Agenda

• Atlas 14 Rainfall Changes
• Impacts of Rainfall Changes
• Detention and Floodplain Impacts
• Interim Guidelines and Criteria
• What’s Next?
Previous Rainfall Depths

- TP-40 (1961), TP-49 (1967) and Hydro-35 (1977)
- USGS Updates in 1994/1998 (HCFCD)
Atlas 14, Volume 11 (Texas)

- Nearly 12,000 stations with some data
- Over 800 stations created in TX for analysis
  - At least 30 years needed for analysis
  - Periods of record up to 150 years
- Frequency Analysis performed
  - 1-Year to 1000-Year Average Recurrence Interval
  - 5-minute to 60-day durations
- Houston Area increase of 3-5” in 100-year, 24-hour rainfall
Atlas 14, Volume 11 (Texas)
Figure 7.3. Map showing differences in 100-year 24-hour estimates (in inches) between NA14 and TP40 for Texas. Superimposed on the map are isohyets (blue lines) from TP40.
Harvey Effects

Harvey broke all multi-day rainfall records and became the official highest amount of rainfall ever to fall on the continental U.S. from a single storm, with total of 60.58 inches over a 7-day period.

- NOAA Atlas 14, Volume 11 (page 27)

Estimates in the Houston area did increase significantly relative to TP40 across all durations and frequencies, but...Harvey's effect is noteworthy only at longer durations and rarer frequencies (100-year ARI or above).

- NOAA Atlas 14, Volume 11 (page A.4-19)

% Change in Final Estimates (100-year, 24-hour) Due to Harvey (page A.4-19)
Atlas 14, Volume 11 (Texas)

- Web-Based Data Released October 2018
- Full Report Released February 2019

[https://hdsc.nws.noaa.gov/hdsc/pfds/](https://hdsc.nws.noaa.gov/hdsc/pfds/)
Using Atlas 14 Data

- All Rainfall Data Based on Rainfall Gages
- “Averaged” and set into a grid-based format
- +/- 200 acre grid size

### PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)

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- Difficult to regulate and review
HCFCD Rainfall Regions -1988

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HCFCD Rainfall Regions - 2019

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<tr>
<td>III</td>
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Watershed and FEMA Studies

- Need Consistent and Appropriate Watershed-Wide Rainfall
  - MAAPnext
  - HCFCD planning
  - H&H studies for large developments
- Duration and Depth of Rainfall
  - Regional approach

![Frequency Storm Table](image)
Storm Sewers & Ditches

• Designed to carry peak flows
  • 2-year design storm
  • Rational Method $Q = CIA$
  • Intensity (inches/hour) of the design storm
    • Previous intensities based on TP-40 rainfall
    • Changes to rainfall = changes to design storm intensity
    • Changes to intensity = changes to peak flows
Storm Sewers & Ditches

- Intensity-Duration-Frequency Curves
  - Same curve used by COH and HC

- New IDF curves generated for each region (3)
Stormwater Detention

• Higher Rainfall means Higher Flows
  • Developed AND undeveloped conditions
  • Harris County soils have very low infiltration rates
Recap of Rainfall Changes

• HCFCD 3-Region Rainfall

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<td>100-Year</td>
<td>500-Year</td>
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<td>Current</td>
<td>Atlas 14</td>
<td>% change</td>
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<td>1</td>
<td>Addicks, Barker, Cypress, Little Cypress, Spring, Willow</td>
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<td>17.1%</td>
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<td>2</td>
<td>Brays, Bufalo, Greens, Hunting, Luce, San Jacinto (u/s Lake Houston), Sims, White Oak</td>
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<td>15.9%</td>
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<tr>
<td>3</td>
<td>Armand, Carpenters, Cedar, Clear, Galveston Bay, Goose, Jackson, San Jacinto (d/s Lake Houston), Vince</td>
<td>4.5</td>
<td>5.3</td>
<td>17.8%</td>
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</table>
Impacts of Rainfall Changes

• Direct Result of Increased Rainfall
  • Intensity-Duration-Frequency Curve Changes
  • Site Runoff Curve Changes
  • Direct Runoff Volume Changes

• Indirect Result of Increased Rainfall
  • Minimum Detention Rate Review
  • Floodplain Fill Mitigation Review
IDF Curve Changes

- Used in Rational Method Calculations
  - Fugate curves used prior to 1990s
  - IDF curves used from early 1990s
- Not Directly Referenced in PCPM
  - Updated for use by Harris County and other cities at their discretion
- IDF Curves Created for 3 Regions
  - Harris County uses Region 3 IDF curve countywide for storm sewer design
IDF Curve Changes

• Generally results in an increase in peak flows
  • +/- 10% in the 2-year event
  • +/- 20% in the 100-year event
Site Runoff Curve Changes

• Site Runoff Curves (PCPM Section 3.3.5)
  • Peak flows for sites up to 640 acres
  • Used in HCFCD Method 1/2 detention analysis

• Site Runoff Curves Recalculated
  • Atlas 14 rainfall depths
  • Results are generally higher than previous SRCs
  • No future updates needed
Direct Runoff Volume Changes

- Direct Runoff Volume (PCPM Section 3.6.5)
  - Based on impervious cover
  - Used with SRC peaks in Small Watershed Method
  - Used in HCFCD Method 2 detention analysis
- Direct Runoff Volume Recalculated
  - Atlas 14 rainfall depths
  - Harris County soil loss data
  - No future updates needed
Detention Rate Review

- Detention Required for 2-, 10-, and 100-yr Events
  - Minimum detention rate applies to 100-yr event
- HCFCD Hydrologic Analysis Methods
  - Method 1 Small Project Analysis
    - Minimum detention rate used and simple outfall calculations
  - Method 2 Moderate Project Analysis
    - Basin routing to calculate detention volume and outfall structure sizing
  - Method 3 Watershed Analysis
    - Effective HEC-HMS/HEC-RAS used
    - Full watershed analysis for detention volume and outfall structure sizing
Detention Criteria Updates

- HEC-HMS Modeling (100-year)
  - 15 existing developments
  - 24-hour storm with updated rainfall
  - Models showed average increase of 0.1 ac-ft/acre with Atlas 14 rainfall
Detention Criteria Updates

• Spreadsheet Analysis (100-year)
  • Small Watershed Method hydrograph comparison
  • Estimated detention size increase about 20%
Detention Rate Updates

• Minimum Detention Required
  • Method 1 – $0 < 20$ acres - $0.65$ ac-ft/ac
  • Method 2 – $20 < 640$ acres - $0.65$ ac-ft/ac
  • Method 3 – $0.55$ ac-ft/ac

• Pumped Detention Rate
  • $0.75$ ac-ft/ac – no changes since pump capacity is typically controlling factor

• These rates are minimum and in some cases will require more detention.
Floodplain Mitigation

- MAAPnext is Underway
  - [www.maapnext.org](http://www.maapnext.org)
  - 1D/2D watershed models
  - Will result in new and different floodplains
- Current 500-year, 24-hour rainfall
  - 17.7-19.3 inches
- Atlas 14 100-year, 24-hour rainfall
  - 16.3-17.9 inches
- 500-year floodplain is a reasonable “proxy” for future Atlas 14 100-year floodplain
Floodplain Mitigation

- Projects within 500-Year Floodplain
  - Provide 500-year floodplain fill mitigation
  - Perform 500-year conveyance analysis as necessary to ensure no adverse impacts
- Method 3 Watershed Analysis for Detention
  - Use effective HCFCD models
  - Include 500-year impact analysis and mitigation
  - No adverse impact up to and including 500-year event
- HCFCD Not Floodplain Administrator
  - CLOMR/LOMR still required for regulatory floodplains (100-year) per FEMA
Floodplain Mitigation

- Crossings Over HCFCD Channels
  - New bridge low chord 18" above BFE or at or above 500-year, whichever is higher
  - Will be variances as long as no adverse impacts shown up to 500-year
  - Twin bridges/bridge widening – must show no adverse impacts up to 500-year
Interim Guidelines and Criteria

- Amendment to October 2018 PCPM Updates
- Remainder of PCPM is valid
Interim Guidelines and Criteria

- Interim Guidelines Address Criteria Between Now and MAAPnext Completion
  - Adoption of “Best Available Data”
  - Anticipated to be late 2021
Vested Rights

- Per Texas LGC Chapter 245
  - Projects underway before new criteria can claim vested rights
  - Review occurs under criteria that was in effect when project was started
  - Project cannot go “dormant”
- Vested Rights must be requested
  - Harris County form and affidavit
  - Engineer note
  - Engineer self-certification
- Applies to All Projects Needing Permits
  - Regardless of owner
The following plan note must be affixed to the cover page of every plan that is determined to have Vested Rights by Harris County. The Project Engineer’s signature and seal confirm this statement.

“On <<date>>, the Engineer whose seal and signature appear on this plan has formally and voluntarily requested that this plan be reviewed under the Floodplain and Infrastructure Regulations and in effect at the time of the initial application or plan submittal in accordance with Texas Local Government Code Chapter 245. The Engineer has demonstrated that the initial application or plan submittal meets the qualifications for Vested Rights and therefore Harris County has signed these plans based on the regulations in effect at the time of the initial project submittal. The Engineer acknowledges that the current Harris County Floodplain and Infrastructure Regulations are based on technical information that more accurately defines flood risk than any prior regulations under which a Vested Rights determination has been sought.”

If the proposed fill is located partially or entirely in Shaded Zone X, the following plan note and calculation must also be affixed to the cover page of every plan that is determined to have Vested Rights by Harris County. The Project Engineer’s signature and seal confirm this statement:

“Additional Volume of Proposed Fill Material Proposed that Remains Unmitigated due to Petition for Vested Rights - ______ Cubic Yards”
Vested Rights

• Owner’s Affidavit Says (among other things)…
  • By developing the Project with a permit issued under a Vested Rights determination, Owner is voluntarily electing to develop the Project in a manner that is not in compliance with the current Regulations of Harris County, Texas for Floodplain Management and the Harris County, Texas Regulations for the Approval and Acceptance of Infrastructure; and that such development is against the recommendation of the Harris County Engineer.
  
  • THE DEVELOPMENT OF THE PROJECT WITH A PERMIT THAT HAS BEEN ISSUED UNDER A VESTED RIGHTS DETERMINATION MAY CAUSE FLOODING ON THE PROPERTY OF OTHERS. FURTHER, FAILING TO MITIGATE FLOOD RISKS USING BEST AVAILABLE DATA MAY RESULT IN THE LIABILITY OF OWNER FOR FLOOD DAMAGE TO THE PROPERTY OF OTHERS.

  • Owner has read Section 11.086 of the Texas Water Code and is familiar with the provisions of said statute.
What’s Next?

• Full PCPM Review and Update
  • Starting in 2021 as preliminary results from MAAPnext are coming in
  • Review of all sections and extensive public input
  • Revisions released after preliminary map adoption as best available data

• Revisions to HCFCD H&H Guidance Manual
  • Replacing standard hydrologic methods with Basin Development Factor (BDF) hydrology
  • Updating all rainfall and related information
  • Updates to 1D Unsteady and 2D guidance manuals
Harris County Engineering
Revisions to Floodplain & Infrastructure Regulations and Response to HB 3167
Agenda

• Infrastructure Regulations
• Floodplain Regulations
• Vested Rights
• Substantial Damage
• Outstanding Violations
• Floodplain Easements
• TX HB 3167 / Concurrent Review
This Regulation is being revised and approved based on the knowledge that the effective Flood Insurance Rate Maps (FIRMs) do not accurately define flood risks because they are based on rainfall information that has since been updated.

The National Oceanic and Atmospheric Administration’s (NOAA) Atlas 14 precipitation frequency analysis indicates that the updated 100-year frequency rainfall approximates the current 500-year frequency rainfall. Therefore, this Regulation has been adjusted to reflect that fact.

Upon issuance of the new FIRMs using updated rainfall data as part of the MAAPnext project undertaken by the Harris County Flood Control District and FEMA, and concurrent with their adoption, this Regulation may require adjustments to more accurately regulate flood risks.
Infrastructure Regulations

- Updated depth-duration-frequency tables, IDF coefficient chart, and site runoff curves
- HCED will implement Region 3 data ONLY for storm sewer design

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<td>17.7</td>
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<td>Clear Creek</td>
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AEP - annual exceedance probability
Infrastructure Regulations

- Updated Minimum Detention Criteria for Storm Sewer Outfall
- **0.65 ac-ft/ac to 0.75.**
- Matches the 0.1 ac-ft/ac increase in HCFCD PCPM.

(2). Storm sewer outfall – Unless otherwise directed by the County Engineer, Minimum storage rate of 0.675 ac-ft/ac to 0.75 ac-ft/ac unless a formal Method 2 hydrologic and hydraulic analysis, as defined by the current most recently amended Harris County Flood Control District Design Criteria Manual, shows a lower rate and volume is acceptable. The discharge rate shall be limited to the existing storm sewer capacity allocated to the tract.

2. **RESIDENTIAL / SUBDIVISION DRAINAGE**

I. PROPOSED DRAINAGE SYSTEM TYPE

- STORM SEWER
- ROADSIDE DITCH
- LOW IMPACT DEVELOPMENT (LID)

II. DESIGN METHOD USED

- CITY OF HOUSTON _____ YEAR FREQUENCY
- OTHER: ____________________________

III. DRAINAGE SYSTEM OUTFALLS DIRECTLY TO EXISTING

- DETENTION POND (APPROVED H.C. PRJ NO.): ________________
- DETENTION POND MAINTAINED BY: ________________
- HCFCD DRAINAGE DITCH UNIT NO.: ________________
- H.C. ROADSIDE DITCH (ROAD NAME): ________________
- H.C. STORM SEWER (APPROVED H.C. PRJ NO.): ________________

IV. H.C. OUTFALL CALCULATIONS

- ROADSIDE DITCH OUTFALL:
  - ALLOWABLE OUTFALL RATE: 0.0027 x _____ LF Frontage = _____ (CFS)
  - PROPOSED OUTFALL RATE: _____ (CFS), CALCULATIONS PROVIDED ON SHEET ____

- STORM SEWER OUTFALL
  - CAPACITY ALLOCATED TO TRACT FROM D.A. MAP: _________ (CFS)
  - FROM DRAINAGE AREA MAP DATED: ________________
  - PREPARED BY: ________________________________
  - APPROVED H.C. PROJECT NO.: ________________
  - ACTUAL OUTFALL RATE: _____ (CFS), CALCULATIONS PROVIDED ON SHEET ____

V. DETENTION PROVIDED BY

- DETENTION BASIN IS PART THIS PLAN SET. SERVICE AREA MAP IS ON SHEET ____
- REGIONAL DETENTION BASIN SYSTEM (APPROVED H.C. PRJ NO.): ______________

PROPOSED STORM SEWER IS SUBMERGED (AGREEMENT MUST BE PROVIDED).
STATIC W.S.E. @ OUTFALL IS __________________________.
Updated Floodplain Mitigation Definition:

“Floodplain Mitigation” means a hydraulically equivalent volume of floodplain storage sufficient to offset a reduction in floodplain storage or conveyance capacity of the 1 percent or 100-year floodplain located outside a coastal area.

Updated Section 4.07(e) Conditions of a Class II Permit:

“Any reduction in floodplain storage or conveyance capacity within the 1 percent, 0.2 percent or 100-year-500-year floodplain must be offset with a hydraulically equivalent (one-to-one) volume of mitigation sufficient to offset the reduction.”
Floodplain Regulations

Current Impacts:
- 1:1 fill mitigation 500-yr floodplain
- New detention rate not accounted for in master planned communities
- Conveyance of additional runoff on a developed site
- Existing regional facilities or reduced service area
Vested Rights

“Vested Right(s)” - rights which allow a person to “freeze” or “vest” governmental regulations

“Administratively Complete” - a completed permit application with all required fees and all the required documents or plans listed on the Administratively Complete Checklist
  - An Administratively Complete permit application is ready for technical review.

“Substantial modification” - changes to the approved Plans, plat, and/or drainage report or change of use that will increase impervious cover, or the volume and/or peak discharge of the stormwater runoff from portions of, or the whole of the project or any other change that would affect the volume or peak discharge of stormwater runoff that would cause adverse impacts to off-site properties.

Replaces 2-year expiration for construction site plans and 5 year expiration for master planned community plans (from date of approval).
Vested Rights – Dormant Projects

If no progress has been made towards completion of a project, the project will be deemed a Dormant Project and an expiration date of two years will be placed on the associated Permit. Progress includes any one of the following:

1. Application for plan or plat
2. Good-faith attempt to file an permit application
3. Costs up to 5% of market value of property
4. Bond
5. Utility fees

PLAN REVIEW COMMENT – VESTED RIGHTS

The design does not meet current regulations effective July 9, 2019 - please revise or submit Petition for Vested Rights - http://www.eng.hctx.net/Portals/23/Notifications/Petition_Vested_Rights_Determination.pdf

Joel Mendez
(FCD Watershed Plan Review)
(Program Management)
joel.mendez@hfcfd.org
Vested Rights

Vested Rights Determination:
- Preliminary Plat submitted, not substantially modified
- Permit application submitted, not substantially modified
- Drainage report submitted, not substantially modified

Subject to Local Government Code § 245.004(9), the rights to which a permit applicant is entitled shall accrue are as follows:

1. Projects with a completed or unexpired administratively complete application for Preliminary Plat submitted (does not include General Plans) to Harris County or a municipality on or before midnight of the effective date of the most currently amended Regulations provided that the project is not Substantially Modified; or

2. An administratively complete development permit application that is submitted to the County Engineer on or before midnight of the effective date of the most currently amended Regulations provided the project is not Substantially Modified; or

3. An administratively complete submitted drainage report for a development project to the County Engineer on or before midnight of the effective date of the most currently amended Regulations provided the project is not Substantially Modified.
Vested Rights

PETITION FOR VESTED RIGHTS - http://www.eng.hctx.net/permits
The following plan note must be affixed to the cover page of every plan that is determined to have Vested Rights by Harris County. The Project Engineer’s signature and seal confirm this statement.

“On <<date>>, the Engineer whose seal and signature appear on this plan has formally and voluntarily requested that this plan be reviewed under the Floodplain and Infrastructure Regulations and in effect at the time of the initial application or plan submittal in accordance with Texas Local Government Code Chapter 245. The Engineer has demonstrated that the initial application or plan submittal meets the qualifications for Vested Rights and therefore Harris County has signed these plans based on the regulations in effect at the time of the initial project submittal. The Engineer acknowledges that the current Harris County Floodplain and Infrastructure Regulations are based on technical information that more accurately defines flood risk than any prior regulations under which a Vested Rights determination has been sought.”

If the proposed fill is located partially or entirely in Shaded Zone X, the following plan note and calculation must also be affixed to the cover page of every plan that is determined to have Vested Rights by Harris County. The Project Engineer’s signature and seal confirm this statement:

“Additional Volume of Proposed Fill Material Proposed that Remains Unmitigated due to Petition for Vested Rights - ____ Cubic Yards”

“Owner’s Acknowledgement Regarding Issuance of Permit under Vested Rights Determination” is required as part of the Petition for Vested Rights. See pages 3 and 4.
Vested Rights

PETITION FOR VESTED RIGHTS - [http://www.eng.hctx.net/permits](http://www.eng.hctx.net/permits)

OWNERS ACKNOWLEDGEMENT REGARDING ISSUANCE OF PERMIT UNDER VESTED RIGHTS DETERMINATION

I, ________________, ("Owner") hereby acknowledge and agree to the following:

1. I am the Owner of certain land in Harris County, Texas, commonly known as: ____________________________
   (Provide Legal Description of Property)

2. As required by law, Harris County has issued a development permit to Owner for a project to be performed on the Property (the "Project") as a result of a Vested Rights determination made in accordance with Tex. Loc. Gov’t Code Section 245.001, et seq.

3. A permit issued under a Vested Rights determination is not based on best available data that more accurately defines flood risks and, by requesting a Vested Rights determination, Owner is voluntarily electing to develop the Project without using the best available data for flood mitigation design.

4. A permit issued by Harris County in recognition of Owner’s Vested Rights is not a determination that the Project on Owner's Property is being constructed in compliance with current state law.

5. By developing the Project with a permit issued under a Vested Rights determination, Owner is voluntarily electing to develop the Project in a manner that is not in compliance with the current Regulations of Harris County, Texas for Floodplain Management and the Harris County, Texas Regulations for the Approval and Acceptance of Infrastructure; and that such development is against the recommendation of the Harris County Engineer.

6. THE DEVELOPMENT OF THE PROJECT WITH A PERMIT THAT HAS BEEN ISSUED UNDER A VESTED RIGHTS DETERMINATION MAY CAUSE FLOODING ON THE PROPERTY OF OTHERS. FURTHER, FAILING TO MITIGATE FLOOD RISKS USING BEST AVAILABLE DATA MAY RESULT

IN THE LIABILITY OF OWNER FOR FLOOD DAMAGE TO THE PROPERTY OF OTHERS.

7. Owner has read Section 11.086 of the Texas Water Code and is familiar with the provisions of said statute.

Signature of Owner

Print Name of Owner (If Individual)

TENANT'S ACKNOWLEDGEMENT REGARDING ISSUANCE OF PERMIT UNDER VESTED RIGHTS DETERMINATION

Owner acknowledges that the development of the Project on Owner’s Property may cause flood damage to the property of others and that Owner is aware of the provisions of Section 11.086 of the Texas Water Code that limit the liability of the Owner for such damages.

Acknowledged, subscribed and sworn to before me by ____________________________ (Signatory’s Name), as (title) ________________ (Owner’s Name), a _____________ day of ____________, 20_______

(SEAL)

Notary Public

In and for the State of Texas

My Commission Expires ________________

Haris County

HARRIS COUNTY ENGINEERING DEPARTMENT
Vested Rights

OWNER ACKNOWLEDGEMENTS

1. Harris County issued a permit based on Vested Rights per State Law
2. Owner is developing without using best available data
3. An issued permit is not a determination that project follows State Law
4. Owner is voluntarily developing a project not in compliance with Harris County Regulations
5. THE DEVELOPMENT OF THE PROJECT WITH A PERMIT THAT HAS BEEN ISSUED UNDER A VESTED RIGHTS DETERMINATION MAY CAUSE FLOODING ON THE PROPERTY OF OTHERS. FURTHER, FAILING TO MITIGATE FLOOD RISKS USING BEST AVAILABLE DATA MAY RESULT IN THE LIABILITY OF OWNER FOR FLOOD DAMAGE TO THE PROPERTY OF OTHERS.
Engineer Self Certification

The Texas Engineering Practice Act imposes a standard of care that requires Texas engineers to protect public health, safety, and welfare. In the context of drainage and floodplain management, and the proposed construction of a new development, ASCE believes that this standard of care should be viewed as follows:

• Floodwater will not inundate any proposed structures, nor worsen any flooding for existing structures, for storms up to and including the Atlas 14 one percent annual exceedance probability event;

• Water surface elevations created by the Atlas 14 one percent annual exceedance probability event upstream of the development do not increase as a result of the development; and,

• Water surface elevations created by the Atlas 14 one percent annual exceedance probability event downstream of the development do not increase as a result of the development.
Engineer Self Certification

• Engineer conducts analysis using Atlas 14 rainfall (or the rainfall depth used in the applicable FIS to predict the 500-year floodplain in the current effective FIRM) and maintains the results in their project files.

• Engineer prepares signed and sealed plans with the following certification added:

The design of this project, as shown on these signed and sealed construction plans, has been analyzed using Atlas 14 data and it has been found that: {1} floodwater will not inundate any proposed structures, nor worsen flooding for existing structures, for storms up to and including the one percent annual exceedance probability event; {2} water surface elevations created by the one percent annual exceedance probability event upstream of the development do not increase as a result of the development; {3} water surface elevations created by the one percent annual exceedance probability event downstream of the development do not increase as a result of the development; and, {4} proposed finished floor elevations of new structures comply with Harris County Floodplain Regulations.
Engineer Self Certification

ASCE Recommendation and Harris County Response - http://www.eng.hctx.net/permits

HARRIS COUNTY
OFFICE OF THE COUNTY ENGINEER
1001 Preston, Suite 600
Houston, Texas 77002
(713) 755-5370

September 27, 2018
American Society of Civil Engineers
Houston Branch
P.O. Box 420472LL
Houston, TX 77242
Attn: Julia P. Clarke, P.E., President
Attn: Michael F. Bloom, P.E., President, Houston Chapter Environmental & Water Resources Institute

Subject: Response to ASCE Letter Dated September 17, 2019 entitled “Proposed Certification Statement and Frequently Asked Questions Pertaining to Phased Projects with Development Permits Issued Both Before and After July 9, 2019 Rule Changes”

Dear Ms. Clarke and Mr. Bloom:

The Harris County Engineering Department appreciates the opportunity to work with the American Society of Civil Engineers Houston Branch (ASCE) in providing clarification related to the nuances in implementation of regulatory changes based on the recently released Atlas 14 rainfall probabilities for our region.

Your attached letter, dated September 17, 2019, addresses many of the questions and concerns both of our entities have heard from the engineering community. We agree with the recommendations presented, and agree that development projects designed in accordance with the ASCE recommendations meet the intent of the recent Atlas 14 related changes to Harris County development regulations.

If you have any further questions or concerns related to implementation of the Harris County regulatory changes brought about due to Atlas 14 rainfall estimates, please do not hesitate to contact General Services Division Manager, Alissa Max, P.E. at Alissa.Max@eng.hctx.net or Permits Manager, Jon Steiber, P.E. at Jon.Steiber@eng.hctx.net.

Sincerely,

John J. Blount, P.E.
County Engineer

Attachment
JRB/asm

cc: Russell Polge, HCFCDD
    Matt Zewe, HCFCDD
    Alissa Max

Shawn Sturhan
Jon Steiber

RE: Proposed Certification Statement and Frequently Asked Questions Pertaining to Phased Projects with Development Permits Issued Both Before and After July 9, 2019 Rule Changes

Dear Mr. Blount:

The Houston branch of the Texas Section of the American Society of Civil Engineers (ASCE) appreciates the opportunity to work with your office. We have been collaborating on how to appropriately seek development permits for the later phases of multi-phased development projects with initial phases approved prior to the enactment of the July 9, 2019 drainage and floodplain management regulations. These new regulations followed the publication of the National Weather Service’s Precipitation-Seasonal Frequency Atlas of the United States, Atlas 14, Volume 11, Version 2.0: Texas (“Atlas 14”), which provides the most current information about rainfall statistics and, indirectly, about flooding risks.

As you know, the Texas Engineering Practice Act imposes a standard of care that requires Texas engineers to protect public health, safety, and welfare. In the context of drainage and floodplain management, and the proposed construction of a new development, ASCE believes that this standard of care should be viewed as follows:

- Floodwater will not inundate any proposed structures, nor worsen any flooding for existing structures, for storms up to and including the Atlas 14 one percent annual exceedance probability event;
- Water surface elevations caused by the Atlas 14 one percent annual exceedance probability event upstream of the development do not increase as a result of the development; and
- Water surface elevations caused by the Atlas 14 one percent annual exceedance probability event downstream of the development do not increase as a result of the development.

After the publication of Atlas 14, Harris County updated its regulations to reflect the new information about rainfall. Application of these regulations frequently result in designs that provide a lower risk of flooding than that required by the standard of care.
<table>
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<tr>
<th>Options</th>
<th>Does the Project meet the new Harris County Regulations?</th>
<th>Does the Project meet Texas Engineering Practice Act requirements? Engineer analyzed Atlas 14 rainfall and found no adverse impact (upstream/downstream/to the development itself)?</th>
<th>Harris County Requirement:</th>
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<tbody>
<tr>
<td>Option 1</td>
<td>Yes</td>
<td>Yes</td>
<td>No vested rights. Normal permitting.</td>
</tr>
<tr>
<td>Option 2</td>
<td>No</td>
<td>Yes (see attached ASCE letter for clarification, supporting evaluation not submitted to or reviewed by Harris County)</td>
<td>Engineer self certifies plans (sample in ASCE letter). No vested rights application nor owner's affidavit.</td>
</tr>
<tr>
<td>Option 3</td>
<td>No</td>
<td>No</td>
<td>Application for vested rights approved by County Engineer required. Plan note and owner's affidavit required. See HC Permits website.</td>
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</table>
Substantial Damage

Substantial damage applies to a structure in a Special Flood Hazard Area (SFHA), or 1% annual chance floodplain, for damages of any origin sustained by the structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

$100,000 structure w $55,000 damage: $55/100 = 55%
Substantial Damage

SUBSTANTIAL DAMAGE DETERMINATIONS

Phase 1 - House Counts
- Locate all flooded structures
- Depth vs market value analysis

Phase 2 - On-site Inspections
- FEMA-approved damage estimator (RSDEv3)
REBUTTING THE SUBSTANTIAL DAMAGE FINDING

- **Provide an estimate** by an independent Texas licensed property and casualty adjuster showing lower cost to repair the structure to pre-damage condition

  $100,000 structure w $55,000 damage: \( \frac{55}{100} = 55\% \)
  
  $120,000 structure w $55,000 damage: \( \frac{55}{120} = 46\% \)

- **Submit a certified appraisal** showing that the structure is valued higher than the HCAD taxable value.

  $100,000 structure w $55,000 damage: \( \frac{55}{100} = 55\% \)
  
  $100,000 structure w $35,000 damage: \( \frac{35}{100} = 35\% \)
Substantial Damage

SECTION 5.01 – SUBSTANTIAL DAMAGE DETERMINATIONS

In cases where the structure is covered by insurance and the property owner receives a flood insurance payment, the “Proof of Loss” statement shall be used by the County Engineer to value the cost to repair the structure. In cases where the structure is covered by insurance and the payment for damage to the structure (excluding contents) is over 95% of the value of the structure, the structure shall be deemed substantially damaged regardless of any other data submitted, except for the submittal of a certified appraisal showing that the structure is valued higher than the HCAD taxable value.

$100,000 structure w $99,000 insurance payment for structure (no contents):
99/100 = 99%

$150,000 structure w $99,000 insurance payment for structure (no contents):
99/150 = 66%
Substantial Damage

SECTION 5.01 – SUBSTANTIAL DAMAGE DETERMINATIONS

- Cannot be substantially damaged if the finished floor is at or above the 1 percent or 100-year flood level
- Substantially Damaged structures must be brought into compliance with the most recently amended Floodplain Management regulations.
- The property owner must obtain a Permit
SECTION 4.02 – OUTSTANDING VIOLATIONS

No new Permit will be issued to a property so long as there are outstanding or unresolved violations under these Regulations on the contiguous property. For purposes of Section 4.02, resolution of the violation may be achieved by addressing the violation in the site plan. The application for a Permit shall be deemed incomplete if it does not address the outstanding violations as part of site plan.
Floodplain Easements

Section 2.04 - BUILDABLE AREA

“Buildable Area” means that portion of a residential lot shown on a final plat upon which a single-family dwelling unit or a multi-family residential structure may be lawfully constructed, located or placed, including a site built home, modular home, manufactured home, duplex, townhouse, or a multi-unit residential building, in accordance with applicable building restriction lines, covenants, plat notations, and setbacks, if any.
Floodplain Easements

SECTION 4.03 - PLAT CRITERIA

5. Surveyor shall delineate the limits of the 100-year floodplain on a final plat and designate a Floodplain Easement on that portion of all residential lots where the buildable area is within the 100-year floodplain.

SECTION 4.06 - RECORDATION REQUIREMENTS

11. If a property lies within the 100-year floodplain as shown on the most recent FIRM adopted by Harris County, the floodplain must be delineated graphically on the final plat. Surveyor shall designate a Floodplain Easement on that portion of all residential lots where the buildable area of those residential lots is within the 100-year floodplain. Refer to Section 4.08 for floodplain easement dedicatory language.
Floodplain Easements

SECTION 4.08 - DEDICATORY LANGUAGE ON PLATS

Additional certification on the plat must indicate the floodplain status of the buildable areas on “residential lots” on the plat, referring to the applicable Flood Insurance Rate Map panel and effective date.

Buildable Areas Outside the Floodplain:
“I, ____________________, a Registered Professional Licensed Surveyor in the State of Texas, do hereby certify that the buildable areas for all residential lots are outside [or, are proposed to be outside, based on engineering plans and specifications submitted to the County Engineers Office,] the 100-Year Floodplain as shown on Federal Insurance Rate Map Panel No. [insert panel number] dated [insert effective date of map]. This certification is based solely on plotting boundaries from the FIRM Map, and no technical analysis was conducted.”

Buildable Areas in the Floodplain:
“I, ____________________ a Registered Professional Licensed Surveyor in the State of Texas, do hereby certify that the buildable areas for all or some of the residential lots are located within the 100-year floodplain as plotted from the Federal Insurance Rate Map Panel No. [insert panel number] dated [insert effective date of map] and are subject to flooding. The 100-year floodplain is a flood hazard area prone to flooding, and subject to additional floodplain management regulations.”
SECTION 4.07 – FLOODPLAIN EASEMENTS ON PLATS

“A Floodplain Easement is hereby established over that portion of the effective 100-year floodplain area as delineated from FIRM PANEL No. XXXX dated XXXX within the boundary of this final plat, the limits of which impact the buildable areas of residential lots, wholly or partially, and within such area is prone to flooding. (*See attached sketch.) Construction of any type of residential housing within a Floodplain Easement is subject to additional flood hazard area regulations. A Floodplain Easement may be abandoned by Harris County Commissioners Court if the buildable area of a residential lot is determined to be outside the 100-year floodplain by submitting County Engineer’s Form 1226, with the applicable documentation and fee, to the Office of the County Engineer.”
Floodplain Easements

SECTION 4.07 – ABANDONMENT OF FLOODPLAIN EASEMENT

1. County Engineers Form 1226 including providing proof that the buildable area of a specific residential lot(s) has been removed from the mapped 100-year floodplain by a letter of map revision (LOMR) or a letter of map amendment (LOMA).

2. Submit the applicable fee, to be the same as a permit for a single family residence outside the floodplain, currently $75.00.

3. Once received, reviewed and approved by the Office of the County Engineer, a Court Order will be submitted to Commissioners Court, abandoning the Floodplain Easement on the residential lot(s).

4. Once approved by Commissioners Court the County Engineer will file the abandonment in the Real Property Records of Harris County.
Floodplain Easements

HARRIS COUNTY
ENGINEERING DEPARTMENT
10555 Northwest Fwy., Suite 120
Houston, Texas 77082
(713) 274-3800

Request for Abandonment of Flood Plain Easement

Contact Information

Applicant Name: ____________________________
Address: __________________________________
Phone: ______________ Email: _______________

Owner Name: ______________________________
Address: __________________________________
Phone: ______________ Email: _______________

Legal Description of Property Where Flood Plain Easement is Located

Section: ______ Lot: ______ Block: ______

Provide the following data to support the abandonment:
1. A copy of the survey showing the easement
2. A drawing sealed by an engineer or surveyor showing the ground elevations in the "buildable area"
3. A copy of the FIRM, FIS, or Map Amendment indicating the current base flood elevation

Signature ______________________ Date __________

Internal Use Only

County Engineer Signature Court Order Date

CEForm1226
TX House Bill 3167

- Amends TX LGC 232 – County Regulation of Subdivisions
- 86th Legislature, 2019-2020
- Passed June 4, 2019 – Effective September 1, 2019
- Affects “Development Plans”
  - Site Plan Application

1. 30 days 1st review, 15 days subsequent reviews
2. 10 days to determine missing documents
3. Disapproval of plans only for a specific reason provided with the original application
4. Automatic permit with no fee if timeline exceeded
TX House Bill 3167

- Harris County Permits response to HB 3167
  - 30 days 1st submittal & 15 days 2nd submittal
  - Previous linear review process changed to Concurrent Review Module (CRM)
  - Added 14 plan reviewers and inspectors
TX House Bill 3167

- Harris County Permits response to HB 3167
  - Updated grid showing progression
  - Auto-Return to Customer at 30/15 days
  - Management alerts

- Project Manager application
- Quick Assign feature
TX House Bill 3167

• Harris County Permits response to HB 3167
  • 10 days to determine missing documentation
  • Review for administrative completeness
  • Courtesy review
  • 30/15 day clock does not start until project is administratively complete
Thank you for submitting {%ProjectNumber%} {%ProjectName%} for property {%PropertyAddress%} to Harris County Permits Office. We have determined that your submitted project is Administratively Incomplete, the listed items below will need to be submitted as applicable.

- Plans:
  - HCFCQ approval
  - TXDOT approval
  - HCTRA approval
  - MUD utility capacity letter
  - Capital Improvement Project Division letter of Interpose No Objection
  - Pipeline easement encroachment agreement
  - Final plat approval
  - Notice of Detention affidavit
  - TIA approval
  - Drainage report approval
  - CLOMR approval for bridge
  - Maintenance agreements
  - SWQ Affidavit (completed and filed with the county clerk)
  - Permittee Certification of SWQ Management Requirements Form (only when a SWQMP is required)
  - SWQMP Engineer Certification Form (only when a SWQMP is required)
  - Meeting Minutes (LID projects)
  - SWQ Vegetative Easement (LID projects. Completed and filed with County Clerk w/meets and bounds attached)
  - Maintenance Declaration (LID Projects. Completed and filed with County Clerk w/exhibits attached)
  - Copy of Plat
  - Copy of Drainage Area Map (grandfathered projects)

As a courtesy, we will continue our assessment of the submitted application and documents. Please make the corrections as identified in e-Permits.
TX House Bill 3167

- Harris County Permits response to HB 3167
  - Disapproval for specific reason provided with original application

The submitted project shall comply with all regulations adopted by Harris County Commissioners Court located at http://www.eng.hctx.net/permits/All-Regulations-Documents-Forms. Additionally, the submitted project shall comply with all applicable Federal, State, and Local rules, laws and regulations, and any other legally adopted regulation or ordinance related to land development. Comments related to the submitted project are made in accordance with:

- Flood Control & Insurance Act
- Harris County Road Law
- Harris County Flood Control District Act of 1937
- Local Government Code
- Texas Water Code
- Texas Transportation Code
- Texas Administrative Code

Wendy Waddell
(HCED Quality Assurance Quality Control)
(Program Management)
wendy.waddell@hcpid.org
QUESTIONS