRAULICS
 - (A) Design Criteria – guidelines used, storm frequency, mitigation requirements, etc.
 - (B) List of programs and software used: include the purpose of uses
 - (C) Hydrologic Methodology
 - (D) Hydraulic Methodology
 - (E) Pre-Project Conditions
 - (F) Exhibits

- (i) Overall Drainage Area Map
 - (ii) Existing Drainage Area Map with 2, 10, 25, 50 & 100-year flows and water surface elevations at major outfall nodes
 - (iii) FEMA Floodplain Maps with project boundary shown on it
- (4) SECTION 4: PROPOSED DRAINAGE PLAN
 - (A) Description
 - (B) Hydrological Analysis – Rational Method, Small Hydrograph Method, HEC-HMS, etc.
 - (C) Hydraulic Analysis – Storm sewer design, Spreadsheet, ICPR, XPSWMM, HEC RAS Applicable Sheet Flow Analysis, etc.
 - (D) Channel and/or detention layout
 - (E) ROW requirement
 - (F) Pipeline and Utility Conflicts
 - (G) Geotechnical Requirement
 - (H) Environmental Issues
 - (I) Exhibits
 - (i) Overall Drainage Area Map
 - (ii) Proposed Drainage Area Map with 2, 10, 25, 50 & 100-year flows and water surface elevations at major outfall nodes
 - (iii) FEMA and Ultimate (if on-site) Floodplain Maps with project boundary shown
 - (iv) Detention Pond layout that includes a cross section of the detention pond with 100-year water surface elevation and detention summary
 - (v) Plan and Profile with 10-yr and 100-yr WSE in case of Roadway
- (5) SECTION 5: CONCLUSION
 - (A) Appendices
 - (i) Detailed Hydrological Calculations
 - (ii) Detailed Hydraulic Calculations
 - (iii) Digital Data (Models of HEC-HMS for hydrology and HEC-RAS for hydraulics)
 - (B) Other supporting documents
- (b) When a detention facility is part of the proposed project, include the following detention summary table (Table 35-1: Detention Summary Table).

Table 35-1: Detention Summary Table

Project Name					
Project Area	Acres				
Detention Pond Service Area	Acres				
Detention Basin Area	Acres				
Detention Storage Rate	Acre-Feet/Acre				
Detention Storage Required	Acre-Feet				
Floodplain Fill Mitigation Volume	Acre-Feet				
Total Storage Required	Acre-Feet				
Total Storage Provided	Acre-Feet				
Storm Event	50% (2-Yr)	10% (10-Yr)	4% (25-Yr)	2% (50-Yr)	1% (100-Yr)
Design Water Surface Elevation (ft) (-----Datum, -----Adjustment)					
Maximum Allowable Outflow (cfs)					
Maximum Proposed Outflow (cfs)					

35.2. QUALITY ASSURANCE

Prepare calculations and construction drawings under the supervision of a Professional Engineer (Civil/Structural/Environmental) licensed in the State of Texas. The final construction drawings and all design calculations must be sealed, signed, and dated by the Professional Engineer responsible for the development of the drawing.

Geotechnical and Design Report for Roadways Checklist

- Discussion of possible variations during construction and mitigation thereof
- Discussion of techniques to maintain moisture in soil
- Discussion of methods to test soil moisture conditioning during construction (i.e. a second geotechnical investigation/re-evaluation may be required to specifically address soil moisture prior to lime operations)
- Address street trees

COMPLETE

☐

N/A

☐

1.5 SUBGRADE DESIGN

Subgrade Stabilization

- Compatibility of subgrade soils to lime treatment and recommended lime content
- Compatibility of subgrade soils to cement treatment and recommended cement content (**discouraged**)
- Recommendations for alternate subgrade stabilization/treatment (e.g., geosynthetics, remove and replace, etc.)
- Construction techniques to implement

☐
☐

Characterization and mitigation of groundwater, if needed

☐
☐

Requirements for cut and fill slopes to be incorporated in the design

COMPLETE

☐

N/A

☐

1.6. PAVEMENT DESIGN

Identify roadway type(s) and classifications(s)

☐
☐

Identify deviations from Pavement Design Input Values

☐
☐

Identify recommended pavement section

☐

COMPLETE

☐

N/A

☐

APPENDIX

Geological Map (USGS and/or Texas Bureau of Economic Geology)

☐
☐

Boring Location Plan

☐
☐

Boring Logs with results of laboratory index testing

☐
☐

Cut vs. fill by station number (for linear projects)

☐
☐

Printout from FPS 21 pavement design software program

☐
☐

Proposed typical section with dimensions showing pavement thickness, subgrade type and thickness, moisture conditioning depth, and location of moisture barrier. If applicable, location of proposed trees and root barriers shall be shown.

Geotechnical Engineer Signature: _____

Date: _____



Summary of Pavement Design Form

Project Name: _____

Geotechnical Engineer/Firm: _____

Report Date: _____ Date Received: _____

Geotechnical Engineer must fill out this form completely, and submit with the Report. A proposed typical section detail must be provided.

1. DESIGN INPUT VALUES

Roadway Classification: _____

Calculated Effective PI: _____

Calculated Effective PVR: _____

Pavement Design Input Value Deviation(s): _____

2. DESIGN RECOMMENDATIONS:

Moisture Conditioning Depth (inches): _____

Subgrade Treatment: _____ Lime, Lime/Cement, Cement, Remove and Replace

Lime/Cement Thickness (inches): _____

Lime/Cement Application Rates: _____

Alternate Subgrade Treatment (Y/N): _____ If yes, describe

Flexbase Thickness (inches): _____

HMAC Thickness (inches): _____

3. PROPOSED TYPICAL SECTION – ATTACH TO THIS FORM

Miscellaneous Items and Notes:

Geotechnical Engineer Signature: _____ Date: _____

May 30, 2025

City of Hutto
City Council

RE: City of Hutto UDC Rewrite

Dear Mayor Snyder and Council Members,

This letter is to provide comment and perspective on the City's current standards relating to required trees to be planted in the "tree lawn" area between the street and sidewalk, particularly within single-family residential neighborhoods and to urge you to remove this requirement from the UDC.

As a developer of residential master-planned communities, Green Brick Partners and its partner builder Trophy Signature Homes have worked in many jurisdictions throughout Texas. We love trees and value them highly when designing a community, however we strongly believe the negative effects of the implementation of "street trees" greatly outweigh the benefits and that there are locations better suited for planting new trees.

1. Limited Space: As these trees grow, they often compete for canopy space with the nearby trees planted in the front yards of homes.
2. Sidewalk and Road Damage: As the trees grow, their roots can grow into or under the adjacent sidewalk and/or road, increasing maintenance costs for the city.
3. Limits lawn growth: As the street trees and lawn trees grow, their canopies grow together and prevent sunlight from reaching the front yard grass, creating bare, unsightly front lawns long-term.

Alternative Considerations: We have found that focusing new tree planting in front yards (with proper spacing) as well as larger park and HOA lots provides the same (or better) aesthetic the city seeks, but with better long-term outcomes.

We appreciate your time and consideration of this matter. Some examples of mature residential communities where the "street tree" policy was implemented are below for your reference.

Thank you,



Ryan Jerke

Austin Division President

TROPHY SIGNATURE HOMES

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NYSE: GRBK

Plum Creek – Kyle, TX



Forest Oaks – Cedar Park, TX



Cedar Park Town Center – Cedar Park, TX

