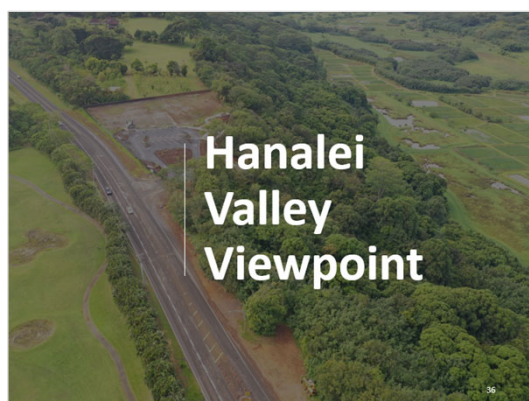
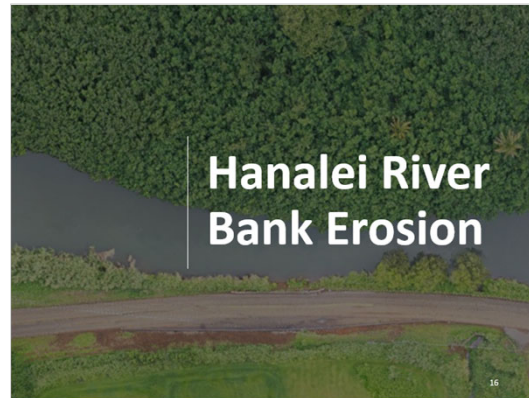
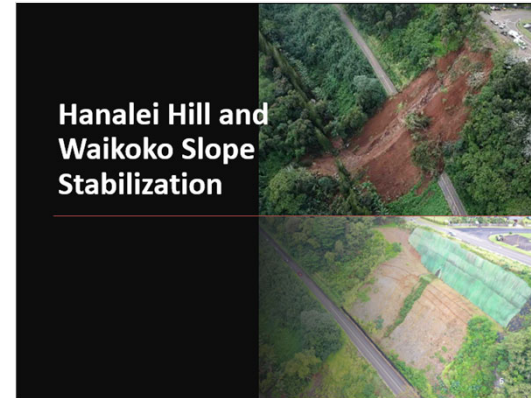




North Shore Community Meeting
State of Hawaii Department of Transportation
June 8, 2022



Discussion Topics



A photograph of a steel truss bridge spanning a small stream, surrounded by lush greenery and a forested hillside. A paved road with yellow bollards is in the foreground, and a worker in a safety vest is visible on the right side of the bridge. The sky is blue with scattered white clouds.

Hanalei Bridge Repair

Scope of Work

- Refurbish timber deck
- Address severe corrosion and section loss primarily for the Warren Truss and bridge stringers
- Replace damaged post-tensioned rods
- Clean and repaint to protect from corrosion





Hanalei River Bridge Repair

- Project Schedule: Begin Early 2023
- Duration: 12 months, preliminary estimate of night closures of 6 months
 - 11:00 pm to 5:30 am (Sunday night to Thursday night)
- A temporary bridge alternative was considered but was not selected due to environmental impacts and associated permitting requirements.

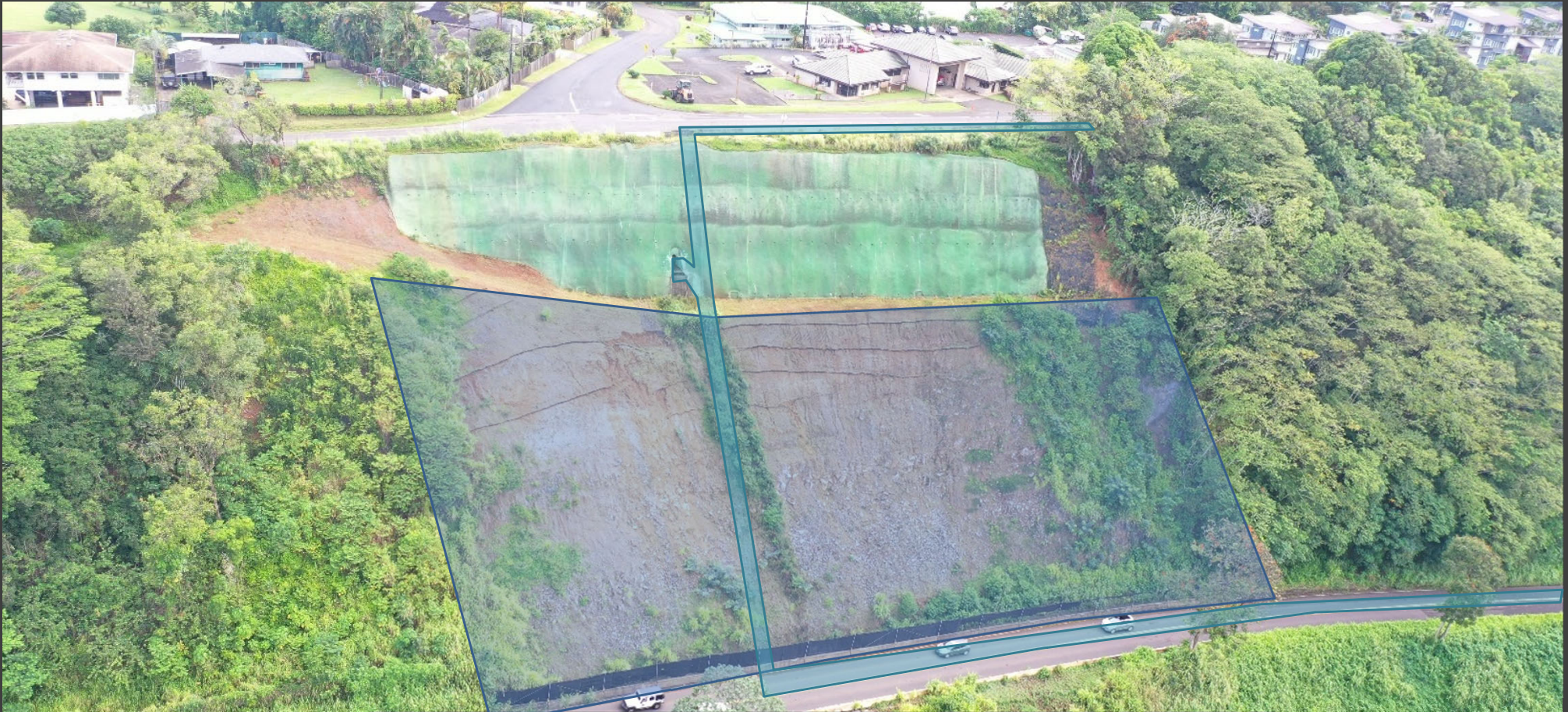
Hanalei Hill and Waikoko Slope Stabilization





Anchored Wire Mesh

- Photos of previous installations of the anchored wire mesh system, vicinity of Wainiha
- Installed following 2018 flood event



Hanalei Hill Slope Stabilization

- Install soil nail anchor mesh system and drainage improvements
- Project Schedule: Begin early 2023
- Preliminary estimate of overall contract duration is 26-months for both locations (Hanalei Hill and Waikoko)
 - Hanalei Hill Day Work for 12 months
 - Hanalei Hill Night Work for 4 months
- Preliminary Proposed Lane Closure Timeframes:
 - One lane (contra flow) day closures at top of hill for drainage improvements
 - One lane night closures (11:00 pm to 5:30 am) along hillside for drainage improvements



Waikoko Slope Stabilization

- Install soil nail anchor mesh system
- Project Schedule: Begin early 2023
- Preliminary estimate of overall contract duration is 26-months for both locations (Hanalei Hill and Waikoko)
 - Waikoko Day Work 12 months
- One lane permanent closure for duration of work at Waikoko
 - Flagger present during the day and temp traffic signal during the night.



Hanalei Bridge Traffic Signal

Existing Morning Condition



Morning Condition with Traffic Signal



Existing Afternoon Condition



Afternoon Condition with Traffic Signal



An aerial photograph of the Hanalei River. The river flows from the top left towards the center. The upper bank is covered in dense, lush green forest. The lower bank, which is closer to the viewer, shows significant erosion, with exposed brown soil and a mix of green vegetation. A road or path runs along the lower bank. The title 'Hanalei River Bank Erosion' is overlaid in large white text on the right side of the image.

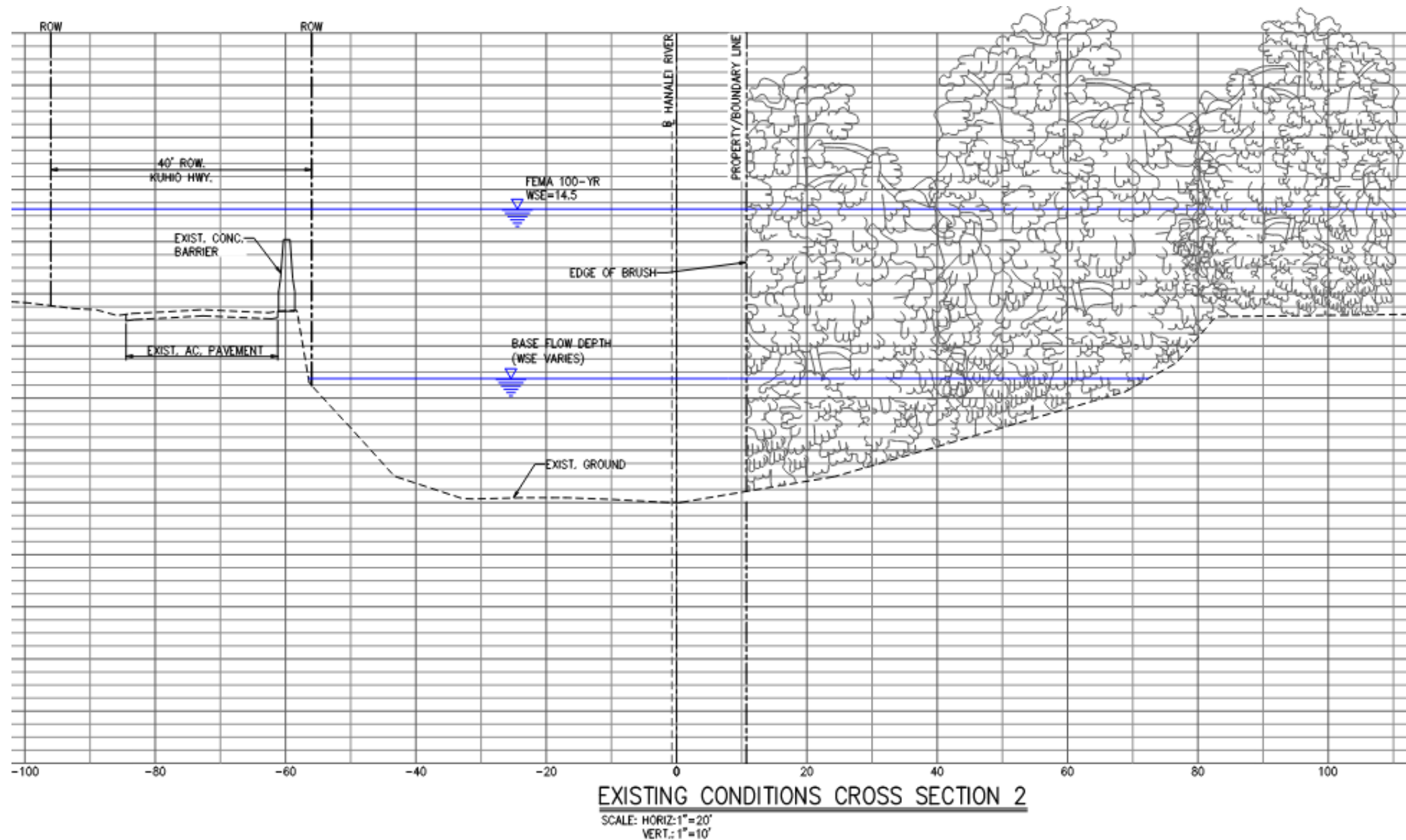
Hanalei River Bank Erosion



Hanalei Bank Existing Conditions

- Stream bank scouring and erosion is being caused by flood flows and hau bush encroachment into the channel.
- Heavy rain events from March 2021 resulted in portion of existing guardrail to fall into the river.
- May 2022, emergency roadway widening was done to move the travel way away from the encroaching erosion

Existing Condition Cross Section





Hanalei River Bank Stabilization

- Repair and stabilize 300 feet of eroded streambank
- Project Schedule: Design and permitting completion 2023
- Various alternatives being considered
 - UngROUTED Riprap
 - Rock Marine Mattresses
 - Vegetated Earth Reinforced Wall
 - Sheet Pile Walls



Rock placed on the streambank to provide a stable embankment and protect from scour:

UngROUTED Riprap

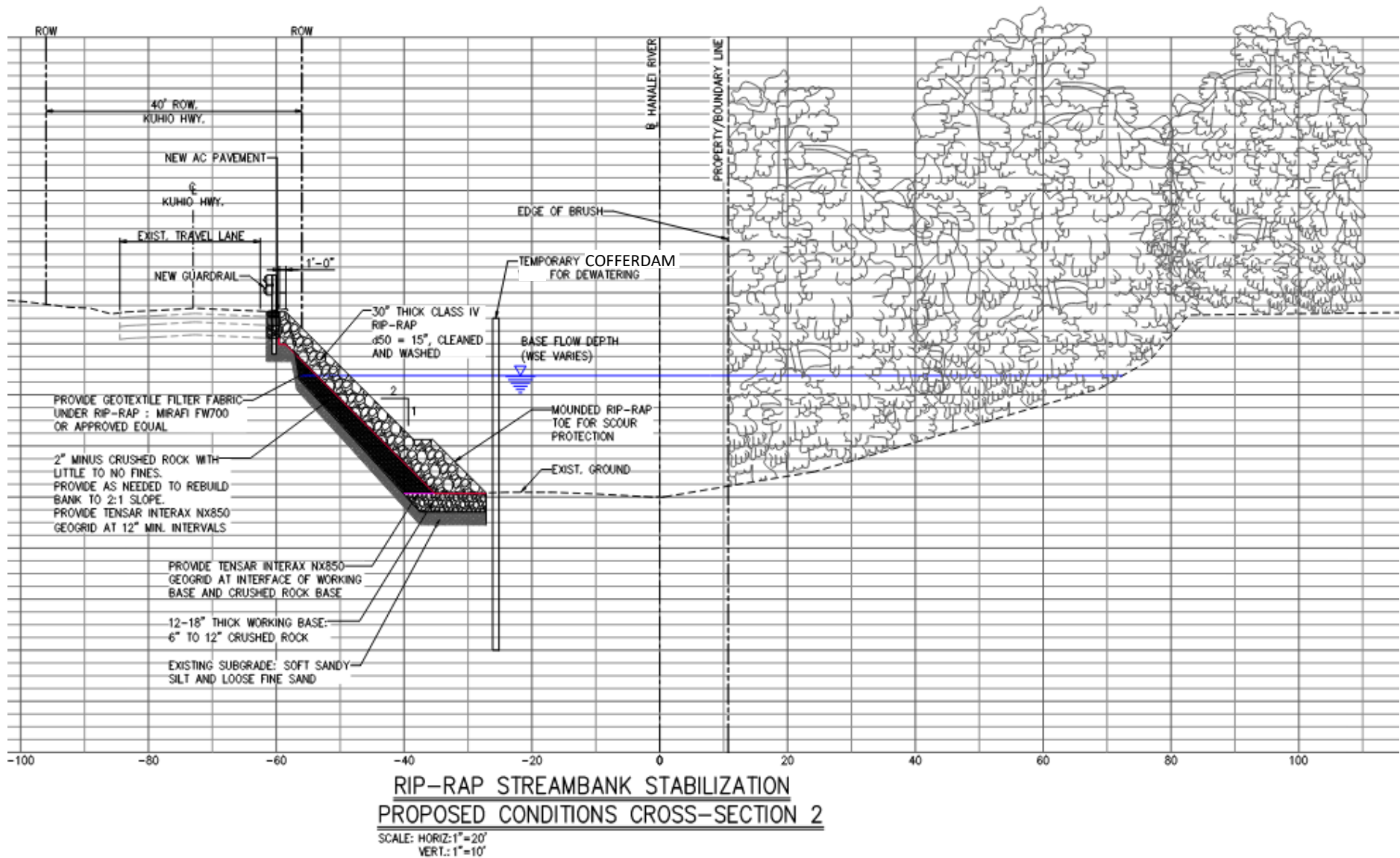
Pros

- Can move and “flex” as stream shifts
- Rock can provide aquatic habitat
- Natural aesthetics

Cons

- Encroachment into stream channel
- Requires temporary cofferdam and dewatering in stream for installation

Rip-rap - Cross Section





Rock Marine Mattress

Engineered rock filled mattress encapsulated by geogrid designed for marine applications to provide a stable embankment and protect from scour.

Pros

- Mattress made of HDPE material to be UV resistant
- Integrated geotextile fabric helps to hold soil back as mattress “flexes” with the stream

Cons

- Encroachment into stream channel
- Requires temporary cofferdam and dewatering in stream for installation

Lifting Tab
(typical)

Top

Bottom

Side

Stone Fill

Diaphragm

End

20 ft – 30 ft typical (filled portion)
for 12 in. mattress thickness.

Compartment shown half-filled
for illustrative purposes.





Vegetated Earth Reinforced Wall

Soil-filled geotextile bag wall system designed to stabilize the streambank. Combines the engineering strength of geotextiles and ground anchors with soil and plants to deliver a sustainable, vegetated solution.

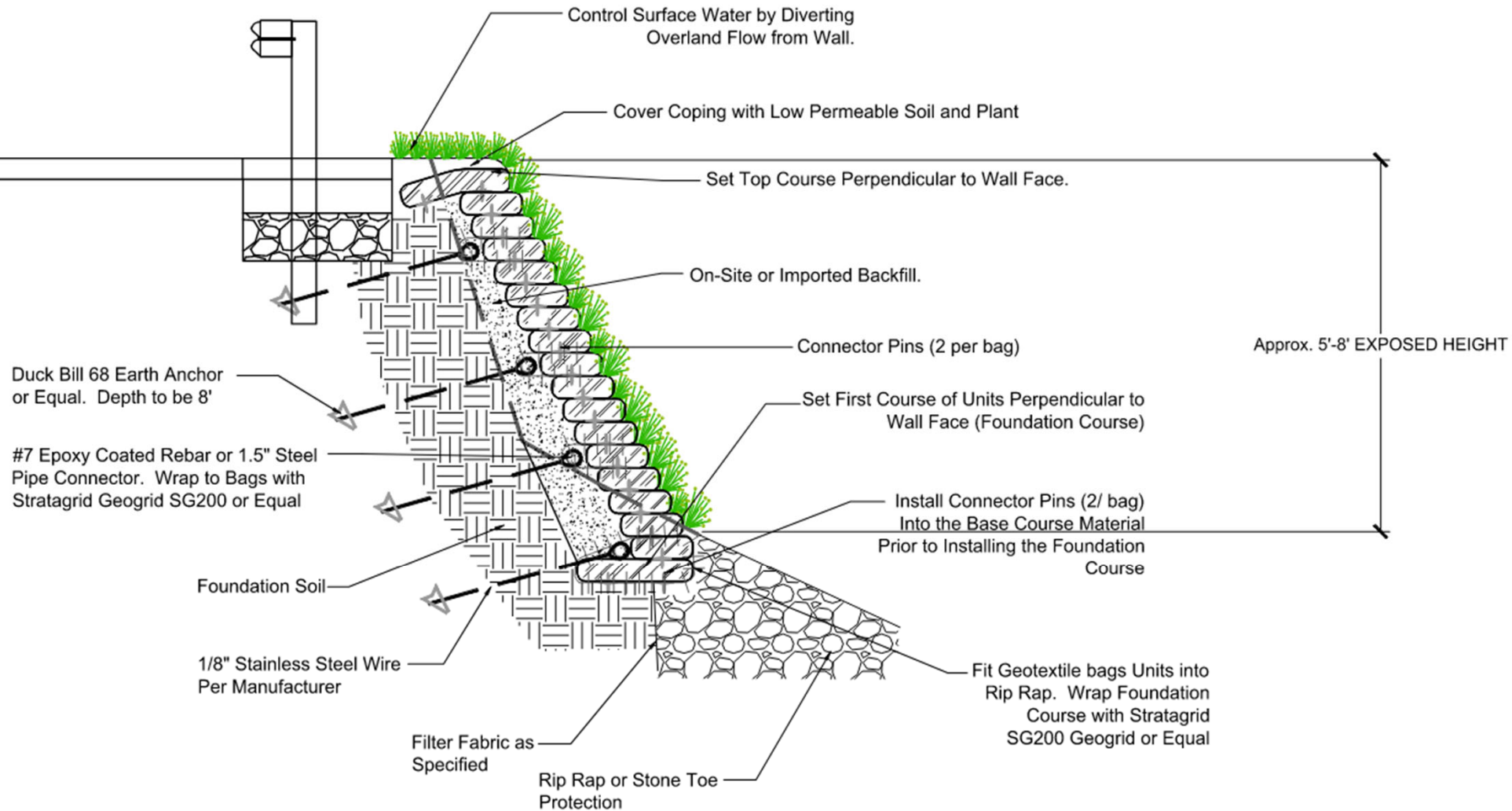
PROS

- A vegetated, natural solution

Cons

- Longer installation time
- Encroachment into stream channel
- Requires temporary cofferdam and dewatering in stream for installation

Vegetated Earth Reinforced Wall - Conceptual Typical Section







A vertical wall formed by interlocking members that are driven into the ground.

Sheet Pile Wall

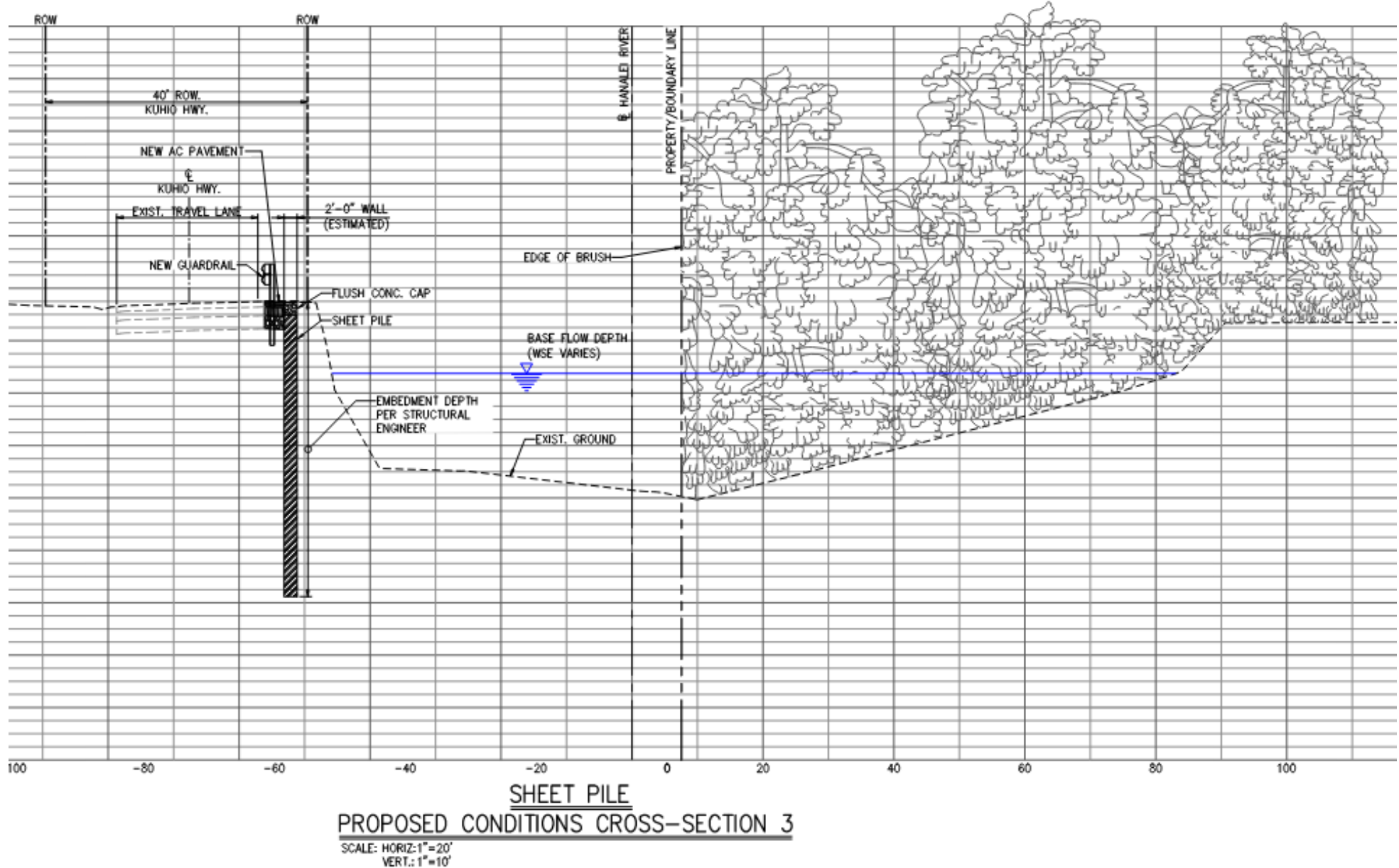
PROS

- Little to no encroachment into stream channel
- Fast Installation
- Does not require dewatering or work in stream

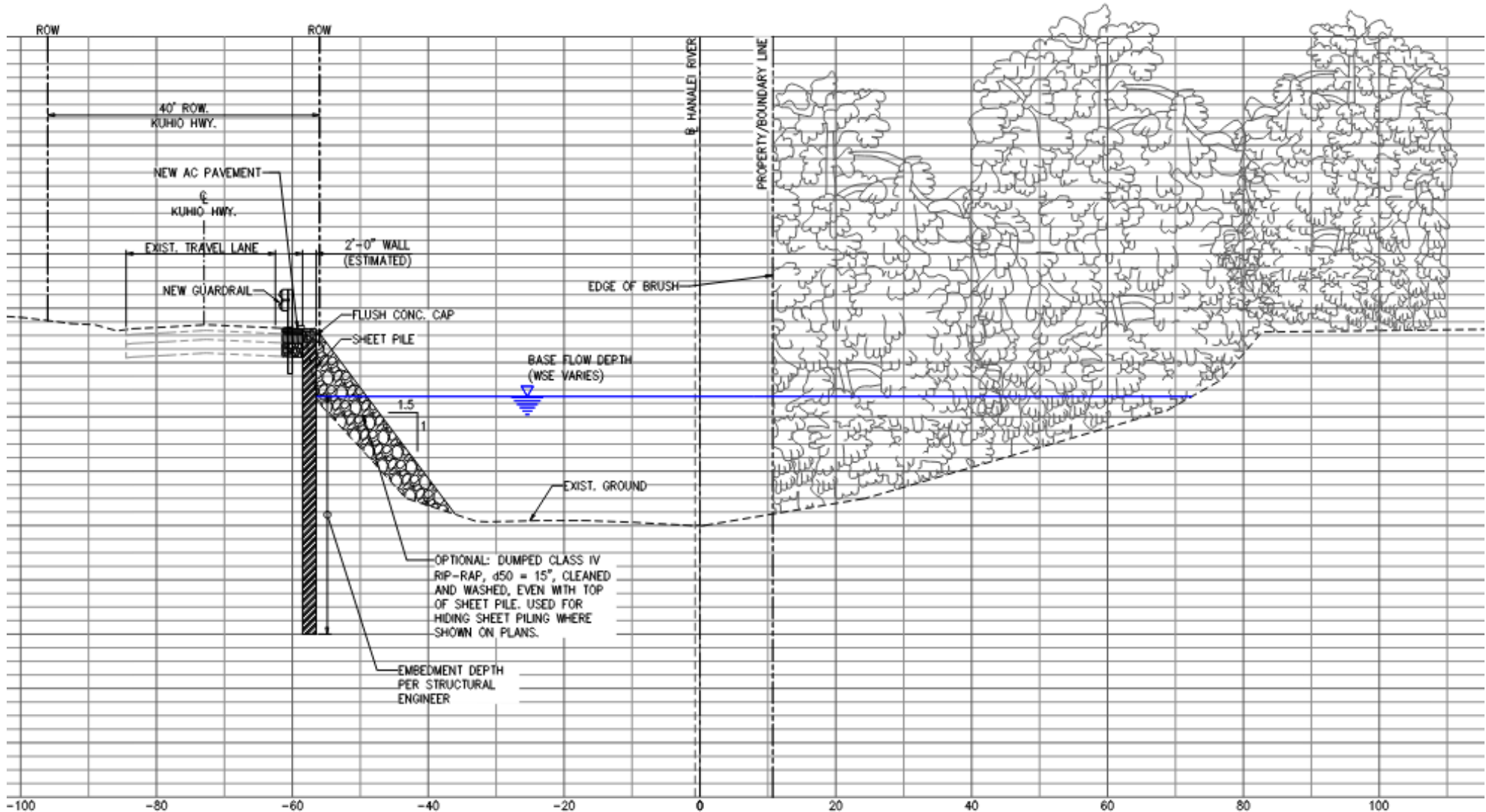
CONS

- A non “natural” solution

Sheet Piles - Cross Section



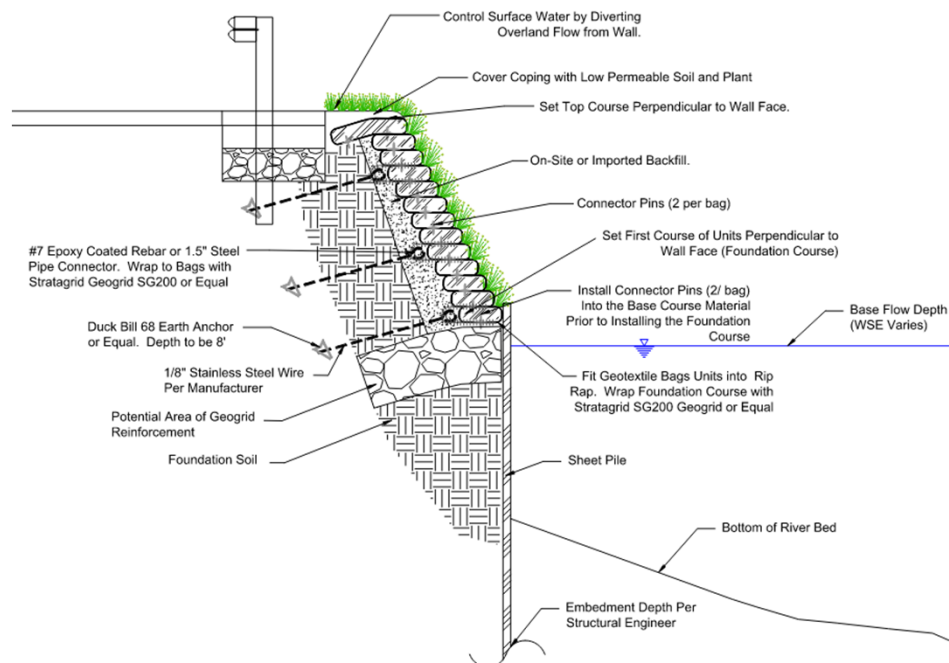
Sheet Piles W/ Optional Rip-rap - Cross Section



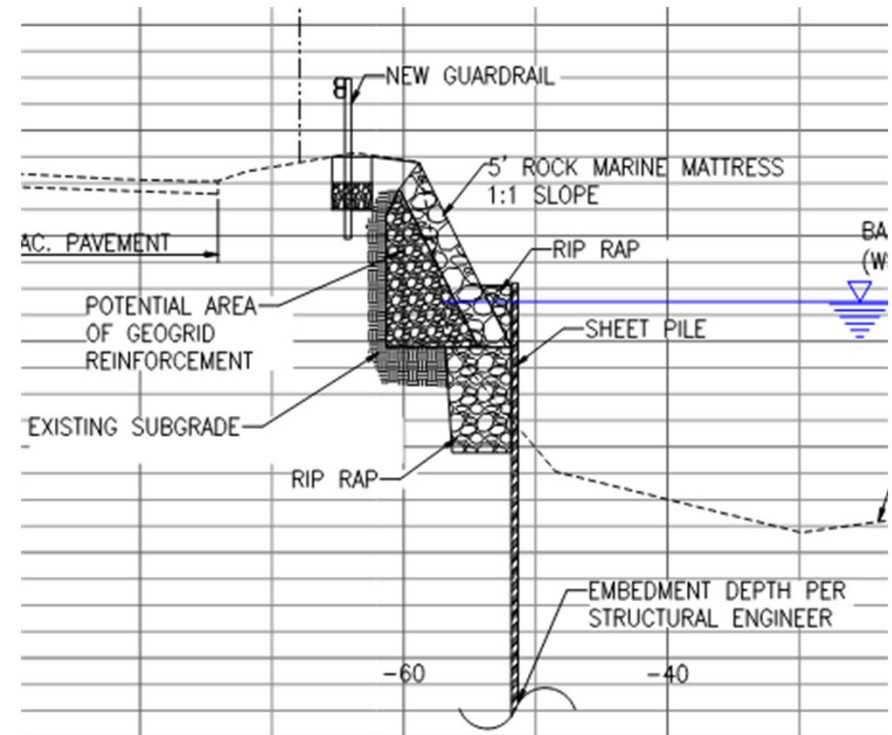
SHEET PILE
PROPOSED CONDITIONS CROSS-SECTION 2
SCALE: HORIZ: 1"=20'
VERT.: 1"=10'

Hybrid Approaches

1. Eliminate need for a temporary cofferdam.
2. Sheet piles provide protection from toe scour.
3. Reduces footprint of system into Hanalei River



Vegetated Earth Reinforced Wall
+ Sheet Pile Hybrid

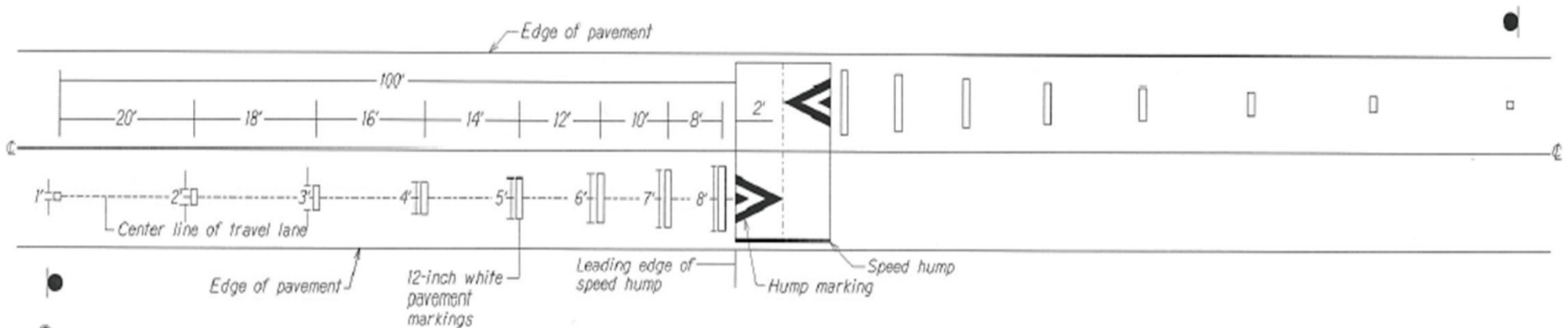
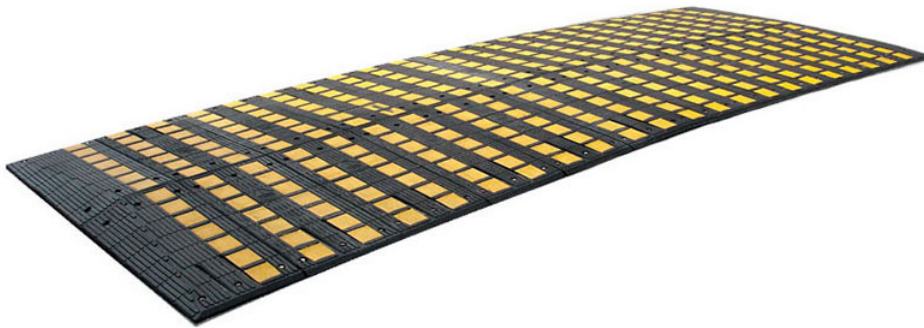


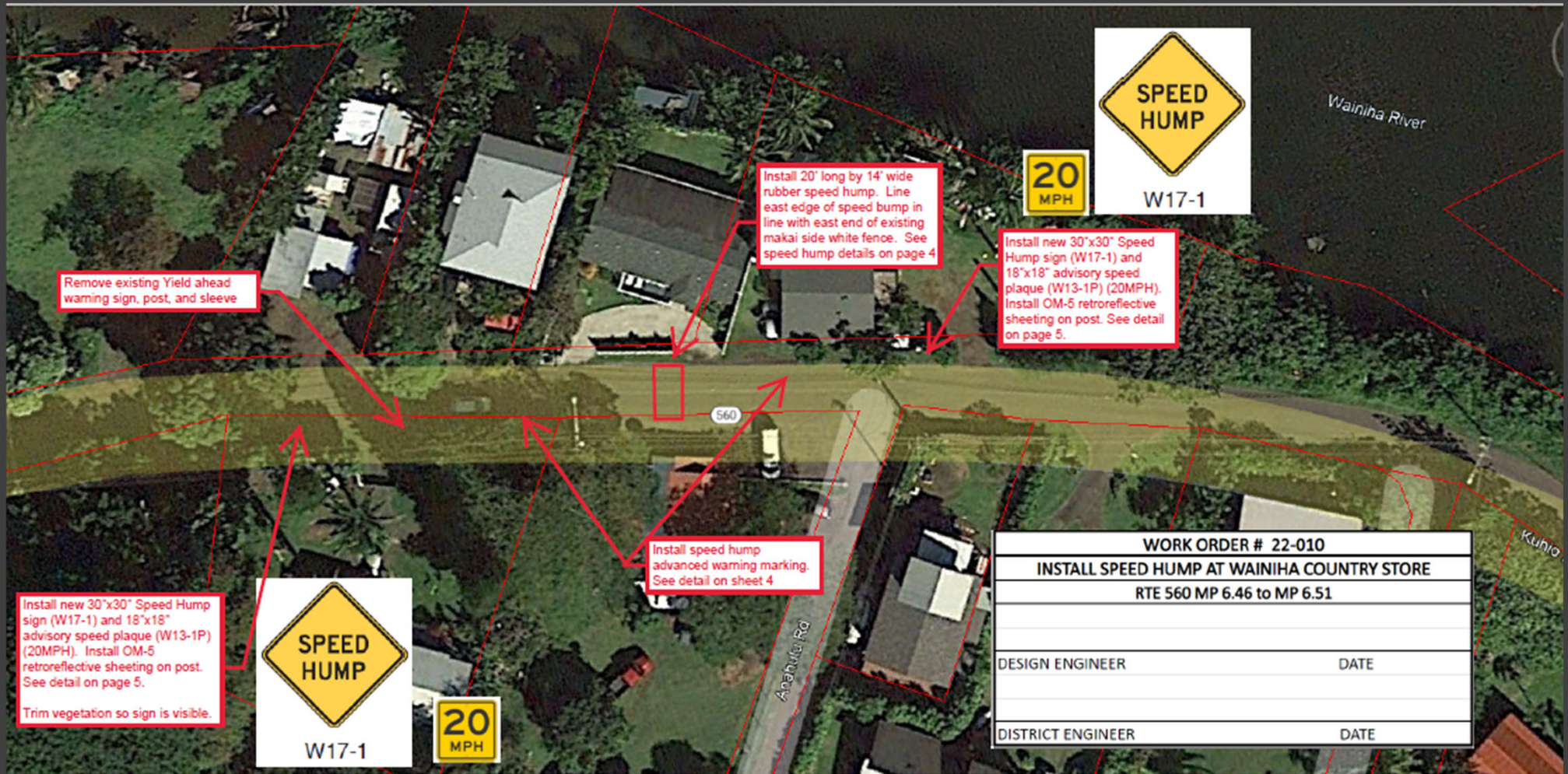
Rock Marine Mattress
+ Sheet Pile Hybrid



Traffic Calming at Wainiha Country Market

Rubber Speed Humps



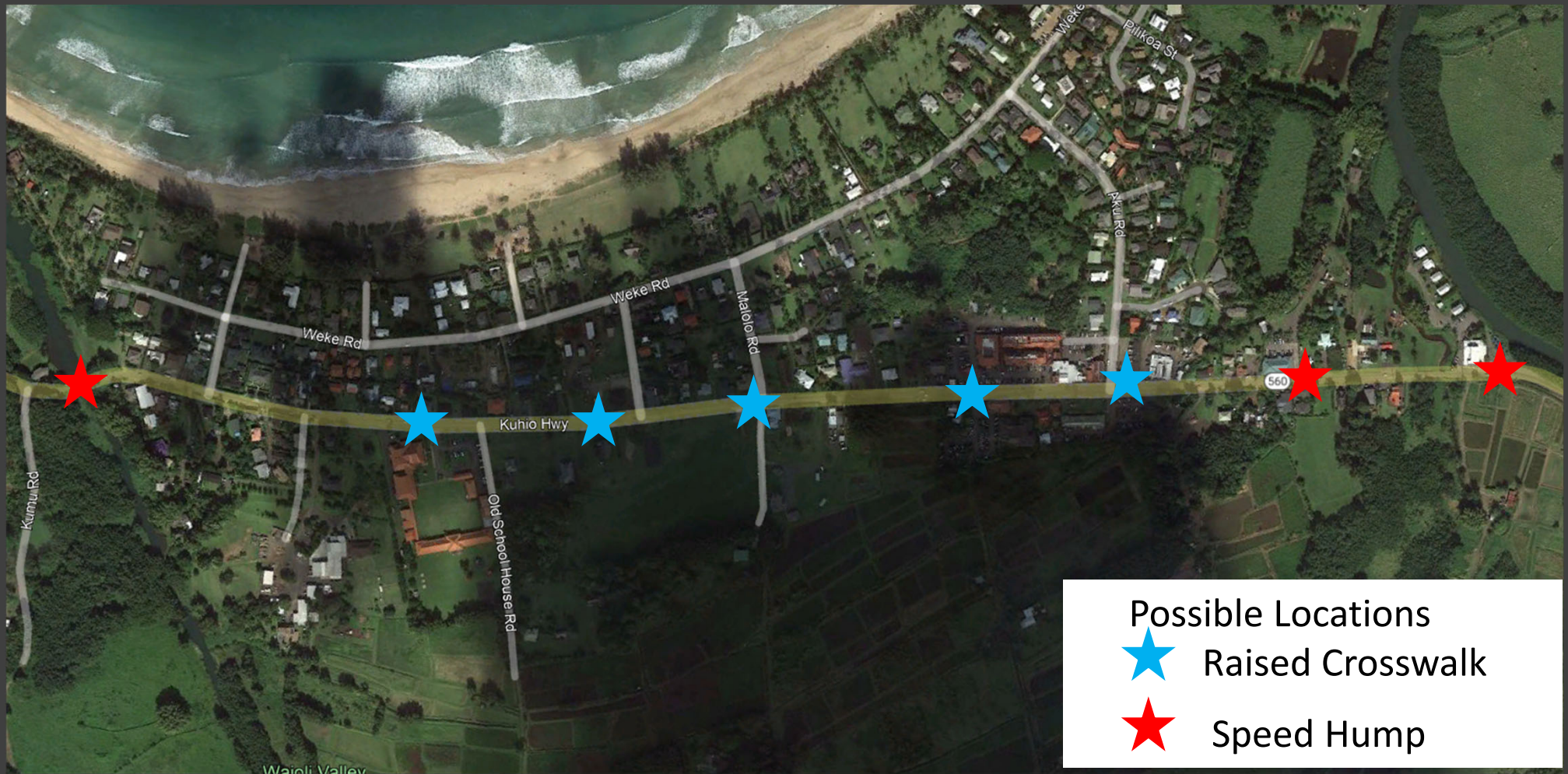


Traffic Calming at Wainiha Country Market

- Install speed hump to reduce speed
- Utilize rubber speed humps
- Install warning signs and pavement markers to notify drivers of the upcoming speed hump

Traffic Calming in Hanalei Town





Possible Locations

★ Raised Crosswalk

★ Speed Hump

Traffic Calming Devices in Hanalei

- Existing Speed Hump at Waioli Bridge
- Existing Raised Crosswalk at Hanalei Elementary School
- Potential Locations at Waioli Huiia Church, Malolo Rd, Aku Rd, west Ching Young Village entrance, between Aku Rd and Hanalei Dolphin Center (Speed Hump) and at the Hanalei Dolphin Center (Speed Hump)
- Raised crosswalks will install rectangular rapid flashing beacons (RRFB) for increased pedestrian safety

An aerial photograph of the Hanalei Valley in Hawaii. The image shows a winding road on the left, a parking lot with a small building, and a dense forest of green trees in the center. To the right, there are green fields and small ponds. The text "Hanalei Valley Viewpoint" is overlaid in large white letters.

Hanalei Valley Viewpoint



Current Striping Plan

- 2 North bound lanes (1 Dedicated Right Turn into Ka Haku Road) and one South bound lane
- Auxiliary lanes for turns into and out of the Hanalei Valley Viewpoint





***Stripers to return to the job the week of June 13th to complete pavement markings and striping.**



Proposed Striping

- One lane in each direction
- Auxiliary lanes for turns into and out of the Hanalei Valley Viewpoint
- Eliminates the Ka Haku Road extension from Kapaka St.
- Anticipated to be completed after the completion of the Kuhio Highway Resurfacing, Kahiliholo to Ka Haku Road project

Kuhio Highway Roadway Projects





Kuhio Highway Roadway Projects



Princeville to Hanalei Resurfacing and Safety Improvements

- Realign pavement markings at the Hanalei hairpin turn, MP 0.6 (2022)
- Restripe fading pavement markings, MP 1.2 to MP 4.2 (2022)
- Proposed Resurfacing and Safety Improvements under consideration, MP 0 to MP 4.5 (2024)
 - Installation of enhanced pavement markings
 - Installation of high friction surface treatment along Hanalei Hill
 - Installation of raised crosswalks and speed humps
 - Install rectangular rapid flashing beacons at marked crosswalks
 - Extension of sidewalks along Kuhio Highway



Kuhio Highway Pavement Preservation and Restriping

- Install crack seal/slurry seal pavement preservation, MP 6.4 to MP 8 (2022)
- Restripe fading pavement markings, MP 6.4 to MP 10 (2022)
- Install drainage improvements near MP 9.5 (2023)

Contact Information

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Willy Ortal, Maintenance Engineer
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(808) 241-3032

Name (optional): _____

FEEDBACK FORM

Contact Info (optional): _____

Hanalei Bridge Traffic Signal

☐ Support ☐ Oppose

Comments:

Hanalei Riverbank Stabilization Options

<input type="checkbox"/> UngROUTed Rip Rap	<input type="checkbox"/> Rock Marine Mattress	<input type="checkbox"/> Sheet Pile Wall
<input type="checkbox"/> Vegetated Earth Reinforced Wall	<input type="checkbox"/> Vegetated Earth / Sheet Pile Hybrid	<input type="checkbox"/> Rock Marine Mattress / Sheet Pile Hybrid

Comments:

Wainiha Country Market Traffic Calming

☐ Support ☐ Oppose

Comments:

Hanalei Town Traffic Calming

<input type="checkbox"/> Waioli Huiia Church	<input type="checkbox"/> Malolo Road	<input type="checkbox"/> West Ching Young Village entrance
<input type="checkbox"/> Aku Road	<input type="checkbox"/> Between Aku Road & Hanalei Dolphin	<input type="checkbox"/> Hanalei Dolphin

Comments:

Name (optional): _____

FEEDBACK FORM

Contact Info (optional): _____

Kuhio Highway Sidewalk Extensions

From: _____ To: _____

From: _____ To: _____

From: _____ To: _____

From: _____ To: _____

Comments:

Pavement Resurfacing MP 0 (Princeville) to MP 4.5 (Waikoko Bridge)

☐ Day work ☐ Night work

Comments:

Miscellaneous Comments

To submit:

- *Complete and drop off this form at the meeting*
- *Complete and drop off this form at, or mail to, Hawaii DOT, 1720 Haleukana Street, Lihue, Hawaii 96766*
- *Complete and submit form at <https://hidot.hawaii.gov/presentations/> where a video recap of the meeting will also be posted*