

STATE OF TEXAS
CITY OF FRIENDSWOOD
COUNTIES OF
GALVESTON/HARRIS
JANUARY 11, 2021



AGENDA

NOTICE IS HEREBY GIVEN OF A FRIENDSWOOD CITY COUNCIL REGULAR MEETING TO BE HELD AT 6:00 PM ON MONDAY, JANUARY 11, 2021, AT FRIENDSWOOD CITY HALL, COUNCIL CHAMBERS, 910 S. FRIENDSWOOD DRIVE, FRIENDSWOOD, TEXAS, REGARDING THE ITEMS OF BUSINESS ACCORDING TO THE AGENDA LISTED BELOW:

6 PM – REGULAR MEETING

1. Call to order
2. Invocation – Pastor Nicholas Lammé, Friendswood Church of Christ
3. Pledge of Allegiance – United States and Texas
(HONOR THE TEXAS FLAG; I PLEDGE ALLEGIANCE TO THEE, TEXAS, ONE STATE UNDER GOD, ONE AND INDIVISIBLE)
4. Communications from the Public
Communications from the Public (To comply with provisions of the Open Meetings Act, the City Council may not deliberate on items discussed under this agenda item. The Council may refer this item to the City Manager or direct this item to be placed on the next regular Council agenda. Out of respect for those speaking during public comment, please refrain from any outbursts or interjections to include, but not limited to, applause and/or disparaging noises from the audience. Doing so discourages others from voicing their thoughts and opinions, and disrupts the meeting. Furthermore, any personnel complaints against a City employee aside from the City Manager, City Secretary, City Attorney or Municipal Judge cannot be discussed under this section. Please contact the City Manager's office for concerns involving a City employee.)
5. WORK SESSION
 - A. Comprehensive Plan Update
 - B. Drainage Update
6. Special Recognition and Acknowledgements

- A. Presentation of the 32nd Consecutive Certificate of Achievement for Excellence in Financial Reporting for the FY19 Comprehensive Annual Financial Report

7. Public Hearing

To receive comments from the public, both oral and written, regarding:

- A. A zone classification change request for 3.2895 acres, also known as Reserve A5, Block 2, Forest Creek Subdivision, located at 4321 Friendswood Link Rd., Friendswood, Harris County, Texas, to change from Multi-Family Residential-Garden Home District (MFR-GHD) to Neighborhood Commercial (NC).

8. Communications from the Public

Communications from the Public (To comply with provisions of the Open Meetings Act, the City Council may not deliberate on items discussed under this agenda item. The Council may refer this item to the City Manager or direct this item to be placed on the next regular Council agenda. Out of respect for those speaking during public comment, please refrain from any outbursts or interjections to include, but not limited to, applause and/or disparaging noises from the audience. Doing so discourages others from voicing their thoughts and opinions, and disrupts the meeting. Furthermore, any personnel complaints against a City employee aside from the City Manager, City Secretary, City Attorney or Municipal Judge cannot be discussed under this section. Please contact the City Manager's office for concerns involving a City employee.)

9. City Manager's Report

- A. Employee Service Awards
- B. Annual Tree Give Away
- C. Parks and Recreation 2020 Events
- D. Hurricane Harvey Update
- E. Coronavirus Disease 2019 (COVID-19) Update
- F. Year End Events

10. Communications from Committees and Special Reports

- A. Annual report from the Zoning Board of Adjustment Chair Phil Ratisseau

11. Discussion and Possible Action

- A. Discussion and possible action regarding entering into a development agreement with Taylor Morrison regarding the Avalon at Friendswood Subdivision and Friendswood Lakes Boulevard

12. Resolutions

Consideration and possible action regarding the following:

- A. Resolution No. R2021-01: A resolution approving and adopting updates/amendments to the "Design Criteria Manual" for the City of Friendswood, Texas; approving the standards contained therein for the design, construction and installation of public infrastructure and related facilities and improvements within the city; and repealing all prior Design Criteria Manuals and repealing other resolutions or parts of resolutions inconsistent or in conflict herewith.
- B. Resolution No. R2021-02: A resolution of the City Council of the City of Friendswood, Texas, authorizing a settlement agreement with Comcast of Houston, LLC, settling the lawsuit styled No. 4:19-CV-00458; City of Alvin, et al., v. Comcast, the United States District Court for the Southern District of Texas, Houston Division.

13. Ordinances

Consideration and possible action regarding the following:

- A. Ordinance No. T2021-01: First reading of an ordinance amending the Code of Ordinances of the City of Friendswood, Texas, Appendix C – "Zoning," by amending the zoning classification for a tract or parcel located at 4321 Friendswood Link Road containing 3.2895 acres, also known as Reserve A5, Block 2, Forest Creek Subdivision, out of the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas; amending the zone classification from Multi-Family Residential-Garden Home District (MFR-GHD) to Neighborhood Commercial (NC); providing for amendment of the Official Zoning Map; providing a penalty in an amount not to exceed \$2,000 for each day of violation of any provision hereof; and providing for severability.
- B. Ordinance No. T2021-02: First and Final reading of an ordinance amending City of Friendswood, Texas, Ordinance No. 2020-35, passed and approved September 14, 2020, same being an ordinance approving and adopting the City's General Budget for Fiscal Year 2020-2021 by approving "Budget Amendment III" to the "Original General Budget of the City of Friendswood, Texas, for the Fiscal Year 2020-2021"; providing for supplemental appropriation and/or transfer of certain funds; providing for severability; and providing other matters related to the subject.
- C. Ordinance No. T2021-03: First and Final reading of an ordinance authorizing the issuance and sale of the City of Friendswood, Texas, Waterworks and Sewer System Revenue Bonds, Series 2021; providing for the security of the bonds; authorizing the execution and delivery of a paying agent/registrar agreement; approving an official statement; and enacting other provisions relating to the subject.

14. Communications from the Mayor and Councilmembers

15. Consent Agenda

Consideration and possible action regarding the following:

- A. Approving a License Agreement with Friendswood Independent School District to add a radio communications antenna to the City's elevated water tower
- B. Approving Buyout License Agreements for 1 Whittier Dr. and 13 Haverford Ln. in the Quaker's Landing Subdivision with the Civic Improvement Association and authorizing the Mayor to execute the agreement
- C. Authorizing the acceptance of the sidewalk easements associated with the Texas Department of Transportation Sidewalk Project along FM 518 between FM 2351 and Whispering Pines Avenue and approving their execution by the City Manager
- D. Approving the ratification of the City Manager's signature on closing and purchase documents associated with the acquisition of property located at 15355 Blackhawk Blvd (the old Food Lion Building)
- E. Accepting the November 2020 Tax Report

16. Adjournment

This facility is wheelchair accessible and accessible parking spaces are available. Requests for accommodations or interpretive service must be made two (2) business days or more prior to this meeting. Please contact the City Secretary's Office at (281) 996-3270 for further information.

I, MELINDA WELSH, CITY SECRETARY OF THE CITY OF FRIENDSWOOD DO HEREBY CERTIFY THAT THE ABOVE NOTICE OF MEETING OF THE FRIENDSWOOD CITY COUNCIL WAS POSTED IN A PLACE CONVENIENT TO THE GENERAL PUBLIC IN COMPLIANCE WITH CHAPTER 551, TEXAS GOVERNMENT CODE, ON

DATE

AT TIME

**MELINDA WELSH, TRMC
CITY SECRETARY**

****All meetings of City Council are open to the public, except when there is a necessity to meet in an Executive Session (closed to the public) under the provisions of Section 551, Texas Government Code. The City Council reserves the right to**

convene into Executive Session to hear any of the above described agenda items that qualify for an executive session by publicly announcing the applicable section number of the Open Meetings Act.

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 11/3/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Comprehensive Plan Update

Originating Department: Community Development

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

Staff has updated the undeveloped property map and calculated new undeveloped acreages by zoning district.

Moving forward, the plan is to work with other departments to update the various sections such as Community Facilities, Utility Systems and Master Drainage Plan.

The Subcommittee can also work on updates to the Future Land Use Map. The plan is to obtain input from city boards and commissions, as well as the public and the development community regarding proposed changes.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

n/a

RECOMMENDATIONS

n/a

ATTACHMENTS

1. Comp Plan Update 01-2021

CITY OF FRIENDSWOOD

Comprehensive Plan Update



Comprehensive Plan Update

- Updated undeveloped land acreages by Zoning District
 - 1900 acres undeveloped/14%

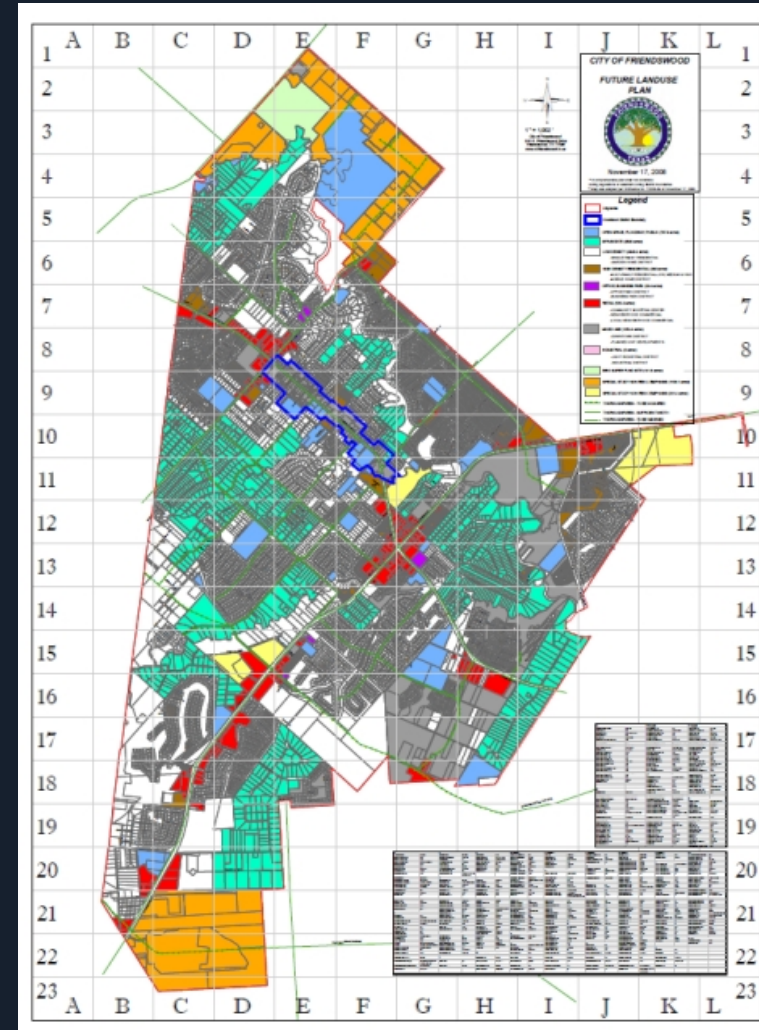
		Percent of Undeveloped	Percent of Total City
SFR	1163.577	61.24%	8.58%
PUD	18.59817	0.98%	0.14%
OPD	7.743469	0.41%	0.06%
NC	13.54481	0.71%	0.10%
LI	101.5775	5.35%	0.75%
I	254.3158	13.38%	1.87%
DD	7.242669	0.38%	0.05%
CSC	258.6241	13.61%	1.91%
BP	74.9328	3.94%	0.55%
TOTAL	1900.156		14.00%



Comprehensive Plan Update

Next:

- Future Land Use Map
 - Establish timeline and process to obtain input from city committees and boards as well as the public and development community



Comprehensive Plan Update

Next:

- Work with Staff and review plans to update the following sections:
 - Community Facilities (approved bond propositions, CIP)
 - Utility Systems (Master Utility Plan 2008)
 - Master Drainage Plan (Master Drainage Plans 1993, 2007)
 - Major Thoroughfare Plan (City Wide Traffic Study 2020)
 - Parks Master Plan (2020 update is underway)



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This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 12/8/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Drainage Update

Originating Department: Engineering

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

The January 2021 Drainage Update includes updates on the Imperial Estates Inline Detention Project, the Lower Clear Creek and Dickinson Bayou Federal Project, the upstream Federal Project, the Texas Coastal Project, the status of awarded Community Development Block Grants - Disaster Recovery, and the proposed Harvey Round One Community Development Block Grant. The update will also provide information on changes made to the Design Criteria Manual that go along with the Flood Ordinance adopted in December of 2020.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Staff is providing an update on drainage projects and will include an overview of changes made to the Design Criteria Manual. These changes are important to uphold the new Flood Ordinance, adoption of Atlas 14 rainfall, and to guarantee best engineering practices by the City staff and contractors that work for the City.

RECOMMENDATIONS

None

ATTACHMENTS

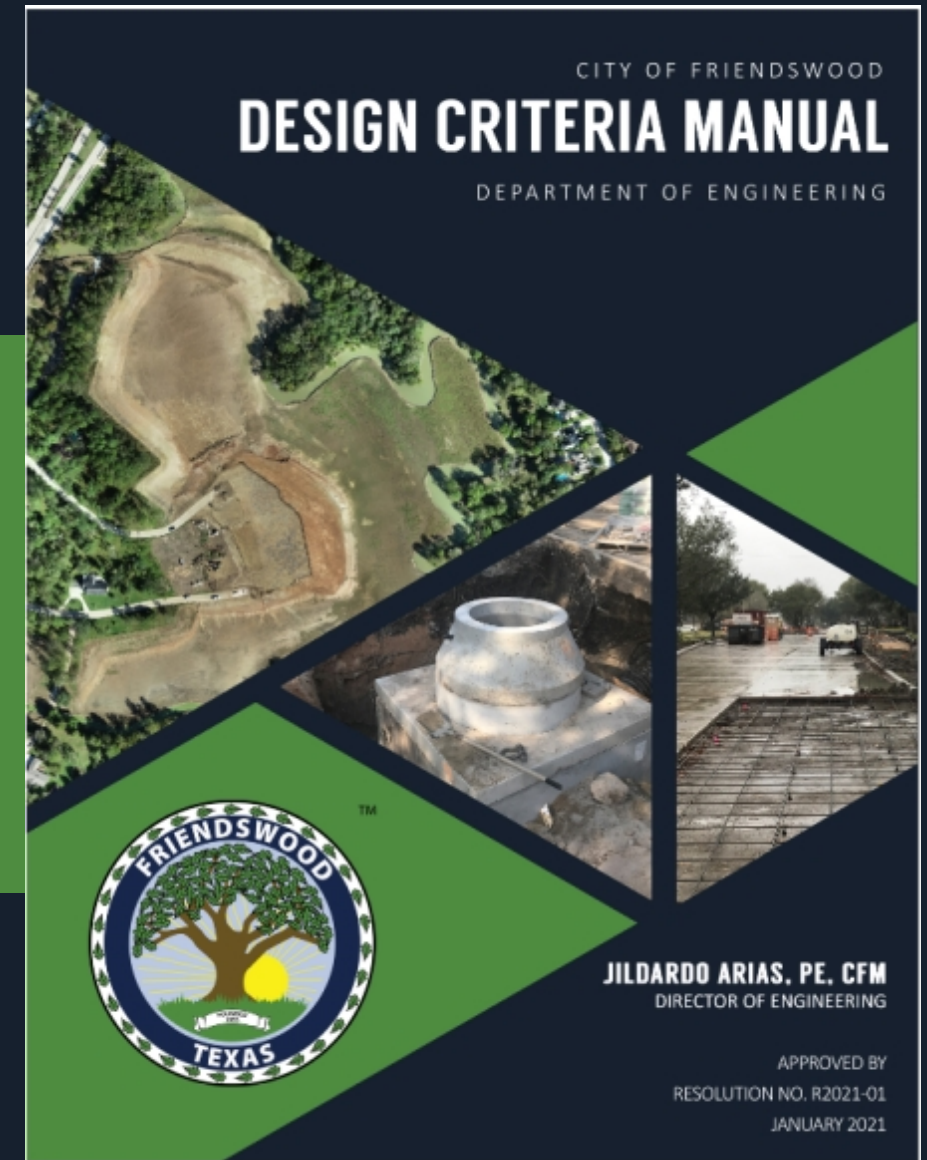
1. January 2021 Drainage Update

CITY OF FRIENDSWOOD

January 2021 Drainage Update
Samantha Haritos – Deputy Director of Engineering



Updates to Flood Ordinance and Design Criteria Manual



Updates to Flood Ordinance / Design Criteria Manual

Adoption Dates: Flood Ordinance 11/7; Design Criteria Manual 1/11

Changes Include:

- Adoption of Atlas 14 Rainfall
- Minimum Structure Elevation
- Fill in 500 Year Floodplain (Zone Shaded X)
- Hydrograph timing as substitution for detention is prohibited
- Drainage Impact Assessments required for development over 50 acres
- Requirements for submittals



Design Criteria Manual Changes – January 2021

Section II – Wastewater Collection System

Section III – Water Line Distribution System

Section IV – Street Paving

Section V – Storm Drainage

Section VI – Site Development

Appendix F – Culvert Policy

Appendix G – Traffic Control Sign Policy

Appendix H – Streetlight Policy

Traffic Calming Policy (Incorporated into DCM)



IMPERIAL ESTATES



Imperial Estates

Construction at 65% (680 Ac-Ft)

100,000 Truckloads



Entity	Expended Funds
City of Friendswood	\$5.5 Million
Galveston County Consolidated Drainage District (GCCDD)	\$5.1 Million*

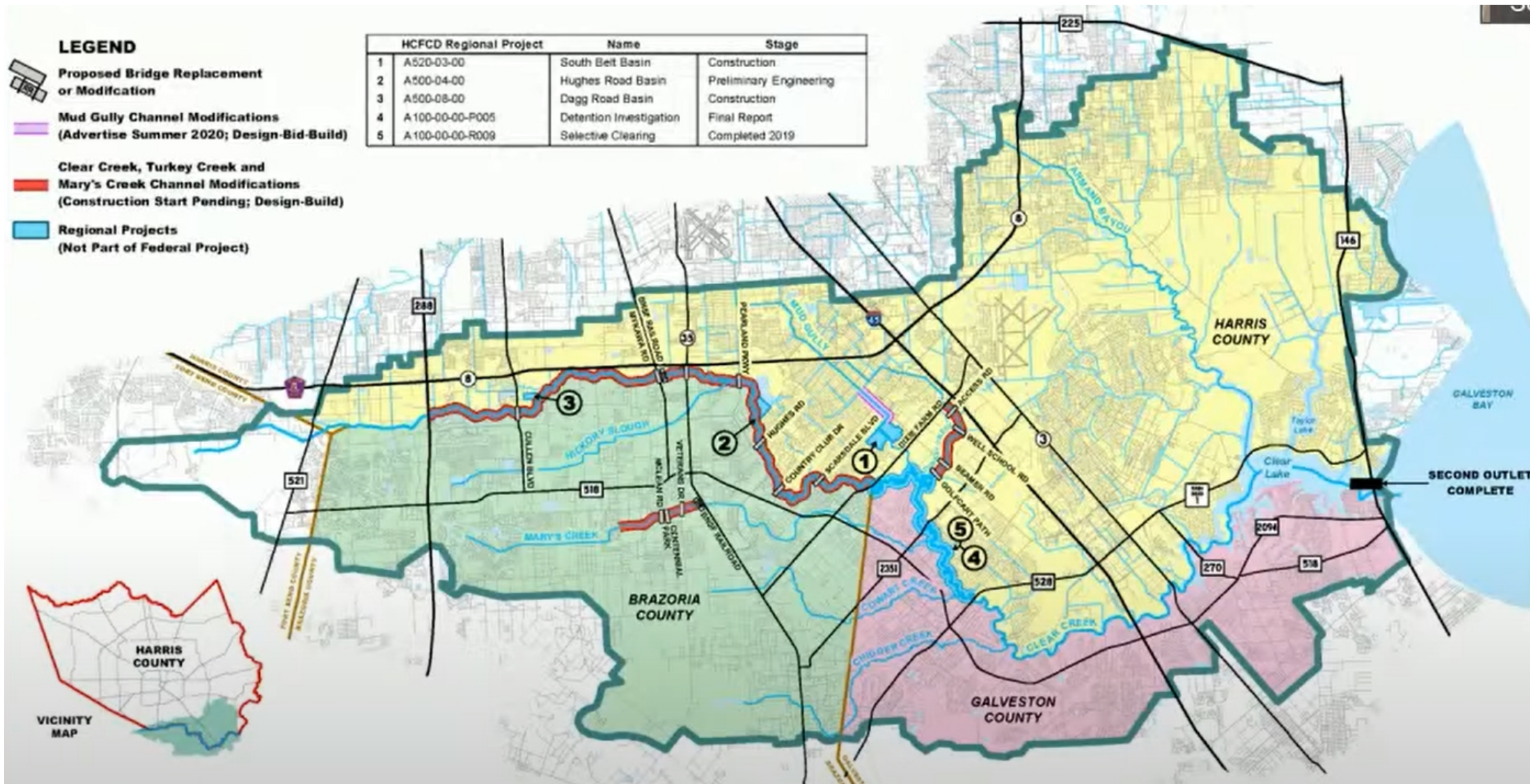
** This figure includes GCCDD's participation to-date. The District is expected to expend more funds on this project.*



C-03 Federal Flood Risk Management Project

www.hcfcd.org/CO3





Federal Project Status

Mud Gully Construction – Started December 2020

H&H Analysis will be submitted to USACE in 2021

Solicitations for design-build contract for Clear Creek, Mary's Creek and Turkey Creek expected in 2021

Ongoing: field investigations, survey, environmental assessments



Mitigation Projects

Dagg Stormwater Detention Basin

Hughes Stormwater Detention Basin

South Belt Detention Basin





www.leaguecity.com/LCCDB

Lower Clear Creek Study



Lower Clear Creek Study - Update

Friendswood is a local partner

Recent Public Meeting – November 4th

Hydraulic Model Completed

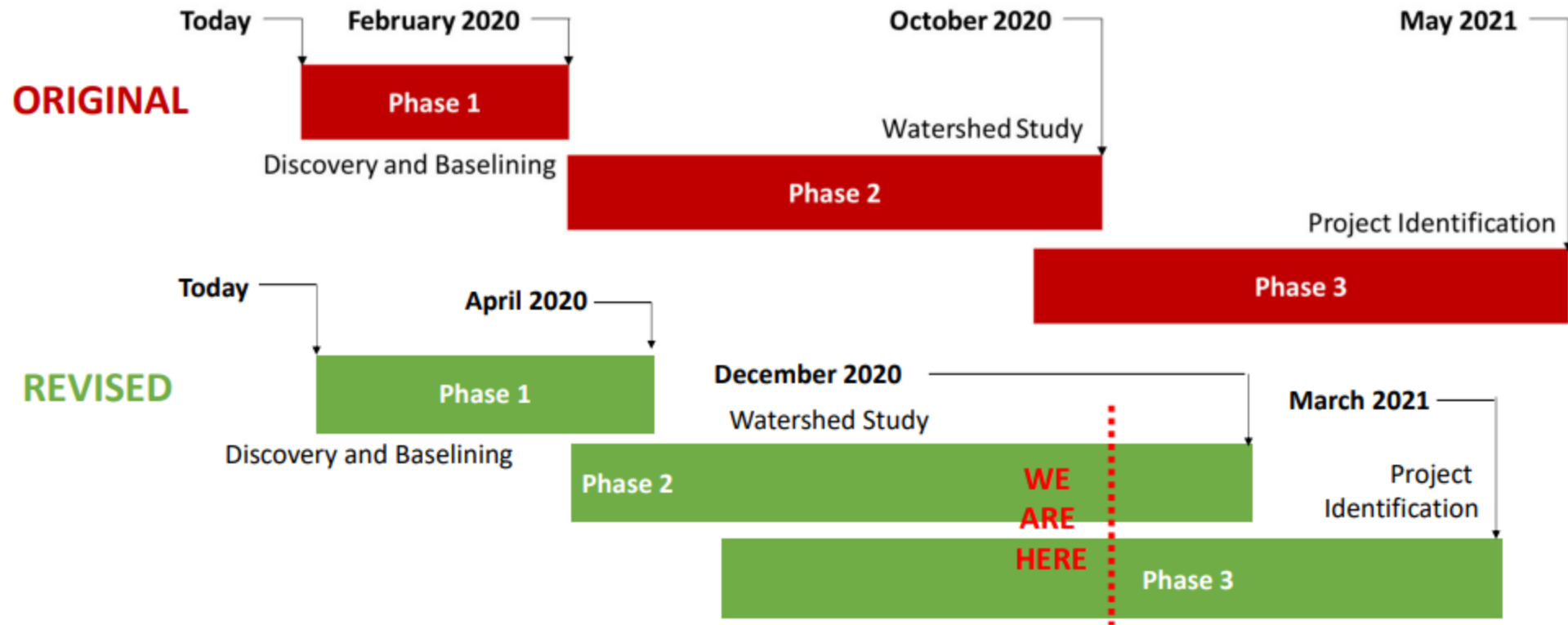
Assessing Alternatives

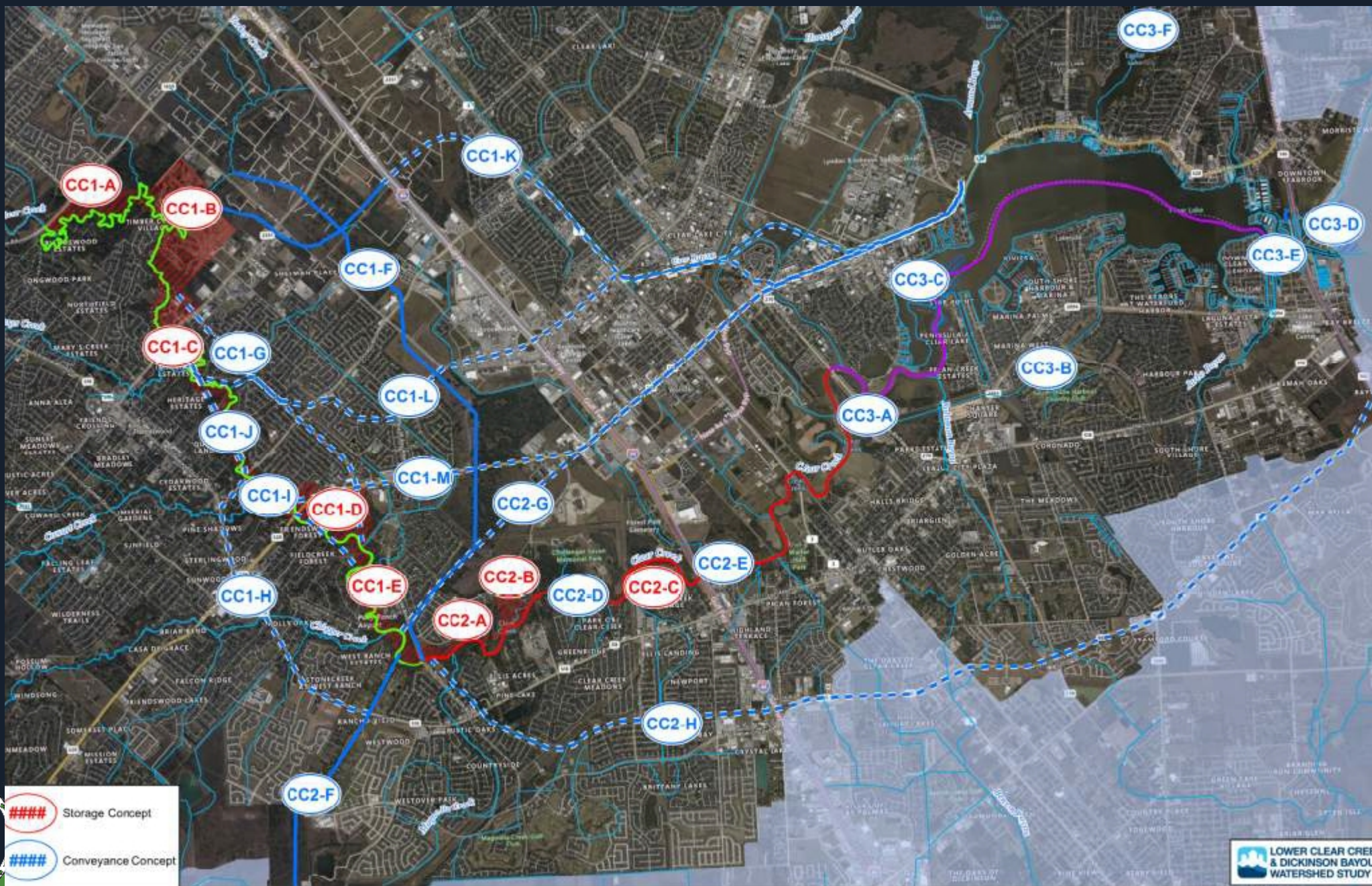
Study Completion - February 2021

<https://www.leaguecitytx.gov/LCCDB>



Project Timeline





Coastal Texas Study

www.coastalstudy.Texas.gov



MULTIPLE LINES OF DEFENSE ON THE TEXAS COAST



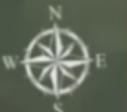
Clear Lake Gate System

-  Bulkhead
-  Floodwall
-  Shoreline Stabilization
-  Circulation Gates
-  Navigation Gate
-  Pump Station
-  Scour Protection
-  Dredge Area
-  Permanent Footprint
-  Temporary Work Footprint



Clear Lake Gate System

0 1/4 1/2 Miles



September 31, 2020



Hurricane Harvey Community Development Block Grants (CDBG – DR)

December 31, 2020

Awarded CDBG-DR Grants

Grant	Project	Grant Award	Local Contribution	Status
Forest Bend Detention (Harris County)	Forest Bend Detention	\$3,451,022	\$25,000 + Overages	Engineering
Acquisition Grant (\$2,691,517)	Frenchman's Creek	\$2,691,517	\$0 + Overages	Grant Administration RFP
	Deepwood		\$0 + Overages	Grant Administration RFP
Infrastructure (\$2,762,650)	Piperack Relocation	\$2,762,650	\$0 + Overages	Engineering
	Deepwood Terracing		\$0 + Overages	Grant Awarded



Forest Bend Offline Detention



Forest Bend Offline Detention

RPS Group Engineering Contractor

Total CDBG-DR Grant: \$3,451,022; (COF Contribution \$25,000)

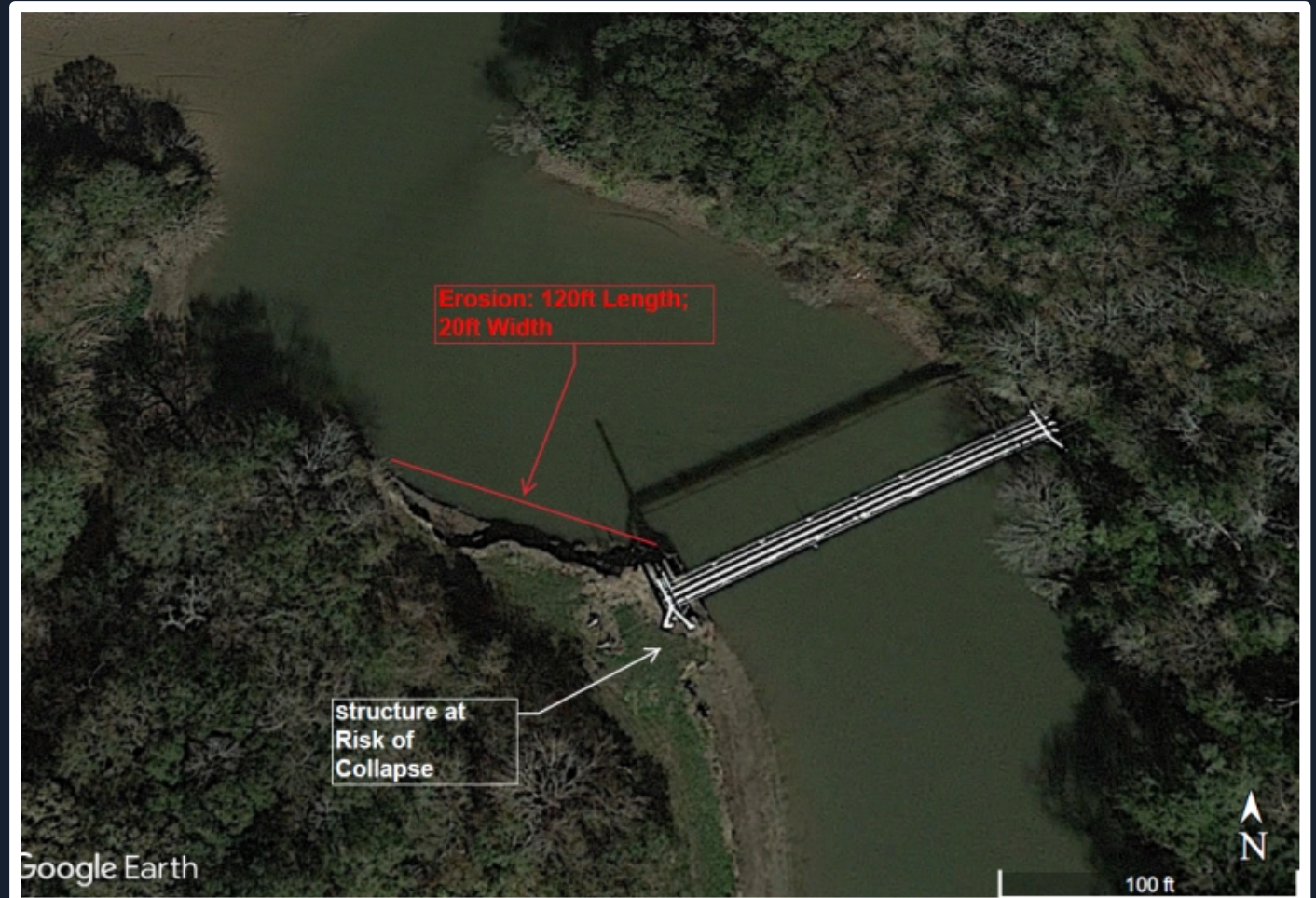
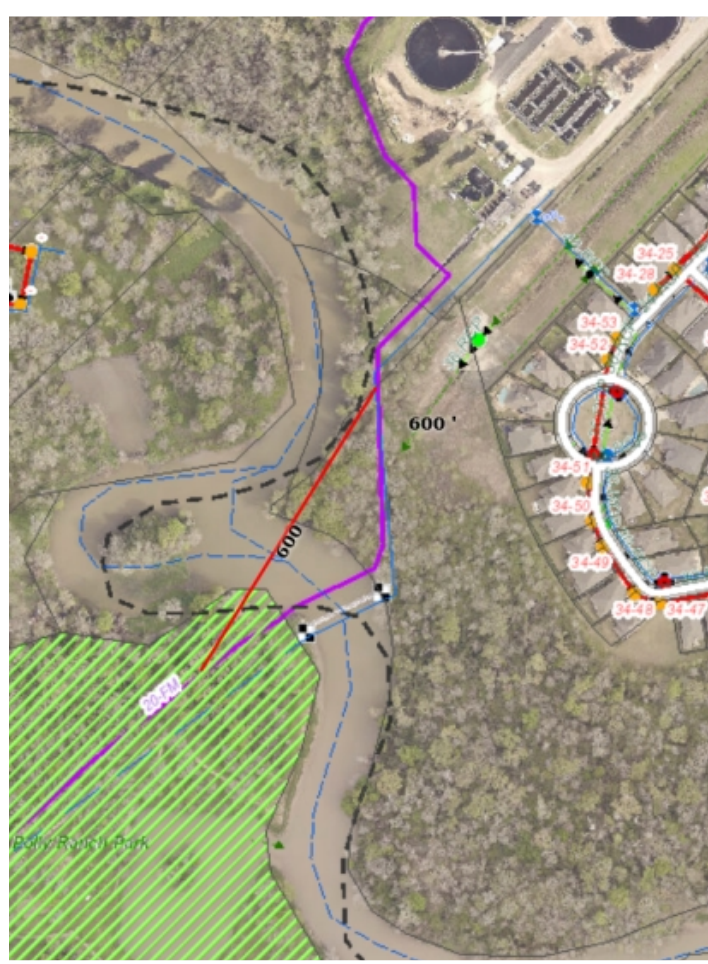
Engineering Costs - \$435,048

Engineering Timeline – September 2020 to May of 2021

30% Submittal Due – February 24, 2021



Clear Creek Utility Relocation



Clear Creek Utility Relocate

Standard Agreement executed with **Kimley-Horn** December 14, 2020

Project Kickoff January ,5 2021

Total CDBG-DR Grant: \$3,451,02

Engineering and Environmental Costs - \$180,000

Engineering Timeline – December 2020 to July/August of 2021



Frenchman's Creek



Round 1 Hurricane Harvey Community Development Block Grants (CDBG – MIT)

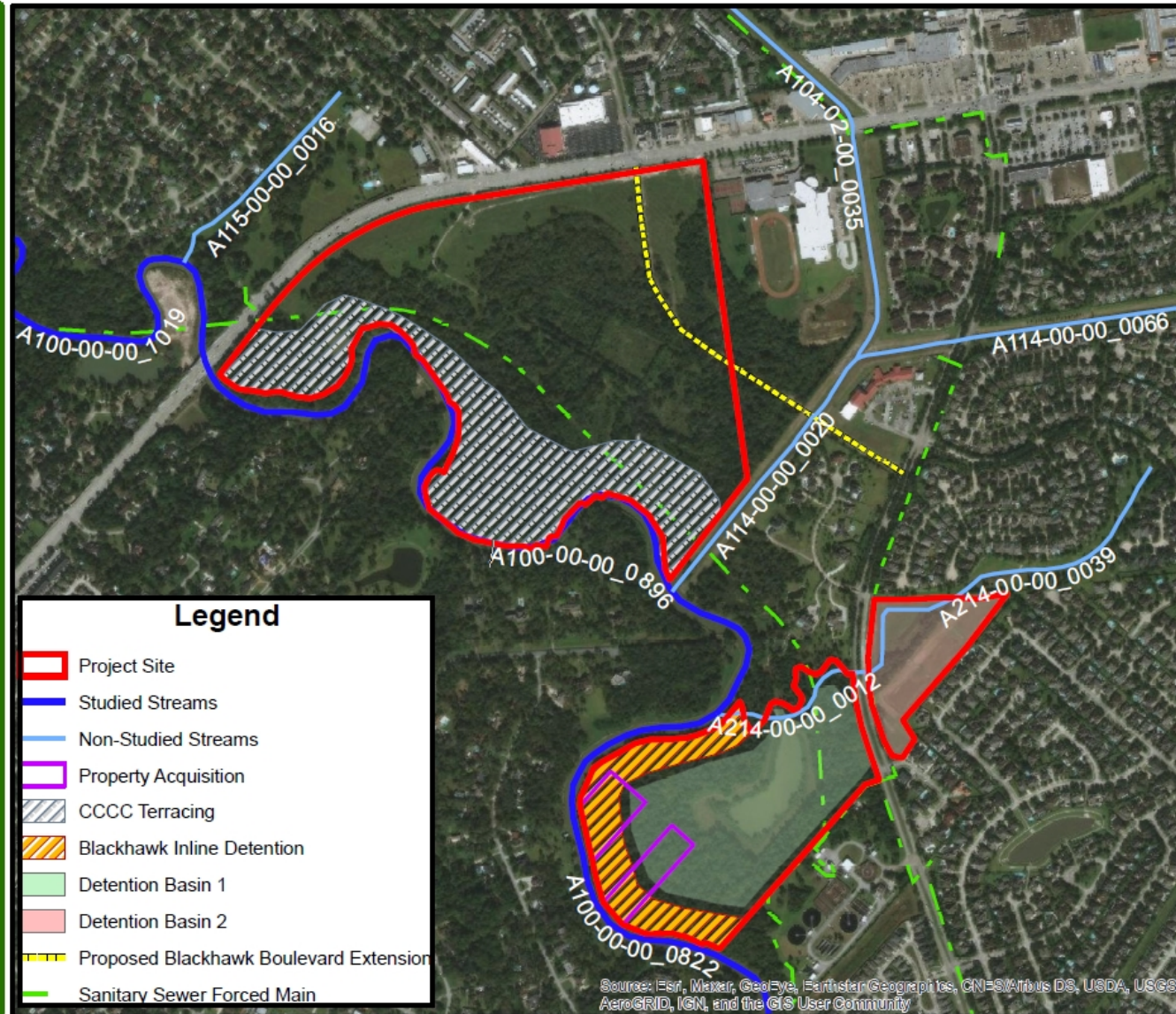


Clear Creek Inline & Offline Detention Bay Area Blvd. Phase I

Latitude: 25.513271
Longitude: -95.168067



Clear Creek Inline and Offline Detention Project
Bay Area Blvd Phase One
Site Map
Lat-Long: 25.513271, -95.168067



Clear Creek Inline & Offline Detention

Bay Area Blvd. Phase I

Competition	Amount Available	Applications Submitted	Amount Submitted
2015 Flood Mitigation	\$46,095,950	31	\$268,079.590.69
2016 Flood Mitigation	\$147,680,760	33	\$224,915,753.48
Harvey Mitigation Round 1	\$1,000,000,000	221	\$5,963,819,139.92



Questions?

Engineering@friendswood.com



FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 12/3/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Presentation of the 32nd Consecutive Certificate of Achievement for Excellence in Financial Reporting for the FY19 Comprehensive Annual Financial Report

Originating Department: Administrative Services

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

The City of Friendswood has received the Certificate of Achievement for Excellence in Financial Reporting for fiscal year 2018 - 2019. Phyllis Rinehart, Controller with the City of La Porte, TX, will present the award.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

The Certificate of Achievement is the highest form of recognition in the area of governmental accounting and financial reporting, and its attainment represents a significant accomplishment by a government and its management. This is the 32nd consecutive year the Administrative Services Department has been recognized with this outstanding achievement.

We would like to recognize the efforts of Katina Hampton, Director of Administrative Services, Rhonda Boskas, Deputy Director of Administrative Services – Finance, the accounting staff, and the entire Administrative Services Department. Their cumulative efforts enabled us to reach this achievement.

RECOMMENDATIONS

N/A

ATTACHMENTS

1. Press Release



GOVERNMENT FINANCE OFFICERS ASSOCIATION
NEWS RELEASE

FOR IMMEDIATE RELEASE

10/30/2020

For more information contact:
Michele Mark Levine, Director/TSC
Phone: (312) 977-9700
Fax: (312) 977-4806
Email: mlevine@gfoa.org

(Chicago, Illinois)—Government Finance Officers Association of the United States and Canada (GFOA) has awarded the Certificate of Achievement for Excellence in Financial Reporting to **City of Friendswood** for its comprehensive annual financial report (CAFR) for the fiscal year ended September 30, 2019. The CAFR has been judged by an impartial panel to meet the high standards of the program, which includes demonstrating a constructive "spirit of full disclosure" to clearly communicate its financial story and motivate potential users and user groups to read the CAFR.

The Certificate of Achievement is the highest form of recognition in the area of governmental accounting and financial reporting, and its attainment represents a significant accomplishment by a government and its management.

Government Finance Officers Association (GFOA) advances excellence in government finance by providing best practices, professional development, resources, and practical research for more than 21,000 members and the communities they serve.

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 11/12/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: A zone classification change request for 3.2895 acres, also known as Reserve A5, Block 2, Forest Creek Subdivision, located at 4321 Friendswood Link Rd., Friendswood, Harris County, Texas, to change from Multi-Family Residential-Garden Home District (MFR-GHD) to Neighborhood Commercial (NC).

Originating Department: Community Development

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

The applicant is requesting to change the zoning of the subject property from Multi-Family Residential - Garden Home District (MFR-GHD) to Neighborhood Commercial (NC) for a commercial development.

The newspaper ad was published, 73 property owner notices were mailed and a sign posted on the property for the public hearing notifications.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

If approved, the property owner will be required to meet the minimum standards of the NC zoning district.

RECOMMENDATIONS

At the Planning and Zoning Commission meeting held December 10, 2020, following the public hearing the City of Friendswood Planning and Zoning Commission voted 6 to 0 (Commissioner Clark was absent) to approve the zone change request. The recommendation memo is attached with more details regarding the recommendation.

ATTACHMENTS

1. Application_4321 Friendswood Link Rd
2. Deed_Friendswood Link Rd
3. Metes and Bounds_Friendswood Link Rd
4. Plat_Forest Creek
5. 4321 Friendswood Link Rd Rezoning Report
6. Aerial Map_Friendswood Link Rd
7. Location Map_Friendswood Link Rd
8. Zoning Map_Friendswood Link Rd

9. Future Land Use Map _4321 Friendswood Link Rd
10. PZ Rec Memo Zone Change 4321 Friendswood Link Rd 12-14-2020



City of Friendswood – Community Development

910 S. Friendswood Drive

Friendswood, TX 77546

Phone: 281-996-3201 Fax: 281-996-3260

www.ci.friendswood.tx.us

Zone Change Application

CURRENT ZONE OF PROPERTY: MFR-GHD

TYPE OF ZONE CHANGE (check one):

☒ Land Use Change to Zone: NC

☐ Specific Use Permit Option 1

☐ Planned Unit Development Option 1

☐ Specific Use Permit Option 2

☐ Planned Unit Development Option 2

SUP for Use(s) #: _____

PROPERTY IDENTIFICATION:

Address: 4322 FRIENDSWOOD LINK RD 4321

Platted Land – Plat Name: FORESTWOOD Lot: _____ Block: 2

Unplatted Land – Attach a certified metes and bounds description

OWNER NAME: PETER GORMAN Phone: _____

Owner's Mailing Address: 130 SURF CT

City: HOUSTON State: TX Zip: 77058 Fax: _____

Owner's Email Address: _____

AGENT'S NAME : ADIL ZAHIR / AMINMOHAMOAD Phone: 832-235-7442

Agent's Mailing Address: 1123 SYDNEY LANE

City: FRIENDSWOOD State: TX Zip: 77546 Fax: _____

Agent's Email Address: SKAROVALIA@GMAIL.COM

In authorizing an agent to represent the owner, the owner attests that his/her agent may make verbal or written representations and/or declarations on the owner's behalf and the owner understands and acknowledges that the City of Friendswood shall rely upon the agent's representations in matters pertaining to the above described property. The designation of an agent in this matter in no way absolves the owner of any of the owner's responsibilities outlined by the City of Friendswood. The owner must be the legal owner of record of the property at the time of submittal of the application.

The undersigned hereby request approval by the City Council on the above identified zone change.

X Owner's Signature: Peter Gorman Date: 11/10/2020 X

Agent's Signature: Adil Zahir Date: 11/8/2020

Received By: Becky Bennett
Date of Public Hearing: 12-10-2020
Property Owner Notices: 11-25-2020

Application Number: 2020-0045
Received Date: 11-9-2020
Newspaper Notice: 11-10-2020
Sign on Property: 11-25-2020

07100034
Stewart Title Co

WD
B

GENERAL WARRANTY DEED**NOTICE OF CONFIDENTIALITY RIGHTS:**

IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OF THE FOLLOWING INFORMATION FROM THIS INSTRUMENT BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

Date: 5/27/07

Grantor: Asta L. Nilsson

Grantor's Mailing Address: 2517 Yunque
Houston TX 77066

Grantee: Peter Gorman

1EE

Grantee's Mailing Address: 130 Surf Court
NASSAU BAY TEXAS 77058

Consideration: Cash and other good and valuable consideration.

Property (including any improvements):

A tract or parcel of land containing 3.2895 acres, or 143,290 square feet, out of the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas, and being more particularly described by metes and bounds on EXHIBIT "A" attached hereto and fully incorporated herein for all purposes.

Reservations from Conveyance: None

Exceptions to Conveyance and Warranty:

Validly existing easements, rights-of-way, and prescriptive rights, whether of record or not; all presently recorded and validly existing instruments, other than conveyances of the surface fee estate, that affect the Property; and taxes for 2007, which Grantee assumes and agrees to pay, and subsequent assessments for that and prior years due to change in land usage, ownership, or both, the payment of which Grantee assumes, but not subsequent assessments for that and prior years due to change in land usage, ownership, or both, the payment of which Grantor assumes.

Grantor, for the Consideration and subject to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty, GRANTS, SELLS, and CONVEYS to Grantee the Property,

EXHIBIT "A"

Being a tract of land in the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas and being all of the vacated subdivision plat of Forestwood, per plat recorded under Film Code 350061 of the Harris County Map Records, and being more particularly described by metes and bounds as follows with all bearings based on said plat;

D

COMMENCING at the intersection of the northeast line of Oxnard Lane (60.06 feet wide) per the plat of Forest Creek recorded in Volume 239, Page 50 Harris County Map Records, with the southeast line of Friendswood Link Road (100.00 feet wide), and the most westerly corner of Lot 1 of Block 2 of said Forest Creek; said point being in a curve concave to the northwest;

THENCE northeasterly, 111.32 feet along the southeast right-of-way line of said Friendswood Link Road and said curve concave to the northwest, having a radius of 1,440.00 feet, a central angle of $04^{\circ} 25' 45''$, and whose chord bears $N 51^{\circ} 05' 07'' E$, 111.29 feet, to the north corner of said Lot 1 and the POINT OF BEGINNING and west corner of the herein described tract; a found 5/8 inch iron rod bears $S 62^{\circ} 45' W$, 0.9 feet;

THENCE continuing northeasterly, 176.83 feet along the southeast right-of-way line of said Friendswood Link Road and the arc of said curve concave to the northwest, having a radius of 1,440.00 feet, a central angle of $07^{\circ} 02' 09''$, and whose chord bears $N 45^{\circ} 21' 10'' E$, 176.72 feet to a 5/8 inch iron rod found marking the point of tangency;

THENCE continuing along the southeast right-of-way line of said Friendswood Link Road, $N 41^{\circ} 49' 57'' E$, 438.39 feet, to a 1/2" inch iron rod found marking the west corner of a tract of land sold to First City Bank Gulfgate as described in deed recorded under Harris County Clerk's File Number K771546, and the north corner of said Forestwood and the herein described tract;

THENCE along the southwest line of said Gulfgate tract and the northeast line of said Forestwood, $S 47^{\circ} 39' 14'' E$, 234.76 feet to a point in the northwest line of said Forest Creek, the south corner of said Gulfgate tract, and the east corner of said Forestwood and the herein described tract;

THENCE along a northwest line of said Forest Creek and the southeast line of said Forestwood, $S 42^{\circ} 20' 46'' W$, 614.85 feet to an "ell" corner of said Forest Creek and the south corner of said Forestwood and the herein described tract;

THENCE along a northeast line of said Forest Creek and the southwest line of said Forestwood, $N 47^{\circ} 39' 14'' W$, 240.10 feet to the POINT OF BEGINNING and containing 3.2895 acres, or 143,290 square feet, of land.

together with all and singular the rights and appurtenances thereto in any way belonging, to have and to hold it to Grantee and Grantee's heirs, successors, and assigns forever. Grantor binds Grantor and Grantor's heirs and successors to warrant and forever defend all and singular the Property to Grantee and Grantee's heirs, successors, and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof, except as to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty.

When the context requires, singular nouns and pronouns include the plural.

Asta L. Nilsson
ASTA L. NILSSON

10R

STATE OF TEXAS

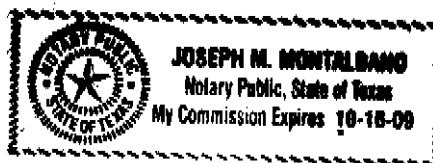
*

COUNTY OF GALVESTON

*

On the 28th day of March, 2007, before me, the undersigned Notary Public, personally appeared Asta L. Nilsson, known to me or satisfactorily proven to be the person whose name is subscribed to this instrument and acknowledged that he executed the same for the purpose contained therein.

Joseph M. Montalbano
Notary Public, State of Texas



Return To:
Peter Norman
130 Surf Court
Nassau Bay Tex
77058

20070190736
Pages 4
03/30/2007 14:03:20 PM
e-Filed & e-Recorded in the
Official Public Records of
HARRIS COUNTY
BEVERLY KAUFMAN
COUNTY CLERK
Fees 24.00

RECORDERS MEMORANDUM

This instrument was received and recorded electronically
and any blackouts, additions or changes were present
at the time the instrument was filed and recorded.

Any provision herein which restricts the sale, rental, or
use of the described real property because of color or
race is invalid and unenforceable under federal law.

THE STATE OF TEXAS
COUNTY OF HARRIS

I hereby certify that this instrument was FILED in
File Number Sequence on the date and at the time stamped
hereon by me; and was duly RECORDED in the Official
Public Records of Real Property of Harris County, Texas.



Beverly L. Kaufman
COUNTY CLERK
HARRIS COUNTY, TEXAS



SCALE: 1 INCH = 100 FEET



A 1.280 ACRE TRACT OF LAND, PART OF RESERVE "A", IN BLOCK TWO (2), OF
FOREST CREEK, A SUBDIVISION IN HARRIS COUNTY, TEXAS, ACCORDING TO THE
MAP ON FILE THEREOF RECORDED IN HARRIS COUNTY CLERK'S OFFICE, BOOK 20 OF THE MAP
RECORDS OF HARRIS COUNTY, TEXAS, AND BEING MORE PARTICULARLY
DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINS at a 1/2 inch iron rod found for the West corner of said Reserve "A", same being
the Northeast corner of Lot 1 in Block 2, Forest Creek and a point on the Southeastern right of
way line of Friendswood Link Road (located on 100 feet in width), said right of way being a curve
to the left having a radius of 1440.00 feet;

THENCE along said right of way and said curve to the left having a radius of 1440.00 feet, a
central angle of 7 deg. 02 min. 10 sec., a chord bearing and distance of North 45 deg. 21 min.
02 sec. East, 176.73 feet, for an arc distance of 176.83 feet to a 1/2 inch iron rod found at the
end of said curve;

THENCE North 41 deg. 49 min. 57 sec. East and continuing along said Southeastern right of
way line, a distance of 428.39 feet to the North corner of the herein described tract, same being
the West corner of a tract of land conveyed to Friendswood Link Development LLC under Harris
County Clerk's File No. 20130454525;

THENCE South 47 deg. 26 min. 14 sec. East along the Southeastern line of said tract, a
distance of 234.76 feet to a 1/2 inch iron rod found for the East corner of the herein described
tract, same being the South corner of said Friendswood Link Development LLC tract, also being
a point on the Southeastern line of said Reserve "A" and the Northwestern line of Lot 15 in
Block 2, Forest Creek;

THENCE South 42 deg. 20 min. 44 sec. West along the Southeastern line of said Reserve "A",
same being the Northwestern line of Lots 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, and 5, Block 2, a
distance of 814.88 feet to a 1/2 inch iron rod found for the South corner of said Reserve "A",
same being the East corner of Lot 2, Block 2;

THENCE North 47 deg. 26 min. 14 sec. West along the Northwestern line of said Reserve "A",
same being the Northwestern line of Lots 2, 3 and 1 in Block 2, Forest Creek, a distance of
345.10 feet to the PLACE OF BEGINNING.

I, Christopher Trusky, Registered Professional Land Surveyor
in the State of Texas, hereby certify that this plot represents
a survey made on the ground under my direction and super-
vision on July 14, 2015. At the time of this survey there
were no encroachments, conflicts or perturbations apparent on
the ground, EXCEPT AS SHOWN.

THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.
This survey meets or exceeds the specifications for a Category
1A, Condition 1 survey as promulgated by the Texas Society of
Professional Surveyors.

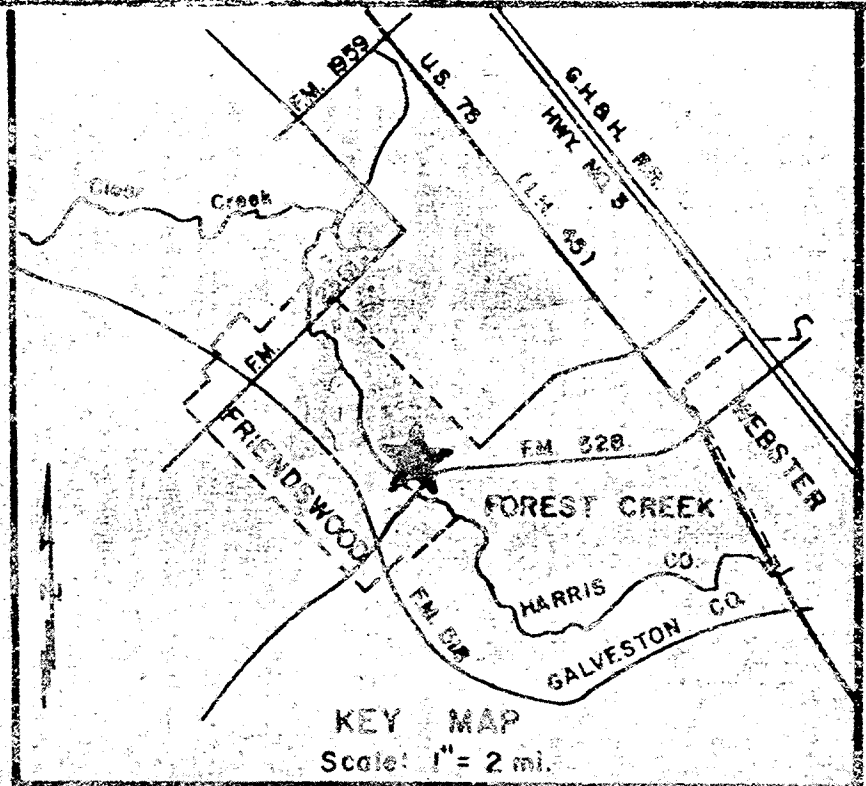
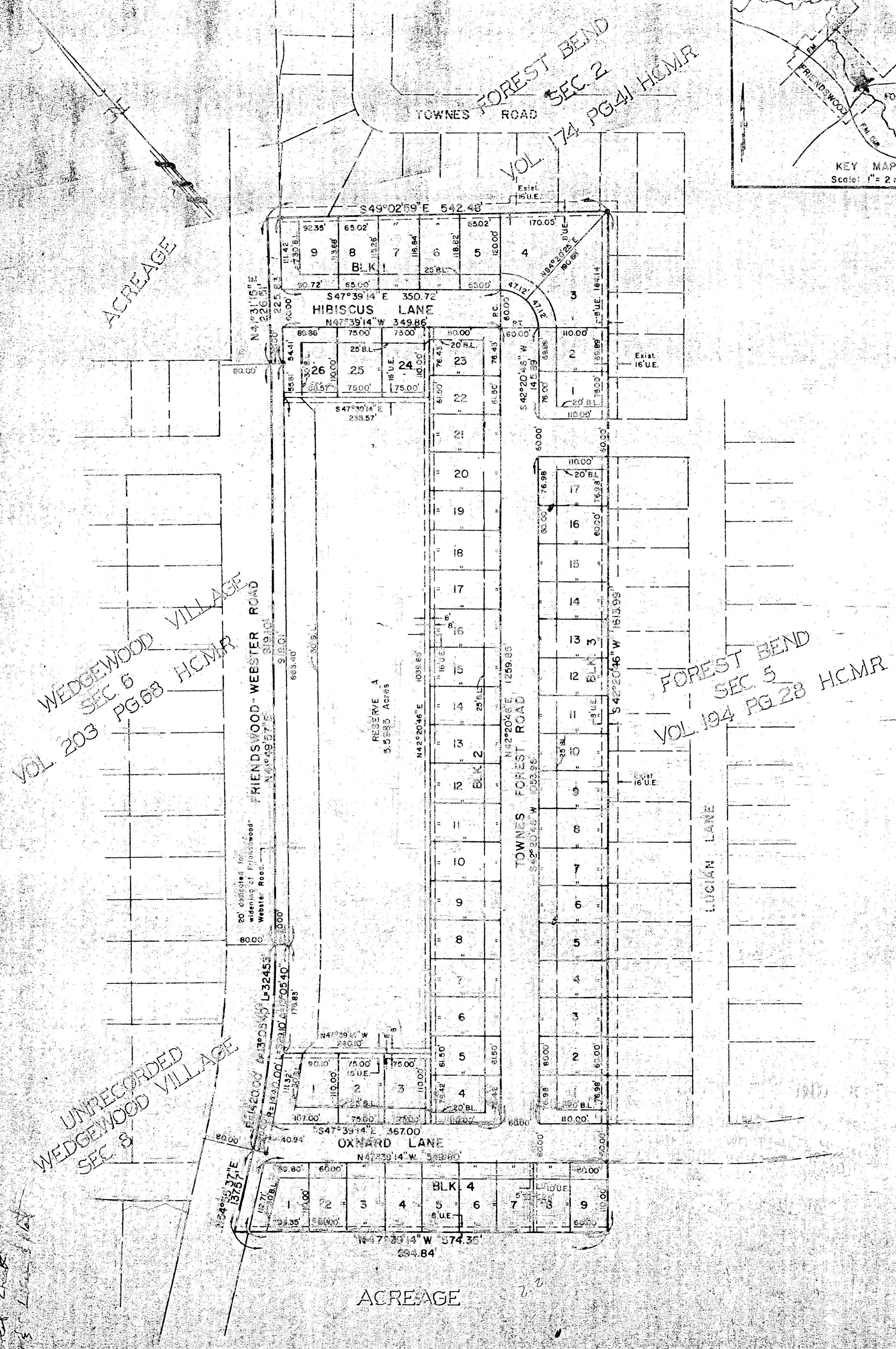

Christopher Trusky
RPLS No. 62647
The Land Survey Co. LLC
Firm Reg. No. 10045700
281-335-4000



Note:
According to FIRM Community Panel No. 4854480000E, dated
08/22/1999, this property lies in Flood Zone "X", which is
considered to be outside the Special Flood Hazard Area. Surveyor
makes no representation as to whether or not this property may flood.

Books of bearings in the Southeastern line of subject property, as platted
and monumented.

Other encumbrances or matters affecting the subject property, if any,
are not shown.



APPROVED by the Commissioner's Court of Harris County, Texas this _____ day of _____, 19__.

Ton Bass, Commissioner, Precinct 1
Jim Fontana, Commissioner, Precinct 2
Jon Lindsay, County Judge

R. V. Eckels, Commissioner, Precinct 3
E. A. Lyons, Commissioner, Precinct 4

This is to certify that the City Planning Commission of the City of Friendswood, Texas has approved this plot and subdivision of Forest Creek as shown hereon.

IN TESTIMONY WHEREOF, witness the official signature of the Chairman and Secretary of the City Planning Commission of the City of Friendswood, Texas, this 6th day of April, 1976.

Clyde Rainey
Clyde Rainey, Chairman
Roy Wiley
Roy Wiley, Secretary

I, Richard P. Doss, County Engineer of Harris County, Texas, do hereby certify that the plot of this subdivision complies with all of the existing rules and regulations of this office as adopted by the Harris County Commissioner's Court; and further, that it complies or will comply with all of the laws included in the Harris County Road Law, also including Section 31-C as amended by Chapter 614, Acts of 1973, 63rd Legislature.

Richard P. Doss, County Engineer

I, G. H. Smith, Flood Control Director of Harris County Flood Control District, Harris County Texas, do hereby certify that the plot of this subdivision complies with requirements for internal subdivision drainage as adopted by Commissioner's Court, however, no certification is hereby given as to the effect of drainage from this subdivision on the intercepting drainage artery or parent stream, or on any other area or subdivision within the watershed.

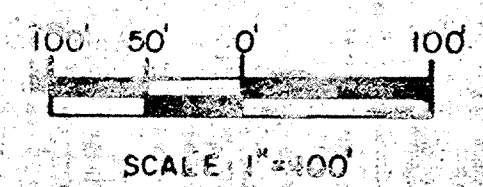
G. H. Smith, Flood Control Director

- NOTES:
- All side lot lines are either perpendicular or radial to street frontage unless otherwise noted.
 - B.L. indicates Building Line
U.E. indicates Utility Easement

FOREST CREEK

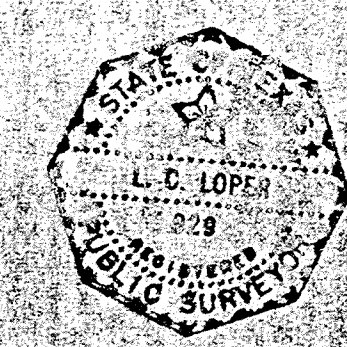
A SUBDIVISION OF 20.1236 ACRES OUT OF SARAH MCKISSICK SURVEY, ABSTRACT NO. 549, HARRIS COUNTY, TEXAS.

ENGINEER: L.C. LOPER & ASSOCIATES
OWNER: CHARLES KORNEGAY BUILDER, INC. - CHARLES KORNEGAY
4 BLOCKS
61 LOTS



This is to certify that I, L.C. Loper, a Licensed Surveyor of the State of Texas, have plotted the above subdivision from an actual survey on the ground; and that all block corners, angle points, and points of curve are properly marked with five eighth inch (5/8") iron rods, 18" long, and that this plat accurately represents that survey made by me.

L.C. Loper
L.C. Loper
Texas Registration No. 929



STATE OF TEXAS
COUNTY OF HARRIS

We, Charles Kornegay, and Jeanette Marie Kornegay, President and Secretary respectively of Charles Kornegay Builder, Inc. owner of the property subdivided in the above and foregoing map of Forest Creek, do hereby make subdivision of said property for and on behalf of said Charles Kornegay Builders, Inc. according to the lines, streets, lots, alleys, parks, building lines, and easements thereon shown and designate said subdivision as Forest Creek, located in the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas and on behalf of said Charles Kornegay Builder, Inc., and dedicate to public use, as such, the streets, alleys, parks, and easements shown thereon forever, and do hereby waive any claims for damages occasioned by the establishing of grades as approved for the streets and alleys dedicated or occasioned by the alteration of the surface of any portion of streets or alleys to conform to such grades; and do hereby bind ourselves, our successors and assigns to warrant and forever defend the title to the land so dedicated.

This is to certify that we, Charles Kornegay and Jeanette Marie Kornegay, President and Secretary respectively of Charles Kornegay Builder, Inc., owner of the property subdivided in the above and foregoing map of Forest Creek, have complied or will comply with the existing Harris County Road Law, Section 31-C as amended by Chapter 614, Acts of 1973, 63rd Legislature, and all other regulations hereof on file with the Harris County Engineer and adopted by the Commissioners' Court of Harris County, Texas.

FURTHER, We do hereby dedicate forever to the public a strip of land fifteen feet (15') wide on each side of the centerline of any and all gullies, ravines, draws, sloughs, or other natural drainage courses located in the said subdivision, as easements for drainage purposes, giving Harris County and/or any other public agency the right to enter upon said easements at any and all times for the purpose of constructing and/or maintaining drainage work and/or structures.

FURTHER, all of the property subdivided in the above and foregoing map shall be restricted in its use, which restrictions shall run with the title to the property, and shall be enforceable, at the option of Harris County, by Harris County or any citizen thereof, by injunction as follows:

- That drainage of septic tanks into road, street, alley or other public ditches, either directly or indirectly, is strictly prohibited.
- Drainage structures under private driveways shall have a net drainage opening area of sufficient size to permit the free flow of water without backwater, and shall be a minimum of one and three quarters (1-3/4) square feet (18" diameter pipe culvert). Culverts or bridges must be used for driveways and/or walks.

There is also dedicated for utilities an unobstructed aerial easement five feet (5') wide from a plane twenty feet (20') above the ground upward, located adjacent to all easements shown hereon.

We hereby covenant and agree with the City of Friendswood and/or Harris County and/or any property owner that the building lines and utility easements shown in adjacent acreage are hereby established as shown.

We hereby covenant and agree that all lots within the boundaries of this subdivision are for residential purposes unless otherwise noted.

IN TESTIMONY WHEREOF, Charles Kornegay Builder, Inc., has caused these presents to be signed by Charles Kornegay, its President, thereto authorized, attested by its Secretary, Jeanette Marie Kornegay, and its common seal hereunto affixed this 3rd day of April, 1976.

CHARLES KORNEGAY BUILDER, INC.

Charles Kornegay
Charles Kornegay, President
Jeanette Marie Kornegay
Jeanette Marie Kornegay, Secretary

STATE OF TEXAS
COUNTY OF HARRIS

BEFORE ME, the undersigned authority, on this date personally appeared Charles Kornegay, President and Jeanette Marie Kornegay, Secretary of Charles Kornegay Builder, Inc., known to me to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that they executed the same for the purposes and considerations therein expressed, and in the capacity therein and herein set out, and as the act and deed of said corporation.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this 2nd day of April, 1976.

John W. Heaton
John W. Heaton
Notary Public in and for Harris County, Texas.

This is to certify that I, Thomas D. Heaney, City Engineer for the City of Friendswood, Texas have approved this plot and subdivision of Forest Creek as shown hereon.

IN TESTIMONY WHEREOF, witness the official signature of the City Engineer for the City of Friendswood, Texas, this 6th day of April, 1976.

Thomas D. Heaney
Thomas D. Heaney, City Engineer

STATE OF TEXAS
COUNTY OF HARRIS

I, R. E. Turrentine, Jr., Clerk of the County Court of Harris County, Texas do hereby certify that the within instrument with its certificate of authentication was filed for registration in my office on _____, 19____, at _____ o'clock _____ M., and duly recorded on _____ of said County, _____ page _____ of record of _____.

WITNESS my hand and seal of office at Houston, the day and date last above written.

R. E. Turrentine, Jr. Clerk, County Court, Harris County, Texas

By _____ Deputy

L.C. LOPER & ASSOCIATES, INC.
CONSULTING ENGINEER
89 BELLAIR BLVD.
HOUSTON, TEXAS 77025
666-2828

Rezoning Report

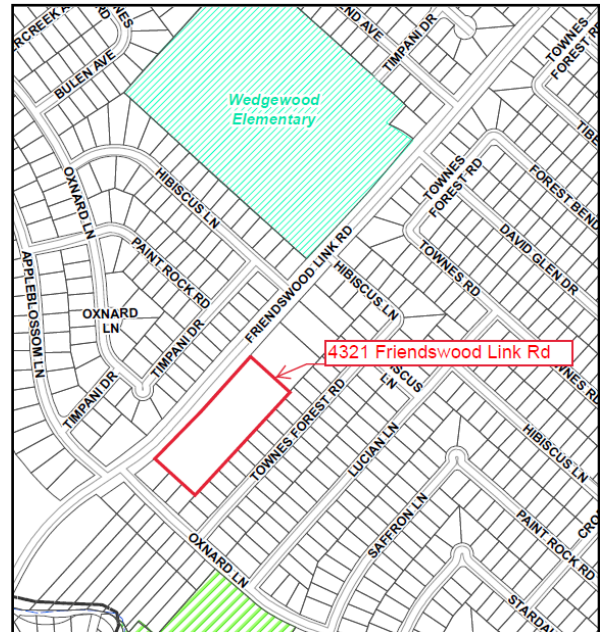
November 2020

Project: Zone Change

Address: 4321 Friendswood Link Rd.

Legal: 3.2895 acres, also known as Reserve A5, Block 2 Forest Creek Subdivision, out of the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas

Request: Zone classification change from Multi-Family Residential-Garden Home District (MFR-GHD) to Neighborhood Commercial (NC)



Applicable Zoning Ordinance Excerpts:

Appendix C
Zoning Ordinance
Section 7. Schedule of District Regulations

G. *NC, Neighborhood Commercial District, general purpose and description.* The NC, Neighborhood Commercial District, is primarily intended for retail sales, services and office activities in a mixed grouping. This designation is intended for use along major thoroughfares and collector streets where larger tracts of land can be utilized as coordinated commercial centers. This designation is intended for use of land areas between one-quarter acre and two acres. Structure size is typically between 4,000 and 20,000 square feet. Development of a neighborhood commercial district requires approval of a development site plan by the planning and zoning commission. Office uses permitted in this district shall not exceed 60 percent of the gross building and structure floor area.

1. Area and height regulations. Area and height regulations in an NC district are set forth in subsection Q.2 of this section, regulation matrix.
2. See section 8 for supplementary district regulations.
3. See section 9 for temporary certificate of zoning compliance that may be granted by the administrative official and specific use permits that may be recommended by the

planning and zoning commission within the NC district under certain circumstances and conditions.

4. Permitted uses. Uses permitted in an NC district are set forth in subsection P of this section, permitted use table.
5. Building site coverage consisting of all buildings and structures and all paved surfaces shall not exceed 90 percent of the total lot area.
6. Buildings in the NC zoning district are encouraged to have exterior cladding of brick, masonry, stone, stucco or glass. Fiber cement boards/siding are discouraged, except as trim for eaves and overhangs, while all building products and materials approved for use by a national model code published within the last 3 code cycles (2018, 2015 and 2012) are allowed by V.T.C.A., Government Code ch. 3000.

Existing Use/Site Attributes:

The subject property is 3.2895 acres of undeveloped land.



City of Friendswood GIS Aerial Map

Zoning History:

The zoning of the property is currently Multi-Family Residential-Garden Home District (MFR_GHD). The original zoning of this tract was Neighborhood Commercial (NC). In 1991, the zoning was changed to Single Family Residential (SFR) with ordinances 91-19 and 91-20. And in 1994, the zoning was changed to Multi-Family Residential – Garden Home District (MFR-GHD) with ordinance 94-16.

Adjacent Zoning/Land Use:

The property is located along Friendswood Link Rd. The property to the northeasterly side is zoned Neighborhood Commercial (NC) and the property to the rear and other side is all Single Family Residential (SFR).



City of Friendswood Zoning Map

Platting Analysis:

The property will require a replat prior to development. This is the remaining portion of Reserve A of Forest Creek Subdivision (Harris County).

Planning Analysis:

NC zoning district requires site plan approval by the Planning and Zoning Commission. The property is subject to a 50-foot building line that was on the original plat of Forest Creek Subdivision. Additionally, since the development would abut residentially zoned property, an 8-foot opaque fence and a 10-foot landscape buffer with a tree planted every 25 feet will be required.

The applicant has provided conceptual drawings of their plans for the property; however, approval of the zone change does not bind them to this plan. They will be required to meet the minimum standards of the NC zoning district, if approved.

Comprehensive Planning Analysis:

The Future Land Use Map identifies this property developing as High Density Residential; however, the most recent zone change application to change the zoning to High Density residential (MFR_H) to allow 36 townhomes met great opposition from the surrounding property owners and the applicant withdrew the application. Owners cited concerns for traffic, impact on the school, and drainage. The current property owner and developers do not feel that it is financially feasible to develop the property under the current zoning of Garden Home District (MFR-GHD). The Future Land Use Map (2008) will be reviewed and updated soon as part of the Comprehensive Plan update.

Infrastructure/Service Delivery Impacts

Storm Water Management and Floodplain Issues:

The property will be required to provide on-site detention.

Utilities:

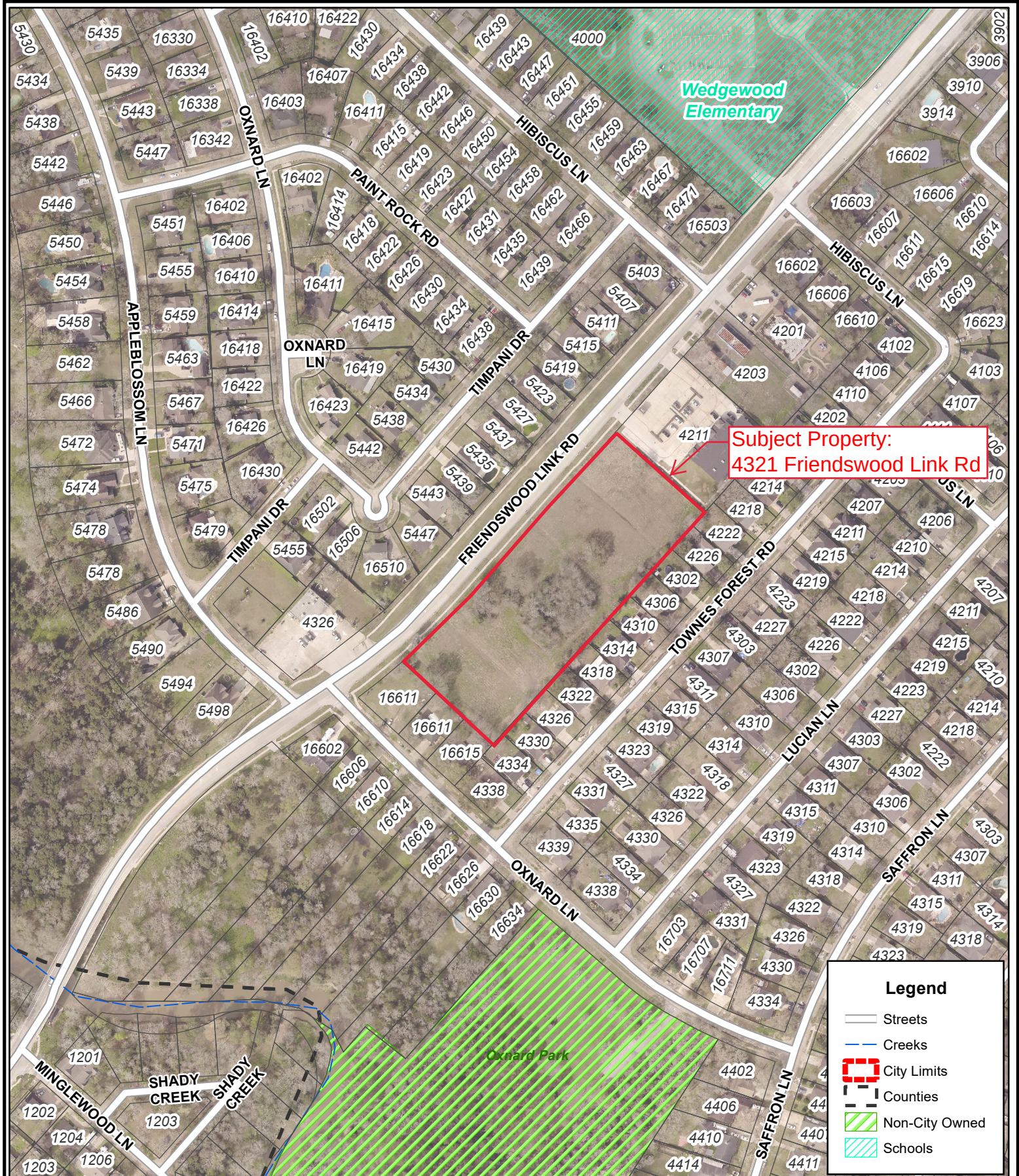
City water and sewer services are available to the property.

Access:

Access will be from three driveways to Friendswood Link Rd. All driveways and parking spaces will be required to meet the current minimum design standards detailed in the Design Criteria Manual.

Park/Open Space:

Park Dedication Fees will not be applicable for commercial development.



Disclaimer: This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. Gov. C. §2501.102. The user is encouraged to independently verify all information contained in this product. The City of Friendswood makes no representation or warranty as to the accuracy of this product or to its fitness for a particular purpose. The user: (1) accepts the product AS IS, WITH ALL FAULTS; (2) assumes all responsibility for the use thereof; and (3) releases the City of Friendswood from any damage, loss, or liability arising from such use.

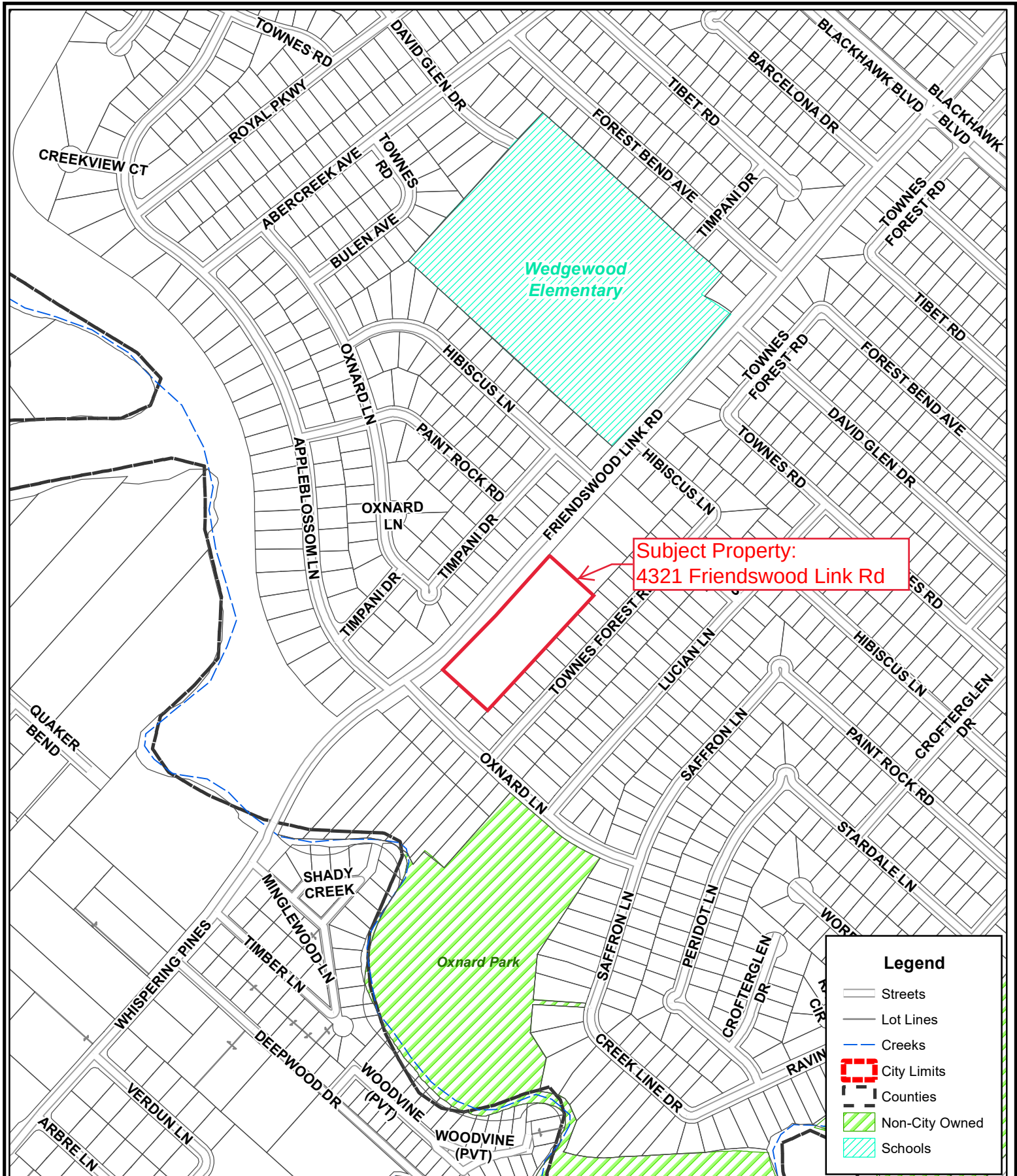


City of Friendswood
910 South Friendswood Drive
Friendswood, Texas 77546
(281) 996-3200
www.ci.friendswood.tx.us

Friendswood GIS Mapping



1" = 247'
Page 55 of 477



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Friendswood GIS Mapping



1" = 493'
 Page 56 of 477



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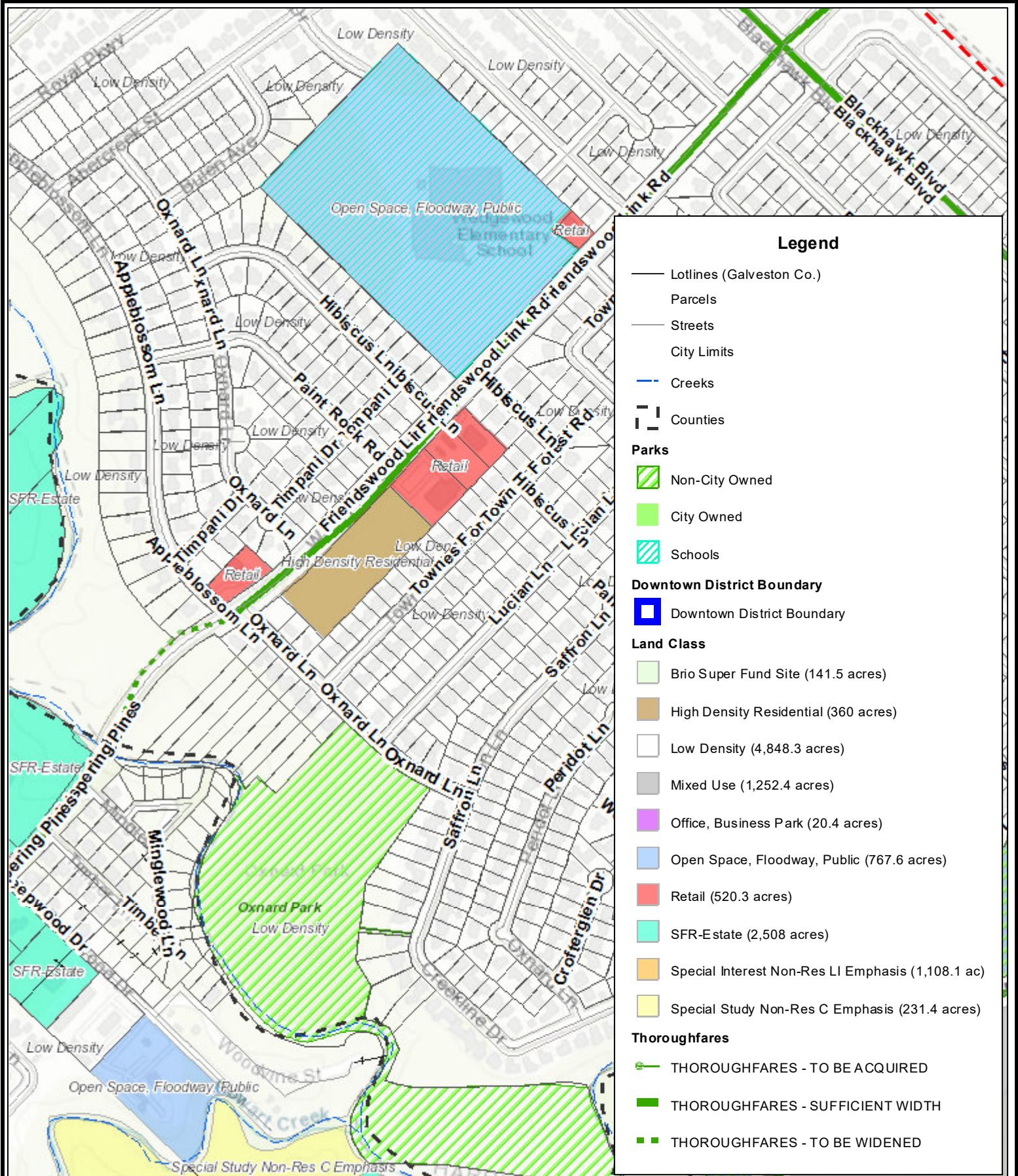


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1" = 247'
 Page 57 of 477



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City of Friendswood
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 Friendswood, Texas 77546
 (281) 996-3200
www.ci.friendswood.tx.us

Friendswood GIS Mapping



1" = 572'
 Page 58 of 477

Memo

To: Mayor and City Council

From: Joe Matranga, P&Z Chairman 
Aubrey Harbin, Director of Community Development/Planner

Date: December 14, 2020

Re: A zone classification change located at 4321 Friendswood Link Rd., 3.2895 acres, also known as Reserve A5, Block 2 Forest Creek Subdivision, out of the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas, to change from Multi-Family Residential-Garden Home District (MFR-GHD) to Neighborhood Commercial (NC)

At the Planning and Zoning Commission meeting held December 10, 2020, following the public hearing the City of Friendswood Planning and Zoning Commission voted 6 to 0 (Commissioner Clark was absent) to approve the zone change request referenced above.

The subject property, approximately 3 acres in size, is located along Friendswood Link Rd. about 1,000 feet northeast of Clear Creek. The property to the northeasterly side is zoned Neighborhood Commercial (NC) and the property to the rear and other side is all Single Family Residential (SFR).

A handful of residents attended the public hearing and expressed opposition to the requested zone change citing concerns about the increased vehicular traffic on Friendswood Link Road as well as pedestrian traffic and impacts on the nearby school.

The Commission was sympathetic to the residents' concerns that development of the tract could increase traffic along Friendswood Link Road; however, it has become apparent that the current Multi-Family Residential – Garden Home zoning is not feasible for the development of this tract and in prior meetings many more residents opposed increasing the tract's allowable density under

Multi-Family Residential – High Density that would make residential development financially feasible.

The Commission ultimately concluded that the property owner deserves a chance to develop his property. It remains vacant after many years and multiple failed attempts to develop and purchase it under the current zoning. The subject property was zoned Neighborhood Commercial (NC) when it was originally annexed into the City, and the adjacent commercial tracts, which were all a part of Reserve A of Forest Creek Subdivision are currently zoned Neighborhood Commercial (NC).

Please note that the current Future Land Use map identifies this property developing as High Density Residential mainly because that was the zoning assigned to the property for many years. The Planning and Zoning Commission will be revising the Future Land Use Map soon and this will be one of the properties discussed in detail.

The Planning & Zoning Commission recommends that City Council approve this zone change request from Multi-Family Residential-Garden Home District to Neighborhood Commercial.

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 12/2/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Employee Service Awards

Originating Department: City Manager

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

Every year in December, the City recognizes its employees for their years of dedicated service. Unfortunately, we had to cancel the event this year due to the COVID-19 pandemic. I would like to acknowledge those staff members and thank them for their years of service to the City. Awards are given in 5 year increments and presented at the Employee Christmas Party. Here is a listing of this year's recipients:

25 Years

Stephanie Price-Taylor PD

20 Years

Tammy Scroggins PD

Brian Mansfield FMO/EM

David Gonzales PD

Elaine Langton PD

15 Years

Jane Sullivan ASO

James Toney Parks

John Johnson IT

Christina Hicks LIB

Andrew Whittaker PD

Stephen Eades PD

Roger Stenstrom PD

Patricia Anaya PD

Jason Ives PD

10 Years

Brian Rouane CDD

Carlos Granillo PD

Bradley Rusk PD
Rosalyn Redmon PD

5 Years

Keri Zombory PD
Matthew Diaz Parks
Tuan Nguyen ENG
Rick Watkins ENG
Quanah Radabaugh PD
Reymundo Orozco PW
Johnny Tram PD
Daniel Wilkerson PD

We appreciate all of our City employees and thank them for their hard work in providing the quality services our citizens have come to expect.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 12/2/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Annual Tree Give Away

Originating Department: City Manager

Degree of importance: Elective

SUMMARY / ORIGINATING CAUSE

The Keep Friendswood Beautiful and City of Friendswood's Annual Tree Give Away has moved and will take place at Centennial Park, 2200 S. Friendswood Drive on Saturday, January 16th at 8 a.m. Please arrive early as the trees usually go quickly.

There will be 150 trees total made up of Live Oak, Water Oak, and Lace Bark Elms. They will also be giving away Loblolly Pine and Red Oak saplings.

The Giveaway is limited to one tree per family (first come-first served) and is for Friendswood residents only, a city water bill or driver's license is required. Delivery is not provided. For more information please contact the Parks and Recreation Department at 281-996-3220.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

2020 EVENTS

FITNESS PREVIEW PARTY

TREE GIVEAWAY

DADDY DAUGHTER

SRS VALENTINES LUNCHEON

SRS MADRI GRAS CELEBRATION

SRS GO TEXAN LUNCHEON

SENIOR PROGRAM SHUT DOWN

SPRING SPARKLE-CANCELLED

DRIVE IN CONCERTS

HALF OF CONCERT SERIES CANCELLED

DRIVE IN MOVIES

KFB'S FAIRY TRAIL

TRADITIONAL 4TH OF JULY CANCELLED

SUMMER CAMP CANCELLED

SWIM LESSONS CANCELLED

POOL OPEN TO LIMITED CAPACITY

SCHOOL'S OUT FOR SUMMER CANCELLED

4TH OF JULY REVERSE PARADE

VIRTUAL BINGO

KFB'S BIRD PHOTO CONTEST

KFB'S-BACK TO SCHOOL PHOTO CONTEST

FM518 MEDIANS BEAUTIFICATION PROJECT COMPLETE

KICKBALL LEAGUE

KFB'S HALLOWEEN SCAVENGER HUNT

FLAPJACK FUN RUN

WINTER AQUA ZUMBA

KFB'S BIRD VIDEO

KFB'S 2 MATCHING GRANTS

THE NEW HOME FOR THE HOLIDAY'S LIGHTED TRAIL

STAFF DECORATED 3 CHRISTMAS TREES

KFB BLUEBONNET SEED GIVEAWAY

DRIVE THRU FALL HAUL

KFB'S DON'T MESS WITH TEXAS CLEANUP

FITNESS CLASSES BRING BACK ZUMBA

SRS VETERANS DAY DRIVE THRU

OPENING OF THE SENIOR PROGRAM-CLASSES ONLY

BLUE SANTA TOURNAMENT-RAINED OUT

SANTA IN THE PARK CANCELLED

LETTERS TO SANTA

CHRISTMAS FAIRY TRAIL HUNT

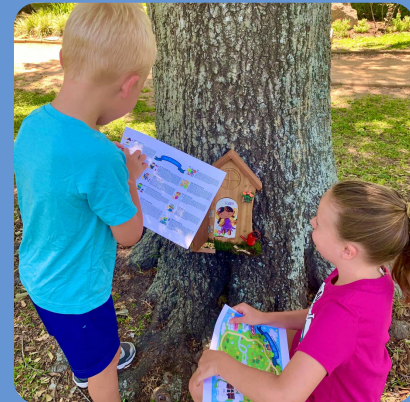
SATURDAY "EVENT" DAYS AT THE TRAIL, SNOW, MUSIC, FOOD TRUCKS

KFB'S CHRISTMAS SCAVENGER HUNT

GINGERBREAD CONTEST

LIGHTED CHRISTMAS TRAIL PHOTO CONTEST

LIGHT UP FRIENDSWOOD DECORATING CONTEST



2020

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 11/3/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Hurricane Harvey Update

Originating Department: City Manager

Degree of importance: Critical

SUMMARY / ORIGINATING CAUSE

Hazard Mitigation Grant Program - Buyouts/Acquisitions

- 24 properties included in the initial application
- 4 properties have closed
- 2 properties are pending
- 18 properties declined offers
- Demolition services have started

Texas Water Development Board - Flood Mitigation Assistance Grant

- 4 properties included in the initial application
- 3 properties closed
- 1 properties have declined offer
- Demolition services have started

CDBG-Disaster Recovery (Harris County)

- Appraisal complete, awaiting receipt of advance funding for Blackhawk Facility (old Food Lion)
- Engineering and environmental services underway for the Forest Bend Detention Project

CDBG-Disaster Recovery (Galveston County)

- Engineering underway for pipe rack project (utility lines relocation across Clear Creek)
- Acquisition services commenced (Deepwood and Frenchman's Creek)

FEMA Disaster Assistance

- FEMA has approved the Deepwood/Shadwell damage costing/project efforts; awaiting obligation of funds
- Staff anticipate closing on the Blackhawk Facility in January

CDBG Mitigation Applications

- Awaiting response on our application submitted in October

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 11/3/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Coronavirus Disease 2019 (COVID-19) Update

Originating Department: City Manager

Degree of importance: Critical

SUMMARY / ORIGINATING CAUSE

As a result of the Coronavirus, staff has implemented and continues to follow our *Continuity of Operations* and *Pandemic Plans*:

- Continue to monitor the pandemic;
- City facilities reopened to the public in October;
- A number of annual events have been altogether cancelled or modified;
- Starting to see employees impacted across all departments due to COVID exposures, mainly outside of work;
- No businesses have been closed by the City of Friendswood due to COVID
- No citations have been issued by the City of Friendswood relative to compliance with Governor Abbott's Executive Orders
- Disinfecting workspaces and vehicles continue;
- Extended screening protocols for public meetings, previously applicable only to staff, to all participants
- Partnered with FISD on the use of some Coronavirus Relief Funding
- Submitted for the reimbursement of eligible expenditures under the CARES Act (Galveston County side approximately \$1.5M allocation; Harris County side approximately \$600K)

A Public Health Event Declaration has been made in accordance with the *Pandemic Plan*.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 1/6/2021

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Year End Events

Originating Department: City Manager

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

Chief Wieners will give an update on shootings, arrests, and DWIs that took place over the holidays.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 11/3/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Annual report from the Zoning Board of Adjustment Chair Phil Ratisseau

Originating Department: Community Development

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

The annual report, presented by Phil Ratisseau, Chairman, is attached. All of the cases this year were cases regarding setbacks.

We are in the process of changing the Zoning Ordinance to allow lots less than 90 feet to continue with 5-foot side yard setbacks even if the house is demolished. Currently, as long as the structure is existing, they can continue to the 5-foot side yard setback, but as soon as the structure is demolished or destroyed, the property is subject to the same setbacks as a 90-foot lot. The public hearing for this ordinance change will be in January for the Planning and Zoning Commission and February for City Council.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

n/a

RECOMMENDATIONS

n/a

ATTACHMENTS

1. 2020 ZBOA Annual Report

Memo

To: **Mayor and City Council**
From: **Philip Ratisseau, Zoning Board of Adjustment Chair**
Mike Czarowitz, Zoning Board of Adjustment Vice-Chair
Date: **January 2021**
Re: **2020 Zoning Board of Adjustment Activity**

The Zoning Board of Adjustment heard six (6) cases in 2020.

MAY 19, 2020

1. **212 E. Heritage Drive** – request to encroach 5-feet into the required front yard setback of 25-feet, being a variance to Appendix C, Zoning Ordinance, Section 7.Q.2. Regulation Matrix – Residential Districts.

Variance request approved unanimously 5 to 0.

2. **212 E. Heritage Drive** – request to encroach 5-feet into the required side yard setback of 10-feet, being a variance to Appendix C, Zoning Ordinance, Section 7.Q.2. Regulation Matrix – Residential Districts.

Variance request approved unanimously 5 to 0.

JUNE 23, 2020

1. **16802 David Glen Drive** – request to encroach 3-feet into the required interior side yard setback of 10-feet, being a variance to Appendix C, Zoning Ordinance, Section 7.Q.2. Regulation Matrix – Residential Districts.

Variance request approved unanimously 5 to 0.

2. **16802 David Glen Drive** – request to encroach 10-feet into the required exterior side yard setback of 20-feet, being a variance to Appendix C, Zoning Ordinance, Section 7.Q.2. Regulation Matrix – Residential Districts.

Variance request approved unanimously 5 to 0.

AUGUST 25, 2020

1. **311 Morningside Dr** – request to encroach 8-feet, 10-inches into the required rear yard setback of 25-feet, being a variance to Appendix C, Zoning Ordinance, Section 7.Q.2. Regulation Matrix – Residential Districts.

Variance request approved unanimously 5 to 0.

2. **5318 Kingsmill Rd** – request to encroach 5-feet into the required interior side yard setback of 10-feet, being a variance to Appendix C, Zoning Ordinance, Section 7.Q.2. Regulation Matrix – Residential Districts.

Variance request approved unanimously 5 to 0.

HISTORICAL PERSPECTIVE:

Year	Number of ZBOA Cases
2020	6*
2019	0
2018	9*
2017	2
2016	5
2015	3
2014	3
2013	1
2012	4

* Multiple requests for same address

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 12/8/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Discussion and possible action regarding entering into a development agreement with Taylor Morrison regarding the Avalon at Friendswood Subdivision and Friendswood Lakes Boulevard

Originating Department: Engineering

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

At the August 2020 City Council meeting, the Council ratified the City Manager's execution of a letter agreement between Taylor Morrison of Texas, Inc., Wesley West Cattle, L.P., Wesley West Descendants Trust and the City of Friendswood, Texas regarding Friendswood Lakes Boulevard right-of-way and Avalon Subdivision detention capacity. This letter agreement memorialized the mutual assent among the parties as to the terms contained within the letter.

The development agreement now under consideration by the City Council is between the City and Taylor Morrison regarding the construction of Friendswood Lakes Boulevard through the Avalon at Friendswood Subdivision. This development agreement provides assurances to the developer that the development regulations that apply to the project will not change during the term of the agreement.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Taylor Morrison is responsible for the construction of the final 210 feet of Friendswood Lakes Boulevard on the southeast side of the project. They project to finish that portion in June 2021.

RECOMMENDATIONS

Authorize the Mayor to sign the development agreement with Taylor Morrison regarding the Avalon at Friendswood Subdivision and Friendswood Lakes Boulevard.

ATTACHMENTS

1. Taylor Morrison Development Agreement - City of Friendswood 11.11.2020 COUNCIL
2. 2020-07-01 TM Letter Agreement for Detention and ROW 6.24.20 - FULLY EXE...

**DEVELOPMENT AGREEMENT
BETWEEN THE CITY OF FRIENDSWOOD
AND TAYLOR MORRISON**

This Development Agreement (the “Agreement”) is made and entered into as of the ____ day of _____, 2020 by THE CITY OF FRIENDSWOOD, TEXAS (the “City”), a home rule municipality in Harris and Galveston Counties, Texas, and TAYLOR MORRISON OF TEXAS, INC., a Texas corporation (the “Developer”).

RECITALS

WHEREAS, the Developer owns approximately 184 acres of land (the “Tract”) primarily located in the City, as described in **Exhibit A** attached hereto; and

WHEREAS, the Developer is developing the Tract as a single family residential development; and

WHEREAS, the development of the Tract requires that certain road and detention facilities be constructed, and the City desires that the Developer construct such road and detention facilities as more particularly described herein; and

WHEREAS, the parties desire to enter into an agreement to provide for terms and conditions by which those certain road and detention facilities that will serve the Tract will be developed;

NOW, THEREFORE, for and in consideration of the mutual promises, covenants, obligations and benefits of this Agreement, the City and the Developer contract and agree as follows:

AGREEMENT

ARTICLE I

CONSTRUCTION OF THE PROJECT

Section 1.01: The Project. The Project shall be and include the design and construction of (i) approximately 250 linear feet of Friendswood Lakes Boulevard, as indicated on the Avalon at Friendswood Section 1 Preliminary Plat attached hereto as **Exhibit B** (the “Road Project”); and (ii) up to 6 acre feet of detention attached hereto as **Exhibit C** (the “Detention Project,” and together with the Road Project, the “Project”) to serve that portion of Friendswood Lakes Boulevard as indicated in the Avalon at Friendswood Drainage Impact Analysis, dated March 2020 and depicted on **Exhibit D**.

Section 1.02: Design of the Project. The Project shall be designed by the Developer’s engineers. The design of the Project shall be subject to the approval of all governmental entities

with jurisdiction, including, as appropriate and without limitation, the City, Galveston County and Galveston County Consolidated Drainage District.

Section 1.03: Construction and Acquisition of Project.

(a) The Developer shall construct the Project, and shall acquire all necessary easements, equipment, materials and supplies required in connection therewith.

(b) The Project shall be constructed in public rights-of-way or utility easements, which easements shall be dedicated by the Developer to the appropriate governmental entity, if required.

(c) The Project may be constructed in stages or by sections pursuant to development plans of the Developer.

(d) Upon completion of construction of the Road Project and City approval, the Developer shall convey such project to the City. Developer shall cause the Road Project to be complete by December 31, 2021.

(e) Upon completion of construction of the Detention Project and City approval, the Developer shall convey such project to the homeowners' association created to serve the Tract. Developer shall cause the Detention Project to be completed by December 31, 2021.

Section 1.04. Maintenance Obligations.

(a) Upon acceptance of the Road Project, the City shall have the sole obligation to continue to maintain such project.

(b) The Developer shall cause the homeowners' association to have the sole obligation to maintain the Detention Project upon acceptance of such project.

ARTICLE II

REPRESENTATIONS

Section 2.01: Representations by Developer. The Developer represents that:

(a) This Agreement, the transactions contemplated herein, and the execution and delivery of this Agreement have been duly authorized by the organizational documents of the Developer.

(b) This Agreement and the representations and covenants contained herein, and the consummation of the transactions contemplated herein, will not violate or constitute a breach of any contract or other agreement to which the Developer is a party.

Section 2.02: Representations by City. The City represents and covenants that:

- (a) The City shall not require any additional contribution, monetary or otherwise, from the Developer related to the construction of Friendswood Lakes Boulevard beyond the completion of the Road Project contemplated herein.
- (b) The City, in conjunction with Galveston County shall cause to be constructed the balance of Friendswood Lakes Blvd, attached hereto as **Exhibit E**, save and except that portion defined as the Road Project being constructed by the Developer.
- (c) The City shall not require any additional drainage studies for the Detention Project or development of the Tract beyond the Drainage Impact Assessment that the Developer completed in accordance with TP40 standards, approved by the City on April 21, 2020.

ARTICLE III

MISCELLANEOUS

Section 3.01: Severability. The provisions of this Agreement are severable, and if any provision or part of this Agreement or the application thereof to any person or circumstance shall ever be held by any court of competent jurisdiction to be invalid or unconstitutional for any reason, the remainder of this Agreement and the application of such provision or part of this Agreement to other persons or circumstances shall not be affected thereby.

Section 3.02: Modification. This Agreement shall be subject to change or modification only with the mutual written consent of the Developer and the City.

Section 3.03: Assignability. This Agreement shall not be assignable by the Developer without the prior written consent of the City, which consent shall not be unreasonably withheld.

Section 3.04: Captions. The captions appearing at the first of each numbered section or paragraph in this Agreement shall never be considered or given any effect in construing this Agreement.

Section 3.05: Applicable Law. This Agreement shall be governed by, and construed in accordance with, the laws of the State of Texas.

Section 3.06: Parties at Interest. This Agreement shall be for the sole and exclusive benefit of the parties hereto and shall never be construed to confer any benefit to any third party.

Section 3.07: Term. Except as otherwise provided herein, this Agreement shall be in force and effect from the date of execution hereof for a term of forty (40) years or until the transactions contemplated herein are consummated, whichever first occurs.

Section 3.08: Force Majeure. If either party is rendered unable, wholly or in part, by force majeure to carry out any of its obligations under this Agreement, then the obligations of either party to the extent affected by such force majeure and to the extent that due diligence is being used to resume performance at the earliest practicable time, shall be suspended during the continuance of any inability so caused to the extent provided but for no longer period. Such cause, as far as possible, shall be remedied with all reasonable diligence. The term “force majeure,” as used herein, shall include, without limitation of the generality thereof, acts of God, strikes, lockouts, or other industrial disturbances, acts of the public enemy, orders of any kind of the Government of the United States or of the State of Texas or any civil or military authority, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, and any other incapacities of either party, whether similar to those enumerated or otherwise, which are not within the control of either party, which either party could not have avoided by the exercise of due diligence and care. It is understood and agreed that the settlement of strikes and lockouts shall be entirely within the discretion of either party, and that the above requirement that any force majeure shall be remedied with all reasonable dispatch shall not require the settlement of strikes and lockouts by acceding to the demand of the opposing party or parties when such settlement is unfavorable to it in the judgment of the affected party.

Section 3.09. Waiver of Immunity. The City and the Developer acknowledge and agree that this Agreement constitutes an agreement for providing goods and/or services to the City, and is subject to the provisions of Subchapter I of Chapter 271, Texas Local Government Code, as amended, and any successor statute(s).

[EXECUTION PAGES FOLLOW]

AGREED TO AND ACCEPTED THIS ____ DAY OF _____, 2020.

TAYLOR MORRISON OF TEXAS, INC.

By: _____

Name: _____

Title: _____

AGREED TO AND ACCEPTED THIS 11th DAY OF JANUARY, 2021.

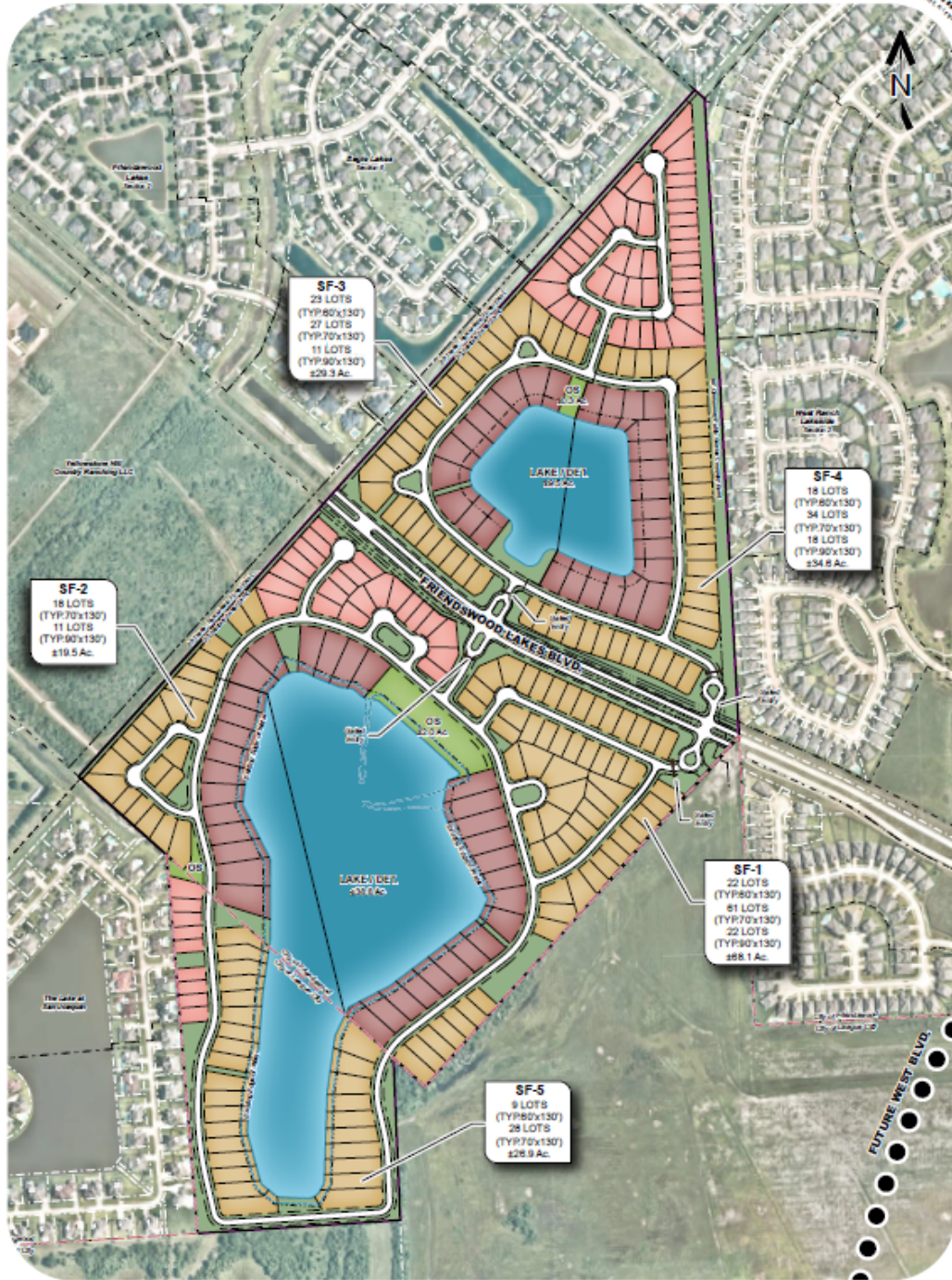
CITY OF FRIENDSWOOD, TEXAS

Mayor

Approved as to Form:

City Attorney

EXHIBIT A



LOT SUMMARY

60'x130'	72 LOTS	24%
70'x130'	168 LOTS	55%
90'x130'	62 LOTS	21%

TOTAL 302 LOTS

THIS DRAWING IS A GRAPHIC REPRESENTATION FOR PRESENTATION PURPOSES ONLY AND IS NOT FOR CONSTRUCTION OR CONSTRUCTION PURPOSES. THIS DRAWING IS A SCHEMATIC AND NOT A CONTRACT. IT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE DEVELOPER, TAYLOR MORRISON, MAKES NO WARRANTY, EXPRESS OR IMPLIED, REGARDING THE ACCURACY, COMPLETENESS, OR QUALITY OF THE INFORMATION, DATA, OR CHARACTER OF THE INFORMATION SHOWN ON THIS MAP. ANY INTENDED ADDITIONAL, NO WARRANTY IS MADE TO THE ACCURACY OF THE INFORMATION SHOWN HEREIN.

© 2020 META PLANNING & DESIGN, ALL RIGHTS RESERVED

a schematic development plan for

AVALON AT FRIENDSWOOD

±184.0 ACRES OF LAND

prepared for
TAYLOR MORRISON

META
ARCHITECTURAL SERVICES

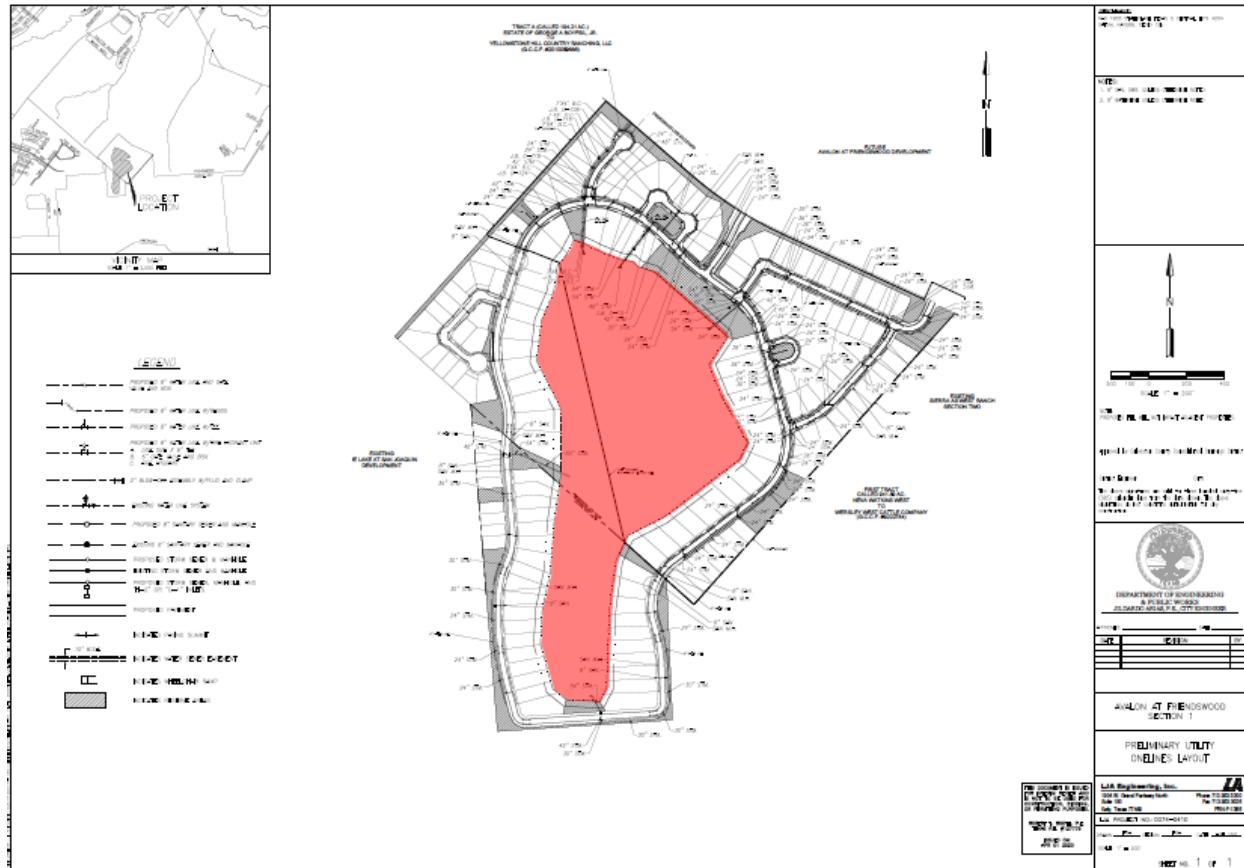
24275 Katy Freeway, Ste. 200
Katy, Texas 77494
Tel. 281-810-1432

SCALE

META-4711A
SEPTEMBER 10, 2020

[illegible]

EXHIBIT C



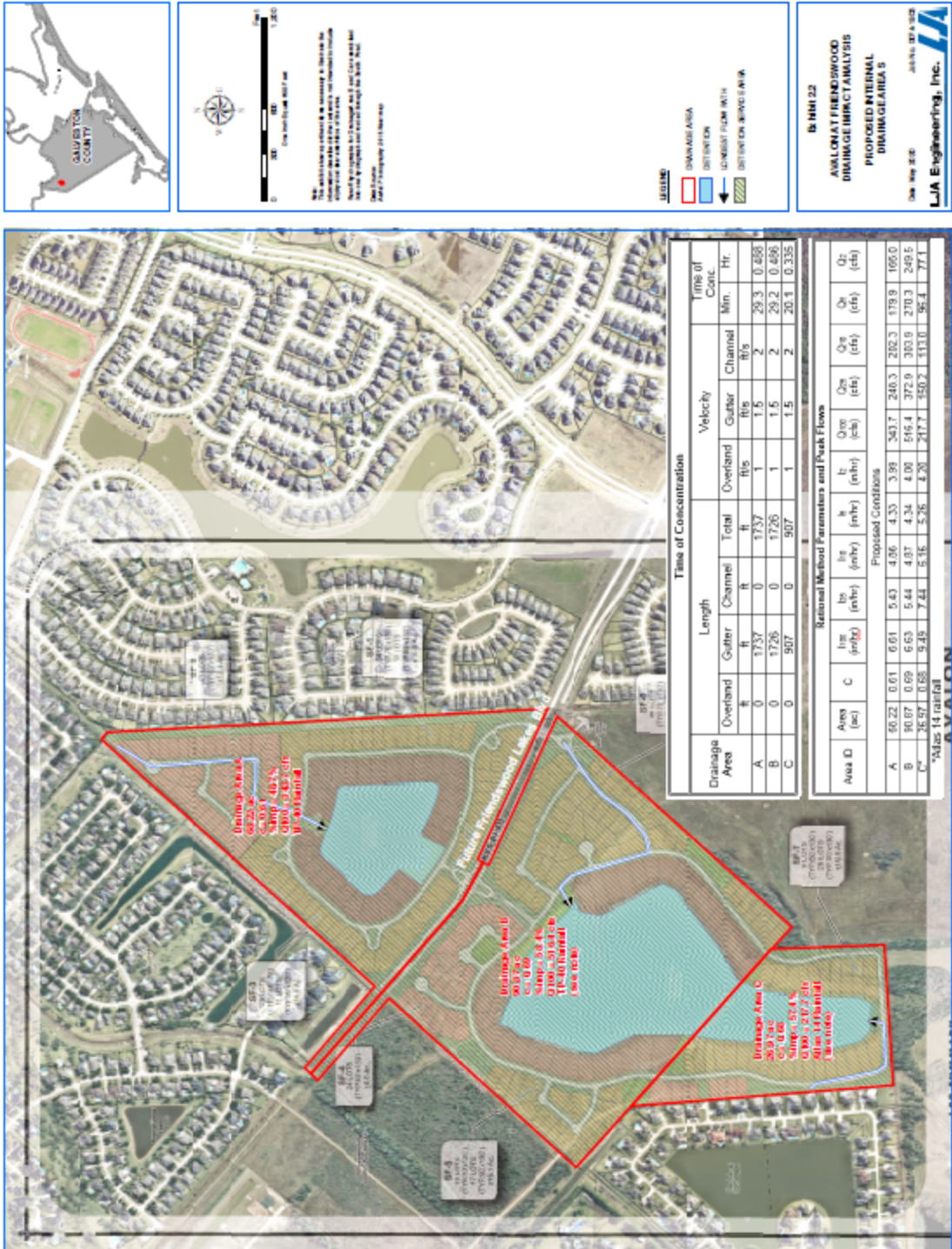
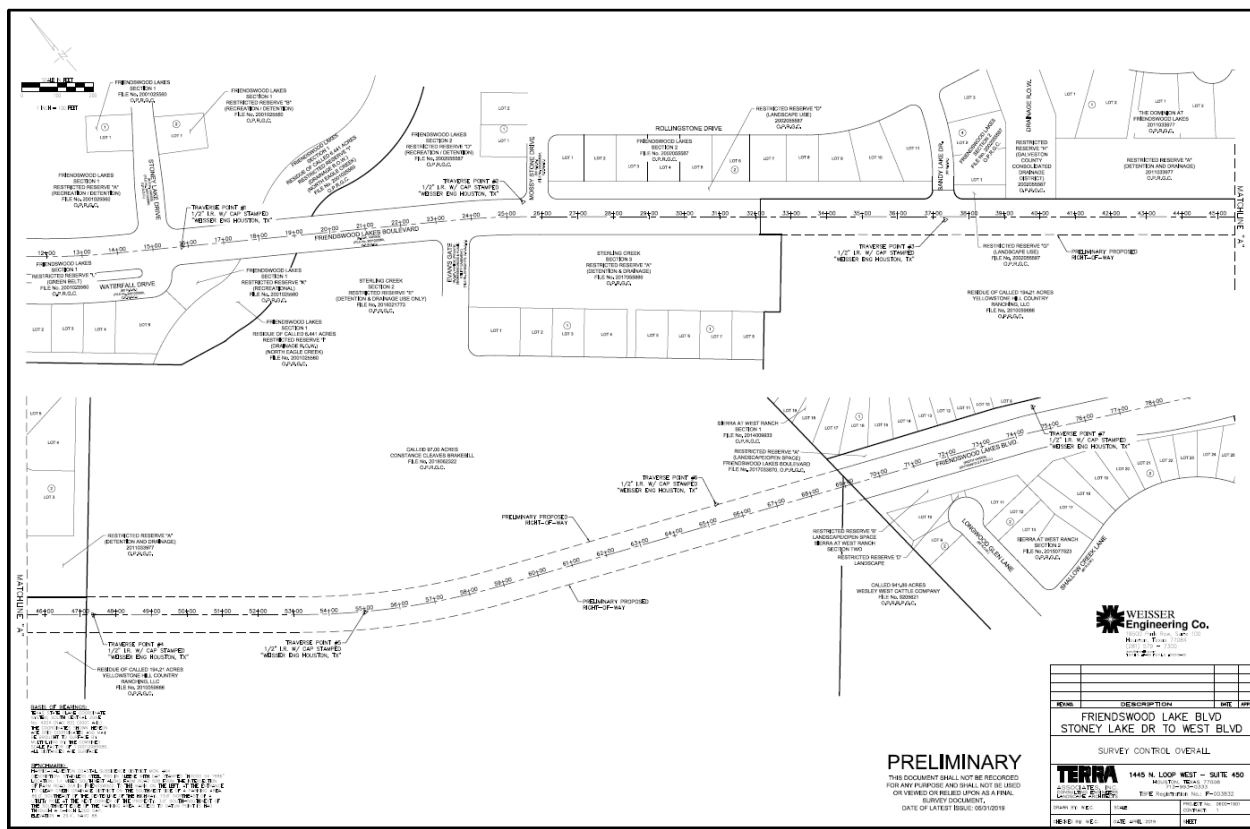


EXHIBIT E





TAYLOR MORRISON OF TEXAS, INC.
Houston Division
2929 Briarpark Dr., Suite 400
Houston, TX 77042
p. (281) 598-3000
f. (281) 598-3100
taylormorrison.com

June 30 , 2020

Via E-Mail and First Class Mail

Stedman West Interests, Inc.
1600 W. Loop South
Suite 2700
Houston, Texas 77027
Attn: Mr. Wm. David Davas
Email: ddavas@stedmanwest.com

City of Friendswood, Texas
910 S. Friendswood Dr
Friendswood, TX 77546
Attn: Morad Kabiri
Email: mkabiri@friendswood.com

Re: Letter Agreement Regarding Friendswood Lakes Boulevard Road Right-of-Way (the "Road Project") and Avalon Subdivision Detention Capacity

Dear Mr. Davas and Mr. Kabiri:

Taylor Morrison of Texas, Inc. ("Taylor Morrison") owns approximately 184 acres of land, more or less (the "TM Tract") located primarily in the City of Friendswood, Galveston County, Texas, which TM Tract as is depicted on **Exhibit "A"** attached hereto.

Taylor Morrison has dedicated the necessary right-of-way to City of Friendswood (the "City") for the construction of Friendswood Lakes Boulevard (the "Boulevard") from the western boundary of the TM Tract to the eastern boundary of the TM Tract, being the current point of termination of such Boulevard as is depicted on Exhibit "B" attached hereto.

Wesley West Cattle, L.P. and Wesley West Descendants Trust (collectively, "West") own approximately .0576 acres of land, more or less (the "Boulevard Parcel") immediately adjacent and east of the TM Tract, as depicted on **Exhibit "C"** attached hereto, which Boulevard Parcel is needed to connect the existing point of termination of the Boulevard and the TM Tract.

This letter agreement ("Letter Agreement") sets forth the understanding and terms by and among Taylor Morrison, the City and West regarding the responsibilities and obligations of each of the parties related to the conveyance of the Boulevard Parcel by West for the construction of the Boulevard and, in exchange, for Taylor Morrison to provide to West for the benefit its property, owned by West immediately east of and adjacent to the TM Tract and depicted on **Exhibit "E"** attached hereto (the "West Property") for drainage of the West Property onto and into the 38 acre lake, more or less on the TM Tract, subject to the terms and conditions provided below. Discharge shall be limited to the developed flows from the 14.5 acres of West Property land currently within the Clear Creek Watershed. Additional drainage for the West Property is provided by the Boulevard via three (3) E Inlets (the "Initial Boulevard West Connection") until the West Property is developed, at which time the Initial Boulevard West Connection will need to be converted to storm sewers with storm pipe tied in.

Section 1: Detention Facilities. On or before September 1, 2021 Taylor Morrison intends to construct detention facilities to accommodate its development on the TM Tract as depicted on **Exhibit "D"** attached hereto (the "Detention Facilities"), which Detention Facilities will provide approximately 158 acre-feet of capacity. Taylor Morrison hereby agrees that West shall be provided with up to thirty (30) acre-feet of capacity within such Detention Facilities so long as such excess capacity is available (it being agreed that the only way that such excess capacity would not be available would be if the City or some other governmental authority increase the required detention amounts so that the excess capacity falls below 30 acre-feet). At its option West and or its successors and assigns shall have access to the Detention Facilities for the West Property (the "West Property Storm Connection") via a twenty-five (25) foot wide storm sewer easement in the approximate location shown on **Exhibit "F"** attached hereto.

Section 2: Allocation of Costs. Taylor Morrison shall be responsible for paying all costs associated with the design, construction, and inspection of the Detention Facilities, except that West, or any future owner wishing to pursue it, shall pay for all costs associated with engineering and construction of the West Property Storm Connection and the conversion of the Initial Boulevard West Connection (which collects undeveloped storm water flows) into storm sewers at such time as the West Property is developed

Section 3: Maintenance Obligation. Once construction of the Detention Facilities has been completed and Taylor Morrison has accepted the Detention Facilities, Taylor Morrison shall have the sole obligation to continue to maintain the Detention Facilities or cause the homeowner's association created to serve the residential community served by the Detention Facilities (the "HOA") to maintain the Detention Facilities at no expense to West. Once the West Property Storm

Connection has been constructed, West shall be responsible for maintaining the West Property Storm Connection at no expense to Taylor Morrison or the HOA.

Section 4: Road Project Construction and Conveyance of Boulevard Parcel. The City agrees that in accordance with (i) the May 7, 2018 Agreement for Funding of Public Improvements and (ii) the May 7, 2018 Interlocal Contract between the City of Friendswood, Texas and the County of Galveston, the Boulevard shall be built under the same specifications and dimensions, as is the existing Friendswood Lakes Boulevard located in the West Ranch Subdivision. Taylor Morrison will be responsible for the construction of approximately two hundred ten feet (210') of the Boulevard being four (4) lanes from the easternmost terminus in lieu of their monetary contribution as provided for in the Agreement for Funding of Public Improvements. West agrees that, within thirty (30) days of execution of this Letter of Agreement, it shall convey the Boulevard Parcel to the City, Galveston County or such other governmental authority, as appropriate, by such deed or other conveyance document requested by the applicable governmental entity.

Section 5: Failure to Construct Detention Facilities. If Taylor Morrison fails to complete construction of the Detention Facilities on or before December 31, 2022, or if Taylor Morrison is unable to make available to West thirty (30) acre-feet of detention within the Detention Facilities, then Taylor Morrison agrees to pay to West the amount of \$ \$20,000.00 as consideration for the conveyance of the Boulevard Parcel.

Section 6: Default and Remedies. If either party fails to perform its obligations under this Letter Agreement, the other party shall have all rights and remedies available to it at law or in equity resulting from such default.

Section 7: Term. Unless terminated in writing by mutual agreement of Taylor Morrison, the City and West, this Letter Agreement shall continue in full force and effect from the date hereof until December 31, 2022.

Section 8: Notice. Any notice provided or permitted to be given under this Letter Agreement must be in writing and may be served by (a) depositing same in U.S. mail, addressed to the party to be notified, postage prepaid and registered or certified with return receipt requested; or (b) by delivering the same in person to such party. Notice given by mail shall be effective three (3) days after deposit in the U.S. mail and notice delivered in person shall be effective upon receipt. For the purpose of notice, addresses of Taylor Morrison and West shall, until changed as hereinafter provided, be as follows:

Taylor Morrison: Taylor Morrison, Inc.
Attn: Mr. Bobby Skinner
2929 Briarpark Dr., Suite 400
Houston, TX 77042
Telephone: (281) 598-3040
Email: bskinner@taylormorrison.com

West: Stedman West Interests, Inc.
Attn: Mr. Wm. David Davas
1600 W. Loop South
Suite 2700
Houston, Texas 77027
Telephone: (713) 363-3003
Email: ddavas@stedmanwest.com

City: City of Friendswood
Attn: Mr. Morad Kabiri
910 S. Friendswood Dr.
Friendswood, TX 77546
Telephone: (281) 996-3250
Email: mkabiri@friendswood.com

Section 9: No Waiver. The failure of either party hereto to insist, in any one or more instances, upon performance of any terms, covenants, or conditions of this Letter Agreement, shall not be construed as a waiver or relinquishment of the future performance of any such term, covenant, or condition by the other party hereto, but the obligation of such other party with respect to such future performance shall continue in full force and effect.

This Letter Agreement constitutes the entire agreement by and between Taylor Morrison, the City and West with respect to the Boulevard Parcel and the Detention Facilities. Please indicate your acceptance of the terms and conditions set forth herein by executing a counterpart of this Letter Agreement where indicated below and returning it to Taylor Morrison. This Letter Agreement may be executed in multiple counterparts, each of which shall be deemed an original, and all of which shall constitute one instrument.

[Signature pages follow this page.]

Very truly yours,

TAYLOR MORRISON OF TEXAS, INC.

DocuSigned by:
By: Robert Skinner
1F4E17823E6A4B8...

Name: Robert Skinner

Title: Authorized Agent

AGREED TO AND ACCEPTED THIS ____ DAY OF _____, 2020.

CITY OF FRIENDSWOOD

DocuSigned by:
By: Morad Kabiri
2498EBA30C15478...

Name: Morad Kabiri

Title: City Manager

AGREED TO AND ACCEPTED THIS 1 DAY OF JULY, 2020.

Wesley West Cattle, L.P.

By: Stuart W. Stedman

Name: Stuart W. Stedman

Sole Manager of Stedman West Land and

Title: Cattle Company LLC, General Partner

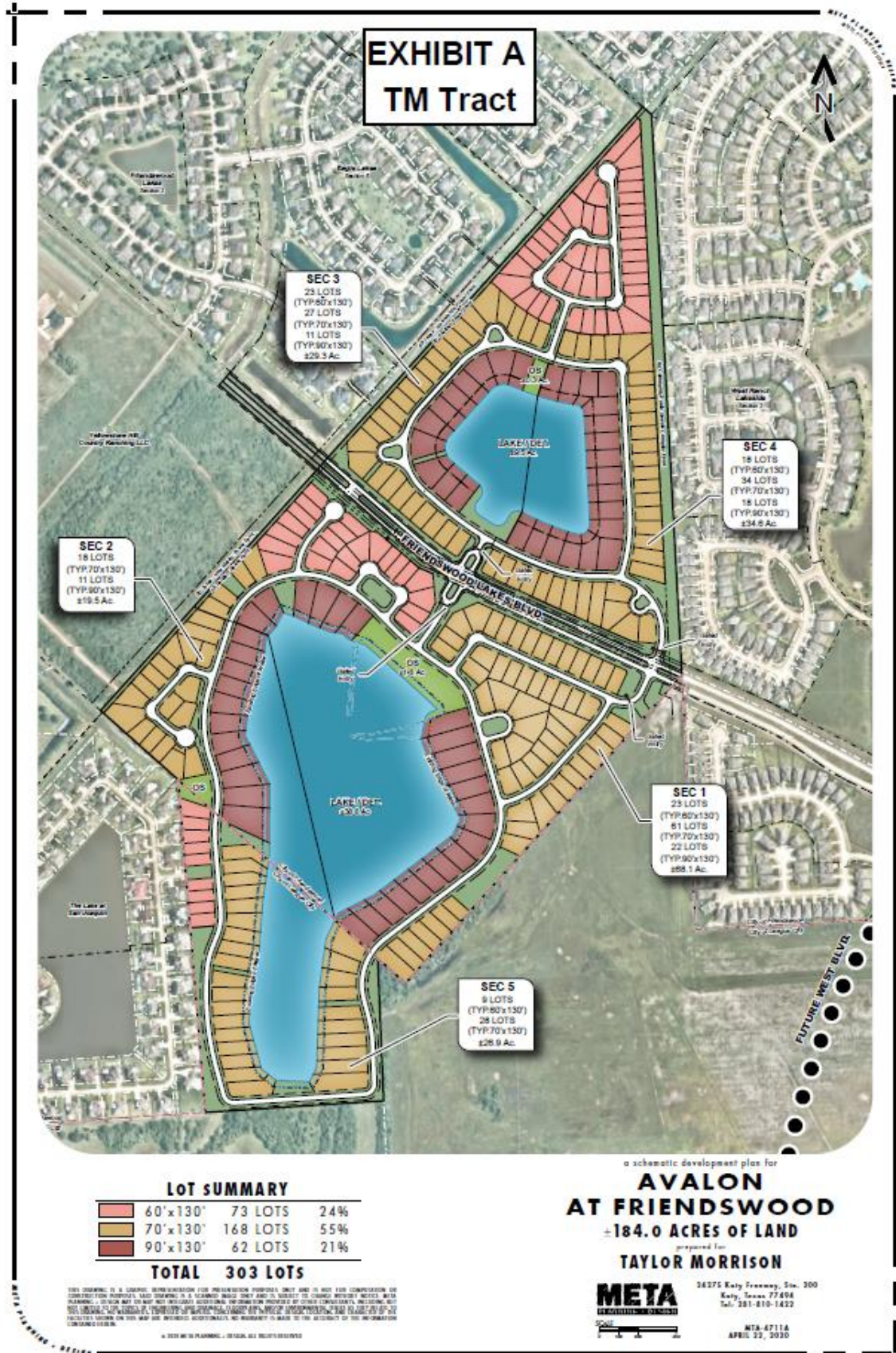
AGREED TO AND ACCEPTED THIS 1 DAY OF JULY, 2020.

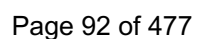
Wesley West Descendants Trust

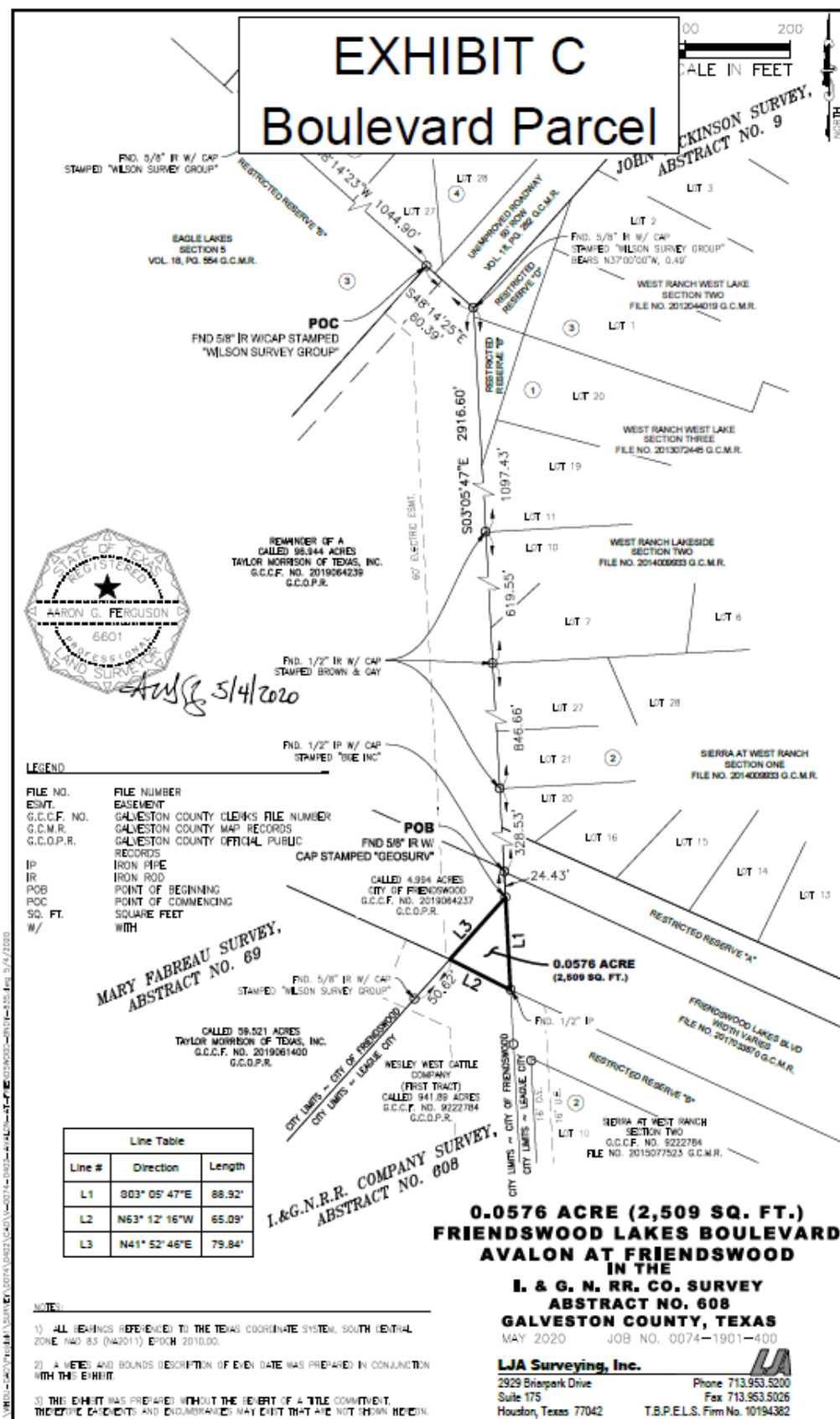
By: Stuart W. Stedman

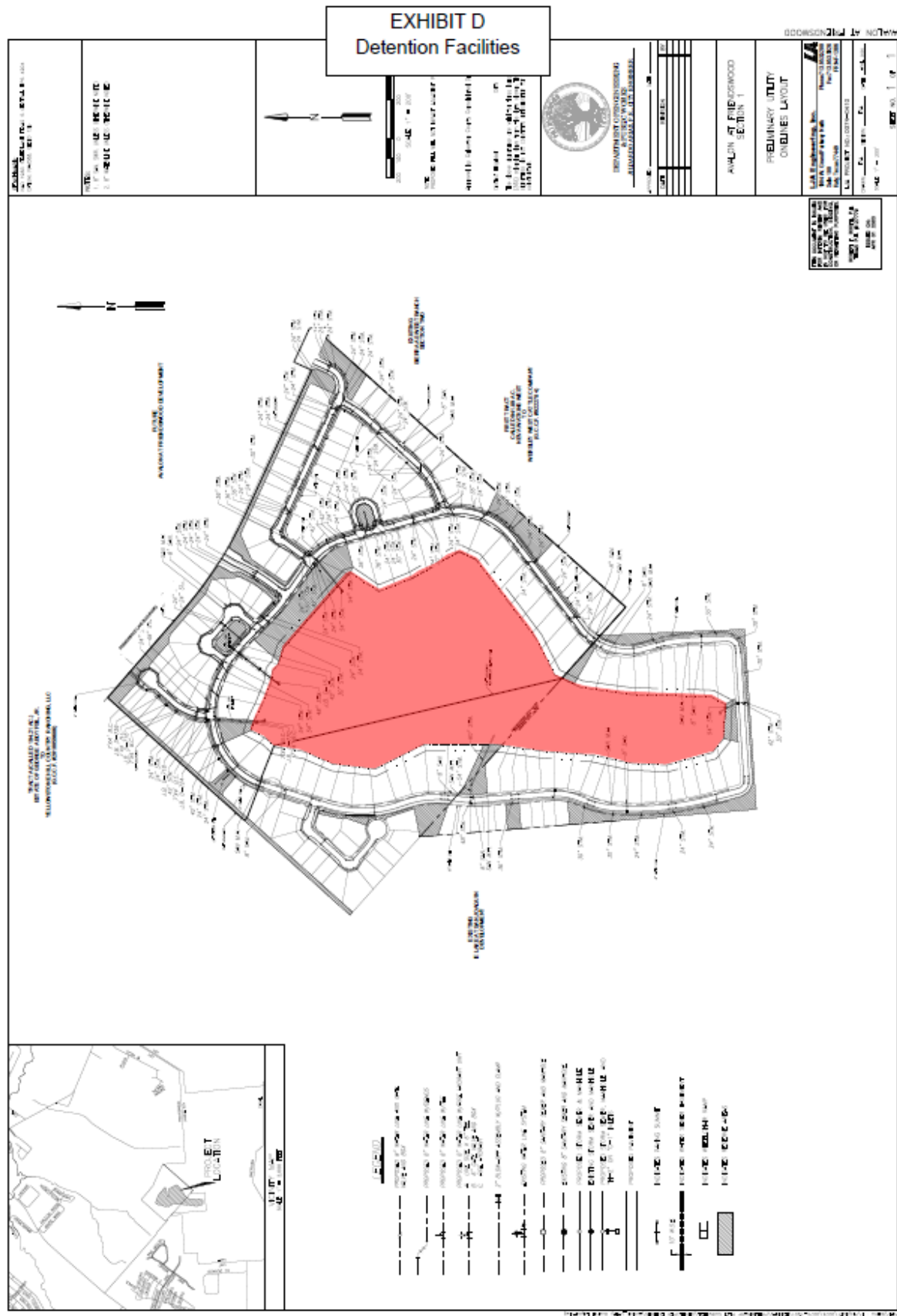
Name: Stuart W. Stedman

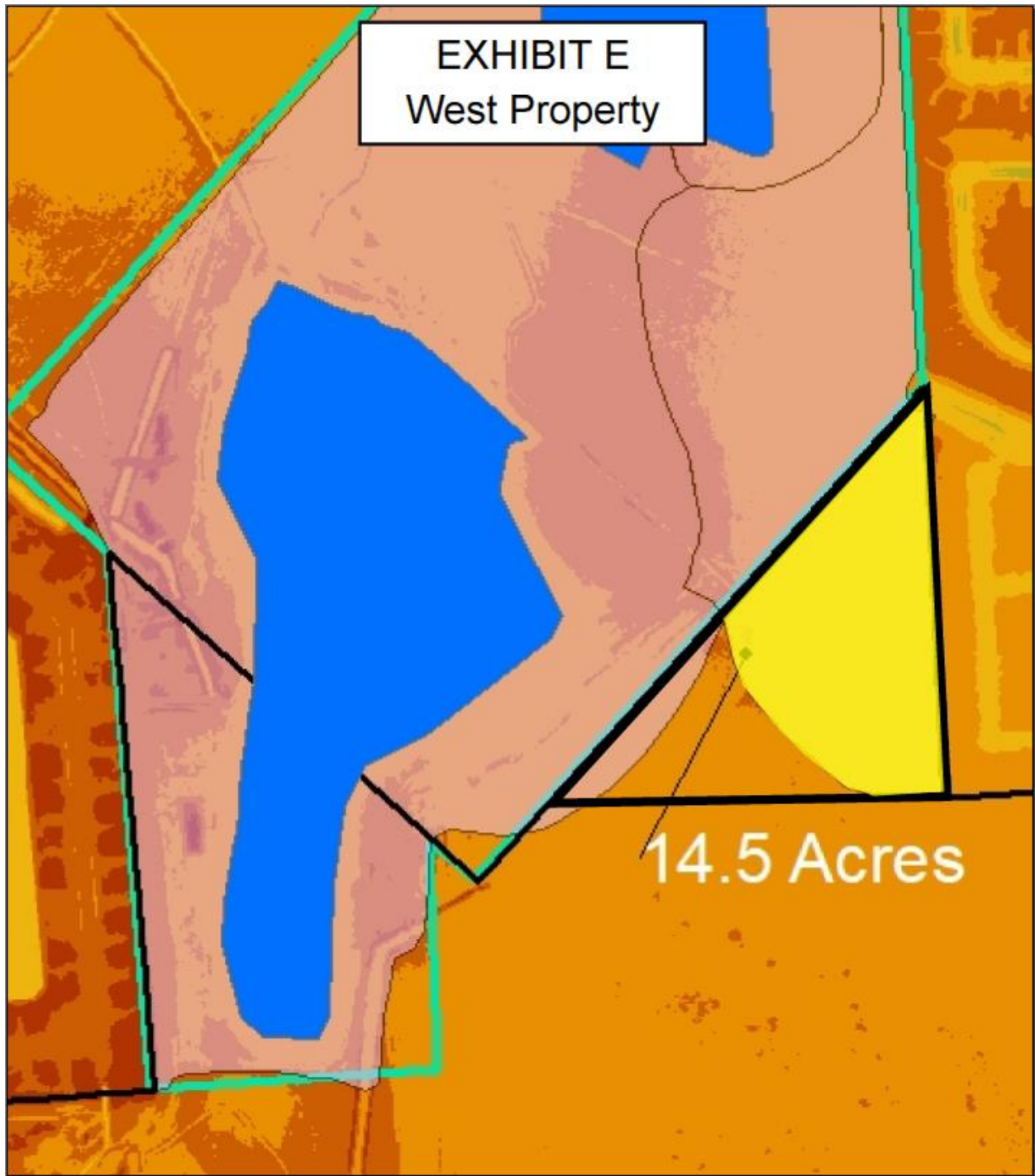
Title: Co-Trustee

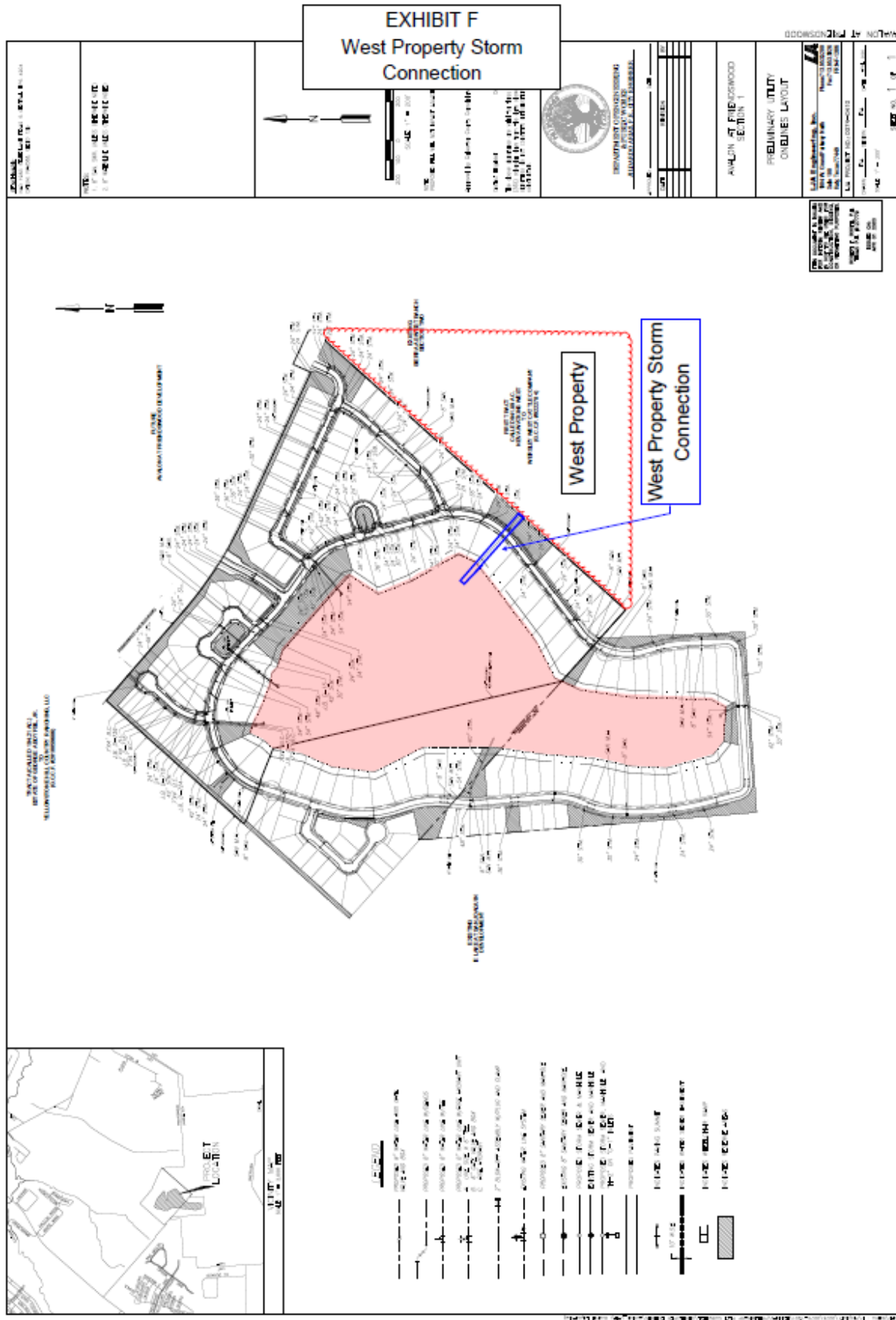












Misty Moniot

From: Dave Davas
Sent: Tuesday, June 30, 2020 5:06 PM
To: Stuart W. Stedman; Misty Moniot
Subject: TM Letter Agreement for Detention and ROW
Attachments: TM Letter Agreement for Detention and ROW 6.24.20 (002) WDD - Commentspdf

Stuart,

Attached for your review and signature is the Letter Agreement between WWC, WWDT, TM and City of Friendswood for our donation of the parcel for Friendswood Lakes Blvd in exchange for us to receive an easement with the option to drain a portion of acreage into TM detention pond.

Misty, please set up for Stuart's e signature.

Stuart, please let me know if you have any questions.

Dave

2020-07-01 TM Letter Agreement for Detention and ROW 6.24.20 (002) WDD - Comments

Final Audit Report

2020-07-01

Created:	2020-07-01
By:	Misty Moniot (mmoniot@stedmanwest.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAA1_Oasz4DxV2OzcpzAPCrBLJmXVlb0mPI

"2020-07-01 TM Letter Agreement for Detention and ROW 6.24.20 (002) WDD - Comments" History

-  Document created by Misty Moniot (mmoniot@stedmanwest.com)
2020-07-01 - 2:04:11 PM GMT- IP address: 139.138.153.186
-  Document emailed to Stuart W. Stedman (swstedman@stedmanwest.com) for signature
2020-07-01 - 2:06:03 PM GMT
-  Email viewed by Stuart W. Stedman (swstedman@stedmanwest.com)
2020-07-01 - 2:15:44 PM GMT- IP address: 104.4.62.226
-  Document e-signed by Stuart W. Stedman (swstedman@stedmanwest.com)
Signature Date: 2020-07-01 - 2:17:03 PM GMT - Time Source: server- IP address: 104.4.62.226
-  Signed document emailed to Misty Moniot (mmoniot@stedmanwest.com) and Stuart W. Stedman (swstedman@stedmanwest.com)
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FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 11/3/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Resolution No. R2021-01: A resolution approving and adopting updates/amendments to the "Design Criteria Manual" for the City of Friendswood, Texas; approving the standards contained therein for the design, construction and installation of public infrastructure and related facilities and improvements within the city; and repealing all prior Design Criteria Manuals and repealing other resolutions or parts of resolutions inconsistent or in conflict herewith.

Originating Department: Engineering

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

The City's Design Criteria Manual is updated periodically for the most current and comprehensive standards covering the design, construction, and installation of public infrastructure and related improvements within the City of Friendswood. Most notably, the City's Design Criteria Manual has been updated to reflect the new higher standards recently adopted in the updated Flood Ordinance adopted by Council on December 7th, 2020.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Included are updates that take into consideration changes in how the City Engineering, Community Development, and Public Works Departments operate. The following Sections have been updated: Section II (Wastewater Collection System), Section III (Water Line Distribution System), Section IV (Street Paving), Section V (Storm Drainage), Section VI (Site Development), Appendix F (Culvert Policy), Appendix G (Traffic Control Sign Policy) and Appendix H (Streetlight Policy).

Changes made to Section V (Storm Drainage) are in support of the newly adopted Flood Ordinance and support Atlas 14 rainfall and adoption of Harris County Minimum Standards for flood control.

Changes to the Manual are catalogued and located at the front of the document.

RECOMMENDATIONS

Staff recommends approval of the resolution adopting the updates and amendments to the City's Design Criteria Manual.

ATTACHMENTS

1. R2021-01 Design Criteria Manual Update
2. Design Criteria Manual

RESOLUTION NO. R2021-01

A RESOLUTION APPROVING AND ADOPTING UPDATES/AMENDMENTS TO THE “DESIGN CRITERIA MANUAL” FOR THE CITY OF FRIENDSWOOD, TEXAS; APPROVING THE STANDARDS CONTAINED THEREIN FOR THE DESIGN, CONSTRUCTION AND INSTALLATION OF PUBLIC INFRASTRUCTURE AND RELATED FACILITIES AND IMPROVEMENTS WITHIN THE CITY; AND REPEALING ALL PRIOR DESIGN CRITERIA MANUALS AND REPEALING OTHER RESOLUTIONS OR PARTS OF RESOLUTIONS INCONSISTENT OR IN CONFLICT HEREWITH.

WHEREAS, consistent with APPENDIX B "Subdivisions", Section III(a), of The City Code of the City of Friendswood, the City of Friendswood Design Criteria Manual shall be updated from time to time and adopted by Resolution; and,

WHEREAS, the City Council has determined a need for updating the City of Friendswood Design Criteria Manual to provide for the most current and comprehensive standards covering the design, construction, and installation of public infrastructure and related improvements within the City; and,

WHEREAS, the City of Friendswood – Department of Engineering and Projects "Design Criteria Manual," which document is updated/amended and on file with the City Secretary's office, shall be approved and adopted as the most recent Design Criteria Manual for the City of Friendswood.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, TEXAS:

Section 1. The facts and matters set forth in the preamble of this Resolution are hereby found to be true and correct.

Section 2. That certain City of Friendswood – Department of Engineering and Projects "Design Criteria Manual," dated December 2020, a true and correct copy of which is on file in the office of the City Secretary and for all things made a part hereof, is hereby adopted. The standards and related documents contained and referred to therein shall control and are hereby established as minimum design, construction, and installation standards for certain public infrastructure and related improvements within the City of Friendswood, Texas, for City projects and subdivision and other related development. In the event of conflict between any provision of the Design Criteria Manual and any ordinance of the City, or between the Design Criteria Manual and any condition of plat or development approval imposed by the City, the provisions of any such ordinance or term or condition of approval shall control.

Section 3. The Director of Engineering and Projects shall maintain copies of such Design Criteria Manual and related documents, which shall be made available, upon payment of the reasonable costs of publication thereof, to any person requesting same. The Director is further directed to periodically evaluate and review such standards and, when deemed necessary and appropriate, recommend changes to City Council.

Section 4. All other resolutions adopting prior versions of the Design Criteria Manual or any resolution inconsistent or in conflict herewith, are, to the extent of such inconsistency or conflict, hereby repealed.

PASSED, APPROVED AND RESOLVED on this 11th day of January 2021.

Mike Foreman
Mayor

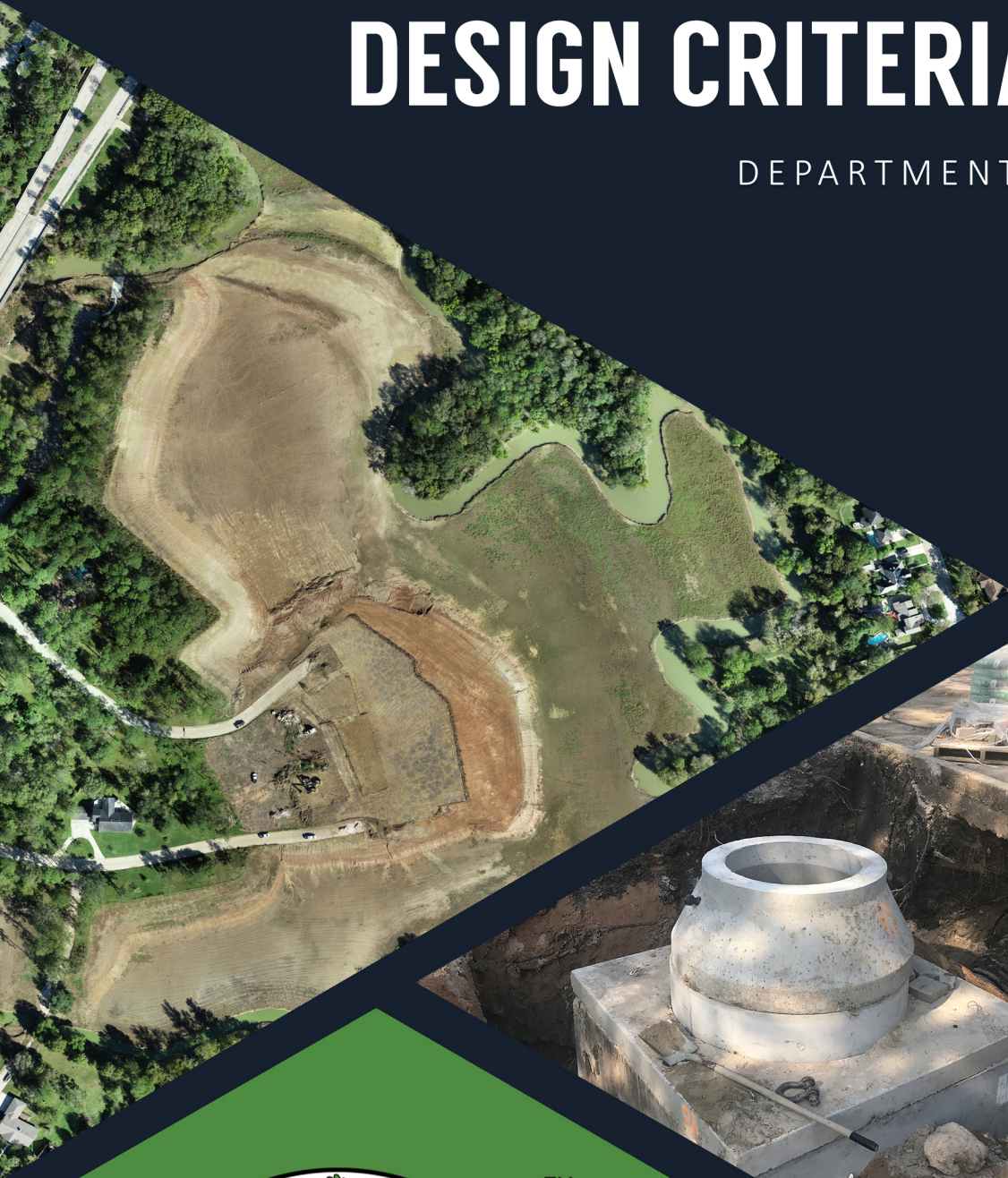
ATTEST:

Melinda Welsh, TRMC
City Secretary

CITY OF FRIENDSWOOD

DESIGN CRITERIA MANUAL

DEPARTMENT OF ENGINEERING



TM

JILDARDO ARIAS, PE, CFM
DIRECTOR OF ENGINEERING

APPROVED BY
RESOLUTION NO. R2021-01

JANUARY 2021
Page 103 of 477

Changes in the 2021 revision of the City of Friendswood Design Criteria Manual shall be listed here by Section.

Changes to Section I – Graphic and Design Requirements: NONE

Changes to Section II – Wastewater Collection System Design Requirements:

1.04.F.4 – Delete “VII” and replace with “III 1.04.B.4”.

1.04.F.16 – Delete “SDR 26” and replace with “SDR 26 PVC pipe (ASTM D 3034, latest edition)”.

1.04.J.2.d.5.b – Delete “(ATSM” and replace with “ASTM”.

Changes to Section III – Water Line Distribution System Design Requirements:

1.02.G – Delete “www.friendswood.com/publications” and replace with “www.ci.friendswood.tx.us/350/Publications-Forms”.

1.04.B.3 – Delete “as in the following sections” and replace with “ as in Section II – Wastewater Collection System Design Requirements”.

1.04.B.4.a – Insert “Refer to Section II – Wastewater Collection System Design Requirement.” after “shall be located above the sewer.”.

1.04.B.4.b – Delete “ long)]” and replace with “long)]”.

1.04.F.1 – Delete this subsection.

1.04.F.2 – Update outline numbering sequence to “1.04.F Stream Ditch Crossings.”.

1.04.F.1.b – Delete “Elevated crossings are preferred rather than underground crossings.” and replace with “Underground crossings via bored polyethylene pipe preferred to elevated crossings.”.

1.04.N.1.a – Insert “to create a physical loop” after “subdivision”.

1.04.N.1.b – Delete this subsection.

1.04.N.1.c – Update outline numbering sequence to “1.04.N.1.b”.

1.04.N.1.d – Delete this subsection.

1.04.N.1.e – Update outline numbering sequence to “1.04.N.1.c”.

1.04.N.1.f – Update outline numbering sequence to “1.04.N.1.d”.

1.04.N.1.g – Delete “*In an unavoidable*” and replace with “*Dead-ends shall be avoided whenever possible; In an unavoidable*”, and update outline numbering sequence to “1.04.N.1.e”.

1.04.O.3.b – Delete “*twenty (20) foot section of C-900 PVC pipe [One hundred fifty (150) psi]*” and replace with “*eighteen (18) foot section of class 150 pipe*”.

1.05.D.2.a – Delete “*and 1b*”.

1.05.D.5 – Insert “*be of specified type*” after “*pressure,*”.

1.05.E.1 – Insert “*Refer to City Standard Details for additional requirements.*” after “*construction plans.*”.

1.06.G – Delete this subsection.

1.06.H – Update outline numbering sequence to “1.06.G”.

2.02.A – Insert “*Minimum pipe size is 8*”, and replace with “*10 also being common.*”.

Changes to Section IV – Street Paving:

1.02.E – Delete “*www.friendswood.com/publications*” and replace with “*www.ci.friendswood.tx.us/350/Publications-Forms*”.

1.04.A.2 – Insert “*The Major Thorough Plan may be found at www.ci.friendswood.tx.us/350/Publications-Forms.*” after “*additional considerations.*”

1.04.B.5 – Delete “*but not less than sixty (60) feet*” and replace with “*no less than sixty (60) feet*”.

1.04.C.1.a – Delete “*a fc*” and replace with “*an fc*”. Delete “*(3000 psi, reinforcement)*” and replace with “*four thousand (4,000) psi. Reinforcement*”. Delete “*bars shall be spaced*” and replace with “*bars, spaced*”. Delete “*eighteen (18)*” and replace with “*twenty-four (24)*”. Delete “*sixteen (60)*” and replace with “*forty (40)*”. Delete “*twelve (12)*” and replace with “*ten (10)*”.

1.04.C.2.a – Delete “*fc = 3,000 psi and reinforcement*” and replace with “*an fc equal to four thousand (4,000) psi. Reinforcement*”. Delete “*bars shall be spaced*” and replace with “*bars, spaced*”. Delete “*eighteen (18)*” and replace with “*twenty-four (24)*”. Delete “*sixty (60)*” and replace with “*forty (40)*”. Delete “*twelve (12)*” and replace with “*ten (10)*”.

1.04.J.8 – Delete “#5 reinforcing bars” and replace with “smooth dowel bars”. Insert “Concrete slab thickness shall be at least matching the existing slab thickness, and be a high strength early yield with $f_c = 5,000$ psi.” after “unless otherwise specified.”.

2.01 – Delete “- Reserved” from the section title, and insert the following subsection:

A. “Research existing utility and right-of-way information.

B. Verify that no restrictions exist that will deny approval of the project concept.”.

Changes to Section V – Storm Drainage:

1.02.C – Insert “,the latest version” after “Manual”.

1.02.D – Delete “Design Criteria Manual. Ordinance No. T2007-20 amends the Flood Damage Prevention Ordinance by adopting the Harris County floodplain maps as revised on June 18, 2007” and replace with “Hydrology and Hydraulics Guidance Manual. Updated June 2019”.

1.02.E – Delete “Bridge Division” and insert “Design” after “Hydraulic”.

1.02.F – Delete “National Weather Service Documents – TP-40 Rainfall Frequency Atlas of the United States” and replace with “Atlas 14 Rainfall Depths for Galveston County Consolidated Drainage District 10/2019.”.

1.02 – Insert the following subsection:

H. “Harris County Flood Control District Policy Criteria and Procedure Manual. Includes Revisions to Chapters 2, 3, 6, 7 & 8 from Interim Guidelines and Criteria for Atlas 14 Implementation revised July 2019.

I. “Harris County. Recommendation on Minimum Standards for Communities in Harris County and Draining to Harris County. May 12, 2020.

J. “National Oceanic and Atmospheric Administration (NOAA) Atlas 14. Precipitation – Frequency Atlas of the United States. Volume 11 Version 2.0: Texas. (Atlas 14).

K. “Kronkosky Blake, Gauge Engineering, Atlas 14 Rainfall Depths for Galveston County Consolidated Drainage District, October 2019.

L. “Federal Emergency Management Agency. Flood Insurance Study Galveston County, Texas and Incorporated areas, August 15, 2019.” .

1.03.A – Insert “or other drainage facilities entering their system” after “ponds”.

1.03.C – Delete “A change in land use that alters the impervious coverage of the tract of land. Impervious cover includes, but is not limited to, concrete, asphalt, stabilized soil, tennis courts, water features, pools, sidewalks, crushed concrete, limestone, and roofing.” and replace with “any manmade change in improved and unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.”.

1.03.E – Insert “In order to meet this requirement all standards in the Harris County Recommendation on Minimum Standards for Communities in Harris County and Draining to Harris County letter released May 12, 2020 must be met.” after “Section.”.

1.03.N – Delete “Weather Service” and replace with “Oceanic and Atmospheric Administration”. Insert “The City uses the Atlas 14 Point Precipitation rainfall depths.” after “Administration”.

1.03.O – Insert “Engineering Department” after “Public Works Department,”. Insert “(when development occurs within Galveston County)” after “Drainage District”.

1.04.A – Insert “based on Atlas 14-point rainfall” after “frequencies”. Delete “City of Friendswood, Galveston County Consolidated Drainage District, and Harris County Flood Control District” and replace with “National Oceanic and Atmospheric Administration for Harris County Region III”. Insert “*All City or District maintained facilities shall be designed for the 100-year storm independent of the amount of acreage served.” after the Type of Facility and Frequency list.

1.04.B.2 – Insert “Allowable” before “Values”. Delete “typically used in” and replace with “for”. Replace “Rainfall Intensity Allowable Values Parameters chart with updated chart”:

$t_c \leq 60 \text{ min}$			
Rainfall			
<u>Frequency</u>	<u>b</u>	<u>d</u>	<u>e</u>
3-year	51.4	8.1	0.705
5-year	46.6	7.0	0.656
10-year	51.9	6.5	0.647
25-year	61.5	6.4	0.644
50-year	67.9	6.1	0.640
100-year	76.2	6.2	0.641

$t_c > 60 \text{ min}$			
Rainfall			

<u>Frequency</u>	<u>b</u>	<u>d</u>	<u>e</u>
3-year	69.9	11.9	0.768
5-year	86.1	19.4	0.775
10-year	110.3	30.9	0.776
25-year	154.0	47.5	0.783
50-year	211.5	67.7	0.798
100-year	318.6	96.0	0.826

1.04.B.3 – Replace “*Land Use Type and Run-off Coefficient chart with updated chart*”:

<u>Land Use Type</u>	<u>Run-off Coefficient</u>
Raw Undeveloped Acres	0.20
Improved Undeveloped Acres (i.e., mowed, filled, re-graded, etc.)	0.30
Parkland	0.40
Residential:	
SFR-Estates (≥ 1 acre)	0.45
SFR (< 1 acre)	0.55
Multi-family	0.85
Commercial/Industrial	0.90
Pond (detention and amenity)	1.00

1.04.D.6 – Insert “*For developments less than five (5) acres, show contours of adjacent properties within fifty (50) feet, and account for natural and existing overland flow or channelized flows. Contour lines shall provide an indication on whether or not adjacent off-site areas drain toward or away from the subject tract.*” after “*channelized flows.*”.

1.04.E.3 – Delete “*Bridge Division*”. Insert “8” in front of “4”.

1.04.H.2 – Delete “*one hundred (100)*” and replace with “*fifty (50)*”.

1.04. H.2.a – Delete “*one hundred (100)*” and replace with “*fifty (50)*”.

1.04.H.2.a.3 – Delete “*five-tenths (0.5)*” and replace with “*fifty-five hundredths (.55)*”.

1.04.H.2.a.4 – Delete “*No*”. Delete “*shall apply*” and replace with “*of fifty-five hundredths (0.55) ac. ft. per acre.*”.

1.04.H.2.a.6 – Insert the following subsection:

6) “*Single family residential and accessory buildings on existing lots and developments under one (1) acre do not have a minimum detention requirement.*”

1.04.H.2.d – Delete “one hundred (100)” and replace with “fifty (50)”.

1.04.H.2.e – Insert the following subsection:

- e. *“Triangular Hydrograph Method for projects fifty (50) acres or less
The volume of storage required may be computed as follows:*

$$B = \frac{43560 V}{0.5 I}$$

$$S = \frac{0.5 B (I - O)}{43560}$$

Where,

B = Duration of inflow (sec)

V = Total inflow volume in ac-ft (24 hr duration even use SCS Curve Number)

S = Required storage volume (ac-ft)

I = Peak inflow rate (cfs)

O = Peak outflow rate (cfs)”

1.04.H.2.f – Insert the following subsection:

f. “Unit Hydrograph Method (Small Watershed Method) may be used for projects with drainage areas between 0 acres and 100 acres a technique developed by Dr. H.R. Malcom may be utilized in determining inflow hydrographs. The maximum inflow rate shall be determined by use of the rational formula. With the peak flow and volume of runoff, the equations presented below may be used to determine the inflow hydrograph for the proposed detention facility.

The maximum allowable outflow rate from the detention facility shall be restricted to the existing flow rate from the undeveloped tract. Outflow control shall be designed for the 5-year, 25-year and 100-year storm frequencies. In cases where the outfall for the detention facility is to be an existing roadside ditch, storm sewer, etc., the allowable outflow rate may need to be restricted to less than the maximum allowable so as to no overload the outfall.

$$1. \quad T_p = \frac{V}{1.39 Q_p}$$

Where,

T_p = Time to peak in seconds

V = Total volume of runoff for the design storm (ft³)

Q_p = Peak runoff for the design storm (cfs)

$$V = Dr \cdot A * \left(\frac{43,560}{12} \right)$$

Where,

Dr = Runoff Depth (in)

A = Runoff Area (acres)

$$2. \quad q_i = \frac{Q_p}{2} \left[1 - \cos \left(\frac{\pi t_i}{T_p} \right) \right] \quad [t_i \leq 1.25 T_p]$$

**Note: The argument of the cosine function shown above must be expressed in radians.*

Where,

t_i = Time of Interest (sec)

q_i = Runoff at Time of Interest (cfs)

$$3. \quad q_i = 4.34 Q_p e^{\frac{-1.3 t_i}{T_p}} \quad [t_i > 1.25 T_p]$$

** Note: The argument of the cosine function shown above must be expressed in radians.*

$$4. \quad T = \frac{T_p}{10} = \text{Time Interval}$$

1.04.H.3 – Delete “The Triangular Hydrograph Method may be used; or” and replace with “Detention Storage Methodology for Projects over 50 acres.

For drainage areas over 50 acres, a detailed hydraulic analysis utilizing the effective FEMA models will use as a minimum HEC-HMS v. 3.2 and HEC-RAS v. 3.0 (or more current version) for windows. This methodology also applies to properties out of tracts of 50 acres or more. A Drainage Impact Assessment report will be required to detail all design assumptions and parameters.”.

1.04.H.3 – Insert the following subsections:

a. “Watershed Modeling Methodology

1. For HEC-HMS watershed analysis, the following parameters shall be used:

Loss Method: Green and Ampt

Transform Method: Clark Unit Hydrograph

Initial Loss: 0.1 Inches
Moisture Deficit: 0.385
Suction: 12.45 inches
Conductivity: 0.024 inches/hour

Percent Impervious Cover	
Land Use	Percent Impervious (%)
<i>Water</i>	<i>100</i>
<i>Isolated Transportation</i>	<i>90</i>
<i>High Density</i>	<i>85</i>
<i>Light Industrial</i>	<i>60</i>
<i>Airport</i>	<i>50</i>
<i>Residential Small Lot</i>	<i>40</i>
<i>Residential Large Lot</i>	<i>20</i>
<i>Development Green Acres</i>	<i>15</i>
<i>Residential Rural Lot</i>	<i>5</i>
<i>Undeveloped</i>	<i>0</i>
<i>Unknown</i>	<i>0</i>

Atlas 14 Annual Exceedance Probability Rainfall Data (Inches) - Region III

<i>Duration</i>	<i>3-Year</i>	<i>5-Year</i>	<i>10-Year</i>	<i>25-Year</i>	<i>100-Year</i>
<i>5-min</i>	<i>0.7</i>	<i>0.8</i>	<i>0.9</i>	<i>1.1</i>	<i>1.4</i>
<i>15-min</i>	<i>1.4</i>	<i>1.50</i>	<i>1.8</i>	<i>2.1</i>	<i>2.7</i>
<i>30-min</i>	<i>2.0</i>	<i>2.2</i>	<i>2.5</i>	<i>3.0</i>	<i>3.8</i>
<i>1-hr</i>	<i>2.6</i>	<i>2.9</i>	<i>3.4</i>	<i>4.1</i>	<i>5.2</i>
<i>2-hr</i>	<i>3.3</i>	<i>3.8</i>	<i>4.5</i>	<i>5.6</i>	<i>7.5</i>
<i>3-hr</i>	<i>3.7</i>	<i>4.3</i>	<i>5.2</i>	<i>6.6</i>	<i>9.2</i>
<i>6-hr</i>	<i>4.5</i>	<i>5.2</i>	<i>6.5</i>	<i>8.4</i>	<i>12.2</i>
<i>12-hr</i>	<i>5.3</i>	<i>6.2</i>	<i>7.8</i>	<i>10.2</i>	<i>15.0</i>
<i>24-hr</i>	<i>6.2</i>	<i>7.3</i>	<i>9.2</i>	<i>12.1</i>	<i>17.9</i>

2. *Indicate on a map drawn to scale the existing and proposed watershed areas. All major features such as major roads and drainage entries shall be indicated. Node locations shall be provided in the base model with corresponding nodes at identical points in the model for the proposed system.*
3. *The model shall include the 5-year, 25-year and 100-year pre-development and post development runoff analysis. If a proposed development is to be constructed in phases, the analysis should address any intermediate developed conditions.*

4. *When time series data or pared data are used in the model, briefly discuss the source of the data in the report or show the calculations. Whenever possible, provide a copy of the calculations, source and model files via file sharing or on an external thumb drive.*
5. *Time of concentration and storage coefficients shall be calculated as outlined in HCFCD and GCCDD methodology.*
6. *If a different model than the FEMA effective hydraulic model is utilized, written justification must be provided, and approval granted by the City prior to beginning. At a minimum HEC-HMS v 3.2 shall be used.*

b. Water Surface Profile Modeling

1. *Water surface profile models shall be created using as a minimum HEC-RAS v 3.1.3 (or more current version) for windows. Alternative approaches to modeling shall be discussed with the City prior to commencing the study.*
2. *The use of one-dimensional steady flow and unsteady flow approach may be utilized with proper justification.*
3. *Provide information and data for the base model which must be included in the report. If the base model is different than the FEMA effective model, written justification must be provided, and approval granted before modeling commences. Base models shall be updated using HEC-RAS v 3.1.3 (or more current version).*
4. *Provide a plan view schematic for the existing and proposed systems. The schematics shall indicate channel designations, node labels and river stations. The river stations and node label so the existing model shall match any identical points on the proposed models whenever possible. Physical reference points shall also be used.*
5. *All models shall include the 5-year, 25-year and 100-year pre-development and post development runoff analysis. If a proposed development is to be constructed in phases, the analysis should address any intermediate development conditions. Proposed bridge and/or culvert crossing analyses shall include an extreme event.*

6. *For any steady flow or unsteady flow data used in the model(s), briefly explain how the data was calculated or the source of the data. Whenever available, these separate data files or calculations shall be included on the required external thumb drive and file share transfer with all submittals.*
7. *All existing bridge or culvert crossing shall be modeled based upon actual on the ground survey data correctly tied to a GCCDD or HCFCD benchmark, datum and year of adjustment unless otherwise authorized.*
8. *Bridge and/or culvert crossing shall be analyzed using the highest energy answer obtained using the energy and momentum equations.*
9. *The model should include a reasonable number of cross sections based upon current elevation data to ensure that the actual drainage system is properly represented. The spacing of cross sections may be approximated by using Samuel's equation. The use of numerous interpolated sections between two surveyed cross sections that are too far apart is not an acceptable way of producing additional cross sections.*
10. *Some portions of channels within the City are tidally influenced. In those reaches, the models shall account for tidal conditions.*
11. *For HEC-RAS models, the following contraction and expansion Coefficients are required. Any variance from these values must be preapproved by the City.*
Contraction Coefficient: 0.1
Expansion Coefficient: 0.3
12. *Manning's "n" values will follow GCCDD design criteria on the Galveston County side and Harris County criteria on the Harris County side. See the latest versions of the GCCDD Drainage Criteria Manual and the HCFCD Policy, Criteria, and Procedure Manual. Any deviation from these "n" values must be approved by the City before modeling begins."*

1.04.H.4 – Delete *"The Unit Hydrograph Method may be used.*

For developments with more than one hundred (100) acres, a detailed hydrologic analysis utilizing the HEC-1 or HEC-HMS Flood Hydrograph method shall be required per the applicable governing entities."

1.04.H.5 – Update outline numbering sequence to “1.04.H.4”.

1.04.H.6 – Update outline numbering sequence to “1.04.H.5”.

1.04.H.7 – Update outline numbering sequence to “1.04.H.6”.

1.04.H.7 – Insert the following subsection:

c. *“Contact the Galveston County Consolidated Drainage District for the latest regional detention rates.”*

1.04.H.8 – Update outline numbering sequence to “1.04.H.7”.

1.04.H.9 – Update outline numbering sequence to I”1.04.H.8”.

1.04.H.8 – Replace “*Detention Requirements Summary*” with updated chart:

Lot or Tract Type	Acreage	Off-Site Detention Available	Engineered Drainage Plans	Detention Volume Calculation Method	Rates	Attachment #4* Required	GCCDD Board Approval
SFR	0-5	Yes	Not Required	Purchase Regional Detention Based On: New Impervious Coverage Calculation of Detention Volume Unnecessary	Contact GCCDD for fees	Yes	Not Required
	5-8	Yes	Required	Engineer Determines the Detention Volume by an Approved Method	Contact GCCDD for fees	No	Required
	8+	No	Required	Engineer On-Site Detention	NA	No	Required

MFR	0-5	Yes	Required	Engineer Determines the Detention Volume by an Approved Method	Contact GCCDD for fees	No	Required
	5+	No	Required	Engineer On-Site Detention	NA	No	Required
COM	0-5	Yes	Required	Engineer Determines the Detention Volume by an Approved Method	Contact GCCDD for fees	No	Required
	5+	No	Required	Engineer On-Site Detention	NA	No	Required

1.04.H.10 – Update outline numbering sequence to I”1.04.H.9”.

1.04.H.9 – Insert the following subsection:

d. “Hydrograph timing as a substitute for detention on any project is prohibited.”

1.04.H.10 – Insert the following subsection:

10. “Lowest Floor Elevation:

- a. Refer to the City of Friendswood Flood Ordinance (December 2020) section 34-63 for special lowest floor elevation requirements.*
- b. The latest FEMA FIRM panel and Flood Insurance Study (FIS) should be referred to for the base flood elevation and the 0.2 percent flood elevation.”*

1.05 – Delete “RESERVED” and replace with “COMPUTER MODELS AND PROGRAMS”.

1.05 – Insert the following subsections:

A. “Current effective models use the HEC-HMS and HEC-RAS computer programs. Guidance for applying these programs is in the HCFCD Hydrology

and Hydraulics Guidance Manual and the Galveston County Consolidated Drainage District Criteria Manual. The current effective FEMA model must be used. Any departure from using this model must be submitted in written format and approved by the City prior to submittal.

- B. In some cases, HEC-HMS and HEC-RAS cannot accurately model some projects or hydraulic conditions. Alternative models may be used only with consent by the City's Engineering Department. All models selected must be freeware or prepared in a form such that the Engineering Department can open and review the models. The Engineering Department must be notified in writing of the program that will be used with justification early in the design process.*
- C. All models must be accompanied by a Letter Report or Drainage Impact Assessment describing any assumptions and changes due to the project. All projects larger than 50 acres required a Drainage Impact Assessment."*

1.06 – Insert subsection title “A. Drainage Plan Submittals”.

1.06.A – Update outline numbering sequence to “1.06.A.1 Preliminary Submittals – Submit for Review and Comment:”.

1.06.A.1 – Update outline numbering sequence to “1.06.A.1.a – One line drawings are required as part of the platting process. One line drawings shall include:”.

1.06.B – Update outline numbering sequence to “1.06.A.2 – Final Design – Submit the following for approval:

- a. Copies of any documents which show approval of exceptions to the City Design Criteria.*
- b. Design calculations for storm line sizes and grades, and for detention facilities, if any.*
- c. Design calculations for the hydraulic grade line of each line or ditch, and for detention facilities, if any.*
- d. Contour map and drainage area map of the project.*
- e. Plan and profile sheets showing storm sewer or open ditch design (public facilities only).*

f. Projects located within a floodplain boundary or within a floodplain management area shall show the floodplain boundary or floodplain area, as appropriate, on the one-line drawing or drainage area map.

g. Soil boring logs.

h. All drainage plans shall have a current FEMA flood zone determination statement.

i. Fill calculations are required for projects located in the FEMA floodway, 100-year floodplain and the 500-year floodplain.”

1.06.C – Update outline numbering sequence to “1.06.A.3 – Signature State – Submit the following for approval:

a. Review prints.

b. Original drawings.

c. Storm water detention maintenance agreement letters.”

1.06 – Insert the following subsection:

A. “National Flood Insurance Program (NFIP) Compliance

1. The City of Friendswood is a participant in the National Flood Insurance program’s (NFIP’s) Community Rating System (CRS). As a CRS community, the City is required to develop and implement various programs intended to reduce flood risk such as identifying drainage problem areas, maintenance of existing drainage systems, construction of drainage projects, outreach to the community, etc. As a result of the community’s commitment to reduce the flood risk, the residents of the City are entitled to receive discounted flood insurance premiums based on the City’s CRS ranking as evaluated by CRS.

2. All runoff impacts created by development shall be mitigated, so post-project runoff rates and flooding levels are equal to or less than equivalent pre-project conditions.

3. Fill placed in the floodway, 100-year floodplain, or 500-year floodplain as designated on the current Flood Insurance Rate Map, and below the 500-year flood elevation shall be mitigated by the removal of a like amount of compensating cut in the vicinity of the fill, while maintaining hydraulic connectivity to the existing floodplain.

4. Any new development in the floodway will require a No Rise study. All calculations and/or models must be submitted with No Rise study via the City's permitting process."

1.06 – Insert the following subsection:

B. "Drainage Report/Drainage Impact Assessment Requirements

Drainage Report/Drainage Impact Analysis must be approved prior to submittal and approval of Construction Plans. The drainage report must include minimum of the following items listed in the drainage report:

- 1. Executive Summary: To include detention summary table for projects with detention.*
- 2. Introduction: Inclusion of project name and purpose, map and description of project limits, project objectives, assumptions and constraints and any existing prior studies. Any data used must be fully described.*
- 3. Existing Conditions: Include location and topography, land use, FEMA floodplains, right-of-way, pipelines and utilities, survey datum, brief discussion of impact of historical storm events at the project site. Include and Existing Condition Drainage Area Map Exhibit.*
- 4. Hydrology and Hydraulics: Include Design Criteria guidelines used, storm frequencies analyzed, mitigation requirements etc. Include a listing of programs and software used. Include discussion of the hydrologic and hydraulic methodologies used. Include Pre-Project and Post-Project conditions. For projects that will be built in a phased approach include an Interim condition. Include analysis of an extreme event. Exhibits will include Overall Drainage Area Map, Existing Drainage Area Map with 5, 25, 100-year flows and water surface elevations at Major Outfall Nodes; Extreme Condition Map; Floodplain Maps with project boundary.*
- 5. Proposed Drainage Plan. Include a description of the proposed drainage plan, results of the hydrological and hydraulics analyses, channel and/or detention layout, right-of-way requirements, pipeline and utility conflicts, geotechnical requirements, and any environmental issues. Exhibits required include Overall Drainage Area Map, Proposed Drainage Area Map with 5, 25 and 100 year flows and water surface elevations at Major Outfall Nodes, Floodplain Maps with project boundaries shown, Detention Pond layout with detention summary, and Plan and Profile with 5-year, 25-year and 100-year waster surface elevations in case of roadway.*
- 6. Fill Results. Include fill calculations for the floodway, 100-year floodplain and the 500-year floodplain and a discussion of any mitigation. Include a Fill Exhibit showing all areas of cut and fill.*
- 7. Conclusions.*

When a detention facility is part of the proposed project, include the following detention summary table:

<i>Project Name</i>				
<i>Detention Basin Area</i>	<i>Acres</i>			
<i>Detention Storage Rate</i>	<i>Acres-Feet/Acre</i>			
<i>Detention Storage Required</i>	<i>Acre-Feet</i>			
<i>Detention Storage Provided</i>	<i>Acre-Feet</i>			
<i>Floodplain Fill Mitigation Volume</i>	<i>Acre-Feet</i>			
<i>Storm Event</i>	<i>20% (5 Yr)</i>	<i>10% (25-Year)</i>	<i>1% (100-Year)</i>	<i>Pond Maximums</i>
<i>Design Water Surface Elevation (-----Datum, -----Adjustment)</i>				
<i>Maximum Allowable Outflow 9cfs)</i>				
<i>Maximum Outflow Provided (cfs)</i>				

8. Appendix. Include detailed hydrological and hydraulic calculations. Include models and Geospatial data on an external drive.

1.07 – Delete “and” before “all design” and replace with a comma. Insert “and any submitted reports” after “calculations”. Insert “All hydrologic and hydraulic calculations and/or models used during design must be submitted to the City via electronic transfer and on an external hard drive.” after “information.”.

2.02 – Insert the following subsection:

F. “All projects located in the floodway, 100-year floodplain, or 500-year floodplain require fill calculations and fill exhibit indicating areas of fill and cut.”

Changes to Section VI – Site Development:

1.02.C – Delete “www.friendswood.com/publications” and replace with “www.ci.friendswood.tx.us/350/Publications-Forms”.

1.04.A.2.d.2.g – Add a line spacing after subsection “g. *Once the site plan is approved, the developer may begin the building permitting process. Approval from the appropriate drainage entity is required prior to the issuance of building permits.*”

1.04.A.2.d.4 – Delete “set out in the” and replace with “set out in Section III –”.

1.04.A.2.d.5 – Delete “refer to the” and replace with “refer to Section II –”.

1.04.A.2.d.6 – Insert “Refer to Section V – Storm Drainage Design Requirements for more details.” after “facilities in the area.”.

1.04.A.2.d.7.O.1 – Add a line spacing after subsection “b) *Ten (10) feet on collector streets, major thoroughfares and boulevards, and local streets greater than twenty-eight (28) feet in width.*” .

1.04.A.2.d.11.a – Delete “Concrete pavement thickness shall be a minimum of five (5) inches with eight (8) inches of stabilized subgrade. Reinforcement shall be Grade 60, $f_y = 60,000$ psi, #4 deformed reinforcing bars spaced at sixteen (16) inches center to center both ways and a minimum lap lengths of eighteen (18) inches.” and replace with “Minimum concrete slab thickness shall be five (5) inches with an f_c equal to four thousand (4,000) psi. Reinforcement shall be Grade 60, $f_y = 60,000$ psi, #4 deformed reinforcing bars, spaced at sixteen (16) inches center to center, both ways with a minimum lap length of twenty-four (24) inches. Minimum stabilized subgrade thickness shall be eight (8) inches.” .

1.04.A.2.d.11.f – Delete “Appendix C – Design Criteria Manual” and replace with “Appendix C of this Design Criteria Manual”.

12.03.J – Delete “Concrete sidewalks [a minimum of four (4) feet wide and four (4) inches thick with steel reinforcement] shall be required along all street frontages.” and replace with “Sidewalks are required as set out in Section III of the Subdivision Ordinance and Section 70-64 of the Code of Ordinances. Where sidewalks are required, they shall have a minimum width of four (4) feet, except on TxDOT rights-of-way where the minimum width shall be five (5) feet.”.

Changes to Appendix A – Attachments: NONE

Changes to Appendix B – Figures: NONE

Changes to Appendix C – Parking Group Tables: NONE

Changes to Appendix D – Qualified Tree List: NONE

Changes to Appendix E – Downtown District Amenities: NONE

Changes to Appendix F – Culverts and Driveways Policy:

III.A.vii – Add a line spacing after subsection “vii. *Alternate sizes and styles may be used as long as they meter the same square inch area of the required pipe size, and is approved by the City Engineer.*”.

III.B.xi – Delete “www.friendswood.com/publications” and replace with “www.ci.friendswood.tx.us/350/Publications-Forms”.

Changes to Appendix G – Traffic Control Sign Policy:

Header of document – Delete “*Engineering Department of Public Works*” and replace with “*Engineering Department*”.

TABLE OF CONTENTS.ATTACHMENTS.F – Delete “32” and replace with “33”.

SCOPE – Delete “*Engineering Department of Public Works*” and replace with “*Engineering Department*”.

TERMS.Traffic Committee – Delete “*Department of Public Works Administration and Public Works Engineering Division*” and replace with “*the Public Works Department and Engineering Department*”.

PROCEDURES.1 – Delete “*Traffic Concern request forms may be obtained from the City of Friendswood Engineering or downloaded at www.friendswood.com/publications.*” and replace with “*Traffic concerns may be submitted directly to Engineering via a fillable form at www.ci.friendswood.tx.us/350/Publications-Forms under Traffic.*”.

PROCEDURES.2 – Delete “*Public Works*” and replace with “*Engineering*”.

PROCEDURES.7 – Delete “*will share*” and replace with “*shall attempt to convey*”.

No Parking/Parking Zone Implementation Requests – Delete “*will share*” and replace with “*shall attempt to convey*”.

No Parking/“Parking” Zone Removal Requests – Delete “*will share*” and replace with “*shall attempt to convey*”.

Commercial Truck Cut-Through Traffic Mitigation Requests – Delete “*will share*” and replace with “*shall attempt to convey*”.

Pedestrian Facility Requests – Delete “*will share*” and replace with “*shall attempt to convey*”.

School Zone Safety Requests – Delete “*Traffic Engineering and Operations will share*” and replace with “*Engineering shall attempt to convey*”.

Speed Control Requests – Delete “*www.friendswood.com*” and replace with “*www.ci.friendswood.tx.us*”. Delete “*Traffic Engineering and Operations will share*” and replace with “*Engineering shall attempt to convey*”.

Intersection Control Requests (Multi-way Stops, Traffic Signals, and Roundabouts) – Delete “*City Traffic Engineer*” and replace with “*City Traffic Director*”. Delete “*Traffic Engineering and Operations will share*” and replace with “*Engineering shall attempt to convey*”.

Other Public Safety and Traffic Issue Requests – Delete “*Traffic Engineering and Operations will share*” and replace with “*Engineering shall attempt to convey*”.

Attachment B.Possible Solutions – Delete “*and sending it to the Engineering Division*” and replace with “*at www.ci.friendswood.tx.us/350/Publications-Forms*”. Delete “*Engineering Division*” and replace with “*Engineering*”.

Attachment D.II.Parking Regulations – Delete “*Department of Public Works*” and replace with “*Engineering Department*”.

Attachment F.III.Purpose – Delete “*Engineering Division of the Department of Public Works*” and replace with “*Engineering Department at www.ci.friendswood.tx.us/350/Publications-Forms*”.

Attachment G – Delete “*Department of Public Works*” and replace with “*Engineering Department*”. Delete “*The Department of Public Works will install*” and replace with “*The City will install*”.

Attachment H – Delete “*speeds down, Engineering Studies*” and replace with “*speeds down, engineering studies*”.

Changes to Appendix H – Streetlight Policy:

VI.b – Add a line spacing after subsection “• *Spacing in rural areas that have large acreage lots may be extended to five hundred (500) foot spacing and staggered along both sides of the roadway.*”.

VII.a – Delete “*Department of Public Works Engineering Division*” and replace with “*Engineering Department at www.ci.friendswood.tx.us/350/Publications-Forms*”.

VII.b – Delete “*Division*”.

VII.c – Delete “*Division*”.

VII.e – Delete “*Division*”. Delete “*Approves*” and replace with “*approves*”.

VII.g – Delete “*Division*”.

VIII – Delete “*Department of Public Works*” and replace with “*Public Works Department*”.

Streetlight Request Form – Delete page titled “*Streetlight Request Form*”.

TABLE OF CONTENTS

REVISION CHANGES

Changes to this revision of the Design Criteria Manual.

SECTIONS

- I. Graphic and Design Requirements
- II. Wastewater Collection System Design Requirements
- III. Water Line Distribution System Design Requirements
- IV. Street Paving Design Requirements
- V. Storm Drainage Design Requirements
- VI. Site Development Requirements

APPENDICES

- A. Attachments
 - 1. Lift Station Start Up Log
 - 2. Design Criteria Modification Form
 - 3. Galveston County Consolidated Drainage District Form DR-001 (Attachment 4)
- B. Figures
 - 1. Geometric Street Design Standards
 - 2. Divided Roadway Cross Sections – Urban
 - 3. Roadway Tapers for Subdivision Streets
 - 4. Undivided Roadway Cross Sections – Urban
 - 5. Typical Length of Median and Median Opening

- 6. Median Nose and Left Turn Bay Design
- 7. Cul-de-Sac
- 8. Driveway Spacing and Other Measurements
- 9. Off-Street Parking
- C. Parking Group Table
- D. Qualified Tree List
- E. Downtown District Amenities
- F. Culverts and Driveways Policy
- G. Traffic Control Sign Policy
- H. Streetlight Policy

SECTION I

GRAPHIC AND DESIGN REQUIREMENTS

1.0 GENERAL

- A. Should any portion of this Section conflict with any provisions of the Subdivision Ordinance or Zoning Ordinance, the more stringent of the three (3) shall govern.
- B. The City Engineer shall have the final interpretation of any provisions in this Design Criteria Manual.
- C. The City Engineer has the right to issue administrative orders or design criteria modifications for just cause related to any provisions or conditions in this Design Criteria Manual.

1.01 CHAPTER INCLUDES

Graphic and design requirements for construction drawings.

1.02 REFERENCES

The City of Friendswood Standard Details and City of Friendswood Technical Specifications, latest versions. These can be downloaded from the City's website at: www.friendswood.com/publications

1.03 DEFINITIONS

- A. CADD (Computer Aided Drafting Design) – the preparation of documents utilizing computer facilities for the production of drawings, plans, prints, and other related documents.
- B. GCCDD – Galveston County Consolidated Drainage District.
- C. HCFCD – Harris County Flood Control District.
- D. PDF – a file format that provides an electronic image of text or text and graphics that looks like a printed document and can be viewed, printed and electronically transmitted.

1.04 DESIGN REQUIREMENTS

- A. Provide a cover sheet for all projects involving three or more design drawings (excluding standard detail sheets). Drawing sheet numbers shall be shown on the

cover sheet or area key map. Include a vicinity map to identify project locations. Also provide current City of Friendswood Standard Details Signature Block that has a note stating that approval is valid for only one (1) year from the date of signatures.

- B. Preliminary drawings shall be prepared on nominal twenty-four (24) inches by thirty-six (36) inches.
- C. Final drawings shall be produced by CADD on paper stock. The engineer shall also submit, at the time of plan approval, an electronic PDF and DWG version of the CADD drawings on CD-ROM of the development showing all lot lines and associated lot information, rights-of-way, easements, contour-lines, utilities, and all drainage and paving improvements.
- D. Details of special structures (not covered by approved standard drawings such as stream or gully crossings, special manholes, or junction boxes, etc.) shall be drawn with vertical and horizontal scales equal to each other, and shown on a separate sheet(s) from the Standard Detail sheets.
- E. Each set of construction drawings shall contain paving and utility key drawings indexing specific plan and profile sheets. City of Friendswood Standard Detail drawings, where applicable, shall be included. All sheets shall have standard title blocks and be sequentially numbered. Where applicable, show HCFCDD or GCCDD key drawings and numbers.
- F. A drawing index shall be shown on the overall cover sheet.
- G. Overall project layouts shall be drawn to a minimum scale of 1 inch = 100 feet and provided with a drawing index.
- H. A north arrow shall be shown on all sheets (except standard or special detail sheets) and shall be located either toward the top or to the right.
- I. Plan and profile sheet stationing must run from left to right.
- J. Standard scales permitted for plans and profiles of paving and utility construction drawings are as follows:
 - 1. Major thoroughfares, major collectors, and boulevards over four hundred (400) feet in length, or special intersections/situation.
 - a. 1 inch = 20 feet horizontal, 1 inch = 2 feet vertical
 - 2. Minor collectors or local streets.

- a. 1 inch = 20 feet horizontal, 1 inch = 2 feet vertical
 - b. 1 inch = 50 feet horizontal, 1 inch = 5 feet vertical
- 3. Scales in Paragraph No. 2 above are a minimum; larger scales may be used to show details of construction.
- K. Each plan and profile sheet shall have a benchmark elevation and description of the benchmark, along with a current flood zone determination statement. Also include the temporary benchmark (TBM) with their elevation and coordinates.
- L. The seal, date, and original signature of the Professional Engineer licensed to practice engineering in the State of Texas, and who is responsible for the drawings, shall be required on each sheet developed by the engineer, along with their firm's registration information. The engineer may use a stamped or embossed imprint for his/her seal; however, the embossed imprint must be shaded such that it will reproduce on prints.
- M. A copy of the final plat for new developments shall be included with the final drawings when submitted for final approval.
- N. If a roadway exists where drawings are being prepared to improve or construct new pavement or a utility, label the existing roadway width, surface type, and thickness. Pavement thickness shall be ascertained by coring with the core hole and grout filled to protect pavement prior to construction.
- O. Show all street and/or road alignments on drawings.
- P. End and beginning of alignment shall include coordinates based upon State Plane.
- Q. Develop drawings to accurate scale showing proposed pavement, typical cross sections, details, lines and grade, and all existing topography within street rights-of-way, and any easement contiguous with the rights-of-way. At the intersection, the cross street details shall be shown at a sufficient distance [twenty (20) foot minimum distance outside the primary roadway rights-of-way] in each direction along the cross street in order to design adequate street crossings or transitions.
- R. Match lines between plan and profile sheets shall not be placed or shown within cross street intersections including cross street rights-of-way.
- S. Natural ground profiles shall be shown as follows:
 - 1. For privately-funded projects, center line profiles are satisfactory except where a difference of one-half (0.5) foot or more exists from one (1) rights-

of-way or easement line to the other, in which case, dual profiles are required.

2. For City of Friendswood projects, provide natural ground profiles at each rights-of-way line. Easement profiles shall conform to S.1 below.

T. Basic plan and profile sheets shall contain the following information:

1. Identify all lot lines, property lines, easements, and/or rights-of-way.
2. Label each plan sheet as to street/easement widths, pavement widths, pavement thickness where applicable, type of roadway materials, curbs, intersection radii, curve data, stationing, existing utilities (type and location), and any other pertinent feature affecting design.
3. Show all utility lines four (4) inches in diameter or larger within the rights-of-way or construction easement in profile view. Show all utility lines, regardless of size, including franchise utility lines, in the plan view.
4. Graphically, show flow line elevations and direction of flow for all existing ditches.
5. Label proposed left and right top of curb elevations and grades, except at railroad crossings. Centerline elevation and grades are acceptable only for paving without curb-and-gutters.
6. Curb return elevations and grades for turnouts shall be shown in profile.
7. The centerline elevation at the property line of all existing driveways shall be shown in profile.
8. Station all esplanade noses or the centerline of all esplanade openings with esplanade width shown, both existing and proposed.
9. The design of both roadways is required on all paving sections with an esplanade.
10. Station all Points of Curvature (PCs), Points of Tangency (PTs), radius returns, and grade change Points of Intersection (PIs) in the plan view. Station all radius returns and grade change Points of Intersection (PIs) in profile with their respective elevations.

U. Provide a Storm Water Pollution Prevention Plan (SWPPP) with legend. See Section VI – Site Development under Design Requirements.

- V. The Drainage Plan shall have a current FEMA flood zone determination statement.
- W. All “No Objection” letters expire one (1) year after issuance.

SECTION II

WASTEWATER COLLECTION SYSTEM DESIGN REQUIREMENTS

1.0 GENERAL

- A. Should any portion of this Section conflict with the Subdivision Ordinance or the Zoning Ordinance, the more stringent of the latter two (2) shall govern.
- B. The City Engineer shall have the final interpretation of any provisions in this Design Criteria Manual.
- C. The City Engineer has the right to issue administrative orders or design criteria modifications for just cause related to any provisions or conditions in this Design Criteria Manual.
- D. Sanitary sewers located on private property that are not in a dedicated easement, are under the jurisdiction of the International Plumbing Code, as adopted and amended by ordinance, and will be addressed/reviewed by the Building Official.

1.01 CHAPTER INCLUDES

Criteria for the design of wastewater collection systems.

1.02 REFERENCES

- A. Texas Commission on Environmental Quality (TCEQ) – "Design Criteria for Sewerage Systems" – Texas Administration Code – Chapter 217 (current revision).
- B. Galveston County Health Department.
- C. City of Friendswood Standard Details and Technical Specifications, latest version. These can be downloaded from www.friendswood.com/publications.

1.03 DEFINITIONS

Where used in these regulations, the following terms shall be construed to carry the meanings given below:

- A. Public Sanitary Sewer – A closed conduit which conveys wastewater flow and which is located within the public rights-of-way or dedicated public easement. A public sanitary sewer (or public sewer system) is intended to serve more than one (1) "owner".
- B. Private Sanitary Sewer – A closed conduit which conveys wastewater flow and is constructed and maintained by a private entity (ies) (i.e., homeowner's association). Private sanitary sewers may be located in areas such as a private street or common area, and are subject to the design and construction requirements of the International Plumbing Code, as adopted and amended by ordinance. Private sanitary sewers must discharge to a public sanitary sewer.
- C. Sanitary Sewer Main – A sanitary sewer which receives the flow from one (1) or more lateral sanitary sewers.
- D. Lateral Sanitary Sewer – A sanitary sewer running laterally down a street, alley, or easement, which receives only the flow from the abutting property.
- E. Service Lead – A sanitary sewer which branches off a public sanitary sewer and extends to the limits of the public rights-of-way. It shall be construed as having reference to a public sanitary sewer branching off from a main or lateral sanitary sewer to serve one (1) or more houses, single-family lots, or other types of small land tracts situated in the same block with the said main or lateral sanitary sewer, but not directly adjacent thereto. Such a line shall never exceed one hundred fifty (150) feet in length. If the sanitary sewer is designed to serve more than two (2) houses, or the equivalent of two single-family residences along a street, a lateral sanitary sewer as defined above shall be constructed.
- F. Service Connection – A private sanitary sewer from a single source to the main or lateral sanitary sewer in the street, alley, or easement adjacent thereto. Service connections are covered by the International Plumbing Code, as adopted and amended by ordinance. It will be owned and maintained by the owner of the property being served by said sanitary sewer.
- G. Project Area – The area within the immediate vicinity of the public sanitary sewer to be constructed. For example, if a public sanitary sewer were to be constructed within the public rights-of-way, the project area would extend ten (10) feet to either side of the public rights-of-way. If as an example, a public sanitary sewer is to be constructed within a dedicated easement adjacent to the public rights-of-way, the project area would extend ten (10) feet to either side of the dedicated easement, depending upon the existing topographical elements, unless impacted by a permanent structure (i.e., telephone pole, trees, drainage ditches, etc.) If, as

an example, a public sanitary sewer is to be constructed within a side lot easement (if approved by the City), the same criteria would apply as for a dedicated easement adjacent to public rights-of-way.

- H. Stack – A riser pipe constructed on main or lateral sanitary sewers which are deeper than six (6) feet, measured from finished grade at manhole to facilitate construction of service leads or service connections.
- I. Force Main – A pressure-rated conduit (i.e. ductile iron pipe, pressure-rated PVC, etc.) that conveys wastewater from a pump station to a discharge point.
- J. All references hereafter to sewer, public sewer, private sewer, sewer main, lateral sewer, service lead, service connections, stack, and force mains shall mean elements of a sanitary sewer system.

1.04 DESIGN REQUIREMENTS

- A. Drawings to be furnished:

Before any main or lateral sewer is constructed and before a permit shall be issued for the construction of same, plans and profiles of the proposed sewer shall be prepared and submitted to the City for approval. All reproducible drawings, PDF, and CADD files shall become the property of the City and shall remain on file in the City for the use of any person who may be interested in such information.

- B. Details to be shown on drawings:

The detailed plan view will show the exact location of public sewer lines in the street, alley, or easement with respect to the edge of the particular rights-of-way, the survey base line, and any nearby utilities, major landscaping, and other structures affecting construction.

- C. Main and Lateral Sewers

- 1. Sewers in curved easements, easements defined by property lines, and combined easements containing other public utilities shall be shown both in detailed plan and profile views.
- 2. The profile shall show other underground and surface utilities, and facilities, both in parallel and at crossings; the size, grade of the proposed line, the elevation of same to hundreds of a foot at all manholes, changes of grade and dead-ends, and the proposed finished grade over the sewer.

It shall show the actual ground line as it exists prior to construction of the sewer. Where proposed fill or cut is contemplated, the proposed new ground line shall be shown as a separate line from the actual ground line. Type of pipe and bedding shall comply with City of Friendswood Technical Specifications and Standard Details.

3. Where public sewers are to be placed between existing pavement and the street rights-of-way (or interior easement line) or under existing pavement or shoulders of pavement, show the existing ground line at both sides (or the closest side for sewers near the edge) of the rights-of-way or adjacent sewer easement.

D. Sewer mains – plan and profile required

1. Sanitary sewer layouts for single-family residential subdivisions should use a scale of one hundred (100) feet or less per inch. A scale of two hundred (200) feet per inch may be used provided the following information is shown on the layout:
 - a. All easements containing or buffering sanitary sewers shall have points of size change shown, and all manhole locations shall be shown.
 - b. The sewer alignment shall accurately reflect the relative location of the sewer as shown on the detailed plan view.
 - c. All service leads that cross street pavement or serve adjacent property shall be shown on the layout. The detail plans and profiles shall show the flow lines of all service leads at the street or easement rights-of-way.
 - d. The number and size of the lots depicted on both the overall sewer layout sheet and the individual plan and profile sheets shall match the number and size of the lots depicted on the final plat after recordation.
 - e. On the overall sanitary sewer layout sheet the size and direction of flow for all existing and proposed sewers shall be shown.
 - f. The location of the proposed sewer within the public rights-of-way, a dedicated easement adjacent to the public rights-of-way, or side lot easement (if allowed by the City).

- g. The overall sanitary sewer layout sheet shall show the area, in acres, which the proposed sewer(s) is (are) designed to serve. A location map shall be included that references the average proximity to nearby major thoroughfare and boulevard streets. The scale of the location map shall be 1 inch = 2,000 feet or less.
- 2. Non-residential subdivision sanitary sewer layouts for large areas, and with a scale of four hundred (400) feet or more per inch, shall have an additional set of layouts at not more than two hundred (200) feet per inch, with match lines and a small index map showing which portion of the overall layout that each sheet's layout represents.
- 3. Acceptable horizontal scales for the detailed plan and profile views shall be ten (10) feet, twenty (20) feet, forty (40) feet, and not more than fifty (50) feet maximum per inch. Horizontal scale for major thoroughfares and boulevards shall be 1 inch = 20 feet or less.
- 4. Acceptable vertical scales for detailed profile views shall be two (2) feet, four (4) feet, and not more than five (5) feet maximum per inch unless otherwise approved. Vertical scale for major thoroughfares and boulevards shall be 1 inch = 2 feet or less.
- 5. The plan view shall show, at a minimum, the following information for the project area:
 - a. All topographical features;
 - b. Stationing for the proposed sewers;
 - c. All existing underground and overhead utilities (i.e. telephone, gas, power, etc.);
 - d. Any significant landscaping and/or other structures which might impact construction and/or construction related activities;
 - e. The width and type of all existing and proposed easements;
 - f. All proposed service leads;
 - g. The limits of bore and/or tunnel;

- h. Locations where pressure rated pipe is to be installed at water line crossings;
 - i. Drawings for single-family residential subdivisions shall show the proposed location by stations of all service leads, service connections, and stacks. The distance from the sewer or survey base line station to the nearest existing manhole shall be shown in the plan view or on an additional sewer layout sheet with a scale no more than 1 inch = 100 feet.
- 6. The profile view shall show, at a minimum, the following information for the project area:
 - a. Underground and/or surface utilities/facilities which are either parallel to the proposed sewer or cross the proposed sewers;
 - b. The proposed sewer's diameter and grade for each manhole section;
 - c. The flow line elevation for all sanitary sewers at each manhole;
 - d. The rim elevation of all existing and proposed manholes;
 - e. The flow line elevation at each sheet "break" [i.e., from one (1) sheet to another];
 - f. Type of pipe bedding/backfill shall be noted on each plan/profile sheet;
 - g. The finished grade for proposed and existing pavement where "fill" and/or "cut" is proposed, the proposed new ground elevation line shall be shown as a separate line from the existing ground elevation line;
 - h. The existing ground elevation line for the "near side" of the public rights-of-way where a sewer is to be placed between the edge of existing pavement and the edge of the public rights-of-way;
 - i. The existing ground elevation line at the centerline of the proposed sanitary sewer where a sanitary sewer is to be placed within an existing easement;

- j. Show any proposed and/or existing pavement;
- k. The flow line elevation of all service leads where they cross the edge of the public rights-of-way or the dedicated easement adjacent to the public rights-of-way;
- l. The limits of bore and/or tunnel;
- m. Locations where pressure rated pipe is to be installed at water line crossings;
- n. The location of special backfill and/or proposed stacks shall be identified by "stations" indicated on the design plans;
- o. The location of stacks shall be labeled with stations.

E. Service leads

- 1. Service leads shall be sized in accordance with Paragraph 1.04.G of this Section.
- 2. Service leads shall be at the property line between two (2) adjoining lots, or as directed by the City. A single six (6) inch service lead located at the property line between two (2) adjoining lots would serve two (2) single-family residences with a wye placed at the end of the service lead. Do not extend the wye clean-outs beyond the edge of either the public rights-of-way or dedicated easement.
- 3. Any service lead extension of more than fifty (50) feet parallel to the street rights-of-way shall be treated as a lateral sewer.
- 4. Service leads from developments with more than seventeen thousand five hundred (17,500) gallons-per-day flow shall discharge into a proposed or existing manhole. Where the flow line of the service is thirty (30) inches or greater above the flow line of the manhole, provide a standard drop to manhole.
 - a. Service leads shall be provided to serve each lot within a proposed development;
 - b. Service leads shall be six (6) inches in diameter (minimum). If the length of a service lead exceeds one hundred (100) feet or the

width of the public rights-of-way by more than twenty (20) feet, the minimum diameter shall be eight (8) inches and a manhole shall be utilized for connection to the public sewer;

- c. Service leads with a diameter of six (6) inches shall utilize "full body" fitting (extruded or factory-fabricated) for connection to the proposed public sewer or an approved saddle-type connector for connection to an existing public sewer;
- d. Saddle-type connectors shall be installed with the "stub" oriented between the "spring line" (3 o'clock and 9 o'clock positions) and forty-five (45) degrees from the "spring line" ("1:30" and "10:30" positions). Tees (aka, "full body fittings") shall be oriented in the same manner;
- e. The service lead shall be designated to minimize the use of bends as site conditions will permit;
- f. Service leads exceeding the limits defined in 1.04.E.3 shall have a manhole at each end; as well as, a plan/profile drawing for each rights-of-way crossing. All, or part, of these service leads which are located in a public rights-of-way, alley or dedicated sanitary sewer or public utility easement may be treated as a public sewer, depending upon the location of the terminal manhole and any intermediate manholes;
- g. For all existing lots (which are not served in accordance with these guidelines) that need a service lead, if the distance to the nearest existing sewer is less than fifty (50) feet, the service lead falls under the jurisdiction of the International Plumbing Code, as adopted and amended by ordinance, and the Building Official.

F. General Requirements

- 1. Sanitary sewers shall allow for orderly expansion of the system and shall conform to the comprehensive water and sewer plan for the City of Friendswood.
- 2. Sewers shall be sized based on the minimum requirements set out in this standard and the standard wastewater flow rates as established by the City of Friendswood;

3. All sewers shall conform to the minimum requirements of the Title 30 of the Texas Administrative Code, Chapter 217 of Texas Commission on Environmental Quality (TCEQ), and Galveston County Health District.
4. Sewers shall be separated from water lines by a minimum of nine (9) feet. Where the minimum separation is not maintained, refer to Section III 1.04.B.4 for allowable clearances. Sewers crossing utilities other than water, a minimum of six (6) inches of clearance must be maintained and called out on plan and profile.
5. As maintained by the City of Friendswood, the public sanitary sewer shall be defined as all sewers, including stacks and service leads, that serve more than one sewer connection, and that are located in public easements or street rights-of-way, and that are installed in accordance with these Standards.
6. Sanitary lines greater than six (6) feet deep shall require stacks to facilitate construction of service leads or service connections. Stacks shall be shown on plans with station numbers. Place stacks and wyes or tees as shown. Where no stacks are shown, it is the responsibility of the licensed plumber to place a City approved saddle for connection to the line and the responsibility of the City Engineer or his designated appointee to determine that such saddle is water tight and properly installed.
7. Materials and construction shall conform to latest City of Friendswood specifications with all amendments thereto, including standard leak test.
8. Unless noted otherwise, all public sewers and service leads shall be completely embedded in cement-stabilized sand to six (6) inches below the pipe, twelve (12) inches above the pipe and to six (6) inches on each side. All such bedding shall be compacted to ninety-five (95) percent standard proctor density. The cross-section so described herein shall be termed the "embedment zone."
9. Backfill all excavation areas/trenches under or within twelve (12) inches of existing or proposed pavement or shoulder of pavement with cement-stabilized sand from the top of the pipe "embedment zone" to the bottom of the subgrade. Cement-stabilized sand must develop one hundred (100) psi compression at forty-eight (48) hours. Backfill shall be compacted to ninety-five (95) percent standard proctor density.

10. The location of all special backfill and of proposed stacks shall be shown by stations in the drawings.
11. Construction notes shall designate the kind and class of pipe with exceptions to the construction notes to be shown on the plan and profile sheets.
12. Non-sanitary sewer easements or fee strips such as pipeline, power company, drainage district, railroad, etc., are in and of themselves insufficient and unacceptable to permit laying of sanitary sewers and/or force mains across or along the underlying private property or restricted non-sanitary use type of public property.
13. The final determination as to that portion of a street, alley, or easement to be occupied by a proposed sewer rests with the City Engineer who will take into consideration existing, planned and proposed facilities such as manholes, pavement, pipe/conduits, along with existing trees, shrubs, or other unique surface conditions when arriving at a decision.;
14. Where an easement for a public sewer ends at a public rights-of-way, the last manhole shall be extended into the public rights-of-way at a minimum of two (2) feet beyond the property line; or as close to the public rights-of-way as possible due to acceptable clearances required for other utilities (i.e., water line and storm sewers).
15. The drawings for the sewer shall show the location of any existing known pipe, duct, or other obstacles that might interfere with the construction of the sewer and call such to the attention of the City any known obstacles that might be encountered in constructing the sewer in any location under consideration. The Professional Engineer for the project, who shall be licensed to practice engineering in the State of Texas, shall determine the existence of pipes, ducts, and/or obstacles from a visual survey on the ground plus research of all public records and private records when available.
16. All sanitary sewer mains shall be constructed utilizing pressure rated pipe SDR 26 PVC pipe (ASTM D 3034, latest edition), unless specifically approved otherwise by the City Engineer.
17. In new developments, sanitary sewer lines shall be centered in sanitary sewer line easements.

G. Line Size

1. The minimum pipe diameter for a public sanitary sewer shall be eight (8) inches.
2. Four (4) inch service leads shall be confined to the limits of the lot which they serve and shall serve only the equivalent of one (1) single-family lot. No four (4) inch sewer shall be laid in any street, alley, or rights-of-way.
3. Six (6) inch service leads shall not serve more than the equivalent of two (2) single-family lots or other types of small land tracts.
4. Four (4) inch and six (6) inch service leads for single-family residential lots shall have a minimum grade of one (1.0) percent and one-half (0.5) percent, respectively.
5. For commercial service leads such as street bores, submit a copy of the approved plumbing drawings to establish the required size of the line. The minimum size lead shall be six (6) inch.
6. All main and lateral sewers shall end in manholes, except for special and/or unusual situations that are subject to specific approval by the City Engineer.
7. All sewer lines shall be laid at a size and depth to conform to designs permitting an orderly expansion of the sewer system of the City, and so as to avoid a duplication of lines in the future.
8. The City Engineer shall have final approval as to what sizes and depths are required, along with exceptions to "lateral service leads" as previously defined.

H. Line Depth

1. The sewer should be laid with the top of the pipe a minimum of three (3) feet below finished grade or top of curb, whichever is lower.

2. Sewer laid in street rights-of-way with curb-and-gutter paved streets shall have a minimum cover of four (4) feet from the top of the pipe to the top of the curb to anticipate future sewer extension.
3. Sewers laid in street rights-of-way with crowned roads and side ditches shall have a minimum cover of five (5) feet from the average ground elevation line at the adjacent street rights-of-way to the top of pipe.
4. Where the minimum cover as specified in paragraphs H.1, H.2, and H.3 above is not possible, the sewer shall be laid in Class 150 [one hundred fifty (150) psi] pressure pipe or rigid factory made pipe with cement-stabilized sand backfill as shown on the City's Standard Details. Ductile iron pipe shall be lined with either a polyethylene or polyurethane coating as approved by the pipe manufacturer and applied by either the pipe manufacturer or an approved application. The minimum liner thickness shall be forty (40) mils.
5. Maximum depth for eight (8) inch, ten (10) inch, and twelve (12) inch collection lines shall be twenty (20) feet from average ground surface to pipe invert. Depths greater than twenty (20) feet are subject to approval by the City Engineer if justified for site-specific reasons during the preliminary engineering phase of the project design and shall be constructed of Class 150 [one hundred fifty (150) psi] pressure pipe.

I. Line Grades

The following table lists the minimum and maximum grades for six (6) inch through twenty-seven (27) inch public sewers. The minimum grade is based on a minimum full pipe velocity of two (2) feet per second. The maximum grade is based on a maximum full pipe velocity of ten (10) feet per second. In both cases, the Manning Formula has been used with an "n" of thirteen-thousandths (0.013). The use of different pipe materials will not alter the use of thirteen-thousandths (0.013) for the purpose of the Design Criteria Manual.

Inside Dimension (I.D.) of Pipe in Inches	Minimum Slope (in Percent) to Develop V=2.0 ft./sec.	Maximum Slope (in Percent) to Develop V=10.0 ft./sec.
6	0.50	12.35
8	0.33	8.40
10	0.25	6.23
12	0.20	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.30
24	0.08	1.93
27	0.06	1.65

For sewers larger than twenty-seven (27) inches in diameter, the Professional Engineer of record, who shall be licensed to practice engineering in the State of Texas, shall determine the appropriate grade utilizing the Manning Formula, $n = 0.013$ and a full pipe velocity of two (2.0) fps minimum and ten (10.0) fps maximum.

J. Manholes

1. All manholes shall be precast concrete, unless the Professional Engineer of record, who is licensed to practice engineering in the State of Texas, submits a "cast in place" manhole design for review and approval by the City Engineer. All precast manholes are required to incorporate a "boot type connector" for sewer diameters up to twenty-four (24) inches. For sewer diameters greater than twenty-foot (24) inches, utilize either the "boot" type connector (if available) or an integral gasket. All precast manholes shall conform to the latest ASTM requirements. No manholes may be placed in the paved portion of the City rights-of-way unless approved by City Engineer.
2. For all public sewers, manholes shall be placed at all changes in alignment, changes in grade, junction points, dead-end mains, laterals, and at street, alley, or easement intersections as designs may require.
 - a. Sewers laid in easements shall have a manhole in each street crossed by the sewer.
 - b. The maximum distance between manholes shall be three hundred fifty (350) feet for eight (8) inch to forty-eight (48) inch pipe

diameters. Spacing for lines of a diameter larger than forty-eight (48) inches shall be determined on an individual project basis.

- c. Sewers with the same or approximate flow line elevation shall intersect each other at a ninety (90) degree angle. However, where a true perpendicular intersection cannot be obtained, and where the entering sewer intersects the receiving sewer at or about the same flow line, one (1) or more manholes shall be utilized to maintain a minimum eighty (80) degree angle at the point of intersection. When the entering sewer is on the upstream side of the manhole, the minimum angle between the sewers may be reduced to a forty-five (45) degree angle; provided:
 - 1) A distinct flow channel can be maintained within the manhole when the flowline elevations of the sewers are at, or within, one (1) pipe diameter of the smaller pipe; or
 - 2) When the flow line elevation of the "entering" pipe is above the crown of the "primary" sewer and clearance can be provided between the sewers.
- d. Criteria for connections to, and utilization of, manholes:
 - 1) Where manholes are utilized to facilitate connections between public sewers, when possible the sewers shall either match the manhole's flow line or match the elevation of each other's crown or utilize a manhole drop.
 - 2) Connections between public sewers at the manhole shall adhere to the following criteria when possible:
 - a) The elevation of the crown of the discharging sewer shall either match the elevation of the crown of the receiving sewer or be approved as special cases by the City Engineer.
 - b) A standard drop connection is required when the difference in elevation between discharging sewer flowline and receiving flowline is greater than thirty (30) inches.

- 3) The routing of service connection directly to manholes is the preferred method of termination. Where the flowline elevation of the existing sanitary sewer is more than ten (10) feet below grade and there is no available stack, and either:
 - a) The lot to be so connected is a single-family, owner-occupied, single lot residence connection to an existing manhole; or
 - b) The lot to be so connected is a single-family, owner-occupied, single lot residence connecting to a proposed manhole at the end of a cul-de-sac.
- 4) When routing an approved service connection to a manhole (see Item 3 above), the wall penetration shall not be greater than ten (10) inches in diameter and shall be cored and sealed using approved grout.
- 5) When routing an approved service connection to a manhole (see Item 3 above), the connections shall utilize a "drop (either inside or outside) and shall adhere to the following criteria:
 - a) The manhole wall penetration shall be a minimum of ten (10) feet below the manhole rim elevation and shall not be greater than ten (10) inches in diameter;
 - b) The drop shall be six (6) inches in diameter and shall be constructed of SDR 26 PVC pipe (ASTM D 3034, latest edition);
 - c) The drop shall be located forty-five (45) degrees from the upstream side of the main sewer;
 - d) An internal drop shall be affixed to the manhole wall utilizing stainless steel bands and anchor bolts.
 - e) An internal drop shall terminate with a forty-five (45) degree bend. Said forty-five (45) degree bend

shall not extend below the "top of pipe" elevation of receiving sanitary sewer and;

- f) The wall penetration (core) shall be sealed using a "grout" as approved by the City Engineer.
- g) All public sewers shall terminate in a manhole. Clean-outs will not be utilized except at the end of each service lead.
- h) The manhole cover shall have a minimum diameter of thirty-two (32) inches.
- i) All sanitary sewer manholes shall have inflow protectors.
- j) All manhole covers shall have the City of Friendswood seal and "SANITARY SEWER" imprinted on the lid as shown in the City of Friendswood Standard Sanitary Sewer Details.
- k) Commercial pressured discharge lines terminating in a manhole shall result in the manhole being protected by either a coating or concrete admixture to the interior walls of the manhole.

K. Lift Stations

1. Lift station design shall comply with the City of Friendswood Technical Specifications. In addition, it shall be confirmed that a storage volume, in the design of the wet well, shall equal to one and one-half (1.5) times the peak design flow to the lift station. Add ten (10) percent to account for volume displaced by pumps.
2. A natural gas standby generator shall be required for all new lift stations. The generator is required to be sized to operate all pumps during an emergency power failure.
3. A startup package for the pumps shall be submitted to the City Engineer before final acceptance. This package should also include a completed start up log sheet with field and product data. See Attachment 1.

4. Minimum site size shall be forty (40) feet by forty (40) feet. Smaller sites that are adjacent to public rights-of-way and are contiguous to green space or similar land use areas, may be approved when adequate odor control provisions are provided.
5. Pumps shall be sized to operate at optimum efficiency. Minimum acceptable efficiency at the operating point will be sixty (60) percent unless specifically approved by the City Engineer.
6. Operation and maintenance shall be considered in the design of the station and the location of the station.
7. Wet well working volume shall be sized to allow for the recommended pump cycle of six (6) minutes for each pump.
8. Prior to installation, controls and equipment shall be approved by the City Engineer.
9. Emergency operations shall be considered. Provide fittings and a blind flange that will be readily accessible for emergency bypass pumping.
10. The inlet structure shall be designed to minimize turbulence.
11. The velocity in the force main and riser pipes shall be less than 8 feet per second and greater than three (3) feet per second.
12. The wet well shall be sized to provide adequate clearance between the pumps (refer to manufacturers recommended clearances).
13. A peak factor of four (4) shall be used for lift station design.
14. A minimum of two (2) feet of clearance shall be provided between pumps and between pump and wall.
15. Low water levels shall be at least six (6) inches above impeller, or higher if required by manufacturer.
16. Complete immersion of submersible pump motor at low water level is preferred, if possible.
17. Tie reinforcing steel in lift station bottom to wall reinforcing steel (includes caisson construction situation) to provide watertight wetwell.

18. Nuts, bolts, chains, and all other metal components within wetwell shall be stainless steel, not carbon steel.
19. Vent pipe shall be eight (8) inch minimum diameter equipped with odor control system.
20. The following Hazen-Williams Coefficient shall be used for various pipe types:

PVC	New	C = 160
	10-year	C = 140
DIP	New	C = 140
	10-year	C = 100
21. Unless City Zoning regulations mandate another material, provide board fence (either cedar or heart redwood 6" width) with steel posts set in concrete. Fence shall be at least eight (8) feet high and include a 2"x12" rot board.
22. Fence design shall be certified by a Texas-licensed engineer.
23. Entrance drive to be at least fourteen (14) feet wide concrete pavement. Provide enough room to park vehicles inside lift station site.
24. Indicate method of drainage of site on site plan. Internal drainage, sheet flow and valley gutter driveways are acceptable. Drain to street or storm sewer, never onto adjacent private property.
25. Under no circumstances may a lift station be located within a regulatory floodway.
26. Locate the control panel and wetwell hatch above the One Hundred (100) Year Flood Plain. Call out the One Hundred (100) Year Flood Plain elevation on the plans.
27. Stainless steel guide rails (or other pump removal method that avoids entering wetwell) are required for submersible pumps.
28. A tee, plug valve (or gate valve), and blind flange assembly is required on the force main on the downstream side of the discharge valves and header.

This is required so truck-mounted pumps can bypass the lift station pumps and piping while maintenance work is being done on lift station.

29. Bedding for PVC force main shall be bank sand.
30. PVC force mains shall be AWWA C-900.
31. Ductile Iron Pipe (DIP) force mains shall be bedded in bank sand and polyethylene wrapped.
32. When calculating headloss in force main and piping, use of K factors on fittings, with the Hazen-Williams formula, is preferred.
33. Backfill structural excavations (wetwell, etc.) with cement-stabilized sand.
34. Lift station site plans shall be submitted in scales of 1 inch = 5 feet or 1 inch = 10 feet.
35. Provide a protective coating or concrete additive to the interior walls of the wetwell. The City Engineer shall approve coating or additive used.
36. Lift station shall be equipped with a telemetry system, approved by the City Engineer, and shall be compatible with existing systems in the City. A submersible transducer for SCADA shall be installed and connected to telemetry system to monitor status of lift station.
37. Power supply to lift station shall be three (3) phase and four hundred eighty (480) volts where possible.
38. A system of floats shall be provided to control pumps.
39. A pressure gauge suitable for application shall be installed on each discharge pipe.
40. A 1 inch minimum water service equipped with backflow prevention shall be provided at the lift station site.

L. Grease Traps/Grease Interceptors

Gravity grease interceptors shall be designed to remove grease from effluent and shall be sized in accordance with this section. Gravity grease interceptors shall

also be designed to retain grease until accumulations can be removed by pumping the interceptor.

1. Each grease trap/grease interceptor shall be installed in such a manner that it can be easily accessible for inspection, cleaning, and removal of the intercepted grease. All permitting, construction, design, and inspection activities must be completed in accordance with the manufacturer's instructions and the International Plumbing Code. Additionally, the following specifications must be incorporated into grease trap design:
 - a. The grease trap/grease interceptor shall be constructed with a minimum of two baffles.
 - b. Grease traps/grease interceptors are to be installed at a minimum distance of 10 feet from sinks and dishwashers to allow for adequate cooling of the wastewater. Water temperatures must be less than one hundred twenty (120) degrees prior to entering grease trap.
 - c. All grease bearing waste streams should be routed through an appropriate grease traps/grease interceptor, including: three-compartment sinks, pot/pan sinks, soup kettles, hand-washing sinks, dishwashers, mop sinks, and floor drains. *Notable Exceptions:* Drains that receive "clear waste" only, such as from ice machines, condensate from coils, and drink stations, may be plumbed to the sanitary system without passing through the grease trap.
 - d. All exterior or recessed grease traps/grease interceptors are to be installed with an effluent sampling well.
2. Requirements for traps are as follows:
 - a. Equipment and facilities of a type and capacity approved by the approving authority shall be provided.
 - b. The trap shall be located in a manner that provides ready and easy accessibility for cleaning and inspection.
 - c. The trap shall be maintained in effective operating condition so as to meet an effluent oil/grease test parameter of less than one hundred (100) mg/l.

- d. Traps shall conform to a minimum detention time of thirty (30) minutes and a maximum of sixty (60) minutes.
- e. The minimum size shall be one thousand (1,000) gallons or greater as determined by the design engineer.

1.05 APPURTENANCES – Reserved

1.06 SUBMITTALS

A. Preliminary design – submit the following for review and comment:

- 1. Copies of any documents which grant approval of exceptions to the City's Design Criteria.
- 2. Design calculations for line sizes and grades.
- 3. Contour map for overall area.
- 4. Plan and profile sheets showing proposed improvements (City projects only).
- 5. Geotechnical soils report for the project (City projects only).

B. Final design – submit the following for approval:

- 1. Final documents of the above plus plan and profile sheets and Geotechnical soils reports for non-City projects.
- 2. Review prints.
- 3. Original drawings.
- 4. Copy of Engineer's Summary Transmittal Letter to TCEQ.

1.07 QUALITY ASSURANCE

Prepare calculations and construction drawings under the supervision of a Professional Engineer licensed to practice engineering in the State of Texas and trained in the disciplines required by the drawings. The final construction drawings must be sealed,

signed, and dated by the Professional Engineer licensed to practice engineering in the State of Texas, and shall be responsible for the development of the drawings along with their firm's registration information.

2.0 EXECUTION

2.01 RESEARCH REQUIREMENTS

- A. Research existing utility and rights-of-way information.
- B. Verify that no restrictions exist that will deny approval of the project concept.

2.02 DESIGN ANALYSIS

Calculations of design flows for overall development project.

2.03 DRAWINGS

Drawings shall include layout sheets with contours, plan and profile sheets, and detail sheets for special items and treatment plants.

SECTION III

WATER LINE DISTRIBUTION SYSTEM DESIGN REQUIREMENTS

1.0 GENERAL

- A. Should any portion of this Section conflict with the Subdivision Ordinance or the Zoning Ordinance, the more stringent of the latter two (2) shall govern.
- B. Should any section conflict with TCEQ Regulations, the more stringent of the two (2) shall govern.
- C. The City Engineer shall have the final interpretation of any provisions in this Design Criteria Manual.
- D. The City Engineer has the right to issue administrative orders or design criteria modifications for just cause related to any provisions or conditions in this Design Criteria Manual.

1.01 CHAPTER INCLUDES:

Criteria for the design of water lines.

1.02 REFERENCES:

- A. Texas Commission on Environmental Quality (TCEQ), Water Utilities Division "Rules and Regulations for Public Water Systems," latest revision.
- B. American Water Works Association (AWWA).
- C. National Sanitation Foundation (NSF).
- D. Texas Department of Health.
- E. Texas State Board of Insurance.
- F. International Fire Code (IFC).
- G. City of Friendswood Standard Details and Technical Specifications, latest version. These can be downloaded from:
www.ci.friendswood.tx.us/350/Publications-Forms.

1.03 DEFINITIONS:

Water Line – Closed conduits designed to distribute potable water for human consumption to various areas and provide fire protection. Line size and fire protection accessory locations are dependent on distance from primary source and quantity of demand.

1.04 DESIGN REQUIREMENTS:

A. Easements for water lines.

1. Lines shall be located within street rights-of-way, permanent access easements with overlapping public utility easements, easements adjacent to street rights-of way or recorded water line easements.
2. When outside of a public street rights-of-way or permanent access easement with an overlapping public utility easement, easements must be dedicated and restricted for water lines only.
3. When possible, easements shall be contiguous with public rights-of-way.
4. Except for side lot easements, water line easements shall be contiguous to a paved access.
5. For water lines twelve (12) inches or smaller located outside of street rights-of-way, minimum width of easement shall be ten (10) feet.
6. For water lines fourteen (14) inches or larger located outside of street rights-of-way, the minimum width of easement shall be fifteen (15) feet.
7. For water mains located less than five (5) feet from the rights-of-way line, the outside edge of a water line easement shall be located from the rights-of-way line as follows:

Twelve (12) inch and smaller pipe – five (5) feet
Fourteen (14) inch and larger pipe – ten (10) feet
8. Water lines along State rights-of-way shall be installed outside of the rights-of-way whenever possible and in a separate ten (10) foot minimum contiguous easement.
9. No back lot easements shall be allowed for the installation of water lines, unless specifically approved by the City.

10. Commercial developments requiring on-site fire hydrants must provide a minimum fifteen (15) foot water line easement for the water line and fire hydrant.
11. In new developments, water lines shall be centered in water line easements.
12. When using side lot easements, such easements shall be a minimum of ten (10) feet in width, located on one (1) lot or centered between lots. If centered between lots, the water line may be centered within the five (5) foot easement on one (1) lot, or centered in the full ten (10) foot easement.
13. Location of water lines in an easement not adjoining a public rights-of-way shall be prohibited, except as specifically approved by the City Engineer. When approved, these water mains will be centered in a fifteen (15) foot wide exclusive easement restricted to water only.

B. Location of water lines.

1. Locate within street rights-of-way.
2. Location of water lines within an easement – locate water lines in the center of a ten (10) foot minimum width dedicated waterline easement. Within a commercial development, center water lines within a fifteen (15) foot easement. Obtain approval for lines to be located in wider or multi-use easements.
3. When a water main is placed parallel to another utility line at or near the same grade, it shall have a minimum of nine (9) feet of horizontal separation. When the other utility is a sanitary sewer and a minimum of nine (9) feet cannot be maintained, the sanitary sewer must be constructed of pressure type pipe with watertight joints as used in water main construction and the clearances must be defined as in Section II – Wastewater Collection System Design Requirements or as specifically approved by the City Engineer. When a water main crosses a utility other than sanitary sewer, a minimum of six (6) inches of clearance must be maintained, and the water main shall have one (1) joint of pipe, a minimum of eighteen (18) feet long, centered on the other utility.
4. When water mains and sanitary sewers are installed, they shall be installed no closer to each other than nine (9) feet in all directions, and parallel lines

must be installed in separate trenches. Where the nine (9) foot separation distance cannot be achieved, the following procedures shall be used:

- a. Where a sanitary sewer parallels the water main, the sanitary sewer shall be constructed of ductile iron, or PVC pipe meeting AWWA specifications, having a minimum working pressure rating of one hundred fifty (150) psi or greater, and equipped with pressure type joints. The water mains and sanitary sewer shall be separated by a minimum vertical distance of two (2) feet, and a minimum horizontal distance of four (4) feet, measured between the nearest outside diameters of the pipes, and the water main shall be located above the sewer. Refer to Section II – Wastewater Collection System Design Requirements.
- b. Where a sanitary sewer crosses the water main, and that portion of the sewer is constructed within nine (9) feet of the water, as described above, the water line may be placed no closer than six (6) inches from the sewer. The separation distance must be measured between the nearest outside pipe diameters and the water line shall be located at a higher elevation than the sewer, and one (1) joint [a minimum of eighteen (18) feet long] of the new pipe must be centered on the existing line.

C. Water line size.

1. Six (6) inch lines may be used on dead-end lines within cul-de-sacs, or if the line is less than one thousand (1,000) feet in length and interconnected between two (2) lines which are eight (8) inches in size or larger. The maximum number of fire hydrants on any length of six (6) inch line is one (1).
2. Eight (8) inch lines may be used for lines over one thousand (1,000) feet long, or when two (2) or more fire hydrants are required.
3. Twelve (12) inch and larger lines – line length, usage, etc., to be determined by a Professional Engineer of record licensed to practice engineering in the State of Texas, and approved by the City Engineer.

D. Dead-end lines.

1. Dead-end lines within public rights-of-way.

- a. On permanent dead-end lines, other than on cul-de-sacs, the dimension of the line shall be six (6) inches and shall not exceed more than five hundred (500) feet in length from the closest interconnecting main line. In addition, it shall terminate with a fire hydrant.
 - b. On permanent dead-end lines on cul-de-sacs it will be required to reduce the pipe size successively. It is required to carry an eight (8) inch pipe to the next to last hydrant, then from that point use a six (6) inch pipe to the line's end. It is required to place the last service as near as possible to the end, and install a fire hydrant or two (2) inch blow-off at the end of the six (6) inch line. The maximum length of this reduced line size configuration shall not exceed eight hundred (800) feet.
- 2. Dead-end lines with one (1) on-site fire hydrant.
 - a. Six (6) inch lines may be used for lengths less than two hundred (200) feet provided domestic service is taken from the end of the line.
 - b. Eight (8) inch lines may be used for lengths greater than two hundred (200) feet but less than five hundred (500) feet, provided domestic service is taken from the end of the line.
- E. Depth of cover.
 - 1. Fourteen (14) inch and smaller mains shall have a minimum cover of four (4) feet from top of curb. For open ditch roadway sections, lines fourteen (14) inches and smaller shall be installed at least three (3) feet below the ultimate flowline of the ditch or six (6) feet below natural ground at the rights-of-way line, whichever is deeper and maintain the elevation throughout that section of line.
 - 2. Sixteen (16) inch and larger mains shall have minimum cover of five (5) feet from top of curb. For open ditch roadway sections, lines sixteen (16) inches and larger shall be installed at least three (3) feet below the flow line of the ditch or seven (7) feet below natural ground at the rights-of-way line, whichever is deeper and maintain the elevation throughout that section of line.
 - 3. Changes in grade, to clear other utilities or underground features, may be made by deflecting pipe joints. The maximum designed deflection shall

be one-half (0.5) of the manufacturer's allowable deflection. If a depth greater than eight (8) feet to the top of the pipe is required, a welded steel section shall be used. The standard depth of cover is to be maintained above the water main, and the grade change shall be made using the welded steel section. The installation of fittings for vertical deflections, or changes in elevation, shall not be allowed except with specific approval by the City Engineer.

F. Stream and Ditch Crossings.

1. Elevated Crossings.

- a. All water lines shall be steel or restrained-joint metallic pipe, and shall extend a minimum of fifteen (15) feet beyond the last bend or to the rights-of-way line, whichever is greater.
- b. Underground crossings via bored polyethylene pipe preferred to elevated crossings.
- c. Use a separate elevated supporting structure for sixteen (16) inch and larger water lines, unless otherwise approved by the City Engineer. The structure shall be located a minimum of ten (10) feet from any other existing or proposed structure.
- d. Support water lines on existing or proposed bridges. The following criteria may be used for fourteen (14) inch and smaller lines when approved in advance by the City Engineer.
 - i. Adequate structural capacity shall be required.
 - ii. Sufficient clearance above the bent cap elevation shall be required for installation under a bridge.
- e. Design elevated crossings with the elevation of the bottom of the water line above the low chord of the nearest adjacent bridge, or a minimum of one and one-half (1.5) feet above the One Hundred (100) Year Flood Plain elevation, whichever is higher.

- f. Extend pipe from rights-of-way to rights-of-way for crossings.
- g. Provide sufficient span length to accommodate for the cross section of any future widening of the stream or ditch, if available.
- h. Support the line on columns spaced to accommodate the structural capacity of the pipe, considering deflection and loading.
- i. Base column support design on soil capacity, spacing, loading, and structural requirements.

G. Underground crossings.

- 1. Provide a minimum three (3) foot clearance above the top of the pipe to the ultimate flow line of the ditch.
- 2. Provide sufficient length to exceed the ultimate future development of the stream or ditch.
- 3. All water lines shall be steel, restrained joint, or polyethylene pipe and shall extend a minimum of fifteen (15) feet beyond the last bend or to the rights-of-way, whichever is greater. In addition, the water lines shall have valves located on both sides of the crossing.

H. TxDOT highway and county road crossings

- 1. Extend carrier pipe from rights-of-way to rights-of-way.
- 2. Use welded steel pipe, or restrained joint pipe in steel casing, under existing and future roadways. The pipe shall be installed from a point fifteen (15) feet outside of the service road, or outside of pavement toward the rights-of-way, to a similar point on the other side of the highway across the rights-of-way. For highway or roadway crossings with open ditch sections, extend the casing from rights-of-way to rights-of-way.
- 3. Highway and county road crossings shall be constructed in conformance with the applicable requirements of where the line is located. (i.e. Texas Department of Transportation, Galveston County or Harris County)

4. When additional rights-of-way has been acquired, or will be required for future widening, the casing where required, shall be carried to within ten (10) feet of each future rights-of-way line.

I. Street crossings

1. All water mains and sprinkler line crossings, under major thoroughfare boulevards, shall be encased using a minimum SDR rated or PVC pipe as required by the City's construction detail for "Water Main Encasement." Welded steel pipe may be substituted on street crossings, when specifically approved by the City Engineer.
2. Crossings under existing concrete streets, other than major thoroughfares, shall be constructed by boring and jacking. PVC and SDR rated pipe shall be jacked into place with equipment designed for that purpose. Water may be used to facilitate boring and jacking operations. Jetting the pipe main into place shall not be permitted. When conditions exist that warrant an open cut across the existing street, approval by the City Engineer shall specifically be required.
3. All open cut installations, under existing or proposed streets, shall be backfilled as required by City's Standard Details.
4. All street crossings shall be constructed in accordance with construction plans approved by the City. All street crossings shall be inspected by a City Project Manager, and shall meet the requirements of these standards.

J. Oil and gas pipeline crossings.

Metallic pipe shall not be used when crossing oil or gas transmission lines, unless a properly designed cathodic system is approved by the City Engineer and it is properly installed. Other pipe may be used, regardless of depth, subject to approval by the City Engineer. There must be a minimum of two (2) feet of separation between the pipeline and waterline.

K. On-site fire loops within commercial and multi-family developments.

1. For commercial and multi-family developments, requiring on-site fire hydrants, the following requirements shall be complied with to allow maintenance and future repair operations:
 - a. Placement of structures or equipment pads within the easement shall not be permitted.

- b. Provide a ten (10) foot wide longitudinal pavement joint along the easement lines where the water line is located under a driveway, paved parking, or street pavement.
- L. Additional requirements.
 - 1. The carrier line shall extend a minimum of one (1) foot beyond the end of the casing to allow flanged joints to be connected.
 - 2. For welded steel bends, extend steel pipe a minimum of five (5) feet beyond the bend.
- M. Auger (bore) construction.
 - a. Use the following general criteria for establishing auger or bore sections:
 - a. Auger or bore sections shall be clearly shown on drawings.
 - b. Improved streets – use auger construction to cross the street regardless of surface. Auger length shall be calculated utilizing the roadway width, at the proposed bore location, plus an additional five (5) feet to either side of the roadway, as applicable.
 - c. Sidewalks – when the water line crosses under a sidewalk, four (4) feet or more in width and in good condition, the sidewalk shall be bored and jacked or the sidewalk shall be removed and replaced to the City of Friendswood Standard Details requirements, whichever is most cost effective. Bore and jack length shall be at least the width of the sidewalk. The proposed type of construction shall be noted on the plans.
 - d. Bore Pits – Bore pits shall be at least three (3) feet from back of curb and shall be at least five (5) feet from the back of curb on a boulevard or major thoroughfare. All bore pits shall be shored in accordance with OSHA requirements. Bore pits and/or receiving pits to be located in a street or driveway paving, shall be shown on the plans.
- N. Water quality – overall system layout.

1. Circulation and flushing – The layout of the overall water distribution system shall provide the maximum circulation of water to prevent future problems of odor, taste, or color due to stagnant water.
 - a. Provide a source of fresh water at each end, or at multiple points of a subdivision to create a physical loop. Provide ways to create circulation, and valves and fire hydrants shall be located to allow simple flushing of all lines.
 - b. Where stubs are provided for future extensions, isolate the stub with a valve, and place one (1) full pipe joint beyond the valve, plug end of pipes. Service connections are to not be connected to the stub.
 - c. All materials which come in contact with public drinking water in any stage shall conform to ANSI/NSF Standard 60.
 - d. Layout and size of all water mains shall be consistent with the overall layout and phasing plan of the City's water system. The overall water system shall be designed to maintain adequate pressure throughout the system.
 - e. Dead-ends shall be avoided whenever possible; in an unavoidable permanent dead-end situation, reduce the sizes of pipe successively. Carry an eight (8) inch pipe to the next to last fire hydrant and use a six (6) inch PVC to the end of the line. Provide a fire hydrant or two (2) inch blow-off at the end of the main.
- O. Clearance of water line from other utilities. (New water lines constructed near sanitary sewers and force mains).
 1. New water lines parallel to sanitary sewers and force mains.
 - a. Water lines shall be located a minimum of nine (9) feet horizontally, outside wall to outside wall, when parallel to sanitary sewers or force mains. Use the following procedure when nine (9) feet of separation cannot be achieved:

When a new water line is to parallel to an existing sanitary sewer force main and/or gravity sanitary sewer, and the nine (9) foot minimum separation distance cannot be maintained, the existing sanitary sewer shall be replaced with lined ductile iron or PVC

pipe meeting ASTM specifications. In addition, the waterline shall have a minimum working pressure rating of one hundred fifty (150) psi or greater, and be equipped with pressure type joints. The water lines and sanitary sewer shall be separated as per the design requirements of TCEQ, at a minimum horizontal distance of four (4) feet measured between the nearest outside walls of the pipe. In all cases, the water line shall be located above the sanitary sewer. When a water main crosses a utility other than sanitary sewer, a minimum of six (6) inches of clearance must be maintained, and the water main shall have one (1) joint of pipe [a minimum eighteen (18) feet long] centered along the other utility line.

- b. Where a sanitary sewer crosses a water main and that portion of the sanitary sewer within nine (9) feet of the water is constructed as described in Section 290.44(e) of the TCEQ Rules and Regulations, the water line may be placed no closer than six (6) inches from the sewer. The separation distance must be measured between the nearest outside pipe diameters. The water line shall be located at a higher elevation than the sanitary sewer wherever possible and one (1) joint of the new pipe [a minimum of eighteen (18) feet long] shall be centered on the existing line.
2. When water lines are installed in areas which have existing sanitary sewers, every effort should be made to maintain nine (9) feet of separation between the outside pipe diameters of the two (2) lines. Where this separation cannot be achieved because of local conditions, which must be fully documented in any planning material submitted, the following spacing's shall be observed:
- a. Where a new water line is to cross or be installed parallel with an existing sanitary sewer and the sanitary sewer is constructed as described in Section 290.44(e) of the TCEQ Rules and Regulations, the separation distances specified in those rules shall apply as though the sanitary sewer was new.
 - b. Where a new water line is to be installed parallel to an existing clay, truss, or concrete gravity sanitary sewer showing no evidence of leakage vertically and horizontally for a distance of four (4) feet, the sanitary sewer is not to be disturbed. Should excavation for the water line produce evidence that the sanitary sewer is leaking; the sanitary sewer shall be repaired.

- c. Where a new water line is to cross an existing clay, truss, or concrete gravity sewer showing no evidence of leakage vertically or horizontally for a distance of four (4) feet, the sewer is not to be disturbed if the water line is installed at least twenty-four (24) inches above the existing sanitary sewer. One (1) full joint of the water line [at least eighteen (18) feet long] shall be centered over the sanitary sewer crossing, so as to provide maximum protection against contamination.
 - d. Where there is an existing clay, truss or concrete sanitary sewer pipe showing no evidence of leakage, and because of physical limitations shall remain at a higher elevation than the proposed intersecting water line, an exception to the nine (9) foot requirement may be granted as long as the water line is inserted in a joint of pressure type carrier pipe at least eight (8) feet and two (2) nominal sizes larger than the waterline. The carrier pipe shall be centered on the sanitary sewer crossing and both ends sealed with cement grout. In lieu of this procedure, that portion of the sanitary sewer within nine (9) feet of the water line may be replaced with cast iron or ductile iron pipe with water-tight joints as described in Section 290.44(e) of the TCEQ Rules and Regulations, above.
- 3. Sanitary sewer manholes – provide a minimum nine (9) foot horizontal clearance from outside wall of existing or proposed sanitary sewer manholes, unless manholes and connecting sanitary sewers can be made water-tight and tested for no leakage. If a nine (9) foot clearance cannot be obtained, the water line may be located closer to a manhole when prior approval has been obtained from the City Engineer using one (1) of the procedures below; however in no case shall the clearance be less than four (4) feet:
 - a. A steel water line may be encased in a steel carrier pipe. Open cut and backfill with compacted cement-stabilized sand.
 - b. The water line may be augured past the manhole, as long as one (1) - eighteen (18) foot section of class 150 pipe, is installed centered on the existing sanitary sewer manhole and a bentonite/clay mixture is utilized during the auguring process.
- 4. Fire hydrants shall not be installed vertically or horizontally within nine (9) feet of sanitary sewer mains, service leads, and force mains regardless of construction.

1.05 APPURTENANCES:

A. Valves.

1. Shall be set at maximum distances along water lines as follows:
 - a. Six (6) inch through fourteen (14) inch – one thousand (1,000) feet.
 - b. Sixteen (16) inch through twenty (20) inch – two thousand (2,000) feet.
 - c. The total number of valves at any intersection shall equal the total number of lines leading out from the intersection point minus one (1), three (3) valves for a cross, and two (2) valves for a tee, unless otherwise specified.

B. Valve Types.

1. Valve types (all valves shall open counterclockwise and have mechanical joints):
 - a. Six (6) inch through fourteen (14) inch – gate valves.
 - b. Sixteen (16) inch through twenty (20) inch – butterfly valves.

C. Valve Location.

1. All water lines shall be valved within the street rights-of-way. Valves shall not be placed under or within two (2) feet of ultimate pavement, except as specifically approved by the City Engineer.
2. Valves shall be located on the projection of intersecting street rights-of-way lines, or at the curb return adjoining a paved street across the main. Tapping Sleeves and Valves are excluded from this requirement.
3. Fire hydrants shall be isolated from the service line with a valve located at the fire hydrant branch. This valve shall not be located in the slope or flowline of ditches on open ditch streets.
4. Intermediate valves, not located on the projection line of the rights-of-way line, shall be located on lot lines or five (5) feet from the fire hydrants. The valves are not set in driveways or sidewalks.
5. Locate valves a minimum of nine (9) feet horizontally from sanitary sewer crossings.

D. Fire Hydrants.

1. Spacing.
 - a. Hydrant spacing shall be governed by the International Fire Code as adopted and amended by the City of Friendswood.
2. Location in or along street rights-of-way.
 - a. Fire hydrants shall be located at street intersections where possible, but in any case, not more than the spacing noted in 1a.
 - b. Locate fire hydrants at P.C.'s of the intersection curb radius, three (3) feet behind the existing curb or location of a future curb.
 - c. On all TxDOT highways, county roads and open-ditch streets, fire hydrants shall be set within three (3) feet of rights-of-way lines. Fire hydrants lead valves shall not be located in the slopes or flowlines of ditches.
 - d. Fire hydrants located between rights-of-way intersections should be set at a lot line, however, this location may be adjusted five (5)

feet either way to miss driveways or other obstructions, in which case the fire hydrant should not be closer than three (3) feet from curbed driveways or five (5) feet from non-curbed driveways.

- e. Fire hydrants shall not be installed within nine (9) feet of a sanitary sewer system under any condition.

3. Location of fire hydrants outside the street rights-of-way.

- a. The City Fire Marshal will establish and approve the location of fire hydrants in apartment complexes, and platted private street developments within the City.
- b. Locate fire hydrants in protected, easily accessible areas behind curb lines.
- c. For fire hydrants, which are located adjacent to water lines constructed in ten (10) foot wide waterline easements, the fire hydrant shall be centered in a minimum ten (10) foot by ten (10) foot separate easement.
- d. For commercial and multi-family developments, provide isolation valves at each end of fire loops requiring on-site fire hydrants.

4. Fire Flow Requirements for Buildings.

- a. The minimum fire flow requirements for one (1) and two (2) family dwellings, having a fire-flow calculation area which does not exceed three thousand six hundred (3,600) square feet, shall be one thousand (1,000) gallons per minute. Fire flow and flow duration for dwellings having a fire-flow calculation area in excess of three thousand six hundred (3,600) square feet shall not be less than that specified in Exhibit A – Table B105.1 of the International Building Code, as adopted and amended by ordinance.

- 5. Fire hydrants should be audited for flow and pressure, be of specified type, and painted per City Technical Specifications.

E. Fittings.

- 1. All fittings shall be identified and described on the construction plans. Refer to City Standard Details for additional requirements.

2. Fittings are not permitted in fire hydrant leads, except as specifically approved by the City Engineer.
3. Water line fittings shall be mechanical joints only. Push-on joints may be used at special locations, if specifically approved by the City Engineer.
4. All plugs shall be provided with retention clamps.
5. Polyethylene tube encasement shall conform to the minimum requirements of "Polyethylene Encasement for Gray and Ductile Cast-Iron Piping for Water and Other Liquids", ANSI/AWWA C105, current revision. Soils within the project shall be tested in accordance with Appendix A of ANSI/AWWA C105 to adequately determine the requirements for encasement.
6. Concrete thrust blocking shall be required on all bends, tees, plugs and combinations thereof.
7. All fittings and fire hydrants shall be tied together with three-quarter (0.75) inch stainless steel all-threads and I-bolts or approved equal (i.e., Mega Lug Fittings).

F. Water main service.

1. Water main service for lines in or along street rights-of-way.
 - a. Meters two (2) inch and smaller – shall be located in rights-of-way, water line easements, or in a minimum five (5) foot x five (5) foot separate water meter easement on private property.
 - b. Meters three (3) inches and larger – shall be located at the property line or in a minimum ten (10) foot x twenty (20) foot separate water meter easement if necessary.
 - c. Meters shall be located in areas with easy access and protected from traffic and adjacent to rights-of-way whenever possible.
 - d. Meters shall not be located in areas enclosed by fences.
 - e. Separate tap and service leads shall be designed for each meter.

- f. Meters larger than two (2) inches must have a bypass assembly and coupling for easy change out. Contact the Department of Engineering and Projects for additional requirements.
 - g. The minimum sized line for two (2) meters shall be three (3) inches or larger.
- 2. For proposed apartments or town homes in private street developments, provide one (1) master meter sized for the entire development. Exceptions may be granted by the City Engineer for unusual circumstances. If an exception is approved, multiple meters shall not be interconnected.
- 3. All sprinkler and irrigation lines shall be equipped with a backflow prevention device according to its application as required by current TCEQ regulations. The backflow assembly shall be located after the water meter for an irrigation system, and in a vault near the building for a sprinkler system. A certified technician shall test applicable backflow prevention assemblies annually, and submit the results to the City.

1.06 SUBMITTALS:

- A. General – Conform to the following submittal requirements in addition to those of general procedure of the City of Friendswood.
- B. Water Line Sizes – Submit justification, calculations, and locations for proposed six (6) inch lines, and for lines twelve (12) inch and larger, for approval by the City Engineer, unless water line sizes are provided by the City in advance.
- C. Valves – Submit information for approval by the City Engineer with justification and locations for the use of sixteen (16) inch and twenty (20) inch gate valves proposed as substitutes for butterfly valves.
- D. Water Meter Service.
 - 1. A permit shall be obtained from the Building Division for meter services and metered sprinkler connections prior to construction.
 - 2. Requests for more than one (1) service meter on a proposed private street, or a multi-family development, shall be submitted to the Department of Public Works.
- E. Elevated stream or ditch crossings – Submit design calculations for support columns and column spacing.

- F. Master Development Plan – For multiple-phase developments, submit a master development plan along with construction plans.
- G. A double check backflow prevention assembly is required for three (3) inch and larger lines.

1.07 QUALITY ASSURANCE

Prepare calculations and construction drawings under the supervision of a Professional Engineer licensed to practice engineering in the State of Texas and trained in the disciplines required by the drawings. The final construction drawings must be sealed, signed, and dated by the Professional Engineer licensed to practice engineering in the State of Texas, shall be responsible for the development of the drawings along with their firm's registration information.

2.0 EXECUTION

2.01 RESEARCH REQUIREMENTS:

- A. Research existing utility and rights-of-way information.
- B. Verify that no restrictions exist that will deny approval of the project concept.

2.02 DESIGN ANALYSIS:

- A. Water line sizes – Minimum pipe size is 8", with 10" also being common. Prepare narrative justification and calculations for proposed six (6) inch lines, and for lines twelve (12) inches and larger, unless sizing is provided by the City in advance.
- B. Elevated stream or Ditch Crossings – Prepare design calculations for support columns and column spacing.

2.03 DRAWINGS:

- A. General: Conform to the following drawing requirements, in addition to those identified within the City's Standard Water Line Details, the City's Technical Specifications, and within "Section I – Graphic Requirements" of this manual.
- B. Appurtenances – Identify, describe, and enclose in rectangular box on drawings.

1. Valves

- a. Designate six (6) inch through twelve (12) inch gate valves with box as GV&B.
 - b. Provide complete description and size for other valves.
- 2. Water meters, service leads, and metered sprinkler connections.
 - a. Show the location of service line tees, tapping sleeve valves, valve boxes, and temporary plugs to be installed to serve future three (3) inch or larger meters.
 - b. Develop plan and profile sheets for four (4) inch and larger leads, and connections that cross public rights-of-way or other utilities.
- C. Construction features.

Show all special construction features required to complete the project, in a safe, convenient, and economical manner.
- D. Auger Construction.
 - 1. If the construction is predominately open cut, all portions of the street that must be augured shall be clearly shown on drawings by location and length. Include designation of sections at trees with six (6) inches or larger diameters, located within ten (10) feet of a water line.
 - 2. Curbs – Include a requirement on drawings for construction of ADA ramps at street intersections where curbs are to be removed, or are damaged by water line construction. Conform to the City's Standard Details for ADA ramps.

SECTION IV

STREET PAVING DESIGN REQUIREMENTS

1.0 GENERAL

- A. Should any portion of this Section conflict with the Subdivision Ordinance or the Zoning Ordinance, the more stringent of the latter two (2) shall govern.
- B. The City Engineer shall have the final interpretation of any provisions in this Design Criteria Manual.
- C. The City Engineer has the right to issue administrative orders or design criteria modifications for just cause related to any provisions or conditions in this Design Criteria Manual.

1.01 CHAPTER INCLUDES

Geometric design guidelines for streets, criteria for street paving, and standard paving notes for drawing call outs.

1.02 REFERENCES

- A. ASHTO – American Association of State Highway and Transportation Officials.
- B. ASTM – American Society for Testing Materials.
- C. ACI – American Concrete Institute.
- D. TMUTCD – Texas Manual on Uniform Traffic Control Devices.
- E. City of Friendswood Standard Details and Technical Specifications, latest version. These can be downloaded from www.ci.friendswood.tx.us/350/Publications-Forms.

1.03 DEFINITIONS

- A. Geotechnical Engineer – An engineer certified by the American Association for Laboratory Accreditation (A2LA).
- B. HMAC – Hot Mix Asphaltic Concrete.

- C. Curb-and-Gutter Streets – Full-width reinforced concrete pavement or asphaltic pavement with curbs. Curb-and-gutter streets require inlets and underground storm sewers.
- D. Open-Ditch Streets – Full-width reinforced concrete pavement or asphaltic pavement with open ditches. Open-ditch streets do not require underground storm sewers; however, the ditches shall be designed to accommodate the storm water runoff.

1.04 DESIGN REQUIREMENTS

The following design requirements are applicable to all street pavement constructed within rights-of-way.

- A. General:
 - 1. Paving and construction plans for all streets shall be approved by the City Engineer.
 - 2. Street design shall conform to all applicable planning tools, such as the Texas Manual on Uniform Traffic Control Devices, major thoroughfare plans, master plans, etc. Other considerations for design shall include street function, street capacity, service levels, traffic safety, pedestrian safety, and utility locations. These additional considerations may affect the minimum requirements set forth herein. Refer to the City of Friendswood Major Thoroughfare Plan for streets requiring additional considerations. The Major Thoroughfare Plan may be found at www.ci.friendswood.tx.us/350/Publications-Forms.
 - 3. Designs shall conform to the City of Friendswood Standard Details and Technical specifications.
 - 4. The use of individual pavers are not allowed in the City of Friendswood rights-of-way. The only exception for use of individual pavers in the rights-or-way is for sidewalks in the Downtown District. Stamped concrete is allowed in the City of Friendswood rights-of-way.
 - 5. No asphalt turnouts are allowed in the City of Friendswood rights-of-way.
 - 6. Concrete mix design shall conform to the City of Friendswood Technical Specifications.

B. Minimum Width Requirements for Concrete Paving:

1. Curb-and-gutter concrete and HMAC streets for low-density residential developments such as SFR, MFR-L, and MFR-GHD: twenty-eight (28) feet from back of curb to the back of curb.
2. Pavement for open-ditch streets used for only SFR residential developments with minimum one hundred twenty (120) foot wide lots: twenty-six (26) feet from edge of pavement to edge of pavement.
3. Streets for medium to high density residential, commercial, and collector streets: forty-one (41) feet from back of curb to back of curb, or from edge of pavement to edge of pavement.
4. Streets for major thoroughfares or boulevards: two (2) divided pavement sections of twenty-five (25) feet from back of curb to back of curb [Four (4) lane divided roadway], or two (2) pavement sections thirty-four (34) feet from back of curb to back of curb [six (6) lane divided].
5. Radius for cul-de-sac pavement on any street shall be a minimum of fifty (50) feet, measured from the face of curb. Radius of rights-of-way for cul-de-sacs shall be ten (10) feet greater than the cul-de-sac pavement, no less than sixty (60) feet.

C. Minimum Thickness and Reinforcement Requirements for Concrete and HMAC Pavement:

The following requirements shall be the minimum allowable. Pavement thickness and reinforcement, not less than the minimum requirements, shall be designed by a Professional Engineer licensed to practice engineering in the State of Texas and who is responsible for the project. The design shall be based on a current soils analysis and recommendations conducted by a qualified geotechnical engineer.

1. For pavement widths twenty-eight (28) feet from back of curb to back of curb or twenty-six (26) feet from edge of pavement to edge of pavement:
 - a. Minimum concrete slab thickness shall be six (6) inches with an f_c equal to three thousand four thousand (4,000) psi. Reinforcement shall be Grade 60, $f_y = 60,000$ psi, #4 deformed reinforcing bars, spaced at sixteen (16) inches center to center, both ways and with a minimum lap length of twenty-four (24) inches. Expansion joints

shall be placed at the end of each curb return, and at a maximum spacing of forty (40) feet with control joints no greater than every ten (10) feet.

- b. Minimum stabilized subgrade thickness shall be six (6) inches.
- 2. For pavement widths greater than twenty-eight (28) feet from back of curb to back of curb, or twenty-six (26) feet from edge of pavement to edge of pavement, and for boulevard or major thoroughfare sections:
 - a. Minimum concrete slab thickness shall be seven (7) inches with an f_c equal to four thousand (4,000) psi. Reinforcement shall be Grade 60, $f_y = 60,000$ psi, #4 deformed reinforcing bars, spaced at sixteen (16) inches center to center, both ways, and with minimum lap length of twenty-four (24) inches. Expansion joints shall be placed at the end of each curb return, at a maximum spacing of forty (40) feet on both residential and collector streets, boulevards, and major thoroughfares, with control joints no greater than every ten (10) feet.
 - b. Minimum stabilized subgrade thickness shall be eight (8) inches.
- 3. For HMAC pavements:
 - a. Minimum thickness shall be two (2) inches.
 - b. Minimum subgrade thickness shall be eight (8) inches of stabilized crushed concrete or limestone, and six (6) inches of lime-stabilized subgrade.
- D. Subgrade Treatment: The geotechnical engineer shall base the depth of the subgrade stabilization on the structural number (SN) in conjunction with pavement thickness design. The following is general guidance for subgrade treatment:
 - 1. For subgrade soil conditions with a clay content of ten (10.0) percent or higher, and a plasticity index (PI) of ten (10) or more, the subgrade shall be stabilized with lime. Subgrade shall be stabilized with a minimum six (6) percent lime by weight at required thickness, and compacted to ninety-five (95) percent standard Proctor density. Alternative subgrade stabilization may be substituted when specific recommendations are made

by the geotechnical engineer for the project, and when specifically approved by the City Engineer.

2. For subgrade soil conditions containing clean sand with no clay content, the subgrade shall be stabilized with cement.

E. Requirements for Intersections, Turnouts, Transitions, and Boulevards or Thoroughfares:

1. At a "T" intersection with a street that has not been improved to its ultimate width, the concrete pavement shall be stopped either at the rights-of-way line, or the end of the curb return, whichever would require less concrete removal at a future date.
2. For roadway turnouts placed at an existing street intersection, the turnout shall be designed to fit the ultimate pavement width of the intersecting cross street and then transitioned to the existing roadway.
3. The transition length for meeting an open-ditch street, shall be fifty (50) feet for street widths less than or equal to twenty-eight (28) feet from back of curb to back of curb; seventy-five (75) feet for twenty-nine (29) feet to forty (40) feet from back of curb to back of curb; and one hundred (100) feet for forty-one (41) feet from back of curb to back of curb or greater.
 - a. Streets other than concrete shall have transitions with a minimum thickness of eight (8) inches of lime-stabilized subgrade, six (6) inches of hot-mix asphaltic concrete base, or approved equal, with two (2) inches of hot-mix asphaltic surfacing.
 - b. Concrete streets shall have transitions with a minimum thickness of six (6) inches of stabilized subgrade and six (6) inches of concrete pavement.
4. When paving only one section of a proposed two-section thoroughfare or boulevard (boulevard section), all left-turn lanes and esplanade crossovers shall be paved to the centerline of the street right-of-way.

F. Requirements for Ditches on Open-Ditch Streets:

1. Minimum grade on ditches shall be two-tenths (0.2) percent.

2. Ditch capacity shall be designed to handle the storm water runoff as determined within “Section V – Storm Drainage” section of this manual.
3. The maximum side slope shall not be steeper than three (3) horizontal to one (1) vertical.
4. Culverts for roadside ditches only shall be designed to carry the storm water runoff, but shall not be less than eighteen (18) inch diameter pipe constructed of reinforced concrete.

G. Requirements for Pavement on Curb-and-gutter Streets:

1. Inlet spacing:
 - a. Curb inlets shall be spaced and sized to intercept the calculated storm water runoff for the design storm. The design water surface elevation for the design storm flow at the inlet, shall be less than or equal to the top of curb adjacent to the inlet.
 - b. Maximum travel distance of water in the street from a high point to a curb inlet shall be three hundred (300) feet on major thoroughfares, boulevards, commercial streets and collector streets unless otherwise approved by the City Engineer. The maximum travel distance of water in the street from a high point to a curb inlet permitted on residential streets shall be three hundred (300) feet unless otherwise approved by the City Engineer.
 - c. Maximum drop of grade tangents from opposite directions to a common inlet shall be one and one-half (1.5) feet.
 - d. Curb inlets shall be located on the intersecting side street at an intersection with a higher classification street. Location of curb inlets required on a major thoroughfare, at intersections, shall be specifically approved by the City Engineer.
 - e. Backfill around inlets below grade shall be one and one-half (1.5) sacks per cubic yard of cement-stabilized sand, and to the top of the first stage of inlet.
2. Design gutter grade shall be three-tenths (0.3) percent; if the gutter grade is less than three-tenths (0.3) percent and approved by the City Engineer,

then the City Engineer shall determine the required inlet spacing. The minimum acceptable gutter grade shall be two-tenths (0.2) percent.

3. Maximum cut from finished grade at property line to top of curb, shall be one and three-quarters (1.75) feet.
4. Minimum grade shall be one (1.0) percent fall around intersection turnout for a minimum radius of twenty-five (25) feet. Grades for larger radius shall be determined on an individual basis.
5. Vertical curves shall be installed when algebraic differences in intersecting grades exceed one (1.0) percent. Elevations shall be shown at ten (10) foot intervals through vertical curves. Maintain a minimum of three-hundredths (0.03) foot elevation change at ten (10) foot intervals by altering the calculated elevations.
6. When a curb-and-gutter intersects a drainage ditch, the elevation of the adjacent gutter shall be above the design water surface elevation in the ditch.
7. Minimum gutter grade around a cul-de-sac shall be six-tenths (0.6) percent.
8. Curves on major thoroughfares shall be superelevated in accordance with AASHTO whenever the centerline radius of any lane of pavement is less than two thousand (2,000) feet.
9. The amount of cross slope over the pavement section shall be shown on the drawings. The required cross slope shall be three-eighths (3/8) inch per foot from curb line to quarter point, and one-quarter (1/4) inch per foot from quarter point to the center line, and one-quarter (1/4) inch per foot for left-turn lanes.
10. A minimum grade of four-tenths (0.4) percent around the longest radius is required on an L-Type street intersection.
11. When meeting an existing upright curbed street, top of new curb elevations shall be designed to meet an elevation six (6) inches above the existing gutter/pavement, or gutters shall be matched and new top of six (6) inch curb transitioned to top of existing curb. At existing inlets, top of new curb elevations shall be designed to match existing top of existing inlets.

12. When the curb elevations are not established below the natural ground, fill lines shall be shown on the drawings and shall be of sufficient height to ensure a minimum of three-eighths (3/8) inch per foot transverse slope toward the curb from the property line between a point, two (2) feet outside the rights-of-way and the top of curb. If this type of fill is required, and the pavement is adjacent to a nonparticipating property owner, fill easements from this property owner shall be obtained, filed, and a copy of the easements shall accompany the final drawings. Construction of this nature will require back-slope drainage design to prevent trapping storm water runoff.
13. Elevations and grades shall be labeled for all tops of curb. Centerline elevations and grades are acceptable for open-ditch sections only.

H. Requirements for Inlets on Curb-and-gutter Streets:

1. Type "BB," with grate or plate tops, or type "H-2" inlets, shall be used on all curb-and-gutter streets depending on storm water runoff requirements, unless otherwise approved by the City Engineer.
2. Inlets shall be placed at the end of pavement in order to eliminate direct drainage of storm water from the pavement gutter into an open-ditch or onto adjacent property.
3. On open-ditch streets, place stub-outs with ring grates from inlets to ditches.

I. Requirements for Curbs and Sidewalks:

1. For curbs located along the outside edges of residential streets, the standard dimensions shall be four (4) inches tall and twelve (12) inches wide. Curb height for streets other than residential shall be six (6) inches tall. The curb height on all esplanades shall be six (6) inches.
2. Sidewalks are required as set out in Section III of the Subdivision Ordinance and Section 70-64 of the Code of Ordinances. Where sidewalks are required, they shall have a minimum width of four (4) feet, except on TxDOT rights-of-way where the minimum width shall be five (5) feet.

3. Sidewalk wheelchair ramps shall be required at all intersections, and at or through all driveways where required. The design and installation of such ramps shall comply with Texas Accessibility Standards Architectural Barriers requirements.
4. All sidewalks shall be constructed in accordance with the City of Friendswood Standard Details, including through all driveways where required. The design and installation of such sidewalks shall comply with the Texas Accessibility Standards Architectural Barriers requirements.
5. The location of all proposed and existing sidewalks shall be shown on the construction drawings.

J. Requirements for Miscellaneous Items:

1. The type and amount of subgrade treatment shall be shown on the drawings.
2. Paving headers shall be placed at the end of all concrete pavements.
3. All concrete to be removed, shall be saw cut one half of the pavement depth before removal.
4. Sight distance requirements shall be based on the latest version of the AASHTO design practices.
5. Standard City of Friendswood barricades shall be placed at the end of all dead-end streets not terminating in a cul-de-sac.
6. The appropriate drainage agency approval shall be obtained before City approval is granted if the design involves a drainage way or other drainage facility.
7. A letter of agreement from the affected pipeline company(s) is required when any paving is placed over a transmission pipeline or any utility line is placed over or under such lines.
8. When new concrete pavement meets existing concrete pavement, horizontal dowels shall be used if no exposed reinforcing steel for interconnection with new pavement exists. Horizontal dowels shall be Grade 60, smooth dowel bars, twenty-four (24) inches long, drilled and embedded twelve (12) inches into the center of the existing slab and

epoxied. Dowels shall be spaced at sixteen (16) inches center to center, unless otherwise specified. Concrete slab thickness shall be at least matching the existing slab thickness, and be a high strength early yield with $f_c = 5,000$ psi.

9. Dead-end streets or ends of concrete streets designed to be extended in the future shall have paving headers and twelve (12) inches of reinforcing steel exposed beyond the pavement, coated with asphalt and wrapped with burlap, or shall have paving headers and dowel type expansion joint for future pavement tie-in.
10. Pavement extensions shall connect to the existing pavement as shown on the City of Friendswood Standard Details.
11. A design for concrete pavement thickness is required for all pavements within industrial areas and on major thoroughfares. Concrete pavement thickness design shall be based on the latest version of the AASHTO design procedures for rigid pavements.
12. The pavement structure for each roadway shall be designed based on soil data from the site, and based on the anticipated traffic volume, loading, and service life of the proposed pavement structure. The design engineer is responsible for ensuring that the pavement structure is designed to withstand the anticipated loads on the roadway.

1.05 APPURTENANCES – Reserved

1.06 SUBMITTALS – Reserved

1.07 QUALITY ASSURANCE

- A. All construction drawings and specifications shall be prepared by or under the supervision of a Professional Engineer licensed to practice engineering in the State of Texas, and all documents shall be sealed, dated, and signed by the engineer responsible for their preparation along with their firm's registration information.
- B. All geotechnical testing, environmental, and similar services for design and testing shall be performed by or under the supervision of a Professional Engineer licensed to practice engineering in the State of Texas, and trained in the science of soil analysis. All design and testing reports and documents shall be sealed, dated,

and signed by the engineer responsible for their preparation along with their firm's registration information.

2.0 EXECUTION

2.01 RESEARCH REQUIREMENTS

- A. Research existing utility and right-of-way information.
- B. Verify that no restrictions exist that will deny approval of the property concept.

2.02 DESIGN ANALYSIS

- A. All pavement design shall be supported by calculations to establish the required thickness and reinforcement.
- B. The appropriate geotechnical soils report shall be the basis for design considering the use, loading, and life span of the proposed pavement.
- C. All drainage improvements shall be designed to accommodate the anticipated storm runoff.

2.03 DRAWINGS

- A. Construction drawings shall be prepared in compliance with the City of Friendswood Design Criteria Manual, Section I – Graphic and Design Requirements.
- B. Refer to The City of Friendswood Design Criteria Manual, Appendix B, Figure 1 “Geometric Street Design Standards” for additional information and guidance.

SECTION V

STORM DRAINAGE DESIGN REQUIREMENTS

1.0 GENERAL

- A. Should any portion of this Section conflict with any provisions of the Subdivision Ordinance, Zoning Ordinance, the Galveston County Consolidated Drainage District or the Harris County Flood Control District, the more stringent of the latter four (4) will govern.
- B. The City Engineer shall have the final interpretation of any provisions in this Design Criteria Manual.
- C. The City Engineer has the right to issue administrative orders or design criteria modifications for just cause related to any provisions or conditions in this Design Criteria Manual.

1.01 CHAPTER INCLUDES

Criteria for the design of storm drainage improvements.

1.02 REFERENCES

- A. City of Friendswood Standard Details and Technical Specifications, latest version. These can be downloaded from www.friendswood.com/publications.
- B. City of Friendswood Flood Damage Prevention Ordinance, Chapter 34 of the Code of Ordinances, and any subsequent revisions.
- C. Galveston County Consolidated Drainage District Criteria Manual, the latest version.
- D. Harris County Flood Control District Hydrology and Hydraulics Guidance Manual. Updated June 2019.
- E. TX DOT Hydraulic Design Manual, the latest edition.
- F. Atlas 14 Rainfall Depths for Galveston County Consolidated Drainage District 10/2019.
- G. Harris County/City of Friendswood Memorandum of Understanding regarding maintenance of Harris County Hydraulic and Hydrologic models.

- H. Harris County Flood Control District Policy Criteria and Procedure Manual. Includes Revisions to Chapters 2, 3, 6, 7 & 8 from Interim Guidelines and Criteria for Atlas 14 Implementation revised July 2019.
- I. Harris County Recommendation on Minimum Standards for Communities in Harris County and Draining to Harris County. May 12, 2020.
- J. National Oceanic and Atmospheric Administration (NOAA) Atlas 14. Precipitation – Frequency Atlas of the United States. Volume 11 Version 2.0: Texas. (Atlas 14).
- K. Kronkosky Blake, Gauge Engineering, Atlas 14 Rainfall Depths for Galveston County Consolidated Drainage District, October 2019.
- L. Federal Emergency Management Agency. Flood Insurance Study Galveston County, Texas and Incorporated Areas, August 15, 2019.

1.03 DEFINITIONS

- A. Acceptance Procedures – For projects in Galveston County, the Galveston County Consolidated Drainage District must accept and approve all detention ponds or other drainage facilities entering their system before the City of Friendswood accepts the infrastructure. The acceptance of the facility shall be placed on the next available Board agenda for approval and acceptance subject to the contractor’s one (1) year maintenance period. For projects in Harris County, the Harris County Flood Control District will accept and approve all detention ponds or other drainage facilities entering their system as applicable.
- B. Conduit – any open or closed device for conveying storm water.
- C. Development – any manmade change in improved and unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.
- D. Drainage Area Map – Area map of a watershed which is subdivided to show each area served by each subsystem.
- E. Design requirements – The drainage criteria developed by the City of Friendswood, and complemented by those of the Galveston County Consolidated Drainage District and the Harris County Flood Control District, are intended to provide design guidelines for protection of all areas of the City from structural flooding resulting from a one hundred (100) year storm event. This is accomplished with the application of various drainage enhancements such as storm sewers, roadside ditches,

open channels, detention, and sheet flow runoff. The combined system is intended to prevent structural flooding from extreme events up to a one hundred (100) year storm; all development must account for the one hundred (100) year storm event as further detailed in this Section. In order to meet this requirement all standards in the Harris County Recommendation on Minimum Standards for Communities in Harris County and Drainage to Harris County letter released May 12, 2020 must be met.

- F. FEMA – Federal Emergency Management Agency
- G. Flood Control – The City of Friendswood is a participant in the National Flood Insurance Program. The intent of the flood insurance program is to make insurance available at a reasonable cost by providing for measures that may reduce the likelihood of structural flooding.
- H. GCCDD – Galveston County Consolidated Drainage District.
- I. HCFCDD – Harris County Flood Control District.
- J. Hydraulic Grade Line – A line representing the pressure head available at any given point within the drainage system.
- K. In-Fill Development – Development of open tracts of land in areas where the storm drainage infrastructure is already in place and takes advantage of the existing infrastructure as a drainage outlet.
- L. Public storm sewers – Defined as sewers and appurtenances that provide drainage for public rights-of-way, more than one private tract, and are located in public rights-of-way or drainage easements.
- M. Private storm sewers – Defined as sewers and appurtenances that provide drainage for a private development, one or more than one private tract, and are located in private drainage easements.
- N. Rainfall frequency – Probability of a rainfall event defined by a percent chance of occurring in any given year. Information on rainfall frequency is published by the National Oceanic and Atmospheric Administration. The City uses the Atlas 14 Point Precipitation rainfall depths. For the purpose of storm drainage design, the following frequencies are applicable:
 - 1. Five (5) year frequency – a rainfall intensity having a twenty (20) percent probability of occurrence in any given year or nominally likely to occur once every five (5) years.

2. Ten (10) year frequency – a rainfall intensity having a ten (10) percent probability of occurrence in any given year or nominally likely to occur once every ten (10) years.
 3. Twenty-five (25) year frequency – a rainfall intensity having a four (4) percent probability of occurrence in any given year or nominally likely to occur every twenty-five (25) years.
 4. One hundred (100) year frequency – a rainfall intensity having a one (1) percent probability of occurrence in any given year or nominally likely to occur every one hundred (100) years.
- O. Relationship to the Platting Process – Approval and review of storm drainage is a part of the review process for planning and platting of new developments. The review of storm drainage is overseen by the Community Development Department, Public Works Department, Engineering Department and the Galveston County Consolidated Drainage District (when development occurs within Galveston County).
- P. Sheet Flow – Overland storm water run-off that is not conveyed in a defined conduit.
- Q. Storm Sewer – Storm sewers and roadside ditch conduits are designed as a balance of capacity and economics. These conduits are designed to convey less intense, more frequent rainfalls with the intent of allowing for traffic movement on streets during these events.
- R. Street Drainage – When rainfall events exceed the capacity of storm sewer systems, the additional runoff is intended to be stored, detained, or conveyed overland in a manner that reduces the threat of flooding to structures. Street ponding of a short duration is anticipated and street drainage is designed accordingly to contribute to the overall capability of the drainage system.

1.04 DESIGN REQUIREMENTS

All designs of drainage facilities shall meet the requirements of the City of Friendswood Standard Details and Technical Specifications.

A. Determination of Runoff

Design Storm Events – All drainage improvements shall be designed for the following storm frequencies based on Atlas 14-point rainfall as established by the National Oceanic and Atmospheric Administration for Harris County Region III.

<u>Type of Facility</u>	<u>Frequency</u>
Road Side Ditch	five (5) year
Storm Sewers	five (5) year
Channels/Storm Sewers/Culverts draining One hundred (100) acres or less	twenty-five (25) year
Creeks/Channels/Culverts draining One hundred (100) acres or more	one hundred (100) year

*All City or District maintained facilities shall be designed for the 100-year storm independent of the amount of acreage served.

B. The Rational Method shall be used for determining the peak flow rate in the sizing of all drainage improvements.

1. Time of Concentration (in minutes) is the time required for peak runoff, from the entire upstream contributing area, to reach the point of interest. Time of concentration can be calculated based upon an analysis of the actual travel time from the most remote point in the drainage area. The travel path should be clearly denoted and a sketch included in the design calculations.

$$t_c = D/60V + 10 \text{ (minutes)}$$

D = flow distance (ft)

V = flow velocity (ft/sec)

For purposes of calculating t_c , the following velocities are recommended:

V = 1 ft/sec for overland flow

V = 1.5 ft/sec for flow across paved surfaces or along gutter flowlines.

V = 2 ft/sec for flow in a ditch or channel

V = 3 ft/sec for flow in a storm sewer

2. Rainfall Intensity (inches/hour) shall be calculated using the following formula:

$$I = \frac{b}{(d + t_c)^e}$$

b, d, and e values are derived from a single frequency rainfall intensity graph.

b = the y-intercept of the straight line

d = a constant used to adjust the relationship to plot as a straight line

e = the slope of the straight line

Allowable Values for Friendswood are listed below:

$t_c \leq 60 \text{ min}$			
Rainfall			
Frequency	<u>b</u>	<u>d</u>	<u>e</u>
3-year	51.4	8.1	0.705
5-year	46.6	7.0	0.656
10-year	51.9	6.5	0.647
25-year	61.5	6.4	0.644
50-year	67.9	6.1	0.640
100-year	76.2	6.2	0.641

$t_c > 60 \text{ min}$			
Rainfall			
Frequency	<u>b</u>	<u>d</u>	<u>e</u>
3-year	69.9	11.9	0.768
5-year	86.1	19.4	0.775
10-year	110.3	30.9	0.776
25-year	154.0	47.5	0.783
50-year	211.5	67.7	0.798
100-year	318.6	96.0	0.826

3. The Rational Method is a method for calculating the peak flow rate for a storm drain system. The formula for determining the peak flow rate is:
 $Q = C_f C I A$

Where:

Q = Flow rate (cubic feet per second (cfs))

C_f = Frequency factor, the product of C_f and C should not exceed 1.0

C = Runoff Coefficient

I = Rainfall intensity (inches/hour) for a given storm frequency
(Typically 5 year, 25 year, and 100 year).

A = Area (acres)

For the purposes of peak flow calculations, use the following “ C_f ”

C_f = 1.00, for storm frequencies of 10 years or less

C_f = 1.10, for storm frequencies of 25 years

C_f = 1.25, for storm frequencies of 100 years

For the purposes of peak flow calculations, use the following runoff coefficient “C,” which are in no way related to the lot coverage percentage as defined in the Zoning Ordinance.

<u>Land Use Type</u>	<u>Run-off Coefficient</u>
Raw Undeveloped Acres	0.20
Improved Undeveloped Acres (i.e., mowed, filled, re-graded, etc.)	0.30
Parkland	0.40
Residential:	
SFR-Estates (≥ 1 acre)	0.45
SFR (< 1 acre)	0.55
Multi-family	0.85
Commercial/Industrial	0.90
Pond (detention and amenity)	1.00

Alternatively, for estate-sized lots [greater than two (2.0) acres], the runoff coefficient “C” in the Rational Method formula can be calculated from the equation:

$$C = 0.6I_a + 0.2$$

Where:

C = watershed coefficient

I_a = impervious area/total area

If the alternate form is to be submitted, the calculation of the runoff coefficient “C” shall be provided as part of the drainage calculations.

C. Design of storm sewers

1. Design Frequency

a. Areas of New Development

The design storm event for sizing storm sewers for new development areas shall be a five (5) year storm. In any case where new development interferes with the natural sheet flow of the existing adjacent land, the storm system shall accommodate the runoff. Stubbed out streets next to undeveloped areas shall have storm sewer lines continuing to an approved outfall.

b. In-fill Development

- 1) An existing storm sewer and structures shall be evaluated using a five (5) year storm, assuming no development takes place. The storm sewer and structures shall then be evaluated with the development in place.
 - a) If the proposed development has a lower or equal impervious cover, no modifications to the existing storm sewer system are required.
 - b) If the hydraulic gradient of the existing storm drain is below the top of the curb, no improvements to the existing storm sewer system are required.

c. Private Drainage Systems

- 1) Storm sewers for private drainage systems shall conform to the City of Friendswood Technical Specifications and Standards Details for public drainage systems. Minimum diameter pipe for a private storm sewer system is ten (10) inches.
 - a) Unless otherwise approved by the City Engineer, all private drainage systems shall be constructed in conformance with the public storm sewer standards.
 - b) An approved permit shall be obtained from the City before any work shall be done on a private drainage system and shall include plan and profile sheets detailing the scope of the work, with elevations.
 - c) Open ditch areas may be converted into storm sewer lines with the approval of a Development Permit and Specifications for Residential Storm Sewer Installation Specification Form. Guidelines for the process are defined in Appendix F of this Design Criteria Manual.
 - d) Private storm sewer connections to public storm sewers shall occur at a manhole, or at the back of an inlet, as approved by the City Engineer.

2. Pipe Velocity and Slope Design

- a. All storm drains shall be designed by the application of Manning's Equation and the Continuity Equation.

Manning's Equation:

$$V = (1.486/n) R^{2/3} S^{1/2}$$

Where

V = velocity (ft/sec)

R = hydraulic radius (area in square feet/wetted perimeter in feet)

S = slope of energy line in feet/feet (same as conduit bottom slopes for uniform flow)

n = coefficient of roughness

n = 0.013 for concrete pipes,

n = 0.024 for CMP (Corrugated Metal Pipe)

n = 0.011 for PVC (Polyvinyl Chloride)

n = 0.010 for HDPE (High Density Polyethylene)

**Note: All public storm sewers in or on public rights-of-way and public drainage easements shall be constructed of RCP (Reinforced Concrete Pipe) unless otherwise approved by the City Engineer. Manning's roughness coefficients for CMP, PVC, and HDPE shall be used for storm sewers on private property only. CMP pipes shall be used for public storm sewers only upon specific approval of the City Engineer and/or the applicable drainage district entity (GCCDD or HCFCD).*

Continuity Equation:

$$Q = VA$$

Where

Q = discharge (cfs)

V = velocity (ft/sec)

A = wetted cross sectional area of conduit (A2)

- b. Design velocities shall be three (3) feet per second with the pipe flowing full.
- c. Maximum velocities shall not exceed seven (7) feet per second without the approval of the City Engineer.

d. Minimum Public Storm Sewer Pipe Slopes:

Pipe Diameter	% Slope
18"*	0.26
24"	0.18
30"	0.14
36"	0.11
42"	0.08
48"	0.07
54"	0.06
60"	0.05
*Used for Inlet leads only.	

- e. For pipe sizes not listed above, the minimum slope shall be determined utilizing a design velocity of three (3) feet per second.

3. Pipe Sizes and Placement

- a. Public storm sewer lines and inlet leads shall be a minimum of twenty-four (24) inch inside diameter and eighteen (18) inch inside diameter, respectively, or equivalent. Box culverts shall be at least two (2) feet x two (2) feet inside dimension.
- b. Larger pipes located upstream shall not flow downstream into smaller pipes unless it is intended for detention requirements.
- c. Match crowns of pipe at any size change unless severe depth constraints prohibit such, or engineering calculations show flowlines should be matched.
- d. Locate public storm sewers in public street rights-of-way, in parallel and adjoining easements, or in other approved easements. Easements shall be at least twenty (20) feet wide, and the storm sewer shall be centered in the easement.

4. Starting Water Surface and Hydraulic Gradient

- a. The hydraulic gradient shall be calculated assuming the top of the outfall pipe as the starting water surface.
- b. At drops in pipe flowline, should the upstream pipe be higher than the hydraulic grade line, the hydraulic grade line shall be re-calculated

assuming the starting water surface to be at the top of pipe at that point.

- c. For the design storm, the hydraulic gradient shall at all times be below the gutter line elevations at any point along the street.
- d. Hydraulic grade lines shall be shown on all profile drawings.

5. Manhole Locations

Manholes are required at the following locations:

- a. Size or cross section changes.
- b. Inlet lead and conduit intersections.
- c. Changes in pipe grade.
- d. Street intersections.
- e. A maximum spacing of six hundred (600) feet measured along the conduit run.
- f. Manholes shall not be placed or located in driveway or sidewalk areas.
- g. Adjust manhole frames and covers within the limits of the pavement to meet the proposed final top of slab.

6. Inlets

- a. Locate inlets at all low points in gutter.
- b. Valley gutters across intersections are not permitted.
- c. Inlet spacing is generally a function of gutter slope. For minimum gutter slopes of three-tenths (0.3) percent, the maximum spacing of inlets shall result from a maximum gutter run of three hundred (300) feet from a high point in the pavement to an inlet on a continuously graded street section, for a maximum spacing of six hundred (600) feet between inlets.

- d. If gutter slopes are less than three-tenths (0.3) percent, the City Engineer shall determine the inlet spacing. The acceptable minimum gutter grade is two-tenths (0.2) percent.
- e. Use only Standard Inlets:

Inlet	Application	Capacity
Type A	Parking Lots/Small Areas	2.5 cfs
Type B-B	Residential	5.0 cfs
Type D	Parking Lots	2.0 cfs
Type E	Roadside ditches	20.0 cfs
Type H-2	Residential / Commercial	5.0 cfs

- f. Do not use "Beehive" style grate inlets or other specialty inlets.
- g. Do not use grate top inlets in an unlined roadside ditch.
- h. Place inlets at the end of curb returns on side streets, when such streets intersect streets of a higher classification, unless special conditions warrant otherwise and are approved by the City Engineer.
- i. Storm sewer inlets shall be established in such numbers and in such locations as to effectively drain storm water from paved sections. A graphical plan and calculations of the hydraulic gradient shall be furnished by the design engineer.

D. Consideration of Overland Flow

- 1. Design Frequency – the design frequency for consideration of overland sheet flow shall consider extreme storm events which exceed the capacity of the underground storm sewer system resulting in ponding and overland sheet flow through the development to the primary drainage outlet.
- 2. Relationship of Structures to Street – all structures shall be constructed as per the Flood Damage Prevention Ordinance, and shall be higher than the highest level of ponding resulting from the extreme storm event as shown on the latest City adopted flood maps.
- 3. Calculation of Flow:
 - a. Streets will be designed so that consecutive high points in the street will provide for a gravity flow of drainage to the ultimate outlet.

- b. The maximum depth of ponding at high points will be the top of curb of streets with curbs, or the elevation of the centerline of roads without curbs.
 - c. The maximum depth of ponding at low points will be nine (9) inches above the gutter elevation of curb of streets with curbs, or three (3) inches above the elevation of the centerline of streets without curbs.
 - d. Sheet flow between lots can be provided only through a defined drainage easement.
 - e. A map shall be provided to delineate the flow direction of the extreme event through a proposed development, and how this flow is discharged to the primary drainage outlet.
 - f. In areas where ponding occurs and no sheet flow path exists, a calculation shall be provided to show that runoff from the one hundred (100) year event can be conveyed and remain in compliance with the other terms of this Section.
- 4. Overland flow shall enter outfall drainage facilities (channels or detention ponds) through a storm sewer with its last run sized to convey the one hundred (100) year event. Calculations shall be submitted for sizing the structure and determining that adequate inlet capacity exists.
 - 5. Maintain pre-existing natural overland flow of storm water, and provide protection for adjacent properties from redirected storm water flows.
 - 6. For development greater than five (5) acres, show contours of adjacent properties within two hundred (200) feet, and account for natural and existing overland flow or channelized flows. For developments less than five (5) acres, show contours of adjacent properties within fifty (50) feet, and account for natural and existing overland flow or channelized flows. Contour lines shall provide an indication on whether or not adjacent off-site areas drain toward or away from the subject tract.

E. Design of Open Channels

- 1. Design Frequency
 - a. Open channels shall be designed according to methods described in the Galveston County Consolidated Drainage District (GCCDD) and Harris County Flood Control District (HCFCD) Criteria Manuals.

- b. Design standards for channel construction shall follow the requirements specified in the GCCDD & HCFCDD Criteria Manuals.
- c. Design standards for the outfalls into channels shall conform to those in the GCCDD & HCFCDD Criteria Manuals.

2. Determination of Water Surface Elevations:

- a. Water surface elevations shall be calculated using Manning's Equation and the Continuity equation.
- b. For the design storm event, the water surface for ditches and channels shall be calculated to remain within the banks and at or below the required freeboard.

3. Design of Culverts

Head losses in culverts shall conform to TxDOT Hydraulics Manual, Chapter 84 – Culverts.

F. Design of Roadside Ditches

1. Design Frequency

- a. Roadside ditches are permissible only for single family residential lots having widths larger than, or equal to, one hundred twenty (120) feet.
- b. Design storm event for a roadside ditch shall provide one-half (0.5) foot of freeboard below the edge of pavement, or the natural ground at the rights-of-way line, whichever is lower.
- c. The design must include an extreme event analysis to indicate that adjoining structures will not be flooded.

2. Velocity Considerations

- a. For grass lined sections, the design velocity shall be two (2.0) feet per second during the design storm event. The maximum velocity shall be five (5) feet per second.

- b. A grass lined or unimproved roadside ditch shall have side slopes no steeper than three (3) horizontal to one (1) vertical.
- c. Minimum grades for roadside ditches shall be two-tenths (0.2) percent.
- d. Calculation of velocity shall use a Manning's roughness coefficient of four hundredths (0.04) for earthen sections, and twenty-five-hundredths (0.025) for ditches with paved inverts.
- e. Use erosion control methods acceptable to the City when design velocities are calculated to be greater than three (3) feet per second and are approved by the City Engineer.

3. Culverts

- a. Culverts shall be placed at all driveway and roadway crossings and other locations where appropriate.
- b. Culverts shall be designed assuming inlet control.
- c. Roadside culverts shall be sized based on drainage area. Calculations shall provide for each block based on drainage design criteria presented in this manual.
- d. Cross open channels with roadside culverts no smaller than eighteen (18) inch diameter or equivalent. The size of culvert used shall not create a head loss of more than two-tenths (0.2) feet greater than the normal water surface profile without the culvert.
- e. Use erosion control methods acceptable to the City when design velocities are calculated to be greater than three (3) feet per second and approved by the City Engineer.
- f. Sloped End Treatments (S.E.T.'s) are required on all TxDOT Highways.

4. Depth and Size Limitations for Open Ditches

- a. Residential streets – the maximum depth shall not exceed two and one-half (2.5) feet below the edge of pavement.
- b. Roadside ditch bottoms shall be at least two (2) feet wide.

- c. Ditches in adjoining and parallel easements shall have the top of bank not less than two (2) feet from the outside easement line or edge of pavement when applicable.
- d. Roadside ditch side slopes shall not exceed three (3) horizontal to one (1) vertical.
- e. The design storm event for a roadside ditch shall provide one-half (0.5) foot of freeboard below the edge of pavement, or the natural ground at the rights-of-way line, whichever is lower.

G. Design of Outfalls.

- 1. Outfall design shall conform to GCCDD and HCFCD standards as applicable.
- 2. Detention pond and storm sewer outfalls shall be placed one foot above the flowline of the receiving channels, creeks, and detention pond, or two foot above normal water elevation, whichever is greater.
- 3. Flowlines of storm sewer outfalls shall be located six (6) inches above the flowline of a receiving roadside ditch.

H. Storm Water Detention

- 1. Application of Detention.
 - a. As a normal consideration, storm water detention shall be required. The use of on-site detention is required in order to mitigate potential damage to existing structures unless: the current infrastructure has been improved and provides mitigation for the development, the City has developed a plan for a detention facility to serve the overall area, the development is within an existing subdivision served by a detention facility that is within the platted boundaries of said subdivision and that has been previously accepted and approved by the City and the GCCDD, or a development qualifies for the purchase of regional detention under certain circumstances enumerated in 1.04.H.8.
 - b. Design calculations for sizing the detention basin and related structures shall be performed by the applicable method described in the following sections.

- c. All calculations shall be sealed and signed by a Professional Engineer licensed to practice engineering in the State of Texas.
 - d. All commercial and non-residential new developments, additions, or redevelopments will require a new or revised drainage plan for additional impervious cover. The standard minimum rate of detention referenced in paragraph 2 below will apply to this impervious cover.
 - e. A parking lot with a curb may be used as part of the detention system, provided that the maximum depth of water over the inlet throat flow line does not exceed nine (9) inches, and the maximum depth in any parking stall does not exceed six (6) inches.
2. Calculation of Detention volume using the Hydrologic Method for Projects of fifty (50) acres or less.
- a. Minimum Rate of Detention for Projects of fifty (50) acres or less.

When using any of the methods detailed below for calculating the required amount of detention, the minimum amount of detention provided shall never be less than the following standard minimum rates as follows:

For the purpose of determining the standard minimum rate, all the acreage used in the calculation must include proposed or existing development. Raw/undeveloped acreage may not be included in the calculation to lower the standard minimum rate.

- 1) Commercial Projects – Defined as projects with ninety (90) percent or more impervious cover or a runoff coefficient of nine-tenths (0.9) or larger – Standard minimum rate of six-tenths (0.6) ac.ft. per acre.
- 2) Multi-Family Projects – Defined as projects with eighty (80) percent or more impervious cover or a runoff coefficient of eight-tenths (0.8) or larger – Standard minimum detention rate fifty-five-hundredths (0.55) ac.ft. per acre.
- 3) Residential Projects – Defined as projects with forty (40) percent or more impervious cover or runoff coefficient of

fifty-five-hundredths (0.55) or larger – Standard minimum detention rate of fifty-five hundredths (.55) ac.ft. per acre.

- 4) Estate Lot Projects – Defined as projects with less than forty (40) percent impervious cover or a runoff coefficient less than fifty-five-hundredths (0.55) –Standard minimum detention rate of fifty-five hundredths (.55) ac. ft. per acre.
- 5) Mixed Use Projects – The Standard minimum rate of detention shall be determined based upon weighted average of the minimum rates set forth above.
- 6) Single family residential and accessory buildings on existing lots and developments under one (1) acre do not have a minimum detention requirement.

b. Modified Rational Method.

The modified rational method may be used to determine detention storage for all projects less than five (5) acres.

c. Simplified Method

For projects less than five (5) acres, the standard minimum rate may be used in lieu of performing a more complex analysis. This coefficient multiplied by the total acreage will yield the total detention volume required.

d. Optional Detention Storage Methodology for Projects of one fifty (50) acres or less.

The maximum allowable release rate from the detention facility during the one hundred (100) year storm event is the one hundred (100) year peak flow rate from the area under pre-development conditions. The undeveloped peak flow rate shall be determined using the rational method.

The following method will be acceptable for determining storage volume if the simplified method is not utilized.

e. Triangular Hydrograph Method for projects fifty (50) acres or less
The volume of storage required may be computed as follows:

$$B = \frac{43560 V}{0.5 I}$$

$$S = \frac{0.5 B (I - O)}{43560}$$

Where,

B = Duration of inflow (sec)

V = Total inflow volume in ac-ft (24 hr duration even use SCS Curve Number)

S = Required storage volume (ac-ft)

I = Peak inflow rate (cfs)

O = Peak outflow rate (cfs)

- f. Unit Hydrograph Method (Small Watershed Method) may be used for projects with drainage areas between 0 acres and 100 acres a technique developed by Dr. H.R. Malcom may be utilized in determining inflow hydrographs. The maximum inflow rate shall be determined by use of the rational formula. With the peak flow and volume of runoff, the equations presented below may be used to determine the inflow hydrograph for the proposed detention facility.

The maximum allowable outflow rate from the detention facility shall be restricted to the existing flow rate from the undeveloped tract. Outflow control shall be designed for the 5-year, 25-year and 100-year storm frequencies. In cases where the outfall for the detention facility is to be an existing roadside ditch, storm sewer, etc., the allowable outflow rate may need to be restricted to less than the maximum allowable so as to no overload the outfall.

$$1. \quad T_p = \frac{V}{1.39 Q_p}$$

Where,

T_p = Time to peak in seconds

V = Total volume of runoff for the design storm (ft³)

Q_p = Peak runoff for the design storm (cfs)

$$V = Dr \cdot A \cdot \left(\frac{43,560}{12} \right)$$

Where,

Dr = Runoff Depth (in)

A = Runoff Area (acres)

$$2. \quad q_i = \frac{Q_p}{2} \left[1 - \cos\left(\frac{\pi t_i}{T_p}\right) \right] \quad [t_i \leq 1.25 T_p]$$

*Note: The argument of the cosine function shown above must be expressed in radians.

Where,

t_i = Time of Interest (sec)

q_i = Runoff at Time of Interest (cfs)

$$3. \quad q_i = 4.34 Q_p e^{\frac{-1.48 t_i}{T_p}} \quad [t_i > 1.25 T_p]$$

*Note: The argument of the cosine function shown above must be expressed in radians.

$$4. \quad T = \frac{T_p}{10} = \text{Time Interval}$$

3. Detention Storage Methodology for Projects over 50 acres

For drainage areas over 50 acres, a detailed hydraulic analysis utilizing the effective FEMA models will use as a minimum HEC-HMS v. 3.2 and HEC-RAS v. 3.0 (or more current version) for windows. This methodology also applies to properties out of tracts of 50 acres or more. A Drainage Impact Assessment report will be required to detail all design assumptions and parameters.

a. Watershed Modeling Methodology

1. For HEC-HMS watershed analysis, the following parameters shall be used:

Loss Method: Green and Ampt
Transform Method: Clark Unit Hydrograph
Initial Loss: 0.1 Inches
Moisture Deficit: 0.385
Suction: 12.45 inches
Conductivity: 0.024 inches/hour

Percent Impervious Cover

Land Use	Percent Impervious (%)
Water	100
Isolated Transportation	90
High Density	85
Light Industrial	60
Airport	50
Residential Small Lot	40
Residential Large Lot	20
Development Green Acres	15
Residential Rural Lot	5
Undeveloped	0
Unknown	0

Atlas 14 Annual Exceedance Probability Rainfall Data (Inches) - Region III

Duration	3-Year	5-Year	10-Year	25-Year	100-Year
5-min	0.7	0.8	0.9	1.1	1.4
15-min	1.4	1.50	1.8	2.1	2.7
30-min	2.0	2.2	2.5	3.0	3.8
1-hr	2.6	2.9	3.4	4.1	5.2
2-hr	3.3	3.8	4.5	5.6	7.5
3-hr	3.7	4.3	5.2	6.6	9.2
6-hr	4.5	5.2	6.5	8.4	12.2
12-hr	5.3	6.2	7.8	10.2	15.0
24-hr	6.2	7.3	9.2	12.1	17.9

2. Indicate on a map drawn to scale the existing and proposed watershed areas. All major features such as major roads and drainage entries shall be indicated. Node locations shall be provided in the base model with corresponding nodes at identical points in the model for the proposed system.
3. The model shall include the 5-year, 25-year and 100-year pre-development and post development runoff analysis. If a proposed development is to be constructed in phases, the analysis should address any intermediate developed conditions.
4. When time series data or pared data are used in the model, briefly discuss the source of the data in the report or show the calculations. Whenever possible, provide a copy of the calculations, source and model files via file sharing or on an external thumb drive.

5. Time of concentration and storage coefficients shall be calculated as outlined in HCFCD and GCCDD methodology.
6. If a different model than the FEMA effective hydraulic model is utilized, written justification must be provided, and approval granted by the City prior to beginning. At a minimum HEC-HMS v 3.2 shall be used.

b. Water Surface Profile Modeling

1. Water surface profile models shall be created using as a minimum HEC-RAS v 3.1.3 (or more current version) for windows. Alternative approaches to modeling shall be discussed with the City prior to commencing the study.
2. The use of one-dimensional steady flow and unsteady flow approach may be utilized with proper justification.
3. Provide information and data for the base model which must be included in the report. If the base model is different than the FEMA effective model, written justification must be provided, and approval granted before modeling commences. Base models shall be updated using HEC-RAS v 3.1.3 (or more current version).
4. Provide a plan view schematic for the existing and proposed systems. The schematics shall indicate channel designations, node labels and river stations. The river stations and node label so the existing model shall match any identical points on the proposed models whenever possible. Physical reference points shall also be used.
5. All models shall include the 5-year, 25-year and 100-year pre-development and post development runoff analysis. If a proposed development is to be constructed in phases, the analysis should address any intermediate development conditions. Proposed bridge and/or culvert crossing analyses shall include an extreme event.
6. For any steady flow or unsteady flow data used in the model(s), briefly explain how the data was calculated or the source of the data. Whenever available, these separate data files or calculations shall be included on the required external thumb drive and file share transfer with all submittals.

7. All existing bridge or culvert crossing shall be modeled based upon actual on the ground survey data correctly tied to a GCCDD or HCFCDD benchmark, datum and year of adjustment unless otherwise authorized.
8. Bridge and/or culvert crossing shall be analyzed using the highest energy answer obtained using the energy and momentum equations.
9. The model should include a reasonable number of cross sections based upon current elevation data to ensure that the actual drainage system is properly represented. The spacing of cross sections may be approximated by using Samuel's equation. The use of numerous interpolated sections between two surveyed cross sections that are too far apart is not an acceptable way of producing additional cross sections.
10. Some portions of channels within the City are tidally influenced. In those reaches, the models shall account for tidal conditions.
11. For HEC-RAS models, the following contraction and expansion Coefficients are required. Any variance from these values must be preapproved by the City.
Contraction Coefficient: 0.1
Expansion Coefficient: 0.3
12. Manning's "n" values will follow GCCDD design criteria on the Galveston County side and Harris County criteria on the Harris County side. See the latest versions of the GCCDD Drainage Criteria Manual and the HCFCDD Policy, Criteria, and Procedure Manual. Any deviation from these "n" values must be approved by the City before modeling begins.

4. Calculation of Outlet Size:

Outfalls which utilize a pipe restrictor to control outflow shall use the orifice equation.

- a. Reducer or Restrictor Pipes shall be sized as follows:
 - 1) Use the following equations to calculate the required outflow orifice:

$$\text{Area of pipe} = \pi d^2/4$$

$$Q = CA (2 gh)^{1/2}$$
$$D = Q^{1/2} / 2.25 h^{-1/4}$$

Where

Q = outflow discharge in cfs.

C = 0.8

h = water surface differential (ft)

D = orifice diameter (ft)

A = area of pipe (ft²)

g = gravity (32.2 ft/s²)

New flow into receiving storm sewer cannot exceed undeveloped flow.

- 2) For head differential in systems outfalling into a roadside ditch or storm sewer, the actual head loss or 1 foot, whichever is greater, shall be used. For all other discharge conditions, use 2 feet, or the difference between one hundred (100) year water surface elevation and the elevation of the twenty-five (25) year storm in the receiving channel, whichever is greater.
- 3) For detention systems outfalling into a public storm sewer, the restrictor shall be sized based upon the peak five (5) year developed flow.
- 4) For detention systems outfalling into a public roadside ditch, the restrictor shall be sized based upon the peak five (5) year undeveloped flow.
- 5) For detention systems outfalling into creeks, channels, or storm sewers sized to carry the twenty-five (25) year or one hundred (100) year storm, the restrictor shall be metered to release the five (5) year, twenty-five (25) year, and one hundred (100) year undeveloped flows.
- 6) Restrictor shall be either the required diameter or the equivalent cross-sectional area. The orifice diameter "D" shall be a minimum of six (6) inches.
- 7) Detention ponds less than 1 acre in size shall have a minimum of 4 inches of freeboard. All ponds one (1) acre or larger in size shall have at least one (1) foot of freeboard. Freeboard shall be measured from the maximum one hundred (100) year

water surface elevation and shall not be used in the calculation of storage or mitigation.

5. Detention Pond Structural Requirements:

- a. Side slopes shall not exceed a slope of four (4) horizontal to one (1) vertical.
- b. Maintenance berms will be required in accordance with the Galveston County Consolidated Drainage District Design Criteria Manual.
- c. Ponds with lengths over fifty (50) feet shall have a concrete pilot channel.
- d. Concrete pilot channels shall have a minimum width of four (4) feet and a minimum thickness of four (4) inches with #3 rebar spaced at twelve (12) inches on center each way. The concrete pilot channels shall be constructed of 5-sack cement concrete with a compressive strength of three thousand (3,000) psi at twenty-eight (28) days. Provide a one (1) inch depression per every one (1) foot of transverse slope, with redwood headers spaced every forty (40) feet.
- e. Single-user ponds may use a GCCDD-approved alternative for concrete pilot channels.
- f. Appropriate covering (grass, slope paving, etc.) shall be established on side slopes and pond bottom, to prevent erosion during periods of maximum water velocity
- g. A concrete gravity spillway, set at the maximum ponding elevation, shall be provided at the detention pond outfall structure.
- h. Wet detention ponds, and ponds with vertical walls, shall provide access for safety and maintenance purposes. Wet detention systems shall have a method in place to minimize stagnation, such as an aeration system.
- i. "Dry" detention ponds shall not be designed with less than two (2) feet of depth.

6. Ownership and Easements:

- a. Private Facilities:

- 1) Pumped systems shall not be allowed. Only detention facilities which rely on gravity to discharge storm runoff will be allowed by the City and the GCCDD.
 - 2) Responsibility for maintenance of the detention facility must be indicated on the plat.
 - 3) All private properties being served shall have drainage access to the pond.
 - 4) A private maintenance agreement must be provided when multiple tracts are being served.
- b. Public Facilities:
- 1) Facilities will only be accepted for maintenance by the City when such is in the public interest.
 - 2) The City will require a maintenance work area twenty (20) feet wide surrounding the extent of the detention area. Public rights-of-way or permanent access easements may be included as a portion of this twenty (20) foot width.
 - 3) A dedication of easements or reserves must be provided by the plat.
 - 4) Proper dedication of public access to the detention pond must be shown on the plat or by separate instrument. This includes permanent access easements with overlapping public utility easements.

7. Off-Site Detention in the Galveston County Consolidated Drainage District:

- a. It is the desire of the City of Friendswood that regional detention be utilized when available. If new development is within the service area of a publicly owned or operated regional storm water detention facility, connection to such regional facility shall be as required by the drainage master plan applicable to such facility.
- b. In Galveston County, offsite detention, such as regional or sub-regional detention, may be purchased from the Galveston County Consolidated Drainage District provided:

- 1) The development drains to the Clear Creek watershed or the tributaries of Clear Creek.
 - 2) All lots or tracts must outfall into a conveyance system with adequate capacity, excluding single family residential construction on lots or tracts containing five (5) acres or less.
 - 3) The proposed improvements do not include the subdivision of land.
 - 4) The developed site does not exceed eight (8) acres for single-family residential lots or tracts, five (5) acres for multi-family residential lots or tracts, and five (5) acres for commercial lots or tracts.
 - 5) Regional detention for site development relating to single-family residential construction on lots or tracts containing five (5) acres or less may be purchased based on square feet of impervious cover by completing the Attachment #4, a copy of which is made a part of this manual. All other site development qualifying for the purchase of regional detention must submit a new or revised drainage plan.
- c. Contact the Galveston County Consolidated Drainage District (GCCDD) for the latest regional detention rates.

8. Detention Requirements Summary:

Lot or Tract Type	Acreage	Off-Site Detention Available	Engineered Drainage Plans	Detention Volume Calculation Method	Rates	Attachment #4* Required	GCCDD Board Approval
SFR	0-5	Yes	Not Required	Purchase Regional Detention Based On: New Impervious Coverage Calculation of Detention Volume Unnecessary	Contact GCCDD for fees	Yes	Not Required
	5-8	Yes	Required	Engineer Determines the Detention Volume by an Approved Method	Contact GCCDD for fees	No	Required
	8+	No	Required	Engineer On-Site Detention	NA	No	Required
MFR	0-5	Yes	Required	Engineer Determines the Detention Volume by an Approved Method	Contact GCCDD for fees	No	Required
	5+	No	Required	Engineer On-Site Detention	NA	No	Required
COM	0-5	Yes	Required	Engineer Determines the Detention Volume by an Approved Method	Contact GCCDD for fees	No	Required
	5+	No	Required	Engineer On-Site Detention	NA	No	Required

9. Conveyance:

- a. The developer shall provide conveyance to a detention facility without having a detrimental effect on any adjacent properties.
- b. If conveyance is directed through properties not directly owned by the developer, an executed contract or recorded deed between the parties agreeing to the said conveyance must be presented to the City and the appropriate drainage district entity.
- c. This procedure is approved by both the City and the corresponding drainage district entity (GCCDD or HCFD) during preliminary plan review.
- d. Hydrograph timing as a substitute for detention on any project is prohibited.

10. Lowest Floor Elevation:

- a. Refer to the City of Friendswood Flood Ordinance (December 2020) Section 34-63 for special lowest floor elevation requirements.
- b. The latest FEMA FIRM panel and Flood Insurance Study (FIS) should be referred to for the base flood elevation and the 0.2 percent flood elevation.

1.05 COMPUTER MODELS AND PROGRAMS

- A. Current effective models use the HEC-HMS and HEC-RAS computer programs. Guidance for applying these programs is in the HCFCD Hydrology and Hydraulics Guidance Manual and the Galveston County Consolidated Drainage District Criteria Manual. The current effective FEMA model must be used. Any departure from using this model must be submitted in written format and approved by the City prior to submittal.
- B. In some cases, HEC-HMS and HEC-RAS cannot accurately model some projects or hydraulic conditions. Alternative models may be used only with consent by the City's Engineering Department. All models selected must be freeware or prepared in a form such that the Engineering Department can open and review the models. The Engineering Department must be notified in writing of the program that will be used with justification early in the design process.

- C. All models must be accompanied by a Letter Report or Drainage Impact Assessment describing any assumptions and changes due to the project. All projects larger than 50 acres required a Drainage Impact Assessment.

1.06 SUBMITTALS

A. Drainage Plan Submittals

1. Preliminary Submittals- Submit for Review and Comment:

One line drawings are required as part of the platting process. One line drawings shall include:

- a. Approximate definition of lots and street patterns.
- b. The approximate drainage areas for each system.
- c. A definition of the proposed drainage system by single line.
- d. The proposed pipe diameters.
- e. Any proposed drainage easements.
- f. Floodplain and floodway boundaries, if any.

2. Final Design – Submit the following for approval:

- a. Copies of any documents which show approval of exceptions to the City Design Criteria.
- b. Design calculations for storm line sizes and grades, and for detention facilities, if any.
- c. Design calculations for the hydraulic grade line of each line or ditch, and for detention facilities, if any.
- d. Contour map and drainage area map of the project.
- e. Plan and profile sheets showing storm sewer or open ditch design (public facilities only).

- f. Projects located within a floodplain boundary or within a floodplain management area shall show the floodplain boundary or floodplain area, as appropriate, on the one-line drawing or drainage area map.
 - g. Soil boring logs.
 - h. All drainage plans shall have a current FEMA flood zone determination statement.
 - i. Fill calculations are required for projects located in the FEMA floodway, 100-year floodplain and the 500-year floodplain.
- 3. Signature State – Submit the following for approval:
 - a. Review prints.
 - b. Original drawings.
 - c. Storm water detention maintenance agreement letters.

B. National Flood Insurance Program (NFIP) Compliance

1. The City of Friendswood is a participant in the National Flood Insurance program's (NFIP's) Community Rating System (CRS). As a CRS community, the City is required to develop and implement various programs intended to reduce flood risk such as identifying drainage problem areas, maintenance of existing drainage systems, construction of drainage projects, outreach to the community, etc. As a result of the community's commitment to reduce the flood risk, the residents of the City are entitled to receive discounted flood insurance premiums based on the City's CRS ranking as evaluated by CRS.
2. All runoff impacts created by development shall be mitigated, so post-project runoff rates and flooding levels are equal to or less than equivalent pre-project conditions.
3. Fill placed in the floodway, 100-year floodplain, or 500-year floodplain as designated on the current Flood Insurance Rate Map, and below the 500-year flood elevation shall be mitigated by the removal of a like amount of compensating cut in the vicinity of the fill, while maintaining hydraulic connectivity to the existing floodplain.

4. Any new development in the floodway will require a No Rise study. All calculations and/or models must be submitted with No Rise study via the City's permitting process.

C. Drainage Report / Drainage Impact Assessment Requirements

Drainage Report/Drainage Impact Analysis must be approved prior to submittal and approval of Construction Plans. The drainage report must include minimum of the following items listed in the drainage report:

1. Executive Summary: To include detention summary table for projects with detention.
2. Introduction: Inclusion of project name and purpose, map and description of project limits, project objectives, assumptions and constraints and any existing prior studies. Any data used must be fully described.
3. Existing Conditions: Include location and topography, land use, FEMA floodplains, right-of-way, pipelines and utilities, survey datum, brief discussion of impact of historical storm events at the project site. Include and Existing Condition Drainage Area Map Exhibit.
4. Hydrology and Hydraulics: Include Design Criteria guidelines used, storm frequencies analyzed, mitigation requirements etc. Include a listing of programs and software used. Include discussion of the hydrologic and hydraulic methodologies used. Include Pre-Project and Post-Project conditions. For projects that will be built in a phased approach include an Interim condition. Include analysis of an extreme event. Exhibits will include Overall Drainage Area Map, Existing Drainage Area Map with 5, 25, 100-year flows and water surface elevations at Major Outfall Nodes; Extreme Condition Map; Floodplain Maps with project boundary.
5. Proposed Drainage Plan. Include a description of the proposed drainage plan, results of the hydrological and hydraulics analyses, channel and/or detention layout, right-of-way requirements, pipeline and utility conflicts, geotechnical requirements, and any environmental issues. Exhibits required include Overall Drainage Area Map, Proposed Drainage Area Map with 5, 25 and 100 year flows and water surface elevations at Major Outfall Nodes, Floodplain Maps with project boundaries shown, Detention Pond layout with detention summary, and Plan and Profile with 5-year, 25-year and 100-year water surface elevations in case of roadway.

6. Fill Results. Include fill calculations for the floodway, 100-year floodplain and the 500-year floodplain and a discussion of any mitigation. Include a Fill Exhibit showing all areas of cut and fill.
7. Conclusions.
When a detention facility is part of the proposed project, include the following detention summary table:

Project Name				
Detention Basin Area	Acres			
Detention Storage Rate	Acres-Feet/Acre			
Detention Storage Required	Acre-Feet			
Detention Storage Provided	Acre-Feet			
Floodplain Fill Mitigation Volume	Acre-Feet			
Storm Event	20% (5 Yr)	10% (25-Year)	1% (100-Year)	Pond Maximums
Design Water Surface Elevation (-----Datum, -----Adjustment)				
Maximum Allowable Outflow 9cfs)				
Maximum Outflow Provided (cfs)				

8. Appendix. Include detailed hydrological and hydraulic calculations. Include models and Geospatial data on an external drive.

1.07 QUALITY ASSURANCE

Prepare calculations and construction drawings under the supervision of a Professional Engineer licensed to practice engineering in the State of Texas and trained in the disciplines required by the drawings. The final construction drawings, all design calculations and any submitted reports shall be sealed, signed, and dated by the Professional Engineer licensed to practice engineering in the State of Texas responsible for the development of the drawings along with their firm's registration information. All hydrologic and hydraulic calculations and/or models used during design must be submitted to the City via electronic transfer and on an external hard drive.

2.0 EXECUTION

2.01 RESEARCH REQUIREMENTS – Reserved

2.02 DESIGN ANALYSIS

- A. All projects shall be tied to National Geodetic Survey (NGS) Datum adjustment which matches the Federal Emergency Management Agency (FEMA) rate maps or the most current NGVD which matches the FEMA rate maps. In the event GPS surveying is used to establish benchmarks, at least two (2) references to benchmarks relating to the FEMA rate maps must be identified. Equations may be used to translate other datum adjustments to the required adjustment.
- B. Plan sets shall include a drainage area map which shall contain all storm sewer drainage calculations.
- C. All drainage systems for curb-and-gutter pavements shall be underground closed conduits; individual residential lot drainage is exempt. Drainage systems for pavements without curb-and-gutter shall be roadside open ditch sections.
- D. Soil boring with logs shall be made along the alignment of all storm sewers having a cross section equal to or greater than seventy-two (72) inches in diameter or equivalent cross section area. Boring should be taken at intervals not to exceed five hundred (500) linear feet, and to a depth not less than three (3) feet below the flow line of the sewer. The required bedding will be determined from the soil boring.
- E. Plan sets shall include the five (5) year Hydraulic Grade Line for storm sewers and roadside ditches on the plan and profile sheets.
- F. All projects located in the floodway, 100-year floodplain, or 500-year floodplain require fill calculations and Fill Exhibit indicating areas of fill and cut.

SECTION VI

SITE DEVELOPMENT

1.0 GENERAL

- A. Should any portion of this Section conflict with the Subdivision Ordinance or the Zoning Ordinance, the more stringent of the latter two (2) shall govern.
- B. The City Engineer shall have the final interpretation of any provisions in this Design Criteria Manual.
- C. The City Engineer has the right to issue administrative orders or design criteria modifications for just cause related to any provisions or conditions in this Design Criteria Manual.

1.01 CHAPTER INCLUDES

Criteria for the design of site development plans.

1.02 REFERENCES

- A. City of Friendswood Zoning Ordinance.
- B. City of Friendswood Subdivision Ordinance.
- C. City of Friendswood Standard Details and Technical Specifications, latest version. These details can be downloaded from:
www.ci.friendswood.tx.us/350/Publications-Forms
- D. Texas Department of Transportation – Traffic Control Plan
- E. Architectural Barriers Texas Accessibility Standards (TAS)

1.03 DEFINITIONS

Commission – Planning and Zoning Commission.

1.04 DESIGN REQUIREMENTS

- A. Site Development Requirements:
 - 1. General Requirements:

- a. Site development plans for all site developments shall be approved by the City Engineer prior to construction.
- b. Site developments, not including single family residential, shall include any project that affects public water, wastewater, storm drainage, sidewalks, or paving facilities.
- c. All sidewalks in new developments shall be a minimum of five (5) feet from the back of curb, two (2) feet from the edge of the public rights-of-way and shall not be in any utility easements.
- d. All site developments shall conform to the requirements of these Standards, the latest version of the International Code Series, as amended, and all applicable rules and regulations of the City of Friendswood.
- e. All wastewater, drainage, and paving site development improvements, up to and including the connection to the public system, shall be privately owned, operated, and maintained. All water site development improvements up to but not including the meter and meter vault, shall be privately owned, operated, and maintained
- f. Restore the City of Friendswood rights-of-way or easements to existing or better condition than that prior to start of work.
- g. Private utilities and service lines shall be placed in an easement on the property being served.
- h. Streets that change direction a minimum of ninety (90) degrees will require a different name.

2. Design Review Requirements for Site Development Plans

- a. All site development plans for proposed developments shall be submitted to the Community Development Department for approval prior to construction. Site development plans shall show all proposed water, wastewater, paving, parking, drainage, street signage, streetlight locations, flood protection facilities, and sidewalks with approved ADA ramps locations, and a traffic control plan.

- b. A traffic impact study shall be required for any development proposal expected to generate traffic volumes that will significantly impact the capacity and/or safety of the street system. All proposed developments generating volumes of five thousand (5,000) trips per day or greater shall abide by this criterion. The trip estimate shall be based on the latest version of the Institute of Transportation Engineers' Trip Generation Manual.
- c. The developer should first schedule a Development Review Committee (DRC) meeting with Community Development Department staff. At this meeting, infrastructure issues and the feasibility of developing the site will be discussed.
- d. The developer shall prepare a site plan for submittal to be reviewed by staff. The developer shall consult with staff until all significant issues surrounding the proposed site plan and development are resolved, prior to proceeding to the Planning and Zoning Commission.
 - 1) The submittal for the site plan requires five (5) copies of the following:
 - a) Cover Sheet
 - b) Site Plan
 - c) Landscaping Plan
 - d) Building Elevation Plan
 - e) Photometric Plan
 - 2) and two (2) copies of:
 - a) Drainage Plan
 - b) Utility Plan
 - c) Grading Plan
 - d) Storm Water Pollution Prevention Plan

- e. The final site plan will be presented to the Planning and Zoning Commission by City Staff for consideration. The Planning and Zoning Commission reviews the final document for completeness and public awareness.
 - f. The final site plan submittal to be provided to Community Development Department staff at least ten (10) days prior to the next regularly scheduled Planning and Zoning Commission meeting.
 - g. Once the site plan is approved, the developer may begin the building permitting process. Approval from the appropriate drainage entity is required prior to the issuance of building permits.
 - h. Three (3) copies of the site development plans shall be submitted to the Building Official for review. The City will typically respond within two (2) to four (4) weeks of the initial submittal.
 - i. When plan changes are requested, two (2) copies of the revised site development plans shall be submitted to the City for review, which will ultimately result in the reissuance of any applicable permit(s).
- 3. Building Slab Elevations – Minimum building slab elevations shall conform to the requirements of the City of Friendswood Flood Damage Prevention Ordinance and latest adopted flood zone maps.
 - 4. Water Service – Water service lines and meters shall be sized in accordance with requirements set out in Section III –Waterline Distribution System Design Requirements.
 - 5. Sanitary Sewer Service – Sanitary sewer service leads are normally installed during construction of the public sanitary sewer. When a sanitary sewer service lead is to be installed for a site development, refer to Section II – Wastewater Collection System Design Requirements. All lots, tracts, or reserves shall be connected directly to a public sanitary sewer by a single lead, except as specifically approved by the City Engineer. The City Department of Public Works shall be contacted for all sanitary sewer connections for commercial projects.
 - 6. Site Drainage Requirements – All commercial, industrial, office, recreational, and multi-family tracts shall have an internal drainage system. The internal drainage system shall collect all site runoff and direct it into a private storm sewer system that shall connect to the public

drainage facilities in the area. Refer to Section V – Storm Drainage Design Requirements for more details. Any exceptions require specific approval from the City.

- a. The internal site storm sewer shall be connected to a public storm sewer at a manhole or at an inlet adjoining the site. The site drainage outfall shall be connected to the nearest existing drainage system with adequate capacity to serve the drainage area. Where extension of the existing drainage system is required, all costs for extension shall be the responsibility of the developer.
- b. All internal facilities shall be designed by a Professional Engineer licensed to practice engineering in the State of Texas, and shall be sized to drain the site in accordance with these standards.
- c. Drainage calculations shall be submitted with all site development plans. Additional supporting data may be required by the City.
- d. When the site drains directly into a Galveston County or Harris County facility, and/or into a TxDOT or county rights-of-way, the appropriate governmental entity(s) shall approve the site development connection to the public facilities.

7. Driveways

- a. It is desirable to minimize the number of non-residential driveways on all streets in order to reduce the number of conflict points and facilitate traffic flow. It is recognized, however, that certain existing tracts may not be able to fully comply with the following standards due to limited frontage or other constraints.
- b. When compliance with these criteria is precluded for any reasons, attempts should be made to obtain alternative access where feasible, including joint access driveways, access easements to adjoining properties, or access to intersecting streets.
- c. If it can be demonstrated to the City Engineer that sufficient attempts to secure alternative access have been made, and that such access is still not possible, the City Engineer may accept a Traffic Impact Analysis performed by a Professional Engineer licensed to practice engineering in the State of Texas. If approved, the analysis will be used to allow a deviation to the driveway spacing requirements indicated herein.

- d. Residential driveways shall be a minimum of twelve (12) feet wide and a maximum of twenty-five (25) feet wide at the rights-of-way line, unless otherwise approved by the City Engineer, and should be placed at least twenty-five (25) feet away from the property line at the intersection of two (2) streets and at least five (5) feet from a property line between two (2) properties.
- e. Residential lots must have a minimum of one hundred (100) feet of frontage in order to be eligible for a circular driveway on the lot, and the two (2) driveways shall have at least forty-five (45) feet of separation between them from the inside edges of driveways.
- f. Non-residential driveways shall be a minimum of twenty-five (25) feet wide and a maximum of thirty-five (35) feet wide. Non-residential driveways shall be spaced with a minimum of fifty (50) foot separation.
- g. Non-residential driveways on major thoroughfares/boulevard streets shall be placed no closer than one hundred (125) feet from the ultimate curb line of the intersecting major thoroughfare or boulevard street. Non-residential driveways on collector/ minor streets are to be placed no closer than seventy-five (75) feet from the ultimate curb line of the intersecting major thoroughfare/boulevard street. Non-residential driveways on major thoroughfares/boulevard streets are to be placed no closer than seventy-five (75) feet from the ultimate curb line of the intersecting collector commercial/minor street.
- h. For purposes of determining the separation distance, the back of curb or edge of street shall be used in conjunction with the edge of driveway which is closest and parallel to the street from which the measurement is to be taken.
- i. Non-residential tracts with less than one hundred fifty (150) feet of frontage on a public street shall have no more than one (1) driveway. Non-residential tracts between one hundred (150) feet and three hundred twenty (320) feet of frontage on a public street shall have no more than two (2) driveways. Non-residential tracts between three hundred twenty-one (321) feet and six hundred (600) feet of frontage on a public street shall have no more than three (3) driveways. Non-residential tracts with over six hundred (600) feet of frontage on a public street shall have the number of

driveways specially designated and specifically approved by the City.

- j. Non-residential driveway connections to the public street shall be approved and inspected by the City, TxDOT, county representative, or appropriate entity.
- k. Driveway radii shall not extend beyond the projection of a property line perpendicular to the back of the curb.
- l. Driveways shall be installed according to the latest version of the City of Friendswood Standard Details and Technical Specifications.
- m. Driveways shall be evaluated with respect to location of existing or proposed signage, landscaping, and structures for adequate sight distance.
- n. A note stating, "Access to adjacent property and common driveways may be required" shall be placed on the site plan.
- o. Curb returns for driveways shall be, at a minimum:
 - 1) For residential driveways:
 - a) Five (5) feet on local streets less than twenty-eight (28) feet in width.
 - b) Ten (10) feet on collector streets, major thoroughfares and boulevards, and local streets greater than twenty-eight (28) feet in width.
 - 2) For non-residential driveways:
 - a) Twenty-five (25) feet on local streets less than twenty-eight (28) feet in width
 - b) Thirty-five (35) feet on collector streets, major thoroughfares, boulevards, and local streets greater than twenty-eight (28) feet in width

8. Fire Lanes

- a. Fire lanes shall be required on all multi-family and non-residential tracts if any part of a building is greater than one hundred fifty (150) feet from either a fire lane, private street, or public street rights-of-way.
- b. Fire lanes shall be either twenty (20) feet wide with a twenty-five (25) foot radius or twenty-five (25) feet wide with a twenty (20) foot radius.
- c. Fire lanes shall be constructed using the same pavement structural requirements as a public pavement. Alternate materials may be used with specific approval from the City Engineer.
- d. Fire lanes shall be designed to drain in compliance with the Site Development Requirement.
- e. Fire lane markings shall be provided as specified in the Friendswood Code of Ordinances.
- f. An emergency vehicle turn-around, whether a cul-de-sac of a radius required by the Fire Marshal or a T-head at least one hundred twenty (120) feet in length, shall be required under certain conditions.

9. Controlled Access Gate Requirements

- a. Plans for access control systems shall be submitted to the Fire Marshal's Office and approved prior to construction.
- b. All access control gates shall have emergency means of operation in the event of power loss.
- c. Access control gates shall provide a clear, passable width of at least twenty (20) feet.
- d. A Knox® key switch shall be provided for all controlled access gates. The key switch shall operate all gates.
- e. A Knox® pad lock shall be provided for all non-motorized gates.

- f. The location of the key switch shall be approved by the Fire Marshal's Office.
- g. The owner or homeowners' association shall maintain all parts of the access system and keep them in good working order.
- h. The Fire Marshal's Office and Police Dispatch shall be notified immediately of any damage to the access system that hinders access including but not limited to, damage to the key box, lock, and gates.
- i. Access gates shall be far enough back to provide at least forty (40) feet of stacking space.

10. Storm Water Pollution Prevention Plan

- a. A storm water pollution prevention plan shall be provided for all site development projects.
- b. Filter fabric fence shall be installed at the perimeter of the site before construction begins.
- c. Once construction is complete, the filter fabric fence may be removed; provided a minimum of five (5) feet of hydro-mulch or sod shall be installed at the back of all curbs, or other Best Management Practices, shall be implemented and/or installed.
- d. Refer to the Storm Water Ordinance for additional requirements.

11. Parking Lot Guidelines

A parking lot layout is required to ensure that adequate off-street parking is provided with the construction, alteration, or remodeling of any building.

- a. Minimum concrete slab thickness shall be five (5) inches with an f_c equal to four thousand (4,000) psi. Reinforcement shall be Grade 60, $f_y = 60,000$ psi, #4 deformed reinforcing bars, spaced at sixteen (16) inches center to center, both ways with a minimum lap length of twenty-four (24) inches. Minimum stabilized subgrade thickness shall be eight (8) inches.

- b. Hot Mix Asphalt Concrete pavement thickness shall be a minimum of two (2) inches with eight (8) inches of stabilized crushed concrete or limestone and six (6) inches of lime-stabilized subgrade.
- c. Off-street parking spaces shall be located on the same lot, tract, parcel, or premises as the use being served, or on other property of the same or less restrictive zoning classification that the owner of the premises being served has a continuing right to use for parking. When the off-street parking spaces are not located on the same lot, tract, parcel, or premises being served, the distance from the center of the parking lot to an entrance to the building, shall not exceed five hundred (500) feet in distance measured along the shortest available pedestrian route with public access.
- d. Any existing building that is enlarged, structurally altered, or remodeled by more than fifty (50) percent as it existed shall be accompanied by off-street parking for the entire building. When the enlargement, structural alteration, or remodel is not increased or changed by more than fifty (50) percent, additional off-street parking shall only be required for the increased or changed floor area.
- e. Existing parking spaces may not be used to satisfy additional off-street parking requirements unless, the existing spaces exceed the number recommended for the building or use for which the existing spaces are associated.
- f. The number of off-street parking spaces required for each building or use shall be determined by reference to the Parking Group Table in Appendix C of this Design Criteria Manual. Where several different property uses will share a joint parking area, the parking should be computed based upon the overall development.
- g. The design and dimensions of off-street parking areas shall be in accordance with the following table of minimum dimensions. Minimum stall width shall be nine feet, except for residential and all-day office parking which may utilize stalls eight and one-half (8.5) feet in width, provided that minimum aisle widths are increased by one (1) foot. In addition, the dimensions of up to twenty (20) percent of the total number of off-street parking spaces may be reduced to eight (8) feet in width and sixteen (16) feet in

depth to accommodate compact automobiles (such spaces must be so marked). All dimensions below are in feet:

	<i>Angle (degrees)</i>				
	<i>0°</i>	<i>35°</i>	<i>45°</i>	<i>60°</i>	<i>90°</i>
Stall, parallel to aisle	23.0	18.0	12.7	10.4	9.0
Stall, perpendicular to aisle	9.0	16.5	19.0	20.0	18.0
Aisle width, one-way	12.0	12.0	12.0	16.0	24.0
Aisle width, one-way	22.0	22.0	22.0	24.0	24.0
Cross aisle, one-way	11.0	11.0	11.0	11.0	11.0
Cross aisle, two-way	22.0	22.0	22.0	22.0	22.0
Refer to Appendix B – Figure 8 of this Design Criteria Manual for Off-street Parking Diagrams					

- h. Off-street parking spaces shall be clearly marked. Parking spaces abutting an adjoining property line or street rights-of-way shall be provided with wheel guards or bumper guards located such that no part of a normally parked vehicle will extend beyond the property line. When wheel guards are used, they shall be centered two and one-half (2.5) feet from the property line for ninety (90) degree parking, two and one-third (2.3) feet for sixty (60) degree parking, and two (2.0) feet for forty-five (45) degree and thirty (30) degree parking.
- i. The parking layout and design of all off-street parking areas shall be approved by the City Engineer. The City Engineer shall determine that spaces provided are usable, and that the circulation pattern within the area is adequate.
- j. The number of accessible parking spaces shall comply with the latest edition of the Architectural Barriers Texas Accessibility Standards (TAS).
- k. Accessible parking spaces must be paved and must include:
 - a. The international symbol of access painted conspicuously on the surface in a color that contrasts the pavement;
 - b. The words “NO PARKING” painted on any access aisle adjacent to the parking space. The words must be painted:
 - i. In all capital letters;
 - ii. With a letter height of at least one (1) foot, and a stroke width of at least two (2) inches; and

- iii. Centered within each access aisle adjacent to the parking space; and
- c. A sign identifying the consequences of parking illegally in a paved accessible space. The sign must:
 - i. At a minimum state “Violators Subject to Fine and Towing” in a letter height of at least one inch;
 - ii. Be mounted on a pole, post, wall, or freestanding board;
 - iii. Be no more than eight (8) inches below a sign required by Texas Accessibility Standards, 502.6; and
 - iv. Be installed so the bottom edge of the sign is no lower than four (4) feet and no higher than six (6) feet above ground level.
- d. A sign that meets the requirements set in Texas Accessibility Standards, 502.6, that includes the required language in subsection (c)(i) satisfies these requirements.

12. Pipelines

All new Pipelines shall be a minimum depth of ten (10) foot in depth to the top of the pipe in all new or existing road rights-of-way.

13. Utility and Cable Installation

- a. Utility infrastructure shall be mounted on pads at ground level; if within the rights-of-way, utility infrastructure shall not block sidewalks or visibility at intersections.
- b. For future individual utility service, lines which originate in a public road right-of-way and extended to any building or structure shall be installed underground.
- c. On side streets with above-ground utility services which intersect a roadway with underground utility lines, the first pole supporting the above ground service shall be placed on such a side street at least one hundred (100) feet from the center of the roadway with the underground utilities.

2.0 EXECUTION

2.01 RESEARCH REQUIREMENTS

- A. Discuss project concepts outlining proposed features and usage with the City.
- B. Research existing utility and rights-of-way information.
- C. Verify that no restrictions exist that could result in denial of the project concept.

2.02 DESIGN ANALYSIS – Reserved

2.03 DRAWINGS

- A. The site development plan shall include layout sheet(s) providing a photometric layout of the site complete with location of proposed lights, information on light heights, and type of light standard proposed.
- B. The site development plan shall include an overall drainage layout showing:
 - 1. Total area (in acres) of site to be drained.
 - 2. Area (in acres) drained to each inlet.
 - 3. Contours or an adequate number of spot elevations to indicate area drained to each inlet.
 - 4. Top elevation and flowline elevation at each inlet.
 - 5. Gradient and size on each private storm sewer.
 - 6. Computations to support pipe sizes and grades shown [minimum private storm size shall be ten (10) inches].
 - 7. Design velocity for storm sewers shall be three (3) feet per second.
 - 8. A TxDOT or a county permit shall be required for drainage affecting a state or county owned/maintained facility. Submit permit with site plan.
 - 9. The drawings shall be prepared and sealed by a Professional Engineer licensed to practice engineering in the State of Texas.
 - 10. The size and location of any required detention facility shall be indicated on the plans, along with the size and location of the outfall structure.
- C. All site development plans shall be approved by the appropriate drainage entity prior to City approval being granted.

- D. The site plan shall show all water and sewer service lines with sizes, grades and alignments; and illustrate any proposed ties into the existing public lines.
- E. The site development plan shall show all parking areas.
- F. The site development plan shall indicate the types and location of all existing and proposed landscaping. Landscaping shall meet the minimum requirements as set forth in the Zoning Ordinance. If no trees exist, a note to that effect shall be placed on the site development plan. The Qualified Tree List can be found in Appendix D of this Design Criteria manual.
- G. The site development plan shall show the location, height, and area of all proposed buildings. All setback lines as required by the Zoning Ordinance shall also be shown with a dimension called out on the site plan between the building and the site boundary.
- H. The land use for all adjacent property shall be shown on the site development plan.
- I. All parking lot pavements for site development plans shall be engineered to provide for operation by vehicles normally expected to utilize the parking area, and the thickness of paving shall be based upon the soil conditions underlying the parking area. A Professional Engineer licensed to practice engineering in the State of Texas shall certify the design submitted for approval.
- J. Sidewalks are required as set out in Section III of the Subdivision Ordinance and Section 70-64 of the Code of Ordinances. Where sidewalks are required, they shall have a minimum width of four (4) feet, except on TxDOT rights-of-way where the minimum width shall be five (5) feet. The design and installation of such sidewalks shall comply with Texas Accessibility Standards Architectural Barriers requirements and the City of Friendswood Standard Details and Technical Specifications. The location of all proposed and existing sidewalks shall be shown on the site development plan.
- K. Show location of signs, screening walls or fences [indicate height, material, and appurtenances], and dumpsters (with appropriate screening).
- L. If the site is located within the Community Overlay District, a plan note shall be made on the site development plan indicating such; and that the site development will conform to the Zoning Ordinance requirements.

- M. No improvements in or to public rights-of-way shall be made without prior approval from the City Engineer. This includes planting trees in public rights-of-way, within residential and non-residential areas, or in any utility or drainage easement. Only Class 2 and Class 3 trees listed in Appendix D of this Design Criteria Manual may be planted in public rights-of way if such planting is approved by the City Engineer. No trees of any class may be planted in utility or drainage easements.

APPENDIX A

Attachments

ATTACHMENTS

1. Lift Station Start-up Log
2. Design Criteria Modification Form
3. GCCDD Form DR-001

City of Friendswood Lift Station Start-Up Log								
Date:			Site:			Pump Number:		
Address:			Pump Designation:					
Name Plate Data								
Pump Data								
Pump Make:			Size:					
Pump Model:			TDH:					
Serial Number:			Impeller Number or Size					
			Flow in GPM:					
Pump Motor Data								
Make (if applicable):			Phase:					
Serial Number (if applicable):			Name Plate Voltages:					
RPM:			Name Plate Full Load Amps:					
Service Factor:			Pump is wired for:					
Start-Up Trial Data								
Insulation Test			Pre-Start Voltage Test					
L1 to GND	L2 to GND	L3 to GND	L1 - L2	L2 - L3	L3 - L1	L1 - GND	L2 - GND	L3 - GND
M	M	M	V	V	V	V	V	V
			Run Voltage Test			Run Amperage Test		
Phase Rotation			L1 - L2	L2 - L3	L3 - L1	L1	L2	L3
ABC		CBA						
Operator:								

**CITY OF FRIENDSWOOD
DESIGN CRITERIA MODIFICATION FORM**

Modifications to standards identified in the Design Criteria Manual may be permitted by the City of Friendswood's City Engineer. The modification proposal must be submitted by a Professional Engineer licensed by the State of Texas and shall follow generally accepted engineering standards for traffic, sidewalk and other infrastructure as applicable, and such proposal contains the following information and substantiates the findings in Paragraph 4 below. If an appeal to the City of Friendswood City Engineer decision is requested, the Construction Board of Adjustment (hereinafter referred to as "the City") will review that appeal.

**This entire form must be completed in its entirety. If form is
submitted incomplete, it will be administratively rejected.**

PROJECT NAME:

PROJECT ENGINEER:

SUBMITTAL DATE:

SUBDIVISION NAME:

MODIFICATION LOCATION:

1. Set forth the proposed deviation to the technical standard.

SPECIFIC PROPOSED DEVIATION FROM TECHNICAL STANDARD:

2. Set forth the impact such deviation has on speed differential and street capacity, the likelihood of accidents, the long term maintenance and operation effect, the degree of functionality and efficiency, the technological advancements involved, and other relevant matters.

IMPACT OF DEVIATION:

3. Show a comparison of the technical standard to the proposed deviation with respect to overall safety and quality, speed differential, street capacity, existing and projected accidents, long-term maintenance and operation, degree of functionality, degree of efficiency, technological advancements, and other relevant matters.

COMPARISON OF TECHNICAL STANDARD TO PROPOSED DEVIATION:

4. Describe all mitigating improvements that reduce the negative impact of the proposed deviation on overall safety and quality, speed differential, street capacity, accident occurrences, long-term maintenance and operation, degree of functionality, degree of efficiency and demonstrating the degree to which the proposed deviation detrimentally affects the foregoing. Other relevant factors, including technological advances, should be explained by describing how they will affect the proposed development. Mitigating improvements can include but are not limited to, traffic control devices, pavement improvements, added acceleration or deceleration lanes, or reservoirs, and other on-site improvements.

MITIGATING IMPROVEMENTS THAT REDUCE NEGATIVE IMPACT:

SUMMARY & CONCLUSION/RECOMMENDATION FOR MODIFICATION:

List of Supporting Documentation Attached?

Yes____

No____

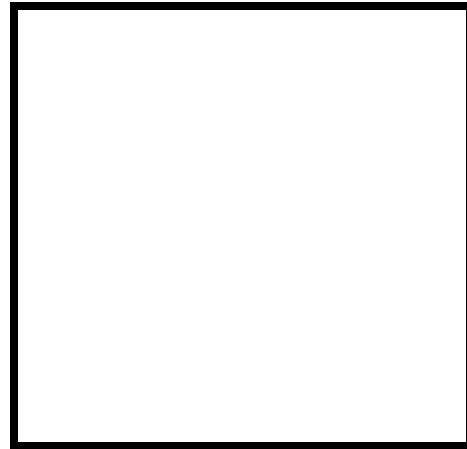
Engineer's Name

Engineering Firm

Address

City, ST, Zip

Telephone



Seal of Professional Engineer

Department of Engineering & Projects Use ONLY

Reviewed By:

Date

Modification Request Approved / Denied By:
Copies of Backup Information/Notes Attached

City Engineer

Date

NAME OF APPLICANT: _____
ADDRESS: _____
LEGAL DESCRIPTION: _____
TOTAL ACREAGE: _____
DATE OF PLAT OR RE-PLAT: _____

QUALIFICATIONS FOR PURCHASING REGIONAL DETENTION

PER THE INTERLOCAL AGREEMENT BETWEEN THE CITY OF FRIENDSWOOD AND GCCDD DATED MARCH 7, 2011:

SINGLE FAMILY RESIDENTIAL (SFR) LOTS OF 3.5 ACRES OR LESS QUALIFY
MUST PROVIDE SUPPORTING DOCUMENTATION FOR THE CALCULATION OF IMPERVIOUS COVER

FEE CALCULATIONS BASED ON SQUARE FEET OF IMPERVIOUS COVER:

_____ SF OF IMPERVIOUS COVER X \$0.25 = _____

PLEASE MAKE CHECKS PAYABLE TO THE GCCDD

* IMPERVIOUS COVER AREA SHALL BE DEFINED AS SURFACE COVER WHICH DOES NOT ALLOW THE PASSAGE OF STORM WATER INTO THE UNDERLYING SOIL, AND INCLUDES, BUT IS NOT LIMITED TO CONCRETE, ASPHALT, STABILIZED SOIL, TENNIS COURTS, WATER FEATURES, POOLS, SIDEWALKS, CRUSHED CONCRETE, LIMESTONE, AND ROOFING

APPENDIX B

Figures

Figure

1. Geometric Street Design Standards
2. Divided Roadway Cross Sections – Urban
3. Roadway Tapers For Subdivision Streets
4. Undivided Roadway Cross Sections – Urban
5. Typical Length of Median and Median Opening
6. Median Nose and Left Turn Bay Design
7. Cul-de Sac
8. Driveway spacing and other measurements
9. Off-Street Parking

FIGURE 1
GEOMETRIC STREET DESIGN STANDARDS (MINIMUM STANDARDS)

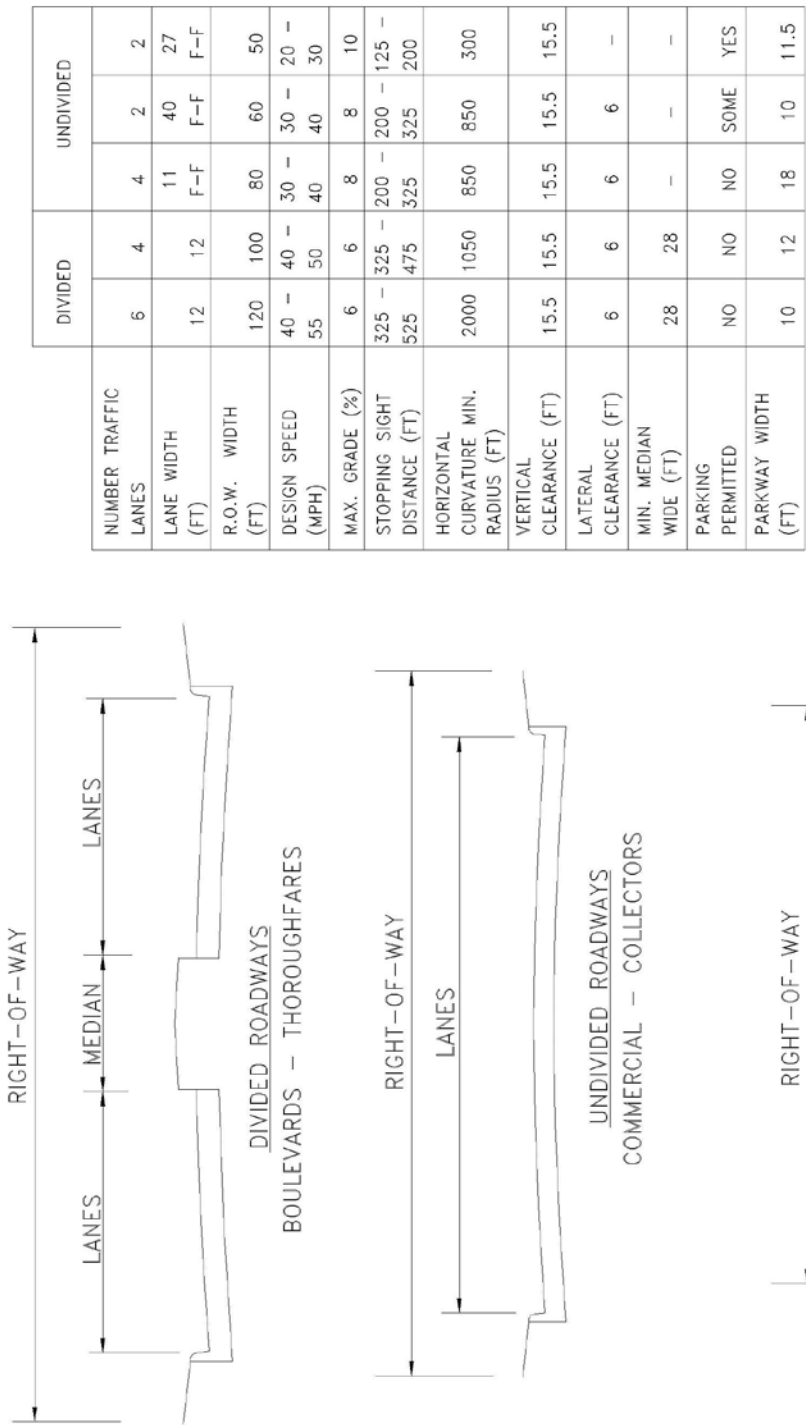
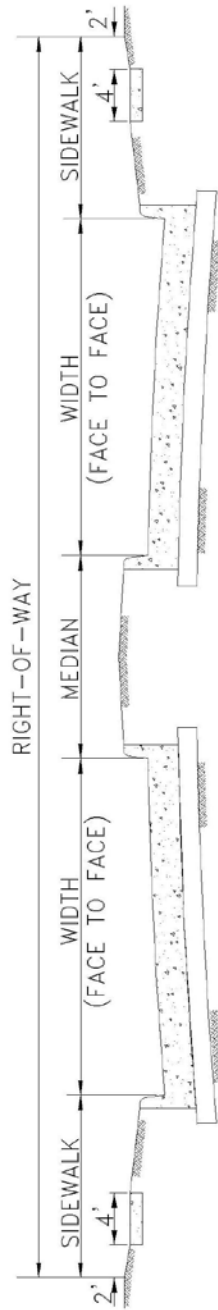


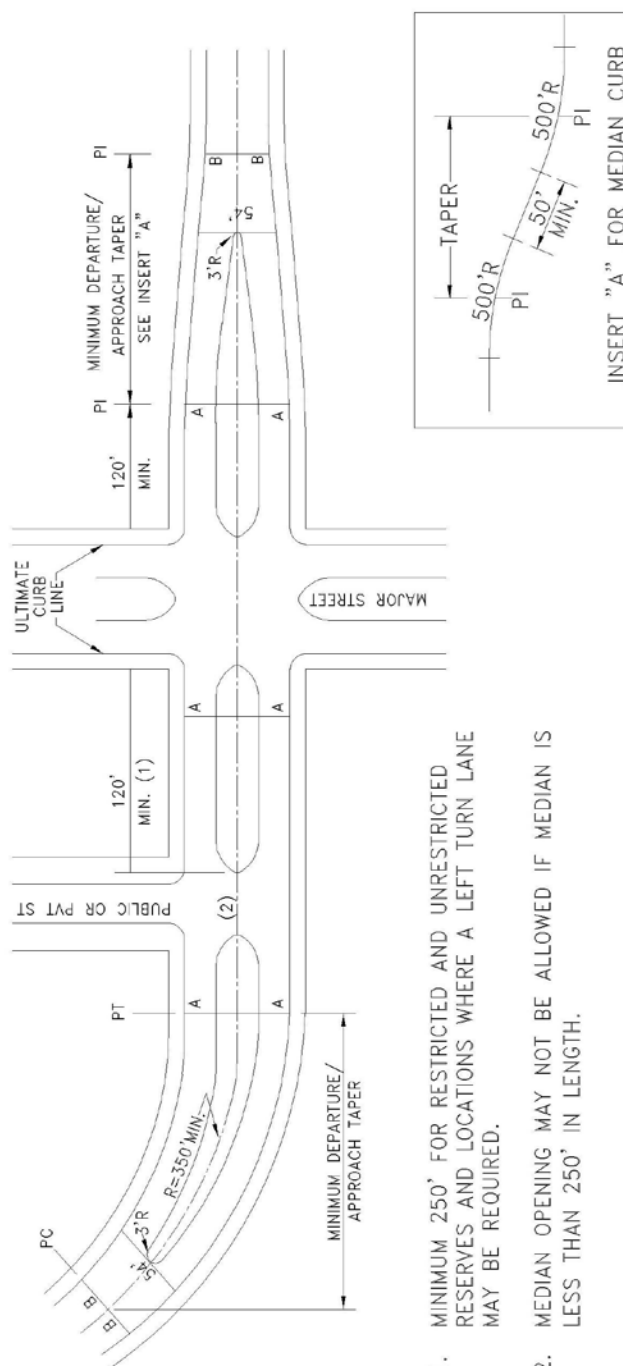
FIGURE 2
DIVIDED ROADWAY CROSS SECTIONS—URBAN



DIVIDED ROADWAY DIMENSIONS (In Feet)			
R.O.W.	80	100	100
WIDTH	24	24	33
MEDIAN	14	28	14
SIDEWALK	9	12	10

NOTE:
THIS DESIGN REPRESENTS THE PRESENCE OF A TYPICAL CURB AND GUTTER,
AND DOES NOT IMPLY OR RECOMMEND A SPECIFIC DRAINAGE DESIGN

FIGURE 3
ROADWAY TAPERS FOR SUBDIVISION STREETS



1. MINIMUM 250' FOR RESTRICTED AND UNRESTRICTED RESERVES AND LOCATIONS WHERE A LEFT TURN LANE MAY BE REQUIRED.
2. MEDIAN OPENING MAY NOT BE ALLOWED IF MEDIAN IS LESS THAN 250' IN LENGTH.

NOTE:

- a. APPROACH AND DEPARTURE TAPER REQUIREMENT:

$$L = \frac{WS^2}{60}$$

WHERE
 L = LENGTH IN FEET
 S = SPEED IN M.P.H.

W = LATERAL OFFSET IN FEET.

S = 30 M.P.H. MINIMUM DESIGN SPEED FOR SUBDIVISION STREETS

$$W = A - B$$

- b. 350' MINIMUM CENTERLINE RADIUS FOR HORIZONTAL CURVE WITH APPROACH OR DEPARTURE TAPERS

QUICK REFERENCE GUIDE		TAPER L=WS ² =60 (FEET)
ROADWAY CROSS SECTION (FEET)		
A+A	B+B	
80	60	150
80	40	300
80	27	400

FIGURE 4
UNDIVIDED ROADWAY CROSS SECTIONS—URBAN

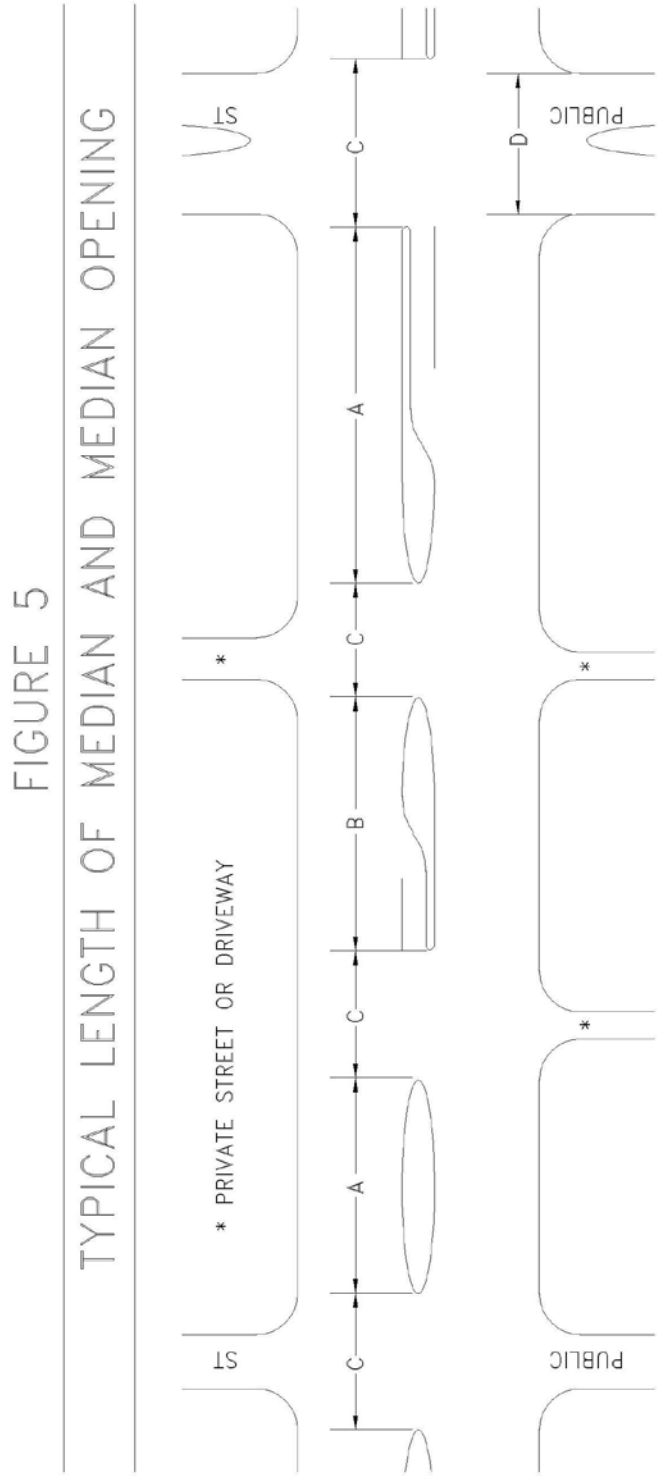


UNDIVIDED ROADWAY DIMENSIONS (In Feet)				
ABUTTING LAND USE	RESIDENTIAL		ALL OTHER	
	MFR-GHD	SFR	MINOR/(2) COMM.	
R.O.W.	50*(1)	60	60	80
WIDTH	27	27	40	44
SIDEWALK	11.5	16.5	10	18

(1) RIGHT-OF-WAY IN MFR-GHD SHALL MEAN THE DRAINAGE AND UTILITY EASEMENT UTILIZED WHEN PRIVATE STREETS ARE CONSTRUCTED.

(2) MINOR/COMM.— ANY PROPERTY USE OTHER THAN SINGLE FAMILY OR A COLLECTOR OR MINOR THOROUGHFARE

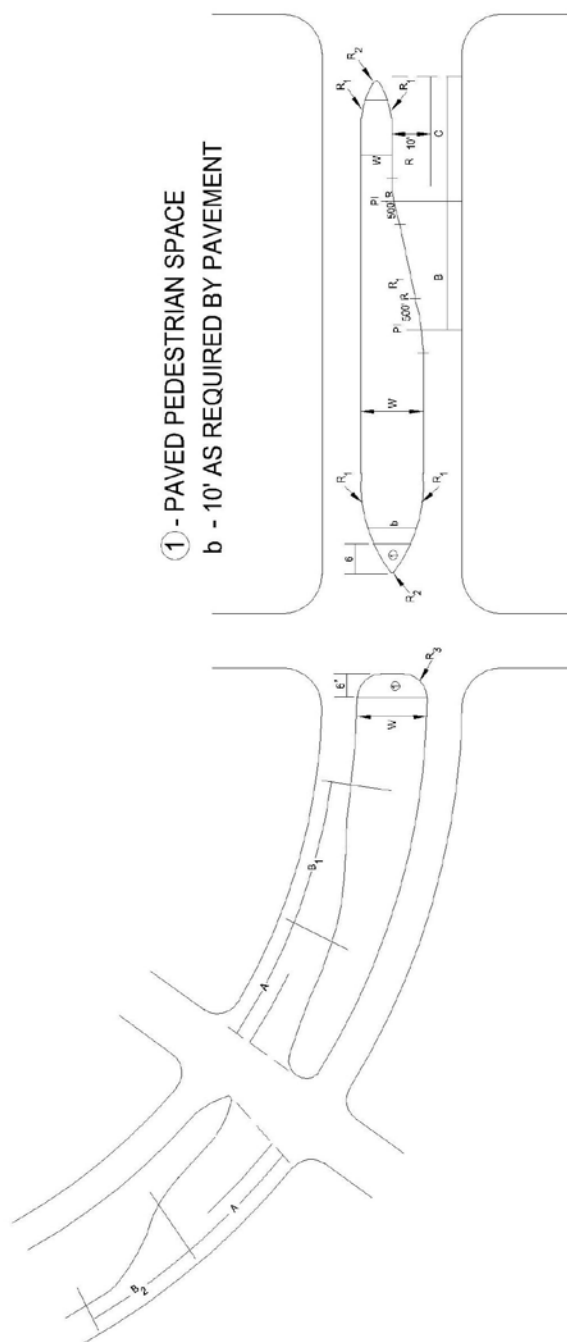
NOTE:
THIS DESIGN REPRESENTS THE PRESENCE OF A TYPICAL CURB AND GUTTER, AND DOES NOT IMPLY OR RECOMMEND A SPECIFIC DRAINAGE DESIGN



TYPICAL LENGTH OF MEDIAN OPENING "C" = 50' OR D+10', WHICHEVER IS GREATER.

IF PLANNED DIVIDED STREET IS:	PURPOSE OF MEDIAN INTERRUPTION		
	MAJOR STREET/ THOROUGHFARE (A)	COLLECTOR STREET (A)	LOCAL STREET (A)
MAJOR STREET/ THOROUGHFARE	350'	300'	300'
COLLECTOR STREET	300'	250'	250'
LOCAL STREET	250'	250'	200'

FIGURE 6
MEDIAN NOSE AND LEFT TURN BAY DESIGN



MEDIAN DIMENSIONS			
W	R ₁	R ₂	R ₃
≤ 8'	NONE	$\frac{W}{2}$	NA
>8' ≤ 38'	90°	$\frac{W}{5}$	NA
>38'	NONE	NONE	15°

NA - NOT APPLICABLE

LEFT TURN BAY DIMENSIONS

A = 150' MINIMUM AT INTERSECTION OF TWO MAJOR STREETS.

= 100' MINIMUM AT ALL OTHER INTERSECTIONS.

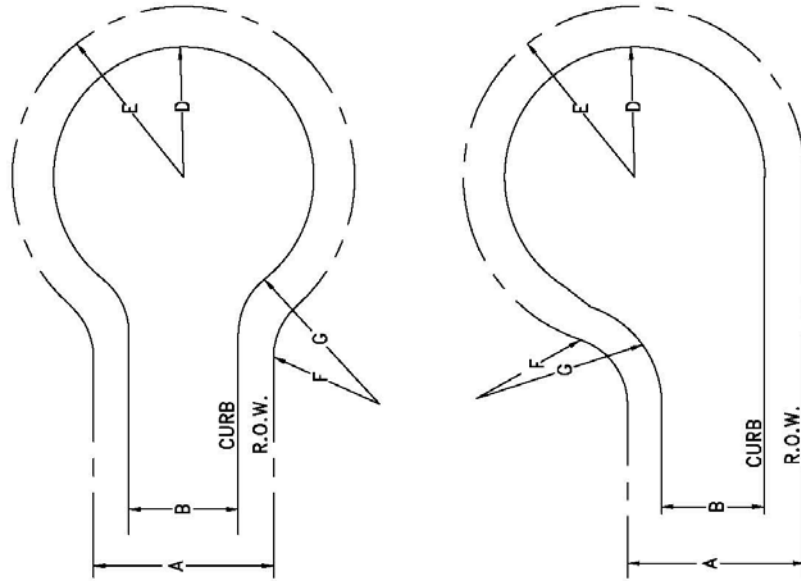
B = 100' MINIMUM ON STRAIGHT ROADWAY.

B_1 = TAPER LENGTH MAY BE SHORTER IF IT IS ON A HORIZONTAL CURVE TO THE LEFT.

B_2 = TAPER LENGTH MAY BE LONGER IF IT IS ON A HORIZONTAL CURVE TO THE RIGHT.

NOTE: DIMENSIONS MAY BE ADJUSTED AS DETERMINED BY TxDOT.

FIGURE 7
CUL-DE-SAC DESIGN FOR STREET TERMINATION



ABUTTING LAND USE	
SINGLE FAMILY *	ALL OTHER
A ALL WIDTHS	60'
B ALL WIDTHS	ALL WIDTHS
D 50'	55'
E 60'	65'
F 25'	25'
G 35'	35'

ALL DIMENSIONS MEASURED IN FEET TO FACE OF CURB.

* NOT OPENING ONTO A MAJOR THOROUGHFARE

MAXIMUM CUL-DE-SAC LENGTH SHALL BE 750 FEET.

FIGURE 8
DRIVEWAY SPACING AND OTHER MEASUREMENTS

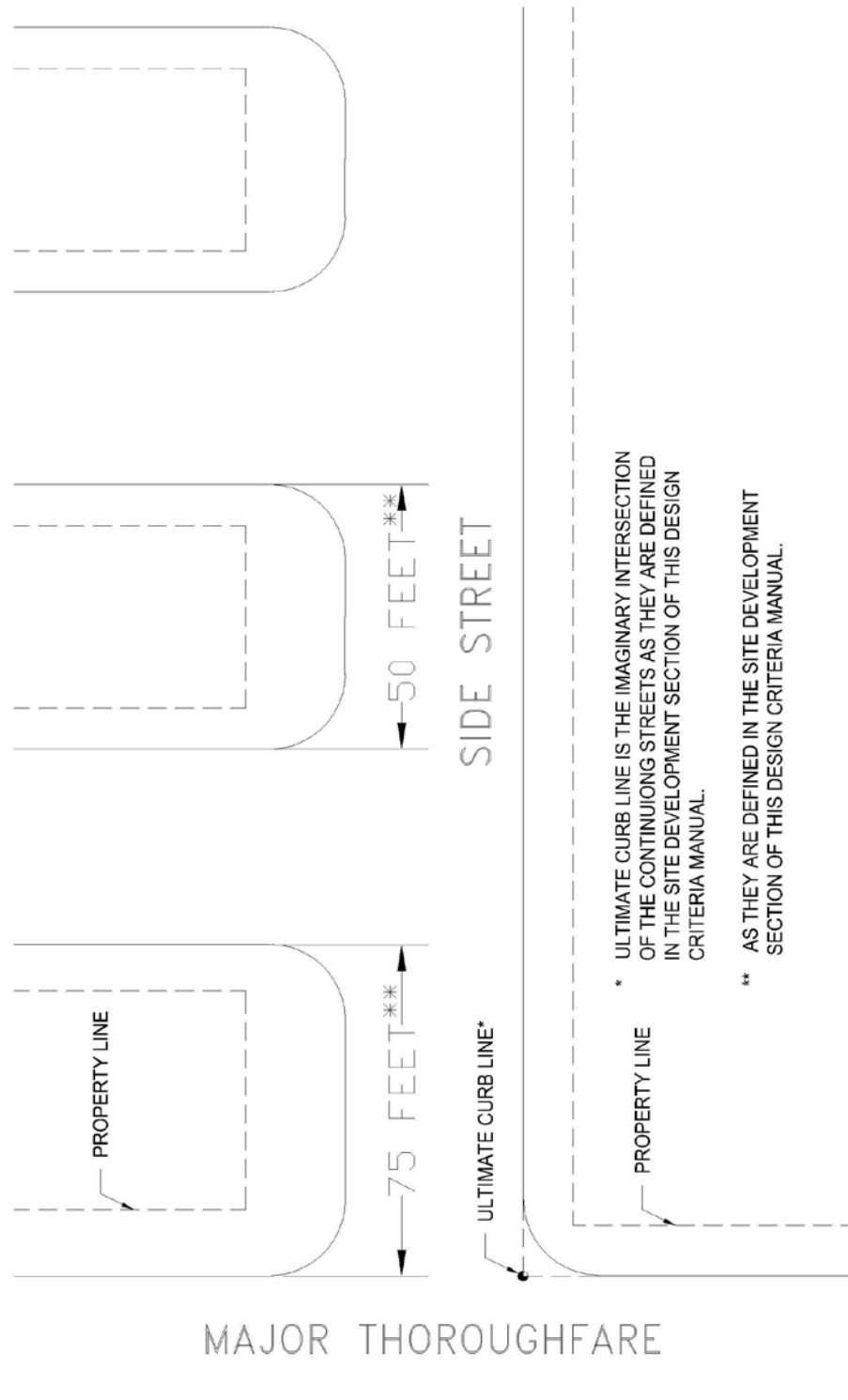
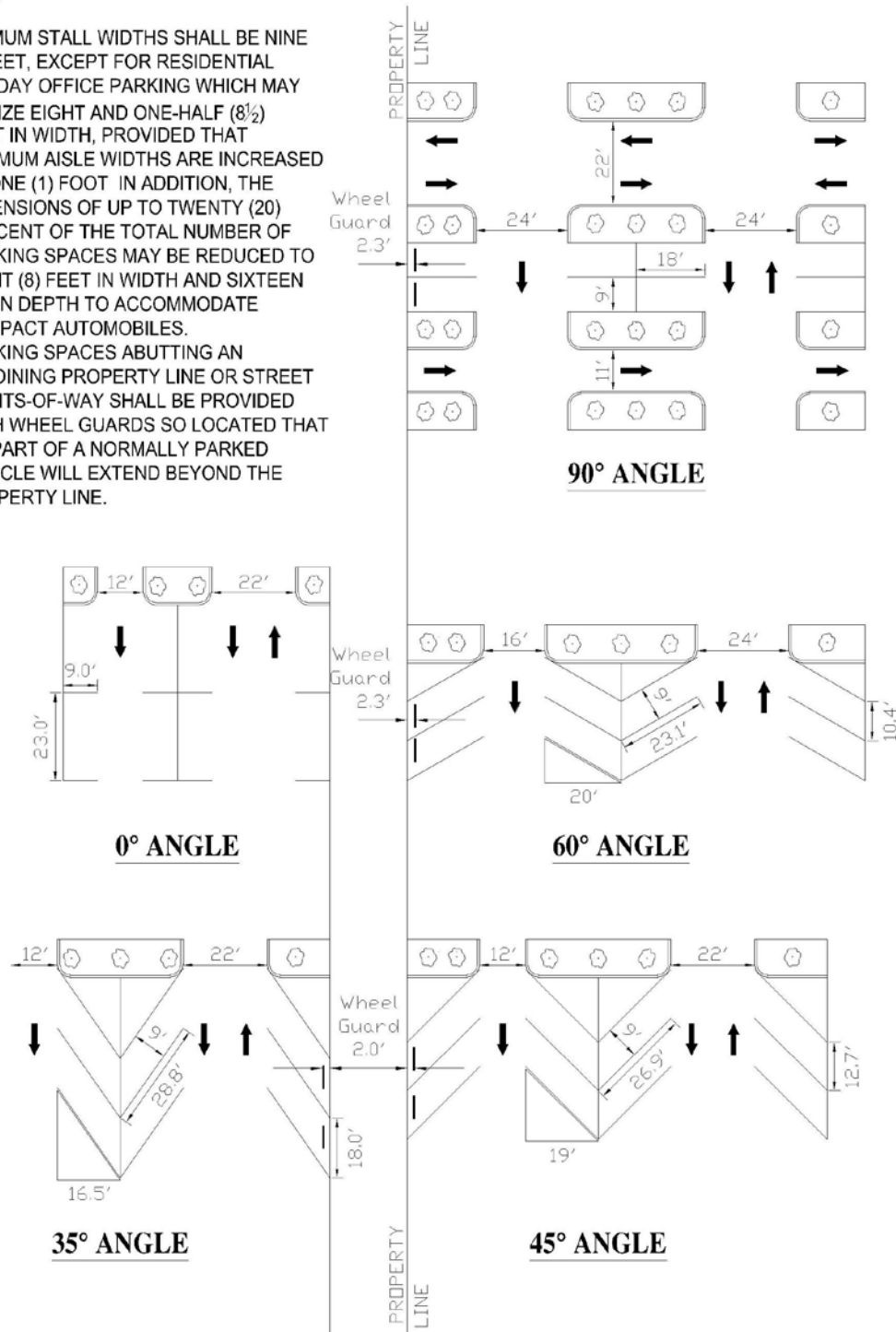


FIGURE 9 OFFSTREET PARKING

NOTES:

1. MINIMUM STALL WIDTHS SHALL BE NINE (9) FEET, EXCEPT FOR RESIDENTIAL ALL-DAY OFFICE PARKING WHICH MAY UTILIZE EIGHT AND ONE-HALF (8½) FEET IN WIDTH, PROVIDED THAT MINIMUM AISLE WIDTHS ARE INCREASED BY ONE (1) FOOT. IN ADDITION, THE DIMENSIONS OF UP TO TWENTY (20) PERCENT OF THE TOTAL NUMBER OF PARKING SPACES MAY BE REDUCED TO EIGHT (8) FEET IN WIDTH AND SIXTEEN (16) IN DEPTH TO ACCOMMODATE COMPACT AUTOMOBILES.
2. PARKING SPACES ABUTTING AN ADJOINING PROPERTY LINE OR STREET RIGHTS-OF-WAY SHALL BE PROVIDED WITH WHEEL GUARDS SO LOCATED THAT NO PART OF A NORMALLY PARKED VEHICLE WILL EXTEND BEYOND THE PROPERTY LINE.



APPENDIX C

Parking Group Table

Parking Use Category	Parking Spaces*
Accommodation	
<i>Accommodations:</i>	1.25 spaces per sleeping room or unit, plus the following meeting per banquet space: - less than 10 sq. ft. per sleeping room = none; - 10 to 20 sq. ft. per sleeping room = 30 spaces per 1,000 sq. ft. GFA; - 21 to 50 sq. ft. per sleeping room and over 50 sq. ft. per sleeping room = 20 spaces per 1,000 sq. ft. GFA.
<i>Accommodations with food:</i>	1.25 spaces per sleeping room or unit, plus 10 spaces per 1000 sq. ft. GFA restaurant lounge, plus the following for meeting/banquet space: - less than 10 sq. ft. per sleeping room = none; - 10 to 20 sq. ft. per sleeping room = 30 spaces per 1,000 sq. ft. GFA; - 21 to 50 sq. ft. per sleeping room and over 50 sq. ft. per sleeping room = 20 spaces per 1,000 sq. ft. GFA.
Adult Establishment	1 space for every 4 seats or 1 space for every 50 sq. ft. of customer service area, whichever is greater.
Agricultural, Forestry, Fishing, and Hunting Uses	2 per site plus 1 per 1,000 sq. ft. enclosed floor area.
Amusement and Recreation Industries	
<i>Arcade:</i>	1 space per 200 sq. ft. GFA.
<i>Driving/Archery/Shooting Range:</i>	1 space per 200 sq. ft. GFA of indoor facilities plus 1 space per tee or target.
<i>Fairground, Exhibition, Carnival:</i>	1 space per 500 sq. ft. of outdoor site area plus 1 space per 4 fixed spectator seats.
<i>Fitness and Recreational Sports:</i>	7 spaces per 1,000 sq. ft. GFA.
<i>Golf Course:</i>	1 space per 150 sq. ft. GFA of indoor facilities plus 5 spaces per green.
<i>Miniature Golf:</i>	1 space per 200 sq. ft. GFA of indoor facilities plus 1.5 spaces per hole.
<i>Rodeo, Circus, Auto/Motorcycle Racing:</i>	1 space per 3 spectator seats.
<i>Skateboarding, Water Slide:</i>	1 space per 200 sq. ft. GFA of indoor facilities plus 1 space per 2 persons design capacity of outdoor facilities.
<i>Sports fields, Swimming Pools, Private Parks, and Playgrounds:</i>	1 space per 100 sq. ft. GFA of indoor facilities plus 1 space per 4 persons design capacity of outdoor facilities, including both participants and spectators, as applicable.
<i>Tennis Courts and Other Sports Courts:</i>	2 spaces per court.
Arts, Entertainment, and Recreations	
<i>Arena:</i>	- .33 spaces per seat.
<i>Baseball Stadium:</i>	- .35 spaces per seat.
<i>Football Stadium:</i>	- .31 spaces per seat.

Parking Use Category	Parking Spaces*
Arts, Entertainment, and Recreations (cont.):	
<i>Theater (live performances):</i>	- .40 spaces per seat.
<i>All Other Public Assembly:</i>	- .25 spaces per person in permitted capacity.
<i>Convention Centers, Meeting/Banquet Facilities, not within a hotel or in a hotel, but exceeding 100 sq. ft. per sleeping room:</i>	- up to 25,000 sq. ft. = 30 spaces per 1,000 sq. ft. GFA; plus - 25,000 to 50,000 sq. ft. = 20 spaces per 1,000 sq. ft. GFA; plus - 50,000 and 100,000 sq. ft. = 10 spaces per 1,000 sq. ft. GFA; plus - 100,000 or more sq. ft. = 6 spaces per 1,000 sq. ft. GFA.
Automotive Repair	3 spaces per service bay (service bays not included as parking).
Broadcast and Telecommunication	1 space for each 300 sq. ft. GFA.
Car Wash	2 per wash bay plus 3 stacking spaces per bay.
Civic, Social, and Fraternal Associations:	1 space for each 300 sq. ft. GFA.
Educational Services (based on maximum design capacity)	
<i>Daycare Center or Pre-Elementary:</i>	.3 spaces per person licensed capacity enrollment.
<i>Elementary, Middle Schools:</i>	Higher of .2 spaces per seat in auditorium/gym or .25 spaces per student.
<i>Secondary Schools:</i>	Higher of .3 spaces per seat in auditorium/gym or .3 spaces per student.
<i>College or University:</i>	To be established based on a study of parking needs prepared specifically for the subject institution.
<i>Other Classroom based:</i>	6 spaces per 1,000 sq. ft. GFA;
<i>Other Not Classroom based:</i>	10 spaces per 1,000 sq. ft. GFA.
Finance and Insurance	
<i>General Business Offices:</i>	- up to 25,000 sq. ft. = 3.8 spaces per 1,000 sq. ft. GFA; plus - 25,000 to 100,000 sq. ft. = 3.4 spaces per 1,000 sq. ft. GFA; plus - 100,000 or more sq. ft. = 2.8 spaces per 1,000 sq. ft. GFA.
<i>Consumer Service Offices:</i>	4.6 spaces per 1,000 sq. ft. GFA.
<i>Data Processing, Telemarketing, Operations:</i>	6 spaces per 1,000 sq. ft. GFA.
Food Service	
<i>Restaurant:</i>	10 spaces per 1,000 sq. ft. GFA;
<i>Restaurant bar area:</i>	15 spaces per 1,000 sq. ft. GFA;
<i>Fast Food:</i>	8 spaces per 1,000 sq. ft. GFA;
<i>Take Out and Delivery Only:</i>	3 spaces per 1,000 sq. ft. GFA;
<i>Night Clubs:</i>	15 spaces per 1,000 sq. ft. GFA.
Gas Station	1 space for each side of a gasoline pump unit.
Health Care and Social Assistance	
<i>Medical Offices (not on hospital campus):</i>	4.5 spaces per 1,000 sq. ft. GFA.
<i>Medical Offices (on hospital campus):</i>	4 spaces per 1,000 sq. ft. GFA.

Parking Use Category	Parking Spaces*
Hospitals, Nursing, and Residential Care Facilities	
<i>Hospital/Medical Center:</i>	To be established based on a study of parking needs prepared specifically for the subject institution.
<i>Elderly Housing:</i>	1 space per dwelling unit.
<i>Congregate Care/Assisted Living:</i>	.35 spaces per dwelling unit.
<i>Group, Convalescent, and Nursing Home:</i>	.5 spaces per bed.
Information Services	3 spaces for each 5 employees on largest shift.; or 1 space per 600 sq. ft. GFA.
<i>Cinemas:</i>	- Single screen - 2 to 5 screens - 5 to 10 screens - Over 10 screens
Mining, Utilities, Construction, Manufacturing, Transportation, and Warehousing	3 spaces for each 5 employees on largest shift.; or 1 space per 600 sq. ft. GFA.
<i>Industrial/Manufacturing:</i>	1.85 spaces per 1,000 sq. ft. GFA plus required parking spaces for office, sales, or similar use where those uses exceed 10% GFA.
Mobile Home	2.5 spaces per trailer unit.
Non-Store Retailers	1 space for each 2,000 sq. ft. GFA.
Other Services	1 space for each 250 sq. ft. GFA.
Professional, Scientific, and Technical Services; Management of Companies and Enterprises; Administration/Support Services	
<i>General Business Offices:</i>	- up to 25,000 sq. ft. = 3.8 spaces per 1,000 sq. ft. GFA; plus - 25,000 to 100,000 sq. ft. = 3.4 spaces per 1,000 sq. ft. GFA; plus - 100,000 or more sq. ft. = 2.8 spaces per 1,000 sq. ft. GFA.
Public Administration	1 space for each 300 sq. ft. GFA.
Real Estate, Rental, and Leasing	1 space for each 300 sq. ft. GFA.
Religious Organizations	.4 spaces per seat.
Residential Uses	
<i>Single Family Dwellings</i>	- less than 3,000 sq. ft. = 2 spaces per dwelling unit; - more than 3,000 sq. ft. = 3 spaces per dwelling unit
<i>Multi-Family Dwellings Rental:</i>	- 1 space per dwelling unit for efficiency units; - 1.5 spaces per dwelling unit for 1st bedroom in units with 1 or more bedrooms, plus .25 spaces for each additional bedroom.
<i>Multi-Family Dwellings Owned:</i>	- 1.0 spaces per dwelling unit for efficiency units; - 1.75 spaces per dwelling unit for the 1st bedroom in units with 1 or more bedrooms, plus .25 spaces for each additional bedroom.
<i>Rental in University District</i>	1 space per dwelling unit for efficiency and 1 bedroom units; plus .5 spaces for each additional bedroom.

Parking Use Category	Parking Spaces*
Retail Trade	4 spaces per 1,000 sq. ft. GFA.
Shopping Centers	- 6 spaces per 1,000 sq. ft. GFA up to 200,000 sq. ft.; - 5.5 spaces per 1,000 sq. ft. GFA over 200,000 sq. ft.
Transit and Ground Passenger Transportation; Scenic & Sightseeing	1 space per 100 sq. ft. GFA.
Truck Transportation; Warehousing & Storage	1 space for each 1,000 sq. ft. non-office floor area, plus 1 space for each 300 sq. ft. office area.
Vehicle Dealers	1 space for each 5,000 sq. ft. of lot area.
Wholesale Trade	1 space per 2,000 sq. ft. gross floor storage per sales area.

**Staff may approve a 5% deviation from the recommended parking requirements, unless an alternative plan is approved by the Planning and Zoning Commission.*

APPENDIX D

Qualified Tree List

<u>Common name</u>	<u>Botanical name</u>	<u>Class</u>	<u>N/I</u>	<u>Site</u>	<u>Light</u>	<u>Size</u>	<u>Foilage</u>
Bald Cypress	Taxodium distichum	1	N	2, 3	2	1	D
Bur Oak	Quercus macrocarpa	1	N	2	1	1	D
Cedar Elm	Ulmus crassifolia	1	N	2	1	2	D
Drummond Red Maple	Acer rubrum var. drummondii	1	N	2	1	2	D
Eastern Redbud	Cercis canadensis	1	N	2	2	2	D
Live Oak	Quercus virginiana	1	N	2	1	1	SE
Overcup Oak	Quercus lyrata	1	N	2, 3	1	1	D
Pecan	Carya illinoensis	1	N	2	1	1	D
Possumhaw Holly	Ilex decidua	1	N	2	1, 2	3	D
Shumard Red Oak	Quercus shumardii	1	N	2	1	1	D
Southern Magnolia	Magnolia grandiflora	1	N	2	1	1	E
Swamp Chestnut Oak	Quercus michauxii	1	N	2, 3	1	1	D
Sweet-Bay Magnolia	Magnolia virginiana	1	N	2	2	2	E
Wax Myrtle	Myrica cerifera	1	N	2, 3	1	3	E
American Elm	Ulmus americana	2	N	2	1	1	D
American Sycamore	Platanus occidentalis	2	N	2	1	1	D
Anacua/Sandpaper Tree	Ehretia anacua	2	N	2	1	2	E
Arrow-wood Viburnum	Viburnum dentatum	2	N	2	2	3	D
Black Hickory	Carya texana	2	N	2	1, 2	2	D
Black Walnut	Juglans nigra	2	N	2	1, 2	1	D
Blackgum	Nyssa sylvatica	2	N	2, 3	1, 2	3	D
Callery Pear/Braford	Pyrus calleryana	2	I	2	1	3	D
Carolina buckthorn	Rhamnus caroliniana	2	N	2	1, 2	3	D
Chalk Maple	Acer leucoderme	2	N	2	2	2	D
Cherry Laurel	Prunus caroliniana	2	N	2	2	2	E
Chinese Elm	Ulmus parvifolia	2	I	2	1	2	D
Chinquapin Oak	Quercus muhlenbergii	2	N	2	1	1	D
Common Crapemyrtle	Lagerstroemia indica	2	I	2	1	3	D
Common Fig	Ficus carica	2	I	2	1	3	D
Common Persimmon	Diospyros virginiana	2	N	2	1	2	D
Eastern Red Cedar	Juniperus virginiana	2	N	2	1, 2	2	E
Eve's Necklace	Sophora affinis	2	N	1	1	3	D
Green Ash	Fraxinus pennsylvanica	2	N	2, 3	1, 2	1	D
Huisache	Acacia farnesiana	2	N	1	1	3	D
Loblolly Pine	Pinus taeda	2	N	2	1	1	E
Mexican Plum	Prunus mexicana	2	N	1	1	3	D
Nuttall Oak	Quercus nuttallii	2	N	2, 3	1	1	D
Ornamental Holly	Ilex spp.	2	I	2	1, 2	3	E
Paloverde	Parkinsonia aculeata	2	N	1	1	2	D

<u>Common name</u>	<u>Botanical name</u>	<u>Class</u>	<u>N/I</u>	<u>Site</u>	<u>Light</u>	<u>Size</u>	<u>Foliage</u>
Parsley Hawthorn	Crataegus marshallii	2	N	2	2	3	D
Post Oak	Quercus stellata	2	N	2	2	1	D
Red Bay	Persea borbonia	2	N	2	2	2	E
River Birch	Betula nigra	2	N	2, 3	2	2	D
Rough-leaf Dogwood	Cornus drummondii	2	N	1, 2	3	3	D
Rusty Blackhaw Viburnum	Viburnum rufidulum	2	N	2	2	3	D
Sassafras	Sassafras albidum	2	N	2	2	2	D
Scarlet (Red) Buckeye	Aesculus pavia	2	N	2	2	3	D
Shagbark Hickory	Carya ovata	2	N	2	1	1	D
Slash Pine	Pinus elliottii	2	I	2	1	1	E
Snowbell	Styrax americana	2	N	2	1, 2	3	D
Southern Red Oak	Quercus falcata var. pagoda	2	N	2	1	1	D
Sweetgum	Liquidambar styraciflua	2	N	2	1	1	D
Texas Mountain-Laurel	Sophora secundiflora	2	N	1	1	3	E
Texas Persimmon	Diospyros virginiana(male)	2	N	1	1	3	D
Texas Pistache	Pistacia texana	2	N	1	1	3	D
Texas Redbud	Cercis canadensis texensis	2	N	1, 2	2	3	D
Water Hickory	Carya aquatica	2	N	2, 3	1	2	D
Water Oak	Quercus nigra	2	N	2, 3	1	1	D
Western Soapberry	Sapindus drummondii	2	N	2	1	2	D
White Ash	Fraxinus americana	2	N	2	1	1	D
White Oak	Quercus alba	2	N	2	1	1	D
Willow Oak	Quercus phellos	2	N	2, 3	1	1	D
Winged Elm	Ulmus alata	2	N	2	1	2	D
Woollybucket Bumelia	Bumelia lanuginosa	2	N	2	2	2	D
Wright Acacia	Acacia wrightii	2	N	1	1	3	D
Yaupon Holly	Ilex vomitoria	2	N	2	1, 2	3	E
American Elderberry	Sambucus canadensis	3	N	2	2	3	D
American Holly	Ilex opaca	3	N	2	2	2	E
American Hornbeam	Carpinus caroliniana	3	N	2	2	2	D
Black Locust	Robinia pseudoacacia	3	N	2, 3	1	2	D
Black Willow	Salix nigra	3	N	3	1	2	D
Box-Elder Maple	Acer negundo	3	N	2	2	2	D
Camphor-Tree	Cinnamomum camphora	3	I	2	1	2	E
Catalpa	Catalpa bignonioides	3	N	2	1	2	D
Common Pear	Pyrus communis	3	N	2	1	2	D
Eastern Cottonwood	Populus deltoides (male)	3	N	2	1	1	D
Flowering Crabapple	Malus spp.	3	I	2	1	3	D
Hercules-Club Prickly-Ash	Zanthoxylum clava-herculis	3	N	1	1	3	D
Honey-Locust	Gleditsia triacanthos	3	N	2, 3	1	2	D
Japanese Yew	Podocarpus macrophyllus	3	I	2	1	2	E
Japanese Maple	Acer palmatum	3	I	2	2	3	D
Loquat	Eriobotrya japonica	3	I	2	2	3	E
Mesquite	Prosopis glandulosa	3	N	1	1	2	D

<u>Common name</u>	<u>Botanical name</u>	<u>Class</u>	<u>N/I</u>	<u>Site</u>	<u>Light</u>	<u>Size</u>	<u>Foliage</u>
Mexican Buckeye	Ungnadia speciosa	3	N	1	1	3	D
Red Mulberry	Morus rubra	3	N	2	1	2	D
Sugar Hackberry	Celtis laevigata	3	N	2	1, 2	2	D
Vitex	Vitex agnus-castus	3	I	1	1	3	D
Water Tupelo	Nyssa aquatica	3	N	3	2	1	D
Weeping Willow	Salix babylonica	3	I	3	1	2	D
Arborvitae	Thuja spp.	4	I				
Arizona Ash	Fraxinus velutina	4	I				
Berlandier Ash	Fraxinus berlandieriana	4	I				
Chinaberry	Melia azedarach	4	I				
Chinese Pistache	Pistacia chinensis	4	I	2	1	2	D
Chinese Tallow	Sapium sebiferum	4	I				
Eucalyptus	Eucalyptus spp.	4	1	1, 2	1	3	E
Golden-Raintree	Koelreuteria paniculata	4	I	2	1	2	D
Japanese Black Pine	Pinus thunbergi	4	I	2	1	2	E
Mimosa(Silktree)	Albizia julibrissin	4	I				
Mulberry	Morus alba	4	I	2	1	2	D
Siberian Elm	Ulmus pumila	4	I				
Silver Maple	Acer saccharinum	4	I				
Tulip-Tree	Liriodendron tulipifera	4	I	2	1	1	D

Trees are divided into four classes. Class 1 and 2 trees are considered the most valuable in enhancing the environment and are the most likely to prosper in the Friendswood area. Therefore, only Class 1 and 2 trees shall be approved as new plantings for a) city parks and property, and parking lots and; b) for streets or other public right-of-ways, respectively, unless otherwise approved by the City Engineer on the advice of an Urban Forester. Species that are classified as shade trees will reach a height and size that will conflict with overhead powerlines, permanent structures, or the canopy will exceed the limits of a confined space. Species that are classified as small trees will not provide the protection or aesthetic impact of a large shade tree, yet they are suitable for planting beneath powerlines and are good alternatives for areas of limited space.

Class 1: For the most part this class is for trees that are native, will do relatively well in the Friendswood area, have few diseases or pest problems, are easy to find in local nurseries, and with few exceptions (redbud, possumhaw, and waxmyrtle) are larger in size.

Class 2: This class is for trees that are mostly native, will still do well in the Friendswood area, have little disease or pest problems, sometimes not quite as easy to find in nurseries, are more varied in size, and in many cases are more suitable for wildlife. These trees tend to have larger and messier fruit and/or are thornier than trees in Class 1. Some of these trees are also more prone to some decay at maturity and might not do as well in urbanized areas.

Class 3: This class starts to pick up more introduced species, the trees might or might not do as well in the Friendswood area, require a little more maintenance and care, the natives

might be harder to find in a nursery while the introduced species may be more readily available and in some cases these trees are more prone to decay, disease and pest problems.

Class 4: this class is exclusively introduced species. They may or may not do well in Friendswood. If they do grow well they have the potential to become invasive species and cause problems for local ecosystems and are more prone to decay, disease and pest problems. **NOT RECOMMENDED FOR PLANTINGS.**

Classifications:

- N – Native
- I – Introduced

Site:

- 1 – Xerophytic (requires little water)
- 2 – Mesic (requires moderate water with good drainage)
- 3 – Aquatic (tolerates poor drainage once established 3 years)

Light:

- 1 – Full Sun (requires a minimum of 6 hours of direct sunlight)
- 2 – Partial Sun (requires a minimum of 3 to 6 hours of direct sunlight)
- 3 – Shade (requires less than 3 hours of direct sunlight)

NOTE: Lower rating number on this scale is the minimum, but can use the next higher rating (i.e. a rating of 2 can also use the rating of 1, a rating of 3, can also use the ratings of 1 and 2)

Size:

- 1 – 60 feet and greater ultimate height (large shade tree)
- 2 – 30 to 60 feet in ultimate height (medium tree)
- 3 – 30 feet and less in ultimate height (small tree)

Foliage:

- D – Deciduous (sheds leaves annually) If placed on the south and west walls will reduce indoor temperatures in summer by shading the roof and walls. In winter, these trees allow sunlight through to help heat the building.
- E – Evergreen (having green leaves/needles throughout the year) can create a wind break if placed on the northwest side of a building.
- SE – Semi evergreen

For example, the code for Live Oak is 1/N/2/1/1, which indicates that the Live Oak is a Class 1 species that is native to Texas, requires moderate water with good drainage, demands or tolerates full sun, and will exceed 60 feet in ultimate height. As a shade tree, the Live Oak will provide protection and has aesthetic impact but the tree is not suitable for planting beneath powerlines or within confined spaces, or in streets or other public rights-of-way.

APPENDIX E

Downtown District Amenities

Streetscape furnishings, as required by City of Friendswood Code of Ordinances, Appendix C – Zoning Ordinance for the Downtown District, are important functional elements and amenities. They should be of high quality, designed for outdoor use, and require minimal maintenance. All provided amenities shall be permanently maintained by the property owner, including paved walkways.

SEATING

Seating should be durable and comfortable. Sharp edges and poorly designed or fabricated furniture should be avoided. Metal is the required material. The seating design should complement other furnishings. All seating should be secured permanently to paved surfaces for safety and to avoid vandalism. The bench below is the preferred model; however, other benches of similar size and features may be approved by the Planning and Zoning Commission.



Manufacturer: Webcoat Products
Product: Metal benches
Model: B5WBCLASSIC
Size: 5'
Color/finish: Black finish
Aluminum frame w/contoured backs

TREE WELLS

Tree wells are an attractive way to protect trees planted in paved areas. Appropriate tree grates and tree wells should be similar to the following:



TREE GRATES

Manufacture: Neenah Foundry Company
Product: Tree grate
Model: ASTM A-48, Metropolitan Series



TREE WELLS

LIGHT POLES

Lighting plays an important part in the character, function, and security of a streetscape. It should be consistent with other streetscape elements and integrate the historic nature of the Downtown District. Light poles shall be the “Bishop’s Crook” style. The light pole below is the preferred model; however, other light poles of similar size and features may be approved by the Planning and Zoning Commission.

	Manufacturer:	Hadco
	Product:	Aluminum Pole w/Teardrop Fixture
	Color/finish:	Black powder coat
		Lighting must be metal halide or LED with full cutoff or semi cutoff fixtures that emits 7,000 to 8,000 lumen, or the equivalent thereof, and 5,000 to 6,000K (Kelvin – color temperature).

Lamp height maximum shall be 12’. Lamp height minimum shall be 10’. Lamp shall be positioned towards the rights-of-way to illuminate the public walkway.

Lamp height is the actual lamp height above ground measured at the bottom of the lamp fixture, where the globe or bulb begins.

TRASH RECEPTACLES

Trash receptacles should be easily accessible for pedestrians and trash collection. They must be placed to be unobtrusive yet effective and their design should relate to other site furnishings. Trash receptacles should be firmly attached to paving to avoid vandalism. They should include covered tops and sealed bottoms to keep contents dry and out of sight at all times. Appropriate trash receptacles should be similar to the following:

	Manufacturer:	Victor Stanley, Inc.
	Product:	Trash receptacle
	Model:	Steelsites RB series
	Color/finish:	Black finish TGIC polyester powder coat

PAVERS

Brick pavers must be used to construct the required brick-paved sidewalk in accordance with the specifications below. The paver color and pattern below is the preferred design; however, other pavers of similar colors and patterns may be approved by the Planning and Zoning Commission.

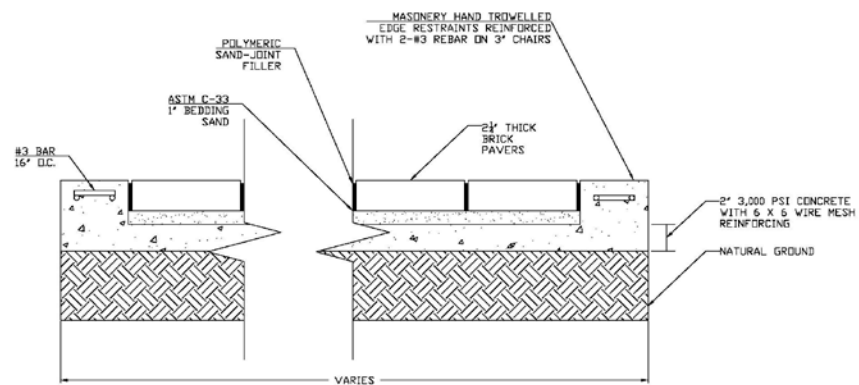
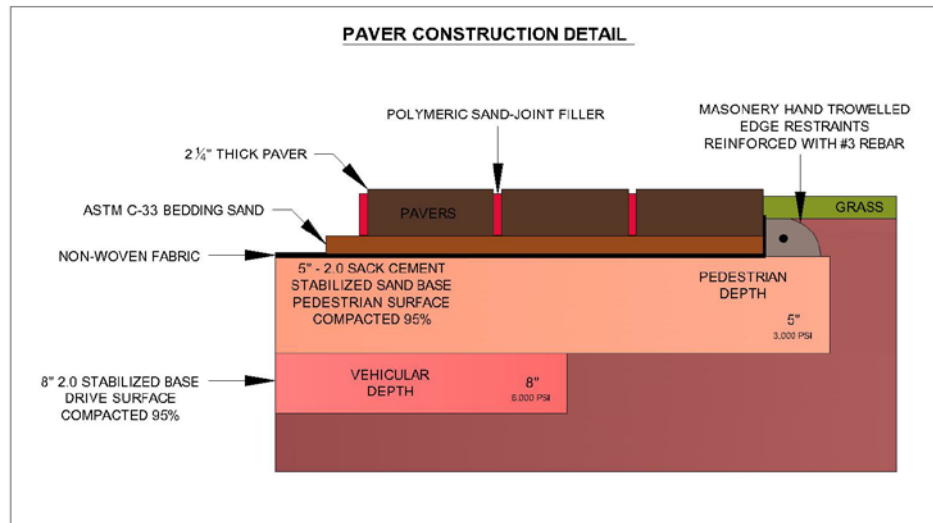
	Manufacturer:	Pine Hall Brick Company, Inc.
	Product:	Pavers
	Model:	Pathway Series, Full Range
	Size:	4" W x 8" L x 2 ¼" thick
	Color:	Red
	Pattern:	Stretcher Bond

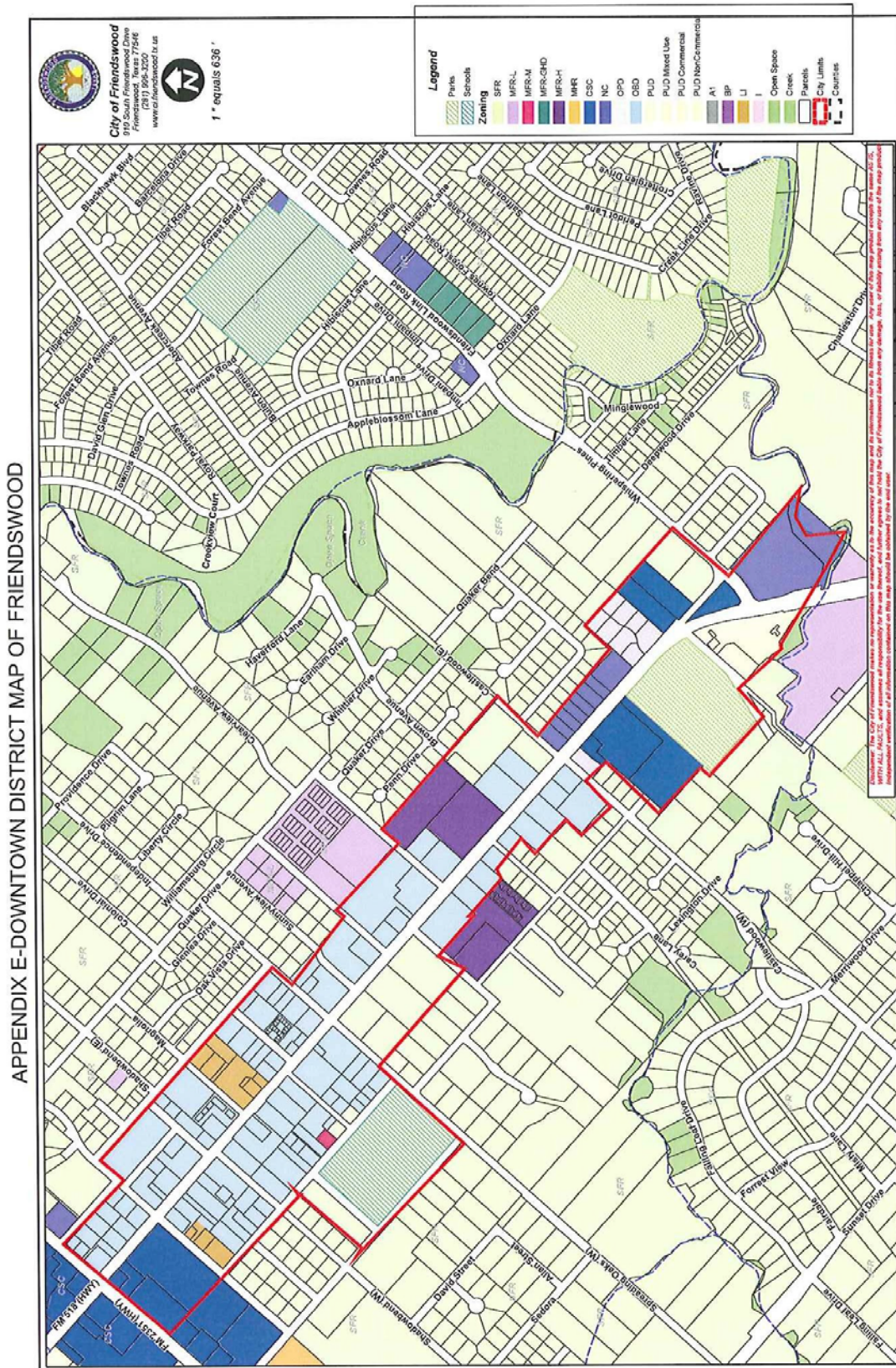
Brick pavers must be set on a sand base with a concrete border as stated below and shown on the attached construction detail drawing. No concrete or stamped concrete is allowed for the sidewalk surface.

Paver installation specs:

- 5" of 2.0 sack cement stabilized sand base
- Non-woven fabric weed block
- 1" of ASTM C-33 bedding sand
- 2 ¼" thick brick unit paver
- Polymeric joint sand
- Masonry hand troweled edge restraints reinforced with #3 rebar

If the pavers are a part of a drive surface for vehicular traffic, an 8" 2.0 stabilized base drive surface, compacted 95% must be installed below the 5" of 2.0 sack cement stabilized sand base.





APPENDIX F

Culverts and Driveways Policy

The purpose of this policy is to establish guidelines, procedures, and standard practices regarding installation, maintenance, and repair of culverts and driveways in new and old subdivisions with open ditches.

I. REPLACEMENT OF DRIVEWAY/CULVERTS DUE TO REPAIRS

- A. If a failure occurs on an existing paved driveway located within the City rights-of-way due to a defect in the existing public infrastructure (i.e., leaking or broken water or sanitary sewer line, failure in storm sewer, culvert failure, etc.) the City will remove the damaged pavement, repair or replace the damaged infrastructure, and replace the pavement up to the rights-of-way line at no cost to the property owner.
- B. If a failure occurs on an existing paved driveway located within the City rights-of-way due to age, wear, or subsidence, and the public infrastructure is found to be in good condition, the property owner shall be responsible for the removal and replacement of the driveway, such replacement being accomplished according to the Ordinances, Design Criteria, Standard Details, and Technical Specifications of the City. In addition, the property owner shall be responsible for any damages that may occur to existing public infrastructure, including the culverts, during the construction process. The property owner shall obtain a building permit from the City for the driveway replacement and shall call in for inspections as needed.
- C. If the driveway to be replaced is on an open ditch street, the culverts may be replaced with the same size as existing with no drainage calculations required, unless:
 - i. They are smaller than the 18" minimum requirements, or
 - ii. The whole drainage ditch is being enclosed (see paragraph III).
- D. When new culverts are installed and concrete paving is being replaced, construction joints shall be installed as shown in Detail A.

II. PROPOSED DRIVEWAY CONSTRUCTION/CULVERT INSTALLATION

- A. When a property owner chooses to make improvements to an existing driveway, the property owner is responsible for removing and replacing the culverts as well as the existing paving.

- B. When a property owner chooses to construct a new driveway, the property owner shall install the proper driveway culverts and new pavement.
- C. All work shall be completed in accordance with the City of Friendswood Technical Specifications and Standard Details, latest edition.
- D. When new culverts are installed and concrete paving is being installed, construction joints shall be installed as shown in Detail A.

III. PROPOSED CULVERT INSTALLATION FOR THE PURPOSE OF ENCLOSING OPEN DITCHES FRONTING RESIDENTIAL PROPERTY.

A. Development Permit:

- i. An approved City of Friendswood Development Permit shall be required prior to installation of residential storm sewer (unless the storm sewer is being installed as part of a new residential building, in which case it shall fall underneath the building permit). Development permits shall only be valid for 1 year.
- ii. A plan drawing shall be submitted with the Development Permit Application. The plan shall be drawn to a 1" = 20' scale.
- iii. Pipe diameters, pipe flow lines, inlet flow lines, and inlet rim elevations shall be shown on the drawings.
- iv. All residential storm sewer projects shall extend from property line to property line.
- v. A Traffic Control Plan shall be provided if any of the proposed work involves obstruction of traffic or lane closures of City streets.
- vi. All residential storm sewers shall be made of Reinforced Concrete Pipe (RCP) Class III, with a minimum 18" diameter, and shall be designed for the purpose intended.
- vii. Alternate sizes and styles may be used as long as they meter the same square inch area of the required pipe size, and is approved by the City Engineer.

B. Installation:

- i. Storm sewer inlets shall be located no farther than 15 feet from the property line.
- ii. Storm sewer inlets shall be no farther than 30 feet from center to center.

- iii. Only Type “A” Inlet (Detail B) or Type “S” Inlet (Detail C) shall be used.
- iv. Inlet and junction box size and design shall be approved by the City Engineer.
- v. High points shall be located halfway between inlets with mild swales (see Detail D).
- vi. Elevations on inlet rims shall be a minimum of 3 inches lower than the surrounding high points (see Detail D).
- vii. All storm sewer projects are subject to inspections by City of Friendswood personnel before they are covered up. Such inspections may require changes or corrections to all or part of the culvert installations during any phase of the work. All inspections shall be called into the Building Division at (281) 996-3201 a minimum of 24 hours prior to inspections.
- viii. Contractor shall have a means to determine flows on site (i.e., laser level, level, etc.).
- ix. All storm sewers shall receive a final inspection and approval by City of Friendswood personnel upon completion. Any deficiencies noted shall be completed within 30 days of such notice.
- x. The City of Friendswood reserves the right to adjust or remove all or part of the storm sewer at any time for any reason.
- xi. All work shall be completed in accordance with the latest revisions of this Design Criteria Manual, City of Friendswood Technical Specifications, and City of Friendswood Standard Detail; which can be found online at:

www.ci.friendswood.tx.us/350/Publications-Forms

IV. ACKNOWLEDGEMENT

By signing the permit application, the applicant acknowledges they have received and fully understand the requirements pertaining to the installation of residential storm sewers.

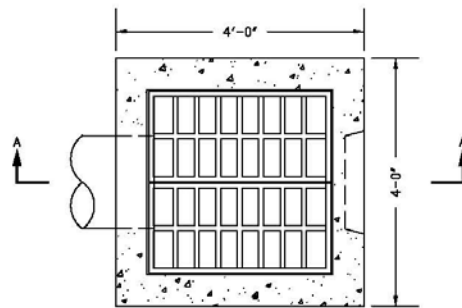


- ## PLAN - ALL STREETS

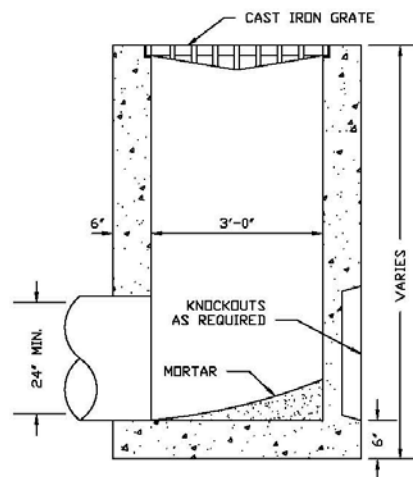


DEPARTMENT OF PUBLIC WORKS

DRAWING: B.S. #11



PLAN



SECTION A-A

TYPE "A" INLET

NOTES:

1. USE #4 REBAR IN 12" D.C.E.W.
2. CONCRETE SHALL BE CLASS "A" WITH A TWENTY-EIGHT DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
3. GRATES SHALL BE CAST IRON.



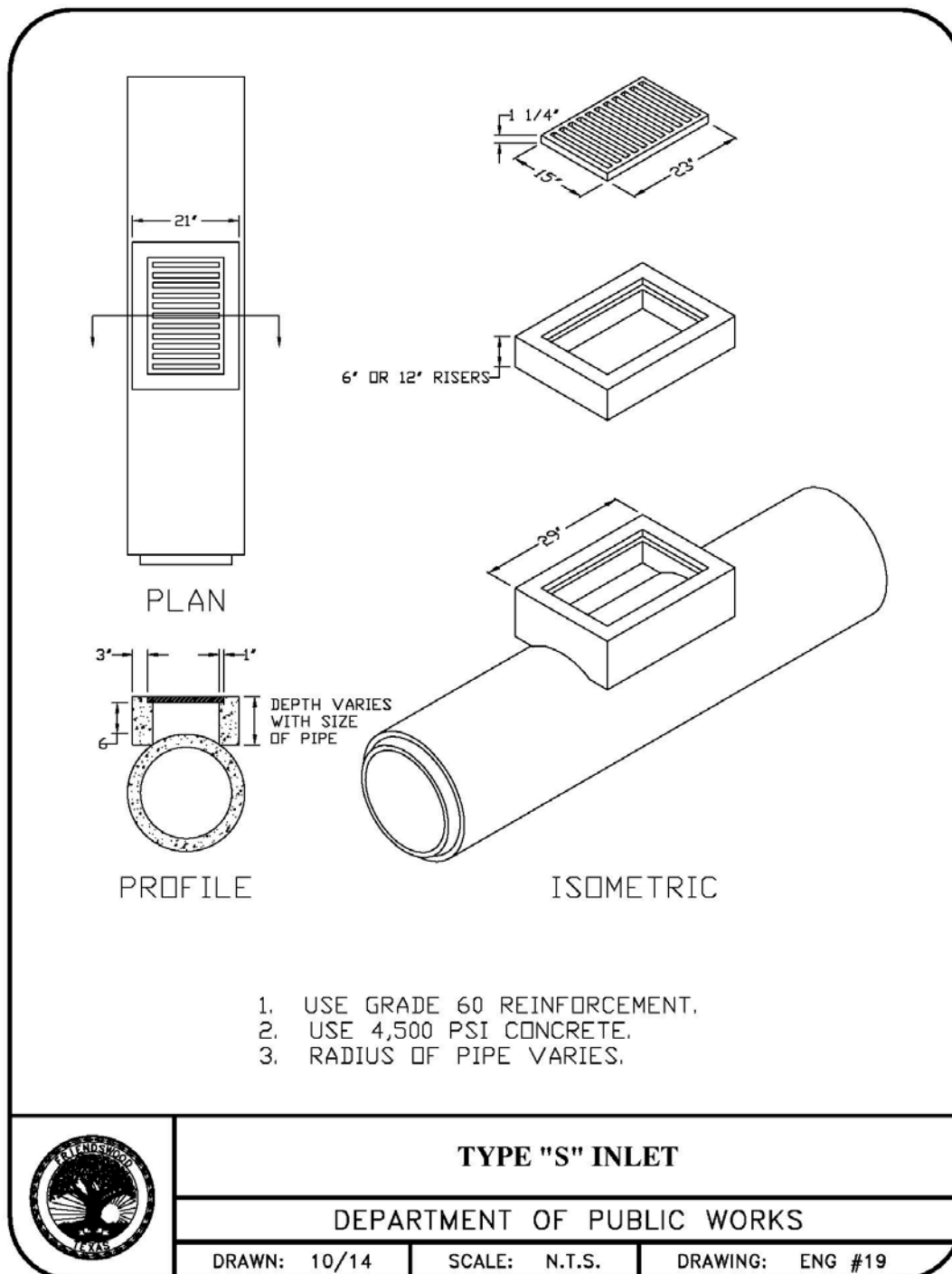
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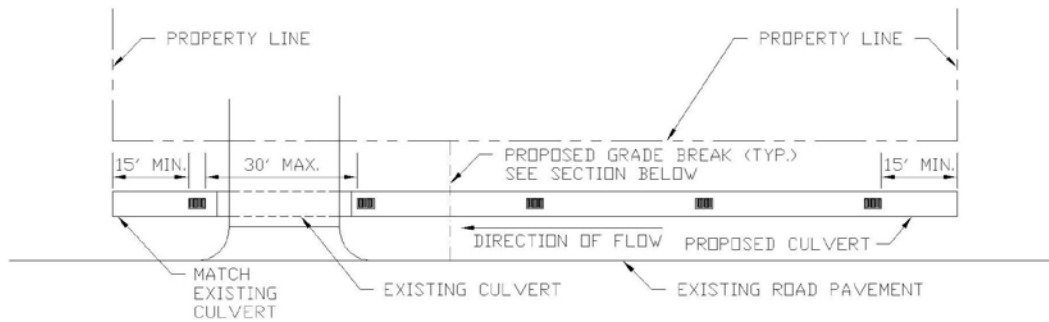
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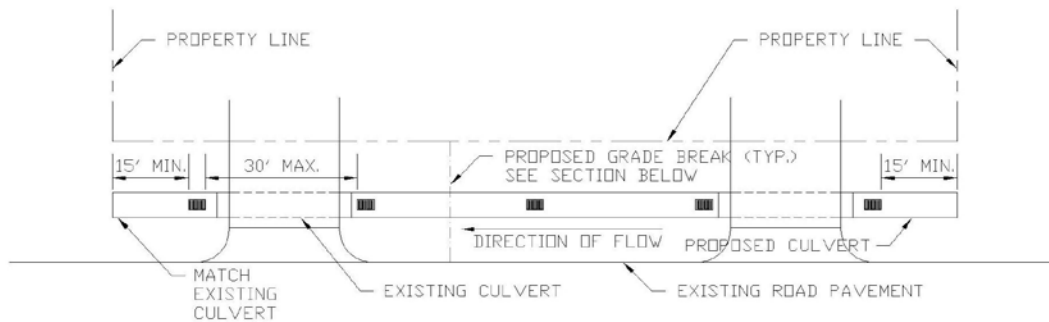
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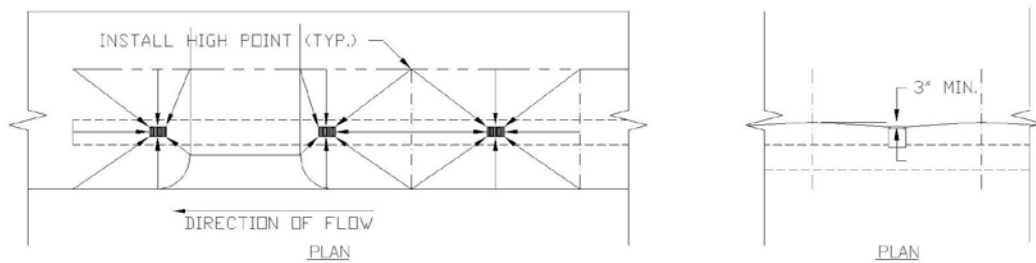




PLAN VIEW FOR SINGLE DRIVEWAY



PLAN VIEW FOR DOUBLE DRIVEWAY



DRAINAGE GRADING



**REQUIREMENTS FOR FILLING IN ROADSIDE
DITCHES IN RESIDENTIAL AREAS**

DEPARTMENT OF PUBLIC WORKS

DRAWN: 10/16

SCALE: N.T.S.

DRAWING: ENG #21

APPENDIX G

Traffic Control Sign Policy

TABLE OF CONTENTS

Attachments List	2
Purpose	3
Scope	3
Terms	4
Procedures	5
Traffic Concern Request Flow Chart	6
Specific Neighborhood Traffic Issues	7
No Parking/Parking Zone Implementation Requests	7
No Parking/Parking Zone Removal Requests	8
Commercial Truck Cut Through Traffic Mitigation Requests	9
Pedestrian Facility Requests	10
School Zone Safety Requests	11
Speed Control Requests	12
Intersection Control Requests (Multi-Way Stops, Traffic Signals, and Roundabouts)	13
“Children at Play” and “Deaf Child Area” Sign Requests	14
Other Advisory or Advanced Warning Sign Requests	14
Other Public Safety and Traffic Issue Requests	14

ATTACHMENTS:

A. No Parking and Parking Zones	15
B. Commercial Truck Cut-Through	18
C. Pedestrian Facilities	20
I. Pedestrian Safety	20
II. Pedestrian Crosswalks	21
III. Pedestrian Signals.....	23
D. School Traffic Safety	25
I. Around Schools	25
II. Around School Buses	26
E. Speed Limits	30
F. Intersection Controls.....	33
I. STOP signs	33
II. YIELD signs.....	34
III. Traffic Signal Installation.....	34
G. Children at Play Signs	36
H. Speed Humps, Bumps, and Lumps.....	37

PURPOSE

This policy establishes consistent procedures for addressing traffic-related concerns that may occasionally arise along roadways within or nearby residential areas in the city. Traffic concerns specifically addressed in this policy include the following:

- No Parking/Parking Zone Requests
- Cut Through Traffic Mitigation Requests
- Pedestrian Treatment Requests
- School Zone Safety Requests
- Speed Control Requests
- Intersection Control Requests (Multi-way Stops, Traffic Signals, and Roundabouts)
- “Children at Play” Sign Requests
- Other Advisory or Advanced Warning Sign Requests
- Other Public Safety and Traffic Issue Requests

Other traffic concerns not specifically addressed in this policy may be presented to staff for review by any citizen, Homeowners Association (HOA) business, or group. The Engineering staff will work with those parties to review their situation and formulate an appropriate response as necessary.

In accordance with the City of Friendswood Code of Ordinances Chapter 82 – Traffic and Vehicles and further stated in Ordinance 300, the Traffic Engineer or their designee, will be responsible for all traffic investigations in the City of Friendswood.

SCOPE

The City of Friendswood is committed to improving the quality of life within its City. When a request is made to review a traffic concern, the City’s direct efforts are to work and coordinate with the requesting party in understanding and addressing concerns in a defined area. The Engineering Department (hereafter called “Engineering”) will inform the affected residents of any significant changes. This policy is applicable only to non-state routes.

The adoption of this policy is not intended and should not be construed to affect or waive the City’s immunity from damages under the Texas Tort Claims Act (CPRC Chapter 101) or any other law or ordinance. This policy does not require the City to install, remove, or modify any traffic control device, sign, signal, or warning device if the City has, in the absence of this policy, the discretion under State law to install, remove, or modify the traffic control device, sign, signal, or warning device. All investigations for traffic concerns and signage shall be investigated and warranted in compliance as outlined in the Texas Manual on Uniform Traffic Control Devices (TMUTCD), latest edition.

TERMS

City Traffic Director – The Duties of the City Traffic Director will be encompassed by the City Engineer. The City Manager will retain the final approval/disapproval authority over all decisions of the City Traffic Director.

Engineering Judgment – The evaluation of available pertinent information, and application of appropriate principles, provisions, and practices as contained in the TMUTCD (see below) and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. Engineering judgment shall be exercised by an engineer, licensed to practice engineering in the State of Texas, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. Documentation of engineering judgement is not required.

HOA – Homeowners Association approved, recognized, and incorporated by law.

Ordinance 300 – The City of Friendswood Ordinance 300 grants the power to the City Traffic Director the authority to determine installation and proper timing and maintenance of traffic control devices, to conduct engineering analyses of traffic accidents to devise remedial measures, to conduct engineering investigations of traffic conditions, to plan the operation of traffic on the streets and highways of the City of Friendswood, and to cooperate with other officials in the development of ways and means to improve traffic conditions, and to carry out the additional powers and duties imposed by the ordinances of this City.

ROW – Right(s)-of-way, the area between property lines given the legal right by usage or grant, for traffic or pedestrian travel.

TMUTCD – Texas Manual on Uniform Traffic Control Devices. The TMUTCD is the authoritative manual on installation, implementation, and maintenance of all types of traffic control devices, both permanent and temporary, for the State of Texas.

Traffic Committee – The Traffic Committee is composed of employees of the City of Friendswood representing the Police Department, the Fire Marshal's Office, the Public Works Department and Engineering Department.

Traffic Study – A traffic study is the procedures and other investigations as described in the TMUTCD to determine if a warrant is necessary for a traffic concern.

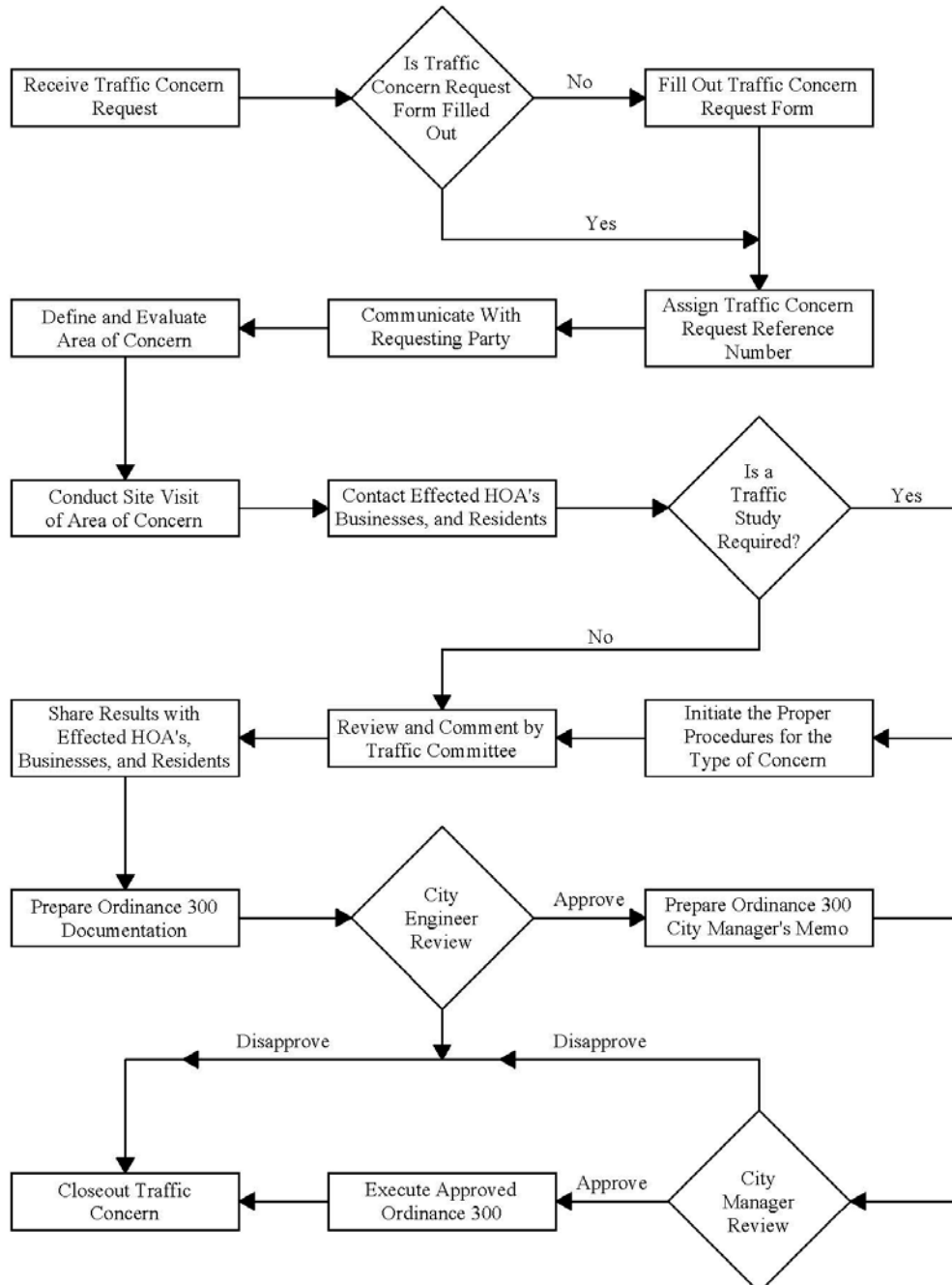
Warrant – a warrant describes the threshold condition based upon average or normal conditions that, if found to be satisfied as part of an engineering study, shall result in analysis of other traffic conditions or factors to determine whether a traffic control device or improvement is justified. Warrants are not a substitute for engineering judgement. The fact that a warrant for a particular traffic control devices is met is not conclusive justification for the installation of the device.

PROCEDURES

1. Residents, homeowners associations, or similar type groups may make a written request to Engineering requesting that a traffic concern be addressed. Traffic concerns may be submitted directly to Engineering via a fillable form at www.ci.friendswood.tx.us/350/Publications-Forms under Traffic.
2. The requesting party's issue will be entered in the Engineering Traffic database to search for similar requests in the subject area.
3. Staff will communicate with the requesting party to fully understand their request and thoroughly define the area of concern.
4. Engineering will identify the area of concern and define the area affected.
5. Engineering staff will evaluate the request, collect data if necessary to confirm the magnitude of the problem, and determine if further study is necessary.
6. If the Engineering staff determines that further study is necessary, procedures to address the specific traffic issue will be implemented. These procedures are detailed in the following portion of this policy, "Specific Traffic Concerns."
7. Should changes be warranted, Engineering shall attempt to convey the proposed changes with the impacted residents before any improvements are implemented.

A flow chart that graphically illustrates the above listed procedures is illustrated on the following page.

Traffic Concern Request Flow Chart



SPECIFIC TRAFFIC CONCERNS

Specific types of traffic requests in the City of Friendswood are addressed in this section of the policy.

No Parking/Parking Zone Implementation Requests

As with all requests to review traffic concerns in the City of Friendswood, requests for “No Parking”/“Parking” zone implementation will be addressed with the same measures outlined in the *Procedures* section of this policy.

- Engineering and the originator of the request will define a study area for property owners that may be impacted by a proposed “No Parking”/“Parking” zone.
- An engineering study will determine if a “No Parking”/“Parking” zone is appropriate for the requested area for twenty-four (24) hours per day or for specific days and/or time periods.
- In order to implement a “No Parking”/“Parking” zone, 100% of the property owners that are projected to be affected adjacent to their property must agree in writing to the “No Parking”/“Parking” zone implementation. The requestor will be required to obtain signatures from the owners.
- If deemed appropriate by an engineering study and agreed to by the property owners that will be affected adjacent to their property, “No Parking”/“Parking” signs will be posted by the entire street, block, or logical termination point as determined by Engineering. Other advisory or advanced warning signs will be placed as dictated by sound common engineering practices or the Texas Manual on Uniform Traffic Control devices, latest edition.
- All “No-Parking”/“Parking” zone applications shall be thoroughly reviewed by Engineering after a period of two (2) full years from the date of implementation. The “No-Parking”/“Parking” zone shall remain in effect unless a compelling safety reason is discovered.

As with all requests to review traffic concerns in the City of Friendswood, should the implementation of a “No Parking”/“Parking” zone in the study area be warranted, Traffic Engineering and Operations shall attempt to convey the proposed changes with the impacted residents before any modifications or improvements are implemented.

Additional information concerning no parking/parking zones is included in the **Attachment A** under the title *No Parking and Parking Zones*.

No Parking/“Parking” Zone Removal Requests

As with all requests to review traffic concerns in the City of Friendswood, requests for “No Parking”/“Parking” zone removal will be addressed with the same measures outlined in the *Procedures* section of this policy.

- An engineering study will determine if the removal of a “No Parking”/“Parking” zone is appropriate for the requested area. If appropriate, “No Parking”/“Parking” signs will be removed by the entire street, block, or logical termination point as determined by Engineering and the requesting party. Other advisory or advanced warning signs will be placed, or removed, as dictated by sound common engineering practice or the Texas Manual on Uniform Traffic Control devices, latest edition.

As with all requests to review traffic concerns in the City of Friendswood, should the removal of a “No Parking”/“Parking” zone in the study area be warranted, Engineering shall attempt to convey the proposed changes with the impacted residents before any modifications or improvements are implemented.

Additional information concerning no parking/parking zones is included in the **Attachment A** under the title *No Parking and Parking Zones*.

Commercial Truck Cut-Through Traffic Mitigation Requests:

As with all requests to review traffic concerns in the City of Friendswood, requests for commercial truck cut-through traffic mitigation control will be addressed with the same measures outlined in the *Procedures* section of this policy.

- An engineering study will determine the measures that are appropriate to address the specific commercial truck cut-through traffic mitigation concerns that may exist for the given the study area. In order to be considered a candidate for measures to reduce commercial truck cut-through traffic, a roadway must be a local roadway or a minor collector roadway with residential characteristics with a peak hour volume of over 375 vehicles in one direction with over 40% cut-through vehicles.
- To implement a plan which limits commercial truck cut-through traffic, 100% of the affected property owners must sign a petition as implemented through these policy guidelines.

As with all requests to review traffic concerns in the City of Friendswood, should changes to the study area to control commercial truck cut-through traffic in the study area be warranted, Engineering shall attempt to convey the proposed changes with the impacted residents before any modifications or improvements are implemented.

Additional information concerning commercial truck cut-through traffic is included in the **Attachment B** under the title *Commercial Truck Cut-Through Traffic Mitigation*.

Pedestrian Facility Requests:

As with all other requests to review traffic issues in the City of Friendswood, requests for pedestrian improvements will be addressed with the same measures outlined in the *Procedures* section of this policy.

- Engineering will study the requested location and perform a crosswalk analysis which includes volume of pedestrian traffic, proximity of the subject location to schools, parks, swimming pools, retail centers, hike and bike facilities, vehicular traffic volume, etc.
- The placement of a crosswalk at an uncontrolled intersection or in the middle of a block shall be considered only in rare cases. In general, the placement of a crosswalk at an uncontrolled intersection may create a false sense of security for pedestrians that could increase the likelihood of a vehicle-pedestrian incident.

As with all other requests to review traffic issues in the City of Friendswood, should pedestrian improvements be warranted, Engineering shall attempt to convey the proposed changes with the impacted residents before any modifications or improvements are implemented.

Additional information concerning pedestrian facilities is included in the **Attachment C** under the titles *Pedestrian Safety*, *Pedestrian Signals*, and *Installation of Marked Crosswalks*.

School Zone Safety Requests.

As with all other requests to review traffic issues in the City of Friendswood, requests for school zone safety will be addressed with the same measures outlined in the *Procedures* section of this policy. School zone safety requests encompass a broad range of requests in the vicinity of a school. Common requests in the City of Friendswood are addressed specifically below. Other requests will be addressed on a case per case basis.

- The traffic policy is not intended to replace or alter the existing provisions and ordinances established by the City of Friendswood.
- Reduced speed school zones are areas in which the speed limit is reduced for certain periods of the day that may be requested by individual citizens, communities, or schools. A traffic engineering study will determine if a reduced speed school zone is warranted based on the proximity of the roadway to the school, the type of school (elementary, junior high, senior high, etc.), vehicular volumes, pedestrian volumes, vehicular speeds, availability of sidewalks, alternative routes between the school residential areas served by the school, and other factors.
- Requests for a crosswalk in the vicinity of a school will be treated with the same procedures as outlined in the “Pedestrian Facility Requests” section of this policy. Proximity to schools and type of vehicular control are major factors in the consideration of crosswalks.
- Parking restrictions in the vicinity of a school will be treated with the same procedures as outlined in the “No Parking Zone Implementation” section of this policy. Proximity of schools is a major factor in the consideration of parking restrictions.
- No right-turn on red at signalized intersections in a school zone is a means to reduce the likelihood of conflicts between right-turn vehicles and school aged children in crosswalks. If appropriate, a traffic engineering study will determine the need for no right-turn on red restrictions based on vehicular volumes, pedestrian volumes, traffic signal timing, and other factors.
- The Texas Manual of Uniform Traffic Control Devices (latest edition) does not require the installation of flashing beacons to alert motorists to school zones. The City of Friendswood will consider the installation of school flashing beacons on arterial and collector roadways, but not on local streets.

As with all other requests to review traffic issues in the City of Friendswood, should changes to the conditions within a school zone be warranted, Engineering shall attempt to convey the proposed changes with the impacted residents before any modifications or improvements are implemented.

Additional information concerning school zone safety is included in the **Attachment D** under the titles *School Zones* and *School Traffic Safety*

Speed Control Requests.

As with all other requests to review traffic issues in the City of Friendswood, requests for speed control will be addressed with the same measures outlined in the *Procedures* section of this policy.

- Engineering will maintain a database of locations at which excessive vehicular speeds have been reported that will be shared with the Police Department for enforcement purposes.
- The Texas Manual of Uniform Traffic Control Devices (latest edition) states that a speed limit should be posted within 5 mph of the 85th percentile speed of the free-flowing traffic. Engineering Judgement is the overriding determination for all speed limit postings.
- The following alternatives are available to address speed control requests.
 - The Neighborhood Speed Watch Program is a public awareness program through which concerned citizens can take an active role in making neighborhood streets safer by observing and recording traffic speeds in their neighborhood. Additional information and application forms to participate in the Neighborhood Speed Watch Program may be obtained from Traffic Engineering and Operations, the Appendix of this policy, or downloaded at www.ci.friendswood.tx.us.
 - A speed feedback sign may be installed to alert motorists to their actual speed and the posted speed limit on a roadway. Additional information concerning the speed feedback sign is included in the Appendix of this policy.
 - A speed study may be conducted at the site. The speed study will determine the 85th percentile speed and consider other issues in the site vicinity including pedestrian traffic volume, roadway curvature, the frequency of traffic accidents, sight distance restrictions, and other issues specific to the study site. The speed study may determine that the posted speed limit at the study site is too low/high and may recommend that the posted speed be adjusted to within 5 mph of the 85th percentile speed.

As with all other requests to review traffic issues in the City of Friendswood, should changes to the speed control in the study area be warranted, Engineering shall attempt to convey the proposed changes with the impacted residents before any modifications or improvements are implemented.

Additional information concerning speed control is included in the **Attachment E** under the title *Speed Limits*.

Intersection Control Requests (Multi-way Stops, Traffic Signals, and Roundabouts):

As with all other requests to review traffic issues in the City of Friendswood, requests for intersection control will be addressed with the same measures outlined in the *Procedures* section of this policy.

- Multi-way stop signs or traffic signals shall not be installed within the corporate City limits of the City of Friendswood unless approved by an authorized warrant analysis and by the City Traffic Director.
- Multi-way stops and traffic signals are warranted based on vehicular traffic volumes, pedestrian traffic volumes, vehicular speeds, traffic accident data, and other traffic data in accordance with guidelines defined in the Texas Manual of Uniform Traffic Control Devices (TMUTCD).
- According to the TMUTCD, “regulatory and warning signs should be used conservatively because these signs, if used to excess, tend to lose their effectiveness.” If confirmed by a traffic engineering study, existing multi-way stop locations that are not warranted will be removed by the City of Friendswood.
- According to the TMUTCD, stop signs or traffic signals shall not be installed for the purpose of controlling the speed of a roadway as they have been shown to become a hazard at times when installed without warrant.
- Implementation of multi-way stop signs, traffic signal, and roundabouts will be in accordance with necessary budget considerations.

As with all other requests to review traffic issues in the City of Friendswood, should changes to the intersection control in the study area be warranted, Engineering shall attempt to convey the proposed changes with the impacted residents before any modifications or improvements are implemented.

Additional information concerning intersection control is included in the **Attachment F** under the titles *Stop Signs*, *Signal Installation*, and *Roundabouts*.

“Children at Play” and “Deaf Child Area” Sign Requests:

“Children at Play” and “Deaf Child Area” signs are not recognized by the State of Texas or by the Federal Highway Administration as official traffic control devices. These signs may create a false sense of security for parents of children and typically do not achieve the desired safety benefits.

The city does not recommend installing “Children at Play” signs within its boundaries. Existing “Children at Play” signs will be removed by the city that have previously been placed without proper authorization and are not in compliance with this sign policy.

“Deaf Child Area” signs may only be installed in school zones if deaf children attend the school. If installed, these signs will be removed when the deaf child no longer attends the school.

Additional information concerning children at play signs and deaf child area signs is included in the **Attachment G** under the title *Children at Play Signs*.

Other Advisory or Advanced Warning Sign Requests:

As with all other requests to review traffic issues in the City of Friendswood, requests for advisory or advanced warning signs will be addressed with the same measures outlined in the *Procedures* section of this policy.

- Traffic Engineering and Operations will study the requested location and perform an advisory/advanced warning sign analysis which includes volume of pedestrian traffic, proximity of the subject location to schools, parks, swimming pools, retail centers, hike and bike facilities, vehicular traffic volume, etc.
- The requesting party will be informed that it is City policy to only install advisory or advanced warning signs that are in accordance with the Texas Manual on Uniform Traffic Control devices, latest edition.

Other Public Safety and Traffic Issue Requests:

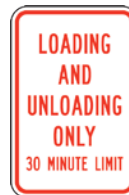
Other requests to review traffic issues in the City of Friendswood will be addressed with the same measures outlined in the *Procedures* section of this policy.

Engineering shall attempt to convey the proposed changes with the impacted residents before any modifications or improvements are implemented.

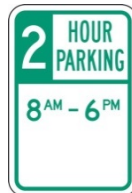
ATTACHMENT A No Parking and Parking Zones

Parking Zones:

Commercial Zones are designated for commercial vehicles to load and unload merchandise for up to 20 minutes. Yellow zones are usually found in commercial areas for the use of adjacent commercial areas.



Green Zones are used for limited term parking, usually 20 minutes as indicated on a sign. In any limited parking you can receive a citation if you exceed the maximum limit by 1 minute or more. To avoid a citation, you must vacate the parking space within the time limit specified and let other members of the public use these high demand spaces.



Red Zones indicate no parking at any time and are reserved for fire and emergency vehicles. Any other vehicle parked or encroaching on or in the red zone is considered a violation of the parking restriction and may receive a ticket and/or be towed.



Blue Zones are reserved parking spaces for vehicles used by disabled persons and displaying the appropriate disabled parking placard or license plate.



Where is it illegal to park?

- No Parking Zones marked by No Parking, No Stopping, or No Standing signs.
- In front of a private or public driveway.
- In front of or within 15 feet of a Fire Hydrant.
- Within marked or unmarked crosswalks. An unmarked crosswalk is considered to be an extension of sidewalk boundary lines across a street or driveway.
- On sidewalks.
- In public rights-of-way for the purpose of advertising or selling without proper authorization.
- In handicapped parking spaces without a legally obtained handicap placard or license plate.
- Where a vehicle will obstruct or block a handicapped parking space.
- Within 30' on the approach to a flashing signal, stop sign, yield sign, or traffic control signal located at the side of the roadway.
- Within 3' of a handicap access ramp.
- In stripped loading zones next to handicapped parking spaces.
- Straddling the markings or lines designating a parking stall.
- Along the curb return within 10' of an intersection.
- Within marked hatched no parking areas.
- Within 15' of the entrance to a fire or ambulance station.
- Within 500' of fire trucks or emergency equipment when these are stopped answering a fire alarm or emergency call.
- Other areas as designated in the Texas State Transportation Code section 545.302 which restricts parking even if no signs are posted.

Parking areas for persons with disabilities

Parking areas for persons with disabilities, also known as handicapped parking spaces are established for the exclusive use of vehicles transporting persons with disabilities. Any vehicle parked in a marked handicapped space or tow away zone parking space that does not display a placard or license plate with the international symbol of access can be given a ticket, towed, and impounded. Handicap spaces can be established on public or private property if the property owner and the City Engineer determine the need for such space/spaces.



A citizen with a valid handicap placard or license plate is allowed to park in a regular metered space without paying provided there are no other restrictions by signage. For example: *No Parking 7 – 9 AM or 4 – 6 PM*. However no one can park at meters in commercial loading/unloading zones unless they possess and have visibly displayed in the vehicle a commercial loading/unloading parking permit.

How close to the curb must I park?

All vehicles parking parallel to the curb must park within 18 inches. All vehicles parking at an angle must have 1 front tire within 6 inches of the curb. All parallel parking must have passenger side to curb, unless parked on a one-way street.

What is the maximum length of time I can park my vehicle on the street without moving it?

- Passenger vehicles cannot be parked on public streets for more than 48 hours.
- Trailer/Semi-Trailer cannot be parked on a public street for more than 2 hours.

ATTACHMENT B

Commercial Truck Cut-Through

Truck cut-through traffic trying to avoid congestion on major streets is a growing concern to city residents. Local and residential streets were not typically designed to carry high volume or heavy loaded through traffic. This unnecessary through traffic generates noise, air pollution, and creates other issues, including safety, for residents. Some trucks also try to park on narrow residential streets, which also causes concerns for the residents and emergency vehicles.

Residents concerned with high volumes of truck traffic traveling through, or parking in, their neighborhood have several remedies available. The City will evaluate the specific problems of your street and implement the most effective solution if the conditions warrant action.

Definitions of “Commercial Vehicle” and “Commercial Truck”

A commercial vehicle can be defined as any vehicle that is used and maintained for commercial purposes. A commercial truck is a commercial vehicle with more than 2 axles.

Cut-Through Traffic

Cut-through traffic can be defined as commercial vehicles passing through a neighborhood without at least 1 trip end (origin or destination) in that neighborhood. Cut-through traffic causes unwanted noise, dust, pollution, and safety issues for residents. Cut-traffic can be passenger vehicles, commercial vehicles, and/or commercial trucks. A cut-through commercial vehicle or truck is one that passes through a street/neighborhood without a scheduled stop in that neighborhood.

In additions to pollution and safety issues, cut-through commercial traffic cause pavement deterioration of the neighborhood roads since most neighborhood roads are not designed for heavy commercial traffic.

Cut-through traffic is also defined as motorized vehicles cutting through a parking lot and/or business to avoid heavy traffic or traffic control devices such as Stop/Yield Signs or traffic signals.

Possible Solutions

If your neighborhood has a high volume of cut-through traffic, you can request a traffic study by filling out the Traffic Concern form at www.ci.friendswood.tx.us/350/Publications-Forms. Upon receiving a completed request form, the Engineering will make an initial determination of the need for a study as in outlined in the procedures of this policy. Counteractive measures such as signage and enforcement, or traffic calming measures may be instituted.

Parking in Residential Neighborhoods

Residential neighborhoods, which are in close proximity to busy commercial areas with limited parking facilities or near a truck parking facility/compound, may find unwanted vehicles parked in the neighborhood. Commercial Vehicles cannot be parked on a public street overnight and trailer/semi-trailer cannot be parked on a public street for more than 2 hours.



ATTACHMENT C **Pedestrian Facilities**

I. PEDESTRIAN SAFETY

The need for Pedestrian Safety:

Whether for school, work, or recreation, most of us walk every day. However, some people have to walk as their primary means of transportation or choose to walk to improve their health. Whatever our reasons may be for walking, pedestrians have a legitimate right to walk without feeling unsafe or uncomfortable. Since most of our roads were designed for vehicular traffic, we need to improve walkability in our communities and make them safer for walking.

Typical Issues with Pedestrian Safety

The first step in improving pedestrian safety involves identifying the problem. Residents can help identify the pedestrian safety concerns in their neighborhoods. The following lists some of the typical problems associated with pedestrian safety and can be used as a guide in identifying problems in a neighborhood.

Poor or Inadequate Walking Facilities

- Existing sidewalks and trails are insufficient and do not connect to schools, parks, churches, etc. Dirt paths or desire lines show that more sidewalks or paths are needed.
- Existing sidewalks are not wide enough for people to walk comfortably or pass each other.
- Sidewalk surfaces are uneven, broken, or covered with debris.
- Sidewalks and paths are blocked by barriers such as vehicles, trash cans, vegetation, utility poles, mail boxes, benches, or other obstructions.
- There is not enough space between the sidewalk and the roadway to make pedestrians feel comfortable.
- The intersections are wide and crossing distances are long. Turning radii at the intersections allow cars to turn at higher speeds.
- Bicyclists riding on the sidewalk (possibly because they do not feel safe in the street) cause conflicts with people walking.

Unsafe Driver Behaviors or Traffic Characteristics

- Drivers do not stop or yield to pedestrians crossing the roadway.
- Drivers drive too fast through neighborhoods, around schools, or near other places where people are walking.
- Drivers take short cuts through neighborhoods to avoid traffic on major roads.
- Red light or stop sign runners endanger pedestrians and bicyclists.
- Drivers pass other vehicles stopped at crosswalks for pedestrians or pass stopped school

buses.

- Drivers are more distracted than ever by cell phones, electronic media, passengers, and other activities.

Unsafe Pedestrian Behaviors

- Pedestrians do not look both ways before crossing the street.
- Pedestrians attempt to cross the street when traffic is approaching.
- Pedestrians cross against pedestrian signals.
- Pedestrians crossing midblock where there are no crosswalks.
- Pedestrians, like drivers, can be distracted by cell phones and other electronic devices.

Typical Solutions

Once the problem or problems have been identified, the next step is developing an appropriate solution. Pedestrian transportation improvements or potential solutions for pedestrian safety are described in terms of the “Four E’s”:

1. **Engineering** – Physical changes to infrastructure (i.e., sidewalks, traffic signals, signs, etc.) that affect the operation and movement of traffic and pedestrians.
2. **Education** – Includes strategies that aim to educate pedestrians, drivers, or other groups in order to motivate a change in behavior.
3. **Enforcement** – Community-based or law-agency-based measures to enforce laws and regulations related to pedestrians.
4. **Encouragement** – Efforts to promote walking and increase the level of walking in a community.

II. Pedestrian Crosswalks

Crosswalks

A crosswalk is typically defined as a designated portion of the roadway that pedestrians use to cross the street. A crosswalk may be marked or unmarked. There is no legal difference between marked and unmarked crosswalks at controlled intersections (those with stop signs or traffic signals). However, marked crosswalks at mid-block locations provide a designated and legal crossing zone for pedestrians.

1. Unmarked Crosswalks – most every intersection is considered to represent a crosswalk, even if it is not marked as such. An unmarked crosswalk is basically the extension of a sidewalk that extends across intersecting roads.
2. Marked Crosswalks – are those crosswalks marked with pavement markings,

usually 12' wide white pavement markings on 6' centers, either plain, perpendicular crosshatched, or 45 degree crosshatched.

3. Enhancements – are traffic control devices or signals that enhance and aids the safe movement of pedestrian traffic in the roadways.



Benefits of Marked Crosswalks

Marked crosswalks guide pedestrians to a proper crossing location and alert motorists of a pedestrian crossing point. However, at uncontrolled locations, marked crosswalks may create a false sense of security for pedestrians resulting in a greater number of pedestrian crashes (if additional safety treatments are not provided).

City Policy on Marked Crosswalks

The City's current policy is to install marked crosswalks at controlled intersections where there is a demonstrated need. Crosswalks are also marked at established school crossings. At other locations, an engineering study must be conducted to ensure that marked crosswalks are installed only where there is significant pedestrian activity and/or based on engineering judgment. The need for, and potential use of, a proposed crossing varies with each location, each should be considered individually, and with an effort to maintain consistency in the decision making process. Approval of marked intersection on state highways, or an intersection of a state highway and city road, within the City Limits shall be coordinated with TxDOT.

Categories of Marked Crosswalks

Marked crosswalk locations fit into 1 of 3 categories:

1. Marked crosswalks are **Standard** on signalized approaches at intersections.
2. Marked crosswalks alone (without other enhancements or treatments) are **Permitted** on roadways with posted or 85th percentile speeds less than or equal to 35 mph, if recommended as part of an engineering study and approved by the City Engineer.
3. Marked crosswalks with enhancements or active devices are installed on roadways with posted or 85th percentile speeds greater than 35 mph, if recommended as part of an engineering study and approved by the City Engineer. Such enhancements might include traffic calming features (i.e. median refuge

islands, curb extensions, narrowed travel lanes, traffic diverters, chicanes), illumination, or enhanced devices (i.e. advance signage), or active devices (i.e. pedestrian-activated signals).

III. Pedestrian Signals

Why do some traffic signals have push button and signal indications for pedestrians and others do not?

Pedestrian signals are primarily installed for 2 reasons:

1. A high volume of pedestrian traffic present; or
2. The green time given for vehicles in a particular direction is not sufficient for pedestrians to cross the roadway in that direction.

When signal indications for vehicles are easy to see and provide plenty of green time for pedestrians to cross safely, push buttons and pedestrian signal indications are often not needed. Push buttons are sometimes provided at intersections where the signal timing is typically controlled by the volume of vehicular traffic. If traffic volumes are low at these intersections, pedestrians will not have enough time to cross the street without push buttons. If pedestrian crossing times were factored into every signal cycle, many intersections would become inefficient and delay vehicles more than necessary. The use of pedestrian push button allows extra time to be provided only when a pedestrian is present.

What do pedestrian signals mean, and why isn't there enough time to cross the street during the walk indication on a pedestrian signal?

The City has in use the pedestrian signals that indicate illuminated symbols of a walking person and an upraised hand, along with a countdown timer of how many seconds of time until the pedestrian signal indicates "Do Not Cross". The signals are timed for an average walking distance of 4 feet per second.

- The steadily illuminated upraised hand indication means that a person should not enter the roadway in the direction of the signal.
- The walk symbol (the white colored walking person) means that a pedestrian may start crossing the road toward the signal.
- The flashing orange upraised hand means you can continue to cross, but there is not adequate time to begin crossing. The purpose of the flashing indication is to keep pedestrians from entering an intersection too late and to let pedestrians already in an intersection know that their time to finish crossing is becoming shorter, which is now indicated by the countdown timer.

Will pushing the pedestrian walk button several times make the signal change faster?

No, the walk button will send a message to the controller requesting a walk indication be granted to the requested direction in the next available signal cycle. Continuously pressing the pedestrian button does not send additional messages to the controller since the controller has already acknowledged the pressing of the walk button with the first push.

Why do vehicles keep turning even when the pedestrian signal indicates that pedestrians have the right to cross?

Pedestrian signals assign the right-of-way for pedestrians to cross the street. However, since right turns on red are allowed, some drivers may make right turns without yielding to pedestrians or do not see the pedestrian signals. This is why it is important to always be cautious when crossing busy intersections. The following suggestions are offered in the interest of safety:

- Always cross intersections defensively.
- When crossing the street, regardless of the availability of signals, cross as quickly as possible. Minimize your time in the roadway.
- Always watch for turning vehicles. You have the legal right to be there, but that does not protect you from the carelessness of some motorists.
- Whether marked or unmarked, or signalized **ALWAYS** look both ways before crossing the roadway.

ATTACHMENT D

School Traffic Safety

School Traffic Safety Statistics

On average, each year 23 school-age children die in school related traffic accidents in the United States. Out of these, 6 are occupants of school transportation and 17 are pedestrians. Based on these statistics, the City would like to stress the importance of pedestrian safety around schools and school buses. However, pedestrian safety is not solely dependent upon the pedestrians themselves but is very much dependent upon the driving practices of motorists near and around schools and school buses.

I. AROUND SCHOOLS

Pedestrian Safety Tips for Children

Most people, and especially young children, cannot judge the speed, distance, and size of oncoming vehicles. Parents should walk the route to school (or other destinations) with children and point out safe and unsafe practices. This includes locations where children may go to catch a bus.

- At a traffic signal, the green light or walk signal (the white walking person) means that children should stop at the curb or edge of the road, look both ways for oncoming traffic, and then if it is safe, cross the street. Having the walk indication or green light does not guarantee that cars will stop. Pedestrians must always look for oncoming and turning traffic even when they have the right of way.
- Before crossing the street, children may want to wait for a “fresh green light.” This means that they wait for the next new walk indication if the “don’t walk” indication (upright orange hand) is flashing and the countdown timer is nearing zero. Doing this gives them the most time to cross.
- If children are in the middle of the street and the “don’t walk” indication begins flashing, they should not stop or return to the curb or edge, but continue on to walk at their maximum comfortable pace until they reach the other side. They should not run as they might fall.
- And Remember;
 - Children crossing the street should be accompanied by an adult whenever possible.
 - Avoid crossing streets at mid-block, especially when parked vehicles may obstruct vision. Use stop signs, traffic signals, and crossing guards when available.
 - Children should not follow others or run to others when the call until a safe crossing is available.

Vehicle Safety Around Schools

Parents and other adults can do much to improve traffic safety around schools by driving cautiously, teaching children safe practices, and limiting vehicle trips. Drivers should obey all traffic laws and apply the following practices:

- Carpooling can reduce the number of vehicles near the school, especially during inclement weather.
- Avoid parking on the opposite side of the street from the school. When it is necessary, instruct children on how to safely reach the vehicle.
- Make sure that children are careful when opening vehicle doors and that they enter and exit on the curbside of the vehicle. Children should not be allowed to cross in the middle of the block to reach the vehicle.
- Drivers should not double park or block traffic. Waiting or parking in red zones is also not allowed.
- Do not block buses or use areas designated for buses only. If an emergency vehicle requires access, the area should be cleared.
- Never leave a vehicle unattended in a loading zone.
- Do not park in a crosswalk or pass a stopped vehicle allowing pedestrians to cross.
- Do not violate the law by using the excuse “I will just be here a minute” when picking up or dropping off children. Violations still present a danger and cause congestion during the time of day when it is most important to provide safety for children and avoid congestion.
- Learn the traffic patterns at and near a school to avoid being a disruption.
- Pay attention to children getting in and out of vehicles. Children sometimes forget to use the curb side door and exit suddenly.

Crossing Guards

The City is responsible for the assignment and designation of crossing guards for the schools within the City Limits. Crossing Guards are employees under the Police Department and have the force of law for traffic movements in school zones. Children and motorists should follow their directions when directing traffic and helping children crossing the street.

II. AROUND SCHOOL BUSES

School Bus Safety – Children

When waiting for, riding, and exiting the school bus, children should follow these rules:

Getting on the School Bus

- When waiting for the school bus, stay away from traffic and avoid roughhousing or other behavior that can lead to carelessness. Do not stray into streets, alleys, or private property.

- Line up away from the street or road as the school bus approaches.
- Wait until the bus has stopped and the door opens before stepping into the roadway.
- Use the handrail when stepping onto the bus.

Behavior on the Bus

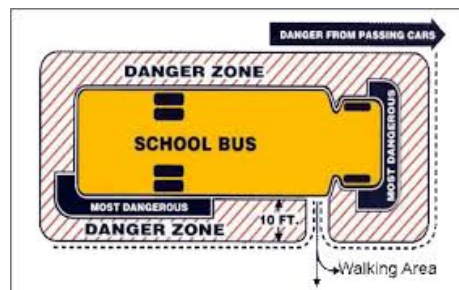
- When on the bus, find a seat and sit down. Loud talking or other noise can distract the bus driver and is not allowed.
- Never put head, arms, or hands out of the window, nor throw anything out of the window.
- Keep aisles clear. Books and bags are tripping hazards and can block the way in an emergency.
- Before you reach your stop, get ready to leave by getting your books and belongings together.
- At your stop, wait for the bus to come to a complete stop before getting up from your seat. Then, walk to the front door and exit using the hand rail.

Getting off the School Bus

- If you have to cross the street in front of the bus, walk at least 10 feet ahead of the bus along the side of the road, until you can turn around and see the bus driver.
- Make sure the bus driver can see you.
- Wait for a signal from the bus driver before beginning to cross.
- When the bus driver signals, walk across the road, keep an eye out for sudden traffic changes.
- Stay away from the bus's rear wheels at all times.

School Bus Safety – Parents

- If possible, accompany children to school bus stop and help them get in and out.
- Teach children to follow common sense practices and **ALWAYS STAY OUT OF THE DANGER ZONE OF THE BUS.**



School Bus Safety - Motorists

- When backing out of a driveway or leaving a garage, always watch out for children walking or bicycling to school.

- When driving in neighborhoods with school zones, watch out for young people who may be thinking about getting to school, but may not be thinking about getting there safely.
- Slow Down! Watch for children walking in the street, especially if there are no sidewalks in the neighborhood.
- Slow down! Watch for children playing in and congregating near bus stops.
- Be Alert! Children arriving late for the bus may dart into the street without looking for traffic.
- Learn to obey the school bus laws. Learn the “flashing signal light system” that school bus drivers use to alert motorists of pending actions:
 - **Yellow Flashing Lights** indicates that the bus is preparing to stop to load or unload children. Motorists should slow down and prepare to stop their vehicles. It also means that the motorist should NOT speed up to pass the bus before the red flashing lights are on.
 - **Red Flashing Lights** and extended stop arms and stop signs indicate that the bus has stopped, and that children are getting on or off. Motorists must adhere to the driving law below and only proceed when the red lights stop flashing and the extended stop sign and bar is withdrawn, and the bus begins moving before they can start driving again.
 - Two Lane roadways, with traffic in both directions, both traffic lanes shall stop.
 - Multi-lane roadways with or without center turn lanes, traffic shall stop in both directions.
 - Roadways divided by raised medians, the traffic traveling in the same directions as the bus shall stop. The traffic in oncoming direction on the other side of the median shall slow and proceed with caution, but it is also suggested that motorist stop for the ultimate safety.

School Zone Signs and Operations

School zones may be installed on streets that border school property line and where students cross a roadway. The signs can be static or include flashers. The flashers are usually installed on roadways with more than 5,000 vehicles per day. The signs conform to the standards and specifications in the Texas Manual on Uniform Traffic Control Devices.



School zone times shall be established and installed according to the following general guidelines:

- **Morning Times** – 45 minutes before start to 15 minutes after the start of school.
- **Midday** – beginning to end of lunch period.
- **Afternoon Times** – 15 minutes before dismissal to 30 minutes after dismissal of school.

These times may be adjusted at each school based on individual campus requirements.

Parking Regulations

In order to promote safe and efficient traffic circulation around a school, it may be necessary to regulate, restrict, or prohibit parking, stopping, or standing adjacent to the school grounds or at an established school crossing. The Engineering Department will determine if the street needs parking restrictions.

Crosswalk Location and Installation

Crosswalks are located to enhance the utilization of sidewalks, to serve school routes and to define the appropriate crossing area in the street at high pedestrian volume intersections. When reviewing an area for installation of a crosswalk, the proximity to a school is one factor. Other factors include: volume of vehicular and pedestrian traffic, average vehicular speed, visibility available to motorist and pedestrians, type of traffic controls present, width of street to be crossed, and location of adjacent crosswalks.

ATTACHMENT E

Speed Limits

Authority

Speed limits are set by statute by the Texas Transportation Code § 545.352. The statute specifies the following speed limits:

- Streets in Urban Districts – 30 mph
- Alley in Urban Districts – 15 mph
- State or Federal numbered highways outside of Urban Districts – 70 mph. Any other highway outside of the Urban District – 60 mph.

These are known as “prima facie” limits and do not require signs for enforcement. For example, in the absence of any other speed limits sign, the speed limit is 30 mph in residential districts within the City Limits. The City Council may alter the maximum or prima facie speed limits based on an engineering and traffic study on any street or portion thereof within the City. The altered speed limits are posted regulatory speed limit signs (signs with black text on white background) and are considered prima facie (or legal) for enforcement.

Speed Zoning

When an engineering study determines that statutory speed limits are not appropriate for the existing road and traffic conditions, altered speed limits are established using speed zoning. The types of speed zones are:

- **Regulatory Speed Zones** impose a restriction on a particular roadway and indicators of the speed limitations imposed by physical and traffic conditions of the roadway. Regulatory speed limits are posted using regulatory speed limit signs which has black lettering on white background as shown in the Texas Manual on Uniform Traffic Control Devices for Streets and Highways (TMUTCD).
- **Construction Speed Zones** may be regulatory or advisory speed zones through a construction project depending on the importance of speed control in the construction zone. Construction advisory signs are typically black lettering on an orange background.
- **School Speed Zones** are established in accordance with city policy on School Zone Installation and Removal and in accordance with State Law. Maximum speed reduction allowed is 15 mph under the posted speed limit.
- **Advisory or Warning Speeds** are desirable speeds for curves, intersections, or other locations where design standards or physical conditions of the roadway restrict safe operating speeds to value less than the maximum legal speeds or posted regulatory speed limit. Advisory speed signs supplement other warning signs (such as for a curve) and have a black message on a yellow background.

What is the Law?

All drivers are required to obey the posted speed limits. These limits are designed to provide for the orderly flow of traffic under normal driving conditions. During periods of heavy traffic, inclement weather, low visibility, or other poor driving conditions, speed must be adjusted so that accidents will be avoided. In the absence of posted speed limits, prima facie speed limits are in effect. Any speed in excess of the legal speed limit on that roadway will be considered prima facie (or “on the face of it”) evidence that the speed is unreasonable, non-prudent, and unlawful.

How are Speed Limits Established?

Regulatory speed zones are established in accordance with the procedures described in the TxDOT manual “Procedures for Establishing Speed Zones”. Posted speed limits are set by the 85th percentile method, which represents the speed of the majority of drivers will be traveling at or below. Speed checks are conducted to determine the 85th percentile speed. The observed free-flowing speed for vehicles is tallied and the 85th percentile speed is calculated using collected data. To ensure a true reflection of normal traffic situation, speed checks are made on average weekdays during off-peak hours, under favorable weather conditions.

The speed limit is normally set at the nearest value to the 85th percentile speed ending in 5 or 0. The posted speed limit may be adjusted downwards of the 85th percentile speed based on the following factors:

- Roadway pavement width of 20 feet or less.
- Curves and hills.
- Hidden driveways and other developments.
- High number of driveways.
- Crash history.
- School crossings and characteristics of sites that generate traffic.
- Lack of striped, improved shoulders.

Once a speed limit is determined, the speed zone is added to the Ordinance 300 identifying the limits and speed of the speed limit zone. After approval by the City Manager, or their designee, the sign shop is instructed to install the necessary signs at the locations approved and shown in the Ordinance 300 memo.

Speed Limit Misconceptions

Studies have shown that there is no significant change in speeds following the posting of a revised speed limit. This is true whether the speed limit is increased or decreased. Safety is also not improved by establishing unreasonably low speeds limits. Some misconceptions about speed limits include:

- Reducing the speed limit will not slow the speed of traffic;
- Reducing speed limits will necessarily decrease the number of crashes and increase safety;
- Having a posted speed limit is not necessarily safer than an unposted speed limit; and
- Drivers always go 5 to 10 mph over the posted speed limit.

Why Do We Need Speed Limits?

Speed limits which are realistic and reasonable:

- Encourage compliance from a majority of the drivers;
- Give a clear reminder of reasonable and prudent speeds;
- Provide an effective enforcement tool to the police; and
- Encourage drivers to travel at the speed where the risk of crash involvement is the lowest.

Studies have shown crash rates are lowest at around the 85th percentile speed. Drivers traveling significantly faster OR slower than this speed are at greater risk for being in a crash. It is not high speeds alone that relate to crash risk; it is variation of speed within the traffic stream. In fact, on a per mile driven basis, high speed roadways, like interstates, have a lower speed-related fatality rate than low speed roadways because large variations in speed within the traffic stream create more conflicts and passing maneuvers (and opportunities for driver error and collisions).

However, unrealistic speed limits:

- Discourage voluntary compliance;
- Create perception of “speed traps;”
- Cause public antagonism toward the police;
- Create a bad image for a community in the eyes of non-residents; and
- May increase the potential for crashes.

ATTACHMENT F **Intersection Controls**

I. STOP SIGNS

Stop Signs

A STOP sign is a sign used to direct motorists to stop at the spot where the STOP sign is located. STOP signs are a method for controlling traffic at intersections where the normal application of the right-of-way rule is insufficient to ensure safety and provide reasonable compliance with the law. These signs are found on the right side of the roadway (and in some cases in the median to increase visibility). When more than two directions are controlled by STOP signs, then a supplemental ALL WAY plaque shall be used to inform motorists of the type of traffic control that exists at the intersection. If a STOP sign is in its correct location and it cannot be seen very well due to hills or curves, a STOP AHEAD warning sign may be used in advance on the approach to the STOP sign.

Installation Policy

STOP sign installations will be addressed according to the City of Friendswood Sign Policy, current edition. STOP signs at an intersection are installed only upon the approval of the City Engineer and reflected in the Ordinance 300, after a careful investigation has been made of existing conditions. The investigation is conducted using the guidelines for installing STOP signs provided in the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

Should STOP Signs Be Used to Control Speeding in Neighborhoods?

This is a question that is frequently asked or requested from citizens concerned about speeding in their neighborhood. Although the City does share the concerns of the citizens about speeding and safety in residential neighborhoods, the installation of STOP signs is not the appropriate way to solve the problem of speeding. STOP signs are traffic control devices intended for assigning rights-of-way, not controlling speed. Traffic calming devices (as stated in the City's Traffic Calming Policy) and police enforcement have been found to be much more effective in controlling speeding.

STOP signs result in speed reduction only near the sign, and drivers tend to speed up between STOP sign controlled intersections to make up for perceived lost time. According to National Engineering Transportation Study, when required to stop by cross street traffic, 5% to 20% of all drivers come to a complete stop, 40% to 60% will come to a rolling stop below 5 mph, and 20% to 40% will pass through at higher speeds.

Often, unjustified STOP signs are ignored by motorists, which can be more dangerous than speeding. Therefore, it is the City's policy not to install STOP signs to control speeding.

Adverse Impacts of Unjustified STOP Signs:

- Unjustified STOP signs cause motorists frustration when they are forced to stop for no

apparent reason. Unwarranted STOP signs result in disrespect for all signs and reduce the effectiveness of STOP signs at other intersections where they are essential for safety.

- Vehicle emissions account for much pollution in the air. These emissions increase when vehicles are accelerated and decelerated. It is important to minimize unnecessary stops since steady speeds increase fuel economy and reduce vehicle emissions. Unwarranted STOP signs increase the number of unnecessary stops and reduce the efficiency of our transportation system which results in increased air pollution.

II. YIELD SIGNS

Yield Signs

At intersections where a full stop is not necessary at all times, consideration should be first given to less restrictive measures such as a YIELD. A YIELD sign is used to assign rights-of-ways on certain approaches to an intersection. Vehicle controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Installation Policy

YIELD sign installations will be addressed according to the City of Friendswood Sign Policy, current edition. YIELD signs at an intersection are installed only upon the approval of the City Engineer and reflected in the Ordinance 300, after a careful investigation has been made of existing conditions. The investigation is conducted using the guidelines for installing YIELD signs provided in the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

III. TRAFFIC SIGNAL INSTALLATION

Purpose

When warranted, properly designed, located, and operated, traffic control signals can provide orderly movement of vehicular and pedestrian traffic, can reduce the frequency and severity of certain types of crashes, and can increase the traffic handling capacity of the intersection. These benefits have perpetuated a common belief that traffic signals provide the solution to all traffic problems at intersections.

However, when unwarranted and improperly designed, traffic signals cause excessive delays, driver frustration, disobedience, overuse of less adequate routes, and increased collisions. This is why the City of Friendswood looks at every intersection being considered for signalization very carefully to determine that a signal is indeed needed.

Signal installation requests, like all other requests for signage, starts with a traffic concern report to the Engineering Department at www.ci.friendswood.tx.us/350/Publications-Forms. There will be an initial review and determination as stated in the procedures in the City of Friendswood's Sign Policy. As is true with all warrant justifications, the same is true of Traffic Signals having

to meet the analysis and standards in the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

Construction, Operation, and Maintenance

Once the signal is approved for placement, plans are created for construction. Depending on the conditions at the intersection, it may require up to two years to recommend design, and construct a traffic signal. Once constructed, the traffic signal is maintained by either Texas Department of Transportation (TxDOT) for signals on highways and Farm-To-Market Roads, Harris County in Harris County or the City in Galveston County. If a traffic signal is malfunctioning, please notify the Police Department.

ATTACHMENT G **Children At Play Signs**

We Have a Lot of Small Children in Our Neighborhood; can we get a “Children at Play” sign?

The City of Friendswood often receives a lot of requests to install signs warning drivers of the possible presence of “Children at Play.” However, these signs may give a false sense of security and have been proven to be ineffective. In residential areas within the City, drivers should expect children to be present. Studies have shown that signs attempting to warn motorists of normal conditions do not achieve the desired safety benefits.

The City of Friendswood does not want to endorse that children can or should be allowed to play safely on or near streets. These signs are not warranted or part of the Texas Manual on Uniform Traffic Devices (TMUTCD). Current Children at Play signs exist in the city in residential areas, but will not be replaced if faded, stolen, or destroyed. However, the City does have in place a process wherein the HOA can petition for these types of signs to be put in their neighborhood in the rights-of-way. These will still need to follow the typical procedures for all other signage with the addition of the following:

- The HOA will have to submit minutes that this was approved at a general HOA meeting with advanced notification relayed to residents of the proposal to install these signs.
- There will need to be a plan establishing the locations of the signs to be installed.
- If approved by the HOA and the Traffic Committee, the HOA would have to purchase the signs, sign bases, and poles and bring them to the Engineering Department. The City will install the signs at the agreed upon locations that have been approved.
- The signs would have to be added to the insurance policy of the HOA.
- As stated previously, stolen, damaged, or faded signs will not be replaced by the City.



ATTACHMENT H

Speed Bumps, Humps, and Lumps

Speed Bumps, Humps, and Lumps are traffic calming devices that use vertical deflection to slow vehicular traffic in order to improve safety conditions. Although their uses are effective in keeping vehicle speeds down, engineering studies have shown that drivers will increase their speed in between vertical speed traffic calming devices to make up for perceived lost time due to slowing down to negotiate the vertical device.

Speed Bumps

Speed Bumps are an abrupt raised area in the pavement surface, effective at controlling speeds on low volume private driveways and parking lots and have the following characteristics:

- Typically they are 3 to 6 inches in height with a travel lane width of 6 to 12 inches.
- Cause significant driver discomfort at typical residential speeds.
- Cause vehicles to slow at 5 mph or less at the bump.
- Considered an increased liability risk on public roads.
- Truck, Emergency Response, cargo, and bus passengers more likely to be affected.
- Maintenance headache.

Speed Humps

Speed Humps are a gradual raised area in the pavement surface and are typically for use in residential and low speed roadways, and have the following characteristics:

- They are typically 3 ½ inches in height with a travel length of 4 to 6 feet.
- Create a gentle rocking motion slowing most vehicles down to 15 to 20 mph, and 25 to 30 mph when properly spaced.
- They are typically painted to identify vertical change in the roadway.
- Need to be properly designed, marked, and signed according to standards in the TMUTCD.
- Effective at controlling speeds without creating accidents or imposing unreasonable or unacceptable safety risks.
- Either permanent bituminous ones or portable ones can be installed; there are pros and cons to each type.
- Can be utilized as a raised crosswalk as well.

Speed Lumps

Speed Lumps are relatively new and have the effect of slowing vehicles down as does a speed hump, but the main problem is that speed humps still cause ALL traffic to slow down. Speed lumps are a hybrid combination of speed bumps and humps. Speed lumps are in a nominal size and placed with a gap between them. This gap is spaced (normally 2 feet) so that emergency

vehicles, such as fire trucks and ambulances, which have a wider wheel base width, can easily transverse the gaps where normal vehicles cannot. Added to the safety issue is that the edges near the gaps are either parabolic or flat.

APPENDIX H

Streetlight Policy

I. SUMMARY:

The goal of this policy is to provide for effective procedures for review, approval, and installation of streetlighting throughout the City of Friendswood. This Policy will enforce requirements specifically targeting areas where existing lighting conditions are deemed to be insufficient for public safety and areas of new residential, commercial, and industrial development.

II. GENERAL:

Streetlight installation is intended as the basis for fixed lighting on all roadways. Careful considerations shall be taken in the making streets and roadways safe during hours of darkness. Certain criteria as shown in the Warranting section of this policy shall be a part of the evaluation process for the need of street lights. Streetlights are to be installed on City owned streets to illuminate the roadway. They are not to be installed on private streets, parking lots, or for security lighting. A street segment shall be in the City Limits in order to be eligible for street lights. All street lights are installed, owned, and maintained by Texas New Mexico Power Company (in Galveston County) or CenterPoint Energy (in Harris County). Once a street light is installed, the City shall pay the monthly operating and maintenance cost of the streetlight.

III. WARRANTING:

The Warranting Process that is used is based on the Transportation Association of Canada (TAC) Guide for Roadway Lighting (27) which was based on the Roadway Lighting Handbook published by the U.S. Department of Transportation. This Streetlight Warrant system is a conditional based and not observed based system. Factors that are taken into consideration are divided into four sections; 1) Geometric, 2) Operational, 3) Environmental, and 4) Collision. Each individual factor is rated from 1 to 5 in accordance with the parameters listed in the warranting worksheet. Each individual factor is weighted as a percentage of the whole, and on a point system of 0 to 100, the warranting condition must achieve a minimum of 60 points to warrant the installation of a streetlight, yet the City Engineer is the final authority of approval for a streetlight.

a. GEOMETRIC SECTION:

There are eight factors that are considered under the Geometric Section of the Streetlight Warrant Process:

- Total number of lanes including center turn lanes.

- Width of the lanes.
- Number of median openings per mile.
- Number of driveways and entrances per mile.
- Horizontal curve radius.
- Vertical grade.
- Sight distance.
- Parking.

b. OPERATIONAL SECTION:

There are five factors that are considered under the Operational Section of the Streetlight Warrant Process:

- Signalized intersections.
- Left turn lanes.
- Median width.
- Posted speed.
- Pedestrian activity.

c. ENVIRONMENTAL SECTION:

There are five factors that are considered under the Environmental Section of the Streetlight Warrant Process:

- Percentage of development adjacent to roadway.
- Area classification
- Distance from development to roadway.
- Ambient lighting.
- Raised median curb.

d. COLLISION SECTION:

There is only one factor in the Collision Section of the Streetlight Warrant Process. This is a Night-to-Day ration of accidents occurring on the street that is being reviewed.

Lighting is warranted where a total point-score of 60 or more is achieved. Lighting of equal scores may be prioritized by also using the different sections in the Warrant Worksheet.

IV. NEW SUBDIVISION INSTALLATION

As per the approved Streetlight Policy for New Development approved by Friendswood City Council Action, the following shall apply:

- a. All subdivision plats shall include a provision for streetlighting using concrete poles.
- b. Streetlights shall be provided at all corners and intersections and, in addition, at two hundred fifty (250) foot intervals along residential streets. Additional lights may be required at the option of the City Engineer.
- c. Each streetlight shall be at least one hundred (100) watts on local and collector streets and two hundred fifty (250) on major thoroughfares.
- d. All necessary easements for streetlighting shall be shown on the final plat prior to final approval by the City of Friendswood and the Planning and Zoning Commission.
- e. The City shall authorize the installation of public streetlights after acceptance of the subdivision by the City for the contractor's one-year maintenance period.

V. PRIVATE SUBDIVISION INSTALLATION

- a. The Developer/Owner may install a private streetlight system in accordance with the standards outlined above, except that ornamental poles other than concrete may be used. Wood poles shall not be used in any new streetlighting system.
- b. The Developer/Owner shall be required to provide for the installation of this private streetlight system and also provide for its perpetual operation and maintenance,
- c. The Final Plat shall indicate that streetlighting is private and this shall also be labeled on all construction plans.

VI. EXISTING SUBDIVISION INSTALLATION

The City's franchise utilities Texas-New Mexico Power (in Galveston County) and CenterPoint Energy (in Harris County) have established programs for installing streetlights in the City. The City will evaluate all requests for streetlights within the guidelines of this policy and the warranting system.

a. STREETLIGHT POLE TYPES

In all cases, any pole to be installed shall match any existing poles already installed inside the subdivision.

- Wooden Poles – lights shall only be installed on existing wooden utility poles served by overhead distribution. The light shall be installed on the existing wooden pole. An additional wooden pole may be installed to

serve a specific need. Other than state previously, no wooden shall be used in areas where the power is distributed underground.

- Concrete Poles – shall be installed on other areas such as commercial/industrial/collector roads within the City Limits.
- Metal Poles – shall be used on all thoroughfare roads inside the City Limits.
- The exception to the above mentioned poles would be the streetlights required in the downtown district by the Design Criteria Manual.

b. STREETLIGHT SPACING AND PATTERN

- All intersections shall have a minimum of one (1) streetlight.
- Undivided roadways less than sixty (60) foot width from back of curb to back of curb shall stagger the streetlighting along both sides of the roadway.
- Undivided roadways greater than sixty (60) foot width from back of curb to back of curb shall pair the streetlighting along both sides of the roadway.
- Divided roadways shall be pair the streetlighting along both sides of the roadway or as an option approved by the City Engineer, substitute one (1) streetlight in the middle of the median/dividing device in lieu of two (2) along both inside lanes of the divided roadway.
- Spacing in rural areas that have large acreage lots may be extended to five hundred (500) foot spacing and staggered along both sides of the roadway.

c. STREETLIGHT COST

The cost of installing new or additional streetlighting would be absorbed by the City of Friendswood, however in the event that there is not available power on the roadway (either overhead or underground), the City would partner with the Homeowners Association or other responsible entity.

- In either case, the City would need to have a letter from the HOA or other entity approving the installation and location of the new streetlight.

- The HOA or other entity approving the installation would be required, if power is not available in the Right-Of-Way of the roadway, to purchase, provide, have surveyed, and recorded all necessary easements for the installation of said pole.

VII. STREETLIGHT REQUEST PROCEDURE

- a. Applicant completes a request form (Exhibit “A”) and submits to the Engineering Department at www.ci.friendswood.tx.us/350/Publications-Forms.
- b. Engineering informs approving authority of the request, and steps needed to complete the process.
- c. Engineering gathers information for Warranting Worksheet.
- d. Engineering draws Exhibits and forwards information to the City Engineer for review.
- e. After City Engineer approves, Engineering requests that City Manager approve the installation of the streetlight and gives authorization to the appropriate franchise utility to install.
- f. The appropriate franchise utility reviews the streetlight request and conducts the installation (if approved) of the proposed streetlight within a designated time period.
- g. Engineering distributes confirmation letter to the applicant and approving authority giving an approximate date of installation.

VIII. LIGHTING PROBLEMS

All streetlights, poles, and wiring remain the property of the franchise utility. If the streetlight is not working properly, or are damaged please contact the appropriate franchise utility.

- a. Galveston County would be Texas New Mexico Power at (281) 996-0453.
- b. Harris County would be CenterPoint Energy at (713) 307-2222.

Please give the franchise utility the pole number (approximately six (6) feet above ground) facing the roadway. If one is not visible, get the address or distance from the nearest intersection.

If tree limbs are blocking the light, please call the Public Works Department at (281) 996-3380.

RESOLUTION NO. R2021-02

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, TEXAS, AUTHORIZING A SETTLEMENT AGREEMENT WITH COMCAST OF HOUSTON, LLC, SETTLING THE LAWSUIT STYLED NO. 4:19-CV-00458; *CITY OF ALVIN, ET. AL., V. COMCAST*, IN THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF TEXAS, HOUSTON DIVISION.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, TEXAS:

Section 1. The plaintiff cities in the above-captioned lawsuit, including the City of Friendswood, Texas, have reached an agreement with Comcast of Houston, LLC to resolve the cable services franchise fee disputes litigated in that lawsuit.

Section 2. The material terms of the Settlement Agreement are payment by Comcast of Houston, LLC to the plaintiff cities in the total amount of \$235,000, to be allocated among the plaintiff cities, including the City of Friendswood, Texas, in the same percentage as each city's estimated share of the damages in the lawsuit, mutual releases of claims relating to the subject matter of the lawsuit through the date of settlement, and dismissal of the lawsuit, as well as other terms and conditions customary in a litigation settlement agreement.

Section 3. That the City Manager or his designee is hereby authorized to execute, and the City Secretary to attest to, a Settlement Agreement between and among the City of Friendswood, Texas, and its fellow plaintiff cities on one part, and Comcast of Houston, LLC on the other part, containing the material terms and additional customary terms reflected in Section 2 above.

PASSED, APPROVED and ADOPTED this the 11th day of January, 2021.

Mike Foreman
Mayor

ATTEST:

Melinda Welsh, TRMC
City Secretary

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 11/12/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Ordinance No. T2021-01: First reading of an ordinance amending the Code of Ordinances of the City of Friendswood, Texas, Appendix C – "Zoning," by amending the zoning classification for a tract or parcel located at 4321 Friendswood Link Road containing 3.2895 acres, also known as Reserve A5, Block 2, Forest Creek Subdivision, out of the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas; amending the zone classification from Multi-Family Residential-Garden Home District (MFR-GHD) to Neighborhood Commercial (NC); providing for amendment of the Official Zoning Map; providing a penalty in an amount not to exceed \$2,000 for each day of violation of any provision hereof; and providing for severability.

Originating Department: Community Development

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

The applicant is requesting to change the zoning of the subject property from Multi-Family Residential - Garden Home District (MFR-GHD) to Neighborhood Commercial (NC) for a commercial development.

The newspaper ad was published, 73 property owner notices were mailed and a sign posted on the property for the public hearing notifications.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

If approved, the property owner will be required to meet the minimum standards of the NC zoning district.

RECOMMENDATIONS

At the Planning and Zoning Commission meeting held December 10, 2020, following the public hearing the City of Friendswood Planning and Zoning Commission voted 6 to 0 (Commissioner Clark was absent) to approve the zone change request. The recommendation memo is attached with more details regarding the recommendation.

ATTACHMENTS

1. Ord 2021-01 Friendswood Link Rd Zone Change MFR-GHD to NC
2. Ord 2021-01 Exhibit A

ORDINANCE NO. T2021-01

AN ORDINANCE AMENDING THE CODE OF ORDINANCES OF THE CITY OF FRIENDSWOOD, TEXAS, APPENDIX C – “ZONING,” BY AMENDING THE ZONING CLASSIFICATION FOR A TRACT OR PARCEL LOCATED AT 4321 FRIENDSWOOD LINK ROAD CONTAINING 3.2895 ACRES, ALSO KNOWN AS RESERVE A5, BLOCK 2 FOREST CREEK SUBDIVISION, OUT OF THE SARAH MCKISSICK SURVEY, ABSTRACT NO. 549, HARRIS COUNTY, TEXAS; AMENDING THE ZONE CLASSIFICATION FROM MULTI-FAMILY RESIDENTIAL-GARDEN HOME DISTRICT (MFR-GHD) TO NEIGHBORHOOD COMMERCIAL (NC); PROVIDING FOR AMENDMENT OF THE OFFICIAL ZONING MAP; PROVIDING A PENALTY IN AN AMOUNT NOT TO EXCEED \$2,000 FOR EACH DAY OF VIOLATION OF ANY PROVISION HEREOF; AND PROVIDING FOR SEVERABILITY.

* * * * *

WHEREAS, Peter Gorman, is the Owner of the tract located at 4321 Friendswood Link Road, also known as a 3.2895 acre tract of land, also known as Reserve A5, Block 2 Forest Creek Subdivision, out of the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas, as also depicted in Exhibit “A” incorporated herein by reference, (the “Property”); and

WHEREAS, the Owner previously made application to the City to change the zoning classification of the Property from Multi-Family Residential-Garden Home District (MFR-GHD) to Neighborhood Commercial (NC); and

WHEREAS, the Planning and Zoning Commission and the City Council have conducted, in the time and manner required by law and the City Code of Ordinances, public hearings on such request, allowing all persons attending to be heard on the question of whether the changes of the uses being requested would affect the public health, safety, or general welfare

of the citizens of Friendswood; and

WHEREAS, the Planning and Zoning Commission has filed its written report with City Council, which recommends approval of the application, subject to any certain conditions made the subject of said recommendation; and

WHEREAS, the City Council deems it appropriate to grant such request, subject to applicable regulations, restrictions, exceptions and conditions; and

WHEREAS, City Council has determined that all public notices have been posted and published, all required hearings on this matter have been held, and that this Ordinance complies with the applicable provisions of the City Charter, City Code and all other applicable laws;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, STATE OF TEXAS:

Section 1. The facts and matters set forth in the preamble of this Ordinance are hereby found to be true and correct and incorporated by reference, including the representations of Applicant, (as referenced in its Zone Change Application), the final report from the Planning & Zoning Commission, and the minutes of City Council, which City Council is specifically relying upon in adopting this Ordinance, as provided hereafter.

Section 2. The Friendswood City Code, Appendix C, “Zoning,” Section 3, “Provision for Official Zoning Map,” is hereby amended, rezoning the Property identified in the attached Exhibit “A”, from Multi-Family Residential-Garden Home District (MFR-GHD) to Neighborhood Commercial (NC), but otherwise consistent and subject to the current Zoning Code, and related conditions contained therein.

Section 3. The Zoning District Map of the City of Friendswood shall be revised and amended to show the designation of the Property, as described and as provided in Section 2 above, with the appropriate reference thereon to the number and effective date of this Ordinance, and a brief description of the nature of the change.

Section 4. This Ordinance shall in no manner amend, change, supplement or revise any provision of any ordinance of the City of Friendswood, save and except the change in zoning classification of said Property as conditioned and described above.

Section 5. In the event any section, paragraph, subdivision, clause, phrase, provision, sentence, or part of this Ordinance or the application of the same to any person or circumstance shall for any reason be adjudged invalid or held unconstitutional by a court of competent jurisdiction, it shall not affect, impair, or invalidate this Ordinance as a whole or any part or provision hereof other than the part declared to be invalid or unconstitutional; and the City Council of the City of Friendswood, Texas, declares that it would have passed each and every part of the same notwithstanding the omission of any and every part of the same notwithstanding the omission of any such part thus declared to be invalid or unconstitutional, or whether there be one or more parts.

Section 6. Any person who shall willfully, intentionally, or with criminal negligence violate any provision of this Ordinance shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be fined in an amount not to exceed \$2,000.00. Each day of violation shall constitute a separate offense.

PASSED AND APPROVED on first reading this 11th day of January, 2021.

PASSED, APPROVED, and ADOPTED on second and final reading this 1st day of February, 2021.

Mike Foreman
Mayor

ATTEST:

Melinda Welsh, TRMC
City Secretary

Exhibit "A"

1. Application
2. Deed
3. Metes & Bounds Description
4. Aerial Map
5. Location Map
6. Zoning Map



City of Friendswood – Community Development

910 S. Friendswood Drive
Friendswood, TX 77546
Phone: 281-996-3201 Fax: 281-996-3260
www.ci.friendswood.tx.us

Zone Change Application

CURRENT ZONE OF PROPERTY: MFR-GHD

TYPE OF ZONE CHANGE (check one):

- ☒ Land Use Change to Zone: NC
☐ Planned Unit Development Option 1
☐ Planned Unit Development Option 2

- ☐ Specific Use Permit Option 1
☐ Specific Use Permit Option 2
SUP for Use(s) #: _____

PROPERTY IDENTIFICATION:

Address: 4322 FRIENDSWOOD LINK RD 4321

Platted Land – Plat Name: FORESTWOOD Lot: _____ Block: 2

Unplatted Land – Attach a certified metes and bounds description

OWNER NAME: PETER GORMAN Phone: _____

Owner's Mailing Address: 130 SURF CT

City: HOUSTON State: TX Zip: 77058 Fax: _____

Owner's Email Address: _____

AGENT'S NAME : ADIL ZAHIR / AMINMOHAMOAD Phone: 832-235-7442

Agent's Mailing Address: 1123 SYDNEY LANE

City: FRIENDSWOOD State: TX Zip: 77546 Fax: _____

Agent's Email Address: SKAROVALIA@GMAIL.COM

In authorizing an agent to represent the owner, the owner attests that his/her agent may make verbal or written representations and/or declarations on the owner's behalf and the owner understands and acknowledges that the City of Friendswood shall rely upon the agent's representations in matters pertaining to the above described property. The designation of an agent in this matter in no way absolves the owner of any of the owner's responsibilities outlined by the City of Friendswood. The owner must be the legal owner of record of the property at the time of submittal of the application.

The undersigned hereby request approval by the City Council on the above identified zone change.

X Owner's Signature: Peter Gorman Date: 11/10/2020 X

Agent's Signature: Adil Zahir Date: 11/8/2020

Received By: <u>Becky Bennett</u>	Application Number: <u>2020-0045</u>
Date of Public Hearing: <u>12-10-2020</u>	Received Date: <u>11-9-2020</u>
Property Owner Notices: <u>11-25-2020</u>	Newspaper Notice: <u>11-10-2020</u>
	Sign on Property: <u>11-25-2020</u>

07100034
Stewart Title Co

WD
B

GENERAL WARRANTY DEED**NOTICE OF CONFIDENTIALITY RIGHTS:**

IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OF THE FOLLOWING INFORMATION FROM THIS INSTRUMENT BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

Date: 5/27/07

Grantor: Asta L. Nilsson

Grantor's Mailing Address: 2517 Yunque
Houston Tx 77066

Grantee: Peter Gorman

1EE

Grantee's Mailing Address: 130 Surf Court
NASSAU BAY TEXAS 77058

Consideration: Cash and other good and valuable consideration.

Property (including any improvements):

A tract or parcel of land containing 3.2895 acres, or 143,290 square feet, out of the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas, and being more particularly described by metes and bounds on EXHIBIT "A" attached hereto and fully incorporated herein for all purposes.

Reservations from Conveyance: None

Exceptions to Conveyance and Warranty:

Validly existing easements, rights-of-way, and prescriptive rights, whether of record or not; all presently recorded and validly existing instruments, other than conveyances of the surface fee estate, that affect the Property; and taxes for 2007, which Grantee assumes and agrees to pay, and subsequent assessments for that and prior years due to change in land usage, ownership, or both, the payment of which Grantee assumes, but not subsequent assessments for that and prior years due to change in land usage, ownership, or both, the payment of which Grantor assumes.

Grantor, for the Consideration and subject to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty, GRANTS, SELLS, and CONVEYS to Grantee the Property,

EXHIBIT "A"

Being a tract of land in the Sarah McKissick Survey, Abstract No. 549, Harris County, Texas and being all of the vacated subdivision plat of Forestwood, per plat recorded under Film Code 350061 of the Harris County Map Records, and being more particularly described by metes and bounds as follows with all bearings based on said plat;

D

COMMENCING at the intersection of the northeast line of Oxnard Lane (60.06 feet wide) per the plat of Forest Creek recorded in Volume 239, Page 50 Harris County Map Records, with the southeast line of Friendswood Link Road (100.00 feet wide), and the most westerly corner of Lot 1 of Block 2 of said Forest Creek; said point being in a curve concave to the northwest;

THENCE northeasterly, 111.32 feet along the southeast right-of-way line of said Friendswood Link Road and said curve concave to the northwest, having a radius of 1,440.00 feet, a central angle of $04^{\circ} 25' 45''$, and whose chord bears $N 51^{\circ} 05' 07'' E$, 111.29 feet, to the north corner of said Lot 1 and the POINT OF BEGINNING and west corner of the herein described tract; a found 5/8 inch iron rod bears $S 62^{\circ} 45' W$, 0.9 feet;

THENCE continuing northeasterly, 176.83 feet along the southeast right-of-way line of said Friendswood Link Road and the arc of said curve concave to the northwest, having a radius of 1,440.00 feet, a central angle of $07^{\circ} 02' 09''$, and whose chord bears $N 45^{\circ} 21' 10'' E$, 176.72 feet to a 5/8 inch iron rod found marking the point of tangency;

THENCE continuing along the southeast right-of-way line of said Friendswood Link Road, $N 41^{\circ} 49' 57'' E$, 438.39 feet, to a 1/2 inch iron rod found marking the west corner of a tract of land sold to First City Bank Gulfgate as described in deed recorded under Harris County Clerk's File Number K771546, and the north corner of said Forestwood and the herein described tract;

THENCE along the southwest line of said Gulfgate tract and the northeast line of said Forestwood, $S 47^{\circ} 39' 14'' E$, 234.76 feet to a point in the northwest line of said Forest Creek, the south corner of said Gulfgate tract, and the east corner of said Forestwood and the herein described tract;

THENCE along a northwest line of said Forest Creek and the southeast line of said Forestwood, $S 42^{\circ} 20' 46'' W$, 614.85 feet to an "ell" corner of said Forest Creek and the south corner of said Forestwood and the herein described tract;

THENCE along a northeast line of said Forest Creek and the southwest line of said Forestwood, $N 47^{\circ} 39' 14'' W$, 240.10 feet to the POINT OF BEGINNING and containing 3.2895 acres, or 143,290 square feet, of land.

together with all and singular the rights and appurtenances thereto in any way belonging, to have and to hold it to Grantee and Grantee's heirs, successors, and assigns forever. Grantor binds Grantor and Grantor's heirs and successors to warrant and forever defend all and singular the Property to Grantee and Grantee's heirs, successors, and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof, except as to the Reservations from Conveyance and the Exceptions to Conveyance and Warranty.

When the context requires, singular nouns and pronouns include the plural.


ASTA L. NILSSON

10R

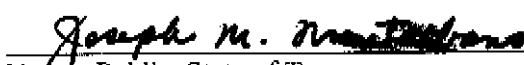
STATE OF TEXAS

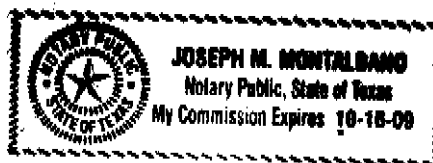
*

COUNTY OF GALVESTON

*

On the 28th day of March, 2007, before me, the undersigned Notary Public, personally appeared Asta L. Nilsson, known to me or satisfactorily proven to be the person whose name is subscribed to this instrument and acknowledged that he executed the same for the purpose contained therein.


Notary Public, State of Texas



Return To:
Peter Norman
130 Surf Court
Nassau Bay Tex
77058

20070190736
Pages 4
03/30/2007 14:03:20 PM
e-Filed & e-Recorded in the
Official Public Records of
HARRIS COUNTY
BEVERLY KAUFMAN
COUNTY CLERK
Fees 24.00

RECORDERS MEMORANDUM

This instrument was received and recorded electronically
and any blackouts, additions or changes were present
at the time the instrument was filed and recorded.

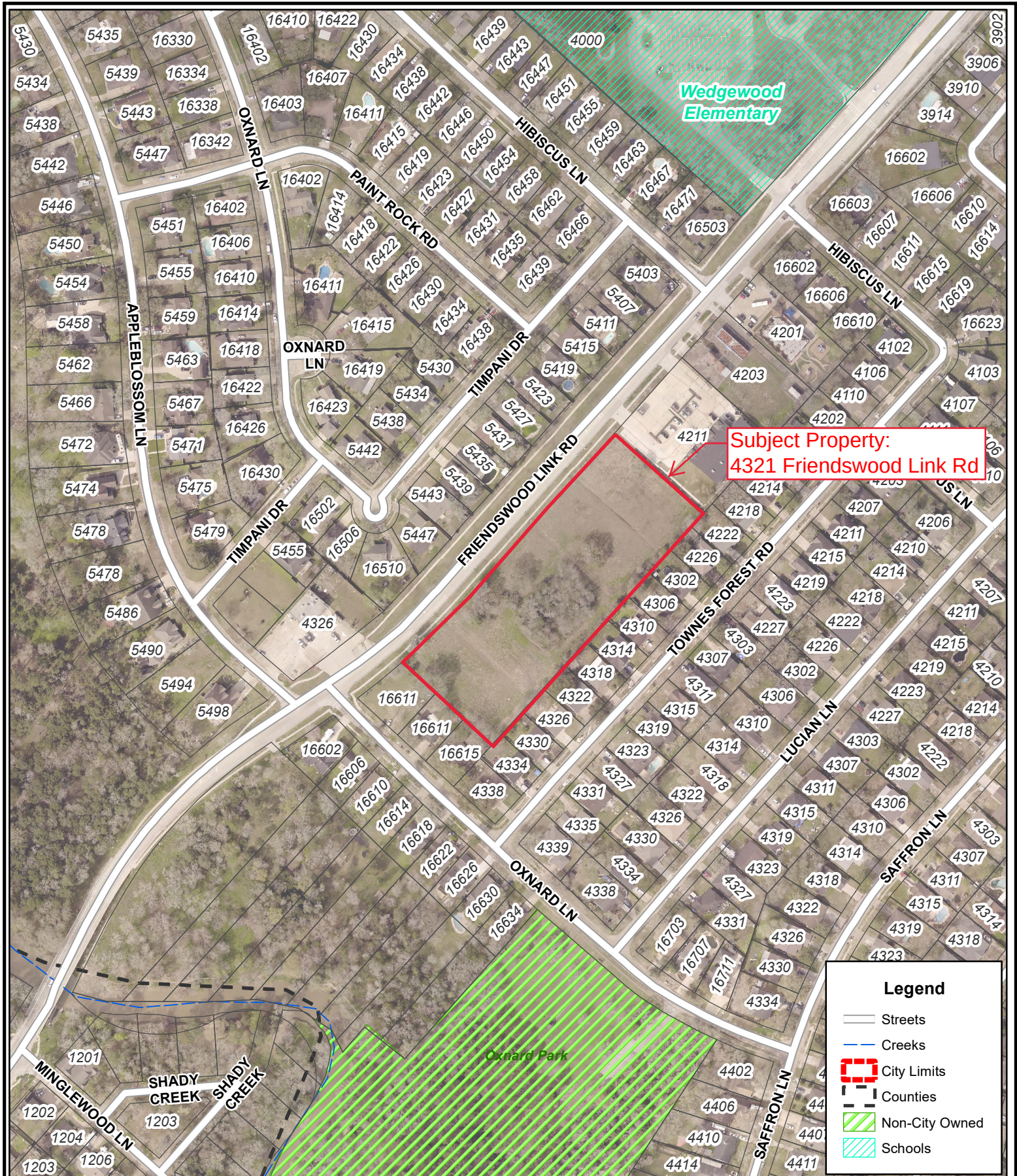
Any provision herein which restricts the sale, rental, or
use of the described real property because of color or
race is invalid and unenforceable under federal law.

THE STATE OF TEXAS
COUNTY OF HARRIS

I hereby certify that this instrument was FILED in
File Number Sequence on the date and at the time stamped
hereon by me; and was duly RECORDED in the Official
Public Records of Real Property of Harris County, Texas.



Beverly L. Kaufman
COUNTY CLERK
HARRIS COUNTY, TEXAS



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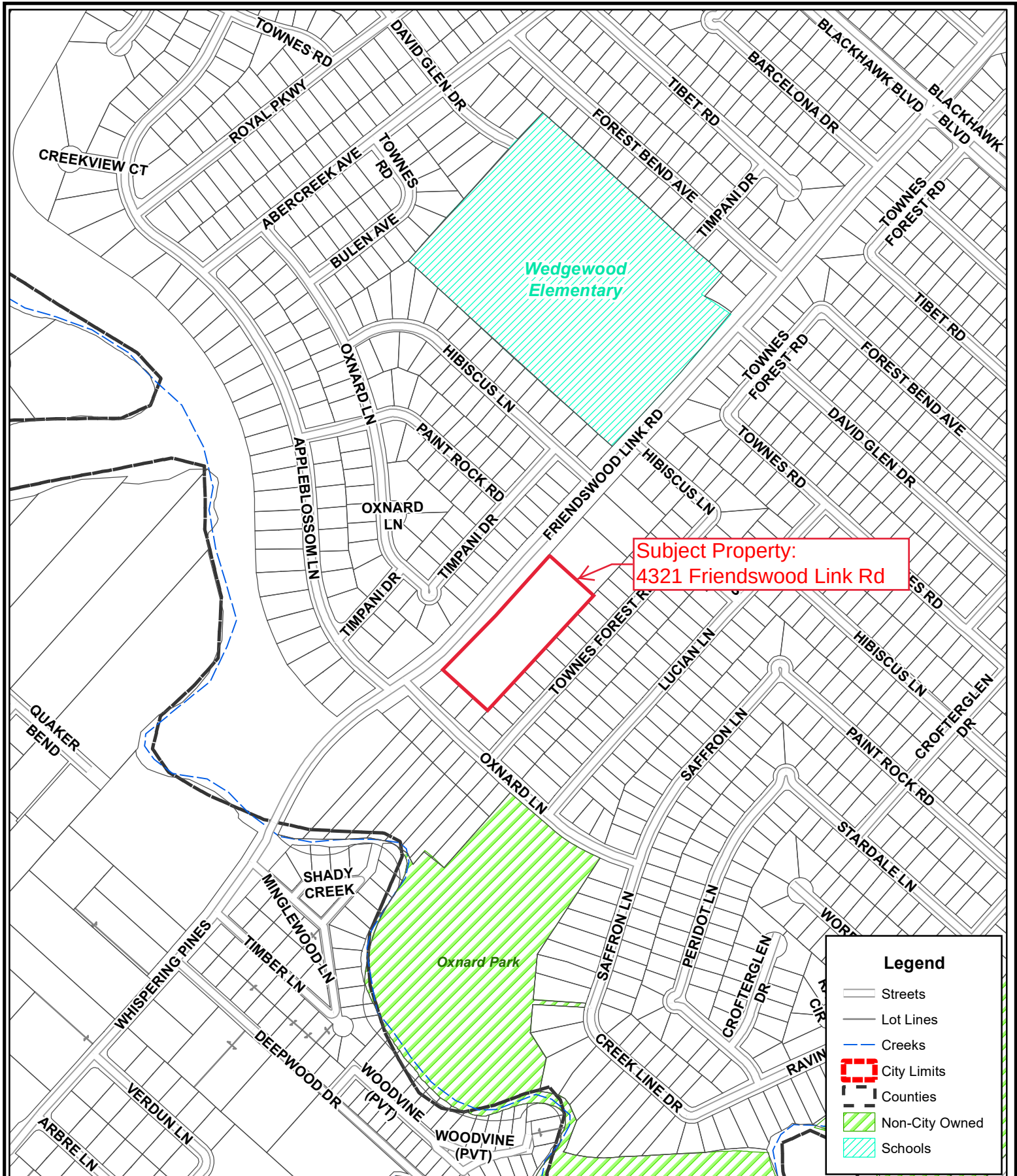


City of Friendswood
910 South Friendswood Drive
Friendswood, Texas 77546
(281) 996-3200
www.ci.friendswood.tx.us

Friendswood GIS Mapping



1" = 247'
Page 324 of 477



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 Page 326 of 477

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 12/8/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Ordinance No. T2021-02: First and Final reading of an ordinance amending City of Friendswood, Texas, Ordinance No. 2020-35, passed and approved September 14, 2020, same being an ordinance approving and adopting the City's General Budget for Fiscal Year 2020-2021 by approving "Budget Amendment III" to the "Original General Budget of the City of Friendswood, Texas, for the Fiscal Year 2020-2021"; providing for supplemental appropriation and/or transfer of certain funds; providing for severability; and providing other matters related to the subject.

Originating Department: Administrative Services

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

By its nature, our budget is an estimate of the revenues and expenditures needed to accomplish the City Council and Staff goals for the year. Throughout the year events occur that require adjustments to the budget. These adjustments may be needed for various reasons, such as the recognition of extraordinary revenues or expenditures, new projects that are authorized by Council or providing funding for expenditures resulting from extraordinary events like natural disasters. As the need arises, items for budget appropriations are accumulated and then submitted for approval at the City Council meeting each month. The budget adjustments covered by this ordinance comprise the third set for fiscal year 2020-2021.

We have attempted to provide as much explanation of the adjustments as possible through two sets of exhibits. Exhibit A provides a narrative explanation of each budget amendment. Exhibit B provides the detail of each accounting transaction.

Ordinance and exhibits are reviewed and approved by the City Attorney prior to inclusion on a City Council meeting agenda.

Expenditure Required: \$2,530,838

Amount Budgeted: \$9,980

Appropriation Required: \$2,520,858

Source of Funds: General Fund unassigned fund balance, General Fund Revenues, Water & Sewer Working Capital

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Approval of this budget amendment will allow for timely procurement of program supplies and limit delays

in the progress of capital improvement projects.

RECOMMENDATIONS

Recommend approval of the ordinance and exhibits covering Budget Amendment III 2020–21.

ATTACHMENTS

1. Ord 2021-02 BA III 2020-21
2. Ord 2021-02 Exhibit A
3. Ord 2021-02 Exhibit B

ORDINANCE NO. T2021-02

AN ORDINANCE AMENDING CITY OF FRIENDSWOOD, TEXAS, ORDINANCE NO. 2020-35, PASSED AND APPROVED SEPTEMBER 14, 2020, SAME BEING AN ORDINANCE APPROVING AND ADOPTING THE CITY'S GENERAL BUDGET FOR FISCAL YEAR 2020-2021 BY APPROVING "BUDGET AMENDMENT III" TO THE "ORIGINAL GENERAL BUDGET OF THE CITY OF FRIENDSWOOD, TEXAS, FOR THE FISCAL YEAR 2020-2021"; PROVIDING FOR SUPPLEMENTAL APPROPRIATION AND/OR TRANSFER OF CERTAIN FUNDS; PROVIDING FOR SEVERABILITY; AND PROVIDING OTHER MATTERS RELATED TO THE SUBJECT.

* * * * *

WHEREAS, by Ordinance No. 2020-35, the City Council of the City of Friendswood, Texas, adopted its "Original General Budget for Fiscal Year 2020-2021"; and

WHEREAS, the City Council has determined that revenues and/or reserves are available for supplemental appropriation, and/or that the transfer of certain funds interdepartmentally is economically feasible and in the best interest of prudent budgeting and for municipal purposes; and

WHEREAS, Section 8.04 of The City Charter provides for amendments after adoption of the budget; and

WHEREAS, the City Council desires to amend said Original General Budget to reflect such supplemental appropriation and/or transfer in the fiscal year 2020-2021;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, STATE OF TEXAS:

Section 1. The facts and matters set forth in the preamble of this Ordinance are hereby found to be true and correct.

Section 2. The “Original General Budget of the City of Friendswood, Texas, for the Fiscal Year 2020-2021,” is hereby amended for municipal purposes as shown on “Budget Amendment III” to the “Original Budget of the City of Friendswood, Texas, for the Fiscal year 2020-2021” attached hereto. Said Budget Amendment III shall be attached to and made a part of such Original General Budget by the City Secretary and shall be filed as required by state law, a true and correct copy of which is attached hereto as Exhibits “A” and “B” and made a part hereof for all purposes.

Section 3. In the event any clause, phrase, provision, sentence, or part of this ordinance or the application of the same to any person or circumstance shall for any reason be adjudged invalid or held unconstitutional by a court of competent jurisdiction, it shall not affect, impair, or invalidate this ordinance as a whole or any part or provision hereof other than the part declared to be invalid or unconstitutional; and the City Council of the City of Friendswood, Texas, declares that it would have passed each and every part of the same notwithstanding the omission of any such part thus declared to be invalid or unconstitutional, whether there be one or more parts.

PASSED AND APPROVED this 11th day of January, 2021.

Mike Foreman
Mayor

ATTEST:

Melinda Welsh, TRMC
City Secretary

**City of Friendswood
Budget Amendment Summary
Fiscal Year 2020 – 2021
Budget Amendment III
January 11, 2021**

1. **Parks & Recreation Donation \$1,000.** Appropriate a donation received from Cathy Newsom on December 15, 2020. The donation will go towards the expenditures related to the lighted Christmas trail. Funds will be appropriated to the Parks and Recreation Department's Recreation division community events budget.
2. **Public Works TML-IRP Insurance Reimbursement, \$645.** Appropriate insurance reimbursement received from TML-IRP. Funding will be appropriated to the Public Works Sewer Utilities division vehicle maintenance account for repairs made to unit PW88.
3. **Police Department TML-IRP Insurance Reimbursement, \$515.** Appropriate insurance reimbursement received from TML-IRP. Funding will be appropriated to the Police CID division vehicle maintenance account for repairs made to unit P331.
4. **15355 Blackhawk, \$1,457,537.** Appropriate funds received from Texas Division of Emergency Management (TDEM) in advance for purchase of the building located at 15355 Blackhawk. This building will house the Public Works Department and the Parks Division.
5. **15355 Blackhawk, \$241,780.** Appropriate flood insurance reimbursement received on November 13, 2017 from TML-IRP for damages made to 220 Shadwell by Hurricane Harvey. Funds will be used to purchase the building located at 15355 Blackhawk. The funding source will be unassigned general fund balance.
6. **Engineering Drone Software, \$9,980.** Transfer funds to purchase Pix4D mapper software and licenses for the Engineering drone. The drone is used for drainage projects as well as street maintenance and operations. The software will allow for multiple users, accurate 3D maps, measuring surface, distance and volume, smooth transfer of imagery and detailed quality reports. Funds will be transferred from the General Fund capital improvements streets maintenance account to the Engineering department's operating services account.
7. **HMGP Buyout Grant, \$381,764.** Appropriate funding in advance to purchase 807 Penn Drive and 16922 Oxnard Lane through the Hazard Mitigation Grant Program (HMGP). The City applied for and was awarded a federal grant through the Texas Division of Emergency Management for the buyout and demolition of homes flooded during Hurricane Harvey. The funding source will be unassigned general fund balance and will be reimbursed once grant funding has been received from the State agency.
8. **HMGP Grant-Demolition, \$27,897.** Advance additional funding for demolition services. The properties 16614 Oxnard, 5303 Shady Oaks, and 13 Haverford were purchased through the Hazard Mitigation Grant Program (HMGP). Original funding for the demolition was approved on the September 14, 2020 FY 2019-2020 BA X. The funding source will be unassigned general fund balance and will be reimbursed once grant funding has been received from the State agency.
9. **TWDB Grant-Demolition, \$68,560.** Advance additional funding for demolition services. The properties 222 Shadwell, 301 Castlewood, and 1 Whitter were purchased through the Texas Water Development Board (TWDB) Buy-out Program grant. Original funding for the demolition was approved on the November 2, 2020 FY 2020-2021 BA I. The funding source will be unassigned

general fund balance and will be reimbursed once grant funding has been received from the State agency.

10. Acquisition and Project Management for Deepwood Flood Control Project, \$14,350.

Appropriate advance funding for acquisition and project management services relating to the Deepwood Flood Control project. The City applied for and was awarded a grant through the 2017 Community Development Block Grant – Disaster Recovery with Galveston County. On November 17, 2020, the City entered into a contract with Jeffrey S. Ward and Associates (JSWA). The funding source will be unassigned general fund balance and will be reimbursed once grant funding has been received from the State agency.

11. Appraisal Services for Deepwood Flood Control Project, \$2,450. Advance funding for appraisals services to be performed by R.C. Chuoke & Associates. There are 7 vacant lots related to the Deepwood Flood Control project. The City applied for and was awarded a grant through the 2017 Community Development Block Grant – Disaster Recovery with Galveston County. The funding source will be unassigned general fund balance and will be reimbursed once grant funding has been received from the State agency.

12. Property Acquisition Management Services, \$127,000. Advance funding for project management services related to the acquisition of lots along Woodvine, Deepwood, and Frenchman's Creek. The City applied for and was awarded a grant through the 2017 Community Development Block Grant – Disaster Recovery with Galveston County. At the October 5, 2020 Council meeting, Council approved a contract with Property Acquisition Services, LLC not to exceed \$127,000. The funding source will be unassigned general fund balance and will be reimbursed once grant funding has been received from the State agency.

13. Appraisal Services, \$10,880. Advance funding for appraisals services to be performed by R.C. Chuoke & Associates. The appraisals will be performed on the 25 lots along Woodvine, Deepwood and Frenchman's Creek. The City applied for and was awarded a grant through the 2017 Community Development Block Grant – Disaster Recovery with Galveston County. The funding source will be unassigned general fund balance and will be reimbursed once grant funding has been received from the State agency.

14. Relocate Utility Pipes at Clear Creek Utility Bridge, \$182,000. Advance funding for engineering services related to the relocation of utility pipes at Clear Creek Utility Bridge. The City applied for and was awarded a grant through the 2017 Community Development Block Grant – Disaster Recovery with Galveston County. Approximately \$121,105 of the cost for engineering services are reimbursable through the grant. The funding source will be unassigned general fund balance and will be reimbursed once grant funding has been received from the State agency.

15. Homeland Security Grant Program – Urban Area Security Initiative (UASI), \$4,480. Appropriate grant funds received from the Homeland Security Grant Program-UASI for Friendswood's Combat Casualty Care Training Project. The grant was awarded to the City of Friendswood in October 2019. Due to Covid-19, classes were rescheduled in 2020 from March and April to October and November. The funding will reimburse the Fire Marshal training budget for related expenditures.

City of Friendswood
January 11, 2021
2020-2021 Budget Amendment III - Exhibit B

BA Number	Account Number	Project Number	Description	Amount
1	001-0000-38600	LGTTTLREV	Appropriate donation received for lighted christmas trail in the Parks Department Recreation division	(1,000)
1	001-6420-452.7910	LGTTTLEXP	Appropriate donation received for lighted christmas trail in the Parks Department Recreation division	1,000
2	401-0000-38310	PW88	Appropriate TML-IRP insurance reimbursement for Public Works Unit PW88	(645)
2	401-3651-433.6300	PW88	Appropriate TML-IRP insurance reimbursement for Public Works Unit PW88	645
3	001-0000-38310	P331	Appropriate TML-IRP insurance reimbursement for Police CID Unit P331	(515)
3	001-2130-421.6300	P331	Appropriate TML-IRP insurance reimbursement for Police CID Unit P331	515
4	001-0000-33438	15355BLK428REV	Appropriate advanced funds received from TDEM to go towards the purchase of the building at 15355 Blackhawk	(1,457,537)
4	001-7001-419.8120	15355BLKHVK	Appropriate advanced funds received from TDEM to go towards the purchase of the building at 15355 Blackhawk	1,457,537
5	001-0000-30500		Appropriate insurance reimbursement to go towards the purchase of the building at 15355 Blackhawk	(241,780)
5	001-7001-419.8120	15355BLKHVK	Appropriate insurance reimbursement to go towards the purchase of the building at 15355 Blackhawk	241,780
6	001-7001-431.8512		Transfer funds to the Engineering Department for the purchase of Pix4Dmapper software	(9,980)
6	001-3770-431.7720		Transfer funds to the Engineering Department for the purchase of Pix4Dmapper software	9,980
7	001-10199		Due from HMPG for advanced funding to purchase 16922 Oxnard in the HMGP buyout grant program	(138,000)
7	001-14018		Due from HMPG for advanced funding to purchase 16922 Oxnard in the HMGP buyout grant program	138,000
7	120-26010		Due to General Fund for advance funding to purchase 16922 Oxnard in the HMGP buyout program	(138,000)
7	120-10199		Due to General Fund for advance funding to purchase 16922 Oxnard in the HMGP buyout program	138,000
7	001-10199		Due from HMPG for advanced funding to purchase 807 Penn Drive in the HMGP buyout grant program	(243,764)
7	001-14018		Due from HMPG for advanced funding to purchase 807 Penn Drive in the HMGP buyout grant program	243,764
7	120-26010		Due to General Fund for advanced funding to purchase 807 Penn Drive in the HMGP buyout grant program	(243,764)
7	120-10199		Due to General Fund for advanced funding to purchase 807 Penn Drive in the HMGP buyout grant program	243,764
8	001-10199		Due from HMPG grant funds for additional demolition service costs with 16614 Oxnard	(721)
8	001-14018		Due from HMPG grant funds for additional demolition service costs with 16614 Oxnard	721
8	120-26010		Due to General Fund for additional demolition service costs with 16614 Oxnard	(721)
8	120-10199		Due to General Fund for additional demolition service costs with 16614 Oxnard	721
8	001-10199		Due from HMPG grant funds for additional demolition service costs with 5303 Shady Oaks	(12,558)
8	001-14018		Due from HMPG grant funds for additional demolition service costs with 5303 Shady Oaks	12,558
8	120-26010		Due to General Fund for additional demolition service costs with 5303 Shady Oaks	(12,558)
8	120-10199		Due to General Fund for additional demolition service costs with 5303 Shady Oaks	12,558
8	001-10199		Due from HMPG grant funds for additional demolition service costs with 13 Haverford	(14,618)
8	001-14018		Due from HMPG grant funds for additional demolition service costs with 13 Haverford	14,618
8	120-26010		Due to General Fund for additional demolition service costs with 13 Haverford	(14,618)
8	120-10199		Due to General Fund for additional demolition service costs with 13 Haverford	14,618
9	001-10199		Due from TWDB-FMA grant funds for additional demolition service costs with 222 Shadwell	(9,880)
9	001-14019		Due from TWDB-FMA grant funds for additional demolition service costs with 222 Shadwell	9,880
9	121-26010		Due to General Fund for additional demolition service costs with 222 Shadwell	(9,880)
9	121-10199		Due to General Fund for additional demolition service costs with 222 Shadwell	9,880
9	001-10199		Due from TWDB-FMA grant funds for additional demolition service costs with 301 Castlewood	(19,737)
9	001-14019		Due from TWDB-FMA grant funds for additional demolition service costs with 301 Castlewood	19,737
9	121-26010		Due to General Fund for additional demolition service costs with 301 Castlewood	(19,737)
9	121-10199		Due to General Fund for additional demolition service costs with 301 Castlewood	19,737
9	001-10199		Due from TWDB-FMA grant funds for additional demolition service costs with 1 Whitter Drive	(38,943)
9	001-14019		Due from TWDB-FMA grant funds for additional demolition service costs with 1 Whitter Drive	38,943
9	121-26010		Due to General Fund for additional demolition service costs with 1 Whitter Drive	(38,943)
9	121-10199		Due to General Fund for additional demolition service costs with 1 Whitter Drive	38,943
10	001-10199		Due from 2017 CDBG-DR (Galveston Cnty) for acquisition and project management services related to Deepwood flood control project	(14,350)
10	001-14029	G00081EXP	Due from 2017 CDBG-DR (Galveston Cnty) for acquisition and project management services related to Deepwood flood control project	14,350
10	124-26010		Due to General Fund for acquisition and project management services related to Deepwood flood control project	(14,350)
10	124-10199	G00081EXP	Due to General Fund for acquisition and project management services related to Deepwood flood control project	14,350

City of Friendswood
January 11, 2021
2020-2021 Budget Amendment III - Exhibit B

BA Number	Account Number	Project Number	Description	Amount
11	001-10199		Due from 2017 CDBG-DR (Galveston Cnty) for appraisal services of seven vacant lots related to Deepwood flood control project	(2,450)
11	001-14029	G00081EXP	Due from 2017 CDBG-DR (Galveston Cnty) for appraisal services of seven vacant lots related to Deepwood flood control project	2,450
11	124-26010		Due to General Fund for appraisal services of seven vacant lots related to Deepwood flood control project	(2,450)
11	124-10199	G00081EXP	Due to General Fund for appraisal services of seven vacant lots related to Deepwood flood control project	2,450
12	001-10199		Due from 2017 CDBG-DR (Galveston Cnty) for property acquisition management services related to Woodvine,Deepwood and Frenchman's Creek	(127,000)
12	001-14029	G000EXP	Due from 2017 CDBG-DR (Galveston Cnty) for property acquisition management services related to Woodvine,Deepwood and Frenchman's Creek	127,000
12	124-26010		Due to General Funds for property acquisition management services related to Woodvine,Deepwood and Frenchman's Creek	(127,000)
12	124-10199	G000EXP	Due to General Funds for property acquisition management services related to Woodvine,Deepwood and Frenchman's Creek	127,000
13	001-10199		Due from 2017 CDBG-DR (Galveston Cnty) for appraisal services of vacant lots on Woodvine, Deepwood and Frenchman's Creek	(10,880)
13	001-14029	G00080EXP	Due from 2017 CDBG-DR (Galveston Cnty) for appraisal services of vacant lots on Woodvine, Deepwood and Frenchman's Creek	10,880
13	124-26010		Due to General Fund for appraisal services of vacant lots on Woodvine, Deepwood and Frenchman's Creek	(10,880)
13	124-10199	G00080EXP	Due to General Fund for appraisal services of vacant lots on Woodvine, Deepwood and Frenchman's Creek	10,880
14	001-10199		Due from 2017 CDBG-DR (Galveston Cnty) for engineering services related to relocating utility pipes at Clear Creek Utility Bridge	(121,105)
14	001-14029	G00082EXP	Due from 2017 CDBG-DR (Galveston Cnty) for engineering services related to relocating utility pipes at Clear Creek Utility Bridge	121,105
14	124-26010		Due to General Fund for engineering services related to relocating utility pipes at Clear Creek Utility Bridge	(121,105)
14	124-10199	G00082EXP	Due to General Fund for engineering services related to relocating utility pipes at Clear Creek Utility Bridge	121,105
14	001-0000-30500		Transfer funds to 2017 CDBG-DR (Galveston Cnty) for City portion of engineering services related to relocating utility pipes at Clear Creek Utility Bridge	(60,895)
14	001-9002-491.9168	G00082EXP	Transfer funds to 2017 CDBG-DR (Galveston Cnty) for City portion of engineering services related to relocating utility pipes at Clear Creek Utility Bridge	60,895
14	124-0000-39120		Transfer funds to 2017 CDBG-DR (Galveston Cnty) for City portion of engineering services related to relocating utility pipes at Clear Creek Utility Bridge	(60,895)
14	124-7001-431.7130	G00082EXP	Transfer funds to 2017 CDBG-DR (Galveston Cnty) for City portion of engineering services related to relocating utility pipes at Clear Creek Utility Bridge	60,895
15	001-0000-33136	G00079	Appropriate 2019 UASI grant reimbursement for Combat Casualty Program training expenses to the Fire Marshal Department	(4,480)
15	001-2501-422.7510	G00079	Appropriate 2019 UASI grant reimbursement for Combat Casualty Program training expenses to the Fire Marshal Department	4,480

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 10/7/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Ordinance No. T2021-03: First and Final reading of an ordinance authorizing the issuance and sale of the City of Friendswood, Texas, Waterworks and Sewer System Revenue Bonds, Series 2021; providing for the security of the bonds; authorizing the execution and delivery of a paying agent/registrar agreement; approving an official statement; and enacting other provisions relating to the subject.

Originating Department: Administrative Services

Degree of importance: Critical

SUMMARY / ORIGINATING CAUSE

On December 7, 2020, Council approved the Schedule of Events for the proposed issuance of the City of Friendswood Waterworks and Sewer System Revenue Bonds, Series 2021 in the amount of \$13,470,000 (which will generate \$14,728,000 in proceeds and \$996,417 for the reserve fund requirement) for utility capital improvements including the following projects.

- 42-inch Water Line Replacement - \$10,284,000
- Water Plants #3 and #4 Tank Rehabilitation - \$1,272,000
- Lift Station #22 (Forest Bend) Rehabilitation - \$1,372,000
- Sanitary Sewer System Assessment VIII Construction - \$1,800,000

Bond issuance costs will also be funded with the bond proceeds.

The posted ordinance, prepared by Bond Counsel and reviewed by our City Attorney, is in draft form. On January 11, 2021, the bonds will be priced in the market. At that time, the terms of the bonds will be added to the ordinance. Bond Counsel will deliver the final ordinance prior to the January 11th City Council Meeting. In addition to the ordinance, the preliminary official statement is included in the agenda packet; but the final draft will be delivered upon completion of the bond issuance. The bond purchase agreement will also be provided after bond pricing occurs. All will be provided prior to the Council Meeting on January 11th. The revenue bonds will be secured by utility charges for services.

Based on our bond ratings call with Standard and Poor's (S&P) on December 14, 2020, we anticipate re-affirmation of the City's AA- rating for this revenue bonds issuance. The bond rating will be determined and provided on January 4, 2021 and will be shared with Council upon receipt of notification. By S&P's definition, the AA- rating means the City has a very strong capacity to meet its financial commitments.

John Robuck, our Financial Advisor (Managing Director – Texas Public Finance, BOK Financial

Securities) will be in attendance to share the results of bond pricing.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Issuance of the bonds will allow the City opportunity to proceed with four major water and sewer utilities projects.

RECOMMENDATIONS

Based on the City's Financial Advisor's assessment of bond pricing on Monday, January 11, 2021, staff recommends approval of the ordinance and related documents.

ATTACHMENTS

1. Ord 2021-03 WWSS Revenue Bonds, Series 2021 (DRAFT)
2. Preliminary Official Statement - City of Friendswood TX_WWSS Rev Bonds Series 2021_POS 12-16-20
3. Schedule of Events Presentation - Series 2021 WWSS (11-29-20)
4. Attorney General of Texas Fee Letter
5. Bond Counsel Engagement Letter

ORDINANCE NO. T2021-03

**ORDINANCE AUTHORIZING THE ISSUANCE AND SALE OF
CITY OF FRIENDSWOOD, TEXAS, WATERWORKS AND
SEWER SYSTEM REVENUE BONDS, SERIES 2021;
PROVIDING FOR THE SECURITY OF THE BONDS;
AUTHORIZING THE EXECUTION AND DELIVERY OF A
PAYING AGENT/REGISTRAR AGREEMENT; APPROVING AN
OFFICIAL STATEMENT; AND ENACTING OTHER
PROVISIONS RELATING TO THE SUBJECT.**

* * * * *

THE STATE OF TEXAS	§
COUNTIES OF HARRIS AND GALVESTON	§
CITY OF FRIENDSWOOD	§

WHEREAS, the City Council (the "Council") of the City of Friendswood, Texas (the "City") has heretofore issued and delivered revenue bonds under authority of Chapter 1502, Texas Government Code, as amended ("Chapter 1502"), to finance improvements to the System (as hereinafter defined); and

WHEREAS, at the date of delivery of the bonds authorized hereby (the "Bonds"), the City will have two series of its System revenue bonds outstanding, which are payable from a first lien on the Net Revenues (as hereinafter defined), to wit: the City of Friendswood, Texas Waterworks and Sewer System Revenue Bonds, Series 2016, outstanding in the principal amount of \$4,825,000 (the "Series 2016 Bonds") and the City of Friendswood, Texas Waterworks and Sewer System Revenue Bonds, Series 2018, outstanding in the principal amount of \$19,500,000 (the "Series 2018 Bonds" and collectively with the 2016 Bonds, the "Outstanding Bonds"); and

WHEREAS, the Bonds are being issued as Parity Bonds (as hereinafter defined), and secured on a parity with the Outstanding Bonds with respect to the pledge of the Net Revenues; and

WHEREAS, the Council deems it advisable to issue the Bonds to provide funds to fund capital improvements to the System and for payment of costs incurred in connection with the issuance of the Bonds; and

WHEREAS, the Bonds are to be issued and delivered pursuant to laws of the State of Texas, including particularly Chapter 1502 and other applicable laws; Now, Therefore

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, TEXAS:

ARTICLE I

RECITALS

It is hereby found and determined that the matters and facts set out in the preamble to this Ordinance are true and correct.

ARTICLE II

DEFINITIONS AND INTERPRETATIONS

Section 2.1: Definitions. In addition to the terms defined in the preambles hereto and elsewhere in this Ordinance, the following terms shall have the following meanings when used in this Ordinance, unless the context clearly indicates otherwise:

"Act" means Chapter 1502.

"Additional Parity Bonds" mean the additional parity revenue bonds permitted to be issued by the City pursuant to Section 5.1 of this Ordinance.

"Bond Purchase Agreement" means the agreement between the City and the Underwriters described in Section 7.1 of this Ordinance.

"Bonds" mean the [\$13,470,000] City of Friendswood, Texas, Waterworks and Sewer System Revenue Bonds, Series 2021 authorized in this Ordinance, unless the context clearly indicates otherwise.

"Business Day" means any day which is not a Saturday, Sunday, or a day on which the Registrar is authorized by law or executive order to close.

"City" means the City of Friendswood, Texas.

"Closing Date" means the date of the initial delivery of and payment for the Bonds.

"Comptroller" means the Comptroller of Public Accounts of the State of Texas.

"DTC" means The Depository Trust Company of New York, New York, or any successor securities depository.

"DTC Participant" means brokers and dealers, banks, trust companies, clearing corporations and certain other organizations on whose behalf DTC was created to hold securities to facilitate the clearance and settlement of securities transactions among DTC Participants.

"Gross Revenues" means all revenues, income and receipts of every nature derived or received by the City from the operation and ownership of the System and the interest income from the investment or deposit of money in the Revenue Fund, the Interest and Sinking Fund, and the Reserve Fund.

"Initial Bond" means the Initial Bond authorized by Section 3.4(d).

"Interest and Sinking Fund" means the debt service fund for payment of principal of and interest on the Bonds described in Section 4.3 of this Ordinance.

"Interest Payment Date", when used in connection with any Bond, means September 1, 2021, and each March 1 and September 1 thereafter until maturity or earlier redemption.

"Maintenance and Operation Expenses" mean the reasonable and necessary expenses of operation and maintenance of the System, including all salaries, labor, materials, repairs and extensions necessary to render efficient service (but only such repairs and extensions as, in the judgment of the governing body of the City, are necessary to keep the System in operation and render adequate service to the City and the inhabitants thereof, or such as might be necessary to meet some physical accident or condition which would otherwise impair the System), and all payments under contracts now or hereafter defined as operating expenses by the Legislature of Texas. Depreciation shall never be considered as a Maintenance and Operation Expense.

"Net Revenues" mean all Gross Revenues remaining after deducting the Maintenance and Operation Expenses.

"Ordinance" means this bond ordinance and all amendments hereof and supplements hereto.

"Outstanding Bonds" mean the City's Waterworks and Sewer System Revenue Bonds, Series 2016, dated March 1, 2016, outstanding at the date of issuance of the Bonds in the amount of \$4,825,000 and the City's Waterworks and Sewer System Revenue Bonds, Series 2018, dated December 1, 2018, outstanding at the date of issuance of the Bonds in the amount of \$19,500,000.

"Owner" when used with respect to any Bond, means the person or entity in whose name such Bond is registered in the Register. Any reference to a particular percentage or proportion of the Owners mean the Owners at the particular time of the specified percentage or proportion in aggregate principal amount of all Bonds then outstanding under this Ordinance, exclusive of Bonds held by the City.

"Parity Bonds" mean the Bonds, the Outstanding Bonds, and each series of Additional Parity Bonds from time to time hereafter issued, but only to the extent such Parity Bonds remain outstanding within the meaning of this Ordinance.

"Record Date" means, with respect to the Bonds, the close of business on the fifteenth day of the month preceding such Interest Payment Date.

"Register" means the books of registration kept by the Registrar, in which are maintained the names and addresses of, and the principal amounts of the Bonds registered to, each Owner.

"Registrar" means The Bank of New York Mellon Trust Company, N.A., and its successors in that capacity.

"Reserve Fund Requirement" means the average annual principal and interest requirements on the Parity Bonds, which may be determined and redetermined each year by the City but in no event less frequently than upon the issuance of each series of Parity Bonds.

"Reserve Fund Surety Policy" means an insurance policy or other credit agreement as provided in Section 4.6 of this Ordinance.

"Special Project" means, to the extent permitted by law, any waterworks or sanitary sewer system property, improvement or facility declared by the City not to be part of the System and substantially all of the costs of acquisition, construction, and installation of which is paid from proceeds of a financing transaction other than the issuance of bonds payable from ad valorem taxes or Gross Revenues or Net Revenues of the System, and for which all maintenance and operation expenses are payable from sources other than revenues of the System, but only to the extent that and for so long as all or any part of the revenues or proceeds of which are or will be pledged to secure the payment or repayment of such costs of acquisition, construction and installation under such financing transaction.

"System" means all properties, facilities, improvements, equipment, interests, and rights constituting the waterworks and sanitary sewer system of the City, including all future extensions, replacements, betterments, additions, and improvements to the System. The System shall not include any Special Project.

"Underwriters" mean FHN Financial Capital Markets and SAMCO Capital Markets, Inc.

Section 2.2: Interpretations. All terms defined herein and all pronouns used in this Ordinance shall be deemed to apply equally to singular and plural and to all genders. The titles and headings of the articles and sections of this Ordinance have been inserted for convenience of reference only and are not to be considered a part hereof and shall not in any way modify or restrict any of the terms or provisions hereof. This Ordinance and all the terms and provisions hereof shall be liberally construed to effectuate the purposes set forth herein and to sustain the validity of the Parity Bonds and the validity of the lien on and pledge of the Net Revenues to secure the payment of the Parity Bonds.

ARTICLE III

TERMS OF THE BONDS

Section 3.1: Purpose and Amount of Bonds. The Bonds shall be issued, pursuant to the Act, in fully registered form in the aggregate principal amount of [\$13,470,000] for the purpose of financing improvements to the System.

Section 3.2: Designation, Date, and Interest Payment Dates. The Bonds shall be designated as "City of Friendswood, Texas, Waterworks and Sewer System Revenue Bonds, Series 2021," and shall be dated February 1, 2021. The Bonds shall bear interest at the rates set out in Section 3.3 of this Ordinance from the date of initial delivery of the Bonds to the Underwriters, or the most recent Interest Payment Date to which interest has been paid or duly provided for, calculated on the basis of a 360 day year of twelve 30 day months, payable on September 1, 2021, and semiannually thereafter on March 1 and September 1 of each year until maturity or earlier redemption.

Section 3.3: Principal Amounts and Interest Rates; Numbers and Denominations. The Bonds shall be issued in the principal amounts and bearing interest at the rates set forth in the following schedule, and may be transferred and exchanged as set out in this Ordinance. The Bonds shall mature subject to prior redemption in accordance with this Ordinance on March 1 in each of the years and in the amounts set out in such schedule. The Initial Bond shall be numbered T-1 and all other Bonds shall be numbered in sequence beginning with R-1. Bonds delivered on transfer of or in exchange for other Bonds shall be numbered in order of their authentication by the Registrar, shall be in the denomination of \$5,000 or integral multiples thereof, and shall mature on the same date and bear interest at the same rate as the Bond or Bonds in lieu of which they are delivered.

<u>Year</u>	<u>Principal Amount</u>	<u>Interest Rate</u>
2022		
2023		
2024		
2025		
2026		
2027		
2028		
2029		
2030		
2031		
2032		
2033		
2034		
2035		
2036		
2037		
2038		
2039		
2040		
2041		

Section 3.4: Execution of Bonds; Seal. (a) The Bonds shall be signed on behalf of the City by the Mayor and countersigned by the City Secretary, by their manual, lithographed, or facsimile signatures, and the official seal of the City shall be impressed or placed in facsimile thereon. Such facsimile signatures on the Bonds shall have the same effect as if each of the Bonds had been signed manually and in person by each of said officers, and such facsimile seal on the Bonds shall have the same effect as if the official seal of the City had been manually impressed upon each of the Bonds.

(b) If any officer of the City whose manual or facsimile signature shall appear on the Bonds shall cease to be such officer before the authentication of such Bonds or before the delivery of such Bonds, such manual or facsimile signature shall nevertheless be valid and sufficient for all purposes as if such officer had remained in such office.

(c) Except as provided below, no Bond shall be valid or obligatory for any purpose or be entitled to any security or benefit of this Ordinance unless and until there appears thereon the Registrar's Authentication Certificate substantially in the form provided herein, duly authenticated by manual execution by an officer or duly authorized signatory of the Registrar. In lieu of the executed Registrar's Authentication certificate described above, the Initial Bond delivered at the Closing Date shall have attached hereto the Comptroller's Registration Certificate substantially in the form provided herein, manually executed by the Comptroller, or by his duly authorized agent, which certificate shall be evidence that the Initial Bond has been duly approved by the Attorney General of the State of Texas and that it is a valid and binding obligation of the City, and has been registered by the Comptroller.

(d) On the Closing Date, the Initial Bond, being a single bond representing the entire principal amount of the Bonds, payable in stated installments to the Underwriters or their designee, executed by manual or facsimile signature of the Mayor and City Secretary of the City, approved by the Attorney General, and registered and manually signed by the Comptroller, shall be delivered to the Underwriters or their designee. Upon payment for the Initial Bond, the Registrar shall cancel the Initial Bond and deliver definitive Bonds to DTC.

Section 3.5: Payment of Principal and Interest. The Registrar is hereby appointed as the paying agent and registrar for the Bonds. The principal of the Bonds shall be payable, without exchange or collection charges, in any coin or currency of the United States of America which, on the date of payment, is legal tender for the payment of debts due the United States of America, upon their presentation and surrender as they respectively become due and payable at the principal payment office of the Registrar in Dallas, Texas. The interest on each Bond shall be payable on each Interest Payment Date, by check mailed by the Registrar on or before the Interest Payment Date to the Owner of record as of the Record Date.

If the date for payment of the principal of or interest on any Bond is not a Business Day, then the date for such payment shall be the next succeeding Business Day with the same force and effect as if made on the date payment was originally due.

Section 3.6: Successor Registrars. The City covenants that at all times while any Bonds are outstanding it will provide a commercial bank or trust company, organized under the laws of the United States or any state, authorized under such laws to exercise trust powers, and subject to supervision or examination by federal or state authority, to serve as and perform the duties and services of Registrar for the Bonds. The City reserves the right to change the Registrar on not less than 50 days written notice to the Registrar, so long as any such notice is effective not less than 45 days prior to the next succeeding principal or interest payment date on the Bonds. Promptly upon the appointment of any successor Registrar, the previous Registrar shall deliver the Register or copies thereof to the new Registrar, and the new Registrar shall notify each Owner, by United States mail; first class postage prepaid, of such change and of the address of the new Registrar. Each Registrar hereunder, by acting in that capacity, shall be deemed to have agreed to the provisions of this Section.

Section 3.7: Special Record Date. If interest on any Bond is not paid on any Interest Payment Date and continues unpaid for thirty (30) days thereafter, the Registrar shall establish a new record date for the payment of such interest, to be known as a Special Record Date. The Registrar shall establish a Special Record Date when funds to make such interest payment are received from or on behalf of the City. Such Special Record Date shall be fifteen (15) days prior to the date fixed for payment of such past due interest, and notice of the date of payment and the Special Record Date shall be sent by United States mail, first class, postage prepaid, not later than five (5) days prior to the Special Record Date, to each affected Owner of record as of the close of business on the day prior to the mailing of such notice.

Section 3.8: Ownership; Unclaimed Principal and Interest. The City, the Registrar and any other person may treat the person in whose name any Bond is registered as the absolute owner of such Bond for the purpose of making and receiving payment of the principal of or interest on such Bond, and for all other purposes, whether or not such Bond is overdue, and neither the City nor the Registrar shall be bound by any notice or knowledge to the contrary. All payments made to the person deemed to be the Owner of any Bond in accordance with this Section shall be valid and effectual and shall discharge the liability of the City and the Registrar upon such Bond to the extent of the sums paid.

Amounts held by the Registrar which represent principal of and interest on the Bonds remaining unclaimed by the Owner after the expiration of three years from the date such amounts have become due and payable shall be reported and disposed of by the Registrar in accordance with the applicable provisions of Texas law including, to the extent applicable, Title 6 of the Texas Property Code, as amended.

Section 3.9: Registration, Transfer, and Exchange. So long as any Bonds remain outstanding, the Registrar shall keep the Register at its principal payment office in Dallas, Texas, and, subject to such reasonable regulations as it may prescribe, the Registrar shall provide for the registration and transfer of Bonds in accordance with the terms of this Ordinance.

Each Bond shall be transferable only upon the presentation and surrender thereof at the principal payment office of the Registrar in Dallas, Texas, duly endorsed for transfer, or accompanied by an assignment duly executed by the registered Owner or his authorized representative in form satisfactory to the Registrar. Upon due presentation of any Bond for transfer, the Registrar shall authenticate and deliver in exchange therefor, within three Business Days after such presentation, a new Bond or Bonds registered in the name of the transferee or transferees, in authorized denominations and of the same maturity and aggregate principal amount and bearing interest at the same rate as the Bond or Bonds so presented.

All Bonds shall be exchangeable upon presentation and surrender thereof at the principal payment office of the Registrar in Dallas, Texas, for a Bond or Bonds of like maturity and interest rate and in any authorized denomination, in an aggregate amount equal to the unpaid principal amount of the Bond or Bonds presented for exchange. The Registrar shall be and is hereby authorized to authenticate and deliver exchange Bonds in accordance with the provisions of this Section. Each Bond delivered in accordance with this Section shall be entitled to the benefits and security of this Ordinance to the same extent as the Bond or Bonds in lieu of which such Bond is delivered.

The City or the Registrar may require the Owner of any Bond to pay a sum sufficient to cover any tax or other governmental charge that may be imposed in connection with the transfer or exchange of such Bond. Any fee or charge of the Registrar for such transfer or exchange shall be paid by the City.

Section 3.10: Mutilated, Lost, or Stolen Bonds. Upon the presentation and surrender to the Registrar of a mutilated Bond, the Registrar shall authenticate and deliver in exchange therefor a replacement Bond of like maturity, interest rate, and principal amount, bearing a number not contemporaneously outstanding. If any Bond is lost, apparently destroyed, or wrongfully taken, the City, pursuant to the applicable laws of the State of Texas and in the absence of notice or knowledge that such Bond has been acquired by a bona fide purchaser, shall authorize and the Registrar shall authenticate and deliver a replacement Bond of like maturity, interest rate and principal amount, bearing a number not contemporaneously outstanding.

The City or the Registrar may require the Owner of a mutilated Bond to pay a sum sufficient to cover any tax or other governmental charge that may be imposed in connection therewith and any other expenses connected therewith, including the fees and expenses of the Registrar. The City or the Registrar may require the Owner of a lost, apparently destroyed or wrongfully taken Bond, before any replacement Bond is issued, to:

- (1) furnish to the City and the Registrar satisfactory evidence of the ownership of and the circumstances of the loss, destruction or theft of such Bond;
- (2) furnish such security or indemnity as may be required by the Registrar and the City to save them harmless;

- (3) pay all expenses and charges in connection therewith, including, but not limited to, printing costs, legal fees, fees of the Registrar and any tax or other governmental charge that may be imposed; and
- (4) meet any other reasonable requirements of the City and the Registrar.

If, after the delivery of such replacement Bond, a bona fide purchaser of the original Bond in lieu of which such replacement Bond was issued presents for payment such original Bond, the City and the Registrar shall be entitled to recover such replacement Bond from the person to whom it was delivered or any person taking therefrom, except a bona fide purchaser, and shall be entitled to recover upon the security or indemnity provided therefor to the extent of any loss, damage, cost or expense incurred by the City or the Registrar in connection therewith.

If any such mutilated, lost, apparently destroyed or wrongfully taken Bond has become or is about to become due and payable, the City in its discretion may, instead of issuing a replacement Bond, authorize the Registrar to pay such Bond.

Each replacement Bond delivered in accordance with this Section shall be entitled to the benefits and security of this Ordinance to the same extent as the Bond or Bonds in lieu of which such replacement Bond is delivered.

Section 3.11: Cancellation of Bonds. All Bonds paid in accordance with this Ordinance, and all Bonds in lieu of which exchange Bonds or replacement Bonds are authenticated and delivered in accordance herewith, shall be cancelled and destroyed upon the making of proper records regarding such payment. The Registrar shall furnish the City with appropriate certificates of destruction of such Bonds.

Section 3.12: Book-Entry System. (a) The Initial Bond shall be registered in the name of FTN Financial Capital Markets. Except as provided in Section 3.13 hereof, all other Bonds shall be registered in the name of Cede & Co., as nominee of DTC.

(b) With respect to Bonds registered in the name of Cede & Co., as nominee of DTC, the City and the Registrar shall have no responsibility or obligation to any DTC Participant or to any person on behalf of whom such DTC Participant holds an interest in the Bonds, except as provided in this Ordinance. Without limiting the immediately preceding sentence, the City and the Registrar shall have no responsibility or obligation with respect to (i) the accuracy of the records of DTC, Cede & Co. or any DTC Participant with respect to any ownership interest in the Bonds, (ii) the delivery to any DTC Participant or any other person, other than an Owner, as shown on the Register, of any notice with respect to the Bonds, including any notice of redemption, or (iii) the payment to any DTC Participant or any other person, other than Owner, as shown on the Register, of any amount with respect to principal of, premium, if any, or interest on the Bonds. Notwithstanding any other provision of this Ordinance to the contrary, the City and the Registrar shall be entitled to treat and consider the person in whose name each Bond is registered in the Register as the absolute Owner of such Bond for the purpose of payment of principal of and interest on the Bonds, for the purpose of giving notices of redemption and other matters with respect to such Bond, for the purpose

of registering transfer with respect to such Bond, and for all other purposes whatsoever. The Registrar shall pay all principal of, premium, if any, and interest of the Bonds only to or upon the order of the respective Owners, as shown in the Register as provided in this Ordinance, or their respective attorneys duly authorized in writing, and all such payments shall be valid and effective to fully satisfy and discharge the City's obligations with respect to payments of principal, premium, if any, and interest on the Bonds to the extent of the sum or sums so paid. No person other than an Owner, as shown in the Register, shall receive a Bond certificate evidencing the obligation of the City to make payments of amounts due pursuant to this Ordinance. Upon delivery by DTC to the Registrar of written notice to the effect that DTC has determined to substitute a new nominee in place of Cede & Co., and subject to the provisions of this Ordinance with respect to interest checks being mailed to the Owner of record as of the Record Date, the phrase "Cede & Co." in this Ordinance shall refer to such new nominee of DTC.

Section 3.13: Successor Securities Depository; Transfer Outside Book-Entry Only System. In the event that the City in its sole discretion, determines that the beneficial owners of the Bonds be able to obtain certificated Bonds, or in the event DTC discontinues the services described herein, the City shall appoint a successor securities depository, qualified to act as such under Section 17(a) of the Securities and Exchange Act of 1934, as amended, notify DTC and DTC Participants, as identified by DTC, of the appointment of such successor securities depository and transfer one or more separate Bonds to such successor securities depository or (ii) notify DTC and DTC Participants, as identified by DTC, of the availability through DTC of Bonds and transfer one or more separate Bonds to DTC Participants having Bonds credited to their DTC accounts, as identified by DTC. In such event, the Bonds shall no longer be restricted to being registered in the Register in the name of Cede & Co., as nominee of DTC, but may be registered in the name of the successor securities depository, or its nominee, or in whatever name or names Owners transferring or exchanging Bonds shall designate, in accordance with the provisions of this Ordinance.

Section 3.14: Payments to Cede & Co. Notwithstanding any other provision of this Ordinance to the contrary, so long as any Bonds are registered in the name of Cede & Co., as nominee of DTC, all payments with respect to principal of, premium, if any, and interest on such Bonds, and all notices with respect to such Bonds, shall be made and given, respectively, in the manner provided in the Blanket Letter of Representations.

Section 3.15: Optional and Mandatory Redemption. The Bonds are subject to optional and mandatory redemption to the extent set forth in the Form of Bonds in this Ordinance.

Principal amounts may be redeemed only in integral multiples of \$5,000. If a Bond subject to redemption is in a denomination larger than \$5,000, a portion of such Bond may be redeemed, but only in integral multiples of \$5,000. Upon surrender of any Bond for redemption in part, the Registrar, in accordance with Section 3.9 hereof, shall authenticate and deliver in exchange therefor a Bond or Bonds of like maturity, Issuance Date, and interest rate in an aggregate principal amount equal to the unredeemed portion of the Bond so surrendered.

Notice of any redemption identifying the Bonds to be redeemed in whole or in part shall be given by the Registrar at least thirty days prior to the date fixed for redemption by sending written

notice by first class mail, postage prepaid, to the Owner of each Bond to be redeemed in whole or in part at the address shown on the Register. Such notices shall state the redemption date, the redemption price, the place at which Bonds are to be surrendered for payment and, if less than all Bonds outstanding of a particular maturity are to be redeemed, the numbers of the Bonds or portions thereof of such maturity to be redeemed. Any notice given as provided in this Section shall be conclusively presumed to have been duly given, whether or not the Owner receives such notice. By the date fixed for redemption, due provision shall be made with the Registrar for payment of the redemption price of the Bonds or portions thereof to be redeemed, plus accrued interest to the date fixed for redemption. When Bonds have been called for redemption in whole or in part and due provision has been made to redeem the same as herein provided, the Bonds or portions thereof so redeemed shall no longer be regarded as outstanding except for the purpose of receiving payment solely from the funds so provided for redemption, and the rights of the Owners to collect interest which would otherwise accrue after the redemption date on any Bond or portion thereof called for redemption shall terminate on the date fixed for redemption.

Section 3.16: Conditional Notice of Redemption. With respect to any optional redemption of the Bonds, unless certain prerequisites to such redemption required by this Ordinance have been met and moneys sufficient to pay the principal of and premium, if any, and interest on the Bonds to be redeemed shall have been received by the Registrar prior to the giving of such notice of redemption, such notice shall state that said redemption may, at the option of the City, be conditional upon the satisfaction of such prerequisites and receipt of such moneys by the Registrar on or prior to the date fixed for such redemption, or upon any prerequisite set forth in such notice of redemption. If a conditional notice of redemption is given and such prerequisites to the redemption and sufficient moneys are not received, such notice shall be of no force and effect, the City shall not redeem such Bonds and the Registrar shall give notice, in the manner in which the notice of redemption was given, to the effect that the Bonds have not been redeemed.

Section 3.17: Forms. The form of the Bonds, including the form of Registration Certificate of the Comptroller of Public Accounts; which shall be attached or affixed to the Initial Bond, the form of the Registrar's Authentication Certificate and the form of Assignment, shall be, respectively, substantially as follows, with such additions, deletions and variations as may be necessary or desirable and not prohibited by this Ordinance:

(a) Form of Bonds.

NO. R-	UNITED STATES OF AMERICA STATE OF TEXAS CITY OF FRIENDSWOOD, TEXAS WATERWORKS AND SEWER SYSTEM REVENUE BOND, SERIES 2021	PRINCIPAL AMOUNT \$ _____	
Interest Rate	Date of Delivery	Maturity Date	CUSIP No.
	_____, 2021	March 1, ____	

REGISTERED OWNER:

PRINCIPAL AMOUNT:

DOLLARS

THE CITY OF FRIENDSWOOD, TEXAS, a municipal corporation duly incorporated under the laws of the State of Texas (herein the "City") for value received, promises to pay, but solely from certain Net Revenues as hereinafter provided, to the registered owner identified above or registered assigns, on the maturity date specified above, upon presentation and surrender of this Bond to The Bank of New York Mellon Trust Company, N.A. (the "Registrar"), at its principal payment office in Dallas, Texas, the principal amount identified above, payable in any coin or currency of the United States of America which on the date of payment is legal tender for the payment of debts due the United States of America, and to pay, solely from such Net Revenues, interest thereon at the rate shown above, calculated on the basis of a 360 day year of twelve 30 day months, from the later of the Date of Delivery set forth above, or the most recent interest payment date to which interest has been paid or duly provided for. Interest on this Bond is payable by check on March 1 and September 1 of each year, beginning on September 1, 2021, mailed to the registered owner of record as of the close of business on the fifteenth day of the month preceding each interest payment date.

THIS BOND is one of a duly authorized issue of Bonds, dated February 1, 2021, aggregating [\$13,470,000] (the "Bonds"), issued for the purposes of improving the City's water and sewer system, under and in strict conformity with the Constitution and laws of the State of Texas, particularly Chapter 1502, Texas Government Code, and pursuant to an ordinance adopted by the City Council (the "Ordinance"), which Ordinance is of record in the City's official minutes.

THE CITY RESERVES THE RIGHT to redeem the Bonds maturing on or after March 1, 2032, in whole or from time to time in part, in integral multiples of \$5,000, on March 1, 2031, or any date thereafter at par plus accrued interest on the principal amounts called for redemption to the date fixed for redemption.

AT LEAST 30 DAYS PRIOR to the date fixed for any redemption of Bonds or portions thereof prior to maturity a written notice of such redemption shall be sent by the Registrar by United States mail, first-class postage prepaid, to the registered owner of each Bond to be redeemed at its address as it appeared on the day such notice of redemption is mailed; provided, however, that the failure of the registered owner to receive such notice, or any defect therein or in the sending or mailing thereof, shall not affect the validity or effectiveness of the proceedings for the redemption of any Bond. By the date fixed for any such redemption, due provision shall be made with the Registrar for the payment of the required redemption price for the Bonds or portions thereof which are to be so redeemed. If such written notice of redemption is sent and if due provision for such payment is made, all as provided above, the Bonds or portions thereof which are to be so redeemed thereby automatically shall be treated as redeemed prior to their scheduled maturities, and they shall not bear interest after the date fixed for redemption, and they shall not be regarded as being outstanding except for the right of the registered owner to receive the redemption price from the Registrar out of the funds provided for such payment. If a portion of any Bond shall be redeemed a substitute Bond or Bonds having the same maturity date, bearing interest at the same rate, in any denomination or denominations in any integral multiple of \$5,000, at the written request of the

registered owner, and in aggregate amount equal to the unredeemed portion thereof, will be issued to the registered owner upon the surrender thereof for cancellation, at the expense of the City, all as provided in the Ordinance.

THE BONDS ARE EXCHANGEABLE at the principal payment office of the Registrar in Dallas, Texas, for Bonds in the principal amount of \$5,000 or any integral multiple thereof, subject to the terms and conditions of the Ordinance.

THIS BOND shall not be valid or obligatory for any purpose or be entitled to any benefit under the Ordinance unless this Bond is either (i) registered by the Comptroller of Public Accounts of the State of Texas by registration certificate attached or affixed hereto or (ii) authenticated by the Registrar by due execution of the authentication certificate endorsed hereon.

THE REGISTERED OWNER of this Bond, by acceptance hereof, acknowledges and agrees to be bound by all the terms and conditions of the Ordinance.

THE CITY has covenanted in the Ordinance that it will at all times provide a legally qualified registrar for the Bonds and will cause notice of any change of registrar to be mailed to each registered owner.

THIS BOND AND THE SERIES OF WHICH IT IS A PART are special obligations of the City that, along with the City's outstanding Waterworks and Sewer System Revenue Bonds, Series 2016 and Waterworks and Sewer System Revenue Bonds, Series 2018 (collectively, the "Outstanding Bonds"), are payable from and are equally and ratably secured by a first lien on the revenues of the City's waterworks and sewer system remaining after deduction of the operation and maintenance expenses of that system (the "Net Revenues"), as defined and provided in the Ordinance, which Net Revenues are required to be set aside and pledged to the payment of the Bonds, the Outstanding Bonds, and all additional bonds issued on a parity therewith, in the Interest and Sinking Fund and the Reserve Fund maintained for the payment of all such bonds, all as more fully described and provided for in the Ordinance. This Bond and the series of which it is a part, together with the interest thereon, are payable solely from such Net Revenues and do not constitute an indebtedness or general obligation of the City. The holder of this obligation is not entitled to demand payment of this obligation out of any money raised by taxation.

THE CITY HAS RESERVED THE RIGHT to issue additional parity revenue bonds, subject to the restrictions contained in the Ordinance, which may be equally and ratably payable from, and secured by a first lien on and pledge of, the Net Revenues in the same manner and to the same extent as this Bond and the series of which it is a part.

IT IS HEREBY DECLARED AND REPRESENTED that this Bond has been duly and validly issued and delivered; that all acts, conditions, and things required or proper to be performed, exist, and be done precedent to or in the issuance and delivery of this Bond have been performed, existed, and been done in accordance with law; that the Bonds do not exceed any statutory limitation; and that provision has been made for the payment of the principal of and interest on this

Bond and all of the Bonds by the creation of the aforesaid lien on and pledge of the Net Revenues.

BY BECOMING the registered owner of this Bond, the registered owner thereby acknowledges all of the terms and provisions of the Ordinance, agrees to be bound by such terms and provisions, acknowledges that the Ordinance is duly recorded and available for inspection in the official minutes and records of the governing body of the City, and agrees that the terms and provisions of this Bond and the Ordinance constitute a contract between each registered owner hereof and the City.

IN WITNESS WHEREOF, the City has caused this Bond to be signed with the manual or facsimile signature of the Mayor of the City (or in the Mayor's absence, by the Mayor Pro-Tem) and countersigned with the manual or facsimile signature of the City Secretary of the City, and has caused the official seal of the City to be duly impressed, or placed in facsimile, on this Bond.

(signature)
City Secretary

(signature)
Mayor

(SEAL)

(b) Form of Registrar's Authentication Certificate.

REGISTRAR'S AUTHENTICATION CERTIFICATE
(To be executed if this Bond is not accompanied by an executed Registration
Certificate of the Comptroller of Public Accounts of the State of Texas)

It is hereby certified that this Bond has been issued under the provisions of the Ordinance described in the text of this Bond; and that this Bond has been issued in conversion or replacement of, or in exchange for, a Bond, Bonds, or a portion of a Bond or Bonds of a series that originally was approved by the Attorney General of the State of Texas and registered by the Comptroller of Public Accounts of the State of Texas.

Dated:_____.

The Bank of New York Mellon Trust Company, N.A.
Dallas, Texas
Registrar

By:_____
Authorized Representative

(c) Form of Assignment.

ASSIGNMENT

For value received, the undersigned hereby sells, assigns and transfers unto

Please insert Social Security or Taxpayer Identification Number of Transferee:

Please print or typewrite name and address, including zip code of Transferee:

the within Bond and all rights thereunder, and hereby irrevocably constitutes and appoints _____, attorney, to register the transfer of the within Bond on the books kept for registration thereof, with full power of substitution in the premises.

Dated:_____.

Signature Guaranteed:

NOTICE: Signature(s) must be guaranteed by an eligible guarantor institution participating in a securities transfer association recognized signature guarantee program.

NOTICE: The signature above must correspond with the name of the Registered Owner as it appears upon the front of this Bond in every particular, without alteration or enlargement or any change whatsoever.

(d) Form of Registration Certificate of the Comptroller of Public Accounts.

COMPTROLLER'S REGISTRATION CERTIFICATE: REGISTER NO. _____

I hereby certify that this Bond has been examined, certified as to validity and approved by the Attorney General of the State of Texas, and that this Bond has been registered by the Comptroller of Public Accounts of the State of Texas.

Witness my signature and seal this_____.

Comptroller of Public Accounts of the State of Texas

(COMPTROLLER'S SEAL)

(e) Initial Bond Insertions.

(i) The initial Bond shall be in the form set forth in paragraph (a) of this Section, except that:

A. immediately under the name of the Bond, the headings "Interest Rate" and "Maturity Date" shall both be completed with the words "As shown below" and "CUSIP No. " shall be deleted.

B. the first paragraph shall be deleted and the following will be inserted:

"THE CITY OF FRIENDSWOOD, TEXAS, a municipal corporation duly incorporated under the laws of the State of Texas (herein the "City") for value received, promises to pay, but solely from certain Net Revenues as hereinafter provided, to the registered owner identified above or registered assigns, on the maturity date specified above, upon presentation and surrender of this Bond to The Bank of New York Mellon Trust Company, N.A. (the "Registrar"), at its principal payment office in Dallas, Texas, the principal amount identified above, payable in any coin or currency of the United States of America which on the date of payment is legal tender for the payment of debts due the United States of America, and to pay, solely from such Net Revenues, on March 1 in each of the years, in the principal installments and bearing interest at the per annum rates set forth in the following schedule:

Years	Principal Installments	Interest Rates	Years	Principal Installments	Interest Rates
2022			2032		
2023			2033		
2024			2034		
2025			2035		
2026			2036		
2027			2037		
2028			2038		
2029			2039		
2030			2040		
2031			2041		

The City promises to pay interest on the unpaid principal amount hereof (calculated on the basis of a 360-day year of twelve 30-day months) from the Date of Delivery shown above at the respective Interest Rate per annum specified above. Interest is payable on September 1, 2021, and semiannually on each March 1 and September 1 thereafter to the date of payment of the principal installment specified above, or the date of redemption prior to maturity; except, that if this Bond is required to be authenticated and the date of its authentication is later than the close of business on the fifteenth day of the month preceding each interest payment date, such Principal Amount shall bear interest from the interest payment date next preceding the date of authentication, unless such date of authentication is after such date but on or before the next following interest payment date, in which case such principal amount shall bear interest from such next following interest payment date; provided, however, that if on the date of authentication hereof the interest on the Bond or Bonds, if any, for which this Bond is being exchanged is due but has not been paid, then this Bond shall bear interest from the date to which such interest has been paid in full."

C. The Initial Bond shall be numbered "T-1."

ARTICLE IV

SECURITY AND SOURCE OF PAYMENT FOR ALL PARITY BONDS

Section 4.1: Pledge and Source of Payment. The City hereby covenants and agrees that all Gross Revenues of the System shall be deposited and paid into the special funds established for the Parity Bonds, as provided in this Ordinance, and shall be applied in the manner set out herein, to provide for the payment of all Maintenance and Operation Expenses and to provide for the payment of principal, interest and any redemption premium of the Parity Bonds and all expenses of paying, securing and insuring the same. The Parity Bonds shall constitute special obligations of the City that shall be payable solely from, and shall be equally and ratably secured by a first lien on, the Net Revenues, as collected and received by the City, from the operation and ownership of the System, which Net Revenues shall, in the manner herein provided, be set aside for and pledged to the payment of the Parity Bonds in the Interest and Sinking Fund and Reserve Fund as hereinafter provided, and the Parity Bonds shall be in all respects on a parity with and of equal dignity with one another. The holders of the Parity Bonds shall never have the right to demand payment out of any funds raised or to be raised by taxation.

Section 4.2: Rates and Charges. So long as any Parity Bonds remain outstanding, the City shall fix, charge and collect rates and charges for the use and services of the System which are fully sufficient to produce Net Revenues in each fiscal year at least equal to 125% of the principal and interest requirements scheduled to occur in such fiscal year on all Parity Bonds then outstanding plus an amount equal to the sum of all deposits required to be made to the Reserve Fund in such fiscal year; but in no event shall Net Revenues ever be less than the amount required to maintain the Interest and Sinking Fund and the Reserve Fund as hereinafter provided, and, to the extent that funds for such purpose are not otherwise available, to pay all other outstanding obligations payable from the Net Revenues of the System, as and when the same become due.

The City will not grant or permit any free service from the System except for public buildings and institutions operated by the City.

Section 4.3: Special Funds. The following special funds created pursuant to, or confirmed in, the ordinance authorizing the Outstanding Bonds are hereby confirmed, and such funds shall be maintained and accounted for as hereinafter provided, so long as any Parity Bonds remain outstanding:

- (a) Waterworks and Sewer System Revenue Fund (the "Revenue Fund");
- (b) Waterworks and Sewer System Revenue Bonds Interest and Sinking Fund (the "Interest and Sinking Fund"); and

- (c) Waterworks and Sewer System Revenue Bonds Reserve Fund (the "Reserve Fund").

The Revenue Fund shall be maintained as a separate account on the books of the City. The Interest and Sinking Fund and the Reserve Fund shall be maintained at an official depository bank of the City separate and apart from all other funds and accounts of the City and shall constitute trust funds which shall be held in trust for the benefit of the Owners of the Parity Bonds and the proceeds of which shall be and are hereby pledged to the payment of the Parity Bonds. All of the Funds named above shall be used solely as provided in this Ordinance so long as any Parity Bonds remain outstanding.

Section 4.4: Flow of Funds. All Gross Revenues of the System (except for interest and earnings on investments in the Reserve Fund and the Interest and Sinking Fund) shall be deposited as collected into the Revenue Fund. Money from time to time on deposit in the Revenue Fund shall be applied as follows in the following order of priority:

- (a) First, to pay Maintenance and Operation Expenses.
- (b) Second, to make all deposits into the Interest and Sinking Fund required by this Ordinance, the ordinance authorizing the issuance of the Outstanding Bonds, and any ordinance authorizing the issuance of Additional Parity Bonds.
- (c) Third, to make all deposits into the Reserve Fund required by this Ordinance, the ordinance authorizing the issuance of the Outstanding Bonds, and any ordinance authorizing the issuance of Additional Parity Bonds.
- (d) Fourth, to pay any amounts due to any bond insurer of Parity Bonds not paid pursuant to subsections (b) or (c) above.
- (e) Fifth, to pay any amounts due to any issuer of a reserve fund surety policy not paid pursuant to subsections (b) or (c) above.
- (f) Sixth, for any lawful purpose.

Whenever the total amounts on deposit to the credit of the Interest and Sinking Fund and the Reserve Fund shall be equivalent to the sum of the aggregate principal amount of all outstanding Parity Bonds plus the aggregate amount of all interest accrued and to accrue thereon, no further payments need be made into the Interest and Sinking Fund or the Reserve Fund.

Section 4.5: Interest and Sinking Fund. On or before the last Business Day of each month, so long as any Parity Bonds remain outstanding, after making all required payments and provision for payment of Maintenance and Operation Expenses, there shall be transferred into the Interest and Sinking Fund from the Revenue Fund:

- (i) such amounts, in approximately equal monthly installments, as will be sufficient to accumulate the amount required to pay the interest scheduled to become due on the Parity Bonds on the next interest payment date; and
- (ii) such amounts, in approximately equal monthly installments, as will be sufficient to accumulate the amount required to pay the next maturing principal of the Parity Bonds, including the principal amounts of, and any redemption premium on, any Parity Bonds payable as a result of the exercise or operation of any optional or mandatory redemption provision contained in any ordinance authorizing the issuance of Parity Bonds.

Money deposited to the credit of the Interest and Sinking Fund shall be used solely for the purpose of paying principal (at maturity or prior redemption or to purchase Parity Bonds issued as term bonds in the open market to be credited against mandatory redemption requirements), interest and any redemption premium on the Parity Bonds, plus all bank charges and other costs and expenses relating to such payment. The paying agent shall destroy all paid Parity Bonds and shall provide the City with appropriate certificates of destruction.

Section 4.6: Reserve Fund. (a) On or before the last Business Day of each month so long as any Parity Bonds remain outstanding, after making all required payments and provision for payment of Maintenance and Operation Expenses, and after making the transfers into the Interest and Sinking Fund required in the preceding Section, there shall be transferred into the Reserve Fund from the Revenue Fund, in approximately equal monthly installments, amounts sufficient to accumulate within sixty (60) months the Reserve Fund Requirement. Each increase in the Reserve Fund Requirement resulting from the issuance of Additional Parity Bonds shall be accumulated within sixty (60) months of the issuance of such Additional Parity Bonds by making transfers from the Revenue Fund into the Reserve Fund in approximately equal monthly installments of amounts sufficient for such purpose. After the Reserve Fund Requirement has accumulated in the Reserve Fund and so long thereafter as such Fund contains the Reserve Fund Requirement, no further deposits shall be required to be made into the Reserve Fund, and any excess amounts may be transferred to the Revenue Fund. If the balance in the Reserve Fund is reduced below the Reserve Fund Requirement, either due to a draw on the funds or reduction or cancellation of a Reserve Fund Surety Policy, monthly deposits into such Fund shall be resumed and continued in amounts at least equal to one twenty-fourth (1/24th) of the deficiency in the Reserve Fund Requirement until the Reserve Fund again equals the Reserve Fund Requirement. The Reserve Fund shall be used to pay the principal of and interest on the Parity Bonds at any time when there is not sufficient money available in the Interest and Sinking Fund for such purpose and to pay and retire the last Parity Bonds to mature or be redeemed.

(b) The City expressly reserves the right at any time to satisfy all or any part of the Reserve Fund Requirement by obtaining for the benefit of the Reserve Fund a Reserve Fund Surety Policy (as defined below). In the event the City elects to substitute a Reserve Fund Surety Policy for any funded amounts in the Reserve Fund, it may apply any bond proceeds thereby released, including investment earnings or such proceeds, to any purposes for which the bonds were issued

and any other funds thereby released to any purposes for which such funds may lawfully be used, including the payment of debt service on the Parity Bonds. A Reserve Fund Surety Policy shall be an insurance policy or other credit agreement (as such term is defined by Section 1371.001, Government Code) in a principal amount equal to the portion of the Reserve Fund Requirement to be satisfied and issued by a financial institution or insurance company with a rating for its long term unsecured debt or claims paying ability in the highest letter category by two major municipal securities evaluation sources. A Reserve Fund Surety Policy shall be for the pro rata benefit of all Parity Bonds. The premium for any such policy shall be paid from bond proceeds or other funds of the City lawfully available for such purpose. Any Reserve Fund Surety Policy shall be authorized by resolution or ordinance and submitted to the Attorney General for examination and approval.

(c) In connection with the issuance of the Bonds, the City will deposit the amount of \$ _____ to the Reserve Fund from proceeds of the Bonds to fully fund the required increase in the Reserve Fund associated with the issuance of the Bonds on the date of initial delivery of the Bonds.

Section 4.7: Deficiencies in Funds. If in any month there shall not be deposited into any Fund maintained pursuant to this Article the full amounts required herein, amounts equivalent to such deficiency shall be set apart and paid into such Fund or Funds from the first available and unallocated money in the Revenue Fund, and such payment shall be in addition to the amounts otherwise required to be paid into such Funds during the succeeding month or months. To the extent necessary, the rates and charges for the System shall be increased to make up for any such deficiencies.

Section 4.8: Investment of Funds; Transfer of Investment Income. (a) Money in the Revenue Fund, the Interest and Sinking Fund and the Reserve Fund may, at the option of the City, be invested as permitted by law; provided that all such deposits and investments shall be made in such manner that the money within each Fund will be available at the proper time or times, and provided further that in no event shall such deposits or investments of money in the Reserve Fund mature later than the final maturity date of the Parity Bonds. Any obligation in which money is so invested shall be kept and held in the Fund from which the investment was made. All such investments shall be promptly sold when necessary to prevent any default in connection with the Parity Bonds.

(b) All interest and income derived from such deposits and investments shall be credited as received to the Fund from which the investment was made.

ARTICLE V

ADDITIONAL BONDS

Section 5.1: Additional Parity Bonds. The City reserves the right to issue, for any lawful purpose (including the refunding of any previously issued Parity Bonds or any other bonds or obligations of the City issued in connection with or payable from the revenues of the System), one

or more series of Additional Parity Bonds payable from and secured by a first lien on the Net Revenues of the System on a parity with the Bonds and any previously issued Additional Parity Bonds; provided, however, that no Additional Parity Bonds may be issued unless:

- (a) the Additional Parity Bonds mature on, and interest is payable on, the same days of the year as any outstanding Parity Bonds;
- (b) the Interest and Sinking Fund and the Reserve Fund each contains the amount of money then required to be on deposit therein;
- (c) for either the preceding fiscal year or a 12 consecutive calendar month period ending no more than 90 days prior to adoption of the ordinance authorizing such Additional Parity Bonds, Net Revenues were equal to at least 140% of the average annual principal and interest requirements on all Parity Bonds that will be outstanding after the issuance of the series of Additional Parity Bonds then proposed to be issued, as certified by the City's Controller or Director of Administrative Services or by an independent certified public accountant or firm of independent certified public accountants; and
- (d) if the City cannot meet the test described in (c) above, but a change in the rates and charges applicable to the System becomes effective at least sixty (60) days prior to the adoption of the ordinance authorizing Additional Parity Bonds and the City's Controller or Director of Administrative Services certifies that, had such change in rates and charges been effective for the preceding fiscal year or 12 consecutive calendar month period ending no more than 90 days prior to adoption of said ordinance, the Net Revenues for such period would have met the test described in (c) above.

Section 5.2: Subordinate Lien Bonds. The City reserves the right to issue, for any lawful purpose, bonds, notes or other obligations secured in whole or in part by liens on the Net Revenues that are junior and subordinate to the lien on the Net Revenues securing payment of the Parity Bonds. Such subordinate lien obligations may be further secured by any other source of payment lawfully available for such purpose.

Section 5.3: Special Project Bonds. The City reserves the right to issue revenue bonds secured by liens on and pledges of revenues and proceeds derived from Special Projects.

ARTICLE VI

COVENANTS AND PROVISIONS RELATING TO ALL PARITY BONDS

Section 6.1: Punctual Payment of Parity Bonds. The City will punctually pay or cause to be paid the interest on and principal of all Parity Bonds according to the terms thereof and will

faithfully do and perform, and at all times fully observe, any and all covenants, undertakings, stipulations and provisions contained in this Ordinance and in any ordinance authorizing the issuance of Additional Parity Bonds.

Section 6.2: Maintenance of System. So long as any Parity Bonds remain outstanding, the City covenants that it will at all times maintain the System, or within the limits of its authority cause the same to be maintained, in good condition and working order and will operate the same, or cause the same to be operated, in an efficient and economical manner at a reasonable cost and in accordance with sound business principles. In operating and maintaining the System, the City will comply with all contractual provisions and agreements entered into by it and with all valid rules, regulations, directions or orders of any governmental, administrative, or judicial body promulgating same, noncompliance with which would materially and adversely affect the operation of the System.

Section 6.3: Sale or Encumbrance of System. So long as any Parity Bonds remain outstanding, the City will not sell, dispose of or, except as permitted in Article VI, further encumber the System; provided, however, that this provision shall not prevent the City from disposing of any portion of the System which is being replaced or is deemed by the City to be obsolete, worn out, surplus or no longer needed for the proper operation of the System. Any agreement pursuant to which the City contracts with a person, corporation, municipal corporation or political subdivision to operate the System or to lease and/or operate all or part of the System shall not be considered as an encumbrance of the System.

Section 6.4: Insurance. The City further covenants and agrees that it will keep the System insured with insurers of good standing against risks, accidents or casualties against which and to the extent customarily insured against by political subdivisions of the State of Texas operating similar systems, to the extent that such insurance is available. The cost of all such insurance together with any additional insurance, shall be a part of the Maintenance and Operation Expenses. All net proceeds of such insurance shall be applied to repair or replace the insured property that is damaged or destroyed, or to make other capital improvements to the System, or to redeem Parity Bonds.

Section 6.5: Account, Records, and Audits. So long as any Parity Bonds remain outstanding, the City covenants and agrees that it will maintain a proper and complete system of records and accounts pertaining to the operation of the System in which full, true and proper entries will be made of all dealings, transactions, business and affairs which in any way affect or pertain to the System or the Gross Revenues or the Net Revenues thereof. The City shall after the close of each of its fiscal years cause an audit report of such records and accounts to be prepared by an independent certified public accountant or independent firm of certified public accountants. Each year promptly after such audit report is prepared, the City shall furnish a copy thereof without cost to the Municipal Advisory Council of Texas, the major municipal rating agencies and any Owner of Parity Bonds who shall request same. All expenses incurred in preparing such audits shall be Maintenance and Operation Expenses.

Section 6.6: Competition. To the extent it legally may, the City will not grant any franchise or permit for the acquisition, construction, or operation of any competing facilities which might be used as a substitute for the System and will prohibit the operation of any such competing facilities.

Section 6.7: Pledge and Encumbrance of Net Revenues. The City covenants and represents that it has the lawful power to create a lien on and to pledge the Net Revenues to secure the payment of the Parity Bonds and has lawfully exercised such power under the Constitution and laws of the State of Texas. The City further covenants and represents that, other than to the payment of the Parity Bonds, the Net Revenues are not and will not be made subject to any other lien, pledge or encumbrance to secure the payment of any debt or obligation of the City, unless such lien, pledge or encumbrance is junior and subordinate to the lien and pledge securing payment of the Parity Bonds.

Section 6.8: Bondowners' Remedies. This Ordinance shall constitute a contract between the City and the Owners of the Parity Bonds from time to time outstanding (including any bond insurers of Parity Bonds) and shall remain in effect until the Parity Bonds and the interest thereon shall be fully paid or discharged or provision therefor shall have been made as provided herein (including payments of any amounts due to bond insurers of Parity Bonds). In the event of a default in the payment of the principal of or interest on any of the Parity Bonds or a default in the performance of any duty or covenant provided by law or in this Ordinance, the Owner or Owners of any of the Parity Bonds may pursue all legal remedies afforded by the Constitution and laws of the State of Texas to compel the City to remedy such default and to prevent further default or defaults. Without in any way limiting the generality of the foregoing, it is expressly provided that any Owner of any of the Parity Bonds may proceed at law or in equity, by suit, action, mandamus, or other proceedings, enforce and compel performance of all duties required to be performed by the City under this Ordinance, including the making and collection of reasonable and sufficient rates and charges for the use and services of the System, the deposit of the Gross Revenues into the special funds herein provided, and the application of the Gross Revenues and the Net Revenues in the manner required in this Ordinance.

Section 6.9: Discharge by Deposit. (a) Any Bond and the interest thereon shall be deemed to be paid, retired and no longer outstanding (a "Defeased Bond") within the meaning of this Ordinance, except to the extent provided in subsection (d) of this Section, when payment of the principal of such Bond, plus interest thereon to the due date (whether such due date be by reason of maturity or otherwise) either (i) shall have been made or caused to be made in accordance with the terms thereof, or (ii) shall have been provided for on or before such due date by irrevocably depositing with or making available to the Registrar in accordance with an escrow agreement or other instrument (the "Future Escrow Agreement") for such payment (1) lawful money of the United States of America sufficient to make such payment or (2) Defeasance Securities that mature as to principal and interest in such amounts and at such times as will insure the availability, without reinvestment, of sufficient money to provide for such payment, and when proper arrangements have been made by the City with the Registrar for the payment of its services until all Defeased Bonds shall have become due and payable, and thereafter the City will have no further responsibility with respect to amounts available to such paying agent (or other financial institution permitted by

applicable law) for the payment of such defeased bonds, including any insufficiency therein caused by the failure of such paying agent (or other financial institution permitted by applicable law) to receive payment when due on the Defeasance Securities. At such time as a Bond shall be deemed to be a Defeased Bond hereunder, as aforesaid, such Bond and the interest thereon shall no longer be secured by, payable from, or entitled to the benefits of, the ad valorem taxes herein levied and pledged as provided in this Ordinance, and such principal and interest shall be payable solely from such money or Defeasance Securities. Notwithstanding any other provision of this Ordinance to the contrary, it is hereby provided that any determination not to redeem Defeased Bonds that is made in conjunction with the payment arrangements specified in Subsection (a)(i) or (ii) of this Section shall not be irrevocable, provided that: (1) in the proceedings providing for such payment arrangements, the City expressly reserves the right to call the Defeased Bonds for redemption; (2) gives notice of the reservation of that right to the owners of the Defeased Bonds immediately following the making of the payment arrangements; and (3) directs that notice of the reservation be included in any redemption notices that it authorizes.

(b) Any moneys so deposited with the Registrar may at the written direction of the City be invested in Defeasance Securities, maturing in the amounts and times as hereinbefore set forth, and all income from such Defeasance Securities received by the Registrar that is not required for the payment of the Bonds and interest thereon, with respect to which such money has been so deposited, shall be turned over to the City, or deposited as directed in writing by the City. Any Future Escrow Agreement pursuant to which the money and/or Defeasance Securities are held for the payment of Defeased Bonds may contain provisions permitting the investment or reinvestment of such moneys in Defeasance Securities or the substitution of other Defeasance Securities upon the satisfaction of the requirements specified in Subsection (a)(i) or (ii) of this Section. All income from such Defeasance Securities received by the Registrar which is not required for the payment of the Defeased Bonds, with respect to which such money has been so deposited, shall be remitted to the City or deposited as directed in writing by the City.

(c) The term "Defeasance Securities" means any securities and obligations now or hereafter authorized by State law that are eligible to refund, retire or otherwise discharge obligations such as the Bonds; provided, however, Defeasance Securities shall exclude securities described in Section 1207.062(b)(3), Texas Government Code.

(d) Until all Defeased Bonds shall have become due and payable, the Registrar shall perform the services of Registrar for such Defeased Bonds the same as if they had not been defeased, and the City shall make proper arrangements to provide and pay for such services as required by this Ordinance.

(e) In the event that the City elects to defease less than all of the principal amount of Bonds of a maturity, the Registrar shall select, or cause to be selected, such amount of Bonds by such random method as it deems fair and appropriate.

Section 6.10: Paying Agents May Own Parity Bonds. The paying agents for the Parity Bonds, in their individual or any other capacity, may become holders or pledges of the Parity Bonds with the same rights they would have if they were not paying agents.

Section 6.11: No Recourse Against City Officials. No recourse shall be had for the payment of principal of or interest on any Parity Bonds or for any claim based thereon or on this Ordinance against any official of the City or any person executing any Parity Bonds.

ARTICLE VII

PROVISIONS CONCERNING SALE AND APPLICATION OF PROCEEDS OF BONDS

Section 7.1: Sale; Bond Purchase Agreement. The Bonds are hereby sold and shall be delivered to the Underwriters at a price of \$_____ (representing the par amount of the Bonds, less an Underwriters' discount of \$_____, plus an aggregate premium of \$_____), all in accordance with the terms of the Bond Purchase Agreement of even date herewith, presented to and hereby approved by the City Council, which price and terms are hereby found and determined to be the most advantageous reasonably obtainable by the City. The Mayor and other appropriate officials of the City are hereby authorized and directed to execute the Bond Purchase Agreement on behalf of the City, and the Mayor and all other officers, agents and representatives of the City are hereby authorized to do any and all things necessary or desirable to satisfy the conditions set out therein and to provide for the issuance and delivery of the Bonds.

Section 7.2: Federal Income Tax Exclusion.

(a) Covenants. The City covenants to take any action necessary to assure, or refrain from any action that would adversely affect, the treatment of the Bonds as obligations described in section 103 of the Internal Revenue Code (the "Code"), the interest on which is not includable in the "gross income" of the holder for purposes of federal income taxation. In furtherance thereof, the City covenants as follows:

(1) to take any action to assure that no more than 10 percent of the proceeds of the Bonds (less amounts deposited to a reserve fund, if any) are used for any "private business use," as defined in section 141(b)(6) of the Code or, if more than 10 percent of the proceeds or the projects financed therewith are so used, such amounts, whether or not received by the City, with respect to such private business use, do not, under the terms of this Ordinance or any underlying arrangement, directly or indirectly, secure or provide for the payment of more than 10 percent of the debt service on the Bonds, in contravention of section 141(b)(2) of the Code;

(2) to take any action to assure that in the event that the "private business use" described in subsection (1) hereof exceeds 5 percent of the proceeds of the Bonds or the projects financed therewith (less amounts deposited into a reserve fund, if any) then the

amount in excess of 5 percent is used for a "private business use" that is "related" and not "disproportionate," within the meaning of section 141(b)(3) of the Code, to the governmental use;

(3) to take any action to assure that no amount that is greater than the lesser of \$5,000,000, or 5 percent of the proceeds of the Bonds (less amounts deposited into a reserve fund, if any) is directly or indirectly used to finance loans to persons, other than state or local governmental units, in contravention of section 141(c) of the Code;

(4) to refrain from taking any action that would otherwise result in the Bonds being treated as "private activity bonds" within the meaning of section 141(b) of the Code;

(5) to refrain from taking any action that would result in the Bonds being "federally guaranteed" within the meaning of section 149(b) of the Code;

(6) to refrain from using any portion of the proceeds of the Bonds, directly or indirectly, to acquire or to replace funds that were used, directly or indirectly, to acquire investment property (as defined in section 148(b)(2) of the Code) that produces a materially higher yield over the term of the Bonds, other than investment property acquired with –

(A) proceeds of the Bonds invested for a reasonable temporary period of 3 years or less or, in the case of a refunding bond, for a period of 90 days or less until such proceeds are needed for the purpose for which the bonds are issued,

(B) amounts invested in a bona fide debt service fund, within the meaning of section 1.148-1(b) of the Treasury Regulations, and

(C) amounts deposited in any reasonably required reserve or replacement fund to the extent such amounts do not exceed 10 percent of the proceeds of the Bonds;

(7) to otherwise restrict the use of the proceeds of the Bonds or amounts treated as proceeds of the Bonds, as may be necessary, so that the Bonds do not otherwise contravene the requirements of section 148 of the Code (relating to arbitrage);

(8) to refrain from using the proceeds of the Bonds or proceeds of any prior bonds to pay debt service on another issue more than 90 days after the date of issue of the Bonds in contravention of the requirements of section 149(d) of the Code (relating to advance refundings);

(9) to pay to the United States of America at least once during each five-year period (beginning on the date of delivery of the Bonds) an amount that is at least equal to 90 percent of the "Excess Earnings," within the meaning of section 148(f) of the Code and to pay to the United States of America, not later than 60 days after the Bonds have been paid in full, 100

percent of the amount then required to be paid as a result of Excess Earnings under section 148(f) of the Code; and

(10) to assure that the proceeds of the Bonds issued for improvements to the System will be used solely for new money projects.

(b) Rebate Fund. In order to facilitate compliance with the above covenant (a)(8), a "Rebate Fund" is hereby established by the City for the sole benefit of the United States of America, and such Fund shall not be subject to the claim of any other person, including without limitation the Bondholders. The Rebate Fund is established for the additional purpose of compliance with section 148 of the Code.

(c) Use of Proceeds. For purposes of the foregoing covenants (a)(1) and (a)(2), the City understands that the term "proceeds" includes "disposition proceeds" as defined in the Treasury Regulations and, in the case of refunding bonds, transferred proceeds (if any) and proceeds of the refunded bonds expended prior to the date of issuance of the Bonds. It is the understanding of the City that the covenants contained herein are intended to assure compliance with the Code and any regulations or rulings promulgated by the U.S. Department of the Treasury pursuant thereto. In the event that regulations or rulings are hereafter promulgated that modify or expand provisions of the Code, as applicable to the Bonds, the City will not be required to comply with any covenant contained herein to the extent that such failure to comply, in the opinion of nationally recognized bond counsel, will not adversely affect the exemption from federal income taxation of interest on the Bonds under section 103 of the Code. In the event that regulations or rulings are hereafter promulgated that impose additional requirements applicable to the Bonds, the City agrees to comply with the additional requirements to the extent necessary, in the opinion of nationally recognized bond counsel, to preserve the exemption from federal income taxation of interest on the Bonds under section 103 of the Code. In furtherance of such intention, the City hereby authorizes and directs the Mayor, the City Manager or the Director of Administrative Services to execute any documents, certificates or reports required by the Code and to make such elections, on behalf of the City, that may be permitted by the Code as are consistent with the purpose for the issuance of the Bonds.

(d) Allocation of, and Limitation on, Expenditures for the Project. The City covenants to account for the expenditure of sale proceeds and investment earnings to be used for the construction and acquisition of the improvements financed with the Bonds (the "Project") on its books and records by allocating proceeds to expenditures within 18 months of the later of the date that (1) the expenditure is made, or (2) the Project is completed. The foregoing notwithstanding, the City shall not expend proceeds of the sale of the Bonds or investment earnings thereon more than 60 days after the earlier of (1) the fifth anniversary of the delivery of the Bonds, or (2) the date the Bonds are retired, unless the City obtains an opinion of nationally-recognized bond counsel that such expenditure will not adversely affect the status, for federal income tax purposes, of the Bonds or the interest thereon. For purposes hereof, the City shall not be obligated to comply with this covenant if it obtains an opinion that such failure to comply will not adversely affect the excludability for federal income tax purposes from gross income of the interest.

(e) Disposition of Project. The City covenants that the Project will not be sold or otherwise disposed in a transaction resulting in the receipt by the City of cash or other compensation, unless the City obtains an opinion of nationally-recognized bond counsel that such sale or other disposition will not adversely affect the tax-exempt status of the Bonds. For purposes of the foregoing, the portion of the property comprising personal property and disposed in the ordinary course shall not be treated as a transaction resulting in the receipt of cash or other compensation. For purposes hereof, the City shall not be obligated to comply with this covenant if it obtains a legal opinion that such failure to comply will not adversely affect the excludability for federal income tax purposes from gross income of the interest.

Section 7.3: Use of Proceeds. Proceeds from the sale of the Bonds shall, promptly upon receipt by the City, be applied as follows:

- (a) \$_____ shall be deposited to the Reserve Fund;
- (b) \$_____ shall be applied to pay costs of issuing the Bonds, including the underwriting discount of \$_____; and
- (c) \$_____ shall be used to pay for improvements to the System and to pay costs of issuing the Bonds.

ARTICLE VIII

CONTINUING DISCLOSURE

Section 8.1: Continuing Disclosure Undertaking.

(a) Definitions. As used in this Section, the following terms have the meanings ascribed to such terms below:

"Financial Obligation" means a (i) debt obligation; (ii) derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation; or (iii) guarantee of a debt obligation or any such derivative instrument; provided that "financial obligation" shall not include municipal securities as to which a final official statement (as defined in the Rule) has been provided to the MSRB consistent with the Rule.

"MSRB" means the Municipal Securities Rulemaking City Council.

"Rule" means SEC Rule 15c2-12, as amended from time to time.

"SEC" means the United States Securities and Exchange Commission.

(b) Annual Reports. (i) The City shall provide annually to the MSRB, in the electronic format prescribed by the MSRB, financial information and operating data with respect to the City of the general type included in the final Official Statement authorized by this Ordinance, being the financial information and operating data with respect to the City of the general type included in the Official Statement under the headings "OFFICIAL STATEMENT SUMMARY – Selected Financial Information," "CITY REVENUE DEBT" and "THE SYSTEM" (collectively, the "Annual Operating Report"). The City will additionally provide financial statements of the City (the "Financial Statements"), that will be (A) prepared in accordance with the accounting principles described in the notes to the financial statements that are attached to the Official Statement as Appendix B, or such other accounting principles as the City may be required to employ from time to time pursuant to state law or regulation, and shall be in substantially the form included in the final Official Statement and (B) audited, if the City commissions an audit of such Financial Statements and the audit is completed within the period during which they must be provided. The City will update and provide the Annual Operating Report within six months after the end of each fiscal year and the Financial Statements within 12 months of the end of each fiscal year, in each case beginning with the fiscal year ending in and after 2020. The City may provide the Financial Statements earlier, including at the time it provides its Annual Operating Report, but if the audit of such Financial Statements is not complete within 12 months after any such fiscal year end, then the City shall file unaudited Financial Statements within such 12-month period and audited Financial Statements for the applicable fiscal year, when and if the audit report on such Financial Statements becomes available.

(ii) If the City changes its fiscal year, it will notify the MSRB of the change (and of the date of the new fiscal year end) prior to the next date by which the City otherwise would be required to provide financial information and operating data pursuant to this Section. The financial information and operating data to be provided pursuant to this Section may be set forth in full in one or more documents or may be included by specific reference to any documents available to the public on the MSRB's internet website or filed with the SEC.

(iii) Event Notices. The City shall notify the MSRB, in a timely manner not in excess of ten Business Days after the occurrence of the event, of any of the following events with respect to the Bonds:

1. Principal and interest payment delinquencies;
2. Non-payment related defaults, if material;
3. Unscheduled draws on debt service reserves reflecting financial difficulties;
4. Unscheduled draws on credit enhancements reflecting financial difficulties;
5. Substitution of credit or liquidity providers, or their failure to perform;
6. Adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the Bonds, or other material events affecting the tax status of the Bonds;
7. Modifications to rights of holders of the Bonds, if material;
8. Bond calls, if material, and tender offers;

9. Defeasances;
10. Release, substitution, or sale of property securing repayment of the Bonds, if material;
11. Rating changes;
12. Bankruptcy, insolvency, receivership or similar event of the City;
13. The consummation of a merger, consolidation, or acquisition involving the City or the sale of all or substantially all of the assets of the City, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material;
14. Appointment of a successor Paying Agent/Registrar or change in the name of the Paying Agent/Registrar, if material;
15. Incurrence of a Financial Obligation of the City, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a Financial Obligation of the City, any of which affect security holders, if material; and
16. Default, event of acceleration, termination event, modification of terms, or other similar events under the terms of a Financial Obligation of the City, any of which reflect financial difficulties.

The City shall notify the MSRB, in a timely manner, of any failure by the City to provide financial information or operating data in accordance with subsection (ii) of this Section by the time required by subsection (ii). As used in clause (iii)12 above, the phrase "bankruptcy, insolvency, receivership or similar event" means the appointment of a receiver, fiscal agent or similar officer for the City in a proceeding under the U.S. Bankruptcy Code or in any other proceeding under state or federal law in which a court of governmental authority has assumed jurisdiction over substantially all of the assets or business of the City, or if jurisdiction has been assumed by leaving the City Council and officials or officers of the City in possession but subject to the supervision and orders of a court or governmental authority, or the entry of an order confirming a plan of reorganization, arrangement or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the City.

(iv) Limitations, Disclaimers, and Amendments. (A) The City shall be obligated to observe and perform the covenants specified in this Section for so long as, but only for so long as, the City remains an "obligated person" with respect to the Bonds within the meaning of the Rule, except that the City in any event will give notice of any deposit made in accordance with this Ordinance or applicable law that causes the Bonds no longer to be outstanding.

(B) The provisions of this Section are for the sole benefit of the registered owners and beneficial owners of the Bonds, and nothing in this Section, express or implied, shall give any benefit or any legal or equitable right, remedy, or claim hereunder to any other person. The City undertakes to provide only the financial information, operating data, financial statements, and notices which it has expressly agreed to provide pursuant to this Section and does not hereby undertake to provide any other information that may be relevant or material to a complete presentation of the City's financial results, condition, or prospects or hereby undertake to update any

information provided in accordance with this Section or otherwise, except as expressly provided herein. The City does not make any representation or warranty concerning such information or its usefulness to a decision to invest in or sell Bonds at any future date.

(C) UNDER NO CIRCUMSTANCES SHALL THE CITY BE LIABLE TO THE REGISTERED OWNER OR BENEFICIAL OWNER OF ANY BOND OR ANY OTHER PERSON, IN CONTRACT OR TORT, FOR DAMAGES RESULTING IN WHOLE OR IN PART FROM ANY BREACH BY THE ISSUER, WHETHER NEGLIGENT OR WITHOUT FAULT ON ITS PART, OF ANY COVENANT SPECIFIED IN THIS SECTION, BUT EVERY RIGHT AND REMEDY OF ANY SUCH PERSON, IN CONTRACT OR TORT, FOR OR ON ACCOUNT OF ANY SUCH BREACH SHALL BE LIMITED TO AN ACTION FOR MANDAMUS OR SPECIFIC PERFORMANCE.

(D) No default by the City in observing or performing its obligations under this Section shall comprise a breach of or default under the Ordinance for purposes of any other provision of this Ordinance. Nothing in this Section is intended or shall act to disclaim, waive, or otherwise limit the duties of the City under federal and state securities laws.

(E) The provisions of this Section may be amended by the City from time to time to adapt to changed circumstances that arise from a change in legal requirements, a change in law, or a change in the identity, nature, status, or type of operations of the City, but only if (1) the provisions of this Section, as so amended, would have permitted an underwriter to purchase or sell Bonds in the primary offering of the Bonds in compliance with the Rule, taking into account any amendments or interpretations of the Rule since such offering as well as such changed circumstances and (2) either (a) the registered owners of a majority in aggregate principal amount (or any greater amount required by any other provision of this Ordinance that authorizes such an amendment) of the outstanding Bonds consent to such amendment or (b) a person that is unaffiliated with the City (such as nationally recognized bond counsel) determined that such amendment will not materially impair the interest of the registered owners and beneficial owners of the Bonds. If the City so amends the provisions of this Section, it shall include with any amended financial information or operating data next provided in accordance with subsection (b) of this Section an explanation, in narrative form, of the reason for the amendment and of the impact of any change in the type of financial information or operating data so provided. The City may also amend or repeal the provisions of this continuing disclosure agreement if the SEC amends or repeals the applicable provision of the Rule or a court of final jurisdiction enters judgment that such provisions of the Rule are invalid, but only if and to the extent that the provisions of this sentence would not prevent an underwriter from lawfully purchasing or selling Bonds in the primary offering of the Bonds.

ARTICLE IX

MISCELLANEOUS

Section 9.1: Official Statement. The Council ratifies and confirms its prior approval of the form and content of the Preliminary Official Statement prepared in the initial offering and sale of

the Bonds and hereby authorizes the preparation of a final Official Statement reflecting the terms of the Bond Purchase Agreement with the Underwriters and other relevant matters. The use of such Official Statement in the reoffering of the Bonds by the Underwriters is hereby approved and authorized.

Section 9.2: Further Proceedings. The Mayor, the Director of Administrative Services, the City Secretary, and other appropriate officials of the City are hereby authorized and directed to do any and all things necessary and/or convenient to carry out the terms of this Ordinance.

Section 9.3: Severability. If any Section, paragraph, clause or provision of this Ordinance shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such Section, paragraph, clause or provision shall not affect any of the remaining provisions of this Ordinance.

Section 9.4: Paying Agent/Registrar Agreement. The form of agreement setting forth the duties of the Registrar is hereby approved and an appropriate official of the City is hereby authorized to execute such agreement for and on behalf of the City.

Section 9.5: No Personal Liability. No recourse shall be had for payment of the principal of or interest on any Bond or for any claim based thereon, or on this Ordinance, against any official or employee of the City or any person executing any Bond.

Section 9.6: Parties Interested. Nothing in this Ordinance expressed or implied is intended or shall be construed to confer upon, or to give to, any person or entity, other than the City, the Registrar and the Owners of the Bonds, any right, remedy or claim under or by reason of this Ordinance or any covenant, condition or stipulation hereof, and all covenants, stipulations, promises and agreements in this Ordinance shall be for the sole and exclusive benefit of the City, the Registrar and the Owners of the Bonds.

Section 9.7: Repealer. All orders, resolutions and ordinances, or parts thereof, inconsistent herewith are hereby repealed to the extent of such inconsistency.

Section 9.8: Open Meeting. It is hereby officially found and determined that the meeting at which this Ordinance was adopted was open to the public, and that public notice of the time, place and purpose of said meeting was given, all as required by the Texas Open Meetings Act.

Section 9.9: Method of Amendment. The City hereby reserves the right to amend this Ordinance subject to the following terms and conditions, to-wit:

(a) The City may from time to time, without the consent of any holder, except as otherwise required by paragraph (b) below, amend or supplement this Ordinance in order to (i) cure any ambiguity, defect or omission in this Ordinance that does not materially adversely affect the interests of the holders, (ii) grant additional rights or security for the benefit of the holders, (iii) add events of default as shall not be inconsistent with the provisions of this Ordinance and that shall not

materially adversely affect the interests of the holders, (iv) qualify this Ordinance under the Trust Indenture Act of 1939, as amended, or corresponding provisions of federal laws from time to time in effect, or (v) make such other provisions in regard to matters or questions arising under this Ordinance as shall not be inconsistent with the provisions of this Ordinance and that shall not in the opinion of the City's Bond Counsel materially adversely affect the interests of the holders.

(b) Except as provided in paragraph (a) above, the holders of Bonds aggregating in principal amount 51% of the aggregate principal amount of then outstanding Bonds that are the subject of a proposed amendment shall have the right from time to time to approve any amendment hereto that may be deemed necessary or desirable by the City; provided, however, that without the consent of 100% of the holders in aggregate principal amount of the then outstanding Bonds, nothing herein contained shall permit or be construed to permit amendment of the terms and conditions of this Ordinance or in any of the Bonds so as to:

- (1) Make any change in the maturity of any of the outstanding Bonds;
- (2) Reduce the rate of interest borne by any of the outstanding Bonds;
- (3) Reduce the amount of the principal of, or redemption premium, if any, payable on any outstanding Bonds;
- (4) Modify the terms of payment of principal or of interest or redemption premium on outstanding Bonds or any of them or impose any condition with respect to such payment; or
- (5) Change the minimum percentage of the principal amount of any series of Bonds necessary for consent to such amendment.

(c) If at any time the City shall desire to amend this Ordinance under this Section, the City shall send by U.S. mail to each registered owner of the affected Bonds a copy of the proposed amendment and cause notice of the proposed amendment to be published at least once in a financial publication published in The City of New York, New York or in the State of Texas. Such published notice shall briefly set forth the nature of the proposed amendment and shall state that a copy thereof is on file at the office of the City for inspection by all holders of such Bonds.

(d) Whenever at any time within one year from the date of publication of such notice the City shall receive an instrument or instruments executed by the holders of at least 51% in aggregate principal amount of all of the Bonds then outstanding that are required for the amendment, which instrument or instruments shall refer to the proposed amendment and that shall specifically consent to and approve such amendment, the City may adopt the amendment in substantially the same form.

(e) Upon the adoption of any amendatory Ordinance pursuant to the provisions of this Section, this Ordinance shall be deemed to be modified and amended in accordance with such amendatory Ordinance, and the respective rights, duties, and obligations of the City and all holders

of such affected Bonds shall thereafter be determined, exercised, and enforced, subject in all respects to such amendment.

(f) Any consent given by the holder of a Bond pursuant to the provisions of this Section shall be irrevocable for a period of six months from the date of the publication of the notice provided for in this Section, and shall be conclusive and binding upon all future holders of the same Bond during such period. Such consent may be revoked at any time after six months from the date of the publication of said notice by the holder who gave such consent, or by a successor in title, by filing notice with the City, but such revocation shall not be effective if the holders of 51% in aggregate principal amount of the affected Bonds then outstanding, have, prior to the attempted revocation, consented to and approved the amendment.

For the purposes of establishing ownership of the Bonds, the City shall rely solely upon the registration of the ownership of such Bonds on the registration books kept by the Registrar.

Section 9.10: Effective Date. In accordance with the provisions of Texas Government Code, Section 1201.028, this Ordinance shall be effective immediately upon its adoption by the Council.

Section 9.11. Custody, Approval, and Registration of Bonds; Bond Counsel's Opinion; CUSIP Numbers and Contingent Insurance Provision, if Obtained; Engagement of Bond Counsel; Attorney General Review Fee.

(a) The Mayor of the Issuer is hereby authorized to have control of the Bonds initially issued and delivered hereunder and all necessary records and proceedings pertaining to the Bonds pending their delivery and their investigation, examination, and approval by the Attorney General of the State of Texas, and their registration by the Comptroller of Public Accounts of the State of Texas. Upon registration of the Bonds said Comptroller of Public Accounts (or a deputy designated in writing to act for said Comptroller) shall manually sign the Comptroller's Registration Certificate attached to such Bonds, and the seal of said Comptroller shall be impressed, or placed in facsimile, on such Bond. The approving legal opinion of the Issuer's Bond Counsel and the assigned CUSIP numbers may, at the option of the Issuer, be printed on the Bonds issued and delivered under this Ordinance, but neither shall have any legal effect, and shall be solely for the convenience and information of the registered owners of the Bonds. In addition, if bond insurance is obtained, the Bonds may bear an appropriate legend as provided by the insurer.

(b) The obligation of the initial purchaser to accept delivery of the Bonds is subject to the initial purchaser being furnished with the final, approving opinion of McCall, Parkhurst & Horton L.L.P., bond counsel to the City, which opinion shall be dated as of and delivered on the date of initial delivery of the Bonds to the initial purchaser. The engagement of such firm as bond counsel to the City in connection with issuance, sale and delivery of the Bonds is hereby approved and confirmed. The execution and delivery of an engagement letter between the City and such firm, with respect to such services as bond counsel, is hereby authorized in such form as may be approved by the Mayor or the City Manager, and the Mayor or the City Manager is hereby authorized to execute such engagement letter.

(c) In accordance with the provisions of Section 1202.004, Tex. Gov't Code Ann., in connection with the submission of the Bonds by the Attorney General of Texas for review and approval, a statutory fee (an amount equal to 0.1% principal amount of the Bond, subject to a minimum of \$750 and a maximum of \$9,500) is required to be paid to the Attorney General upon the submission of the transcript of proceedings for the Bonds. The City hereby authorizes and directs that a check in the amount of the Attorney General filing fee for the Bonds, made payable to the "Texas Attorney General," be promptly furnished to the City's Bond Counsel, for payment to the Attorney General in connection with his review of the Bonds.

PRELIMINARY OFFICIAL STATEMENT DATED JANUARY 4, 2021

In the opinion of Bond Counsel to the City, interest on the Bonds will be excludable from gross income for federal income tax purposes under statutes, regulations, published rulings and court decisions existing on the date thereof, subject to the matters described under "TAX MATTERS" herein.

The Bonds will **NOT** be designated as "Qualified Tax-Exempt Obligations for Financial Institutions."

NEW ISSUE: BOOK-ENTRY-ONLY

RATINGS: S&P Global Ratings. " "

See "SALE AND DISTRIBUTION OF THE BONDS – Municipal Bond Ratings"

\$13,470,000*

CITY OF FRIENDSWOOD, TEXAS

(A home rule city of the State of Texas located within Galveston and Harris Counties)

WATERWORKS AND SEWER SYSTEM REVENUE BONDS, SERIES 2021

Dated: February 1, 2021

Due: March 1, as shown below

Interest Accrues from Delivery Date

Principal of and interest on the \$13,470,000* City of Friendswood, Texas, Waterworks and Sewer System Revenue Bonds, Series 2021 (the "Bonds") are payable by The Bank of New York Mellon Trust Company, N.A., Dallas, Texas, the initial paying agent/registrant (the "Paying Agent/Registrar"). The Bonds are initially registered and delivered only to Cede & Co., the nominee of The Depository Trust Company ("DTC") pursuant to the Book-Entry-Only System described herein. Beneficial ownership of the Bonds may be acquired in denominations of \$5,000 or integral multiples thereof. **No physical delivery of the Bonds will be made to the beneficial owners thereof.** Principal of and interest on the Bonds will be payable by the Paying Agent/Registrar to Cede & Co., which will make distribution of the amounts so paid to the beneficial owners of the Bonds. See "THE BONDS - Book-Entry-Only System" herein.

Interest on the Bonds will accrue from the Delivery Date (defined below), and is payable on March 1 and September 1 of each year, commencing September 1, 2021, to the registered owners (initially Cede & Co.) appearing on the registration books of the Paying Agent/Registrar on the 15th day of the month preceding each interest payment date. See "THE BONDS - Description."

The Bonds are special obligations of the City of Friendswood, Texas (the "City") and are payable from a first lien on and pledge of the Net Revenues (hereinafter defined) of the City's waterworks and sanitary sewer system (the "System") on parity with the City's outstanding System revenue bonds. The Bonds are further secured by amounts on deposit in the Reserve Fund. See "THE BONDS – Source of Payment" and "SELECTED PROVISIONS OF THE ORDINANCE." The Bonds are issued pursuant to the Constitution and general laws of the State of Texas, particularly Chapter 1502, Texas Government Code, as amended, and an ordinance authorizing the issuance of the Bonds. See "THE BONDS – Authority for Issuance."

PRINCIPAL AMOUNTS, MATURITIES, INTEREST RATES AND PRICES (Due March 1)

Maturity March 1	Principal Amount*	Interest Rate	Initial Reoffering Yield (a)	CUSIP Nos. 358595 (b)	Maturity March 1	Principal Amount*	Interest Rate	Initial Reoffering Yield (a)	CUSIP Nos. 358595 (b)
2022	\$ 415,000	%	%		2032(c)	\$ 680,000	%	%	
2023	435,000				2033(c)	710,000			
2024	460,000				2034(c)	740,000			
2025	485,000				2035(c)	770,000			
2026	505,000				2036(c)	800,000			
2027	535,000				2037(c)	835,000			
2028	560,000				2038(c)	865,000			
2029	590,000				2039(c)	900,000			
2030	620,000				2040(c)	940,000			
2031	650,000				2041(c)	975,000			

* Preliminary, subject to change.

(a) The initial yields will be established by and are the sole responsibility of the Underwriters (hereinafter defined), and the yields of some Bonds may subsequently be changed.

(b) CUSIP numbers have been assigned to the Bonds by CUSIP Global Services, managed by S&P Global Market Intelligence on behalf of the American Bankers Association, and are included solely for the convenience of the registered owners of the Bonds. Neither the City, the Financial Advisor, nor the Underwriters are responsible for the selection or correctness of the CUSIP numbers set forth herein.

(c) The Bonds maturing on March 1, 2032* and thereafter are subject to redemption on March 1, 2031* or any date thereafter, in whole or in part, at the option of the City, at the par value thereof plus accrued interest from the most recent interest payment date to the date of redemption. See "THE BONDS - Redemption Provisions."

Proceeds from the sale of the Bonds will be used to make certain extensions and improvements to the System, to fund a deposit to the Reserve Fund, and to pay the costs of issuance of the Bonds. See "THE BONDS - Use of Proceeds."

The Bonds are offered when, as and if issued, subject to the approving opinion of the Attorney General of the State of Texas and the opinion of McCall, Parkhurst & Horton L.L.P., Dallas, Texas, Bond Counsel for the City, as to the validity of the issuance of the Bonds under the Constitution and laws of the State of Texas. See "LEGAL MATTERS." Certain legal matters will be passed upon for the underwriters listed below (the "Underwriters") by Orrick, Herrington & Sutcliffe LLP, Houston, Texas, as counsel to the Underwriters. Delivery of the Bonds through DTC is expected to be on or about February 4, 2021 (the "Delivery Date").

FHN FINANCIAL CAPITAL MARKETS

SAMCO CAPITAL

* Preliminary, subject to change.

USE OF INFORMATION IN OFFICIAL STATEMENT

For purposes of compliance with Rule 15c2-12 of the Securities and Exchange Commission, as amended ("Rule 15c2-12"), and in effect on the date of this Official Statement, this document constitutes an Official Statement of the City with respect to the Bonds that has been "deemed final" by the City as of its date except for the omission of no more than the information permitted by Rule 15c2-12.

This document, when further supplemented by adding information specifying the interest rates and certain other information relating to the Bonds, shall constitute a "final official statement" of the City with respect to the Bonds, as such term is defined in Rule 15c2-12.

No dealer, broker, salesman or other person has been authorized by the City to give any information or to make any representation other than those contained in this Official Statement, and, if given or made, such other information or representations must not be relied upon as having been authorized by the City.

This Official Statement is not to be used in an offer to sell or the solicitation of an offer to buy in any state in which such offer or solicitation is not authorized or in which the person making such offer or solicitation is not qualified to do so or to any person to whom it is unlawful to make such offer or solicitation.

This Official Statement contains, in part, estimates, assumptions and matters of opinion which are not intended as statements of fact, and no representation is made as to the correctness of such estimates, assumptions or matters of opinion or as to the likelihood that they will be realized. Any information and expressions of opinion herein contained are subject to change without notice, and neither the delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the condition of the City or other matters described herein since the date hereof.

The Underwriters have provided the following sentence for inclusion in this Official Statement. The Underwriters have reviewed the information in this Official Statement in accordance with, and as part of their responsibilities to investors under federal securities laws as applied to the facts and circumstances of this transaction, but the Underwriters do not guarantee the accuracy or completeness of such information.

NEITHER THE CITY, THE UNDERWRITERS, NOR THE FINANCIAL ADVISOR MAKES ANY REPRESENTATION OR WARRANTY WITH RESPECT TO THE INFORMATION CONTAINED IN THIS OFFICIAL STATEMENT REGARDING DTC OR ITS BOOK-ENTRY-ONLY SYSTEM.

THE COVER PAGE CONTAINS CERTAIN INFORMATION FOR GENERAL REFERENCE ONLY AND IS NOT INTENDED AS A SUMMARY OF THIS OFFERING. INVESTORS SHOULD READ THIS ENTIRE OFFICIAL STATEMENT, INCLUDING THE ATTACHED APPENDICES, TO OBTAIN INFORMATION ESSENTIAL TO MAKING AN INFORMED INVESTMENT DECISION.

IN CONNECTION WITH THIS OFFERING, THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE BONDS AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

THE BONDS ARE EXEMPT FROM REGISTRATION WITH THE UNITED STATES SECURITIES AND EXCHANGE COMMISSION AND CONSEQUENTLY HAVE NOT BEEN REGISTERED THEREWITH. THE REGISTRATION, QUALIFICATION, OR EXEMPTION OF THE BONDS IN ACCORDANCE WITH APPLICABLE SECURITIES LAW PROVISIONS OF THE JURISDICTIONS IN WHICH THE BONDS HAVE BEEN REGISTERED, QUALIFIED, OR EXEMPTED SHOULD NOT BE REGARDED AS A RECOMMENDATION THEREOF.

All information contained in this Official Statement is subject, in all respects, to the complete body of information contained in the original sources thereof and no guaranty, warranty, or other representation is made concerning the accuracy or completeness of the information herein. In particular, no opinion or representation is rendered as to whether any projection will approximate actual results, and all opinions, estimates and assumptions, whether or not expressly identified as such, should not be considered statements of fact.

References to web site addresses presented herein are for informational purposes only and may be in the form of a hyperlink solely for the reader's convenience. Unless specified otherwise, such web sites and the information or links contained therein are not incorporated into, and are not part of, this final official statement for purposes of, and as that term is defined in, Rule 15c2-12.

TABLE OF CONTENTS

INTRODUCTORY STATEMENT.....	4	Pledge and Source of Payment.....	23
SALE AND DISTRIBUTION OF THE BONDS.....	4	Rates and Charges	24
Underwriting.....	4	Special Funds.....	24
Prices and Marketability.....	4	Flow of Funds.....	24
Securities Laws.....	4	Interest and Sinking Fund	25
Municipal Bond Ratings	5	Reserve Fund.....	25
OFFICIAL STATEMENT SUMMARY.....	6	Additional Parity Bonds.....	26
INTRODUCTION.....	9	Subordinate Lien Bonds.....	26
THE BONDS.....	9	Special Project Bonds.....	26
Special Obligations.....	9	Bondowners' Remedies	26
Description.....	9	ADMINISTRATION OF THE CITY.....	27
Redemption Provisions	10	Mayor and City Council.....	27
Mandatory Redemption.....	10	Administration.....	27
Notice of Redemption	10	Consultants	28
Book-Entry-Only System.....	10	LEGAL MATTERS.....	28
Successor Paying Agent/Registrar	12	Legal Opinion.....	28
Source of Payment.....	12	No-Litigation Certificate	29
Authority for Issuance	13	No Material Adverse Change.....	29
Use of Proceeds	13	TAX MATTERS.....	29
Sources and Uses of Funds	13	Opinion	29
Amendments.....	13	Federal Income Tax Accounting	
Defeasance.....	13	Treatment of Original Issue	
Future Debt.....	14	Discount.....	29
Legal Investments in Texas.....	14	Collateral Federal Income Tax	
Remedies in the Event of Default	14	Consequences	30
INVESTMENT AUTHORITY AND		State, Local and Foreign Taxes.....	31
INVESTMENT OBJECTIVES OF THE		Information Reporting and Backup	
CITY	15	Withholding.....	31
Legal Investments.....	15	Future and Proposed Legislation.....	31
Investment Policies.....	16	CONTINUING DISCLOSURE OF	
Current Investments	17	INFORMATION.....	31
Additional Provisions	17	Annual Reports.....	31
CITY REVENUE DEBT.....	18	Notice of Certain Events	32
Revenue Bond Debt Statement	18	Availability of Information	32
Bonded Indebtedness Payable from		Limitations and Amendments	32
Waterworks and Sewer System		Compliance With Prior Undertakings.....	33
Revenue	18	SEVERE WEATHER EVENTS	33
Pro-Forma Revenue Bonds Debt		INFECTIOUS DISEASE OUTBREAK –	
Service Schedule	19	COVID-19	33
THE SYSTEM.....	20	EXPOSURE TO OIL AND GAS INDUSTRY	34
Description of the System	20	FINANCIAL ADVISOR	34
Water and Sewer Rates	20	GENERAL CONSIDERATIONS.....	34
Southeast Water Purification Plant	22	Sources and Compilation of Information.....	34
Blackhawk Regional Waste Treatment		Forward Looking Statements.....	34
Plant	22		
Historical Operations of the System	22		
Pension Fund.....	23		
SELECTED PROVISIONS OF THE			
ORDINANCE	23	APPENDIX A – General Information Regarding the City of	
Definitions	23	Friendswood	
		APPENDIX B – Audited Financial Statements of the City	
		APPENDIX C – Form of Bond Counsel Opinion	

\$13,470,000*

CITY OF FRIENDSWOOD, TEXAS

(A home rule city of the State of Texas located within Galveston and Harris Counties)

WATERWORKS AND SEWER SYSTEM REVENUE BONDS, SERIES 2021

INTRODUCTORY STATEMENT

Information contained in this Official Statement, including Appendices A and B, has been obtained from the City of Friendswood, Texas (the "City") in connection with the offering by the City of its \$13,470,000* Waterworks and Sewer System Revenue Bonds, Series 2021 (the "Bonds") identified on the cover page hereof.

All financial and other information presented in this Official Statement has been provided by the City from its records, except for information expressly attributed to other sources. The presentation of information, including tables of receipts from taxes and other sources, is intended to show recent historic information, and is not intended to indicate future or continuing trends in the financial position or other affairs of the City. No representation is made that past experience, as is shown by that financial and other information, will necessarily continue or be repeated in the future.

SALE AND DISTRIBUTION OF THE BONDS

Underwriting

FHN Financial Capital Markets and SAMCO Capital Markets, Inc. (together, the "Underwriters") have agreed to purchase the Bonds from the City for \$_____, (being the principal amount of the Bonds, plus/less a [net premium/discount] on the Bonds of \$_____ and an Underwriters' discount of \$_____).

FHN Financial Capital Markets is a division of First Horizon Bank and First Horizon Advisors, Inc., is a wholly owned subsidiary of First Horizon Bank. FHN Financial Capital Markets has entered into a distribution agreement with First Horizon Advisors, Inc., for the distribution of the offered Bonds at the original issue prices. Such arrangement generally provides that FHN Financial Capital Markets will share a portion of its underwriting compensation or selling concession with First Horizon Advisors, Inc.

Prices and Marketability

The delivery of the Bonds is conditioned upon the receipt by the City of a certificate executed and delivered by the Underwriters on or before the date of delivery of the Bonds stating the prices at which a substantial amount of the Bonds of each maturity have been sold to the public. For this purpose, the term "public" shall not include any person who is a bondhouse, broker or similar person acting in the capacity of underwriter or wholesaler. The City has no control over trading of the Bonds after a bona fide offering of the Bonds is made by the Underwriters at the yields specified on the cover page. Information concerning reoffering yields or prices is the responsibility of the Underwriters.

The prices and other terms respecting the offering and sale of certain of the Bonds may be changed from time to time by the Underwriters after the Bonds are released for sale, and the Bonds may be offered and sold at prices other than the initial offering price, including sales to dealers who may sell the Bonds into investment accounts. IN CONNECTION WITH THE OFFERING OF THE BONDS, THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE BONDS AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

Securities Laws

No registration statement relating to the Bonds has been filed with the Securities and Exchange Commission under the Securities Act of 1933, as amended, in reliance upon the exemptions provided thereunder. The Bonds have not been registered or qualified under the Securities Act of Texas in reliance upon various exemptions contained therein; nor have the Bonds been registered or qualified under the securities acts of any jurisdiction. The City assumes no responsibility for registration or qualification of the Bonds under the securities laws of any jurisdiction in which the

* Preliminary, subject to change.

Bonds may be offered, sold or otherwise transferred. This disclaimer of responsibility for registration or qualification for sale or other disposition of the Bonds shall not be construed as an interpretation of any kind with regard to the availability of any exemption from securities registration or qualification provisions in such jurisdictions.

Municipal Bond Ratings

In connection with the sale of the Bonds, the City has made application to S&P Global Ratings, a division of Standard & Poor's Financial Services LLC ("S&P"), for a rating on the Bonds, and a rating of "___" has been assigned. An explanation of the significance of such rating may be obtained from S&P. The rating reflects only the view of S&P, and the City makes no representation as to the appropriateness of such rating.

There is no assurance that such rating will continue for any period of time or that such rating will not be revised downward or withdrawn entirely by S&P, if, in the judgment of S&P, circumstances so warrant. Any such downward revision or withdrawal of the rating may have an adverse effect on the market price of the Bonds.

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OFFICIAL STATEMENT SUMMARY

The following material is a summary of certain information contained herein and is qualified in its entirety by the detailed information and financial statements appearing elsewhere in this Official Statement. The reader should refer particularly to sections that are indicated for more complete information.

The Issuer	The City of Friendswood, Texas (the "City") is a political subdivision and home rule city of the State of Texas located primarily within Galveston County with a small portion in Harris County, Texas. See "ADMINISTRATION OF THE CITY" and "APPENDIX A – General Information Regarding the City of Friendswood" herein.
The Bonds.....	\$13,470,000* Waterworks and Sewer System Revenue Bonds, Series 2021 (the "Bonds"), are dated February 1, 2021 and mature on March 1, 2022 through March 1, 2041 inclusive, unless the Underwriters designate one or more maturities as a term bond. See "THE BONDS – Description."
Payment of Interest.....	Interest on the Bonds will accrue from the date of initial delivery, and is payable initially on September 1, 2021, and on each March 1 and September 1 thereafter until the earlier of maturity or prior redemption. See "THE BONDS - Description."
Other Characteristics	The Bonds are issued in fully registered form in integral multiples of \$5,000. The Bonds maturing on and after March 1, 2032* are subject to redemption on March 1, 2031* or any date thereafter, in whole or in part, at the option of the City, at a price of the par value thereof plus accrued interest from the most recent interest payment date to the date of redemption. See "THE BONDS - Redemption Provisions."
Authority.....	The Bonds are special obligations of the City and are payable solely from a first lien on and pledge of the Net Revenues (hereinafter defined) of the City's waterworks and sanitary sewer system (the "System") on parity with the City's outstanding System revenue bonds. See "THE BONDS - Source of Payment." The Bonds are issued pursuant to the Constitution and general laws of the State of Texas, particularly Chapter 1502, Texas Government Code, as amended, and an ordinance authorizing the issuance of the Bonds. See "THE BONDS – Authority for Issuance."
Paying Agent/Registrar.....	The initial paying agent/registrar is The Bank of New York Mellon Trust Company, N.A., Dallas, Texas (the "Paying Agent/Registrar"). The City intends to use the book-entry-only system of The Depository Trust Company ("DTC"), but reserves the right on its behalf or on behalf of the DTC to discontinue use of such system. (See "THE BONDS - Book-Entry-Only System.")
Source of Payment.....	Principal of and interest on the Bonds are payable from a first lien on and pledge of the Net Revenues (hereinafter defined) from the operations of the System on a parity with the City's Outstanding Bonds. See "SELECTED PROVISIONS OF THE ORDINANCE – Definitions" for a description of the Outstanding Bonds. The Bonds are further secured by amounts on deposit in the Reserve Fund. The Bonds are not a charge upon any other income or revenues of the City, and shall never constitute an indebtedness or pledge of the general credit or taxing powers of the City. See "THE BONDS - Source of Payment."
Use of Proceeds	Proceeds from the sale of the Bonds will be used to make certain System extensions and improvements, to fund a deposit to the Reserve Fund, and to pay the costs of issuance of the Bonds. See "THE BONDS - Use of Proceeds."

* Preliminary, subject to change.

Rating S&P Global Ratings..... "___"

Tax Exemption In the opinion of Bond Counsel to the City, interest on the Bonds will be excludable from gross income for federal income tax purposes under statutes, regulations, published rulings and court decisions existing on the date thereof, subject to the matters described under "TAX MATTERS" herein.

The Bonds will **NOT** be designated as "Qualified Tax-Exempt Obligations for Financial Institutions."

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- Selected Financial Information -
(Unaudited)

The Revenue Bonds

Outstanding Parity Bonds (as of December 1, 2020).....	\$ 24,325,000
Plus: The Bonds.....	<u>13,470,000 *</u>
Total Revenue Supported Debt	<u>\$ 37,795,000 *</u>
 General Obligation Debt Payable From Waterworks and Sewer System Revenues	 \$ 22,400,000 (a)
 Fund Balances (Unaudited, as of September 30, 2020)	
Debt Service Fund	\$ 156,462
Reserve Fund	\$ 1,912,622 (b)
 Water and Sewer Operations (Unaudited, as of September 30, 2020)	
Total Revenues	\$ 16,981,017
Total Expenditures	<u>10,311,567</u>
Net Revenues Available for Debt Service	<u>\$ 6,669,450</u>
 Coverage Based on Pro-forma Net Revenue	
Estimated Average Annual Debt Service of \$2,602,521* (2021-2041)	2.56 x(c)
Estimated Maximum Annual Debt Service of \$2,954,350* (2025)	2.26 x(c)
 Water Customers (as of September 30, 2020)	14,098
Sewer Customers (as of September 30, 2020)	13,029

Summary of Water and Sewer Operating Revenues and Expenditures:

	Fiscal Year Ended September 30,				
	2019	2018	2017	2016	2015
Revenues	\$13,809,591	\$12,384,160	\$12,437,419	\$11,415,626	\$11,069,167
Expenditures	<u>9,378,672</u>	<u>7,205,293</u>	<u>6,911,675</u>	<u>6,361,229</u>	<u>6,010,050</u>
Revenue Available for Debt Service	<u>\$ 4,430,919</u>	<u>\$ 5,178,867</u>	<u>\$ 5,525,744</u>	<u>\$ 5,054,397</u>	<u>\$ 5,059,117</u>

* Preliminary, subject to change.

- (a) Includes an aggregate \$22,400,000 of the City's Permanent Improvement Refunding Bonds, Series 2010B, General Obligation Refunding Bonds, Series 2014, General Obligation Permanent Improvement and Refunding Bonds, Series 2016 and General Obligation Refunding Bonds, Series 2016A (the "General Obligation Debt Payable From System Revenues") debt requirements, which are not Parity Bonds with the Bonds, but which pursuant to City policy are paid from revenues of the System and such policy is subject to change at the discretion of the City. Any such payments from Net Revenues (herein defined) to pay obligations that are not Parity Bonds (herein defined) is subordinate to Net Revenue payments on the Bonds and other Parity Bonds.
- (b) The Reserve Fund for Parity Bonds may be accumulated over time or provided by deposits of proceeds in connection with the issuance of the Parity Bonds. See "SELECTED PROVISIONS OF THE ORDINANCE – Reserve Fund." The increase in the Reserve Fund which is required in connection with the issuance of the Bonds will be funded by proceeds from the sale of the Bonds.
- (c) Does not include the General Obligation Debt Payable From System Revenues.

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INTRODUCTION

This Official Statement and the Appendices hereto provide certain information with respect to the issuance by the City of Friendswood, Texas (the "City") in connection with the offering by the City of its \$13,470,000* Waterworks and Sewer System Revenue Bonds, Series 2021 (the "Bonds").

The Bonds are issued pursuant to the Texas Constitution, the general laws of the State of Texas, including particularly Chapter 1502 Texas Government Code, as amended, and an ordinance authorizing issuance of the Bonds (the "Ordinance") adopted by the City Council of the City (the "Council").

There follows in this Official Statement descriptions of the Bonds, the plan of financing, and certain information about the City and its finances. All descriptions of documents contained herein are only summaries and are qualified in their entirety by reference to each such document. Copies of such documents may be obtained from the City upon request. Certain capitalized terms used in this Official Statement have the same meanings assigned to such terms in the ordinance authorizing the Bonds (the "Ordinance"), except as otherwise indicated herein.

THE BONDS

Special Obligations

THE BONDS ARE SPECIAL OBLIGATIONS OF THE CITY PAYABLE FROM AND SECURED BY A FIRST LIEN ON NET REVENUES AS COLLECTED AND RECEIVED BY THE CITY FROM THE OPERATION AND OWNERSHIP OF THE CITY'S WATERWORKS AND SANITARY SEWER SYSTEM (THE "SYSTEM") AND BY AMOUNTS ON DEPOSIT IN THE RESERVE FUND. THE LIEN ON NET REVENUES AND AMOUNTS ON DEPOSIT IN THE RESERVE FUND IS ON A PARITY WITH THE LIENS SECURING THE CITY'S OUTSTANDING SYSTEM BONDS AND ANY ADDITIONAL PARITY BONDS HEREAFTER ISSUED BY THE CITY. THE BONDS DO NOT CONSTITUTE AN INDEBTEDNESS OR GENERAL OBLIGATION OF THE CITY AND ARE NOT PAYABLE FROM FUNDS RAISED OR TO BE RAISED BY TAXATION AND OWNERS OF THE BONDS SHALL NEVER HAVE THE RIGHT TO DEMAND PAYMENT THEREOF FROM THE LEVY OF AD VALOREM TAXES OR FROM ANY SOURCE NOT PLEDGED TO PAYMENT OF THE BONDS. SEE "THE BONDS – Source of Payment."

Description

The Bonds are dated February 1, 2021 and bear interest from the Delivery Date (as defined on the cover hereof) at the stated interest rates indicated under "PRINCIPAL AMOUNTS, MATURITIES, INTEREST RATES AND PRICES" on the cover page hereof, which interest is payable initially on September 1, 2021, and each March 1 and September 1 thereafter until the earlier of maturity or prior redemption. The Bonds are issued in fully registered form in denominations of \$5,000 each or any multiple thereof. Principal of the Bonds is payable at the principal payment office of The Bank of New York Mellon Trust Company, N.A., Dallas, Texas (the "Paying Agent/Registrar"). Interest on the Bonds will be payable by check, dated as of the interest payment date, and mailed by the Paying Agent/Registrar to registered owners as shown on the records of the Paying Agent/Registrar. The Bonds initially will be registered only to Cede & Co., the nominee of The Depository Trust Company pursuant to the Book-Entry-Only System described below.

In the event the Book-Entry-Only-System is discontinued, the Bonds may be transferred and exchanged on the bond register kept by the Paying Agent/Registrar upon surrender and reissuance. The Bonds are exchangeable for an equal principal amount of Bonds of the same maturity in any authorized denomination upon surrender of the Bonds to be exchanged at the principal payment office of the Paying Agent/Registrar. No service charge will be made for any transfer, but the City may require payment of a sum sufficient to cover any tax or governmental charge payable in connection therewith.

The record date (the "Record Date") for the interest payable on any interest payment date means the 15th day of the month next preceding such interest payment date.

It will be required that all transfers be made within three business days after request and presentation.

The City has agreed to replace mutilated, destroyed, lost or stolen Bonds upon surrender of the mutilated Bonds, or receipt of satisfactory evidence of such destruction, loss or theft, and receipt by the City and the Paying Agent/Registrar of security or indemnity to keep them harmless. The City may require payment of taxes, governmental charges and other expenses in connection with any such replacement.

* Preliminary, subject to change.

Redemption Provisions

The Bonds maturing on March 1, 2032* and thereafter are subject to optional redemption prior to maturity, in whole or in part, on March 1, 2031*, or any date thereafter, at the option of the City at a price equal to the principal amount thereof plus accrued interest from the most recent interest payment date to the date of redemption. If less than all of the Bonds are redeemed at any time, the maturities of such Bonds to be redeemed shall be selected by the City. If less than all of a maturity of the Bonds is to be redeemed, the Paying Agent/Registrar (or DTC while the Bonds are in Book-Entry-Only form) shall determine by lot or other random selection method the Bonds, or portions thereof, within such maturity to be redeemed. If a Bond (or any portion of the principal sum thereof) shall have been called for redemption and notice of such redemption shall have been given, such Bond (or the principal amount thereof to be redeemed) shall become due and payable on such redemption date and interest thereon shall cease to accrue from and after the redemption date, provided funds for the payment of the redemption price and accrued interest thereon are held by the Paying Agent/Registrar on the redemption date.

Mandatory Redemption

If principal amounts designated in the serial maturity schedule herein are combined to create Term Bonds, each such Term Bond shall be subject to mandatory sinking fund redemption commencing on March 1 of the first year which has been combined to form such Term Bond and continuing on March 1 in each year thereafter until the stated maturity date of that Term Bond. Term Bonds to be redeemed in any year by mandatory redemption shall be redeemed at par and shall be selected by lot, or other customary random selection method, from and among the Term Bonds then subject to redemption. The City, at its option, may credit against any mandatory redemption requirement Term Bonds of the maturity then subject to redemption which have been purchased and canceled by the City or have been redeemed and not theretofore applied as a credit against any mandatory redemption requirement.

Notice of Redemption

Not less than 30 days prior to a redemption date for the Bonds, the City shall cause a notice of redemption to be sent by United States mail, first class, postage prepaid, to the registered owners of the Bonds to be redeemed, in whole or in part, at the address of the registered owner appearing on the registration books of the Paying Agent/Registrar. **ANY NOTICE OF REDEMPTION SO MAILED SHALL BE CONCLUSIVELY PRESUMED TO HAVE BEEN DULY GIVEN IRRESPECTIVE OF WHETHER RECEIVED BY THE BONDHOLDER, AND, SUBJECT TO PROVISION FOR PAYMENT OF THE REDEMPTION PRICE HAVING BEEN MADE AND THE SATISFACTION OF ANY OTHER CONDITION SPECIFIED IN THE NOTICE, INTEREST ON THE REDEEMED BONDS SHALL CEASE TO ACCRUE FROM AND AFTER SUCH REDEMPTION DATE NOTWITHSTANDING THAT A BOND HAS NOT BEEN PRESENTED FOR PAYMENT.**

With respect to any optional redemption of the Bonds, unless certain prerequisites to such redemption required by the Ordinance have been met and money sufficient to pay the principal of and premium, if any, and interest on the Bonds to be redeemed has been received by the Paying Agent/Registrar prior to the giving of such notice of redemption, such notice may state that said redemption is conditional upon the satisfaction of such prerequisites and receipt of such money by the Paying Agent/Registrar on or prior to the date fixed for such redemption or upon any prerequisite set forth in such notice of redemption. If a conditional notice of redemption is given and such prerequisites to the redemption are not fulfilled, such notice will be of no force and effect, the City will not redeem such Bonds, and the Paying Agent/Registrar will give notice in the manner in which the notice of redemption was given, to the effect that such Bonds have not been redeemed.

Book-Entry-Only System

This section describes how ownership of the Bonds is to be transferred and how the principal of, premium, if any, and interest on the Bonds are to be paid to and credited by The Depository Trust Company ("DTC"), New York, New York, while the Bonds are registered in its nominee name. The information in this section concerning DTC and the Book-Entry-Only System has been provided by DTC for use in disclosure documents such as this Official Statement. The City, the Underwriters and the Financial Advisor believe the source of such information to be reliable, but takes no responsibility for the accuracy or completeness thereof.

The City, the Underwriters and the Financial Advisor cannot and do not give any assurance that (1) DTC will distribute payments of debt service on the Bonds, or redemption or other notices, to DTC Participants, (2) DTC Participants or others will distribute debt service payments paid to DTC or its nominee (as the registered owner of

* Preliminary, subject to change.

the Bonds), or redemption or other notices, to the Beneficial Owners, or that they will do so on a timely basis, or (3) DTC will serve and act in the manner described in this Official Statement. The current rules applicable to DTC are on file with the Securities and Exchange Commission, and the current procedures of DTC to be followed in dealing with DTC Participants are on file with DTC.

DTC will act as securities depository for the Bonds. The Bonds will be issued as fully-registered securities registered in the name of Cede & Co. (DTC's partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully registered certificate will be issued for each maturity of the Bonds, in the aggregate principal amount of each such maturity, and will be deposited with DTC.

DTC, the world's largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code, and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.5 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC's participants ("Direct Participants") deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants' accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). DTC has a Standard & Poor's rating of "AA+." The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at www.dtcc.com.

Purchases of Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Bonds on DTC's records. The ownership interest of each actual purchaser of each Bond ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the Bonds are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in the Bonds, except in the event that use of the book-entry system for the Bonds is discontinued.

To facilitate subsequent transfers, all Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the Bonds; DTC's records reflect only the identity of the Direct Participants to whose accounts such Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time. Beneficial Owners of Bonds may wish to take certain steps to augment the transmission to them of notices of significant events with respect to the Bonds, such as redemptions, tenders, defaults, and proposed amendments to the Bond documents. For example, Beneficial Owners of Bonds may wish to ascertain that the nominee holding the Bonds for their benefit has agreed to obtain and transmit notices to Beneficial Owners. In the alternative, Beneficial Owners may wish to provide their names and addresses to the Paying Agent/Registrar and request that copies of notices be provided directly to them.

Redemption notices shall be sent to DTC. If less than all of the Bonds within a maturity are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such maturity to be redeemed.

Neither DTC nor Cede & Co. (nor any other DTC nominee) will consent or vote with respect to the Bonds unless authorized by a Direct Participant in accordance with DTC's MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the City as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Redemption proceeds and principal and interest payments on the Bonds will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from the City or the Paying Agent/Registrar, on payable dates in accordance with their respective holdings shown on DTC's records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as in the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC, the Paying Agent or the City, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of redemption proceeds and principal and interest to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the City or the Paying Agent/Registrar, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct and Indirect Participants.

DTC may discontinue providing its services as depository with respect to the Bonds at any time by giving reasonable notice to the City or the Paying Agent/Registrar. Under such circumstances, in the event that a successor depository is not obtained, Bond certificates are required to be printed and delivered.

The City may decide to discontinue use of the system of book-entry transfers through DTC (or a successor securities depository). In that event, Bond certificates will be printed and delivered.

The information in this section concerning DTC and DTC's book-entry system has been obtained from sources that the City believes to be reliable, but the City takes not responsibility for the accuracy thereof.

Use of Certain Terms in Other Sections of this Official Statement

In reading this Official Statement it should be understood that while the Bonds are in the Book-Entry-Only System, references in other sections of this Official Statement to registered owners should be read to include the person for which the Participant acquires an interest in the Bonds, but (i) all rights of ownership must be exercised through DTC and the Book-Entry-Only System, and, (ii) except as described above, notices that are to be given to registered owners under the Ordinance will be given only to DTC.

Successor Paying Agent/Registrar

Provision is made in the Ordinance for replacing the Paying Agent/Registrar. If the City replaces the Paying Agent/Registrar, such Paying Agent/Registrar shall, promptly upon the appointment of a successor, deliver the Paying Agent/Registrar's records to the successor paying agent/registrar (the "Successor Paying Agent/Registrar"), and the Successor Paying Agent/Registrar shall act in the same capacity as the previous Paying Agent/Registrar. Any Successor Paying Agent/Registrar selected by the City shall be a commercial bank or trust company organized under the laws of the United States or any state and duly qualified and legally authorized to serve and perform the duties of the Paying Agent/Registrar for the Bonds.

Source of Payment

The Bonds are special obligations of the City payable, both as to principal and interest, from and secured by a first lien on and a pledge of the Net Revenues of the City's Waterworks and Sanitary Sewer System (the "System"). The Bonds are further secured by amounts on deposit in the Reserve Fund. The Ordinance defines Net Revenues as all Gross Revenues remaining after deducting Maintenance and Operation Expenses. See "SELECTED PROVISIONS OF THE ORDINANCE – Definitions." The Bonds are not a charge upon any other income or revenues of the City and shall never constitute an indebtedness or pledge of the general credit or taxing powers of the City. The Ordinance does not create a lien or mortgage on the System and any judgment against the City may not be enforced by levy and execution against any property of the City. See "THE BONDS – Remedies in the Event of Default."

The Ordinance permits the City to issue additional first lien bonds that are on a parity with the Bonds and to issue junior lien bonds and special project bonds. See "SELECTED PROVISIONS OF THE ORDINANCE."

As additional security for the Bonds, a Reserve Fund has been established pursuant to the Ordinance which is to be funded in an amount equal to the aggregate average annual debt service requirements of the Parity Bonds (as defined in the Ordinance). See "SELECTED PROVISIONS OF THE ORDINANCE." The Ordinance permits the City to use reserve fund surety policies in lieu of making cash deposits to the Reserve Fund. However, the City intends to fund the increase in the Reserve Fund associated with the issuance of the Bonds with proceeds of the Bonds.

Authority for Issuance

The Bonds are being issued pursuant to the applicable provisions of the Constitution and laws of the State of Texas, including particularly Chapter 1502, Texas Government Code, as amended, and the provisions of the Ordinance.

Use of Proceeds

Proceeds from the sale of the Bonds will be used to make certain System extensions and improvements, to fund a deposit to the Reserve Fund, and to pay the costs of issuance of the Bonds.

Sources and Uses of Funds

The proceeds from the sale of the Bonds will be applied as follows:

SOURCES OF FUNDS:

Principal Amount of Bonds	\$
[Net Premium/Discount] on the Bonds	
Total Sources of Funds	<u>\$</u>

USES OF FUNDS

Deposit to Construction Fund	\$
Deposit to Reserve Fund	
Expenses:	
Underwriters' Discount	\$
Other Issuance Expenses	
Total Uses of Funds	<u>\$</u>

Amendments

In the Ordinance, the City has reserved the right to amend the Ordinance without the consent of any holder for the purpose of amending or supplementing the Ordinance to (i) cure any ambiguity, defect or omission therein that does not materially adversely affect the interests of the holders, (ii) grant additional rights or security for the benefit of the holders, (iii) add events of default as shall not be inconsistent with the provisions of the Ordinance that do not materially adversely affect the interests of the holders, (iv) qualify the Ordinance under the Trust Indenture Act of 1939, as amended, or corresponding provisions of federal laws from time to time in effect or (v) make such other provisions in regard to matters or questions arising under the Ordinance that are not inconsistent with the provisions thereof and which, in the opinion of Bond Counsel for the City, do not materially adversely affect the interests of the holders.

The Ordinance further provides that the majority of owners of the Bonds shall have the right from time to time to approve any amendment not described above to the Ordinance if it is deemed necessary or desirable by the City; provided, however, that without the consent of 100% of the holders in principal amount of the then outstanding Bonds so affected, no amendment may be made for the purpose of: (i) making any change in the maturity of any of the outstanding Bonds; (ii) reducing the rate of interest borne by any of the outstanding Bonds; (iii) reducing the amount of the principal payable on any outstanding Bonds; (iv) modifying the terms of payment of principal or interest on outstanding Bonds or imposing any condition with respect to such payment; or (v) changing the minimum percentage of the principal amount of the Bonds necessary for consent to such amendment. Reference is made to the Ordinance for further provisions relating to the amendment thereof.

Defeasance

The Ordinance provides for the defeasance of the Bonds when payment of the principal amount of the Bonds plus interest accrued on the Bonds to their due date (whether such due date be by reason of stated maturity, redemption or otherwise), is provided by irrevocably depositing with a paying agent, or other authorized escrow agent, in trust (1) money in an amount sufficient to make such payment and/or (2) Defeasance Securities, that will mature as to principal and interest in such amounts and at such times to insure the availability, without reinvestment, of sufficient money to make such payment, and all necessary and proper fees, compensation and expenses of the paying agent for the Bonds, and thereafter the City will have no further responsibility with respect to amounts available to such paying agent (or other financial institution permitted by applicable law) for the payment of such defeased Bonds, including any insufficiency therein caused by the failure of such paying agent (or other financial institution permitted by applicable law) to receive payment when due on the Defeasance Securities. The City has additionally reserved the right, subject to satisfying the requirements of (1) and (2) above, to substitute other Defeasance Securities originally deposited, to reinvest the uninvested moneys on deposit for such defeasance and to withdraw

for the benefit of the City moneys in excess of the amount required for such defeasance. The Ordinance provides that "Defeasance Securities" means any securities and obligations now or hereafter authorized by State law that are eligible to discharge obligations such as the Bonds. Current State law permits defeasance with the following types of securities: (a) direct, noncallable obligations of the United States of America, including obligations that are unconditionally guaranteed by the United States of America, (b) noncallable obligations of an agency or instrumentality of the United States of America, including obligations that are unconditionally guaranteed or insured by the agency or instrumentality and that, on the date the governing body of the City authorizes the defeasance, are rated as to investment quality by a nationally recognized investment rating firm not less than AAA or its equivalent, and (c) noncallable obligations of a state or an agency or a county, municipality, or other political subdivision of a state that on the date the governing body of the City adopts or approves the proceedings authorizing the financial arrangements have been refunded and are rated as to investment quality by a nationally recognized investment rating firm not less than AAA or its equivalent. There is no assurance that the current law will not be changed in a manner which would permit investments other than those described above to be made with amounts deposited to defease the Bonds. Because the Ordinance does not contractually limit such investments, registered owners will be deemed to have consented to defeasance with such other investments, notwithstanding the fact that such investments may not be of the same investment quality as those currently permitted under State law. There is no assurance that the ratings for U.S. Treasury securities used for defeasance purposes or that for any other Defeasance Security will be maintained at any particular rating category.

Upon such deposit as described above, such Bonds shall no longer be regarded to be outstanding or unpaid. Provided, however, the City has reserved the option, to be exercised at the time of the defeasance of the Bonds, to call for redemption at an earlier date those Bonds which have been defeased to their maturity date, if the City (i) in the proceedings providing for the firm banking and financial arrangements, expressly reserves the right to call the Bonds for redemption, (ii) gives notice of the reservation of that right to the owners of the Bonds immediately following the making of the firm banking and financial arrangements, and (iii) directs that notice of the reservation be included in any redemption notices that it authorizes. After firm banking and financial arrangements for the discharge and final payment of the Bonds have been made as described above, all rights of the City to initiate proceedings to take any other action amending the terms of the Bonds are extinguished.

Future Debt

The City may issue additional bonds payable from the Net Revenues which together with the Outstanding Bonds (as defined in the Ordinance) and the Bonds shall be equally and ratably secured by a parity lien on and pledge of the Net Revenues of the System, subject, however, to complying with certain conditions in the Ordinance. See "SELECTED PROVISIONS OF THE ORDINANCE – Additional Parity Bonds" for terms and conditions to be satisfied for the issuance of Additional Bonds.

Legal Investments in Texas

Pursuant to the Texas Public Securities Procedures Act, Chapter 1201, Texas Government Code, as amended, the Bonds, whether rated or unrated, are (a) legal investments for insurance companies, fiduciaries and trustees and (b) legal investments for the sinking funds of political subdivisions or public agencies of the State. Most political subdivisions in the State of Texas are required to adopt investment guidelines under the Public Funds Investment Act, Chapter 2256, Texas Government Code, as amended, and such political subdivisions may impose a requirement consistent with such act that the Bonds have a rating of not less than "A" or its equivalent to be legal investments for such entity's funds. The Bonds are eligible under the Public Funds Collateral Act, Chapter 2257, Texas Government Code, as amended, to secure deposits of public funds of the State or any political subdivision or public agency of the State and are lawful and sufficient security for those deposits to the extent of their market value. Again, political subdivisions in the State of Texas may impose a requirement that the Bonds have a rating of not less than "A" or its equivalent to be eligible to serve as collateral for their funds.

The City has not made any investigations of any other laws, rules, regulations or investment criteria that might affect the suitability of the Bonds for any of the above purposes or limit the authority of any of the above entities or persons to purchase or invest in the Bonds.

Remedies in the Event of Default

The Ordinance provides that in the event of a default in the payment of the principal of or interest on any of the Parity Bonds or a default in the performance of any duty or covenant provided by law or in the Ordinance, the Owner or Owners of any of the Parity Bonds may pursue all legal remedies afforded by the Constitution and laws of the State of Texas to compel the City to remedy such default and to prevent further default or defaults. Without in any way limiting the generality of the foregoing, it is expressly provided in the Ordinance that any Owner of any of the Parity Bonds may proceed at law or in equity, by suit, action, mandamus, or other proceedings, enforce and

compel performance of all duties required to be performed by the City under the Ordinance, including the making and collection of reasonable and sufficient rates and charges for the use and services of the System, the deposit of the Gross Revenues into the special funds in accordance with the Ordinance, and the application of the Gross Revenues and the Net Revenues in the manner required in the Ordinance.

The issuance of a writ of mandamus is controlled by equitable principles, so rests with the discretion of the court, but may not be arbitrarily refused. There is no acceleration of maturity of the Bonds in the event of default and, consequently, the remedy of mandamus may have to be relied upon from year to year. The Ordinance does not provide for the appointment of a trustee to represent the interest of the registered owners upon any failure of the City to perform in accordance with the terms of the Ordinance, or upon any other condition, and, accordingly, all legal actions to enforce such remedies would have to be undertaken at the initiative of, and be financed by, the registered owners.

The Texas Supreme Court has ruled in *Tooke v. City of Mexia*, 197 S.W.3d 325 (Tex. 2006), that a waiver of sovereign immunity in a contractual dispute must be provided for by statute in "clear and unambiguous" language. Because it is unclear whether the Texas legislature has effectively waived the City's sovereign immunity from a suit for money damages, registered owners may not be able to bring such a suit against the City for breach of the Bond or Ordinance covenants. Even if a judgment against the City could be obtained, it could not be enforced by direct levy and execution against the City's property.

Furthermore, the City is eligible to seek relief from its creditors under Chapter 9 of the U.S. Bankruptcy Code. Chapter 9 also includes an automatic stay provision that would prohibit, without Bankruptcy Court approval, the prosecution of any other legal action by creditors or bond holders of an entity which has sought protection under Chapter 9. Therefore, should the City avail itself of Chapter 9 protection from creditors, the ability to enforce the remedies under the Ordinance would be subject to the approval of the Bankruptcy Court (which could require that the action be heard in Bankruptcy Court instead of other federal or state court); and the Bankruptcy Code provides for broad discretionary powers of a Bankruptcy Court in administering any proceeding brought before it. The opinion of Bond Counsel will note that all opinions relative to the enforceability of the Ordinance and the Bonds are qualified with respect to the customary rights of debtors relative to their creditors, by general principles of equity which permit the exercise of judicial discretion and by governmental immunity.

INVESTMENT AUTHORITY AND INVESTMENT OBJECTIVES OF THE CITY

The City invests its investable funds in investments authorized by Texas law in accordance with investment policies approved by the Mayor and the City Council of the City. Both state law and the City's investment policies are subject to change.

Legal Investments

Under State law, the City is authorized to invest in: (1) obligations, including letters of credit, of the United States or its agencies and instrumentalities, including the Federal Home Loan Banks; (2) direct obligations of the State or its agencies and instrumentalities; (3) collateralized mortgage obligations issued by a federal agency or instrumentality of the United States, the underlying security for which is guaranteed by an agency or instrumentality of the United States; (4) other obligations, the principal and interest of which are unconditionally guaranteed or insured by, or backed by the full faith and credit of, the State or the United States or their respective agencies and instrumentalities, including obligations that are fully guaranteed or insured by the Federal Deposit Insurance Corporation (the "FDIC") or by the explicit full faith and credit of the United States; (5) obligations of states, agencies, counties, cities, and other political subdivisions of any state rated as to investment quality by a nationally recognized investment rating firm not less than A or its equivalent; (6) bonds issued, assumed, or guaranteed by the State of Israel; (7) interest-bearing banking deposits that are guaranteed or insured by the FDIC or the National Credit Union Share Insurance Fund (the "NCUSIF") or their respective successors; (8) interest-bearing banking deposits, other than those described in clause (7), that (i) are invested through a broker or institution with a main office or branch office in this state and selected by the City in compliance with the PFIA, (ii) the broker or institution arranges for the deposit of the funds in one or more federally insured depository institutions, wherever located, for the City's account, (iii) the full amount of the principal and accrued interest of the banking deposits is insured by the United States or an instrumentality of the United States, and (iv) the City appoints as its custodian of the banking deposits, in compliance with the PFIA, the institution in clause (8)(i) above, a bank, or a broker-dealer; (9) certificates of deposit and share certificates meeting the requirements of the PFIA (i) that are issued by an institution that has its main office or a branch office in the State and are guaranteed or insured by the FDIC or the NCUSIF, or their respective successors, or are secured as to principal by obligations described in clauses (1) through (8), above, or secured in accordance with Chapter 2257, Texas Government Code, or in any other manner and amount provided by law for City deposits, or (ii) where (a) the funds are invested by the City through a broker or institution that has a main

office or branch office in the State and selected by the City in compliance with the PFIA, (b) the broker or institution arranges for the deposit of the funds in one or more federally insured depository institutions, wherever located, for the account of the City, (c) the full amount of the principal and accrued interest of each of the certificates of deposit is insured by the United States or an instrumentality of the United States; and (d) the City appoints, in compliance with the PFIA, the institution in clause (9)(ii)(a) above, a bank, or broker-dealer as custodian for the City with respect to the certificates of deposit; (10) fully collateralized repurchase agreements that have a defined termination date, are secured by a combination of cash and obligations described by clause (1) which are pledged to the City, held in the City's name, and deposited at the time the investment is made with the City or with a third party selected and approved by the City, and are placed through a primary government securities dealer, as defined by the Federal Reserve, or a financial institution doing business in the State; (11) certain bankers' acceptances with a stated maturity of 270 days or less, if the short-term obligations of the accepting bank, or of the holding company of which the bank is the largest subsidiary, are rated not less than A-1 or P-1 or the equivalent by at least one nationally recognized credit rating agency; (12) commercial paper with a stated maturity of 270 days or less that is rated at least A-1 or P-1 or an equivalent by either (i) two nationally recognized credit rating agencies, or (ii) one nationally recognized credit rating agency if the commercial paper is fully secured by an irrevocable letter of credit issued by a United States or state bank; (13) no-load money market mutual funds registered with and regulated by the Securities and Exchange Commission and complies with Securities and Exchange Commission Rule 2a-7; (14) no-load mutual funds that are registered and regulated by the Securities and Exchange Commission that have a weighted maturity of less than two years and either (i) have a duration of one year or more and are invested exclusively in obligations approved in this paragraph, or (ii) have a duration of less than one year and the investment portfolio is limited to investment grade securities, excluding asset backed securities; (15) guaranteed investment contracts that have a defined termination date and are secured by obligations described in clause (1), excluding obligations which the City is explicitly prohibited from investing in, and in an amount at least equal to the amount of bond proceeds invested under such contract; and (16) securities lending programs if (i) the securities loaned under the program are 100% collateralized, including accrued income, (ii) a loan made under the program allows for termination at any time, (iii) a loan made under the program is either secured by (a) obligations described in clauses (1) through (8) above, (b) irrevocable letters of credit issued by a state or national bank that is continuously rated by a nationally recognized investment rating firm at not less than A or its equivalent, or (c) cash invested in obligations described in clauses (1) through (8) above, clauses (12) through (14) above, or an authorized investment pool, (iv) the terms of a loan made under the program require that the securities being held as collateral be pledged to the City, held in the City's name, and deposited at the time the investment is made with the City or with a third party designated by the City, (v) a loan made under the program is placed through either a primary government securities dealer or a financial institution doing business in the State, and (vi) the agreement to lend securities has a term of one year or less.

Investment Policies

Under Texas law, the City is required to invest its funds under written investment policies that primarily emphasize safety of principal and liquidity; that address investment diversification, yield, maturity, and the quality and capability of investment management; and that includes a list of authorized investments for City funds, maximum allowable stated maturity of any individual investment and the maximum average dollar-weighted maturity allowed for pooled fund groups. All City funds must be invested consistent with a formally adopted "Investment Strategy Statement" that specifically addresses each funds' investment. Each Investment Strategy Statement will describe its objectives concerning: (1) suitability of investment type, (2) preservation and safety of principal, (3) liquidity, (4) marketability of each investment, (5) diversification of the portfolio, and (6) yield.

Under Texas law, City investments must be made "with judgment and care, under prevailing circumstances, that a person of prudence, discretion, and intelligence would exercise in the management of the person's own affairs, not for speculation, but for investment, considering the probable safety of capital and the probable income to be derived." At least quarterly, the investment officers of the City shall submit an investment report detailing: (1) the investment position of the City; (2) that all investment officers jointly prepared and signed the report, (3) the beginning and the ending market value for each pooled fund group, (4) the book value and market value of each separately listed asset at the end of the reporting period, (5) the maturity date of each separately invested asset, (6) the account or fund or pooled fund group for which each individual investment was acquired, and (7) the compliance of the investment portfolio as it related to: (a) adopted investment strategy statements and (b) state law. No person may invest City funds without express written authority from the Mayor and Council of the City.

The City's policies require investments in accordance with applicable state law. The City's Statement of Investment Policy does not exclude any investments allowable under State law described above under "Legal Investments." The City generally invests in certificates of deposit, money market accounts and obligations of the United States or its agencies and instrumentalities.

Current Investments

The City's investment balances on September 30, 2020 (unaudited) were as follows:

	Principal Invested	Market Value	Book Value
Government Securities	\$ 9,500,000	\$ 9,606,703	\$ 9,606,703
Investment Pool	38,174,384	38,174,384	38,174,384
Total Portfolio	<u>\$47,674,384</u>	<u>\$47,781,087</u>	<u>\$47,781,087</u>

Additional Provisions

Under Texas law, the City is additionally required to: (1) annually review its adopted policies and strategies; (2) require any investment officers with personal business relationships or relatives with firms seeking to sell securities to the City to disclose the relationship and file a statement with the Texas Ethics Commission and the Mayor and Council; (3) require the registered principal of firms seeking to sell securities to the City to: (a) receive and review the City's investment policy, (b) acknowledge that reasonable controls and procedures have been implemented to preclude imprudent investment activities, and (c) deliver a written statement attesting to these requirements; (4) perform an annual audit of the management controls on investments and adherence to the City's investment policy; (5) provide specific investment training for the Treasurer, Chief Financial Officer and investment officers; (6) restrict reverse repurchase agreements to not more than 90 days and restrict the investment of reverse repurchase agreement funds to no greater than the term of the reverse repurchase agreement; (7) restrict the investment in mutual funds in the aggregate to no more than 80% of the City's monthly average fund balance, excluding bond proceeds and reserves and other funds held for debt service and further restrict the investment in non-money market mutual funds of any portion of bond proceeds, reserves and funds held for debt service and to not more than 15% of the entity's monthly average fund balance, excluding bond proceeds and reserves and other funds held for debt service; and (8) require local government investment pools to conform to the new disclosure, rating, net asset value, yield calculation, and advisory board requirements.

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CITY REVENUE DEBT

Revenue Bond Debt Statement

The following tables and calculations relate to the Bonds, Parity Bonds and to all other System revenue supported debt of the City.

Bonded Indebtedness Payable from Waterworks and Sewer System Revenue

Direct Debt:

Outstanding Parity Bonds (as of December 1, 2020)	\$	24,325,000
The Bonds		<u>13,470,000</u> *
Total Revenue Supported Debt.....	\$	<u>37,795,000</u> *
General Obligation Debt Payable From Waterworks and Sewer System Revenues	\$	22,400,000 (a)
Debt Service Fund Balance (Unaudited, as of September 30, 2020).....	\$	156,462
Reserve Fund Balance	\$	1,912,622 (b)

* Preliminary, subject to change.

- (a) Includes an aggregate \$22,400,000 of the City's Permanent Improvement Refunding Bonds, Series 2010B, General Obligation Refunding Bonds, Series 2014, General Obligation Permanent Improvement and Refunding Bonds, Series 2016 and General Obligation Refunding Bonds, Series 2016A (the "General Obligation Debt Payable From System Revenues") debt requirements, which are not Parity Bonds with the Bonds, but which pursuant to City policy are paid from revenues of the System and such policy is subject to change at the discretion of the City. Any such payments from Net Revenues (herein defined) to pay obligations that are not Parity Bonds (herein defined) is subordinate to Net Revenue payments on the Bonds and other Parity Bonds.
- (b) The Reserve Fund for Parity Bonds may be accumulated over time or provided by deposits of proceeds in connection with the issuance of the Parity Bonds. See "SELECTED PROVISIONS OF THE ORDINANCE – Reserve Fund." The increase in the Reserve Fund which is required in connection with the issuance of the Bonds will be funded by proceeds from the sale of the Bonds.

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Pro-Forma Revenue Bonds Debt Service Schedule

The following sets forth the principal and interest on the City's Outstanding System Revenue Supported Debt.

FY Ending 9/30	Current Debt Service Payable From System Revenues	Less: General Obligation Debt Payable From System Revenues (a)	Current Debt Service Requirements of Parity Bonds	Plus: The Bonds*		Total Principal and Interest	Total Debt Service Requirements
				Principal*	Interest (b)		
2021	\$ 4,879,050	\$ 2,927,100	\$ 1,951,950		\$ 340,026	\$ 340,026	\$ 2,291,976
2022	4,395,425	2,439,225	1,956,200	\$ 415,000	580,975	995,975	2,952,175
2023	4,392,800	2,439,325	1,953,475	435,000	559,725	994,725	2,948,200
2024	4,389,475	2,435,700	1,953,775	460,000	537,350	997,350	2,951,125
2025	4,394,125	2,438,500	1,955,625	485,000	513,725	998,725	2,954,350
2026	4,446,550	2,494,000	1,952,550	505,000	488,975	993,975	2,946,525
2027	4,359,100	2,403,575	1,955,525	535,000	462,975	997,975	2,953,500
2028	4,361,825	2,404,750	1,957,075	560,000	435,600	995,600	2,952,675
2029	4,474,400	2,518,675	1,955,725	590,000	406,850	996,850	2,952,575
2030	4,472,700	2,517,800	1,954,900	620,000	376,600	996,600	2,951,500
2031	2,689,100	732,400	1,956,700	650,000	344,850	994,850	2,951,550
2032	2,687,800	731,300	1,956,500	680,000	315,000	995,000	2,951,500
2033	2,688,000	734,100	1,953,900	710,000	287,200	997,200	2,951,100
2034	2,686,400	732,600	1,953,800	740,000	258,200	998,200	2,952,000
2035	1,956,000		1,956,000	770,000	228,000	998,000	2,954,000
2036	1,955,400		1,955,400	800,000	196,600	996,600	2,952,000
2037	1,555,100		1,555,100	835,000	163,900	998,900	2,554,000
2038	1,550,400		1,550,400	865,000	129,900	994,900	2,545,300
2039				900,000	94,600	994,600	994,600
2040				940,000	57,800	997,800	997,800
2041				975,000	19,500	994,500	994,500
Totals	<u>\$62,333,650</u>	<u>\$27,949,050</u>	<u>\$34,384,600</u>	<u>\$13,470,000</u>	<u>\$6,798,351</u>	<u>\$20,268,351</u>	<u>\$54,652,951</u>

Estimated Average Annual Requirements (2021-2041).....	\$2,602,521(c)*
Estimated Maximum Annual Requirement (2025).....	\$2,954,350(c)*

Principal Payout (All Revenue Supported Bonds) (c)*	22.70% in 5 years
	48.35% in 10 years
	80.16% in 15 years
	100.00% in 20 years

* Preliminary, subject to change.

(a) Includes an aggregate \$22,400,000 of the City's Permanent Improvement Refunding Bonds, Series 2010B, General Obligation Refunding Bonds, Series 2014, General Obligation Permanent Improvement and Refunding Bonds, Series 2016 and General Obligation Refunding Bonds, Series 2016A (the "General Obligation Debt Payable From System Revenues") debt requirements, which are not Parity Bonds with the Bonds, but which pursuant to City policy are paid from revenues of the System and such policy is subject to change at the discretion of the City. Any such payments from Net Revenues (herein defined) to pay obligations that are not Parity Bonds (herein defined) is subordinate to Net Revenue payments on the Bonds and other Parity Bonds.

(b) Interest estimated at market rates for illustration purposes only. Preliminary, subject to change.

(c) Does not include the General Obligation Debt Payable From System Revenues.

THE SYSTEM

Description of the System

- Waterworks System -

The water production facilities consist of 6 water wells with a total capacity of 9.39 million gallons per day ("MGD") and 2 surface water booster stations capable of pumping 12.0 MGD. The system total water capacity is 20.1 MGD.

The distribution system consists of over 216 miles of 4" - 24" water lines, two 1 million gallon elevated tanks and 2 ground storage tanks with a total capacity of over 1.0 MGD.

- Sanitary Sewer System -

The sanitary sewer system consists of one 9.25 MGD regional activated sludge wastewater treatment plant, 40 lift stations and over 202 miles of sewer lines ranging in size from 6" - 36" diameter.

- Top Ten Water Customers -

Customer	2020 Water Consumption (in thousand gallons)	2020 Revenue	2019 Water Consumption (in thousand gallons)	2019 Revenue
The Reserve @ Autumn Creek	13,251	\$ 65,462	12,002	\$ 46,681
Bellevue at Clear Creek, LP	11,490	56,898	7,089	29,696
Bay Meadows Apartments	7,459	37,020	7,548	29,052
HUT-Mobile Park	6,347	30,879	6,865	26,674
Baywood Apartments	6,101	30,528	6,509	25,097
Friendswood TRS LLC	6,143	30,304	5,098	20,595
Friendswood Retirement Living Ltd.	5,031	27,645	(a)	(a)
Friendswood Development Company	5,232	25,963	4,921	21,077
Bridgestone Apartments	4,365	22,275	(a)	(a)
Park Place Friendswood	4,306	21,909	5,677	21,954
JSJW Friendswood LLC	(a)	(a)	5,319	21,647
Kroger Co – Div 034	(a)	(a)	4,060	17,844
Totals	69,725	\$348,883	65,088	\$260,317

(a) Not a top ten water customer in that year.

Water and Sewer Rates

The City currently serves 14,098 water customers and 13,029 sewer customers. The following is a summary of the City's current water and sewer rates.

- Water Service Charges - (Effective January 1, 2020)

The City charges the following monthly water rates:

Residential Water Rates Inside City Limits

- Minimum Monthly Base Charge By Meter Size (Includes 3,000 Gallons) -

Meter Size	Minimum Base Charge
Up to 1 Inch	\$ 21.24
1.5 Inch	53.58
2 Inch	85.94
3 Inch	133.05
4 Inch	200.34
6 Inch	368.58
8 Inch	570.46

Usage	Rate
Minimum 0 - 3,000 gallons	Base Charge
3,001 – 10,000 gallons, per thousand	\$3.21
10,001 – 25,000 gallons, per thousand	4.01
25,001 gallons and over	6.02

Commercial and Multi-Unit Water Rates Inside City Limits

- Minimum Monthly Base Charge By Meter Size (No Gallons Included) -

Meter Size	Minimum Base Charge
Up to 1 Inch	\$ 21.24
1.5 Inch	53.58
2 Inch	85.94
3 Inch	133.05
4 Inch	200.34
6 Inch	368.58
8 Inch	570.46
Usage	Rate
Per 1,000 gallons, per thousand	\$4.90

Water Rates Outside City Limits

The amount to be charged and collected for water service outside the corporate limits of the City is computed and charged as 1.5 times the amount established for service inside the City.

- Sanitary Sewer Service Charges -
(Effective January 1, 2020)

The City charges the following monthly sanitary sewer service rates:

Residential Sanitary Sewer Rates Inside City Limits

Usage	Rate
Minimum	\$24.15
Per thousand gallons	4.16

Commercial and Multi-Unit Sanitary Sewer Rates Inside City Limits

Usage	Rate
Minimum	\$24.15
Per thousand gallons	4.16

Sanitary Sewer Rates Outside City Limits

The amount to be charged and collected for sewer service outside the corporate limits of the City is computed and charged as 1.5 times the amount established for service inside the City.

- Irrigation/Sprinkler Service Charges -
(Effective January 1, 2020)

Residential or Commercial Irrigation/Sprinkler Rates Inside City Limits

- Minimum Monthly Base Charge By Meter Size (Includes 3,000 Gallons) -

Meter Size	Minimum Base Charge
Up to 1 Inch	\$ 21.24
1.5 Inch	53.58
2 Inch	85.94
3 Inch	133.05
4 Inch	200.34
6 Inch	368.58
8 Inch	570.46
Usage	Rate
Minimum 0 - 3,000 gallons	Base Charge
3,001 – 10,000 gallons, per thousand	\$4.00
10,001 – 25,000 gallons, per thousand	4.25
25,001 gallons and over	6.02

Irrigation/Sprinkler Rates Outside City Limits

The amount to be charged and collected for sewer service outside the corporate limits of the City is computed and charged as 1.5 times the amount established for service inside the City.

Southeast Water Purification Plant

The City has entered into a contract with the City of Houston, Texas (the "City of Houston") for constructing, operating and maintaining a water purification plant known as Southeast Water Purification Plant. The City's pro rata share of the actual pumping construction costs is 1.33 percent.

The City began receiving water from the plant on October 15, 1990. The City is billed on a monthly basis for the actual gallons of water received times the City's pro rata share of actual costs. At the end of each quarter, the City of Houston computes the total operation and maintenance expense for the quarter just ended, recalculates the cost per one thousand gallons, and adjusts previous billings on the next invoice.

The relationship of the parties is fiduciary. No partnership or joint venture is created by this contract.

Blackhawk Regional Waste Treatment Plant

The City has entered into an arrangement with the Gulf Coast Waste Disposal Authority for the operation and maintenance of a joint treatment plant known as Blackhawk Regional Waste Treatment Plant. The City, the City of Houston, Harris County MUD No. 55, and the Baybrook MUD 1 (collectively, the "Participants") share in the expense of operation and maintenance based on their respective usage on a monthly basis. The percentages of equity in the joint venture based on their respective capacity rights at September 30, 2020, are as follows:

City of Friendswood	59.45%
City of Houston	8.23%
Harris County MUD No. 55	21.24%
Baybrook MUD No. 1	<u>11.08%</u>
	<u>100.00%</u>

An annual budget for operations is submitted to the Gulf Coast Waste Disposal Authority each year. The Gulf Coast Waste Disposal Authority is the governing authority and consists of 9 members (3 appointed by the governor, 3 appointed by Harris County, Galveston County, and Chambers County, and 3 appointed by the Participants).

Historical Operations of the System

	Fiscal Year Ended September 30, (a)				
	2020 (b)	2019	2018	2017	2016
REVENUES					
Water and Sewer Services	\$16,553,259	\$13,013,404	\$12,086,801	\$12,295,441	\$11,319,801
Other Revenues	<u>427,758</u>	<u>796,187</u>	<u>297,359</u>	<u>141,978</u>	<u>95,825</u>
Total Revenues	\$16,981,017	\$13,809,591	\$12,384,160	\$12,437,419	\$11,415,626
EXPENDITURES					
Personnel Services	\$ 2,464,232	\$ 2,210,357	\$ 2,156,316	\$ 2,117,344	\$ 1,995,978
Sewer Operations	3,280,869	3,668,638	1,653,459	1,594,805	1,573,019
Water Purchases	1,326,100	1,879,358	1,554,202	1,539,452	1,280,556
Repairs and Maintenance	2,018,934	696,986	798,427	676,143	684,363
Supplies	115,900	159,742	128,801	133,402	93,296
Other Services and Charges	<u>1,105,442</u>	<u>763,591</u>	<u>914,088</u>	<u>850,529</u>	<u>734,017</u>
Total Expenditures	\$10,311,567	\$ 9,378,672	\$ 7,205,293	\$ 6,911,675	\$ 6,361,229
Available for Debt Service	\$ 6,669,450	\$ 4,430,919	\$ 5,178,867	\$ 5,525,744	\$ 5,054,397
Customer Count:					
Water Customers	14,098	13,913	13,619	13,482	13,289
Sewer Customers	13,029	12,870	12,588	12,483	12,407

(a) Source: City's audited financial statements.

(b) Unaudited, as of September 30, 2020.

Pension Fund

The City participates in the Texas Municipal Retirement System ("TMRS"), an agency operated by the State of Texas. Employees of the City who participate in TMRS contribute a fixed percentage, currently 7%, of their gross pay and the City matching percent is currently 2 to 1. As employees leave municipal employment other than through retirement, they may withdraw from TMRS those funds they contributed, but forfeit their employer's contributions. Each municipal employer's requirements for current contributions are offset by the amounts of such forfeitures.

As of September 30, 2020, the City employed 210 full-time employees and 35 part-time and seasonal employees. All full-time employees are covered by TMRS and the City's contribution for fiscal year 2019, amounted to approximately \$2,375,185. The City had a net pension benefit obligation in the amount of \$14,426,100 as of September 30, 2019. The liability for prior service benefits will be amortized over a period of twenty-seven years or less by contributions from the City which are a level percentage of payroll.

SELECTED PROVISIONS OF THE ORDINANCE

The Ordinance authorizes the issuance and sale of the Bonds and prescribes terms, conditions, and provisions for the payment of the principal of and interest on the Bonds by the City. Set forth below is a summary of certain provisions of the Ordinance. Such summary is not a complete description of the entire Ordinance and is qualified by reference to the Ordinance, copies of which are available from the City's Financial Advisor upon request.

Definitions

The following are selected terms that are defined in the Ordinance.

"Additional Parity Bonds" mean the additional parity revenue bonds permitted to be issued by the City pursuant to the Ordinance.

"Gross Revenues" mean all revenues, income and receipts of every nature derived or received by the City from the operation and ownership of the System and the interest income from the investment or deposit of money in the Revenue Fund, the Interest and Sinking Fund, and the Reserve Fund.

"Maintenance and Operation Expenses" mean the reasonable and necessary expenses of operation and maintenance of the System, including all salaries, labor, materials, repairs and extensions necessary to render efficient service (but only such repairs and extensions as, in the judgment of the governing body of the City, are necessary to keep the System in operation and render adequate service to the City and the inhabitants thereof, or such as might be necessary to meet some physical accident or condition which would otherwise impair the System), and all payments under contracts now or hereafter defined as operating expenses by the Legislature of Texas. Depreciation shall never be considered as a Maintenance and Operation Expense.

"Net Revenues" mean all Gross Revenues remaining after deducting the Maintenance and Operation Expenses.

"Outstanding Bonds" mean the City's Waterworks and Sewer System Revenue Bonds, Series 2016, dated March 1, 2016, outstanding at the date of issuance of the Bonds in the amount of \$4,825,000 and the City's Waterworks and Sewer System Revenue Bonds, Series 2018, dated December 1, 2018, outstanding at the date of issuance of the Bonds in the amount of \$19,500,000.

"Parity Bonds" mean the Bonds, the Outstanding Bonds and each series of Additional Parity Bonds from time to time hereafter issued, but only to the extent such Parity Bonds remain outstanding within the meaning of this Ordinance.

"Reserve Fund Requirement" means the average annual principal and interest requirements on the Parity Bonds, which may be determined and redetermined each year by the City but in no event less frequently than upon the issuance of each series of Parity Bonds.

"System" means all properties, facilities, improvements, equipment, interests, and rights constituting the waterworks and sanitary sewer system of the City, including all future extensions, replacements, betterments, additions, and improvements to the System. The System shall not include any Special Project.

Pledge and Source of Payment

The City covenants and agrees that all Gross Revenues of the System shall be deposited and paid into the special funds established for Parity Bonds, as provided in the Ordinance, and shall be applied in the manner set out therein, to provide for the payment of all Maintenance and Operation Expenses and to provide for the payment of principal, interest and any redemption premium of the Parity Bonds and all expenses of paying, securing and insuring the same. The Parity Bonds shall constitute special obligations of the City that shall be payable solely from, and shall

be equally and ratably secured by a first lien on, the Net Revenues, as collected and received by the City, from the operation and ownership of the System, which Net Revenues shall, in the manner therein provided, be set aside for and pledged to the payment of the Parity Bonds in the Interest and Sinking Fund and Reserve Fund as hereinafter provided, and the Parity Bonds shall be in all respects on a parity with and of equal dignity with one another. The owners of the Parity Bonds shall never have the right to demand payment out of any funds raised or to be raised by taxation.

Rates and Charges

So long as any Parity Bonds remain outstanding, the City shall fix, charge and collect rates and charges for the use and services of the System which are fully sufficient to produce Net Revenues in each fiscal year at least equal to 125% of the principal and interest requirements scheduled to occur in such fiscal year on all Parity Bonds then outstanding plus an amount equal to the sum of all deposits required to be made to the Reserve Fund in such fiscal year; but in no event shall Net Revenues ever be less than the amount required to maintain the Interest and Sinking Fund and the Reserve Fund as provided in the Ordinance, and, to the extent that funds for such purpose are not otherwise available, to pay all other outstanding obligations payable from the Net Revenues of the System, as and when the same become due.

The City will not grant or permit any free service from the System except for public buildings and institutions operated by the City.

Special Funds

The following special funds are created in the Ordinance and such funds shall be maintained and accounted for as provided in the Ordinance, so long as any Parity Bonds remain outstanding:

- (a) Waterworks and Sewer System Revenue Fund (the "Revenue Fund");
- (b) Waterworks and Sewer System Revenue Bonds Interest and Sinking Fund (the "Interest and Sinking Fund"); and
- (c) Waterworks and Sewer System Revenue Bonds Reserve Fund (the "Reserve Fund").

The Revenue Fund shall be maintained as a separate account on the books of the City. The Interest and Sinking Fund and the Reserve Fund shall be maintained at an official depository bank of the City separate and apart from all other funds and accounts of the City and shall constitute trust funds which shall be held in trust for the benefit of the Owners of the Parity Bonds and the proceeds of which shall be and are hereby pledged to the payment of the Parity Bonds. All of the Funds named above shall be used solely as provided in the Ordinance so long as any Parity Bonds remain outstanding.

Flow of Funds

All Gross Revenues of the System (except for interest and earnings on investments in the Reserve Fund and the Interest and Sinking Fund) shall be deposited as collected into the Revenue Fund. Money from time to time on deposit in the Revenue Fund shall be applied as follows in the following order of priority:

- (a) First, to pay Maintenance and Operation Expenses.
- (b) Second, to make all deposits into the Interest and Sinking Fund required by the Ordinance, the ordinance authorizing the issuance of the Outstanding Bonds and any ordinance authorizing the issuance of Additional Parity Bonds.
- (c) Third, to make all deposits into the Reserve Fund required by the Ordinance, the ordinance authorizing the issuance of the Outstanding Bonds and any ordinance authorizing the issuance of Additional Parity Bonds.
- (d) Fourth, to pay any amounts due to any bond insurer of Parity Bonds not paid pursuant to subsections (b) or (c) above.
- (e) Fifth, to pay any amounts due to any issuer of a reserve fund surety policy not paid pursuant to subsections (b) or (c) above.
- (f) Sixth, for any lawful purpose.

Whenever the total amounts on deposit to the credit of the Interest and Sinking Fund and the Reserve Fund shall be equivalent to the sum of the aggregate principal amount of all outstanding Parity Bonds plus the aggregate amount of all interest accrued and to accrue thereon, no further payments need be made into the Interest and Sinking Fund or the Reserve Fund.

Interest and Sinking Fund

On or before the last Business Day of each month so long as any Parity Bonds remain outstanding, after making all required payments and provision for payment of Maintenance and Operation Expenses, there shall be transferred into the Interest and Sinking Fund from the Revenue Fund:

- (i) such amounts, in approximately equal monthly installments, as will be sufficient to accumulate the amount required to pay the interest scheduled to become due on the Parity Bonds on the next interest payment date; and
- (ii) such amounts, in approximately equal monthly installments, as will be sufficient to accumulate the amount required to pay the next maturing principal of the Parity Bonds, including the principal amounts of, and any redemption premium on, any Parity Bonds payable as a result of the exercise or operation of any optional or mandatory redemption provision contained in any ordinance authorizing the issuance of Parity Bonds.

Money deposited to the credit of the Interest and Sinking Fund shall be used solely for the purpose of paying principal (at maturity or prior redemption or to purchase Parity Bonds issued as term bonds in the open market to be credited against mandatory redemption requirements), interest and any redemption premium on the Parity Bonds or reimbursing credit providers for amounts, advanced for such purpose, plus all bank charges and other costs and expenses relating to such payment. The paying agent shall destroy all paid Parity Bonds and shall provide the City with appropriate certificates of destruction.

Reserve Fund

On or before the last Business Day of each month so long as any Parity Bonds remain outstanding, after making all required payments and provision for payment of Maintenance and Operation Expenses, and after making the transfers into the Interest and Sinking Fund required in the preceding Section, there shall be transferred into the Reserve Fund from the Revenue Fund, in approximately equal monthly installments, amounts sufficient to accumulate within sixty (60) months the Reserve Fund Requirement. Each increase in the Reserve Fund Requirement resulting from the issuance of Additional Parity Bonds shall be accumulated within sixty (60) months of the issuance of such bonds by making transfers from the Revenue Fund into the Reserve Fund in approximately equal monthly installments of amounts sufficient for such purpose. After the Reserve Fund Requirement has accumulated in the Reserve Fund and so long thereafter as such Fund contains the Reserve Fund Requirement, no further deposits shall be required to be made into the Reserve Fund, and any excess amounts may be transferred to the Revenue Fund. But if and whenever the balance in the Reserve Fund is reduced below the Reserve Fund Requirement, either due to a draw on the funds or reduction or cancellation of a Reserve Fund Surety Policy, monthly deposits into such Fund shall be resumed and continued in amounts at least equal to one-twelfth (1/12th) of the deficiency in the Reserve Fund Requirement until the Reserve Fund again equals the Reserve Fund Requirement. The Reserve Fund shall be used to pay the principal of and interest on the Parity Bonds at any time when there is not sufficient money available in the Interest and Sinking Fund for such purpose and to pay and retire the last Parity Bonds to mature or be redeemed.

The City expressly reserves the right at any time to satisfy all or any part of the Reserve Fund Requirement by obtaining for the benefit of the Reserve Fund a Reserve Fund Surety Policy (as defined below). In the event the City elects to substitute at any time a Reserve Fund Surety Policy for any funded amounts in the Reserve Fund, it may apply any bond proceeds thereby released, to the greatest extent permitted by law, to any purposes for which the bonds were issued and any other funds thereby released to any purposes for which such funds may lawfully be used, including the payment of debt service on the Parity Bonds. A Reserve Fund Surety Policy shall be an insurance policy or other instrument issued pursuant to a credit agreement (as such term is defined by Section 1371.001, Government Code) in a principal amount equal to the portion of the Reserve Fund Requirement to be satisfied and issued by a financial institution or insurance company with a rating for its long term unsecured debt or claims paying ability in the highest letter category by two major municipal securities evaluation sources. The premium for any such policy shall be paid from bond proceeds or other funds of the City lawfully available for such purpose. Any Reserve Fund Surety Policy shall be authorized by resolution or ordinance and submitted to the Attorney General for examination and approval.

At any time that there are insufficient funds available in the Interest and Sinking Fund to make any required payment of interest on or principal of the Bonds, or to reimburse the credit providers for amounts advanced for such purpose, there shall be transformed from the Reserve Fund to the Interest and Sinking Fund such amounts as may be necessary for such purpose. In the event the Reserve Fund contains one or more Reserve Fund Surety Policy or

Policies, the City shall not draw on Reserve Fund Surety Policy unless no other cash or investments are otherwise available in the Reserve Fund. If more than one Reserve Fund Surety Policy is held in the Reserve Fund, the City shall draw on such policies on a proportionate basis. Whenever amounts have been drawn on one or more Reserve Fund Surety Policies, amounts subsequently transferred to the Reserve Fund shall be used to reimburse the provider (or if more than one, to the providers on a proportionate basis) of such Reserve Fund Surety Policies in accordance with the terms thereof, for the amounts advanced, interest thereon and any associated fees. The issuer(s) of such Reserve Fund Surety Policy or Policies shall be secured with respect to such reimbursement obligations by a lien on the Net Revenues, subject and subordinate to the lien securing the Bonds and the required deposits to the Fund, and shall further be secured by a lien on amounts from time to time on deposit in and required to be deposited to the Reserve Fund.

Additional Parity Bonds

The City reserves the right to issue, for any lawful purpose (including the refunding of any previously issued Parity Bonds or any other bonds or obligations of the City issued in connection with or payable from the revenues of the System), one or more series of Additional Parity Bonds payable from and secured by a first lien on the Net Revenues of the System on a parity with the Bonds and any previously issued Additional Parity Bonds; provided, however, that no Additional Parity Bonds may be issued unless:

- (a) The Additional Parity Bonds mature on, and interest is payable on, the same days of the year as the Bonds;
- (b) The Interest and Sinking Fund and the Reserve Fund each contains the amount of money then required to be on deposit therein;
- (c) For either the preceding fiscal year or a 12 consecutive calendar month period ending no more than 90 days prior to adoption of the ordinance authorizing such Additional Parity Bonds, Net Revenues were equal to at least 140% of the average annual principal and interest requirements on all Parity Bonds that will be outstanding after the issuance of the series of Additional Parity Bonds then proposed to be issued, as certified by the City's Controller or Director of Administrative Services or by an independent certified public accountant or firm of independent certified public accountants; and
- (d) If the City cannot meet the test described in (c) above, but a change in the rates and charges applicable to the System becomes effective at least sixty (60) days prior to the adoption of the ordinance authorizing Additional Parity Bonds and the City's Controller or Director of Administrative Services certifies that, had such change in rates and charges been effective for the preceding fiscal year or 12 consecutive calendar month period ending no more than 90 days prior to adoption of said ordinance, the Net Revenues for such period would have met the test described in (c) above.

Subordinate Lien Bonds

The City reserves the right to issue, for any lawful purpose, bonds, notes or other obligations secured in whole or in part by liens on the Net Revenues that are junior and subordinate to the lien on the Net Revenues securing payment of the Parity Bonds. Such subordinate lien obligations may be further secured by any other source of payment lawfully available for such purpose.

Special Project Bonds

The City reserves the right to issue revenue bonds secured by liens on and pledges of revenues and proceeds derived from Special Projects.

Bondowners' Remedies

This Ordinance shall constitute a contract between the City and the Owners of the Parity Bonds from time to time outstanding (including any bond insurers of Parity Bonds) and shall remain in effect until the Parity Bonds and the interest thereon shall be fully paid or discharged or provision therefor shall have been made as provided herein (including payments of any amounts due to bond insurers of Parity Bonds). In the event of a default in the payment of the principal of or interest on any of the Parity Bonds or a default in the performance of any duty or covenant provided by law or in this Ordinance, the Owner or Owners of any of the Parity Bonds may pursue all legal remedies afforded by the Constitution and laws of the State of Texas to compel the City to remedy such default and to prevent further default or defaults. Without in any way limiting the generality of the foregoing, it is expressly

provided that any Owner of any of the Parity Bonds may proceed at law or in equity, by suit, action, mandamus, or other proceedings, enforce and compel performance of all duties required to be performed by the City under this Ordinance, including the making and collection of reasonable and sufficient rates and charges for the use and services of the System, the deposit of the Gross Revenues into the special funds herein provided, and the application of the Gross Revenues and the Net Revenues in the manner required in this Ordinance.

ADMINISTRATION OF THE CITY

Mayor and City Council

Policy-making and supervisory functions are the responsibility of and are vested in the Mayor and City Council for the City, under provisions of the "Charter of the City of Friendswood" (the "Charter") approved by the electorate October 16, 1971. City Council is elected at large on the first Saturday in May. The Mayor and six Council members serve three-year staggered terms. Members of the Council are described below:

<u>Council Members</u>	<u>Period Served</u>	<u>Term Expires May</u>	<u>Occupation</u>
Mike Foreman Mayor	3 Years	2021	Business Owner
Steve Rockey Council Member	9 Years	2021	Chief Operating Officer
Sally Branson Council Member	4 Years	2023	Financial Advisor
Trish Hanks Mayor Pro-Tem Council Member	3 Years	2021	Education Consultant
Robert J. Griffon Council Member	3 Years	2022	Investor
John H. Scott Council Member	10 Years	2023	Business Owner
Brent Erenwert Council Member	2 Years	2022	Produce Buyer

Administration

Under provisions of the Charter, the City Council enacts local legislation, adopts budgets, determines policies and appoints the City Manager, who is charged with the duties of executing the laws and administering the government of the City. As the chief executive officer and head of the administrative branch of the City government, the City Manager is given the power and duties to:

- (1) Appoint and remove all department heads and all other employees in the administrative service of the City and may authorize the head of a department to appoint and remove subordinates in his respective department;
- (2) Prepare the budget annually, submit it to City Council, and be responsible for its administration;
- (3) Prepare and submit to City Council a complete report on the finances and administrative activities of the City;
- (4) Keep City Council advised of the financial condition and future needs of the City and make appropriate recommendations; and
- (5) Perform such other necessary duties as prescribed by the Charter or required by City Council.

Members of the administrative staff are described below:

Name	Position	Period Served
Morad Kabiri	City Manager	13 Years
Steven Rhea	Assistant City Manager	3 Years
Melinda K. Welsh	City Secretary	18 Years
Katina Hampton	Director of Administrative Services	14 Years
James Toney	Director of Parks and Recreation	16 Years
Rene Ibarra	Director of Public Works	15 Years
Jildardo Arias	Director of Engineering	2 Years
Matthew Riley	Director of Library Services	31 Years
Aubrey Harbin	Director of Community Development	14 Years
Brian Mansfield	Fire Marshal / Emergency Management Coordinator	21 Years
Robert B. Wieners	Police Chief	22 Years
Mary K. Fischer	Internal City Attorney	4 Years

Consultants

The City has retained several consultants to perform professional services in connection with the independent auditing of its books and records and other City activities. Several of these consultants are identified below:

Bond Counsel	McCall, Parkhurst & Horton L.L.P. Dallas, Texas
Certified Public Accountants.....	Whitley Penn LLP Houston, Texas
Financial Advisor	BOK Financial Securities, Inc. Houston, Texas

LEGAL MATTERS

Legal Opinion

The delivery of the Bonds is subject to the approving opinion of the Attorney General of Texas to the effect that the Bonds are valid and legally binding obligations of the City payable from the Net Revenues and, the approving legal opinion of McCall, Parkhurst & Horton L.L.P., Bond Counsel to the City ("Bond Counsel"), in substantially the form attached as APPENDIX C. Though it represents the Financial Advisor and the Underwriters, from time to time in matters unrelated to the issuance of the Bonds, Bond Counsel has been engaged by and only represents the City in connection with the issuance of the Bonds. The City expects to pay the legal fees of Bond Counsel for services rendered in connection with the issuance of the Bonds from proceeds of the Bonds. Certain legal matters will be passed upon for the Underwriters by Orrick, Herrington & Sutcliffe LLP, Houston, Texas, Counsel to the Underwriters, whose legal fees are contingent upon the sale and delivery of the Bonds.

Bond Counsel has reviewed the statements and information appearing in the Official Statement under the captions "THE BONDS" (except the subcaptions "Book-Entry-Only System," "Future Debt," "Sources and Uses of Funds" and "Remedies in the Event of Default"), "SALE AND DISTRIBUTION OF THE BONDS – Securities Laws," "SELECTED PROVISIONS OF THE ORDINANCE," "LEGAL MATTERS - Legal Opinion" (excluding the last sentence of the first paragraph thereof), "TAX MATTERS," and "CONTINUING DISCLOSURE OF INFORMATION" (except the subcaption "Compliance With Prior Undertakings") and such firm is of the view that the information under such captions fairly summarizes the procedures and documents referred to therein and is correct as to matters of law. Bond Counsel has not independently verified any of the factual information contained in this Official Statement nor have they conducted an investigation of the affairs of the City for the purpose of passing upon the accuracy or completeness of this Official Statement. No person is entitled to rely upon such firm's limited participation as an assumption of responsibility for, or an expression of opinion of any kind with regard to, the accuracy or completeness of any of the information contained herein.

The various legal opinions to be delivered concurrently with the delivery of the Bonds express the professional judgment of the attorneys rendering the opinions as to the legal issues explicitly addressed therein. In rendering a legal opinion, the attorney does not become an insurer or guarantor of the expression of professional judgment, of the transaction opined upon, or of the future performance of the parties to the transaction. Nor does the rendering of an opinion guarantee the outcome of any legal dispute that may arise out of the transaction.

No-Litigation Certificate

The City will furnish to the Underwriters a certificate, dated as of the date of delivery of the Bonds, executed by appropriate City officials, to the effect that no litigation of any nature has been filed or is then pending or threatened, either in state or federal courts, contesting or attacking the Bonds; restraining or enjoining the issuance, execution or delivery of the Bonds; affecting the provisions made for the payment of or security for the Bonds; in any manner questioning the authority or proceedings for the issuance, execution, or delivery of the Bonds; or affecting the validity of the Bonds.

No Material Adverse Change

The obligations of the Underwriters to take and pay for the Bonds, and of the City to deliver the Bonds, are subject to the condition that, up to the time of delivery of and receipt of payment for the Bonds, there shall have been no material adverse change in the condition (financial or otherwise) of the City subsequent to the date of sale from that set forth or contemplated in the Official Statement, as it may have been supplemented or amended through the date of sale.

TAX MATTERS

Opinion

On the date of initial delivery of the Bonds, McCall, Parkhurst & Horton L.L.P., Dallas, Texas, Bond Counsel to the City, will render its opinion that, in accordance with statutes, regulations, published rulings and court decisions existing on the date thereof ("Existing Law"), (1) interest on the Bonds for federal income tax purposes will be excludable from the "gross income" of the holders thereof and (2) the Bonds will not be treated as "specified private activity bonds" the interest on which would be included as an alternative minimum tax preference item under section 57(a)(5) of the Internal Revenue Code of 1986 (the "Code"). Except as stated above, Bond Counsel to the City will express no opinion as to any other federal, state or local tax consequences of the purchase, ownership or disposition of the Bonds. See Appendix C -- Form of Bond Counsel Opinion.

In rendering its opinion, Bond Counsel to the City will rely upon (a) the City's federal tax certificate and (b) covenants of the City with respect to arbitrage, the application of the proceeds to be received from the issuance and sale of the Bonds and certain other matters. Failure of the City to comply with these representations or covenants could cause the interest on the Bonds to become includable in gross income retroactively to the date of issuance of the Bonds.

The Code and the regulations promulgated thereunder contain a number of requirements that must be satisfied subsequent to the issuance of the Bonds in order for interest on the Bonds to be, and to remain, excludable from gross income for federal income tax purposes. Failure to comply with such requirements may cause interest on the Bonds to be included in gross income retroactively to the date of issuance of the Bonds. The opinion of Bond Counsel to the City is conditioned on compliance by the City with the covenants and the requirements described in the preceding paragraph, and Bond Counsel to the City has not been retained to monitor compliance with these requirements subsequent to the issuance of the Bonds.

Bond Counsel's opinion represents its legal judgment based upon its review of Existing Law and the reliance on the aforementioned information, representations and covenants. Bond Counsel's opinion is not a guarantee of a result. The Existing Law is subject to change by the Congress and to subsequent judicial and administrative interpretation by the courts and the Department of the Treasury. There can be no assurance that such Existing Law or the interpretation thereof will not be changed in a manner which would adversely affect the tax treatment of the purchase, ownership or disposition of the Bonds.

A ruling was not sought from the Internal Revenue Service by the City with respect to the Bonds or the facilities financed or refinanced with the proceeds of the Bonds. Bond Counsel's opinion represents its legal judgment based upon its review of Existing Law and the representations of the City that it deems relevant to render such opinion and is not a guarantee of a result. No assurances can be given as to whether the Internal Revenue Service will commence an audit of the Bonds, or as to whether the Internal Revenue Service would agree with the opinion of Bond Counsel. If an audit is commenced, under current procedures the Internal Revenue Service is likely to treat the City as the taxpayer and the Bondholders may have no right to participate in such procedure. No additional interest will be paid upon any determination of taxability.

Federal Income Tax Accounting Treatment of Original Issue Discount

The initial public offering price to be paid for one or more maturities of the Bonds may be less than the principal amount thereof or one or more periods for the payment of interest on the Bonds may not be equal to the accrual period or be in excess of one year (the "Original Issue Discount Bonds"). In such event, the difference between (i)

the "stated redemption price at maturity" of each Original Issue Discount Bond, and (ii) the initial offering price to the public of such Original Issue Discount Bond would constitute original issue discount. The "stated redemption price at maturity" means the sum of all payments to be made on the Bonds less the amount of all periodic interest payments. Periodic interest payments are payments which are made during equal accrual periods (or during any unequal period if it is the initial or final period) and which are made during accrual periods which do not exceed one year.

Under Existing Law, any owner who has purchased such Original Issue Discount Bond in the initial public offering is entitled to exclude from gross income (as defined in section 61 of the Code) an amount of income with respect to such Original Issue Discount Bond equal to that portion of the amount of such original issue discount allocable to the accrual period. For a discussion of certain collateral federal tax consequences, see discussion set forth below.

In the event of the redemption, sale or other taxable disposition of such Original Issue Discount Bond prior to stated maturity, however, the amount realized by such owner in excess of the basis of such Original Issue Discount Bond in the hands of such owner (adjusted upward by the portion of the original issue discount allocable to the period for which such Original Issue Discount Bond was held by such initial owner) is includable in gross income.

Under Existing Law, the original issue discount on each Original Issue Discount Bond is accrued daily to the stated maturity thereof (in amounts calculated as described below for each six-month period ending on the date before the semiannual anniversary dates of the date of the Bonds and ratably within each such six-month period) and the accrued amount is added to an initial owner's basis for such Original Issue Discount Bond for purposes of determining the amount of gain or loss recognized by such owner upon the redemption, sale or other disposition thereof. The amount to be added to basis for each accrual period is equal to (a) the sum of the issue price and the amount of original issue discount accrued in prior periods multiplied by the yield to stated maturity (determined on the basis of compounding at the close of each accrual period and properly adjusted for the length of the accrual period) less (b) the amounts payable as current interest during such accrual period on such Original Issue Discount Bond.

The federal income tax consequences of the purchase, ownership, redemption, sale or other disposition of Original Issue Discount Bonds which are not purchased in the initial offering at the initial offering price may be determined according to rules which differ from those described above. All owners of Original Issue Discount Bonds should consult their own tax advisors with respect to the determination for federal, state and local income tax purposes of the treatment of interest accrued upon redemption, sale or other disposition of such Original Issue Discount Bonds and with respect to the federal, state, local and foreign tax consequences of the purchase, ownership, redemption, sale or other disposition of such Original Issue Discount Bonds.

Collateral Federal Income Tax Consequences

The following discussion is a summary of certain collateral federal income tax consequences resulting from the purchase, ownership or disposition of the Bonds. This discussion is based on Existing Law, which is subject to change or modification, retroactively.

The following discussion is applicable to investors, other than those who are subject to special provisions of the Code, such as financial institutions, property and casualty insurance companies, life insurance companies, individual recipients of Social Security or Railroad Retirement benefits, individuals allowed an earned income credit, certain S corporations with Subchapter C earnings and profits, foreign corporations subject to the branch profits tax, taxpayers qualifying for the health insurance premium assistance credit, and taxpayers who may be deemed to have incurred or continued indebtedness to purchase tax-exempt obligations.

THE DISCUSSION CONTAINED HEREIN MAY NOT BE EXHAUSTIVE. INVESTORS, INCLUDING THOSE WHO ARE SUBJECT TO SPECIAL PROVISIONS OF THE CODE, SHOULD CONSULT THEIR OWN TAX ADVISORS AS TO THE TAX TREATMENT WHICH MAY BE ANTICIPATED TO RESULT FROM THE PURCHASE, OWNERSHIP AND DISPOSITION OF TAX-EXEMPT OBLIGATIONS BEFORE DETERMINING WHETHER TO PURCHASE THE BONDS.

Under section 6012 of the Code, holders of tax-exempt obligations, such as the Bonds, may be required to disclose interest received or accrued during each taxable year on their returns of federal income taxation.

Section 1276 of the Code provides for ordinary income tax treatment of gain recognized upon the disposition of a tax-exempt obligation, such as the Bonds, if such obligation was acquired at a "market discount" and if the fixed maturity of such obligation is equal to, or exceeds, one year from the date of issue. Such treatment applies to "market discount bonds" to the extent such gain does not exceed the accrued market discount of such Bonds; although for this purpose, a de minimis amount of market discount is ignored. A "market discount bond" is one

which is acquired by the holder at a purchase price which is less than the stated redemption price at maturity or, in the case of a bond issued at an original issue discount, the "revised issue price" (i.e., the issue price plus accrued original issue discount). The "accrued market discount" is the amount which bears the same ratio to the market discount as the number of days during which the holder holds the obligation bears to the number of days between the acquisition date and the final maturity date.

State, Local and Foreign Taxes

Investors should consult their own tax advisors concerning the tax implications of the purchase, ownership or disposition of the Bonds under applicable state or local laws. Foreign investors should also consult their own tax advisors regarding the tax consequences unique to investors who are not United States persons.

Information Reporting and Backup Withholding

Subject to certain exceptions, information reports describing interest income, including original issue discount, with respect to the Bonds will be sent to each registered holder and to the Internal Revenue Service. Payments of interest and principal may be subject to backup withholding under section 3406 of the Code if a recipient of the payments fails to furnish to the payor such owner's social security number or other taxpayer identification number ("TIN"), furnishes an incorrect TIN, or otherwise fails to establish an exemption from the backup withholding tax. Any amounts so withheld would be allowed as a credit against the recipient's federal income tax. Special rules apply to partnerships, estates and trusts, and in certain circumstances, and in respect of Non-U.S. Holders, certifications as to foreign status and other matters may be required to be provided by partners and beneficiaries thereof.

Future and Proposed Legislation

Tax legislation, administrative actions taken by tax authorities, or court decisions, whether at the Federal or state level, may adversely affect the tax-exempt status of interest on the Bonds under Federal or state law and could affect the market price or marketability of the Bonds. Any such proposal could limit the value of certain deductions and exclusions, including the exclusion for tax-exempt interest. The likelihood of any such proposal being enacted cannot be predicted. Prospective purchasers of the Bonds should consult their own tax advisors regarding the foregoing matters.

CONTINUING DISCLOSURE OF INFORMATION

In the Ordinance, the City has made the following agreement for the benefit of the holders and beneficial owners of the Bonds. The City is required to observe the agreement for so long as it remains obligated to advance funds to pay the Bonds. Under the agreement, the City will be obligated to provide certain updated financial information and operating data annually, and timely notice of specified events, to the Municipal Securities Rulemaking Board ("MSRB"). Information will be available from the MSRB free of charge via the Electronic Municipal Market Access ("EMMA") system at www.emma.msrb.org.

Annual Reports

The City will provide certain updated financial information and operating data to the MSRB annually via EMMA. The information to be updated includes all quantitative financial information and operating data with respect to the City of the general type included in this Official Statement under the headings "OFFICIAL STATEMENT SUMMARY – Selected Financial Information," "CITY REVENUE DEBT" and "THE SYSTEM" (collectively, the "Annual Operating Data"). The City will update and provide the Annual Operating Data within six months after the end of each fiscal year. The City will additionally provide audited financial statements of the City (the "Financial Statements"), and such Financial Statements will be provided within 12 months after the end of each fiscal year ending in or after 2020. If the audit of such Financial Statements is not complete within 12 months after any such fiscal year end, then the City will file unaudited Financial Statements within such 12-month period and audited Financial Statements for the applicable fiscal year, when and if the audit report on such statements becomes available. Any such Financial Statements will be prepared in accordance with the accounting principles described in APPENDIX "B" or such other accounting principles as the City may be required to employ from time to time pursuant to state law or regulation. The City may provide updated information in full text or may incorporate by reference certain other publicly available documents, as permitted by Rule 15c2-12.

The City's current fiscal year end is September 30. Accordingly, the Annual Operating Data must be provided by March 31 in each year, and the Financial Statements must be provided by September 30 of each year, unless the City changes its fiscal year. If the City changes its fiscal year, it will file notice of the change (and of the date of the new fiscal year end) with the MSRB prior to the next date by which the City otherwise would be required to provide financial information and operating data as set forth above.

Notice of Certain Events

The City will also provide timely notices of certain events to the MSRB. The City will provide notice in a timely manner not in excess of ten business days after the occurrence of the event of any of the following events with respect to the Bonds: (1) principal and interest payment delinquencies; (2) non-payment related defaults, if material; (3) unscheduled draws on debt service reserves reflecting financial difficulties; (4) unscheduled draws on credit enhancements reflecting financial difficulties; (5) substitution of credit or liquidity providers, or their failure to perform; (6) adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the Bonds, or other material events affecting the tax status of the Bonds; (7) modifications to rights of holders of the Bonds, if material; (8) bond calls, if material, and tender offers; (9) defeasances; (10) release, substitution, or sale of property securing repayment of the Bonds, if material; (11) rating changes; (12) bankruptcy, insolvency, receivership or similar event of the City; (13) the consummation of a merger, consolidation, or acquisition involving the City or the sale of all or substantially all of the assets of the City, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material; (14) appointment of a successor trustee or change in the name of the trustee, if material; (15) incurrence of a Financial Obligation of the City, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a Financial Obligation of the City, any of which affect security holders, if material; and (16) default, event of acceleration, termination event, modification of terms, or other similar events under the terms of a Financial Obligation of the City, any of which reflect financial difficulties. Neither the Bonds nor the Ordinance make any provision for debt service reserves, liquidity enhancement, credit enhancement, merger, consolidation, acquisition, or the appointment of a trustee. In addition, the City will provide timely notice of any failure by the City to provide information, data, or financial statements in accordance with its agreement described above under "Annual Reports."

For these purposes, any event described in (12) in the immediately preceding paragraph is considered to occur when any of the following occur: the appointment of a receiver, fiscal agent, or similar officer for the City in a proceeding under the United States Bankruptcy Code or in any other proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the City, or if such jurisdiction has been assumed by leaving the existing governing body and officials or officers in possession but subject to the supervision and orders of a court or governmental authority, or the entry of an order confirming a plan of reorganization, arrangement, or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the City. The term "Financial Obligation" shall mean, for purposes of the events in clauses (15) and (16) above, a (i) debt obligation; (ii) derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing, or planned debt obligation; or (iii) guarantee of (i) or (ii). The term "Financial Obligation" shall not include municipal securities (as defined in the Securities Exchange Act of 1934, as amended) as to which a final official statement (as defined in the Rule) has been provided to the MSRB consistent with the Rule.

Availability of Information

All information and documentation filing required to be made by the City will be made with the MSRB in electronic format in accordance with MSRB guidelines. Access to such filings is provided, without charge to the general public, by the MSRB at www.emma.msrb.org.

Limitations and Amendments

The City has agreed to update information and to provide notices of certain events only as described above. The City has not agreed to provide other information that may be relevant or material to a complete presentation of its financial results of operations, condition, or prospects or agreed to update any information that is provided, except as described above. The City makes no representation or warranty concerning such information or concerning its usefulness to a decision to invest in or sell Bonds at any future date. The City disclaims any contractual or tort liability for damages resulting in whole or in part from any breach, WHETHER NEGLIGENT OR WITHOUT FAULT ON ITS PART, of its continuing disclosure agreement or from any statement made pursuant to its agreement. Holders or beneficial owners of Bonds may seek as their sole remedy a writ of mandamus to compel the City to comply with its agreement. No default by the City with respect to its continuing disclosure agreement shall constitute a breach of or default under the Ordinance for purposes of any other provision of the Ordinance.

Nothing in this paragraph is intended or shall act to disclaim, waive, or otherwise limit the duties of the City under federal and state securities laws. The City's undertakings and agreements are subject to appropriation of necessary funds and to applicable legal restrictions.

The City may amend its continuing disclosure agreement to adapt to changed circumstances that arise from a change in legal requirements, a change in law, or a change in the identity, nature, status or type of operations of the City if, but only if (i) the agreement, as so amended, would have permitted an underwriter to purchase or sell the Bonds in the offering made hereby in compliance with Rule 15c2-12, taking into account any amendments or interpretations of Rule 15c2-12 to the date of such amendment, as well as such changed circumstances, and (2) either (a) the holders of a majority in aggregate amount of the outstanding Bonds consent to such amendment or (b) a person unaffiliated with the City (such as nationally recognized bond counsel) determines that the amendment will not materially impair the interests of the holders and beneficial owners of the Bonds. The City may also amend or repeal the agreement if the SEC amends or repeals the applicable provisions of Rule 15c2-12 or a court of final jurisdiction determines that such provisions are invalid, and the City may amend the agreement in its discretion in any other circumstance or manner, but in either case only to the extent that its right to do so would not prevent an underwriter from purchasing the Bonds in the offering described herein in compliance with Rule 15c2-12. If the City amends the agreement, it has agreed to include with any financial information or operating data next provided in accordance with its agreement described above under "Annual Reports" an explanation, in narrative form, of the reasons for the amendment and of the impact of any change in the type of financial information and operating data so provided.

Compliance With Prior Undertakings

During the last five years, the City has substantially complied in all material respects with its undertakings made in accordance with Rule 15c2-12.

SEVERE WEATHER EVENTS

The City is located approximately 25 miles from the Texas Gulf Coast. Land located in this area is susceptible to high winds, heavy rain and flooding caused by hurricanes, tropical storms, and other tropical disturbances. If a hurricane (or any other natural disaster) significantly damaged all or part of the improvements within the City, System revenues could be substantially reduced. Further, there can be no assurance that a casualty loss to taxable property within the City will be covered by insurance (or that property owners will even carry insurance), that any insurance company will fulfill its obligation to provide insurance proceeds, or that insurance proceeds will be used to rebuild or repair any damaged improvements within the City. Even if insurance proceeds are available and improvements are rebuilt, there could be a lengthy period during which System revenues could be adversely affected and, therefore, the City's ability to pay its obligations, including the Bonds, could be adversely impacted.

INFECTIOUS DISEASE OUTBREAK – COVID-19

The World Health Organization has declared a pandemic following the outbreak of COVID-19, a respiratory disease caused by a new strain of coronavirus (the "Pandemic"), which is currently affecting many parts of the world, including the United States and Texas. On January 31, 2020, the Secretary of the United States Health and Human Services Department declared a public health emergency for the United States in connection with COVID-19. On March 13, 2020, the President of the United States (the "President") declared the Pandemic a national emergency and the Texas Governor (the "Governor") declared COVID-19 an imminent threat of disaster for all counties in Texas (collectively, the "disaster declarations"). On March 25, 2020, in response to a request from the Governor, the President issued a Major Disaster Declaration for the State of Texas, which declaration has been continued on a monthly basis.

Pursuant to Chapter 418 of the Texas Government Code, the Governor has broad authority to respond to disasters, including suspending any regulatory statute prescribing the procedures for conducting state business or any order or rule of a state agency that would in any way prevent, hinder, or delay necessary action in coping with the disaster, and issuing executive orders that have the force and effect of law. The Governor has since issued a number of executive orders relating to COVID-19 preparedness and mitigation. These include executive orders which, among other things, impose limitations on business occupancy and operations and social gatherings, and require people to wear face coverings in public spaces (with a few exceptions). Additional information regarding executive orders issued by the Governor is accessible on the website of the Governor at <https://gov.texas.gov/>. Neither the information on (nor accessed through) such website of the Governor is incorporated by reference, either expressly or by implication, into this Official Statement. In addition to the actions by the state and federal officials, certain local officials have declared a local state of disaster. Many of the federal, state and local actions and policies under the aforementioned disaster declarations are focused on limiting instances where the public can congregate or interact with each other, which negatively affects the operation of businesses and the state and national economies.

Since the disaster declarations were made, the Pandemic has negatively affected travel, commerce, and financial markets locally and globally, and is widely expected to continue negatively affecting economic growth and financial

markets worldwide and within Texas. See "APPENDIX A - GENERAL INFORMATION REGARDING THE CITY OF FRIENDSWOOD, TEXAS - Employment Statistics."

Such adverse economic conditions, if they continue, could result in declines in the demand for residential and commercial property in the Houston area resulting in reduced System revenues.

While the potential impact of COVID-19 on the City cannot be quantified at this time, the continued outbreak of COVID-19 could have an adverse effect on the City's operations and financial condition and its ratings (see "SALE AND DISTRIBUTION OF THE OBLIGATIONS – Municipal Bond Ratings"). The financial and operating data contained herein is as of dates and for the periods noted. Some of such information addresses time periods prior to the economic impact of the Pandemic and measures instituted to slow it. Accordingly, such information may not be indicative of the economic impact of the Pandemic on the City's financial condition.

EXPOSURE TO OIL AND GAS INDUSTRY

Recent declines in oil prices in the United States and globally may lead to adverse conditions in the oil and gas industry. Such adverse conditions may result in reduced revenues, declines in capital and operating expenditures, business failures, and the layoff of workers within the oil and gas industry. In the past, the greater Houston area has been affected by adverse conditions in the oil and gas industry, and adverse conditions in the oil and gas industry and spillover effects into other industries could adversely impact the businesses in the City, resulting in reduced System revenues.

FINANCIAL ADVISOR

BOK Financial Securities, Inc. is employed as Financial Advisor to the City in connection with the issuance of the Bonds. The Financial Advisor's fee for services rendered with respect to the sale of the Bonds is contingent upon the issuance and delivery of the Bonds. The Financial Advisor is not obligated to undertake, and has not undertaken to make, an independent verification or to assume responsibility for the accuracy, completeness, or fairness of the information in this Official Statement.

GENERAL CONSIDERATIONS

Sources and Compilation of Information

The information contained in this Official Statement has been obtained primarily from the City and from other sources believed to be reliable. No representation is made as to the accuracy or completeness of the information derived from sources other than the City. The summaries of the statutes, ordinances and other related documents are included herein subject to all of the provisions of such documents. These summaries do not purport to be complete statements of such provisions and reference is made to such documents for further information.

Neither this Official statement nor any statement that may have been made orally or in writing is to be constructed as or as part of a contract with the original purchasers or subsequent owners of the Bonds.

Forward Looking Statements

The statements contained in this Official Statement, and in any other information provided by the City, that are not purely historical, are forward-looking statements, including statements regarding the City's expectations, hopes, intentions, or strategies regarding the future. Readers should not place undue reliance on forward-looking statements. All forward-looking statements included in this Official Statement are based on information available to the City on the date hereof, and the City assumes no obligation to update any such forward-looking statements. It is important to note that the City's actual results could differ materially from those in such forward-looking statements.

The forward-looking statements herein are necessarily based on various assumptions and estimates and are inherently subject to various risks and uncertainties, including risks and uncertainties relating to the possible invalidity of the underlying assumptions and estimates and possible changes or developments in social, economic, business, industry, market, legal and regulatory circumstances and conditions and actions taken or omitted to be taken by third parties, including customers, suppliers, business partners and competitors, and legislative, judicial and other governmental authorities and officials. Assumptions related to the foregoing involve judgments with respect to, among other things, future economic, competitive, and market conditions and future business decisions, all of which are difficult or impossible to predict accurately and many of which are beyond the control of the City. Any of such assumptions could be inaccurate and, therefore, there can be no assurance that the forward-looking statements included in this Official Statement would prove to be accurate.

This Official Statement was duly authorized and approved by the City Council of the City of Friendswood, Texas as of the date specified on the first page hereof.

Mayor
City of Friendswood

ATTEST:

City Secretary
City of Friendswood

APPENDIX A

GENERAL INFORMATION REGARDING THE CITY OF FRIENDSWOOD, TEXAS

The following information has been derived from various sources, including the Texas Municipal Reports, U.S. Census data, "Sales Management Survey of Buying Power", and City officials. While such sources are believed to be reliable, no representation is made as to the accuracy thereof.

- City Economics -

The City of Friendswood, Texas (the "City"), is a commercial center located 20 miles southeast of downtown Houston at the intersection of Farm to Market Road 2351 and Farm to Market Road 518 in the northeast corner of Galveston County, with a small portion in Harris County. At present, there are numerous residential subdivisions either developed or under construction within the City with homes ranging in value from approximately \$75,000 to over \$2,500,000, the average being approximately \$400,000.

Manufacturing and Commerce

Employment in Galveston County (the "County") is provided by the extensive petro-chemical industry. (Source: Texas Municipal Report.) Also adding to the general economy of the County are fishing, tourism and recreation activities and agribusiness. The Gulf Intracoastal Waterway comes through the lowlands near Surfside Beach and is an important waterway in America with reported annual tonnage comparable to the Panama and Suez Canals.

ECONOMIC AND GROWTH INDICATORS

U.S. Census of Population

	City of Friendswood		Galveston County	
	Number	% Change	Number	% Change
1930	---	---	23,054	+11.84
1940	---	---	27,069	+17.42
1950	---	---	46,549	+71.96
1960	1,497	---	76,204	+63.71
1970	6,444	+330.46	108,312	+42.13
1980	13,248	+105.59	169,587	+56.57
1990	18,927	+42.87	191,707	+13.04
2000	29,037	+53.42	250,158	+30.49
2010	35,805	+23.31	291,309	+16.45

(a) Source: U.S. Census Bureau.

Employment Statistics**State of Texas**

	<u>2020 (a)</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>
Labor Force	14,094,292	14,045,312	13,816,690	13,574,795	13,335,578
Employed	13,144,000	13,551,791	13,285,118	12,989,682	12,720,226
Unemployed	950,292	493,521	531,572	585,113	615,352
Unemployment Rate	6.7%	3.5%	3.8%	4.3%	4.6%

Galveston County

	<u>2020 (a)</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>
Labor Force	164,960	165,479	163,247	161,977	160,038
Employed	152,361	158,807	155,732	153,462	151,521
Unemployed	12,599	6,672	7,515	8,515	8,517
Unemployment Rate	7.6%	4.0%	4.6%	5.3%	5.3%

City of Friendswood

	<u>2020 (a)</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>
Labor Force	19,710	20,083	19,794	19,596	19,520
Employed	18,644	19,435	19,061	18,778	18,644
Unemployed	1,066	648	733	818	876
Unemployment Rate	5.4%	3.2%	3.7%	4.2%	4.5%

(a) As of October 31, 2020.

Employment Statistics

Source: Texas Workforce Commission

APPENDIX B
AUDITED FINANCIAL STATEMENTS OF THE CITY

APPENDIX C
FORM OF BOND COUNSEL OPINION



Tentative Schedule of Events

November - 2020						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

December - 2020						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

January - 2021						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

February - 2021						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

\$13,470,000*

Waterworks and Sewer System Revenue Bonds, Series 2021

Date	Action	Role
Monday, November 16, 2020	First Draft of Preliminary Official Statements ("POS")	BOKFS
Monday, November 30, 2020	Second Draft of POS	BOKFS, MPH, City
Monday, December 7, 2020	Council Meeting to Review Schedule of Events and Plan of Finance	BOKFS, City
Tuesday, December 8, 2020	Third Draft of POS	BOKFS, MPH, City
Week of December 14, 2020	Rating Agency Calls	BOKFS, City
Monday, December 28, 2020	Final Draft of POS	BOKFS, MPH, City, UW
Monday, January 4, 2021	Print and Distribute Final POS	BOKFS, UW
Monday, January 11, 2021	Pricing of Series 2021 Bonds	BOKFS, MPH, City, UW
	Council Meeting to Approve Sale	
Thursday, February 4, 2021	Closing of Series 2021 Bonds	BOKFS, MPH, City, UW

Participants

City – City of Friendswood, Texas
 BOKFS – BOK Financial Securities, Inc.
 MPH – McCall, Parkhurst & Horton L.L.P.
 UW - Underwriters

* Preliminary, subject to change.



August 10, 2005

To All Bond Counsel:

Re: Statutory Fee Increase

As most of you are aware, the Legislature this year passed Senate Bill 495, which amended Chapter 1202 of the Texas Government Code, relating to the examination fees charged for Attorney General review and approval of public securities and credit agreements.

Instead of the tiered structure currently in place, the amended Section 1202.004 provides for a fee equal to one-tenth of one percent of the principal amount of the public security to which the record of proceedings relates or \$9,500, whichever is less; provided, the fee shall not be less than \$750. If the record of proceedings includes multiple series, a separate fee must be calculated and paid for each series. If the record of proceedings includes authorization of a credit agreement, but does not also include the authorization of a public security, the fee is calculated based on the principal amount of the public security or public securities to which the credit agreement relates.

The fee may be rounded to the nearest whole dollar. If the principal amount of the public security has not been finalized at the time a record of proceedings is submitted for review, the fee will be calculated and paid based on the maximum principal amount authorized.

The amendment is effective for all records of proceedings submitted on or after September 1, 2005. Please be advised that any transcript submitted prior to September 1, 2005, with a closing date after September 21, 2005, must be substantially complete; pro forma transcripts will not be accepted.

We recognize that questions will arise as we all transition to the new fee structure. We will endeavor to promptly address each question. Thank you in advance for your cooperation.

Yours truly,

T.Lynn Stuck
Assistant Attorney General
Chief, Public Finance Division

January 11, 2021

Mayor and Members of the City Council
City of Friendswood
910 S. Friendswood Drive
Friendswood, Texas 77546

Re: Proposed City of Friendswood, Texas, Waterworks and Sewer System Revenue Bonds,
Series 2021

Ladies and Gentlemen:

The purpose of this engagement letter is to set forth certain matters concerning the services we will perform as bond counsel to the City of Friendswood, Texas (the "Issuer") in connection with the issuance of the above-referenced bonds (the "Bonds"). We understand that the Bonds are being issued for the purpose of providing approximately \$11,400,000 to finance improvements to the waterworks and sewer system of the Issuer (the "System"), to fund a debt service reserve fund for the Bonds and to pay the costs of issuing the Bonds, and that the Bonds will be secured by a pledge of the net revenues (the "Net Revenues") of the System. We further understand that the Bonds will be authorized to be sold by the City Council of the Issuer (the "Council") pursuant to an ordinance (the "Ordinance") adopted on the date hereof (the "Sale Date"), and that the Bonds will be sold by negotiation to FHN Financial Capital Markets and SAMCO Capital Markets, Inc. (collectively, the "Underwriter") on the Sale Date.

A. THE FINANCING

As Bond Counsel to the Issuer, we would like for the Council to understand how the issuance of the Bonds will be effected and the ramifications of the financing. I will briefly describe the procedures and certain applicable law that pertains to the issuance of the Bonds, below. However, you should feel free to call me at any time to discuss any questions that you or your staff may have.

(1) The Bonds will be "ordered to be issued" when and if the Council approves the Ordinance on the Sale Date. The Ordinance provides for (i) the terms of the Bonds, including the principal amortization schedule and interest rates; (ii) the Issuer's pledge of the Net Revenues to pay the debt service on the Bonds; (iii) the sale of the Bonds to the Underwriter; (iv) the approval of this engagement letter; (v) approval of a paying agent agreement with a paying agent/registrant bank, to whom you will make semiannual payments sufficient to pay the debt service on the Bonds; (vi) covenants of the Issuer with respect to on-going disclosure obligations in accordance with Rule 15c2-12 of the Securities and Exchange Commission; and (vii) certain other covenants of the Issuer that are designed to allow the Issuer to issue the Bonds as tax-exempt obligations. As you can see, the Ordinance is an omnibus undertaking of the Issuer that is intended to provide for all actions and undertakings that are required for the issuance of the Bonds. There will be other certificates and letters that will be required to be executed by officers of the Issuer on the Sale Date, but they all spring from, and are authorized by, the Ordinance.



(2) As noted above, the Bonds will be sold to the Underwriter in accordance with the provisions of the Ordinance and, in addition, in accordance with a Bond Purchase Agreement, which will set forth the terms of the sale of the Bonds. In connection with the sale of the Bonds, the Issuer will make representations to the Underwriter in various closing certificates (collectively, the "Closing Certificate") to the effect that the Issuer is authorized to issue the Bonds and that it has made full disclosure to the Underwriter and the bond investors of all material information. The Issuer's representations regarding its disclosures are statements of inducement that are governed by the anti-fraud provisions of State and federal securities laws. As a condition to the Underwriter's payment for the Bonds, the Underwriter will require this firm to deliver our Bond Counsel opinion to them, in which we will opine that the Bonds are valid obligations of the Issuer and that, assuming ongoing compliance by the Issuer with the provisions of the Ordinance, the interest on the Bonds will be exempt from federal income taxation. The Underwriter's bid will also require the delivery of an opinion of the Texas Attorney General approving the Bonds, as is required by State law. We have reviewed the Issuer's representations in the Closing Certificate, and we believe that it is appropriate for the Issuer to make such representations. However, if there are any unusual financial or legal circumstances affecting the Issuer that would make the covenants, representations or statements made by the Issuer in the Official Statement (described below) or the Closing Certificate untrue or incomplete, you should let BOK Financial Securities, your Financial Advisor, or the undersigned know about them as soon as possible.

(3) You should know that the purchase price for the Bonds will likely be somewhat higher than the principal amount of the Bonds. This is because additional proceeds are often generated by the sale of certain of the Bonds at a premium. Any premium can be used to pay costs of issuance of the Bonds and to fund the construction of the project.

(4) The Underwriter will offer the Bonds into the public debt markets prior to the time that the Council meets to accept the Underwriter's offer for the Bonds. Through this process, the Bonds will be "priced" – i.e., interest rates and premiums or discounts, if any, for the Bonds will be established. On the Sale Date, the Council will then consider the terms offered to the Issuer by the Underwriter based upon the market conditions and other factors that determine interest rates and pricing information. The Issuer's Financial Advisor, working with the staff of the Issuer, has prepared an offering document called an "Official Statement" that contains financial and operating data concerning the Issuer, and information that describes the Bonds. The Issuer is responsible for the information that is contained in the Official Statement to the extent that it describes the Bonds and the Issuer. Some information in the Official Statement has been prepared by others, including the Underwriter, and the Issuer is not responsible for that information. As your Bond Counsel, we have reviewed the Official Statement to ensure that the information describing the Bonds and the Ordinance are correct. The Issuer has strict responsibility for truthful disclosures when it offers securities into the public markets. An issuer of securities does not have a "due diligence defense" should there be material misrepresentations or omissions in the document that relate to the information for which the issuer is responsible. Therefore, if you know of any information that an investor would consider to be material in order to make an investment decision, and that information is omitted from, or incorrect in, the Official Statement, the Underwriter needs to know, and the Official Statement should be corrected, accordingly.



B. SCOPE OF ENGAGEMENT

In this engagement, we have performed, or expect to perform, the following duties:

(1) Subject to the completion of proceedings to our satisfaction, render our legal opinion (the "Bond Opinion") regarding the validity and binding effect of the Bonds, the source of payment and security for the Bonds, and the excludability of interest on the Bonds from gross income for federal income tax purposes.

(2) Prepare and review documents necessary or appropriate to the authorization, issuance and delivery of the Bonds, coordinate the authorization and execution of such documents, and review enabling legislation.

(3) Assist the Issuer in seeking from other governmental authorities such approvals, permissions and exemptions as we determine are necessary or appropriate in connection with the authorization, issuance and delivery of the Bonds, except that we will not be responsible for any required federal or state securities law filings. In this connection, we particularly undertake to assist the Issuer in having the Bonds approved by the Public Finance Division of the Office of the Texas Attorney General, and, following such approval, registered by the Texas Comptroller of Public Accounts.

(4) Review legal issues relating to the structure of the Bond issue.

(5) Review those sections of the official statement to be disseminated in connection with the sale of the Bonds which describe the Bonds, the Ordinance pursuant to which they will be issued and the tax-exempt treatment of the interest on the Bonds for purposes of federal income taxation.

(6) If requested, assist the Issuer in presenting information to bond rating organizations and providers of credit enhancement relating to legal issues affecting the issuance of the Bonds.

(7) Draft the continuing disclosure undertaking of the Issuer.

Our Bond Opinion will be delivered by us on the date the Bonds are exchanged for their purchase price (the "Closing"). The Issuer will be entitled to rely on our Bond Opinion.

The Bond Opinion will be based on facts and law existing as of its date. In rendering our Bond Opinion, we will rely upon the certified proceedings and other certifications of public officials and other persons furnished to us without undertaking to verify the same by independent investigation, and we will assume continuing compliance by the Issuer with applicable laws relating to the Bonds. During the course of this engagement, we will rely on you to provide us with complete and timely information on all developments pertaining to any aspect of the Bonds and their security. We understand that you will direct members of your staff and other employees of the Issuer to cooperate with us in this regard. Our Bond Opinion will represent the our legal judgment based upon our review of existing law and the reliance on the aforementioned information, as well as other representations and covenants of the Issuer. The Bond Counsel opinion is not a guarantee of a result. Applicable law pertaining to the Bond Opinion is subject to change by the Congress and to subsequent judicial and administrative interpretation by the



courts and the Department of the Treasury. There can be no assurance that such applicable law or the interpretation thereof will not be changed in a manner which would adversely affect the tax treatment of the purchase, ownership or disposition of the Bonds. As Bond Counsel to the Issuer, we are not being retained to monitor compliance with the requirements of applicable law subsequent to the issuance of the Bonds, but we will provide advice to the Issuer following the issuance of the Bonds, which advice will be based on post-issuance information (if any) provided to us by the Issuer.

Our duties in this engagement are limited to those expressly set forth above. Unless we are separately engaged in writing to perform other services, our duties do not include any other services, including the following:

(a) Except as described in paragraph (5) above, assisting in the preparation or review of an official statement or any other disclosure document with respect to the Bonds, or performing an independent investigation to determine the accuracy, completeness or sufficiency of any such document or rendering advice that the official statement or other disclosure document does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements contained therein, in light of the circumstances under which they were made, not misleading.

(b) Preparing requests for tax rulings from the Internal Revenue Service, or no action letters from the Securities and Exchange Commission.

(c) Preparing state securities law memoranda or investment surveys with respect to the Bonds.

(d) Drafting state constitutional or legislative amendments.

(e) Pursuing test cases or other litigation.

(f) Making an investigation or expressing any view as to the creditworthiness of the Issuer or the Bonds.

(g) Except as described in paragraph (7) above, assisting in the preparation of, or opining on, a continuing disclosure undertaking pertaining to the Bonds or, after Closing, providing advice concerning any actions necessary to assure compliance with any continuing disclosure undertaking.

(h) Representing the Issuer in Internal Revenue Service examinations or inquiries, or Securities and Exchange Commission investigations.

(i) After Closing, providing continuing advice to the Issuer or any other party concerning any actions necessary to assure that interest paid on the Bonds will continue to be excludable from gross income for federal income tax purposes (e.g., our engagement does not include rebate calculations for the Bonds).

(j) Negotiating the terms of, or opining as to, any investment contract.



(k) Addressing any other matter not specifically set forth above that is not required to render our Bond Opinion.

C. ATTORNEY-CLIENT RELATIONSHIP

Upon execution of this engagement letter, the Issuer will be our client and an attorney-client relationship will exist between us. We further assume that all other parties in this transaction understand that we represent only the Issuer in this transaction, we are not counsel to any other party, and we are not acting as an intermediary among the parties. Our services as bond counsel are limited to those contracted for in this letter; the Issuer's execution of this engagement letter will constitute an acknowledgment of those limitations. Our representation of the Issuer will not affect, however, our responsibility to render an objective Bond Opinion.

Our representation of the Issuer and the attorney-client relationship created by this engagement letter will be concluded upon issuance of the Bonds. Nevertheless, subsequent to Closing, we will mail the appropriate Internal Revenue Service Form 8038, prepare and distribute to the participants in the transaction a transcript of the proceedings pertaining to the Bonds.

D. FIRM NOT A MUNICIPAL ADVISOR

As a consequence of the adoption of Rule 15Ba1-1 pursuant to the Securities Exchange Act of 1934 (the "Municipal Advisor Rule"), which has been promulgated by the Securities and Exchange Commission as a result of the enactment of the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act"), we hereby inform the Issuer that we are not a "Municipal Advisor" within the meaning of the Municipal Advisor Rule or the Dodd-Frank Act (collectively, the "MA Rule"). In the course of performing our services as Bond Counsel in this transaction, we may engage in analysis, discussion, negotiation, and advice to the Issuer regarding the legal ramifications of the structure, timing, terms, and other provisions of the financial transaction that culminates with the planned issuance of the Bonds, and such services and advice may be essential to the development of the plan of finance for the issuance of the Bonds. In turn, these services become, among other things, the basis for the transaction's basic legal documents, the preparation and delivery of the official statement or any other disclosure document that describes the material terms and provisions of the transaction, if an offering document is used in the offering of the Bonds, the preparation of the various closing certificates that embody the terms and provisions of this transaction and the preparation and delivery of our Bond Opinion. Moreover, legal advice and services of a traditional legal nature in the area of municipal finance inherently involve a financial advice component; but we hereby advise the Issuer that while we have expertise with respect to the legal aspects relating to the issuance of municipal securities, we are not "financial advisors" or "financial experts" in a manner that would subject us to the provisions of the MA Rule. As Bond Counsel, we provide only legal advice, not purely financial advice that is not inherent in our legal advice to the Issuer. The Issuer should seek the advice of its financial advisor with respect to the financial aspects of the issuance of the Bonds. By signing this engagement letter, the Issuer acknowledges receipt of this information, and evidences its understanding of the limitations of our role to the Issuer as Bond Counsel with respect to the MA Rule, as discussed in this paragraph.



E. CONFLICTS

As you are aware, our firm represents many political subdivisions and investment banking firms, among others, who do business with political subdivisions. It is possible that during the time that we are representing the Issuer, one or more of our present or future clients will have transactions with the Issuer, including the Issuer's financial advisor and the Underwriter. It is also possible that we may be asked to represent, in an unrelated matter, one or more of the entities involved in the issuance of the Bonds. We do not believe such representation, if it occurs, will adversely affect our ability to represent you as provided in this letter, either because such matters will be sufficiently different from the issuance of the Bonds so as to make such representations not adverse to our representation of you, or because the potential for such adversity is remote or minor and outweighed by the consideration that it is unlikely that advice given to the other client will be relevant to any aspect of the issuance of the Bonds. Execution of this letter will signify the Issuer's consent to our representation of others consistent with the circumstances described in this paragraph.

F. ELECTRONIC COMMUNICATION AND STORAGE

In the interest of facilitating our services to you, we may send documents, information or data electronically or via the Internet or store electronic documents or data via computer software applications hosted remotely or utilize cloud-based storage. Your confidential electronic documents or data may be transmitted or stored using these methods. We may use third party service providers to store or transmit these documents or data. In using these electronic communication and storage methods, we employ reasonable efforts to keep such communications, documents and data secure in accordance with our obligations under applicable laws, regulations, and professional standards; however, you recognize and accept that we have no control over the unauthorized interception or breach of any communications, documents or data once it has been transmitted or if it has been subject to unauthorized access while stored, notwithstanding all reasonable security measures employed by us or by our third party vendors. By your acceptance of this letter, you consent to our use of these electronic devices and applications and submission of confidential client information to or through third party service providers during this engagement.

G. FEES

Based upon: (i) the terms, structure, size and schedule of the financing represented by the Bonds; (ii) the duties we will undertake pursuant to this engagement letter; (iii) the time we anticipate devoting to the financing; and (iv) the responsibilities we will assume in connection therewith, our fee will be \$6,000 for the first \$1,000,000 in net proceeds of the Bonds, plus \$1 per \$1,000 of net proceeds of the Bonds for all such amounts above \$1,000,000. Net proceeds include any net original issue premium, less the amount of the Underwriter's discount, plus the principal amount of the Bonds (accrued interest is excluded from net proceeds). In addition, we will be reimbursed for all client charges made or incurred on your behalf, such as election translation costs, travel costs, photocopying, deliveries, long distance telephone charges, telecopier charges, computer-assisted research and other expenses. Our fee will be billed after the Closing. This Agreement has a value of less than \$100,000 for purposes of Section 2271.002, Texas Government Code.



H. RECORDS

After the transaction has closed, you will receive from us a transcript of proceedings that contain the primary financing and closing documents related to the transaction. At your request, papers and property furnished by you, and work product belonging to you and to which you are entitled, will be returned promptly. We may have copies of any and all documents made for our files at our sole cost and expense, to be retained by us. For various reasons, including the minimization of unnecessary storage expenses, we reserve the right to dispose of any documents or other materials retained by us after the closing of the transaction.

I. ACCEPTANCE OF TERMS OF ENGAGEMENT

If the foregoing terms are acceptable to you, please so indicate by returning the enclosed copy of this engagement letter dated and signed by an authorized officer, retaining the original for your files. We look forward to working with you.

Respectfully yours,

McCall, Parkhurst & Horton L.L.P.

By:

Dan S. Culver

Accepted and Approved

City of Friendswood, Texas

By:

Its: Mayor

Date: January 11, 2021

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 11/3/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Approving a License Agreement with Friendswood Independent School District to add a radio communications antenna to the City's elevated water tower

Originating Department: Public Works

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

The City was approached by members of the Friendswood Independent School District (FISD) requesting consideration to install an emergency radio antenna and repeater cabinet system at the City of Friendswood Elevated Water Tower located in the rear of the Friendswood High School. The City and FISD have coordinated with the FISD's proposed contractor for the proposed installation, and they will be adhering to the requirements for the installation. The antenna and cabinet installation will permit the FISD to be in a more efficient position for needed communications during an emergency.

All required costs for the installation and future maintenance to the system will be covered by the FISD.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

In a continued partnership between the City and FISD, this license agreement would provide a more efficient avenue for the FISD to be able to communicate during a critical emergency situation.

RECOMMENDATIONS

Staff recommends approval of the agreement.

ATTACHMENTS

1. License and Indemnity Agreement FISD
2. Exhibit A - FISD Letter
3. mototrbo_slr_5000_series_repeater_data_sheet
4. IOD-46DXC Cabinet System Data

LICENSE AND INDEMNITY AGREEMENT

WHEREAS, on January 11, 2021, the City Council agreed to the request by the Friendswood Independent School District (FISD) to place an emergency radio antenna and repeater cabinet system atop and within a City facility located at 1100 Mustang Dr., Friendswood, Galveston County, Texas; and further described on Exhibit "A".

WHEREAS, the City Council was agreeable to said project, subject to the execution of this License to Use agreement;

NOW, THEREFORE, the City of Friendswood (City) and Friendswood Independent School District (Licensee), in consideration of the promises, covenants, and conditions hereby mutually agree as follows:

1. License

- 1.01 The City agrees to the placement of an emergency radio antenna and repeater cabinet system ("Licensed Use"), in the location and of the size/type as presented to city staff and the City Council. A site map and depiction of the specific property for the Licensed Use are attached as Exhibit "A" hereto, ("Licensed Property"). This license is hereby granted for the Licensed Property which is generally located atop and within the pedestal of the City's elevated storage tank at 1100 Mustang Dr., Friendswood, Galveston County, Texas.
- 1.02 The Licensee agrees that this license is based upon the stated Licensed Use only and shall terminate upon the cessation of said use by Licensee, unless sooner terminated according to other terms and provisions contained in this Agreement.
- 1.03 Licensee shall provide consideration to the City for the license to use the city property as reflected in the Conditions and related requirements hereafter.

2. Conditions

- 2.01 The City and Licensee agree that the Licensed Property is granted for the Licensed Use subject to the following conditions, terms and reservations
 - a) The Licensee must not create or allow any nuisances on the property, as that term is defined by State law and/or The City Code.
 - b) The Licensee must be accompanied by designated City personnel at all times when accessing the facility
 - c) At such time as this license is terminated or canceled, for any reason whatsoever, Licensee shall, at the City's option, remove all improvements and appurtenances owned by them, situated in, on, over, under or attached to the Licensed Property, and Licensee shall restore the premises in accordance with the requirements of the City Engineer. If Licensee fails to remove all improvements and appurtenances or if Licensee fails to restore the Licensed Property as required, then, in either event, the City shall have the right to do all work necessary or cause such work to be done and assess the cost of all work against Licensee and the City shall in no case be liable to Licensee.

- 2.02 Licensee shall obtain and keep in place a general liability insurance policy of not less than \$1,000,000 in coverage for the Licensed Property, and shall name the City of Friendswood as an additional insured. Licensee shall provide, or cause to be provided, in advance, notice to the City of ANY termination or change in coverage.
- 2.03 Temporary cessation. Licensee agrees to temporarily remove the Licensed Use at request of the City, if same obstruct the City's temporary maintenance or construction activity within the Licensed Property.
- 2.04 Permanent removal. This license is made subordinate to the right of the City to use the Licensed Property for a public purpose. It is understood and agreed that should the City deem it in the public interest to use the above area, or a portion thereof, for a public purpose, or for any utility service which will require the use of Licensed Property then in that event, the City shall give the Licensee ninety (90) days written notice of the City's intention to cancel this license. Licensee shall have the same right of cancellation upon giving the City ninety (90) days written notice of Licensee's intention to cancel. Upon the termination or cancellation by the City or Licensee, this license shall become null and void, and Licensee or anyone claiming any rights under this instrument shall remove any improvements and encroachments from the Licensed Property at Licensee's expense. All work shall be done at Licensee's sole cost and to the reasonable satisfaction of the Building Official. The determination by the City Manager as to the public necessity of the use of the property shall be final and binding upon the parties.
- 2.05 This license is subject to all state and federal laws, the provisions of the Charter of the City of Friendswood as it now exists or as it may hereafter be adopted or amended, and the ordinances of the City of Friendswood now in effect or those which may hereafter be passed, adopted, or amended.
- 2.06 The Licensee must apply for and receive any necessary permits from the Building Department, or other pertinent City boards or departments.

3. Indemnity

- 3.01 Licensee, and each person, firm, corporation, association, or entity of any kind (hereinafter "person") performing work within the City's public right-of-way and property as a contractor on behalf of the Licensee, shall indemnify, defend, and hold the City harmless as set forth below to provide such indemnity to the extent allowed by law. The provisions referring to the Licensee herein below shall be constructed to mean all such persons.

The Licensee shall promptly defend, indemnify, and hold harmless the City from and against all damages, costs, losses, or expenses:

- a. For the repair, replacement, and/or restoration of City's property, equipment, materials, structures, and facilities which are damaged, destroyed, or found to be defective solely as a result of the Licensee's acts or omissions; and
- b. From and against any and all claims, demands, suits, causes of action and judgments for:

- i. Damage to loss of the Licensed Property of any person (including, but not limited to Licensee, its agents, officers, employees, and subcontractors, and the City, its agents, officers, and employees and third parties); and/or
 - ii. Death, bodily injury, illness, disease, loss of services, or loss of income or wages to any person (including, but not limited to, the officers, agents, and employees of the Licensee, the Licensee's contractors, and the City's officer, agents, and employees, and third parties), arising out of, incident to, concerning, or resulting from, the negligent or willful acts or omissions of the Licensee, its officers, agents, employees, and/or subcontractors, in the performance of activities pursuant to the Licensee's use of the City's right of way and Licensed Property, whether or not caused in whole or in part by the negligence of the City, its agents or employees. For purposes of this indemnification provision, acts or omission of the officer, agents, employees and contractors of the Licensee shall be considered the acts and omissions of the Licensee. The indemnity provisions set forth above is solely for the benefit of City and the Licensee and is not intended to create or grant any rights, contractual or otherwise, to any other person. This provision shall also cover any claim for damages that any utility, whether publicly or privately owned, may sustain or receive by reason of Licensee's use of said license for Licensee's improvements located on the Licensed property.
- 3.02 Licensee shall never make any claim of any kind or character against the City for damages that it may suffer by reason of the installation, construction, reconstruction, operation, and/or maintenance of the Licensed Use. It is Licensee's intention, and a condition of this license, that this provision shall constitute a full and total indemnity against any kind or character or claim whatsoever that may be asserted against the City by reason of, or a consequence of having granted permission to Licensee to use and maintain the Licensed Property. Licensee agrees to defend any and all suits, claims, or cause of action brought against the City on account of same, and discharge any judgment or judgments that may be rendered against the City in connection herewith.
- 3.03 For the avoidance of doubt, the indemnity obligations in Section 3 of this agreement only apply to the extent permitted by Texas law.

4. General Provisions

- 4.01 This Agreement constitutes the entire agreement between the City and Licensee. No agreements, modifications, implied or otherwise, shall be binding on any of the parties unless set forth in writing and signed by both parties.
- 4.02 The phrases, clauses, sentences, paragraphs or sections of this license to use agreement are severable and, if any phrase, clause, sentence paragraph, or section of this license to use agreement should be declared invalid by the final decree or judgment of any court of competent jurisdiction, such as invalidity shall not affect any of the remaining phrases, clauses, sentences, paragraphs and sections of this Agreement.
- 4.03 Any notice required to be given pursuant to the terms and provisions of this Agreement shall be in writing and mailed by certified or registered mail, addressed as set forth below or at such

other address as may be specified by written notice:

CITY OF FRIENDSWOOD :

Attn: City Manager
910 S. Friendswood Dr.
Friendswood, TX 77546
(281) 996-3250

LICENSEE:

Friendswood Independent School District
Attn: FISD Superintendent of Schools
302 Laurel Drive
Friendswood, TX 77546

- 4.04 The City and Licensee agree that this Agreement shall be construed in accordance with the laws of the State of Texas.
- 4.05 This Agreement and the obligations of the parties hereunder are subject to all rules, regulations, and laws which may be applicable by the State of Texas. Exclusive venue for any dispute out of this License Agreement shall lie in a court of competent jurisdiction in Galveston County, Texas.

IN TESTIMONY WHEREOF, the Friendswood Independent School District, Licensee, has caused these presents to be signed by _____, Member (title) there unto authorized, this _____ day of _____ 2021.

By: _____

Name: _____

Title _____

THE STATE OF TEXAS)

)

COUNTY OF GALVESTON)

BEFORE ME, the undersigned authority, on this day personally appeared _____, whose name is subscribed to the foregoing instrument and acknowledge to me that she/he was duly authorized and executed the same for the purposes and considerations therein expressed, in the capacity therein and herein stated for and on behalf of said Licensee.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this _____ day of _____ 2021.

Notary Public in and for the State of Texas
My Commission Expires: _____

(SEAL)

IN TESTIMONY WHEREOF, the City of Friendswood, Texas, has caused these presents to be signed by Mike Foreman, Mayor of the City of Friendswood, and Melinda Welsh, City Secretary of the City of Friendswood, there unto authorized, this _____ day of _____ 2021.

CITY OF FRIENDSWOOD, TEXAS

By: _____

Mike Foreman
Mayor

ATTEST

By: _____

Melinda Welsh, TRMC
City Secretary

(SEAL)

THE STATE OF TEXAS)
)

COUNTY OF GALVESTON)

BEFORE ME, the undersigned authority, on this day personally appeared Mike Foreman of the City of Friendswood, Texas, whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and considerations therein expressed and in the capacity therein and herein stated for and on behalf of said City.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this ____ day of _____ 2021.

(SEAL)

Notary Public in and for the State of Texas
My Commission Expires: _____

Rene Ibarra, CFM
Director of Public Works
City of Friendswood
15355 Blackhawk Blvd.
Friendswood, TX 77546

Re: Proposed Installation of Emergency Radio Antenna and Repeater Cabinet System

Dear Rene,

In continued City of Friendswood and Friendswood Independent School District (FISD) partnership, the FISD is wishing to request consideration / approval of a proposal to install an emergency radio repeater antenna on the top of the elevated water tower in the rear of the Friendswood High School, along with the installation of the repeater storage cabinet system within the pedestal of the water tower. The installation will be for primary emergency radio communications in the event of a critical emergency. For added reference, please find below added specifics of the proposed installation.

Antenna Installation:

We will install a radio antenna that weighs approximately 3 pounds. The antenna is well below the 300-pound antenna mount design limit at the top of the tower. The antenna is a single vertical antenna and will be mounted on one of two antenna mounts installed when the water tower was constructed.

The antenna coaxial cable will be Andrews LDF-50A ½ inch diameter and weighing approximately 21 pounds for the entire run estimated to be approximately 170 ft. The coax will enter the tower's access conduit through one of the three entry points installed at the top of the tower during its initial construction, and upon completion it will be weather sealed to prevent any rain water entering the pedestal of the water tower. This will be accomplished by fitting a correctly sized threaded pipe into the pre-existing threaded access entry point, then using two 90-degree fittings or "sweeping 90s" to pointing the opening downward. The open will be fitted with weatherproof rubber drilled to fit the coax cable and sealed with proper sealant.

The cable will be secured to the existing rigid conduit by the use of clips or ties approximately every 10 feet or less. At the bottom of the pedestal, the coax cable will be attached to a lightening arrester that will be affixed to the ground cable currently installed in the pedestal for the same purpose.

Radio/ Repeater Cabinet System:

The radio equipment to be installed will consist of a digital two-way Motorola MOTOTRBO SLR 5000 Series Repeater. Support equipment such as duplexers, power supplies, controllers, etc. will be installed also. All the equipment will be installed in a high quality Model# IOD-46DXC, NEMA Type 4 - Class 250 Repeater Cabinet System utilized for such installations (find attached reference info.). The cabinet with all installed equipment should be approximately 26 inches wide, 30 inches deep, and 4 feet tall. Electrical power for the antenna and cabinet system will be obtained using existing 120 VAC available in the pedestal.

To remotely control the repeater, it will be necessary for us to have Internet access. It is our understanding that this is not currently in place, so we will have it installed at our expense and we will pay any

monthly fee charged by the Internet service provider. In the event the City of Friendswood wants to use this Internet access point for telemetry or security cameras, we are open to and will make it available at no charge as long as such use does not interfere with the School District's control of the repeater. The access cable for the Internet will enter the pedestal through the currently available entry point at the control box, so it will not be necessary to drill an access point.

Please let me know if this proposed installation meets with your approval, or if additional information or changes are required. We are in review of and prepared to enter into the City's Licensed Use Agreement and look forward towards its consideration and approval at a future city council meeting.

On behalf of the Friendswood Independent School District, its students, parents, staff, and myself, I want to thank you for your continued assistance and consideration in making this endeavor possible. The approval of the proposed installation of this emergency radio antenna and repeater cabinet system will significantly improve the critical position of emergency communications between the FISD and all emergency entities should an event occur.

Sincerely,

John A. Hesse
Energy Specialist & Security
Friendswood ISD



MOTOTRBO™ SLR 5000 SERIES REPEATER

For your organization to be successful, you need dependable voice and data communications that reach every corner of your operations. The MOTOTRBO SLR 5000 Series repeater delivers high performance, high reliability two-way radio service with all the features you need to connect your workplace.

With its sleek form factor and low power consumption, it's engineered for low cost of ownership. And with a huge leap forward in technology, it represents the next generation in repeaters.

Versatile and powerful, MOTOTRBO combines the best of two-way radio functionality with the latest digital technology. It integrates voice and data seamlessly, offers advanced features that are easy to use and delivers increased capacity to meet your communication needs from the field to the factory floor.

Whether you need the simplicity of a single site conventional system, or the powerful trunking capabilities of Capacity Plus, Capacity Max or Connect Plus, the SLR 5000 Series delivers the power of digital two-way radio to your workforce. It can also operate as an analog repeater (conventional or MPT 1327), or as a mixed mode analog/digital repeater while you transition away from a legacy analog system.

NEXT GENERATION MOTOTRBO REPEATER

The SLR 5000 Series represents a huge leap forward in design and technology. Based on a wealth of field experience, customer feedback and technological innovation, the product delivers outstanding performance and efficiency for your business two-way radio system. From rock-solid reliability to clever touches like an integrated battery charger, the SLR 5000 Series is truly the next generation in repeaters.

HIGH PERFORMANCE

The SLR 5000 Series is designed to offer round-the-clock reliable operation, even at its continuous full transmit power of 50W. The high-quality design has been validated through Motorola's Accelerated Life Testing (ALT) program, and meets stringent quality criteria.

To deliver reliable coverage throughout your premises, the product has a next-generation receiver design, with high sensitivity and improved noise blocking. Combined with the 50W transmit output power and digital error correction, this gives you clear voice quality, even in the most adverse conditions.

The SLR 5000 Series supports the full MOTOTRBO feature set, and is compatible with all the MOTOTRBO system architectures: single site conventional, IP Site Connect, Capacity Plus (single and multi-site), Capacity Max and Connect Plus. The IP interface allows you to build applications and consoles directly into your system.

To help you build your system for top performance, MOTOTRBO RF Planning and IP Integration Services are available for purchase.

HIGH EFFICIENCY

The latest RF technology gives the SLR 5000 Series exceptionally good power efficiency. Together with its space-efficient 1U height and low thermal footprint, it gives you a very low cost of ownership.

The product has simple servicing requirements, with field-replaceable Power Amplifier, Power Supply and Modem modules. A front panel USB port allows easy configuration, with optional support for remote management. It also has built-in features such as a 3A battery charger, external alarm ports and an auxiliary power output to ease site installation.

The standard warranty is 2 years, and can be enhanced with Service from the Start: a full service support program that protects your hardware investment with prioritized expert repair, proactive technical support, software updates and more.

DESIGNED FOR THE FUTURE

Motorola is committed to supporting you with even more sophisticated workforce communication solutions as your needs evolve, so the SLR 5000 Series is designed with the future in mind. Compared to first generation repeaters, it has 10x more processing power, 15x more memory and 125x more data storage. The architecture even has provision for expansion modules, should more functionality be required in the future.

MOTOTRBO SLR 5000 SERIES

With excellent performance, high reliability and clever design in a small, slim unit, the SLR 5000 Series repeater is at the heart of a MOTOTRBO professional two-way radio system. To find out more, please contact your local authorized Motorola Channel Partner.



GENERAL SPECIFICATIONS

	VHF	UHF	UHF2
Frequency Range	136-174 MHz	400-470 MHz	450-512 MHz
Channel Capacity	64		
RF Output Power	1-50 W		
Dimensions (H x W x D)	1.75 x 19 x 14.6 in (44 x 483 x 370 mm)		
Weight	19 lbs (8.6 kg)		
Input Voltage (AC)	100-240 Vac, 47-63 Hz		
Current (standby), 110 / 240 V	0.18 / 0.25 A		
Current (transmitting), 110 / 240 V	1.5 / 0.9 A		
Input Voltage (DC)	11.0-14.4 Vdc		
Current (standby)	0.7 A		
Current (transmitting)	9.5 A		
Operating Temperature Range	-22 to +140 °F (-30 to +60 °C)		
Humidity	RH of 95%, non-condensing at 122F (50 C)		
Max Duty Cycle	100%		
FCC Description	ABZ99FT3094	ABZ99FT4096	ABZ99FT4097
IC Description	109AB-99FT3094	109AB-99FT4096	109AB-99FT4097
Digital Vocoder Type	AMBE+2™		
Battery Charger Capacity	12 V, 3 A		
Connectivity	Tx (N female), Rx (BNC female), USB A receptacle, 2x Ethernet		
Supported System Types	Digital Conventional, IP Site Connect, Capacity Plus (Single Site and Multi-Site), Capacity Max, Connect Plus, Analog Conventional, MPT 1327		

RECEIVER

	136-174 MHz	400-470 MHz	450-512 MHz
Frequency Range	136-174 MHz	400-470 MHz	450-512 MHz
Channel Spacing	25* / 12.5 kHz		
Frequency Stability	0.5 ppm		
Sensitivity, 12dB SINAD	0.22 uV		
Sensitivity, 5% BER	0.22 uV		
Selectivity (TIA603D), 25* / 12.5 kHz	83 / 55 dB	80 / 55 dB	80 / 55 dB
Selectivity (TIA603), 25* / 12.5 kHz	83 / 68 dB	80 / 68 dB	80 / 68 dB
Selectivity (ETSI), 25* / 12.5 kHz	70 / 63 dB		
Intermodulation Rejection (TIA603D/ETSI)	82 / 73 dB		
Spurious Rejection (TIA603D/ETSI)	95 / 90 dB		
Audio Distortion	< 1%		
Transmitter Hum and Noise, 25* / 12.5 kHz	-50dB / -45		

TRANSMITTER

	136-174 MHz	400-470 MHz	450-512 MHz
Frequency Range	136-174 MHz	400-470 MHz	450-512 MHz
RF Output Power	1-50 W		
Max Duty Cycle	100%		
Channel Spacing	25* / 12.5 kHz		
Frequency Stability	0.5 ppm		
Intermodulation Attenuation	40 dB		
Adjacent Channel Power (TIA603D), 25* / 12.5 kHz	78 / 62 dB		
Adjacent Channel Power (ETSI), 25* / 12.5 kHz	78 / 62 dB		
Conducted Spurious Emissions	-36 dBm < 1 GHz, -30 dBm > 1 GHz		
Modulation Fidelity (4FSK)	FSK Error 5%, FSK Magnitude 1%		
Audio Response	TIA603D		
Audio Distortion	< 1%		
Receiver Hum and Noise, 25* / 12.5 kHz	-50dB / -45		
Rated System Deviation, 25* / 12.5 kHz	±5.0 / ±2.5 kHz		

* 25 kHz channels not available in the US

Availability is subject to individual country law and regulations. All specifications shown are typical unless otherwise stated and are subject to change without notice.

For more information on how to make your business more efficient and better connected, visit www.motorolasolutions.com/mototrbo

Availability is subject to individual country law and regulations.
All specifications shown are typical unless otherwise stated and are subject to change without notice.



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Indoor/Outdoor Cabinet 46"H X 30"D

IOD-46DXC

46"H X 30 1/2"D X 25 3/4"W (19" Racking) **Painted Cream** 220 CFM
115 Volt Fan Kit with Adjustable Thermostat

Standard 2 Sets of 19" Rails





FEATURES

HANDLES - Stainless steel - NEMA

RAILS - Fully adjustable & alodine coated

DOORS - Removable Front and rear secured with three point locks and padlocking handles

VENTS - Front & Rear Doors, Filters Supplied

The **IOD-46DXC** is the superior design in communication cabinets, being as rigid as steel & yet noticeably lighter than the old heavy steel constructed cabinets. This is made possible with our own aluminum recipe called ALUMIFLEX. The **IOD-46DXC** offers the protection needed for any severe outdoor environment. The **IOD-46DXC** is constructed of .125 ALUMIFLEX material. Ultimate security is provided by a three point locking system, which utilizes a NEMA stainless steel padlocking handle. Unlike steel cabinets, the **IOD-46DXC**, made of ALUMIFLEX, will operate without affecting or being effected by RF influences. Outdoor cabinets are becoming the alternative shelter solution for today's complicated zoning requirements. So whether your installing a new shelter or adding room to your existing one, the **IOD-46DXC** is the ultimate solution.

GENERAL

Weights:	132 Lbs. Assembled 180 Lbs. Shipping weight
Doors Removable:	Two - secured by three point locking system Locks via customer supplied padlocks Sealed with 13/16" aluminum filled gaskets
Materials:	.125 ALUMIFLEX Finish: Flat aluminum RF properties: Non-ferrous
Vents:	30 Filtered Louvers per door One removable filter panel per door
Fan Kit Assemble	1 - 110 CFM 115 Volt Fan per Door with Adjustable Thermostat
Handles:	Stainless steel
Exterior Screws:	Stainless with NEMA washers & nylon locking nuts

RACKING SPECIFICATIONS

Rails:	Four standard (For additional rails see accessories) Holes tapped to 10 x 32 threads Each rail supported by three R-STRUTS .125 material (ALUMIFLEX)
Spacing:	19" EIA STANDARD
Positioning:	All rails fully adjustable from front to rear
Useable Height:	46 inches
Useable Depth:	Maximum: 26 3/8 Minimum 25 3/4

REMOVABLE FRONT DOOR OPENING CLEARANCE

Width:	19 1/2 inches
Height:	41 3/4 inches

REMOVABLE BACK DOOR OPENING CLEARANCE

Width:	19 1/2 inches
Height:	36 3/4 inches

EXTERIOR CABINET DIMENSIONS

Main Body:	Width: 25 1/2 inches Height: 46 1/2 inches Depth: 30 inches
Handles:	Protrude 1 7/8 inches

INSIDE CLEARANCE - LESS RAILS

Width:	23 5/8 inches
Height:	46 inches
Depth:	See racking spec's - useable depth chart above

RATINGS

NEMA:	CLASS: 250 TYPE: 4
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WARRANTY

PERIOD:	SEVEN YEARS - UNCONDITIONAL
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ACCESSORIES**ACCESSORIES & CLIMATE CONTROL OPTIONS**

R-2-46:	Two extra 46" rails & mtg. hardware
MTDX:	Mounting tray
CA-4:	Caster Kit (4) & mtg. hardware

SHIPPING INFORMATION

The **IOD-46DXC** is shipped fully assembled, but can be easily knocked down and re-assembled at your site, if desired.

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 12/9/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Approving Buyout License Agreements for 1 Whittier Dr. and 13 Haverford Ln. in the Quaker's Landing Subdivision with the Civic Improvement Association and authorizing the Mayor to execute the agreement

Originating Department: Parks and Recreation

Degree of importance: Significant

As we acquire more and more Buyout Properties, Parks and Recreation has continued to seek out and coordinate license agreements with other entities.

SUMMARY / ORIGINATING CAUSE

This item is on the agenda requesting a new license agreement for the property(s) located at 1 Whittier Drive and 13 Haverford Lane. Both properties are newly acquired by the City and are located in the Quaker's Landing Subdivision.

Similar to buyout lots aquired following Tropical Storm Allison in Quaker's Landing, the Civic Improvement Association (HOA) has aksed to take over maintenance of these lots.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

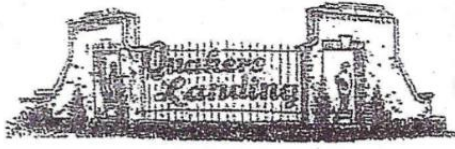
Approved License Agreements helps to relieve the financial and maintenance burden.

RECOMMENDATIONS

Staff recommends that Council approve the license agreement with Quaker's Landing Civic Improvement Association located at P.O. Box 633, and authorize the Mayor to execute the agreement on behalf of the City according to the Open Space Guidelines.

ATTACHMENTS

1. Buyout Lot Licensing Cover Letter_QL
2. Homeowner Questionnaire_QL
3. License Agreement-1 Whitter Dr and 13 Haverford Lane
4. FWD GIS Mapping- 13 Haverford Ln & 1 Whitter Dr



QUAKERS LANDING CIVIC IMPROVEMENT ASSOCIATION

P.O. Box 633 Friendswood, Texas 77549-0633

November 15, 2020

Ms. Kimberly Ramirez
Assistant to Director of Parks & Recreation
910 S. Friendswood Dr.
Friendswood, TX 77546

Dear Ms. Ramirez,

On behalf of the Quakers Landing Civic Improvement Association Board of Directors, I have enclosed an application to lease two lots under the City of Friendswood's Buyout Lot Licensing Program.

The lots concerned, located at 1 Whitter Drive and 13 Haverford Lane, are located within the Quakers Landing neighborhood. Quakers Landing currently maintains several other neighborhood lots under this program. The Board appreciates the benefits this program provides to the residents of Quakers Landing, and looks forward to renewing its current leases in the future.

If you have any questions about our application, please do not hesitate to contact us at QuakersLanding.Board@gmail.com.

Respectfully,

James Purcell
QLCIA President, 2020

November 15, 2020

Re. City of Friendswood Open Space Licensing Program

Dear,

On June 22, 2004, the City of Friendswood received formal notification from the Governor's Division of Emergency Management that our Tropical Storm Allison Buyout Project is now closed. As you know, we had been anxiously awaiting this formal notification in order to proceed with our Open Space Licensing Program.

In order to provide the most appropriate use for each of the 136 lots obtained in the Buyout Project, our Open Space Committee identified the following priorities:

1. Galveston County Consolidated Drainage District *(Complete)*
2. City of Friendswood Parks and Recreation Department *(Complete)*
3. Homeowners Associations *(Complete)*
4. **Homeowners (Available)**

At this time, we would like to request that you please review the enclosed information and determine if you are interested in pursuing this unique opportunity.

Specific items to note include:

- There is no direct fee associated with this Licensing Program; therefore, it is not considered a "Lease".
- The Homeowner agrees to maintain the lots to the City and HOA standards.
- The Homeowner agrees to pay any HOA dues corresponding to the Buyout lots.
- The Homeowner would be able to use the Buyout lots for open space, green space, common parks, common garden areas, etc. with the stipulation that no structures, impervious cover, or fencing be placed on the lots.

This is just a brief summary, so please refer to the actual Agreement for further details. Once you have made a decision on which lot(s) you would like included within your Licensing Agreement, please let me know by completing the attached questionnaire, so that we can draft the final documents for signature.

In order to expedite the final phase of this Program, I am requesting a response from all potential licensors of these lots within the next 30 days.

We look forward to working with you to ensure that the remaining Buyout lots are maintained in the most effective and efficient manner. If you have any questions, please do not hesitate to call 281-996-3220.

City of Friendswood
Buyout Lot Licensing Program
Adjacent Homeowner's Questionnaire

Name(s): Quakers Landing Civic Improvement Association (HOA)

Address: PO Box 633, Friendswood, Texas 77549

Phone: 281-309-2386 or 337-397-2525

Email: quakerslanding.board@gmail.com

I have lived at this address since*: HOA was incorporated approximately 1968.

* In the event that more than one homeowner expresses interest in the same property, priority will be given to the one who has lived at their current address the longest.

I am interested in licensing the following lot(s): Lots located at 1 Whittier Dr & 13 Haverford Ln, in Friendswood, Texas, within the Quakers Landing neighborhood.

I am NOT interested in licensing any of the Buyout Lot properties. _____

Please return this form within the next 30 days to:
City of Friendswood
Parks and Recreation Department
910 S. Friendswood
Friendswood, TX 77546

LICENSE AGREEMENT

THE STATE OF TEXAS §
 § KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF GALVESTON §

This License Agreement is made and entered into this 11th day of January, 2021, by and between the City of Friendswood, Texas, a municipal corporation located in Galveston and Harris Counties, Texas, having its City Hall located at 910 South Friendswood Drive, Friendswood, Texas, hereinafter referred to as "Licensor," and Quakers Landing Civic Improvement Association, Inc. (QLCIA), being located at, P.O. Box 633 Friendswood, Texas 77549-0633, QLCIA President, hereinafter referred to as "Licensee."

W I T N E S S E T H:

1. **Premises:** Licensor hereby grants to Licensee the right, privilege, and license to use the following described property located in Galveston County, Texas, hereinafter referred to as the "Premises," and being more particularly described as follows:

**1Whitter Drive and 13 Haverford Lane
Friendswood, TX 77546**

SEE EXHIBIT "A"

2. **Use:** The License granted hereby to Licensee shall and does authorize Licensee to use and occupy the Premises nonexclusively for the purpose of maintaining and using as open space, in accordance with the Licensor's open space use guidelines. Licensee is authorized to construct such improvements, and only those improvements, as may be consented to in writing by Licensor's Floodplain Manager. Licensee covenants not to use the Premises in any manner that would preclude Licensor's future use of any portion of the Premises or easement thereon consistent with the Licensor's open space guidelines. Licensor hereby reserves the right to use the Premises in the future for utilities, parks, or any other use consistent with Licensor's open space guidelines.

3. **Term:** The term of this License shall be for a period of ten (10) years, commencing on January 11, 2021 and terminating at midnight, January 11, 2031. This ten (10) year term is renewable by Licensee for one (1) additional ten (10) year term by written notice provided by Licensee to Licensor a minimum of thirty (30) days prior to the termination date of this License Agreement.

4. **Consideration:** In consideration for the License granted hereby, Licensee shall pay to the respective Home Owner's Association all Home Owners' Association fees and dues associated with the Premises each year for the term of this License Agreement (hereinafter "License Fees"). Licensee shall also maintain the Premises in accordance with all applicable ordinances of

the City of Friendswood, policies of the respective Home Owner's Association, and any applicable restrictive covenants covering the Premises.

5. **Access:** Licensee is hereby given and granted the right of ingress and egress over and across the Premises for such purposes as may be needed in conjunction with the rights granted in this License Agreement. Such right of ingress and egress shall be over existing roads, parking lots, or other roads that may be established by Licensee hereafter, subject to the prior written approval of Licensor's Flood Plain Manager. Licensee, subject to approval by Licensor's Flood Plain Manager, which approval shall not be unreasonably withheld, may improve any lands of Licensor in keeping with the purposes of the open space of the Premises.

6. **Utilities at Licensee's Cost:** Licensee shall be solely responsible for and promptly pay any and all charges for gas, electricity, telephone service, or any other utility used or consumed by Licensee on the Premises. Licensee may have an electrical current meter installed on the Premises, and Licensee thereof shall pay for the cost of such meter and of installation, maintenance, and repair.

7. **Holding Over:** If Licensee should continue occupancy of the Premises after the expiration of the primary term or any extension of this License, without the exercise of an option or the execution by Licensor and Licensee of a new License Agreement, then Licensee shall be deemed to be occupying the Premises as a licensee-at-sufferance on a month-to-month basis, subject to all the covenants and obligations of this License Agreement.

8. **Notice:** Any notice required hereunder shall be given in writing and shall be delivered by hand or sent by United States Registered or Certified Mail, postage prepaid addressed as follows:

If to Licensor:

City Friendswood, Texas
910 South Friendswood Drive
Friendswood, Texas 77546
Attention: City Manager

If to Licensee:

Quakers Landing Civic Improvement
Association, Inc. (QLCIA)
P.O. Box 633
Friendswood, TX 77549-0633
Attention: QLCIA President

Either party hereto may change its address to which said notice shall be delivered or mailed by giving notice of such change as provided above. Notice shall be deemed given when delivered (if delivered by hand) or when postmarked (if sent properly by mail).

9. **Liability and Indemnity:** Licensee agrees to indemnify and save Licensor harmless from and against any and all claims (including costs and expenses of defending against such claims)

arising or alleged to arise from any negligence, gross negligence, or wrongful act of whatsoever nature, of Licensee or Licensee's agents, employees, or contractors occurring or in anywise incident to, in connection with, or arising directly or indirectly out of this License Agreement. Licensee agrees to use and occupy the Premises at its own risk and hereby releases Licensor, its officers, agents and employees, from all claims for any damage or injury caused by or as a result of any negligence or wrongful act or omission of Licensee, its officers, agents, employees, or contractors, unless due to the negligence, gross negligence, or wrongful act of whatsoever nature of Licensor, its agents or employees.

10. **Termination:** Either party hereto shall have the right to terminate this License at any time upon providing the other party thirty (30) days advance written notice. Upon notice of termination by either party, Licensee shall return the Premises to the condition of the Premises at the time of the execution of this License Agreement, normal wear and tear excepted.

11. **Defaults and Remedies:** Notwithstanding any other provision contained in this License Agreement to the contrary, Licensee shall not be in default under this License until:

A. In the case of a failure to pay License Fees or other sums due under this License, fifteen (15) days after receipt of written notice thereof from Licensor; or

B. In the case of any other default, thirty (30) days after receipt of written notice thereof from Licensor; provided, however, where any such default cannot reasonably be cured within thirty (30) days, Licensee shall not be deemed to be in default under the License if Licensee commences to cure such default within said thirty (30) day period and thereafter diligently pursues such cure to completion.

In the event of Licensee's default in the payment of License Fees or Licensee's failure to comply with any other material provision of this License, Licensor may, at its option, terminate this License without affecting its right to sue for all past due License Fees, and any other damages to which Licensor may be entitled. Should Licensor be entitled to collect License Fees or damages and be forced to do so through its attorney, or by other legal procedures, Licensor shall, upon receipt of a favorable ruling, be entitled to its reasonable costs and attorney fees thereby incurred, upon said collection.

12. **Taxes:** Licensee shall pay annually an amount equal to any increase in ad valorem taxes that may be attributable to any improvement to the Premises made by Licensee. If Licensor pays such tax, Licensee shall reimburse Licensor for the amount of any such tax payment within sixty (60) days of the receipt of sufficient documentation indicating the amount paid and the calculation of Licensee's pro-rata share. Upon written request by Licensee, Licensor shall furnish evidence of payment of all taxes.

13. **Improvements:** Licensee covenants and agrees that it will not construct, erect, or place any improvements on the Premises or other real property owned by Licensor without the prior written consent of the Licensor.

14. **Assignment:** Licensee shall not assign (by sublease or other means) any rights granted it under this License Agreement without the prior written consent of Licensors Floodplain Manager, which consent shall not be unreasonably withheld.

15. **Other Conditions:**

A. Whenever under the License the consent or approval of either party is required or a determination must be made by either party, no such consent or approval shall be unreasonably withheld or delayed, and all such determinations shall be made on a reasonable basis and in a reasonable manner. Provided, however, nothing contained herein shall be construed to limit or restrict the exercise of Licensors legislative authority, specifically, but not limited to, matters relating to building, zoning, and other land development regulatory matters.

B. Licensors covenants that Licensee shall, upon the payment of License Fees and observation of covenants and conditions herein, possess the right, title, and license to use the Premises during the License Term or as may be extended without hindrance, ejection, or molestation by Licensors, or by any person claiming under Licensors or any other licensee of Licensors.

C. In the event that any government or public body shall take all or such part of the Premises thereby making it physically or financially infeasible for the Premises to be used in the manner it was intended to be used by this Agreement, Licensee shall have the right to terminate this License effective as of the date of the taking by the condemning party and the License Fees shall be prorated appropriately. However, if only a portion of the Premises is taken, and Licensee does not elect to terminate this License under this provision, then License Fees provided under this License shall be abated proportionately as to the portion taken which is not then usable by Licensee and this License shall continue.

D. Licensee shall not use the Premises in any way which interferes with the use of the surrounding Licensors property by Licensors, or lessees or licensees of Licensors, with rights in the Premises prior in time to Licensees (subject to Licensees rights under this License Agreement, including, without limitation, non-interference). Similarly, Licensors shall not use, nor shall Licensors permit its lessees, licensees, employees, invitees or agents to use, any portion of the Premises in any way, which interferes with the operations of Licensee. Such interference shall be deemed a material breach by the interfering party, who shall, upon written notice from the other, be responsible for terminating said interference. In the event such interference does not cease promptly, the parties acknowledge that continuing interference may cause irreparable injury and, therefore, the injured party shall have the right, in addition to any other rights it may have at law or in equity, to bring a court action to enjoin such interference or to terminate this License immediately upon written notice.

16. **Severability and Substitution of Valid Provisions:** In the event that any provision of this Agreement shall be found to be void or unenforceable, such finding shall not be construed to render any other provision of this License either void or unenforceable, and all other provisions shall remain in full force and effect unless the provisions which are invalid or unenforceable shall

substantially affect the rights or obligations granted to or undertaken by either party.

17. **Entire Agreement and Binding Effect:** This License and any attached exhibits signed or initialed by the parties constitute the entire agreement between Licensor and Licensee; no prior written nor prior, contemporaneous, or subsequent oral promises or representations shall be binding. This License shall not be amended, or changed except by written instrument signed by both parties hereto. Paragraph captions herein are for convenience only, and neither limit nor amplify the provisions of this instrument. The provisions of this License shall be binding upon and inure to the benefit of the heirs, executors, administrators, successors, and assigns of the parties.

IN WITNESS WHEREOF, Licensor and Licensee have executed this License Agreement as of the date and year first above written.

LICENSOR:

CITY OF FRIENDSWOOD, TEXAS

By:

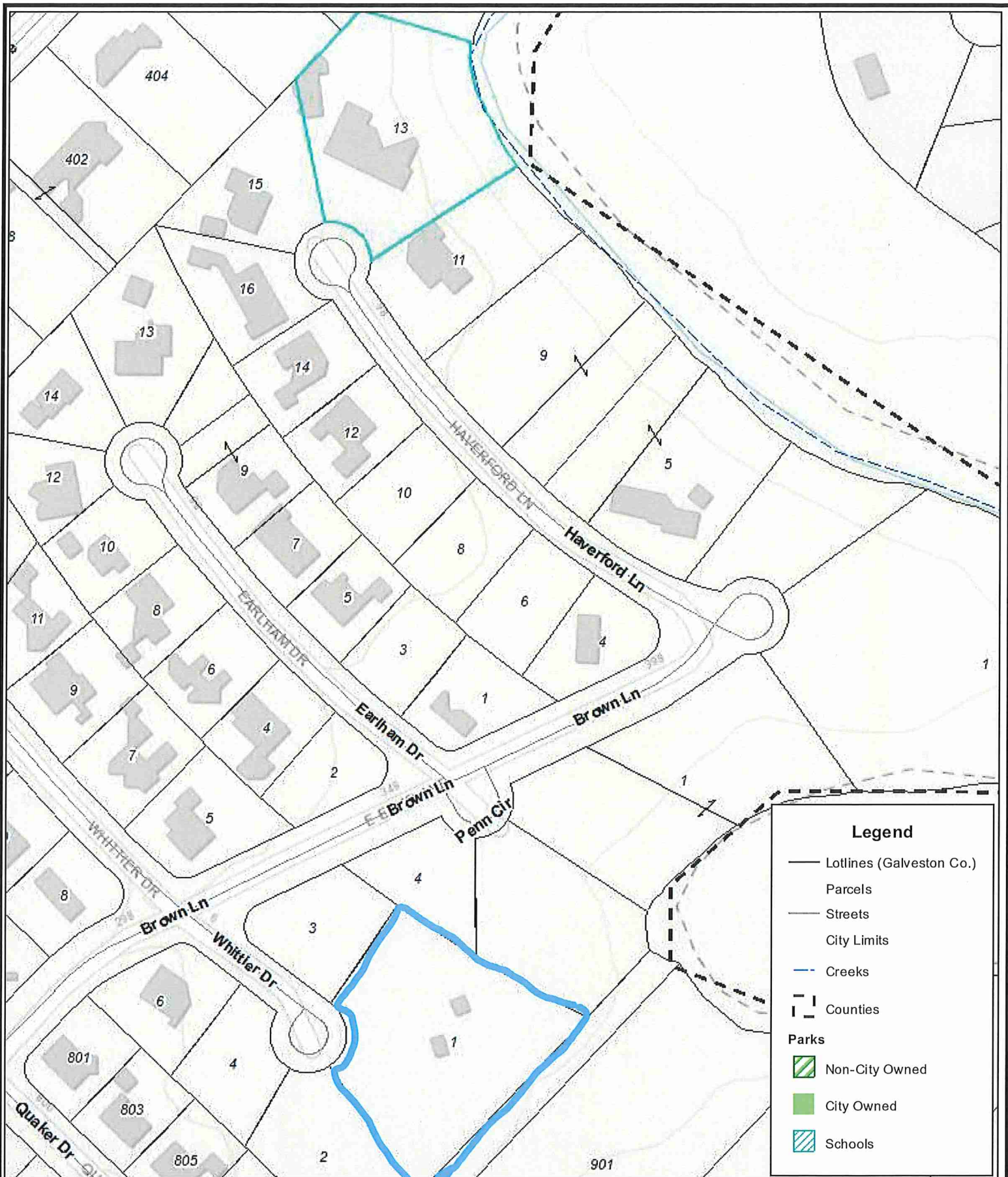
Mike Foreman
Mayor

Attested:

Melinda Welsh
City Secretary

LICENSEE:

By:



Disclaimer: This product is for informational purposes and may not have been prepared for use as suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. Gov. C. §2501.102. The user is encouraged to independently verify all information contained in this product. The City of Friendswood makes no representation or warranty as to the accuracy of this product or to its fitness for a particular purpose. The user: (1) accepts the product AS IS, WITH ALL FAULTS; (2) assumes all responsibility for the use thereof; and (3) releases the City of Friendswood from any damage, loss, or liability arising from such use.



City of Friendswood
 910 South Friendswood Drive
 Friendswood, Texas 77546
 (281) 996-3200
www.ci.friendswood.tx.us

Friendswood GIS Mapping



PUBLIC SIDEWALK EASEMENT

THE STATE OF TEXAS	§	
	§	KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF GALVESTON	§	

THAT _____ ("Grantor"), for and in consideration of the sum of One Dollar (\$1.00) and other good and valuable consideration in hand paid to Grantor by the City of Friendswood, Texas, a home rule municipal corporation of the State of Texas ("Grantee"), the receipt and sufficiency of which is hereby acknowledged and confessed, has GRANTED, SOLD, and CONVEYED, and by these presents does hereby GRANT, SELL, and CONVEY unto the said Grantee, its successors, assigns and legal representatives, a perpetual easement for the purpose of constructing, reconstructing, altering, and maintaining a sidewalk in, on, upon, over, along and across those certain tracts or parcels of land, (hereinafter the "Easement), shown in EXHIBIT "A" attached hereto and made a part hereof for all purposes.

Grantee may do and perform all acts necessary to construct, reconstruct, repair, or maintain the sidewalk within said Easement and to operate thereon all necessary machinery and equipment to efficiently prosecute the work. Grantor retains, reserves, and shall continue to enjoy the use of the surface of the easement property for any and all purposes which do not interfere with or prevent the use by Grantee of the Easement for the purposes stated herein and Grantee has the right to remove from said Easement obstructions which endanger or may interfere with the efficiency of said sidewalk; and the right of exercising all other rights hereby granted.

This conveyance is expressly made subject to any and all restrictions, mineral and/or royalty reservations, covenants, and easements appearing of record relative to the Easement, but only to the extent that the same are still in force and effect and enforceable against the same.

TO HAVE AND TO HOLD the above described Easement, together with all and singular the rights and appurtenances thereto in any wise belonging unto the said Grantee, its successors and

assigns forever, and Grantor binds itself, its successors and assigns, to warrant and forever defend all and singular the said easement unto Grantee and Grantee's successors and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof, except as to the reservations from and exceptions to conveyance and warranty, when the claim is by, through, or under Grantor, but not otherwise

WITNESS MY HAND, this ____ day of _____, 20__.

FOR GRANTOR:

Printed Name: _____

Printed Title: _____

ACKNOWLEDGEMENT

STATE OF TEXAS }
 }
COUNTY OF GALVESTON } KNOW ALL MEN BY THESE PRESENTS

BEFORE ME, a notary public, on this day personally appeared _____, known to me or having proved to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me the he/she executed the same for the purposes and considerations therein expressed.

GIVEN MY hand and seal of office this ____ day of _____, 20__.

Notary Public in and for the State of Texas

My Commission Expires: _____

ACCEPTED BY GRANTEE:

ATTEST:

Morad Kabiri
City Manager

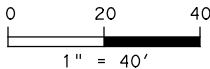
Melinda Welsh, TRMC
City Secretary

Return to Grantee at:
City of Friendswood
Engineering Department
15355 Blackhawk Boulevard
Friendswood, TX 77546

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- LEGEND
- TEMPORARY CONSTRUCTION LICENSE
 - SIDEWALK EASEMENT
 - EXISTING RIGHT OF WAY



THESE DOCUMENTS ARE FOR
INTERIM REVIEW AND NOT
FOR CONSTRUCTION, BIDDING
OR PERMIT PURPOSES.

RESPONSIBLE ENGINEER:
HDR ENGINEERING, INC.
TBPE FIRM REGISTRATION NO F-9073
EDWIN R. RYDELL, P.E.
TEXAS REGISTRATION NO. 81553

JUNE 2020

NO.	DATE	REVISION	APPROVED
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HDR
Firm Registration No. F-754
4828 Loop Central Drive, Suite 800
Houston, Texas 77081-2220
713.622.9264



Texas Department of Transportation

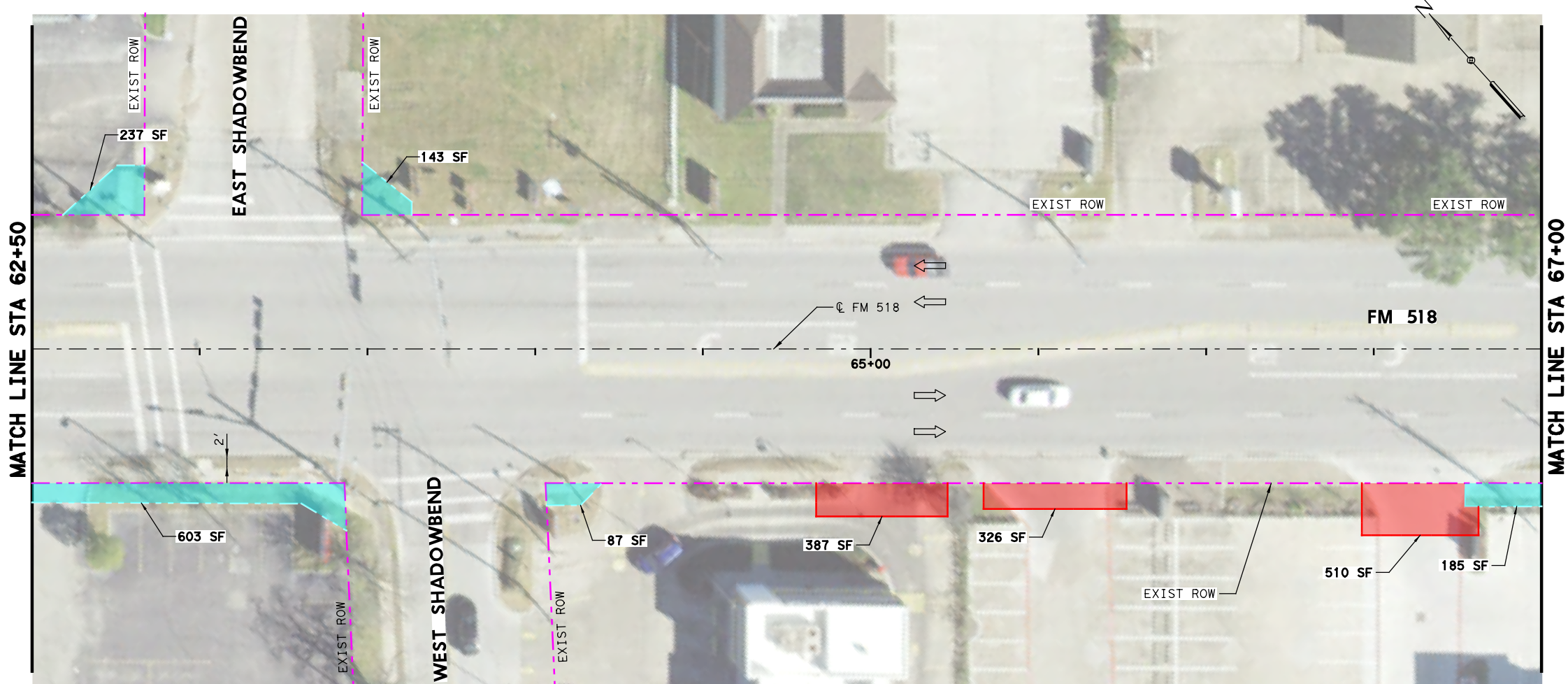
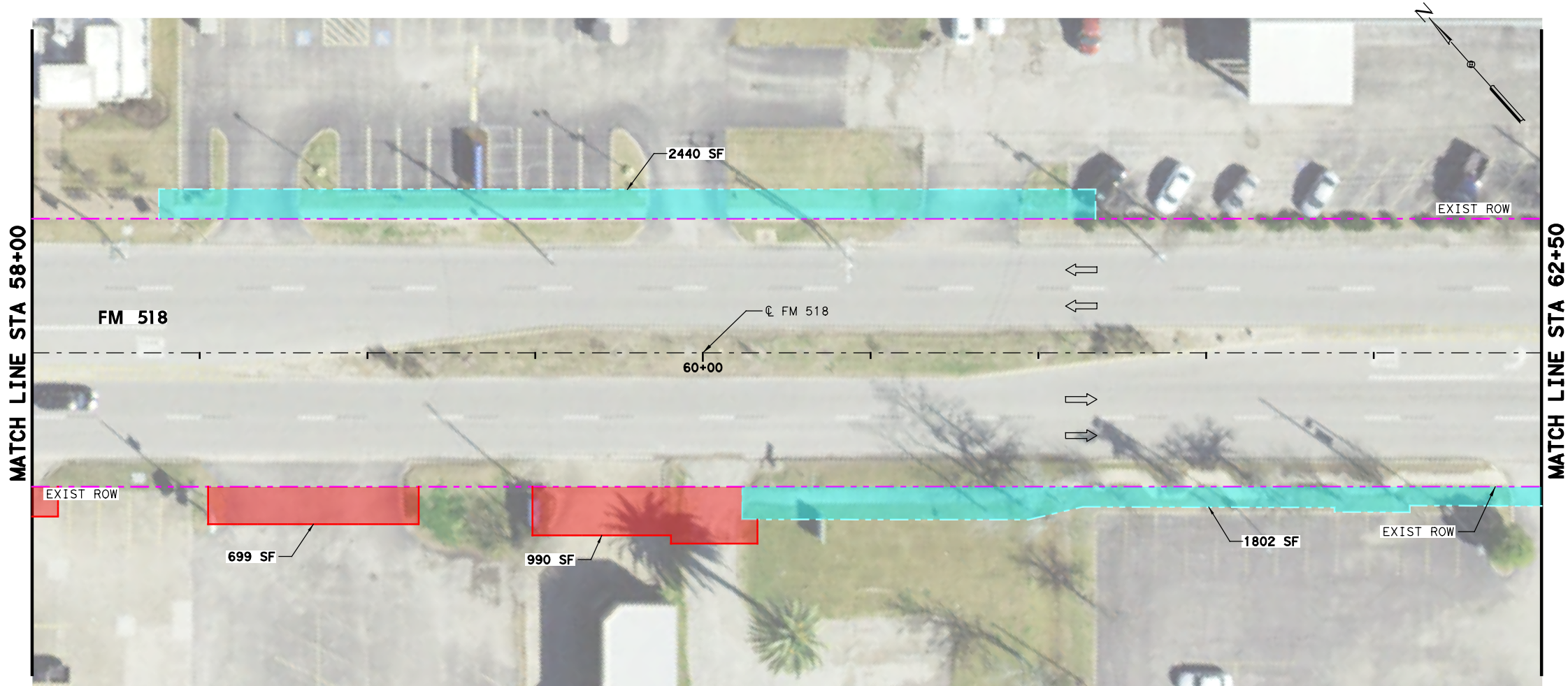
**FM 518
SIDEWALK EASEMENTS AND
TEMP CONST LICENSE EXHIBITS
(BEGIN TO STA 58+00)**

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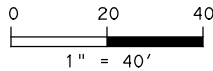
SHEET 1 OF 9

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
MHS	6			FM 518
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
BKT	TEXAS	HOU	GALVESTON	
CHECK	CONTROL	SECTION	JOB	
ERR	0976	03	111	
MHS				

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FILE: 20-009_R-ESMT02



- LEGEND
- TEMPORARY CONSTRUCTION LICENSE
 - SIDEWALK EASEMENT
 - EXISTING RIGHT OF WAY



THESE DOCUMENTS ARE FOR
INTERIM REVIEW AND NOT
FOR CONSTRUCTION, BIDDING
OR PERMIT PURPOSES.

RESPONSIBLE ENGINEER:
LAMB-STAR ENGINEERING, LLC
TBPE FIRM REGISTRATION NO F-9073
COOPER LIEBAU, P.E.
TEXAS REGISTRATION NO. 118391

MAY 2020

NO.	DATE	REVISION	APPROVED
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HDR
Firm Registration No. F-754
4828 Loop Central Drive, Suite 800
Houston, Texas 77081-2220
713.622.9264



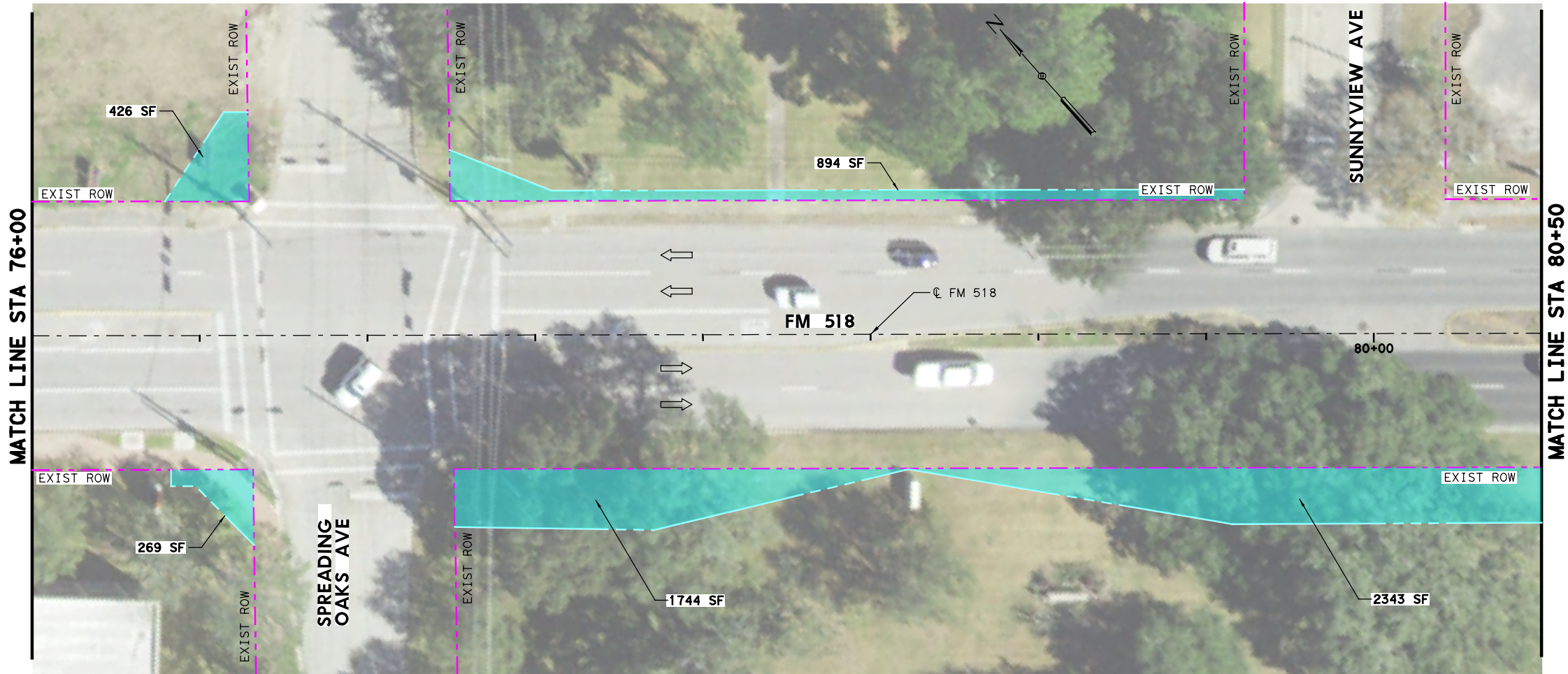
Texas Department of Transportation

**FM 518
SIDEWALK EASEMENTS AND
TEMP CONST LICENSE EXHIBITS
(STA 58+00 TO STA 67+00)**

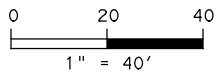
SCALE: 1"=40' SHEET 2 OF 9

DESIGN MHS	FED. RD. DIV. NO. 6	PROJECT NO.		HIGHWAY NO. FM 518
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CHECK MHS	CONTROL	SECTION	JOB	
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- LEGEND
- TEMPORARY CONSTRUCTION LICENSE
 - SIDEWALK EASEMENT
 - EXISTING RIGHT OF WAY



THESE DOCUMENTS ARE FOR
INTERIM REVIEW AND NOT
FOR CONSTRUCTION, BIDDING
OR PERMIT PURPOSES.

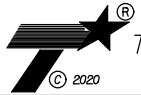
RESPONSIBLE ENGINEER:
HDR ENGINEERING, INC.
TBPE FIRM REGISTRATION NO F-9073
EDWIN R. RYDELL, P.E.
TEXAS REGISTRATION NO. 81553

JUNE 2020

NO.	DATE	REVISION	APPROVED
-----	------	----------	----------



HDR
Firm Registration No. F-754
4828 Loop Central Drive, Suite 800
Houston, Texas 77081-2220
713.622.9264



Texas Department of Transportation

**FM 518
SIDEWALK EASEMENTS AND
TEMP CONST LICENSE EXHIBITS
(BEGIN TO STA 58+00)**

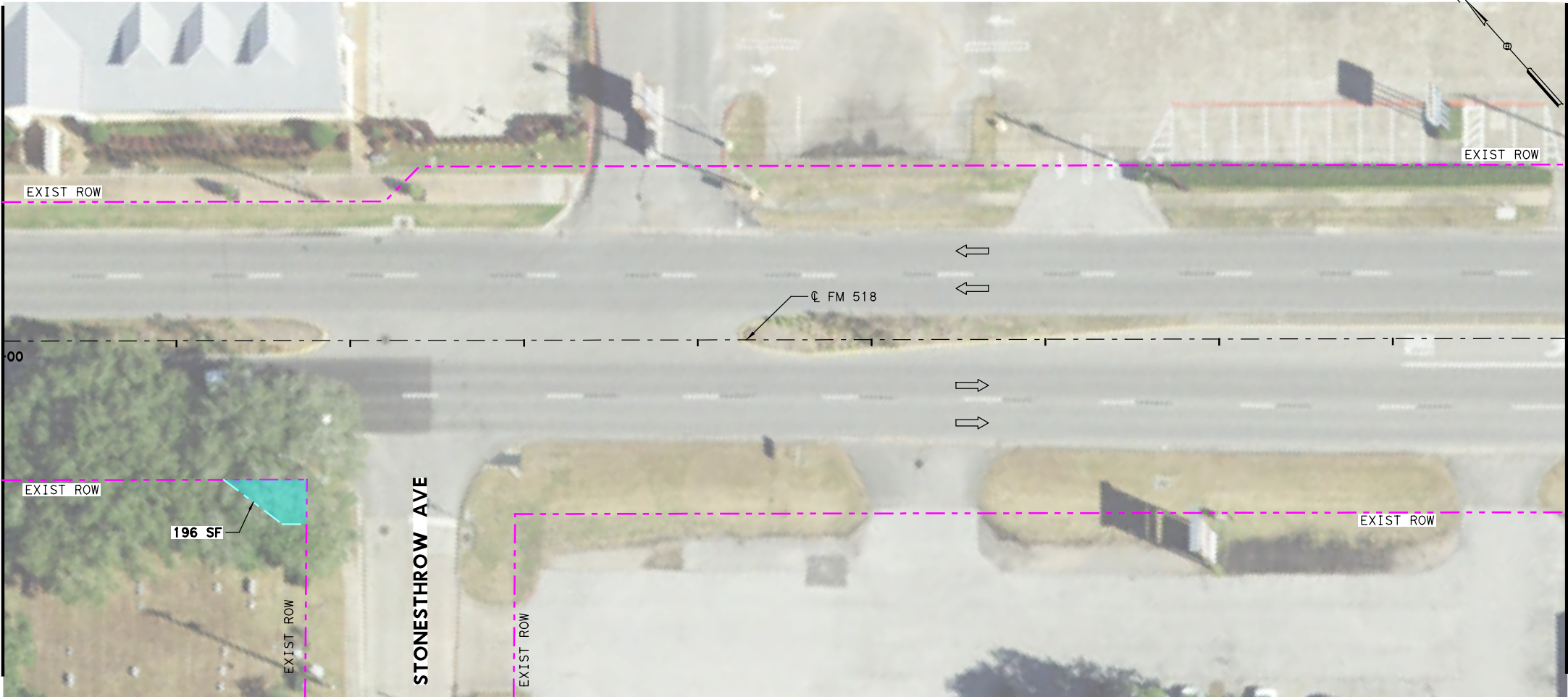
SCALE: 1"=40'

SHEET 4 OF 9

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
MHS	6			FM 518
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
BKT	TEXAS	HOU	GALVESTON	
CHECK	CONTROL	SECTION	JOB	
ERR	0976	03	111	
CHECK				
MHS				

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FILE: 20-009-R-ESMT05

MATCH LINE STA 85+00



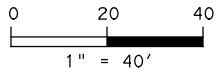
MATCH LINE STA 89+50

MATCH LINE STA 89+50



MATCH LINE STA 94+00

- LEGEND
- TEMPORARY CONSTRUCTION LICENSE
 - SIDEWALK EASEMENT
 - EXISTING RIGHT OF WAY



THESE DOCUMENTS ARE FOR
INTERIM REVIEW AND NOT
FOR CONSTRUCTION, BIDDING
OR PERMIT PURPOSES.

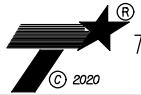
RESPONSIBLE ENGINEER:
LAMB-STAR ENGINEERING, LLC
TBPE FIRM REGISTRATION NO F-9073
COOPER LIEBAU, P.E.
TEXAS REGISTRATION NO.118391

MAY 2020

NO.	DATE	REVISION	APPROVED
-----	------	----------	----------

HDR

HDR
Firm Registration No. F-754
4828 Loop Central Drive, Suite 800
Houston, Texas 77081-2220
713.622.9264



Texas Department of Transportation

**FM 518
SIDEWALK EASEMENTS AND
TEMP CONST LICENSE EXHIBITS
(STA 85+00 TO STA 94+00)**

SCALE: 1"=40'

SHEET 5 OF 9

DESIGN MHS	FED. RD. DIV. NO. 6	PROJECT NO.		HIGHWAY NO. FM 518
GRAPHICS BKT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK ERR	TEXAS	HOU	GALVESTON	
CHECK MHS	CONTROL	SECTION	JOB	
	0976	03	111	

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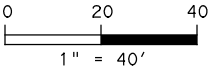
MATCH LINE STA 98+50

MATCH LINE STA 98+50



MATCH LINE STA 103+00

- LEGEND
- TEMPORARY CONSTRUCTION LICENSE
 - SIDEWALK EASEMENT
 - EXISTING RIGHT OF WAY



THESE DOCUMENTS ARE FOR
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OR PERMIT PURPOSES.

RESPONSIBLE ENGINEER:
LAMB-STAR ENGINEERING, LLC
TBPB FIRM REGISTRATION NO F-9073
COOPER LIEBAU, P.E.
TEXAS REGISTRATION NO.118391

MAY 2020

NO.	DATE	REVISION	APPROVED
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HDR

HDR
Firm Registration No. F-754
4828 Loop Central Drive, Suite 800
Houston, Texas 77081-2220
713.622.9264



Texas Department of Transportation

FM 518
SIDEWALK EASEMENTS AND
TEMP CONST LICENSE EXHIBITS
(STA 94+00 TO STA 103+00)

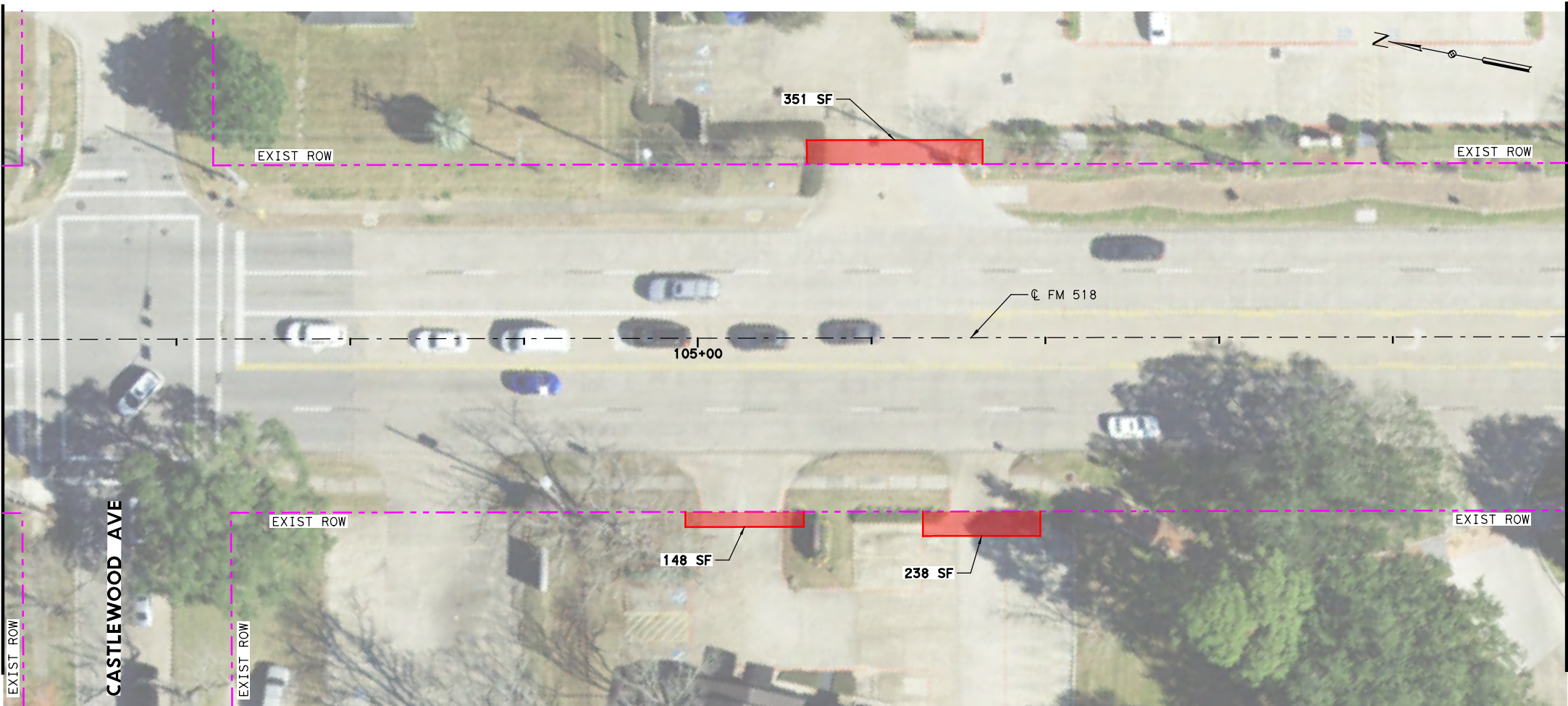
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SHEET 6 OF 9

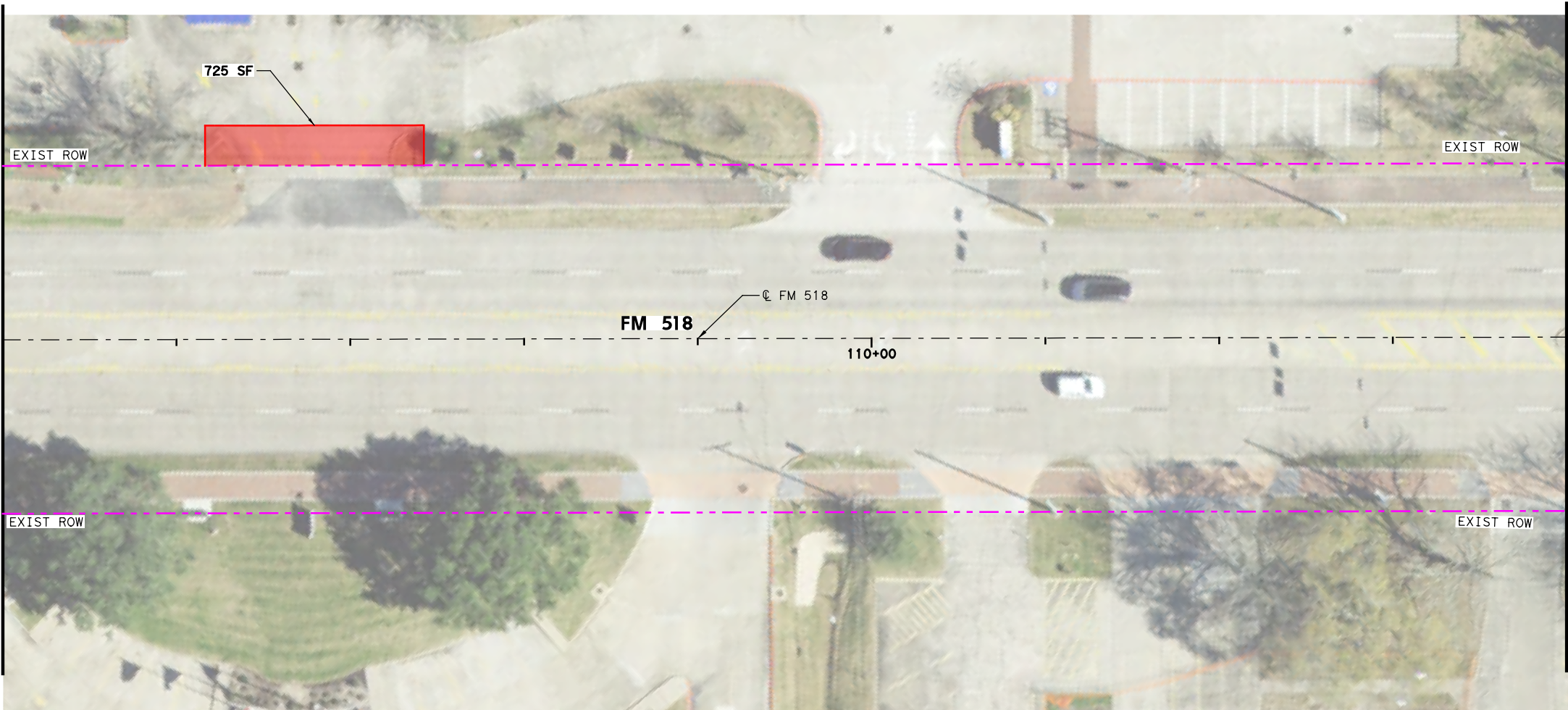
DESIGN MHS	FED. RD. DIV. NO. 6	PROJECT NO.		HIGHWAY NO. FM 518
GRAPHICS BKT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK ERR	TEXAS	HOU	GALVESTON	
CHECK MHS	CONTROL	SECTION	JOB	
	0976	03	111	

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MATCH LINE STA 103+00



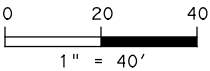
MATCH LINE STA 108+50



MATCH LINE STA 108+50

MATCH LINE STA 112+00

- LEGEND
- TEMPORARY CONSTRUCTION LICENSE
 - SIDEWALK EASEMENT
 - EXISTING RIGHT OF WAY



THESE DOCUMENTS ARE FOR
INTERIM REVIEW AND NOT
FOR CONSTRUCTION, BIDDING
OR PERMIT PURPOSES.

RESPONSIBLE ENGINEER:
LAMB-STAR ENGINEERING, LLC
TBPE FIRM REGISTRATION NO F-9073
COOPER LIEBAU, P.E.
TEXAS REGISTRATION NO.118391

MAY 2020

NO.	DATE	REVISION	APPROVED
-----	------	----------	----------

HDR

HDR
Firm Registration No. F-754
4828 Loop Central Drive, Suite 800
Houston, Texas 77081-2220
713.622.9264



Texas Department of Transportation

FM 518
SIDEWALK EASEMENTS AND
TEMP CONST LICENSE EXHIBITS
(STA 103+00 TO 112+00)

SCALE: 1"=40'

SHEET 7 OF 9

DESIGN MHS	FED. RD. DIV. NO. 6	PROJECT NO.		HIGHWAY NO. FM 518
GRAPHICS BKT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK ERR	TEXAS	HOU	GALVESTON	
CHECK MHS	CONTROL	SECTION	JOB	
	0976	03	111	

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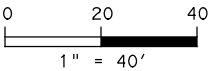


LEGEND

TEMPORARY CONSTRUCTION LICENSE

SIDEWALK EASEMENT

EXISTING RIGHT OF WAY



THESE DOCUMENTS ARE FOR
INTERIM REVIEW AND NOT
FOR CONSTRUCTION, BIDDING
OR PERMIT PURPOSES.

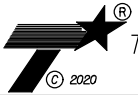
RESPONSIBLE ENGINEER:
LAMB-STAR ENGINEERING, LLC
TBPE FIRM REGISTRATION NO F-9073
COOPER LIEBAU, P.E.
TEXAS REGISTRATION NO.118391

MAY 2020

NO.	DATE	REVISION	APPROVED
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HDR
Firm Registration No. F-754
4828 Loop Central Drive, Suite 800
Houston, Texas 77081-2220
713.622.9264



Texas Department of Transportation

FM 518
SIDEWALK EASEMENTS AND
TEMP CONST LICENSE EXHIBITS
(STA 112+00 TO 120+00)

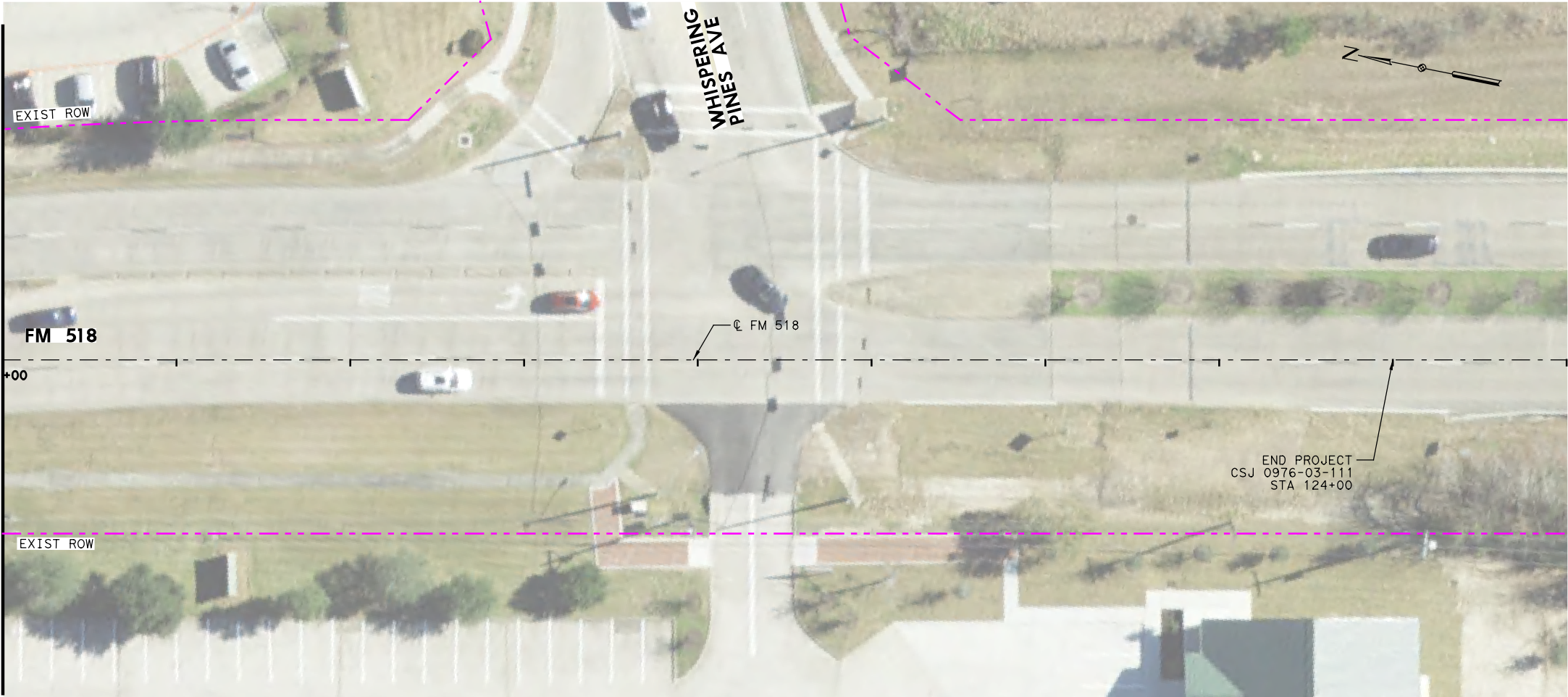
SCALE: 1"=40'

SHEET 8 OF 9

DESIGN MHS	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS BKT	6			FM 518
CHECK ERR	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK MHS	TEXAS	HOU	GALVESTON	
	CONTROL	SECTION	JOB	
	0976	03	111	

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FILE: 20-009_R-ESMT09

MATCH LINE STA 120+00

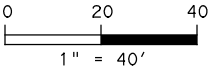


LEGEND

TEMPORARY CONSTRUCTION LICENSE

SIDEWALK EASEMENT

EXISTING RIGHT OF WAY



THESE DOCUMENTS ARE FOR
INTERIM REVIEW AND NOT
FOR CONSTRUCTION, BIDDING
OR PERMIT PURPOSES.

RESPONSIBLE ENGINEER:
LAMB-STAR ENGINEERING, LLC
TBPE FIRM REGISTRATION NO F-9073
COOPER LIEBAU, P.E.
TEXAS REGISTRATION NO.118391

MAY 2020

NO.	DATE	REVISION	APPROVED
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HDR
Firm Registration No. F-754
4828 Loop Central Drive, Suite 800
Houston, Texas 77081-2220
713.622.9264



Texas Department of Transportation

FM 518
SIDEWALK EASEMENTS AND
TEMP CONST LICENSE EXHIBITS
(STA 112+00 TO 120+00)

SCALE: 1"=40'

SHEET 9 OF 9

DESIGN MHS	FED. RD. DIV. NO. 6	PROJECT NO.		HIGHWAY NO. FM 518
GRAPHICS BKT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK ERR	TEXAS	HOU	GALVESTON	
CHECK MHS	CONTROL	SECTION	JOB	
	0976	03	111	

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 1/6/2021

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Approving the ratification of the City Manager's signature on closing and purchase documents associated with the acquisition of property located at 15355 Blackhawk Blvd (the old Food Lion Building)

Originating Department: City Manager

Degree of importance: Critical

SUMMARY / ORIGINATING CAUSE

As Council is aware, the City's Deepwood Facility was severely damaged by Hurricane Harvey. The storm devastated our Public Works, Parks, and ancillary storage facilities rendering them uninhabitable.

In late 2017 and early 2018, the City worked with representatives of FEMA to solicit suitable replacement facilities to temporarily house displaced staff and equipment. The owner of the old Food Lion (15355 Blackhawk Blvd) responded to the City's RFP, and subsequently signed a lease agreement with an option to purchase upon finalization of projects with FEMA and the State.

Thankfully, after an extended delay awaiting FEMA and CDBG-Harris County approvals, the City has been authorized to purchase and close the property. The new facility will house our Public Works, Engineering, and Parks/Facility staff and their equipment. Additionally, the facility will provide for emergency shelter for folks displaced in future storms and/or events.

Funding for the purchase is provided by: (1) insurance claim proceeds; (2) FEMA dollars; (3) CDBG-Harris County dollars; (4) a portion of previous lease payments; and (5) the City's General Fund Balance/Water & Sewer Working Capital.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Acquisition of the old Food Lion facility gives the City a presence on both sides of Clear Creek, allowing us to better serve our citizens under normal circumstances; even more so during emergency events.

RECOMMENDATIONS

Ratify the City Manager's signature on closing and purchase documents associated with the acquisition of the old Food Lion building/property (15355 Blackhawk Blvd).

ATTACHMENTS

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: January 11, 2021

Date submitted: 11/3/2020

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Accepting the November 2020 Tax Report

Originating Department: City Manager

Degree of importance: Choose an Option

SUMMARY / ORIGINATING CAUSE

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

1. Gal Co Nov 2020



Cheryl E. Johnson, PCC
Assessor and Collector of Taxes
County of Galveston
722 Moody Avenue, Galveston, Texas 77550
Toll Free (877) 766-2284 Fax: (409) 766-2479
Email: galcotax@co.galveston.tx.us



December 8, 2020

The Governmental Entities of the Galveston County Tax Assessor/Collector's Office:

I, Cheryl E. Johnson, Tax Assessor and Collector of the County of Galveston do solemnly swear that this statement of collections made by me and the disposition thereof during the month of November, 2020 is true and correct.

Under my hand and seal this 8th day of December, 2020.

Cheryl E. Johnson, PCC
Galveston County Tax Assessor/Collector

cc: Randall Rice, County Auditor
Linebarger, Goggan, Blair, & Simpson
Perdue, Brandon, Fielder, Collins, & Mott
Assessment & Collection Partners:

City of Bayou Vista
City of Clear Lake Shores (delinquent)
City of Dickinson
City of Friendswood
City of Galveston
City of Hitchcock
City of Jamaica Beach
City of Kemah
City La Marque
City of League City
City of Santa Fe
City of Texas City
City of Tiki Island
Dickinson Independent School District
Galveston Independent School District
High Island Independent School District
Hitchcock Independent School District
College of the Mainland

Galveston Community College
GC Drainage District No. 1
GC Drainage District No. 2
GC Emergency Services Dist. No. 1
GC Emergency Services Dist. No. 2
GC Fresh Water Supply Dist. No. 6
Bacliff MUD
Bayview MUD
Galveston County MUD No. 12
Galveston County MUD No. 13
Galveston County MUD No. 44
San Leon MUD
Tara Glen MUD
GC Navigation District No. 1
WCID No. 1
WCID No. 12
WCID No. 19
Westwood Management District

12/01/2020 13:07:26 3636528
 TC298-D SELECTION: DEPOSIT
 RECEIPT DATE: ALL
 LOCATION: ALL

TAX COLLECTION SYSTEM
 DEPOSIT DISTRIBUTION
 FROM: 11/01/2020 THRU 11/30/2020
 JURISDICTION: 0337 FRIENDMD CITY

PAGE: 31
 INCLUDES AG ROLLBACK

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2020	M & O	.392153	1,307,285.41	.00	.00	.00	1,307,285.41	.00	.00	.00	1,307,285.41
	I & S	.095161	317,229.83	.00	.00	.00	317,229.83	.00	.00	.00	317,229.83
	TOTAL	.487314	1,624,515.24	.00	.00	.00	1,624,515.24	.00	.00	.00	1,624,515.24
2019	M & O	.432160	2,112.81-	.00	853.65	.00	1,259.16-	1,437.61	.00	.00	178.45
	I & S	.089279	436.49-	.00	176.33	.00	260.16-	.00	.00	.00	260.16-
	TOTAL	.521439	2,549.30-	.00	1,029.98	.00	1,519.32-	1,437.61	.00	.00	81.71-
2018	M & O	.437173	1,629.99-	.00	179.70	.00	1,450.29-	201.91	.00	.00	1,248.38-
	I & S	.095218	355.00-	.00	39.12	.00	315.88-	.00	.00	.00	315.88-
	TOTAL	.532391	1,984.99-	.00	218.82	.00	1,766.17-	201.91	.00	.00	1,564.26-
2017	M & O	.432349	8.01	.00	.96	.00	8.97	.00	.00	.00	8.97
	I & S	.095000	1.76	.00	.21	.00	1.97	.00	.00	.00	1.97
	TOTAL	.527349	9.77	.00	1.17	.00	10.94	.00	.00	.00	10.94
2016	M & O	.462000	7.32	.00	.00	.00	7.32	.00	.00	.00	7.32
	I & S	.084000	1.33	.00	.00	.00	1.33	.00	.00	.00	1.33
	TOTAL	.546000	8.65	.00	.00	.00	8.65	.00	.00	.00	8.65
2015	M & O	.497200	37.90	.00	24.49	.00	62.39	13.72	.00	.00	76.11
	I & S	.071500	5.45	.00	3.52	.00	8.97	.00	.00	.00	8.97
	TOTAL	.568700	43.35	.00	28.01	.00	71.36	13.72	.00	.00	85.08
2013	M & O	.530300	.71	.00	.59	.00	1.30	.00	.00	.00	1.30
	I & S	.061000	.06	.00	.07	.00	.15	.00	.00	.00	.15
	TOTAL	.591400	.79	.00	.66	.00	1.45	.00	.00	.00	1.45
2012	M & O	.530700	6.38	.00	.00	.00	6.38	.00	.00	.00	6.38
	I & S	.066300	.80	.00	.00	.00	.80	.00	.00	.00	.80
	TOTAL	.597000	7.18	.00	.00	.00	7.18	.00	.00	.00	7.18
2010	M & O	.519800	3.64	.00	4.74	.00	8.38	1.89	.00	.00	10.27
	I & S	.065300	.46	.00	.59	.00	1.05	.00	.00	.00	1.05
	TOTAL	.585100	4.10	.00	5.33	.00	9.43	1.89	.00	.00	11.32
2009	M & O	.499700	2.80	.00	3.81	.00	6.61	.00	.00	.00	6.61
	I & S	.080000	.45	.00	.61	.00	1.06	.00	.00	.00	1.06
	TOTAL	.579700	3.25	.00	4.42	.00	7.67	.00	.00	.00	7.67
2008	M & O	.509700	3.54	.00	.00	.00	3.54	.00	.00	.00	3.54
	I & S	.070000	.49	.00	.00	.00	.49	.00	.00	.00	.49
	TOTAL	.579700	4.03	.00	.00	.00	4.03	.00	.00	.00	4.03

12/01/2020 13:07:26 3636528
 TC298-D SELECTION: DEPOSIT
 RECEIPT DATE: ALL
 LOCATION: ALL

TAX COLLECTION SYSTEM
 DEPOSIT DISTRIBUTION
 FROM: 11/01/2020 THRU 11/30/2020
 JURISDICTION: 0337 FRIENDMD CITY

PAGE: 32
 INCLUDES AG ROLLBACK

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
ALL	M & O		1,303,612.91	.00	1,067.94	.00	1,304,680.85	1,655.13	.00	.00	1,306,335.98
ALL	I & S		316,449.16	.00	220.45	.00	316,669.61	.00	.00	.00	316,669.61
ALL	TOTAL		1,620,062.07	.00	1,288.39	.00	1,621,350.46	1,655.13	.00	.00	1,623,005.59
DLQ	M & O		3,672.50-	.00	1,067.94	.00	2,604.56-	1,655.13	.00	.00	949.43-
DLQ	I & S		780.67-	.00	220.45	.00	560.22-	.00	.00	.00	560.22-
DLQ	TOTAL		4,453.17-	.00	1,288.39	.00	3,164.78-	1,655.13	.00	.00	1,509.65-
CURR	M & O		1,307,285.41	.00	.00	.00	1,307,285.41	.00	.00	.00	1,307,285.41
CURR	I & S		317,229.83	.00	.00	.00	317,229.83	.00	.00	.00	317,229.83
CURR	TOTAL		1,624,515.24	.00	.00	.00	1,624,515.24	.00	.00	.00	1,624,515.24

12/01/2020 13:04:53
TC298-M SELECTION: DEPOSIT

3636528

TAX COLLECTION SYSTEM
DEPOSIT DISTRIBUTION
REVERSALS DETAIL SCHEDULE
FROM: 11/01/2020 THRU 11/30/2020
JURISDICTION: 337 FRIENDWD CITY

PAGE:
INCLUDES AG ROLLBACK

65

YEAR	DEPOSIT	ACCOUNT NUMBER	EFF YR/MO	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	ATTORNEY CAUSE /REV	REFUND AMOUNT	PAYMENT AMOUNT CAT
2019	RF201104	184176	201912	138.53-	0.00	0.00	0.00 19S9	138.53	0.00 RF
2019	RF201104	200832	201912	0.00	0.00	0.00	0.00 19S9	535.15-	535.15-RF
2019	RF201104	200832	201912	535.15-	0.00	0.00	0.00 19S9	535.15	0.00 RF
2019	RF201104	201860	201912	0.00	0.00	0.00	0.00 19S9	158.87-	158.87-RF
2019	RF201104	201860	201912	158.87-	0.00	0.00	0.00 19S9	158.87	0.00 RF
2019	RF201104	202207	201912	245.30-	0.00	0.00	0.00 19S9	245.30-	0.00 RF
2019	RF201104	202207	201912	0.00	0.00	0.00	0.00 19S9	245.30-	245.30-RF
2019	RF201104	202312	202001	183.91-	0.00	0.00	0.00 19S9	183.91	0.00 RF
2019	RF201104	202312	202001	0.00	0.00	0.00	0.00 19S9	183.91-	183.91-RF
2019	RF201104	203181	202001	130.36-	0.00	0.00	0.00 19S9	130.36	0.00 RF
2019	RF201104	203181	202001	0.00	0.00	0.00	0.00 19S9	130.36-	130.36-RF
2019	RF201104	219105	202001	139.05-	0.00	0.00	0.00 19S9	139.05	0.00 RF
2019	RF201104	219105	202001	0.00	0.00	0.00	0.00 19S9	139.05-	139.05-RF
2019	RF201104	231879	202001	0.00	0.00	0.00	0.00 19S9	254.56-	254.56-RF
2019	RF201104	231879	202001	254.56-	0.00	0.00	0.00 19S9	254.56	0.00 RF
2019	864110320PHC	511197	202010	57.04-	0.00	11.97-	13.80-CERT	0.00	82.81-RF
2019	RF201113	H0214595	202002	25.47	0.00	0.00	0.00 HK07	0.00	25.47 RF
2019	RF201113	H0922096	202001	7.79-	0.00	0.00	0.00 HK07	7.79	0.00 RF
2019	RF201113	H0922096	202001	0.00	0.00	0.00	0.00 HK07	7.79-	7.79-RF
		2019 TOTAL		9,453.26-	0.00	11.97-	13.80-	0.00	9,479.03-
2020	924112420CHC	168940	202011	817.09-	0.00	0.00	0.00 CERT	0.00	817.09-TR
2020	RF201104	202596	202010	0.00	0.00	0.00	0.00 20S2	176.19-	176.19-RF
2020	RF201104	202596	202010	176.19-	0.00	0.00	0.00 20S2	176.19	0.00 RF
2020	844945113020	364761	202011	893.88-	0.00	0.00	0.00 CERT	0.00	893.88-TR
2020	RF201104	394219	202010	0.00	0.00	0.00	0.00 20S2	13.49-	13.49-RF
2020	RF201104	394219	202010	13.49-	0.00	0.00	0.00 20S2	13.49	0.00 RF
		2020 TOTAL		1,900.65-	0.00	0.00	0.00	0.00	1,900.65-
		TOTAL REVERSALS		14,514.51-	0.00	33.53-	13.80-	0.00	14,561.84-

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TC298-N SELECTION: DEPOSIT

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TAX COLLECTION SYSTEM
DEPOSIT DISTRIBUTION
SUMMARY OF PAYMENTS AND REVERSALS
FROM: 11/01/2020 THRU 11/30/2020
JURISDICTION: 337 FRIENDWD CITY

PAGE: 18
INCLUDES AG ROLLBACK

YEAR DEPOSIT	ACCOUNT NUMBER	EFF YR/MO	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	ATTORNEY CAUSE /REV	REFUND AMOUNT	PAYMENT AMOUNT
2008 TOTAL			4.03	0.00	0.00	0.00	0.00	4.03
2009 TOTAL			3.25	0.00	4.42	0.00	0.00	7.67
2010 TOTAL			4.10	0.00	5.33	1.89	0.00	11.32
2012 TOTAL			7.18	0.00	0.00	0.00	0.00	7.18
2013 TOTAL			0.79	0.00	0.66	0.00	0.00	1.45
2015 TOTAL			43.35	0.00	28.01	13.72	0.00	85.08
2016 TOTAL			8.65	0.00	0.00	0.00	0.00	8.65
2017 TOTAL			9.77	0.00	1.17	0.00	0.00	10.94
2018 TOTAL			1,175.61	0.00	240.38	201.91	0.00	1,617.90
2019 TOTAL			6,903.96	0.00	1,041.95	1,451.41	0.00	9,397.32
2020 TOTAL			1,626,415.89	0.00	0.00	0.00	0.00	1,626,415.89
TOTAL PAYMENTS			1,634,576.58	0.00	1,321.92	1,668.93	0.00	1,637,567.43
2018 TOTAL			3,160.60-	0.00	21.56-	0.00	0.00	3,182.16-
2019 TOTAL			9,453.26-	0.00	11.97-	13.80-	0.00	9,479.03-
2020 TOTAL			1,900.65-	0.00	0.00	0.00	0.00	1,900.65-
TOTAL REVERSALS			14,514.51-	0.00	33.53-	13.80-	0.00	14,561.84-
TOTAL FOR UNIT			1,620,062.07	0.00	1,288.39	1,655.13	0.00	1,623,005.59

12/01/2020 14:38:0 3636593
TC168

TAX COLLECTION SYSTEM
TAX COLLECTOR MONTHLY REPORT
FROM 08/01/2020 TO 11/30/2020

PAGE: 19
INCLUDES AG ROLLBACK

FISCAL START: 08/01/2020 END: 07/31/2021 JURISDICTION: 0337 FRIENDWD CITY

CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE	TAX RATE	TAX LEVY	PAID ACCTS
3,797,796,969	120,601,889	3,918,398,858	00.487314	18,661,272.22	2,451

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2020	18,065,542.22	595,730.00	595,730.00	1,726,899.19	1,726,899.19	16,934,373.03	9.25	0.00
2019	221,138.15	25,566.85-	25,566.85-	67,891.09	67,891.09	127,680.21	34.71	0.00
2018	46,656.63	2,892.82-	2,892.82-	1,196.51	1,196.51	42,567.30	2.73	0.00
2017	21,992.69	3,443.33	3,443.33	1,794.55	1,794.55	23,641.47	7.06	0.05-
2016	17,330.46	480.14-	480.14-	1,408.62	1,408.62	15,441.70	8.36	0.00
2015	14,009.79	.00	.00	172.64	172.64	13,837.15	1.23	0.00
2014	14,747.87	.00	.00	127.11	127.11	14,620.76	.86	0.00
2013	11,225.18	.00	.00	178.27	178.27	11,046.91	1.59	0.00
2012	10,965.91	115.47-	115.47-	7.78	7.78	10,842.66	.07	115.47-
2011	10,272.17	74.99-	74.99-	59.29	59.29	10,137.89	.58	74.99-
2010	9,505.56	.00	.00	487.71	487.71	9,017.85	5.13	0.00
2009	6,883.00	.00	.00	391.18	391.18	6,491.82	5.68	0.00
2008	5,727.32	.00	.00	116.16	116.16	5,611.16	2.03	0.00
2007	1,978.69	.00	.00	0.00	0.00	1,978.69	.32	0.00
2006	2,787.78	.00	.00	8.96	8.96	2,778.82	.49	0.00
2005	1,428.40	.00	.00	6.95	6.95	1,421.45	1.54	0.00
2004	650.49	.00	.00	10.02	10.02	640.47	.32	0.00
2003	647.12	.00	.00	0.00	0.00	647.12	.32	0.00
2002	924.85	.00	.00	0.00	0.00	924.85	.32	0.00
2001	941.66	.00	.00	0.00	0.00	941.66	.32	0.00
2000	996.69	.00	.00	0.00	0.00	996.69	.32	0.00
1999	0.00	.00	.00	0.00	0.00	0.00	.32	0.00
****	18,466,352.63	570,043.06	570,043.06	1,800,756.03	1,800,756.03	17,235,639.66		190.51-

12/01/2020 14:19:3 3636593
TC160

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2020
JURISDICTION: 0337 FRIENDMD CITY

PAGE: 193
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2020	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 11/30/2020
LAND VALUE	5,043,274.252	4,336,860.912	39,666,759	51,945-	39,614,814	4,376,475,726
AG EXCLUSION	27,337,308	27,337,308	1,092,372	809,940-	282,432	27,619,740
IMPROVEMENTS	706,413,340	706,413,340	125,574,324	24,915,076-	100,659,248	807,072,588
APPRAISED VALUE	5,043,274.252	5,043,274.252	165,241,083	24,967,021-	140,274,062	5,183,548,314
EXEMPTIONS	1,218,139,975	1,218,139,975	25,011,386	5,621,645-	19,672,173	1,237,812,148
TAXABLE VALUE	3,797,796,969	3,797,796,969	139,137,325	18,535,436-	120,601,889	3,918,398,858
LEVY	18,065,542.22	18,065,542.22	668,844.59	73,114.59-	595,730.00	18,661,272.22
UNCOLLECTIBLE	.00	.00	.00	.00	.00	.00
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	10,220	10,220	313	20	20	10,240
OVER 65	3,163	3,163	94	8	9	3,172
DISABLED	182	182	4	2	2	184
VETERAN	221	221	5	2	2	223
TOTAL EXEMPT	80	80	0	0	0	80

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2019
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 194
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2020	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 11/30/2020
LAND VALUE	4,537,437.822	3,891,505.950	161,398	50,000-	111,398	3,891,617,348
AG EXCLUSION	24,683,691	24,683,691	0	0	0	24,683,691
IMPROVEMENTS	645,931,872	645,931,872	929,965	3,816,190-	2,886,225-	643,045,647
APPRAISED VALUE	4,537,437,822	4,537,437,822	1,091,363	3,866,190-	2,774,827-	4,534,662,995
EXEMPTIONS	1,018,439,121	1,018,439,121	226,024	2,537,173	2,763,197	1,021,202,318
TAXABLE VALUE	3,494,315,010	3,494,315,010	865,339	6,403,363-	5,538,024-	3,488,776,986
LEVY	221,138.15	221,138.15	4,521.61	30,088.46-	25,566.85-	195,571.30
UNCOLLECTIBLE	.00	.00	.00	.00	.00	.00
RECEIVABLE						
EXEMPTION COUNTS:						
HOMESTEADS	10,000	10,000	1	29	29	10,029
OVER 65	2,975	2,975	0	10	10	2,985
DISABLED	181	181	0	3	3	184
VETERAN	205	205	0	1-	1-	204
TOTAL EXEMPT	74	74	0	0	0	74

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2018
JURISDICTION: 0337 FRIENDMD CITY

PAGE: 195
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 06/01/2020	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 11/30/2020
LAND VALUE	4,207,374,518	3,589,474,109	0	0	0	3,589,474,109
AG EXCLUSION	23,842,910	23,842,910	0	0	0	23,842,910
IMPROVEMENTS	617,900,409	617,900,409	18,000	79,082-	61,082-	617,839,327
APPRAISED VALUE	4,207,374,518	4,207,374,518	18,000	79,082-	61,082-	4,207,313,436
EXEMPTIONS	891,117,422	891,117,422	0	1,357,245	1,357,245	892,474,667
TAXABLE VALUE	3,292,414,186	3,292,414,186	18,000	1,436,327-	1,418,327-	3,290,995,859
LEVY	46,656.63	46,656.63	105.41	2,998.23-	2,892.82-	43,763.81
UNCOLLECTIBLE	.00	.00	.00	.00	.00	.00
RECEIVABLE						
EXEMPTION COUNTS:						
HOMESTEADS	10,001	10,001	0	20	20	10,021
OVER 65	2,897	2,897	0	4	4	2,901
DISABLED	0	0	0	2	2	2
VETERAN	204	204	0	1-	1-	203
TOTAL EXEMPT	0	0	0	0	0	0

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2017
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 196
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2020	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 11/30/2020
LAND VALUE	4,271,816,787	3,655,904,976	0	0	0	3,655,904,976
AG EXCLUSION	18,989,755	18,989,755	0	0	0	18,989,755
IMPROVEMENTS	615,911,811	615,911,811	0	15,270-	15,270-	615,896,541
APPRAISED VALUE	4,271,816,787	4,271,816,787	0	15,270-	15,270-	4,271,801,517
EXEMPTIONS	988,826,434	988,826,434	0	209,394	209,394	989,035,828
TAXABLE VALUE	3,264,000,598	3,264,000,598	0	224,664-	224,664-	3,263,775,934
LEVY	21,992.69	21,992.69	.00	3,443.33	3,443.33	25,436.02
UNCOLLECTIBLE	.00	.05	.00	.00	.00	.05
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	10,005	10,005	0	1	1	10,006
OVER 65	2,854	2,854	0	1	1	2,855
DISABLED	0	0	0	0	0	0
VETERAN	207	207	0	0	0	207
TOTAL EXEMPT	647	647	0	0	0	647

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2016
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 197
INCLUDES AG ROLLBACK

	CERTIFIED ROLL 08/01/2020	ROLL AS OF 08/01/2020	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 11/30/2020
LAND VALUE	3,999,127,118	3,429,239,107	0	0	0	3,429,239,107
AG EXCLUSION	13,436,213	13,436,213	0	0	0	13,436,213
IMPROVEMENTS	569,888,011	569,888,011	0	13,200-	13,200-	569,874,811
APPRAISED VALUE	3,999,127,118	3,999,127,118	0	13,200-	13,200-	3,999,113,918
EXEMPTIONS	968,850,710	968,850,710	0	75,952	75,952	968,926,662
TAXABLE VALUE	3,016,840,195	3,016,840,195	0	89,152-	89,152-	3,016,751,043
LEVY	17,330.46	17,330.46	.00	480.14-	480.14-	16,850.32
UNCOLLECTIBLE	.00	.00	.00	.00	.00	.00
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	9,913	9,913	0	0	0	9,913
OVER 65	2,721	2,721	0	1-	1-	2,720
DISABLED	0	0	0	0	0	0
VETERAN	242	242	0	0	0	242
TOTAL EXEMPT	642	642	0	0	0	642

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2012
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 198
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 06/01/2020	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 11/30/2020
LAND VALUE	3,010,746.098	3,010,746.098	0	0	0	3,010,746.098
AG EXCLUSION	24,253,634	24,253,634	0	0	0	24,253,634
IMPROVEMENTS	0	0	0	0	0	0
APPRAISED VALUE	3,010,746.098	3,010,746.098	0	0	0	3,010,746.098
EXEMPTIONS	688,493,465	688,493,465	0	0	0	688,493,465
TAXABLE VALUE	2,297,998.999	2,297,998.999	0	0	0	2,297,998.999
LEVY	10,965.91	10,965.91	.00	115.47-	115.47-	10,850.44
UNCOLLECTIBLE	.00	115.47	.00	.00	.00	115.47
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	9,520	9,520	0	0	0	9,520
OVER 65	2,294	2,294	0	0	0	2,294
DISABLED	184	184	0	0	0	184
VETERAN	202	202	0	0	0	202
TOTAL EXEMPT	611	611	0	0	0	611

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2011
JURISDICTION: 0337 FRIENDMD CITY

PAGE: 199
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2020	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 11/30/2020
LAND VALUE	3,027,077.728	3,027,077.728	0	0	0	3,027,077.728
AG EXCLUSION	25,181,497	25,181,497	0	0	0	25,181,497
IMPROVEMENTS	0	0	0	0	0	0
APPRAISED VALUE	3,027,077.728	3,027,077.728	0	0	0	3,027,077.728
EXEMPTIONS	693,987,772	693,987,772	0	0	0	693,987,772
TAXABLE VALUE	2,307,908,459	2,307,908,459	0	0	0	2,307,908,459
LEVY	10,272.17	10,272.17	.00	74.99-	74.99-	10,197.18
UNCOLLECTIBLE	.00	74.99	.00	.00	.00	74.99
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	9,686	9,686	0	0	0	9,686
OVER 65	2,190	2,190	0	0	0	2,190
DISABLED	191	191	0	0	0	191
VETERAN	183	183	0	0	0	183
TOTAL EXEMPT	606	606	0	0	0	606

Summary of Jurisdiction Remittances Processed

Report run on: December 4, 2020 5:13 PM

For Remitted Deposit Dates 11/01/2020 thru 11/30/2020 as of 12/04/2020

Version 1.50

Tax Unit		M & O Total	I & S Total	TIF Levy	TIF Interest	Fee Total	Total
337 FRIENDWD CITY							
ACH 61968	Print Date:11/05/2020						
	Current	17,884.78	4,339.98	0.00	0.00	0.00	22,224.76
Last Deposit Date	11/02/2020	\$17,884.78	\$4,339.98	\$0.00	\$0.00	\$0.00	\$22,224.76
ACH 62010	Print Date:11/05/2020						
	Current	25,356.05	6,152.97	0.00	0.00	0.00	31,509.02
	Delq	352.80	77.48	0.00	0.00	0.00	430.28
Last Deposit Date	11/03/2020	\$25,708.85	\$6,230.45	\$0.00	\$0.00	\$0.00	\$31,939.30
ACH 62054	Print Date:11/05/2020						
	Current	49,566.55	12,027.97	0.00	0.00	0.00	61,594.52
	Delq	(5,071.21)	(1,073.42)	0.00	0.00	0.00	(6,144.63)
Last Deposit Date	11/04/2020	\$44,495.34	\$10,954.55	\$0.00	\$0.00	\$0.00	\$55,449.89
ACH 62099	Print Date:11/09/2020						
	Current	37,324.33	9,057.24	0.00	0.00	0.00	46,381.57
	Delq	36.36	7.51	0.00	0.00	0.00	43.87
Last Deposit Date	11/05/2020	\$37,360.69	\$9,064.75	\$0.00	\$0.00	\$0.00	\$46,425.44
ACH 62143	Print Date:11/10/2020						
	Current	129,792.59	31,495.93	0.00	0.00	0.00	161,288.52
	Delq	553.69	114.38	0.00	0.00	0.00	668.07
Last Deposit Date	11/06/2020	\$130,346.28	\$31,610.31	\$0.00	\$0.00	\$0.00	\$161,956.59
ACH 62189	Print Date:11/12/2020						
	Current	119,217.58	28,929.68	0.00	0.00	0.00	148,147.26
	Delq	167.93	30.95	0.00	0.00	0.00	198.88
Last Deposit Date	11/09/2020	\$119,385.51	\$28,960.63	\$0.00	\$0.00	\$0.00	\$148,346.14
ACH 62235	Print Date:11/13/2020						
	Current	92,830.20	22,526.42	0.00	0.00	0.00	115,356.62
Last Deposit Date	11/10/2020	\$92,830.20	\$22,526.42	\$0.00	\$0.00	\$0.00	\$115,356.62
ACH 62280	Print Date:11/16/2020						
	Current	26,632.13	6,462.65	0.00	0.00	0.00	33,094.78
	Delq	747.99	156.52	0.00	0.00	0.00	904.51
Last Deposit Date	11/12/2020	\$27,380.12	\$6,619.17	\$0.00	\$0.00	\$0.00	\$33,999.29
ACH 62324	Print Date:11/17/2020						
	Current	183,192.08	44,453.95	0.00	0.00	0.00	227,646.03
	Delq	(1,215.63)	(251.10)	0.00	0.00	0.00	(1,466.73)
Last Deposit Date	11/13/2020	\$181,976.45	\$44,202.85	\$0.00	\$0.00	\$0.00	\$226,179.30
ACH 62369	Print Date:11/18/2020						
	Current	28,062.76	6,809.83	0.00	0.00	0.00	34,872.59
Last Deposit Date	11/16/2020	\$28,062.76	\$6,809.83	\$0.00	\$0.00	\$0.00	\$34,872.59
ACH 62414	Print Date:11/19/2020						
	Current	140,919.50	34,195.95	0.00	0.00	0.00	175,115.45
	Delq	155.50	32.13	0.00	0.00	0.00	187.63
Last Deposit Date	11/17/2020	\$141,075.00	\$34,228.08	\$0.00	\$0.00	\$0.00	\$175,303.08

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Summary of Jurisdiction Remittances Processed

Report run on: December 4, 2020 5:13 PM

For Remitted Deposit Dates 11/01/2020 thru 11/30/2020 as of 12/04/2020

Version 1.50

Tax Unit		M & O Total	I & S Total	TIF Levy	TIF Interest	Fee Total	Total
337 FRIENDWD CITY							
ACH 62461	Print Date:11/20/2020						
	Current	43,259.46	10,497.44	0.00	0.00	0.00	53,756.90
	Delq	1,481.51	305.02	0.00	0.00	0.00	1,786.53
Last Deposit Date	11/18/2020	\$44,740.97	\$10,802.46	\$0.00	\$0.00	\$0.00	\$55,543.43
ACH 62507	Print Date:11/20/2020						
	Current	109,099.24	26,474.36	0.00	0.00	0.00	135,573.60
	Delq	1,870.76	388.61	0.00	0.00	0.00	2,259.37
Last Deposit Date	11/19/2020	\$110,970.00	\$26,862.97	\$0.00	\$0.00	\$0.00	\$137,832.97
ACH 62550	Print Date:11/24/2020						
	Current	18,770.74	4,554.98	0.00	0.00	0.00	23,325.72
	Delq	635.64	131.31	0.00	0.00	0.00	766.95
Last Deposit Date	11/20/2020	\$19,406.38	\$4,686.29	\$0.00	\$0.00	\$0.00	\$24,092.67
ACH 62591	Print Date:11/25/2020						
	Current	99,857.33	24,231.68	0.00	0.00	0.00	124,089.01
	Delq	(2,919.13)	(603.06)	0.00	0.00	0.00	(3,522.19)
Last Deposit Date	11/23/2020	\$96,938.20	\$23,628.62	\$0.00	\$0.00	\$0.00	\$120,566.82
ACH 62635	Print Date:11/30/2020						
	Current	18,067.57	4,384.34	0.00	0.00	0.00	22,451.91
	Delq	14.44	2.64	0.00	0.00	0.00	17.08
Last Deposit Date	11/24/2020	\$18,082.01	\$4,386.98	\$0.00	\$0.00	\$0.00	\$22,468.99
ACH 62680	Print Date:11/30/2020						
	Current	39,964.96	9,698.01	0.00	0.00	0.00	49,662.97
Last Deposit Date	11/25/2020	\$39,964.96	\$9,698.01	\$0.00	\$0.00	\$0.00	\$49,662.97
ACH 62726	Print Date:12/04/2020						
	Current	127,487.56	30,936.45	0.00	0.00	0.00	158,424.01
	Delq	584.79	120.81	0.00	0.00	0.00	705.60
Last Deposit Date	11/30/2020	\$128,072.35	\$31,057.26	\$0.00	\$0.00	\$0.00	\$159,129.61
Total:		\$1,304,680.85	\$316,669.61	\$0.00	\$0.00	\$0.00	\$1,621,350.46