

City of Carver Levee Improvements

CITY OF CARVER

FEBRUARY 19, 2019

An aerial photograph showing a residential neighborhood completely inundated with floodwater. Numerous houses and trees are visible above the water level. In the foreground, a train with several freight cars is traveling along a track that runs parallel to the flooded area. The text 'Agenda:' is overlaid on the left side of the image.

Agenda:

Background Information

Levee Requirements & Existing Deficiencies

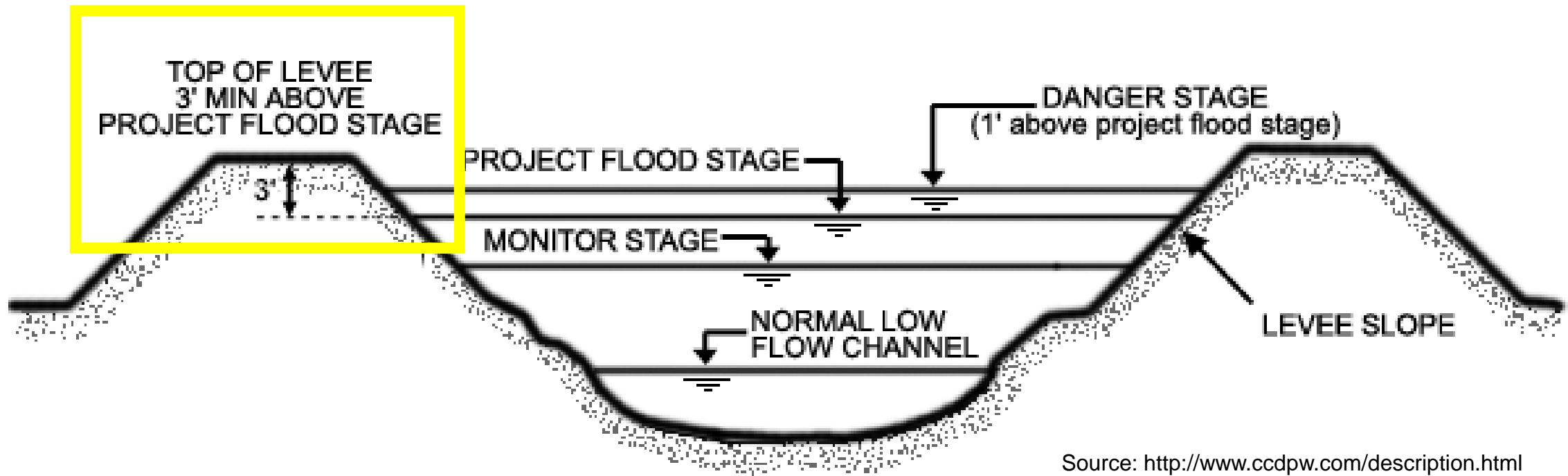
Concept Plan

Cost & Funding

Background Information

- City of Carver Historic District became one of the first historic districts in Minnesota to be named to the National Registry of Historic Places
- ~55 Properties and businesses behind the levee are limited to 50% of property value for reinvestment due to the floodplain restriction associated with the non-FEMA certified levee.
- Levee protecting the City of Carver's Historic Downtown doesn't meet current standards for either USACE or FEMA.



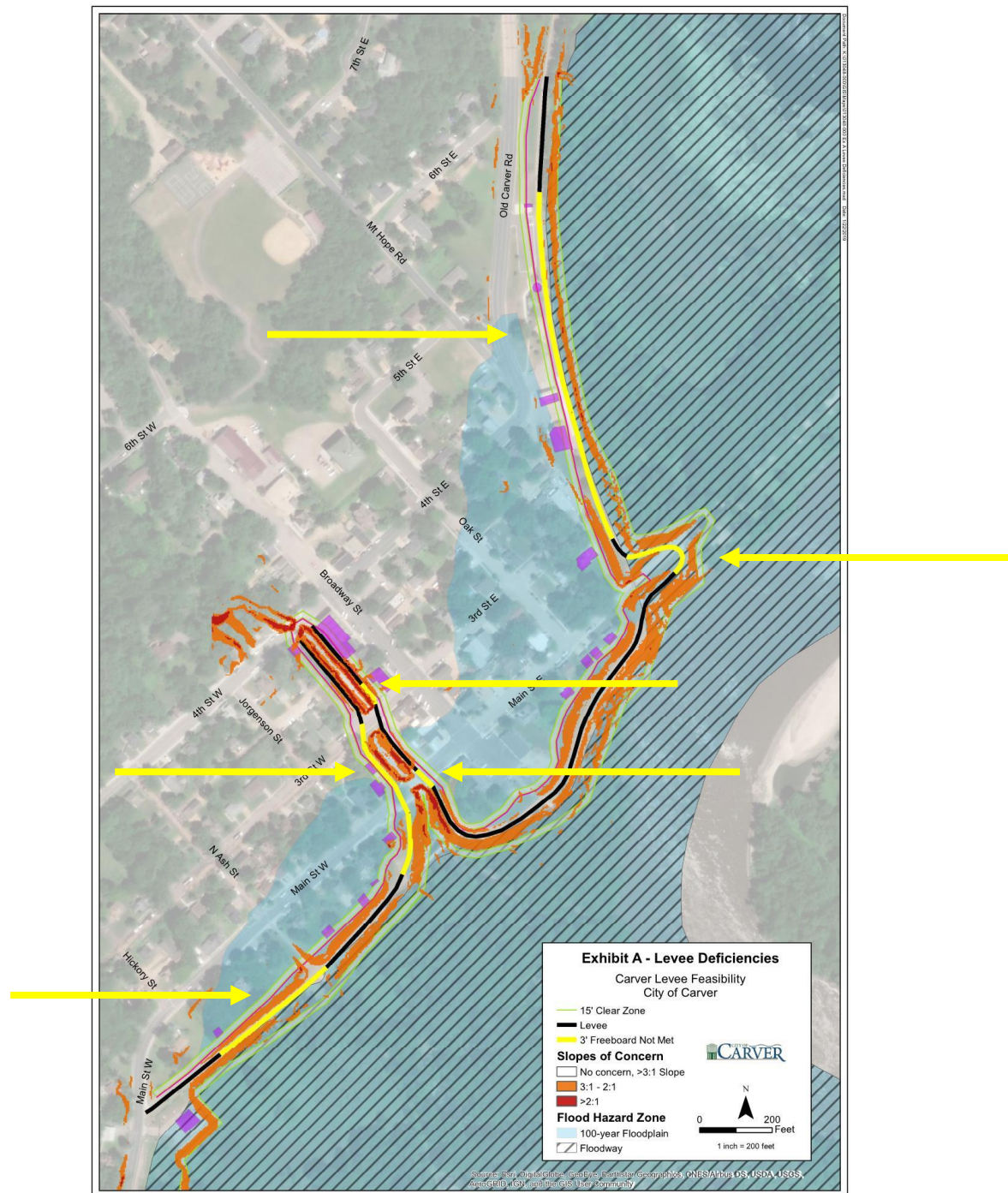


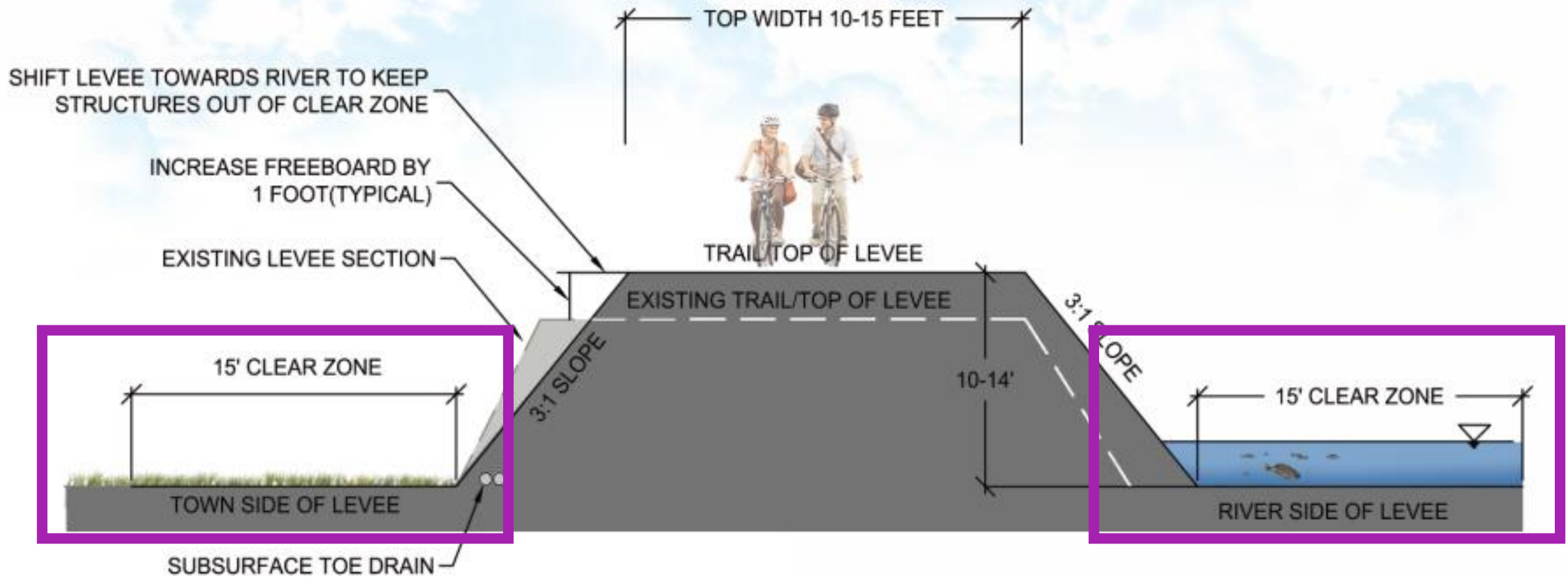
Freeboard Requirements

- Freeboard = Height of the levee from the water surface to the top of the levee
- FEMA requires 3-feet above Base Flood Elevation (Project Flood Stage)

Freeboard Deficiencies

- Areas along the levee do not meet this requirement and are highlighted in yellow





Clear Zone Requirements

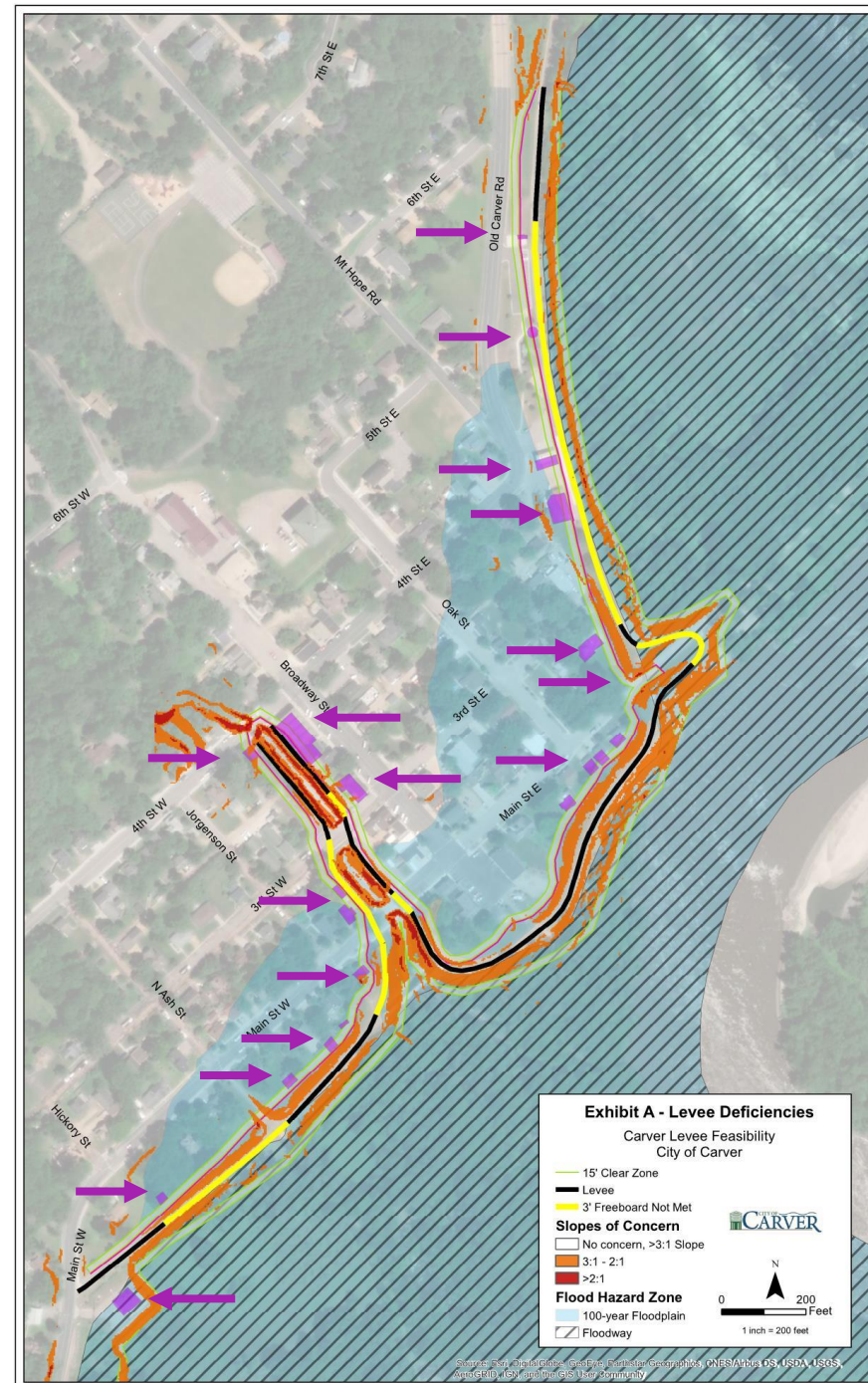
- Clear Zone = 15 ft. measured from outer edge of the levee
- Clear Zone must be clear of structures and vegetation (other than approved grasses) to allow access to levee

Clear Zone Deficiencies

- Areas along the levee do not meet this requirement are highlighted in purple



Vegetation and Structures within Clear zone



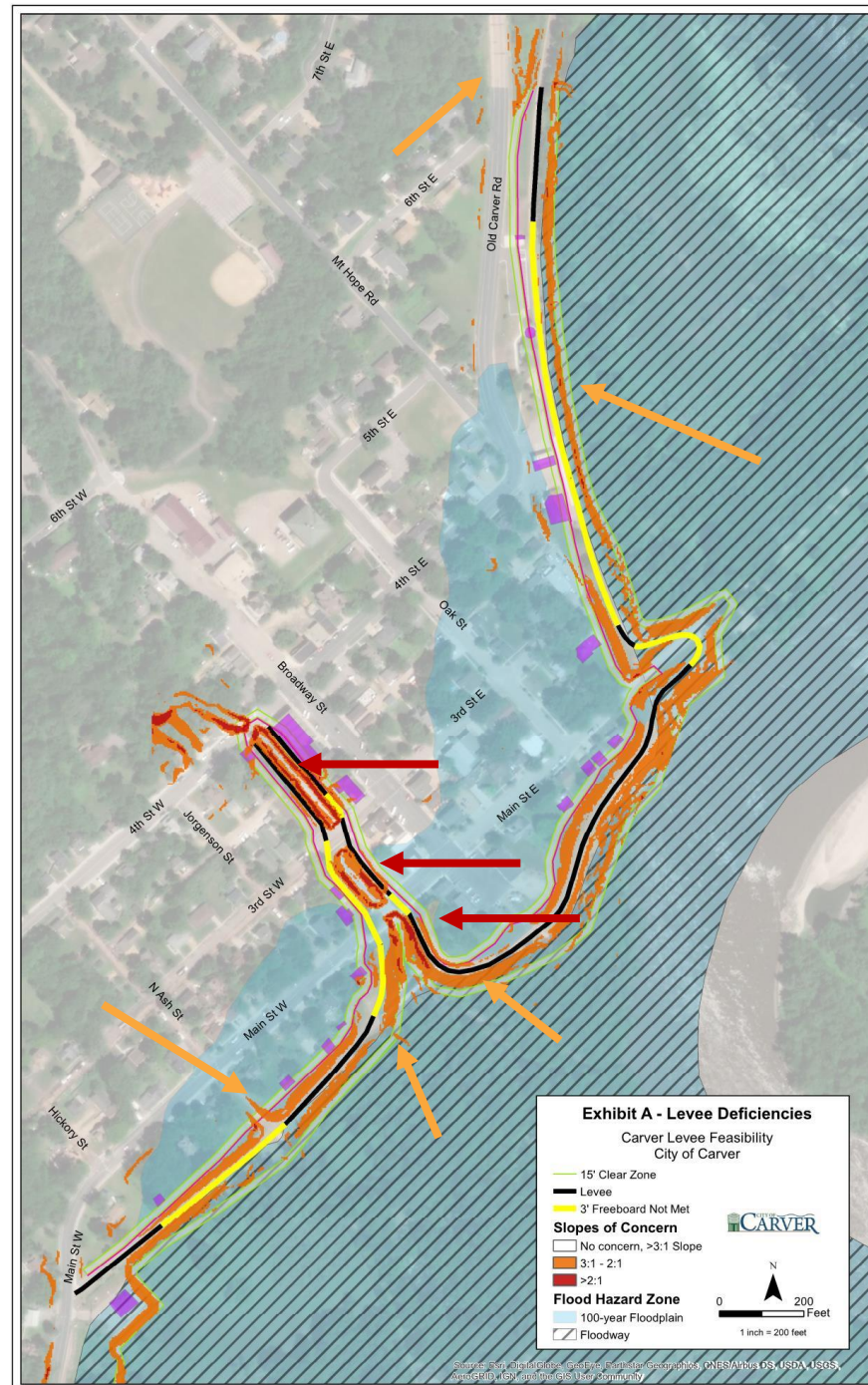
Steep Slopes

- USACE stipulates maximum allowable slope is 2V:1H, and it is required that they are lined with riprap.
- Areas with a 3:1 slope can be mowed.



Steep Slopes

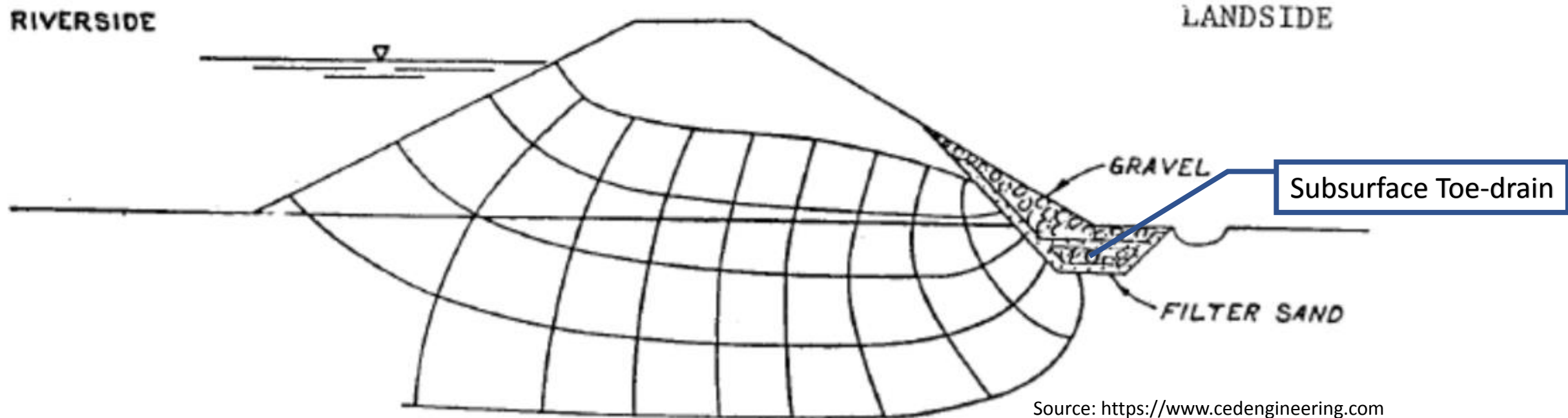
- Several places along levee do not meet USACE slope requirements
 - Slopes between 3:1 and 2:1 are highlighted in **orange**
 - Slopes greater than 2:1 are highlighted in **red**





Seepage

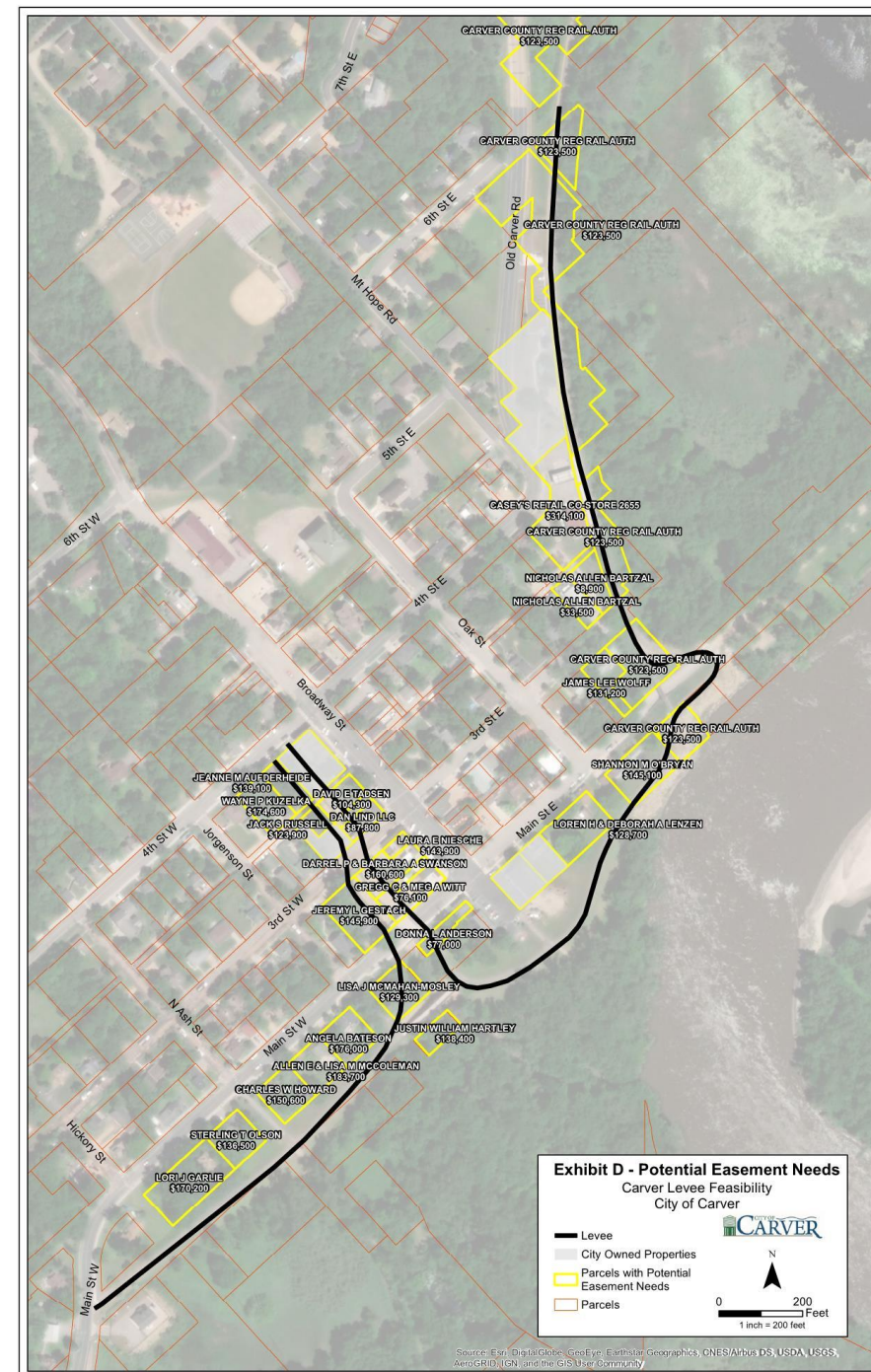
- Sand and gravel is present below the levee
- Potential for seepage to occur during flood events



Source: <https://www.cedengineering.com>

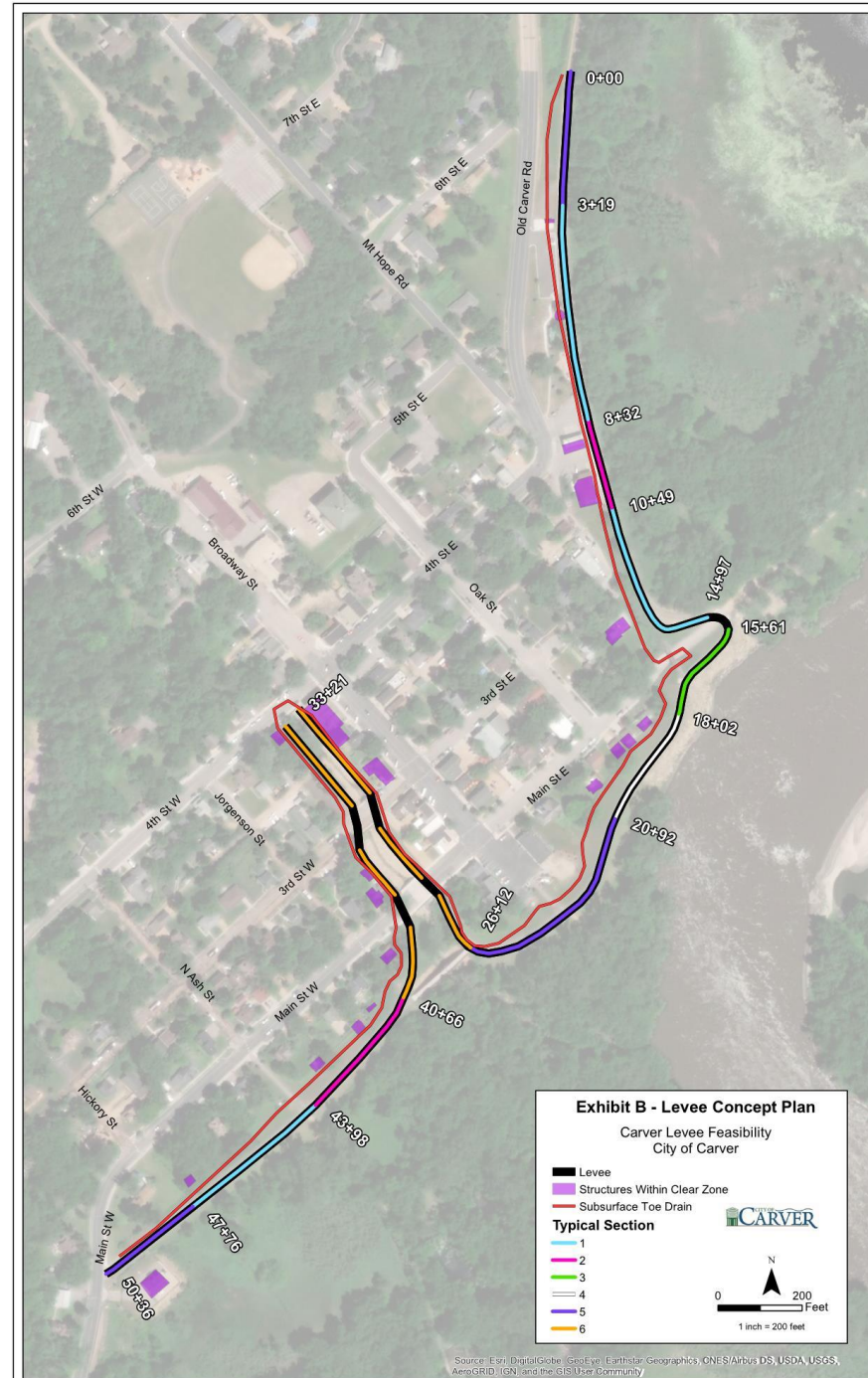
Easements

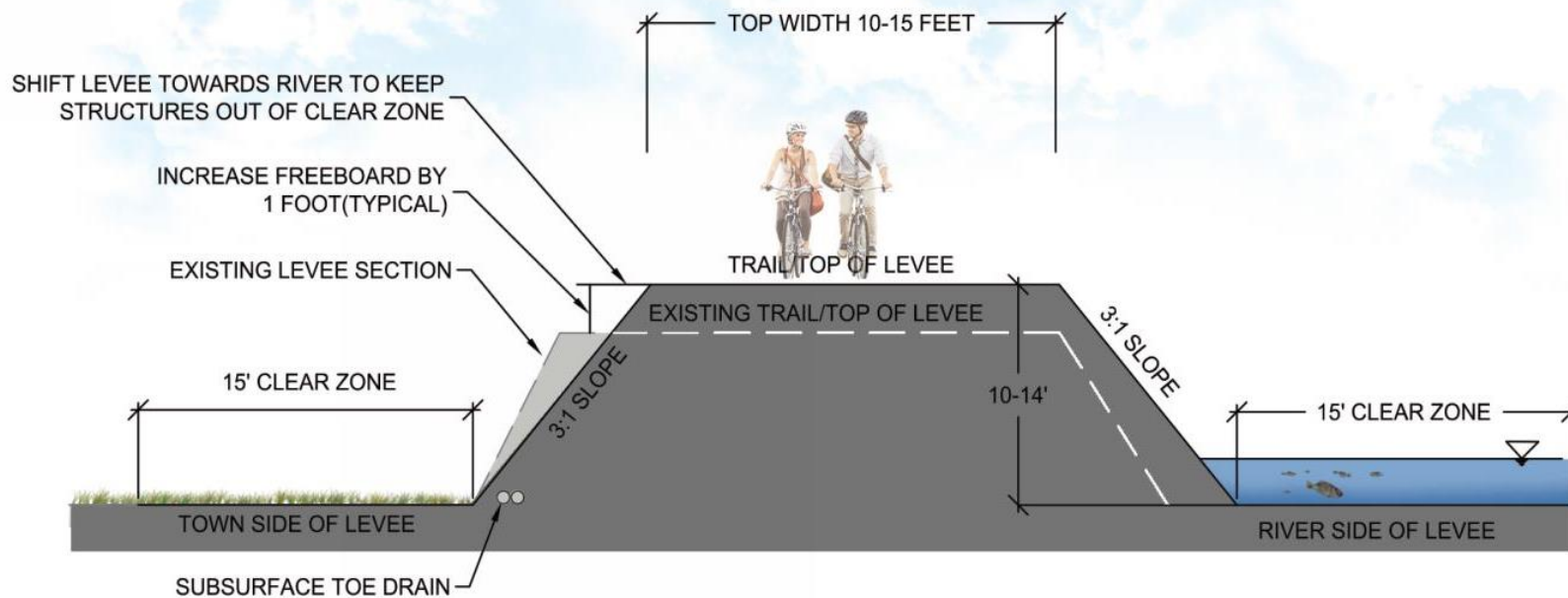
- USACE requires the City has easement over the entire levee
- US Fish & Wildlife Service has indicated they may dedicate necessary easements in areas along their parcels.



Concept Plan

- We've identified 6 typical sections that will correct deficiencies along the levee



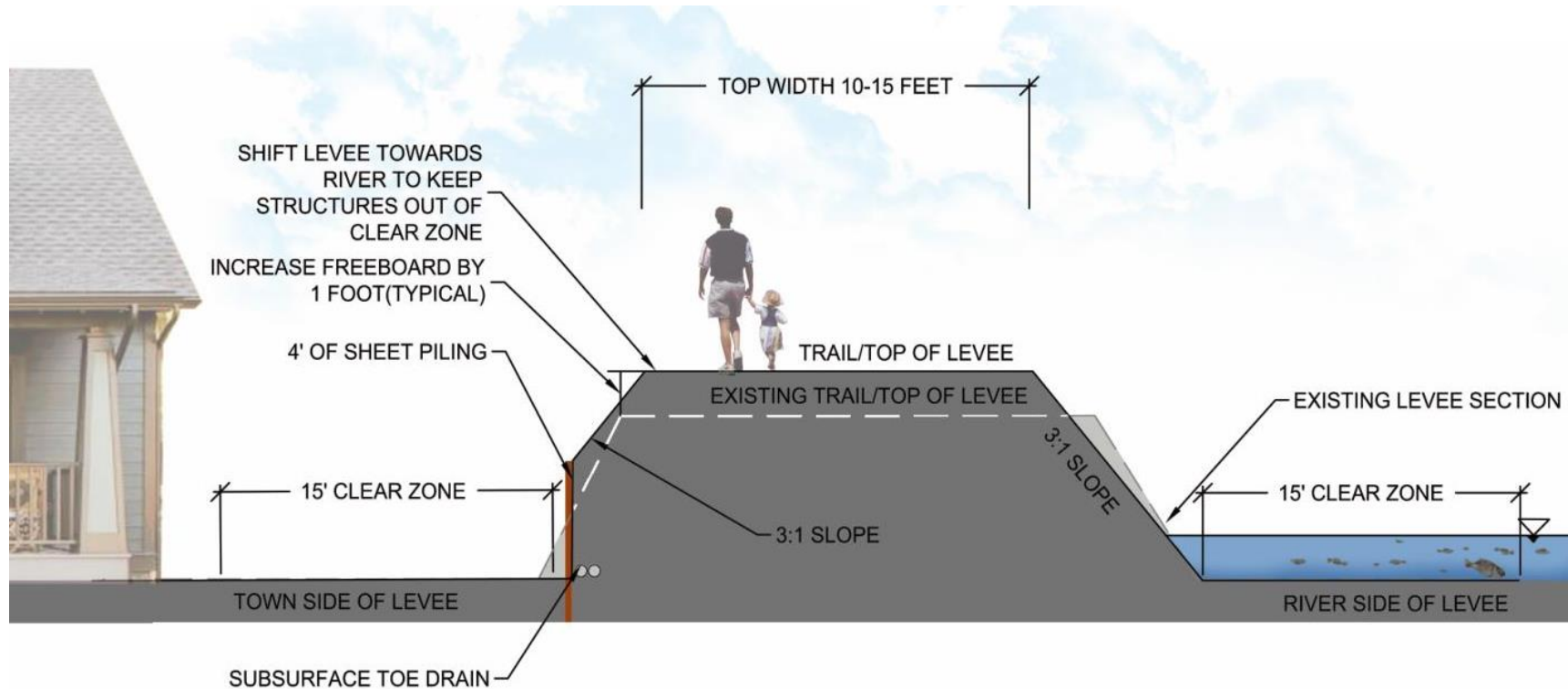


1 TYPICAL SECTION DETAIL 1 (BLUE)
CG.01 SCALE: NO SCALE

Typical Sections

- Cost per lineal foot for Typical Section 1 = \$305.00



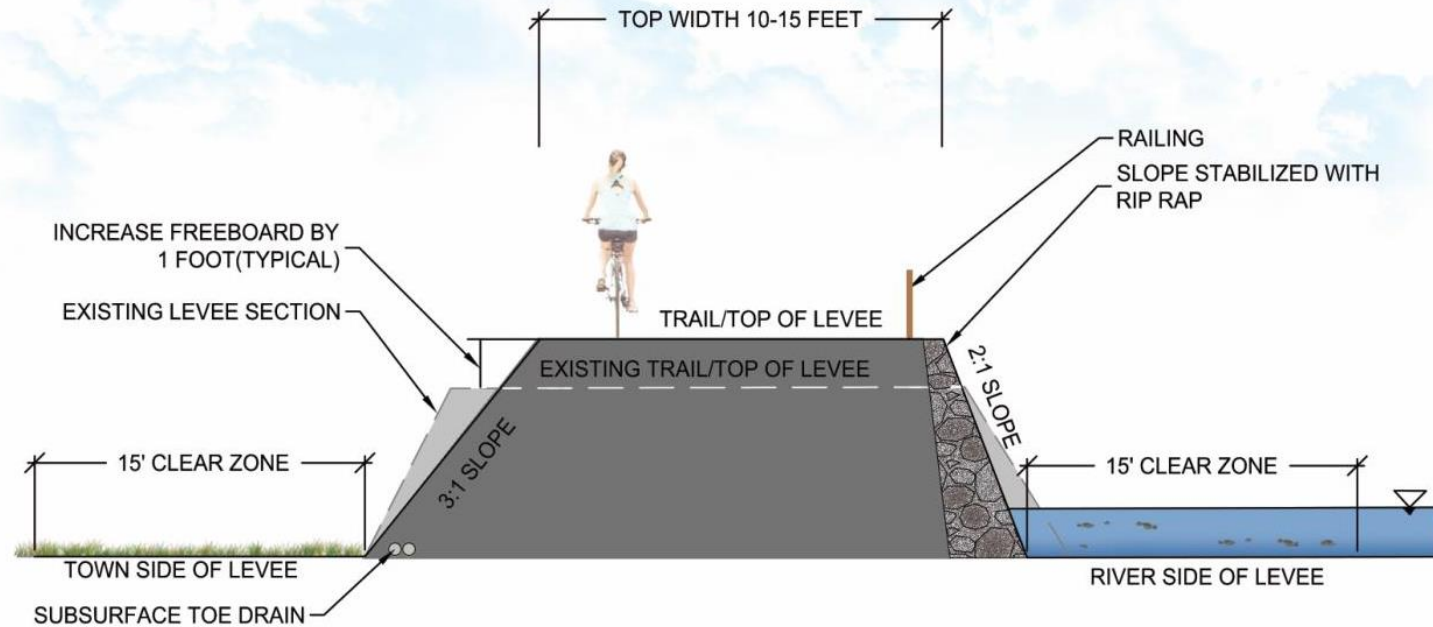


2 TYPICAL SECTION DETAIL 2 (PINK)
CG.01 SCALE: NO SCALE

Typical Sections

- Cost per lineal foot for Typical Section 2 = \$1,117.50



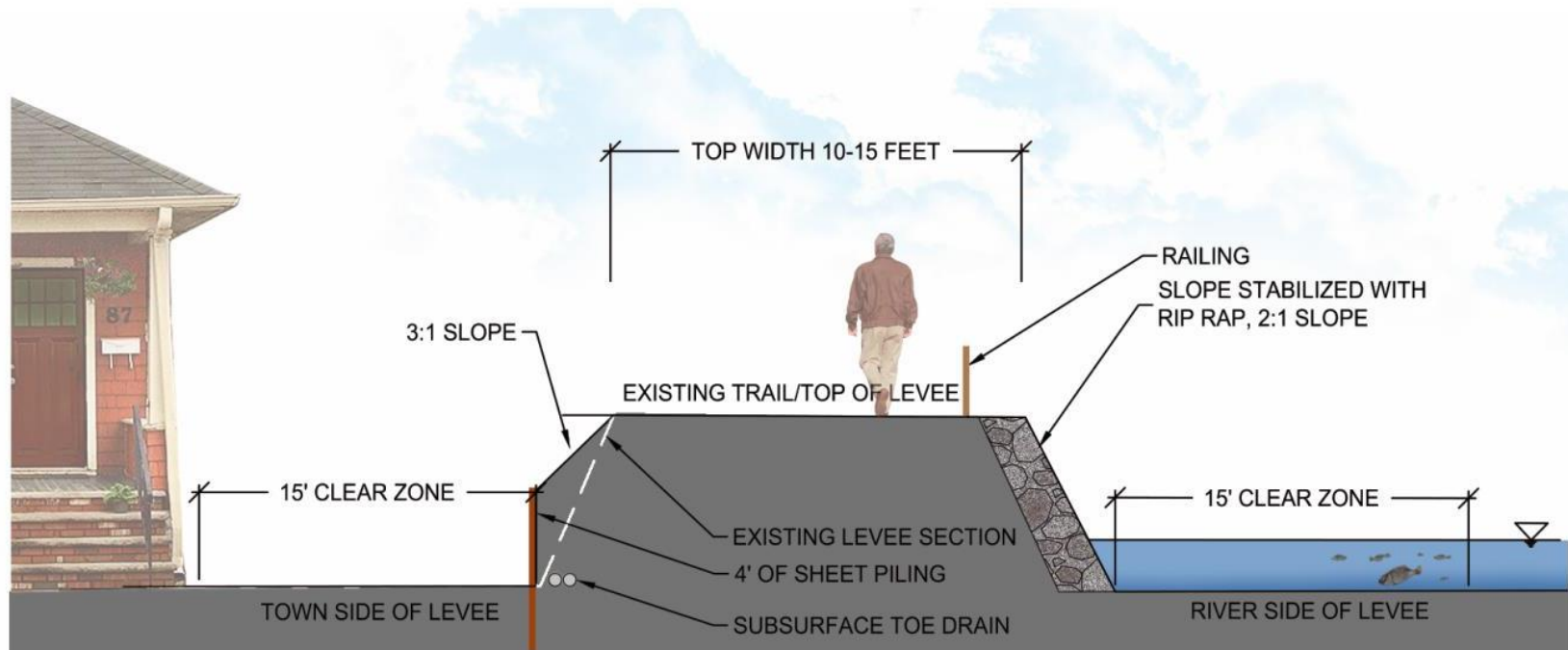


3 TYPICAL SECTION DETAIL 3 (GREEN)
CG.01 SCALE: NO SCALE

Typical Sections

- Cost per lineal foot for Typical Section 3 = \$669.50



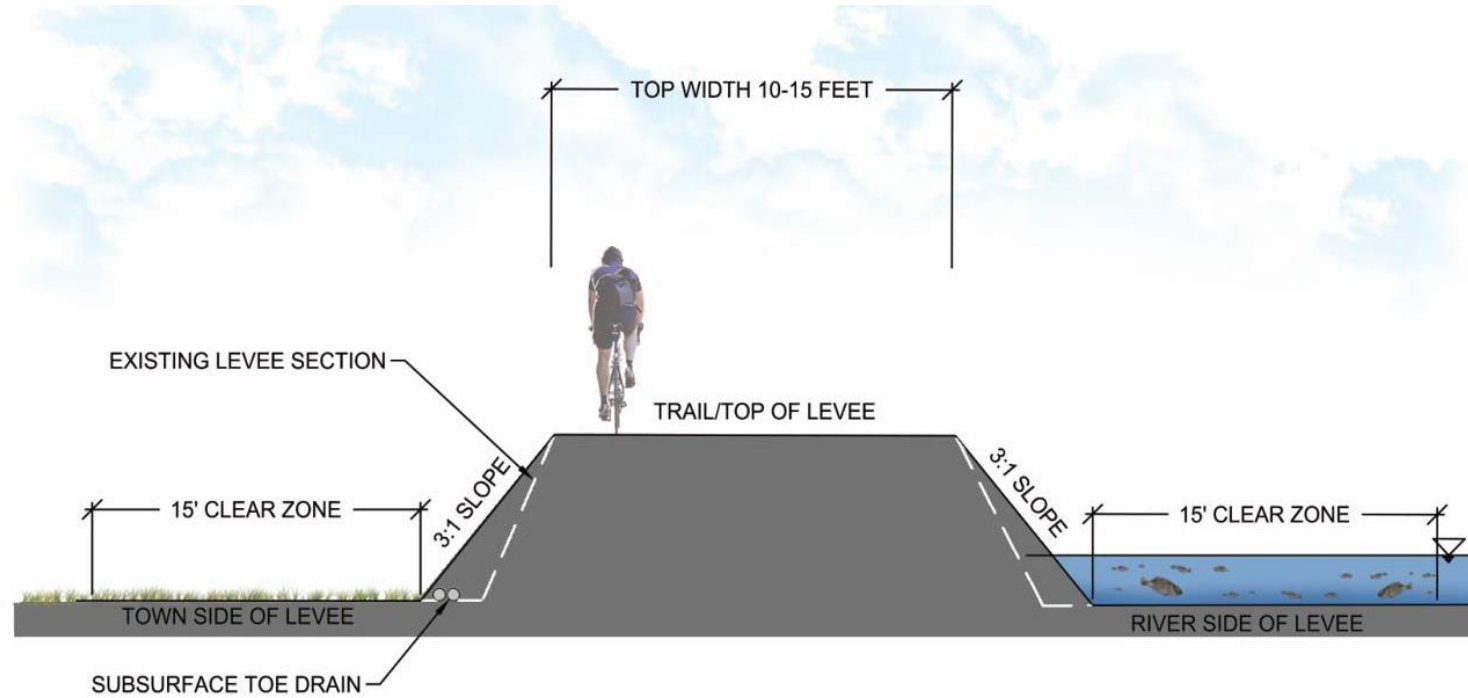


4
CG.01 TYPICAL SECTION DETAIL 4 (WHITE)
SCALE: NO SCALE

Typical Sections

- Cost per lineal foot for Typical Section 4 = \$1,732.50



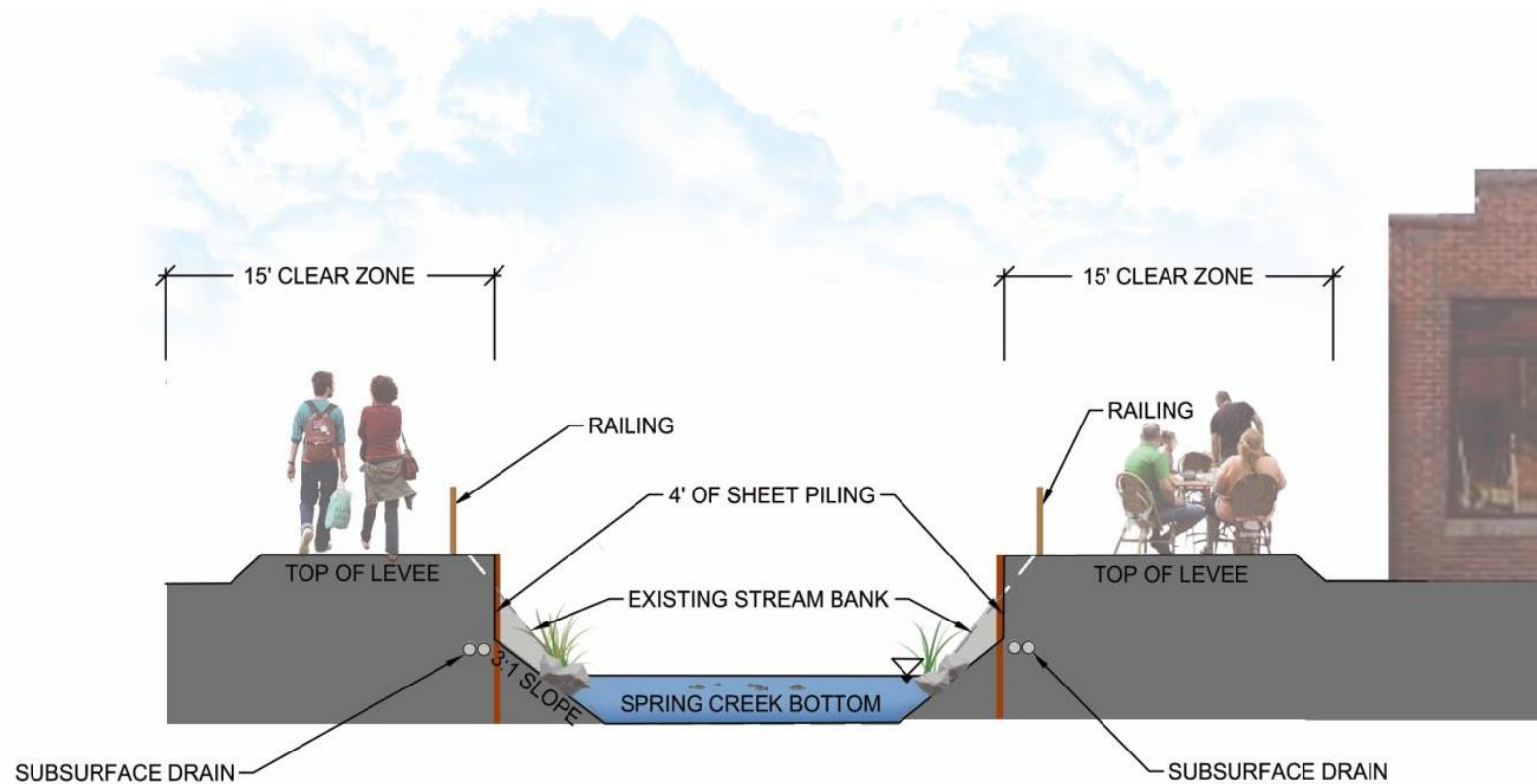


5 TYPICAL SECTION DETAIL 5 (PURPLE)
CG.01 SCALE: NO SCALE

Typical Sections

- Cost per lineal foot for Typical Section 5 = \$337.50





6
CG.01 TYPICAL SECTION DETAIL 6 (ORANGE)
SCALE: NO SCALE

Typical Sections

- Cost per lineal foot for Typical Section 6 = \$2,210.00



Cost Estimate



Levee Improvements Summary

Typical Section	Cost/LF	Feet	Total
1	\$305	1,364	\$416,020
2	\$1,118	549	\$613,508
3	\$670	280	\$187,460
4	\$1,733	290	\$502,425
5	\$338	1,099	\$370,913
6	\$2,210	1,454	\$3,213,340
Total		5,036	\$5,303,665

Cost Estimate

Item	Cost
Levee Improvements	\$5,303,700
Related Flood Improvements	\$534,000
Construction Contingency (30%)	\$1,751,300
Indirect (Admin, Engineering, Legal) (25%)	\$1,459,400
Land Acquisition	\$377,700
Total	\$9,426,100

Land and Structures in the Floodplain	
Taxable Value (2017)	\$7,500,000
Annual Tax Revenue (2017)	\$142,000

City of Carver Levee Improvements

City of Carver Historic District



Historic Resources

- Historic Downtown Carver platted in 1857
- The City of Carver was home to Minnesota School District #1 for 100 years.
- The City of Carver became one of the first historic districts in Minnesota to be named to the National Register of Historic Places.
- City of Carver Historic District included 87 buildings and four structures of historical significance.

Flooding

- City of Carver Downtown is at high risk of flooding from interior drainage during floods on the Minnesota River due to Spring Creek.
- Major flood events in 1965, 1969, 1997, 2001 and 2014. Many minor events in between requiring city response.
- The Minnesota River is experiencing more frequent floods requiring more frequent flood response costs.
- All properties and businesses behind the levee are limited to 50% of property value for reinvestment due to the floodplain restriction associated with a non-FEMA certified levee. This has resulted in vacant businesses and limited reinvestment.
- Floodplain restrictions are contributing to the deterioration of the Historic District. Certification of the levee is necessary to preserve this historic treasure.

Current Levee

- Levee protecting the City of Carver's Historic Downtown doesn't meet current standards for either USACE or FEMA programs due to:
 - Levee height does not provide required freeboard elevations
 - Levee internal drainage is non-existent
 - Levee slopes are too steep to maintain
 - Structures and vegetation encroach within levee clear zone



Project Improvements and Benefits

- Complete levee improvements and secure FEMA certification of the levee allows continued participation in the USACE programs and the removal of the floodplain restriction for the historic downtown district.
- Business and property owners may invest and improve their properties.
- Business and properties owners would no longer be required to carry flood insurance.
- Protect the City of Carver Historic District from future flood damages.
- Improve habitat for Spring Creek.

Project Needs

Item	Cost of Improvements
Final Design / Construction	\$9,025,000
Land Acquisition	\$400,000
Total	\$9,425,000

Taxable value currently within flood plain	\$7,500,000
Value of Historic District	Priceless

Potential Funding

Approach partners for funding

- Carver County
- DNR
- Lower Minnesota River Watershed District
- State Legislative
- US Fish & Wildlife Service





QUESTIONS