

**To the Mayor and Members of the City Council****September 6, 2022**

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**SUBJECT: THE ROLE OF STREETS AND FINISHED FLOOR ELEVATIONS
FOR STORMWATER MANAGEMENT**

The purpose of this Informal Report (IR) is to respond to the record number of reported street and structure flooding incidents from the August 21-22, 2022 rain event, to provide information regarding the role of street and finished floor elevation requirements for stormwater management, and to discuss the next steps for evaluating potential improvements in development regulations.

The August 21-22, 2022 Rain Event

The August 21-22, 2022 rain event brought over eight inches of rain in a 24-hour period to several parts of the City of Fort Worth (City), according to City rain gauge measurements. This amount of rain exceeded what would occur during a 50-year event, an event that has a 2% chance of occurring in any given year. DFW Airport reported 9.19 inches of rain in 24 hours, the second highest rainfall on record. The amount of rainfall at DFW Airport approximated a 100-year event, an event that has a 1% chance of occurring in any given year. Additionally, many other areas received over four and a half inches of rain in 24 hours, considered to be above a 5-year event, an event that has a 20% chance of occurring in any given year. In the City, the rainfall event resulted in reported flooding to 49 structures, 22 high water rescues, 237 flooded vehicles, and 58 overtopped road locations, with 17 out of 49 gauged and monitored hazardous road overtopping locations reporting flooding.

The Role of Streets

Paved streets with curbs and gutters are integral to local drainage systems across the City, helping to convey stormwater runoff to inlets and channels and providing roughly one foot of flood storage in the public right-of-way, away from residential and commercial structures. In developments constructed since the City's Stormwater Criteria Manual in 1975 (1975 Manual), stormwater regulations require runoff from a 5-year event to be contained within the top of curb and runoff from a 100-year event to be contained within the public right-of-way, which typically extends 10 feet beyond the curbs. Using a 100-year event to calculate runoff, any stormwater runoff that cannot fit within the public right-of-way must be contained within drainage pipes.

Streets in areas developed prior to the 1975 Manual were typically built to lower standards resulting in deeper street flooding (potentially up to 4 or more feet in some areas) and flooding beyond the public right-of-way. This includes many parts of the Central City, such as the Linwood area, which was mostly developed in the 1920s through the 1940s. These areas were also developed with storm drain systems that lacked the capacity to contain a 100-year event.

The Role of Finished Floor Elevation Requirements

In 1980, the City of Fort Worth joined the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program and adopted higher standards for floodplain management than what is required by FEMA minimum standards. One of the most important standards that the City adopted, through various regulations, was requiring finished floor elevations (known as freeboard) or floodproofing at least two feet above the regulatory flood elevation, as calculated by the City or by FEMA. These heightened standards provide protection to structures during heavy rain events. Currently, freeboard and floodproofing requirements are only regulated within (i) the FEMA floodplain; (ii) for developments over 1.0

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acre; (iii) common plan developments in which non-contiguous land disturbance totals over one acre; or (iv) properties being re-platted.

The lack of regulation for developments of less than one acre in flood-prone areas can lead to flooding of structures, especially in older areas, as recently occurred in the Linwood area.

Next Steps

As mentioned in an IR on August 16, 2022 (Informal Report No. 22-120), upcoming updates to the Floodplain Ordinance and Stormwater Criteria Manual will allow the City to more effectively regulate developments in non-FEMA City Flood Risk Areas (CFRAs), including those developments involving less than one acre, where detailed engineering has been performed to better understand the flood risk. An M&C will be brought to Council this fall requesting approval of these updates. Also beginning this fall, non-FEMA flood risk mapping will be placed on the City's website in two phases, so that residents and developers can better understand and consider flood risks.

Further, the Stormwater Program is currently evaluating changes in development regulations to consider the cumulative impact of increased stormwater runoff volume from impervious surface, which is not regulated currently. To address this issue, another IR will be provided to Council this fall and a presentation to the Mobility, Infrastructure and Transportation Committee will be made in September.

The establishment of interim development conditions, or the state of active development between pre-development and post-development, which is also currently not regulated, will also be evaluated in the future in conjunction with stakeholders to determine if regulation updates considering interim development conditions are warranted.

Questions about this Informal Report can be directed to Clair Davis, Floodplain Administrator, at 817-392-5981.

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City Manager