ORDINANCE NO. 2020-1322

AN ORDINANCE OF THE CITY OF FULSHEAR, TEXAS, ADOPTING THE FORT BEND COUNTY – INTERIM ATLAS 14 DRAINAGE CRITERIA MANUAL AND MINIMUM SLAB ELEVATION MANUAL; PROVIDING FOR A PENALTY; PROVIDING FOR SEVERABILITY; PROVIDING FOR REPEAL AND PROVIDING FOR AN EFFECTIVE DATE.

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WHEREAS, the City Council of the City of Fulshear, Texas, adopted Ordinance No. 03-905, adopting and accepting the Fort Bend County Drainage Plan; and

WHEREAS; Fort Bend County has since adopted a supplement or addendum to its drainage plan, being the Fort Bend County – Interim Atlas 14 Drainage Criteria Manual and Minimum Slab Elevation Criteria, December 2019; and

WHEREAS, the City Council finds that it is in the best interest of health, safety, and welfare of the residents of the City to adopt said supplement or addendum;

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FULSHEAR, TEXAS:

Section 1. The Fort Bend County – Interim Atlas 14 Drainage Criteria Manual and Minimum Slab Elevation Criteria, December 2019, attached hereto as Exhibit A, is hereby adopted and incorporated herein by this reference.

Section 2. In the event of any conflict between the provisions of the Fort Bend County – Interim Atlas 14 Drainage Criteria Manual and Minimum Slab Elevation Criteria, December 2019, and Ordinance No. 03-905, as amended, the provisions of the Fort Bend County – Interim Atlas 14 Drainage Criteria Manual and Minimum Slab Elevation Criteria, December 2019, shall apply.

Section 3. **Penalty**. Any person who violates or causes, allows, or permits another to violate any provision of this ordinance, rule, or police regulation of the city shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine or penalty not to exceed five hundred dollars ($500.00), provided that if such rule, ordinance, or police regulation governs fire safety, zoning, or public health and sanitation, other than the dumping of refuse, the fine or penalty shall not exceed two thousand dollars ($2,000.00), and further provided that if such rule, ordinance, or police regulation governs the dumping of refuse, the fine or penalty shall not exceed four thousand dollars ($4,000.00). Each occurrence of any violation of this ordinance, rule, or police regulation shall constitute a separate offense. Each day on which any such violation of this ordinance, rule, or police regulation occurs shall constitute a separate offense.

Section 4. **Severability**. In the event any clause, phrase, provision,

sentence or part of this Ordinance or the application of the same to any person or circumstances 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 Fulshear, Texas declares that it would have passed each and every part of the same notwithstanding the omission of any part thus declared to be invalid or unconstitutional, or whether there be one or more parts.

Section 5. **Repeal**. All other ordinances or parts of ordinances inconsistent or in conflict herewith are, to the extent of such inconsistency or conflict, hereby repealed.

Section 6. **Effective date**. This Ordinance shall be effective and in full force when published as required by law.

PASSED, APPROVED, and ADOPTED this, the 17th day of March, 2020.

THE CITY OF FULSHEAR TEXAS

Aaron Groff, Mayor

ATTEST:

Kimberly Kopecky, City Secretary

EXHIBIT A

Fort Bend County – Interim Atlas 14 Drainage Criteria Manual and Minimum Slab Elevation Criteria December 2019

1. Definitions

a. Minimum Slab Elevation – (abbreviation = MSE) minimum slab elevation of a structure built or substantially improved in Fort Bend County.
b. Atlas-14 Study – a drainage study using Section 6, Design Rainfall Depth, and the Drainage Criteria Manual to compute the 100-year water surface elevations and water surface ponding elevations for drainage infrastructure and drainage ways.
c. Base Flood Elevation – (abbreviation = BFE) the 100-year base flood plain elevation established in accordance with the FEMA Flood Insurance Rate Maps and the Flood Insurance Study for Fort Bend County, other drainage study approved by Fort Bend County or Atlas-14 Study.
d. Existing BFE – the flood plain or water surface elevation approved by Fort Bend County, prior to October 2018.
e. New BFE – the updated water surface elevation (BFE or subdivision ponding level) established by an Atlas- 14 Study.
f. Elevation – Elevation means height above mean sea level. The North American Vertical Datum (NAVD) of 1988 shall be used. If a datum other than NAVD 88 is used, a conversion to NAVD 88 must be provided and both the NAVD 88 and alternate datum must be documented within all elevation analyses. (plats, drainage reports, elevation certificates, etc....)

2. Minimum Slab Elevation (MSE)

a. **Structures on property located within recorded subdivisions approved in accordance with FBC Subdivision Regulations. MSE** will be the greater of the following:
    i. 2.0 feet above the existing (Pre-Atlas 14) 500-year water surface elevation for the receiving stream or in the absence of an existing

(Pre-Atlas 14) 500-year water surface elevation, 4.0 feet above the Existing (Pre-Atlas 14) BFE*

- * 2.0' above existing (Pre-Atlas 14) Brazos River BFE will be allowed

ii. 2.5 feet above the existing (Pre-Atlas 14)100-year water surface elevation or maximum ponding elevation based on an existing detention facility designed prior to the adoption of these rules;

iii. 2.0 feet above the lowest top of curb elevation within, or adjacent to, each lot or reserve; or, in the absence of a curb, 2.0 feet above the highest natural ground along perimeter of building foundation and 1.0 foot above any down gradient roadway or any down gradient drainage restraint, whichever is higher.

iv. In lieu of 2.a.i-ii, 2.0 feet above the New (Atlas 14) BFE, and no lower than the new (Atlas 14) 500- year water surface elevation.

b. **Structures on property not located within a recorded subdivision. MSE** will the greater of the following:

i. 2.0 feet above the existing (Pre-Atlas 14) 500-year water surface elevation for the receiving stream or in the absence of an existing (Pre-Atlas 14) 500-year water surface elevation, 4.0 feet above the Existing (Pre-Atlas 14) BFE*

* 2.0' above existing (Pre-Atlas 14) Brazos River BFE will be allowed

ii. 2.5 feet above the existing (Pre-Atlas 14) 100-year water surface elevation or maximum ponding elevation based on an existing detention facility designed prior to the adoption of these rules;

iii. 2.0 feet above the lowest top of curb elevation within, or adjacent to, each lot or reserve; or, in the absence of a curb, 2.0 feet above the highest natural ground along perimeter of building foundation and 1.0 foot above any down gradient roadway or any down gradient drainage restraint, whichever is higher.

iv. In lieu of 2.b.i-ii, 2.0 feet above the New (Atlas 14) BFE, and no lower than the new (Atlas 14) 500- year water surface elevation.

c. **Structures located within Zone A. MSE** will the greater of the following:

i. 4.0 feet above the estimated Existing (Pre-Atlas 14) BFE;

ii. In lieu of 2.c.i, 2.0 feet above the New (Atlas 14) BFE, and no lower than the new (Atlas 14) 500- year water surface elevation.

3. Drainage Master Plans and Impact Analysis

a. Existing development drainage master plans, at the option of the developer, may be the basis for approval of new sections within a development through January 1, 2020.
b. New developments, without an approved drainage master plan shall be based on an Atlas-14 Study.
c. After January 1, 2020, minimum slab elevations and drainage infrastructure for all development shall be based on an Atlas-14 Study.

4. Atlas 14 Analysis Requirements after January 1, 2020

a. **New developments without an approved drainage master plan or impact analysis:** Evaluate using Section 6, Design Rainfall Depths, to determine pre-development discharges and size detention facilities to not exceed pre-development discharges for the Atlas 14 10-yr, , and 100-yr events. Evaluation of the 500- year event will be required in special circumstances (E.g. changing outfall location along a stream, diverting flows to a different channel, a natural overflow occurs along tract or drainage channel in the 100-year event).

b. **A <u>new</u> upstream development, or drainage system modifications within an <u>existing</u> development, draining into a downstream development with facilities sized for a release rate based on the previous (pre-Atlas 14) drainage criteria:** Follow guidelines from 4.a and incorporate an additional scenario with a 12.5" rainfall event (previous criteria),verifying that the outfall structure of the new upstream development does not result in discharges above the allowable release rate (from previously approved drainage report) into the downstream development.

c. **Expansion of an existing development to incorporate development of off-site areas (areas that in the original drainage report were off site and not a part of the original development) draining through the existing development:** Follow guidelines from 4.a and include an additional scenario with a 12.5" rainfall event, verifying that the outfall structure for the new facilities does not result in discharges above the allowable release rate (from previously approved drainage report) from the off-site area. In addition, the resulting discharges from the existing development and developed off-site areas should not exceed the off-site

predevelopment discharges for the Atlas 14 100-yr rainfall event.

d. **Developments, less than 50 Acres, utilizing the simplified method for detention volume calculations:** no change.

e. **For developments not described in 4.a-d:** coordinate with FBCDD to establish drainage master plan / impact study evaluation criteria.

f. **Within an existing development where no modification of the existing outfall is proposed:** detention basins or drainage system facilities constructed prior to or following the implementation of these rules will be allowed to construct additional detention storage, utilize existing detention basin freeboard and allow for ponding in streets to a depth no greater than 1-foot below the lowest slab to accommodate the increase in storage volume resulting from the Atlas 14 100-year rainfall event. Reference the certification requirements in Section 9.

5. Bridge Crossings

a. For all new or modified bridge crossings, the low chord should be set at lowest at 12" above current 500- year WSE or 12" above the Atlas-14 100-year WSE.

6. Design Rainfall Depths

Table 1 summarizes the rainfall depths to be used within Fort Bend County for all drainage facilities. These values are based on Atlas 14, Volume 11 at latitude 29.5427°, longitude -95.5013°. Values for the 3-year event were interpolated from values for the 2-year, 5-year, and 10-year events. All values correspond to a Partial Duration series.

Table 1. Rainfall Depths

Duration	Rainfall Depths (in)								
	2 yr	3 yr	5 yr	10 yr	25 yr	50 yr	100 yr	500 yr	12.5" Event
5 min	0.59	0.65	0.73	0.84	1.00	1.13	1.26	1.57	0.90
10 min	0.94	1.04	1.16	1.34	1.60	1.80	2.01	2.47	[redacted]
15 min	1.19	1.31	1.46	1.69	2.00	2.25	2.50	3.11	2.01
30 min	1.70	1.87	2.08	2.39	2.83	3.16	3.50	4.40	3.70
1 hr	2.26	2.49	2.78	3.22	3.83	4.30	4.80	6.20	4.55
2 hr	2.83	3.15	3.53	4.19	5.16	5.99	6.91	9.45	6.05
3 hr	3.17	3.55	4.00	4.82	6.08	7.19	8.47	12.00	6.85
6 hr	3.77	4.27	4.86	5.97	7.72	9.33	11.20	16.30	8.40
12 hr	4.40	5.04	5.79	7.20	9.41	11.40	13.80	20.50	10.45
24 hr	5.09	5.89	6.82	8.55	11.20	13.70	16.50	24.50	12.50

Table 2 summarizes e, b, d coefficients to be used within Fort Bend County. Note that these values are based on a regression analysis optimized (and only valid) for durations **between 10 minutes and up to two-hours**. The rainfall amounts generated using these coefficients do not supersede the rainfall amount in Table 1.

Table 2. Updated e, b, d Coefficients

	50% (2-year)	33% (3-year)	20% (5-year)	10% (10-year)	4% (25-year)	2% (50-year)	1% (100-year)	0.20% (500-year)
E	0.7122	0.7063	0.7033	0.6771	0.6222	0.5782	0.5274	0.4782
b (in.)	45.19	48.73	53.74	55.66	51.65	47.69	42.99	45.22
d (min)	8.51	8.37	8.30	7.43	5.09	3.04	1.08	0.20

7. Impervious Values for Residential areas

For residential areas, use the impervious values outlined in Table 3. If the streets within the subdivision are delineated separately from the lots, use the values under the "without/street" column, otherwise use the impervious values that account for streets. Undeveloped areas within a residential subdivision, such as parks, pipeline corridors, or maintenance berms can be delineated separately and assigned a separate impervious value. For other types of development, refer to table 2-2 of the 2011 Drainage Criteria Manual.

Table 3. Typical Average Values for Impervious Cover

Lot size (ac)		% Impervious	
		without/street	w/street
1/4	0.2500	49	53
1/5	0.2000	50	55
1/6	0.1667	54	58
1/7	0.1429	58	62
1/8	0.1250	62	66
1/9	0.1111	63	66

8. Floodplain Storage Mitigation for conditions where Atlas 14 100-year BFEs are not defined

Any reduction in floodplain storage within the existing 500-year (Pre-Atlas 14) floodplain must be offset with a hydraulically equivalent (one-to-one) volume of mitigation sufficient to offset the reduction. The reduction may result from development or placement of fill within the 500-year (Pre-Atlas 14) floodplain. Such mitigation shall be within the same watershed and shall be provided on the same property within the same hydrologic sub-watershed or at an alternate site meeting the approval of the County Engineer. A full hydrological and hydraulic analysis must be submitted to support a request for mitigation outside the boundaries of the property being developed.

9. Certification Memorandum for a Pre-Atlas 14 Development

The purpose of the "certification statement" below is to allow a MUD/LID/ Development Engineer of a development (with a pre-Atlas 14 approved report), to submit a memorandum, with the below statement, to FBCDD which will detail the pre-Atlas 14 100-yr WSEL and post-Atlas 14 100-yr WSEL for the drainage system. This memorandum will confirm conformance with section 4(f) of Interim Guidelines and documenting the 1-foot of freeboard from lowest slab elevation to the Atlas 14 100-yr WSEL. This memo will be prepared for each detention basin service area within a pre-Atlas existing development and will be in lieu of a new formal, Atlas 14 drainage report for said development. This memo is only applicable for conditions where:

a. Ultimate outfall size/configuration, including the extreme event outfall does not change from previously approved (pre-Atlas 14) analysis/design
b. Original service area defined by previously approved drainage report (pre-Atlas 14) has not changed (such as land area or land use density)
c. The intent of section is to promulgate a policy which provides for continued development without modification or increase of the size of the existing outfall structure.

Certification Statement

The design of this project, as shown on these signed and sealed construction plans, has been analyzed in accordance with the Fort Bend County Drainage Criteria Manual and the Interim Atlas 14 Drainage Criteria Manual and Minimum Slab Elevation Criteria effective January 1, 2020 and it has been found that for storms utilizing Atlas 14 rainfall up to and including the one percent annual exceedance probability event: (1) floodwater will not inundate any existing structures, and (2) proposed finished floor elevations of new structures will comply with Fort Bend County Floodplain Regulations.

ORDINANCE NO. 03-905

AN ORDINANCE OF THE CITY OF FULSHEAR, TEXAS, ADOPTING AND ACCEPTING THE FORT BEND COUNTY DRAINAGE PLAN; PROVIDING IT TO BE UNLAWFUL FOR ANY PERSON TO LOCATE OR ALTER ANY STRUCTURE OR LAND WITHIN THE CITY WITHOUT COMPLYING WITH THE FORT BEND COUNTY DRAINAGE PLAN; PROVIDING A PENALTY OF AN AMOUNT NOT TO EXCEED $2,000 FOR EACH DAY OF VIOLATION OF ANY PROVISION HEREOF; AND PROVIDING FOR SEVERABILITY.

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BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FULSHEAR, TEXAS:

Section 1. The City Council of the City of Fulshear (the "City") hereby finds that it is in the best interest of health, safety, and welfare of the citizens of the City that the City adopt the Fort Bend County Drainage Plan and require that all land or structures located within the City comply with the Fort Bend County Drainage Plan.

Section 2. The Fort Bend County Drainage Plan is hereby adopted and accepted by the City of Fulshear. A true and correct copy of the Fort Bend County Drainage Plan is on file in the City Secretary's Office.

Section 3. It shall be unlawful for any person or entity to construct, erect, alter, or modify any land or structure located within the corporate limits of the City without complying in all applicable respects with the Fort Bend County Drainage Plan.

Section 4. Any person who shall violate any provision of this Ordinance shall be deemed guilty of a misdemeanor and, upon conviction, shall be fined in an amount not to exceed $2000. Each day of violation shall constitute a separate offense.

Section 5. In the event any clause phrase, provision, sentence, or part of this Ordinance or the application of the same to any person or circumstances 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 Fulshear, 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, APPROVED, AND ADOPTED this 17th day of December, 2003.

J. Michael Dinges

Michael Dinges, Mayor

ATTEST:

Kathy Mayfield

Kathy Mayfield, City Secretary