August 20, 2022 Storm Update

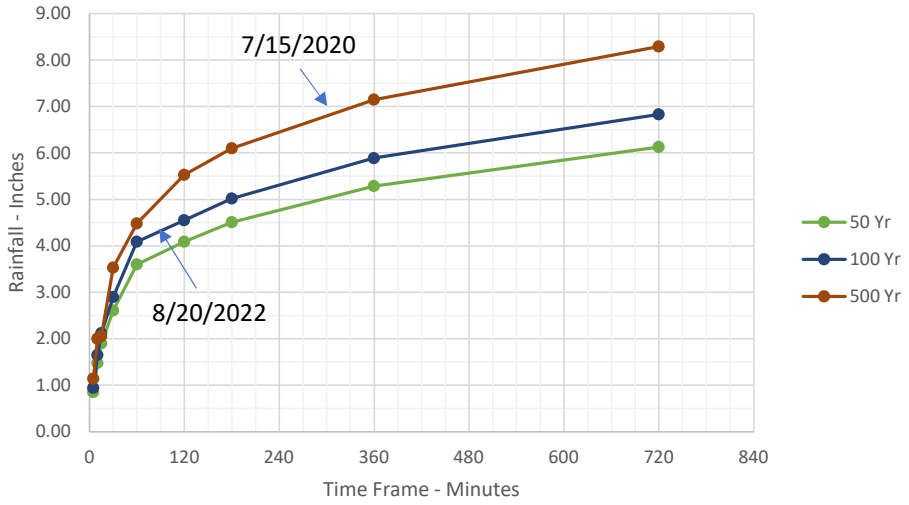
Rainfall Intensity – Bulletin 75

Storm Duration	2-month	3-month	4-month	6-month	9-month	1-year	2-year	5-year	10-year	25-year	50-year	100-year	500-year
5 minutes	0.19	0.21	0.24	0.27	0.30	0.33	0.40	0.52	0.61	0.74	0.85	0.94	1.14
10 minutes	0.33	0.38	0.41	0.47	0.53	0.58	0.70	0.90	1.07	1.30	1.48	1.65	2.00
15 minutes	0.42	0.48	0.53	0.60	0.68	0.74	0.90	1.16	1.38	1.67	1.90	2.12	2.57
30 minutes	0.58	0.66	0.72	0.83	0.94	1.02	1.23	1.59	1.89	2.29	2.61	2.90	3.53
1 hour	0.73	0.84	0.92	1.05	1.19	1.30	1.56	2.02	2.40	2.91	3.31	3.69	4.48
2 hours	0.91	1.04	1.14	1.29	1.47	1.60	1.93	2.49	2.96	3.60	4.09	4.55	5.53
3 hours	1.00	1.14	1.25	1.43	1.62	1.76	2.12	2.75	3.26	3.97	4.51	5.02	6.10
6 hours	1.17	1.34	1.47	1.67	1.90	2.07	2.49	3.23	3.83	4.65	5.29	5.89	7.15
12 hours	1.36	1.55	1.70	1.94	2.20	2.40	2.89	3.74	4.44	5.39	6.13	6.83	8.29
18 hours	1.47	1.68	1.84	2.10	2.38	2.59	3.12	4.04	4.79	5.83	6.63	7.38	8.96
24 hours	1.56	1.79	1.96	2.23	2.53	2.76	3.32	4.30	5.10	6.20	7.05	7.85	9.53
48 hours	1.69	1.93	2.12	2.41	2.73	2.98	3.59	4.61	5.47	6.65	7.55	8.40	10.21
72 hours	1.82	2.09	2.29	2.60	2.95	3.22	3.88	4.96	5.90	7.17	8.09	8.98	10.81
120 hours	2.01	2.30	2.52	2.87	3.26	3.55	4.27	5.42	6.42	7.75	8.72	9.60	11.54
240 hours	2.57	2.94	3.22	3.67	4.16	4.54	5.46	6.87	8.04	9.53	10.55	11.50	13.65

Rainfall Intensity – Local Storms

- 8/20/2022
  - Pintail Weather Gauge showed 4.4 inches in 90 Minutes
    - Short burst rainfall recorded at almost 10” per hour for a 10-15 minute duration
  - MacKenzie Weather Gauge showed 3.9 inches in 90 Minutes
  - High School Weather Gauge showed 3.4 inches in 90 Minutes
  - Multiple Local Rain Gauges between 4.5”-7” reported.

- 7/15/2020 (500 Year Event)
  - Pintail Weather Gauge showed 3.5 inches in 90 Minutes and 7 inches in 5 hours
  - MacKenzie Weather Gauge showed 3.5 inches in 90 Minutes and 6.9 inches in 5 hours
  - High School Weather Gauge showed 3.5 inches in 90 Minutes and 6.3 inches in 5 hours



Reported Findings

- Detention Basins Spillway Engaged
  - Calvin Drive – Closed Nofsinger
  - Pintail
  - Five Points
  - Kingsbury/Dallas
  - Mackenzie/Patricia
  - Coventry/Bishop
  - Kelsey
  - Cherry Tree Shopping Center
- Roadways Flooded
  - Westgate/Devonshire
  - Nofsinger Road
  - Calvin
  - Business 24
  - Holland/Spruce
  - Cedar @ St. Pats
  - Gilman
  - Elgin
  - Westminster/Dorchester

- 100 Year Flood Route from Patricia to Johnathon was engaged
  - Property Grading issues from builders has caused this area to not function properly
- Driveway behind Dallas/Westminster Church was under water
  - Driveway isn't designed for even a 25 year storm passage.
- Ditches out of banks in Felkers and Beverly Manner Areas
  - Ditches and culverts filled in
- The 223 Property was acting as a detention pond even with the large box culvert as an outfall structure.
- Multiple Feet of Water in BTD Parking Lot
  - Berm removed from adjacent field property

City of Washington Drainage

- The 100-Yr Event does not mean an event won't happen but once every 100 years. It is industry terminology for a storm intensity that has a 1% chance of happening during any given year.
- Local Weather patterns have produced isolated 50-100-500 Yr events in the recent years.
- Central Washington has been unlucky to have been hit twice in 3 years.

City of Washington Drainage Requirements

- Storm Sewer Sizing – 25 year event (Regional Average is 10)
- Overland Flow Route for 100 Yr Event
- Inlet Spacing Not Specified.
  - Water to not exceed curb height outside of a 100 – Yr Flow Route

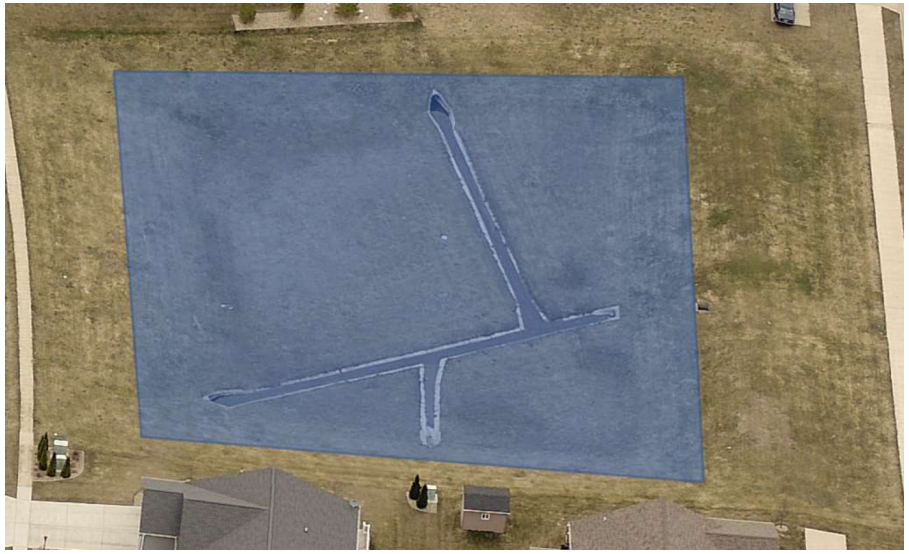
City of Washington
Detention Basin Requirements

- Detain a 25 Year event and Release at a 2 year pre-developed rate
- Primary Outlet Structure designed to control/release a 50 year event
- Emergency Spillway designed to control/release a 100 year event

- Regionally – Our Controls are in line with the region.

Dallas/Simon Basin Overview

25 Year Event Storage
Outfall – Pre-Developed 2 Yr Event



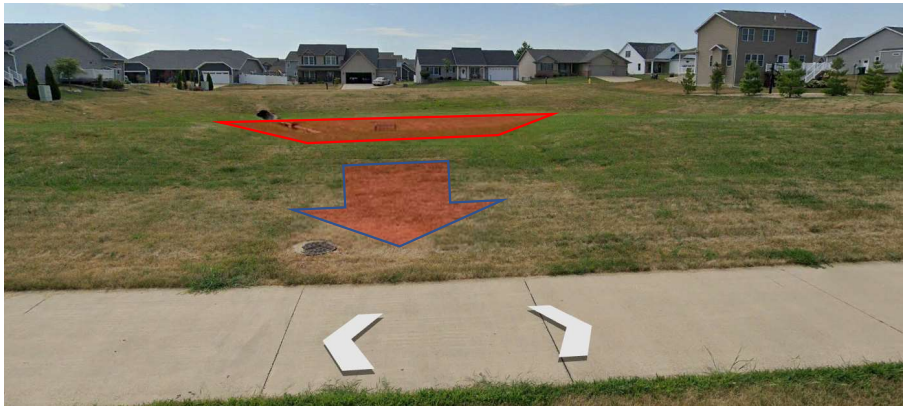
Storm is controlled and reduced to pre-development low flows. Increase in channel flows from surrounding properties is just as impactful as that from basins. Basins will continue low flow after the storm has expired.

50 Year Event Control
Primary Outfall Control Structure

There will be a sizeable increase in downstream flow when the primary outfall control engages.

Design philosophy shifts from detention to flow control of a storm.

100 Year Event Control
Emergency Spillway



Water will begin to flow through the spillway. Downstream flows will see the larger discharge from the outfall control structure as well as the flow from the spillway.

Design philosophy is to control flows and minimize damages to surrounding homes during the disaster until storm expires.