2% (50-year)

Levee Reach Name: A_50_2023, Return Period: 50 YR, Project Year: 2023

- $q_{90} = 0.057727$ cfs/ft
- $q_{50} = 0.0035423$ cfs/ft

Design Elevation = 8.5 ft; NAVD88 2004.65 ft

Still water level $z = 8$ ft; $\sigma_z = 0.00623$ ft

Significant wave height at toe $H_s = 2.4$ ft; $\sigma_{H_s} = 0.24$ ft

Peak period $T_p = 3s; \sigma_{T_p} = 0.6s$

Elevation (ft): NAVD88 2004.65 ft

Stationing (ft)

Levee Reach Name: A_50_2073, Return Period: 50 YR, Project Year: 2073

- $q_{90} = 0.048217$ cfs/ft
- $q_{50} = 0.0028666$ cfs/ft

Design Elevation = 11.5 ft; NAVD88 2004.65 ft

Still water level $z = 8$ ft; $\sigma_z = 0.00623$ ft

Significant wave height at toe $H_s = 2.4$ ft; $\sigma_{H_s} = 0.24$ ft

Peak period $T_p = 3s; \sigma_{T_p} = 0.6s$

Elevation (ft): NAVD88 2004.65 ft

Stationing (ft)
Levee Reach Name: B_50_2023, Return Period: 50 YR, Project Year: 2023

- Design Elevation = 7.5 ft (NAVD88 2004.65)
- Hydraulic design characteristics (mean and standard deviation)
  - Still water level $\zeta = 4.2$ ft, $\sigma_\zeta = 0.5062$ ft
  - Significant wave height at toe $H_s = 2.4$ ft, $\sigma_{H_s} = 0.24$ ft
  - Peak period $T_p = 3$ s, $\sigma_{T_p} = 0.6$ s
- Slope = 1:4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

Levee Reach Name: B_50_2073, Return Period: 50 YR, Project Year: 2073

- Design Elevation = 10 ft (NAVD88 2004.65)
- Hydraulic design characteristics (mean and standard deviation)
  - Still water level $\zeta = 7.3$ ft, $\sigma_\zeta = 0.6062$ ft
  - Significant wave height at toe $H_s = 2.4$ ft, $\sigma_{H_s} = 0.24$ ft
  - Peak period $T_p = 3$ s, $\sigma_{T_p} = 0.6$ s
- Slope = 1:4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1
Levee Reach Name: F_50_2023, Return Period: 50 YR, Project Year: 2023

- $q_{50} = 0.078462$ cfs/ft
- $q_{50} = 0.0052197$ cfs/ft
- Number of simulations = 20000

Levee Reach Name: F_50_2073, Return Period: 50 YR, Project Year: 2073

- $q_{50} = 0.082281$ cfs/ft
- $q_{50} = 0.0053587$ cfs/ft
- Number of simulations = 20000

Design Elevation = 7ft
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

Design Elevation = 9ft
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

Hydraulic design characteristics (mean and standard deviation):
- Still water level $\zeta = 3.8ft$, $\sigma_{\zeta} = 0.86623ft$
- Significant wave height at toe $H_s = 2.4ft$, $\sigma_{H_s} = 0.24ft$
- Peak period $T_p = 3s$, $\sigma_{T_p} = 0.6s$
Levee Reach Name: H_50_2023, Return Period: 50 YR, Project Year: 2023

Design Elevation = 6.5 ft. (NAVDD88 2004.65)
Hydraulic design characteristics (mean and standard deviation):
- Still water level \( \zeta \) = 3.2 ft, \( \sigma \) = 0.0623 ft
- Significant wave height at toe \( H_s = 2.4 \text{ ft} \), \( \sigma_{H_s} = 0.24 \text{ ft} \)
- Peak period \( T_p = 3s, \sigma_{T_p} = 0.6s \)
- Slope = 1.4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

Number of simulations = 20000

Levee Reach Name: H_50_2073, Return Period: 50 YR, Project Year: 2073

Design Elevation = 9 ft. (NAVDD88 2004.65)
Hydraulic design characteristics (mean and standard deviation):
- Still water level \( \zeta \) = 5.6 ft, \( \sigma \) = 0.0623 ft
- Significant wave height at toe \( H_s = 2.4 \text{ ft} \), \( \sigma_{H_s} = 0.24 \text{ ft} \)
- Peak period \( T_p = 3s, \sigma_{T_p} = 0.6s \)
- Slope = 1.4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

Number of simulations = 20000
1% (100-year)

Reach Name: A_100_2023, Return Period: 100 YR, Project Year: 2023

Design Elevation = 10 ft
Hydraulic design characteristics (mean and standard dev)
Still water level $c = 6.5$ ft, $\sigma_s = 0.80623$ ft
Significant wave height at toe $H_s = 2.4$ ft, $\sigma_{Hs} = 0.24$ ft
Peak period $T_p = 3s$, $\sigma_{T_p} = 0.6s$

Slope = 1.4
Berm Factor = 1
Roughness Factor = 1
Wave Angle Factor = 1

Reach Name: A_100_2073, Return Period: 100 YR, Project Year: 2073

Design Elevation = 13 ft
Hydraulic design characteristics (mean and standard dev)
Still water level $c = 9.5$ ft, $\sigma_s = 0.80623$ ft
Significant wave height at toe $H_s = 2.4$ ft, $\sigma_{Hs} = 0.24$ ft
Peak period $T_p = 3s$, $\sigma_{T_p} = 0.6s$

Slope = 1.4
Berm Factor = 1
Roughness Factor = 1
Wave Angle Factor = 1
Reach Name: E_100_2023, Return Period: 100 YR, Project Year: 2023

Design Elevation = 8.5 ft
Hydraulic design characteristics (mean and standard dev
Still water level $\zeta$ = 5.2 ft, $\sigma = 0.8062$ ft
Significant wave height at toe $H_s = 2.4$ ft, $\sigma_{H_s} = 0.24$ ft
Peak period $T_p = 3$ s, $\sigma_{T_p} = 0.6$ s
Slope = 1.4
Berm Factor = 1
Roughness Factor = 1
Wave Angle Factor = 1

Reach Name: E_100_2073, Return Period: 100 YR, Project Year: 2073

Design Elevation = 12 ft
Hydraulic design characteristics (mean and standard dev
Still water level $\zeta$ = 7.5 ft, $\sigma = 0.8062$ ft
Significant wave height at toe $H_s = 3.3$ ft, $\sigma_{H_s} = 0.33$ ft
Peak period $T_p = 3.4$ s, $\sigma_{T_p} = 0.68$ s
Slope = 1.4
Berm Factor = 1
Roughness Factor = 1
Wave Angle Factor = 1
0.5% (200-year)

**Reach Name: A_200_2023, Return Period: 200 YR, Project Year: 2023**

- $q_{90} = 0.049877$ cfs/ft
- $q_{50} = 0.0029282$ cfs/ft
- Number of simulations = 20,000

**Reach Name: A_200_2073, Return Period: 200 YR, Project Year: 2073**

- $q_{90} = 0.057255$ cfs/ft
- $q_{50} = 0.0036058$ cfs/ft
- Number of simulations = 20,000
Levee Reach Name: F_200_2023, Return Period: 200 YR, Project Year: 2023

- $q_{50} = 0.089508$ cfs/ft
- $q_{90} = 0.00811$ cfs/ft
- Number of simulations = 20000

Probability of Exceedance (-)

- Design Elevation = 10 ft
- Hydraulic design characteristics (mean and standard deviation):
  - Still water level $\zeta = 5.5$ ft, $\sigma = 0.80623$ ft
  - Significant wave height at toe $H_s = 3.4$ ft, $\sigma_{H_s} = 0.34$ ft
  - Peak period $T_p = 3.5$ s, $\sigma_{T_p} = 0.7$s
- Slope = 1.4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

Elevation (ft, NAVD88 2004.65)

Levee Reach Name: F_200_2073, Return Period: 200 YR, Project Year: 2073

- $q_{50} = 0.060786$ cfs/ft
- $q_{90} = 0.0047223$ cfs/ft
- Number of simulations = 20000

Probability of Exceedance (-)

- Design Elevation = 13 ft
- Hydraulic design characteristics (mean and standard deviation):
  - Still water level $\zeta = 8.3$ ft, $\sigma = 0.80623$ ft
  - Significant wave height at toe $H_s = 3.8$ ft, $\sigma_{H_s} = 0.38$ ft
  - Peak period $T_p = 3.5$ s, $\sigma_{T_p} = 0.7$s
- Slope = 1.4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

Elevation (ft, NAVD88 2004.65)
Reach Name: H_200_2023, Return Period: 200 YR, Project Year: 2023

Design Elevation = 8.5 ft
- Still water level \( \zeta = 5 \) ft, \( \sigma = 0.80623 \) ft
- Significant wave height at toe \( H_s = 2.4 \) ft, \( \sigma_{H_s} = 0.24 \) ft
- Peak period \( T_p = 3 \) s, \( \sigma_{T_p} = 0.6 \) s
- Slope = 1:4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

Reach Name: H_200_2073, Return Period: 200 YR, Project Year: 2073

Design Elevation = 11 ft
- Still water level \( \zeta = 8.2 \) ft, \( \sigma = 0.80623 \) ft
- Significant wave height at toe \( H_s = 2.4 \) ft, \( \sigma_{H_s} = 0.24 \) ft
- Peak period \( T_p = 3 \) s, \( \sigma_{T_p} = 0.6 \) s
- Slope = 1:4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1
Reach Name: A_500_2023, Return Period: 500 YR, Project Year: 2023

- Design Elevation: 12 ft
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

- Significant wave height at toe: $H_s = 2.4$ ft, $\sigma_{H_s} = 0.24$ ft
- Peak period: $T_p = 3$ s, $\sigma_{T_p} = 0.6$ s

$q_{50} = 0.0065438$ cfs/ft
$q_{90} = 0.091505$ cfs/ft

Number of simulations = 20000

Reach Name: A_500_2073, Return Period: 500 YR, Project Year: 2073

- Design Elevation: 15 ft
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

- Significant wave height at toe: $H_s = 2.4$ ft, $\sigma_{H_s} = 0.24$ ft
- Peak period: $T_p = 3$ s, $\sigma_{T_p} = 0.6$ s

$q_{50} = 0.006286$ cfs/ft
$q_{90} = 0.091792$ cfs/ft

Number of simulations = 20000
Reach Name: B_500_2023, Return Period: 500 YR, Project Year: 2023

- $q_{90} = 0.066318 \text{ cfs/ft}$
- $q_{50} = 0.00434 \text{ cfs/ft}$
- Number of simulations = 20000

Probability of Exceedance (-)

Stationing (ft)

Reach Name: B_500_2073, Return Period: 500 YR, Project Year: 2073

- $q_{90} = 0.092417 \text{ cfs/ft}$
- $q_{50} = 0.0064672 \text{ cfs/ft}$
- Number of simulations = 20000

Probability of Exceedance (-)

Stationing (ft)
Reach Name: C_500_2023, Return Period: 500 YR, Project Year: 2023

Overtopping Rate (cfs/ft)

Design Elevation = 11
Still water level $\zeta = 8.1$ ft, $\sigma = 0.806$ ft
Significant wave height at toe $H_s = 10.6$ ft, $\sigma_{H_s} = 0.24$ ft
Peak period $T_p = 3$ s, $\sigma_{T_p} = 0.6$ s

Number of simulations = 20000

Probability of Exceedance (-)

Reach Name: C_500_2073, Return Period: 500 YR, Project Year: 2073

Overtopping Rate (cfs/ft)

Design Elevation = 14
Still water level $\zeta = 10.6$ ft, $\sigma = 0.806$ ft
Significant wave height at toe $H_s = 2.4$ ft, $\sigma_{H_s} = 0.24$ ft
Peak period $T_p = 3$ s, $\sigma_{T_p} = 0.6$ s

Number of simulations = 20000

Probability of Exceedance (-)
Reach Name: E_500_2023, Return Period: 500 YR, Project Year: 2023

Design Elevation = 12 ft
Hydraulic design characteristics (mean and standard dev)
- Still water level \( \zeta = 7.6 \text{ ft}, \sigma = 0.80623 \text{ ft} \)
- Significant wave height at toe \( H_s = 2.9 \text{ ft}, \sigma_{H_s} = 0.29 \text{ ft} \)
- Peak period \( T_p = 3.6 \text{ s}, \sigma_{T_p} = 0.72 \text{ s} \)
- Slope = 1:4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

Reach Name: E_500_2073, Return Period: 500 YR, Project Year: 2073

Design Elevation = 16 ft
Hydraulic design characteristics (mean and standard dev)
- Still water level \( \zeta = 10.7 \text{ ft}, \sigma = 0.80623 \text{ ft} \)
- Significant wave height at toe \( H_s = 4.3 \text{ ft}, \sigma_{H_s} = 0.43 \text{ ft} \)
- Peak period \( T_p = 3.6 \text{ s}, \sigma_{T_p} = 0.72 \text{ s} \)
- Slope = 1:4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1
Levee Reach Name: F_500_2023, Return Period: 500 YR, Project Year: 2023

Hydraulic design characteristics (mean and standard deviation)
- Still water level $\zeta = 6.7$ ft, $\sigma = 0.8062$ ft
- Significant wave height at toe $H_s = 3.8$ ft, $\sigma_{H_s} = 0.38$ ft
- Peak period $T_p = 3.9$ s, $\sigma_{T_p} = 0.78$ s

Values:
- $q_{90} = 0.062042$ cfs/ft
- $q_{50} = 0.0050014$ cfs/ft

Number of simulations = 20000

Levee Reach Name: F_500_2073, Return Period: 500 YR, Project Year: 2073

Hydraulic design characteristics (mean and standard deviation)
- Still water level $\zeta = 10.2$ ft, $\sigma = 0.8062$ ft
- Significant wave height at toe $H_s = 4.3$ ft, $\sigma_{H_s} = 0.43$ ft
- Peak period $T_p = 3.9$ s, $\sigma_{T_p} = 0.78$ s

Values:
- $q_{90} = 0.095997$ cfs/ft
- $q_{50} = 0.0091947$ cfs/ft

Number of simulations = 20000
**Reach Name: G_500_2023, Return Period: 500 YR, Project Year: 2023**

- $q_{90} = 0.057401 \text{ cfs/ft}$
- $q_{50} = 0.0035391 \text{ cfs/ft}$
- Number of simulations = 20000

**Design Elevation** = 10 ft

- Hydraulic design characteristics (mean and standard deviation)
  - Still water level = 6.6 ft, $\sigma = 0.00623 ft$
  - Significant wave height at toe $H_s = 2.4 ft$, $\sigma_H = 0.24 ft$
  - Peak period $T_p = 3 s$, $\sigma_{T_p} = 0.6 s$

- Slope = 1.4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1

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**Reach Name: G_500_2073, Return Period: 500 YR, Project Year: 2073**

- $q_{90} = 0.067668 \text{ cfs/ft}$
- $q_{50} = 0.004371 \text{ cfs/ft}$
- Number of simulations = 20000

**Design Elevation** = 13 ft

- Hydraulic design characteristics (mean and standard deviation)
  - Still water level = 9.7 ft, $\sigma = 0.00623 ft$
  - Significant wave height at toe $H_s = 2.4 ft$, $\sigma_H = 0.24 ft$
  - Peak period $T_p = 3 s$, $\sigma_{T_p} = 0.6 s$

- Slope = 1.4
- Berm Factor = 1
- Roughness Factor = 1
- Wave Angle Factor = 1