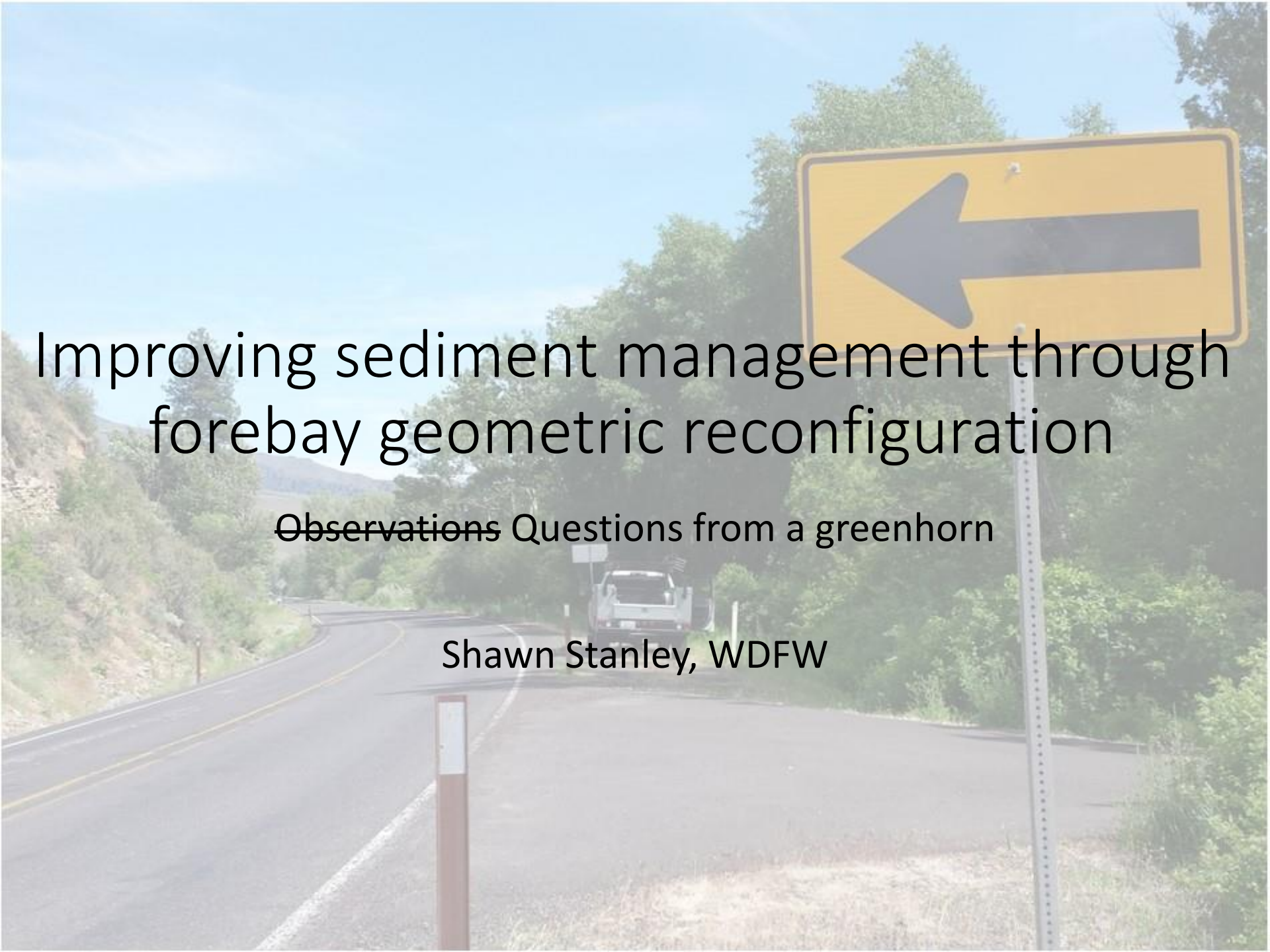

Improving sediment management through forebay geometric reconfiguration

~~Observations~~ Questions from a greenhorn

Shawn Stanley, WDFW


2 rules of screening:
1. Easy to screen clean water

2. Don’t upset the maintenance


MT. ADAMS

Species concerns

FISH PROTECTION SCREEN GUIDELINES
FOR WASHINGTON STATE

April 25, 2000
Washington Department of Fish and Wildlife

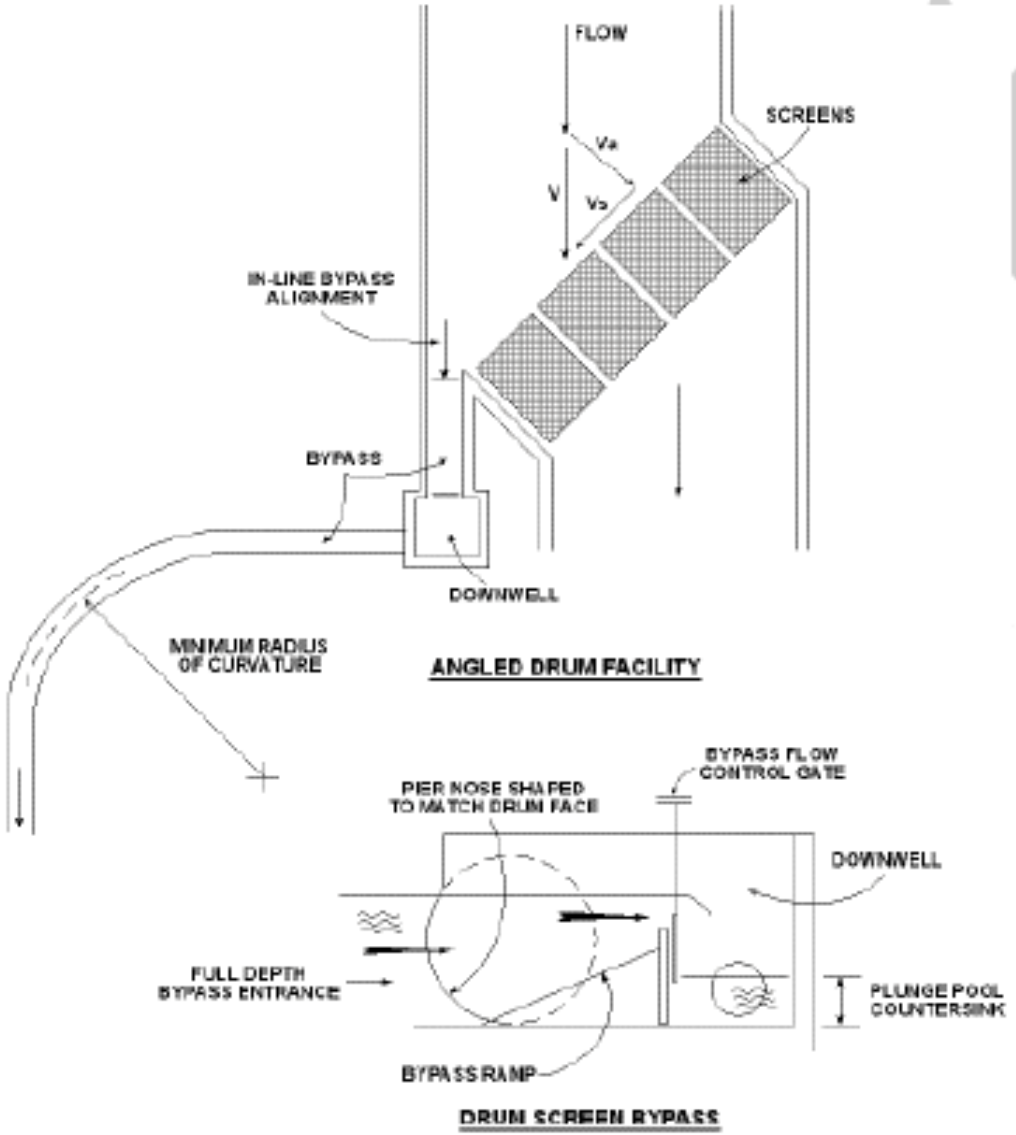

FIG. 13 - BYPASS SYSTEM AT DRUM SCREEN INSTALLATION

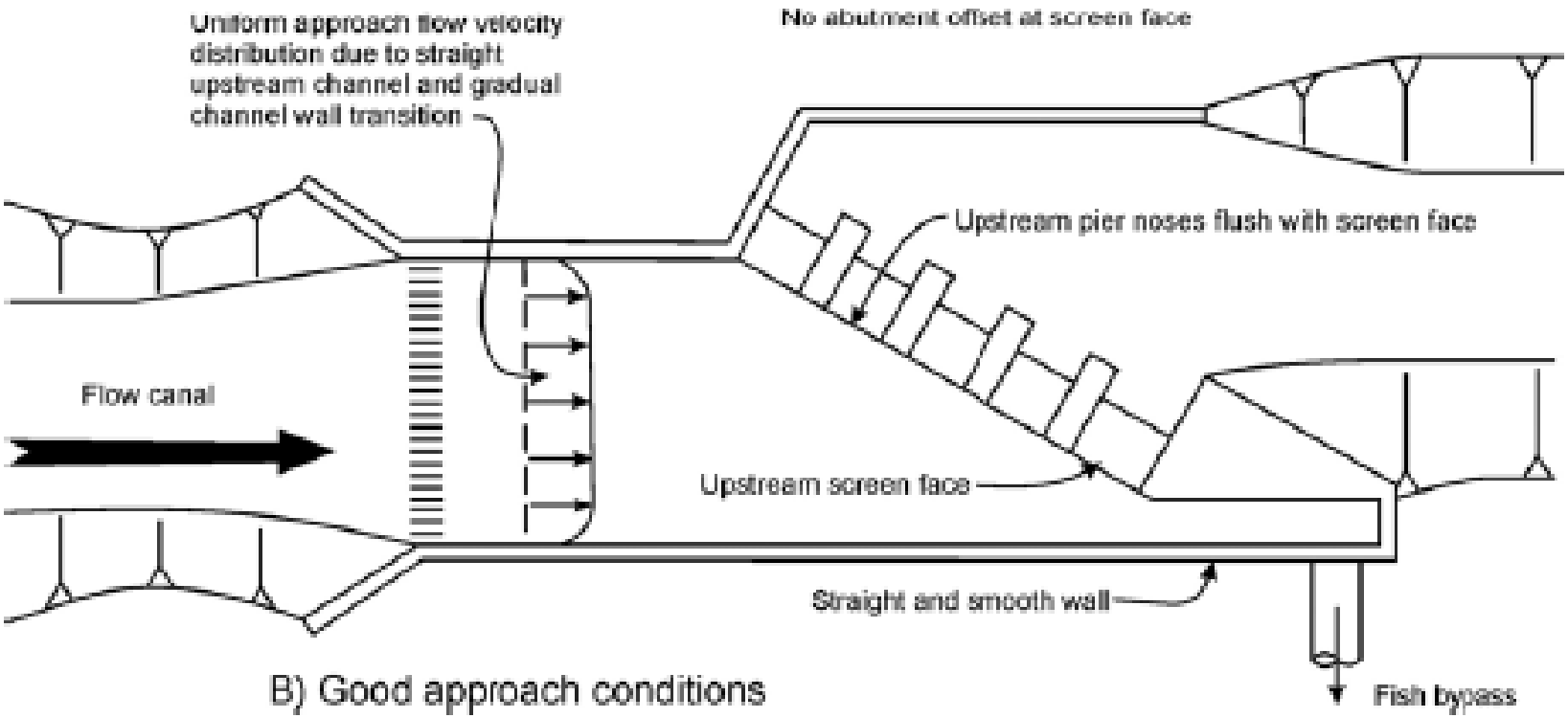

Figure 36.—Effect of approach channel on screen flow distribution (Pearce and Lee, 1991).

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Managing Water in the West

Water Resources Technical Publication

Fish Protection at Water Diversions

A Guide for Planning and Designing Fish Exclusion Facilities

Figure 20.—Horizontal flat plate screen, East Fork Ditch Company, East Fork, Weiser River, Idaho.

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Water Resources Technical Publication

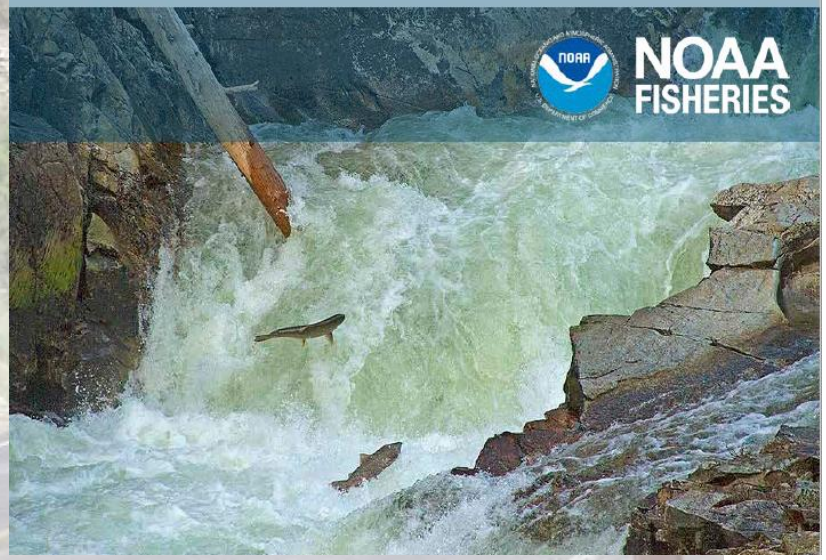
Fish Protection at Water Diversions

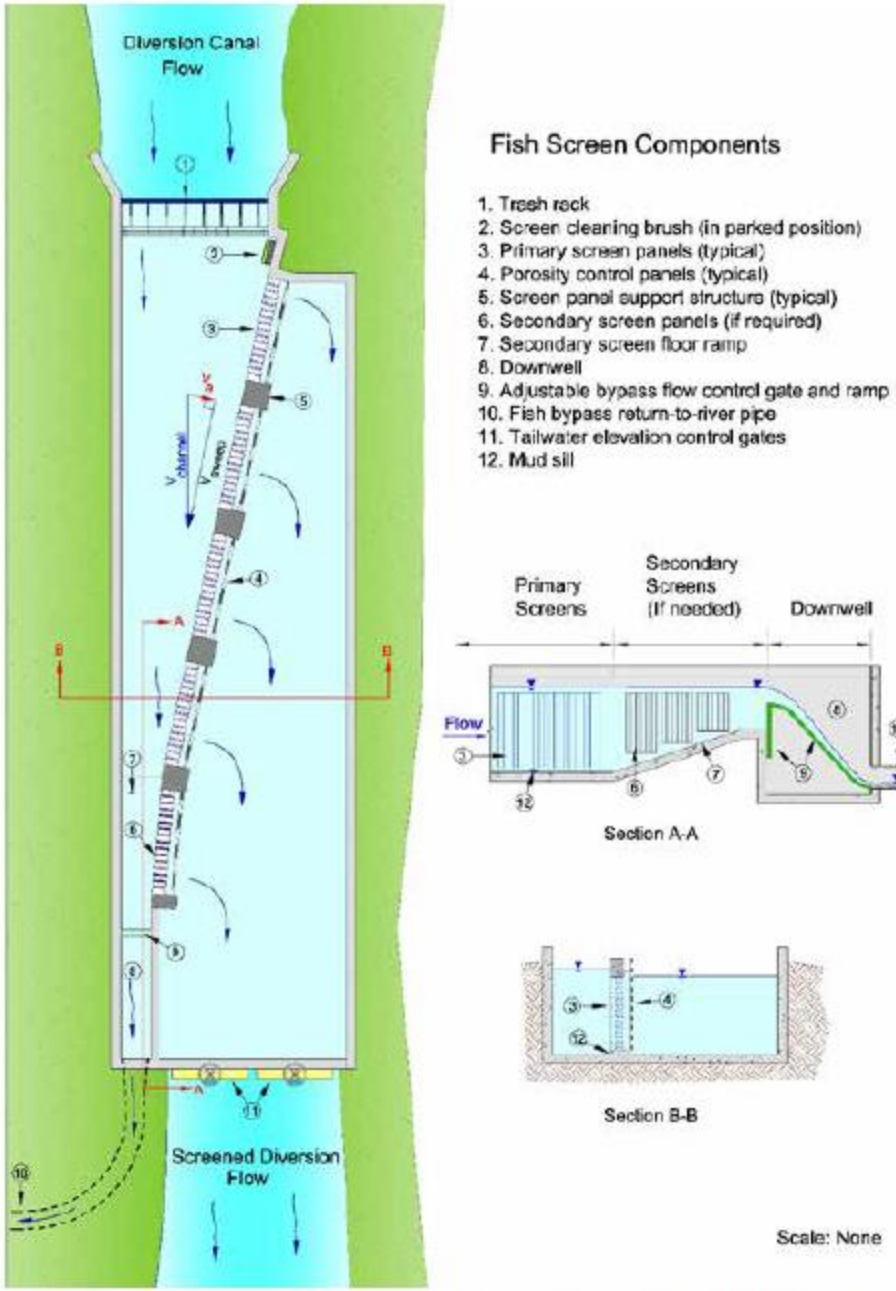
NOAA Technical Memorandum NMFS-NWFSC-1xx

NOAA Fisheries West Coast Region Anadromous Salmonid Passage Design Guidelines

National Marine Fisheries Service
West Coast Region
Oregon & Washington Coastal Office, Environmental Services Branch
California Coastal Office, Environmental Services Branch

PEER REVIEW DRAFT: August 16, 2018





4626

4627 Figure 10-4. Schematic of a typical fish screen system layout and components at water
4628 diversions

RECLAMATION

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Water Resources Technical Publication

Fish Protection at Water Diversions

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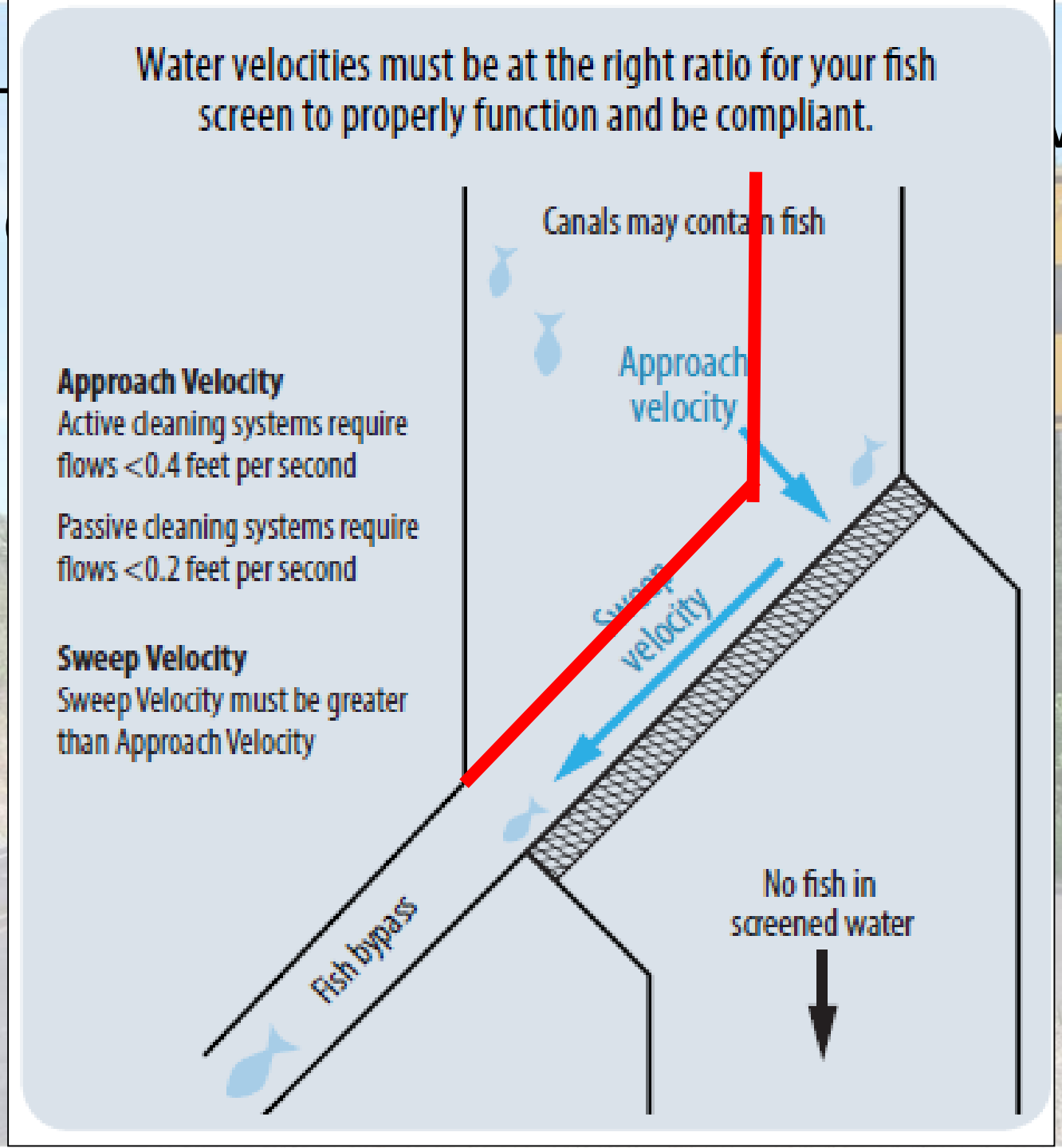
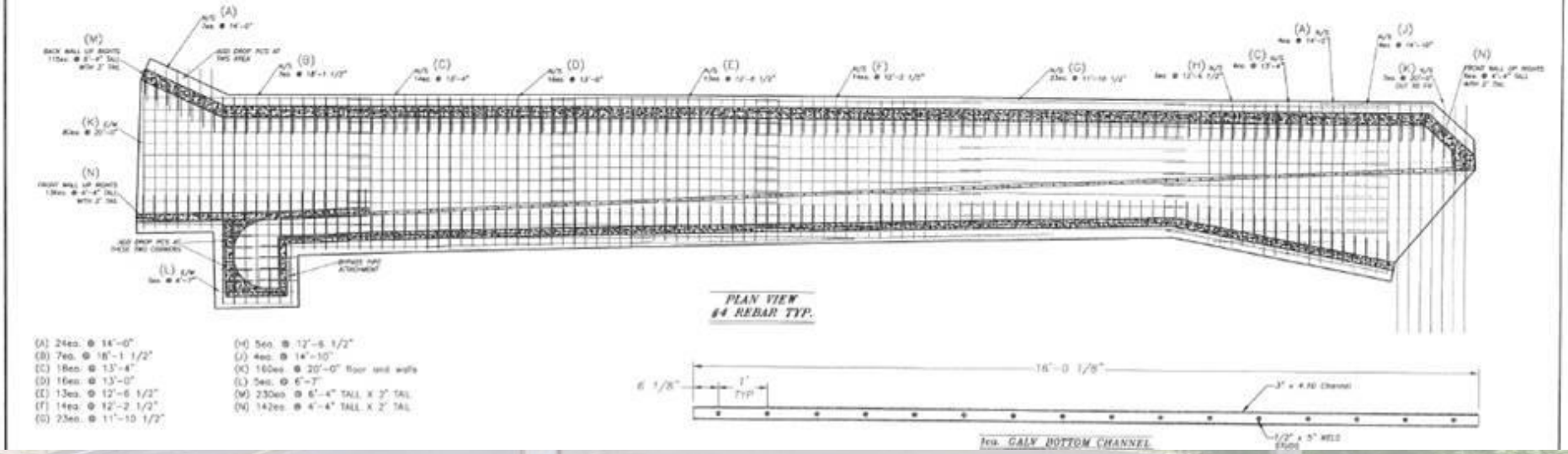

Water velocities must be at the right ratio for your fish screen to properly function and be compliant.
Canals may contain fish
Approach velocity
Approach Velocity
Active cleaning systems require flows <0.4 feet per second
Passive cleaning systems require flows <0.2 feet per second
Sweep Velocity
Sweep Velocity must be greater than Approach Velocity
Sweep velocity
Fish bypass
No fish in screened water

WALLS

STATE OF WASHINGTON
DEPARTMENT OF FISH & WILDLIFE
YAKIMA CONSTRUCTION SHOP

FOR REVIEW ONLY

ICICLE CREEK
FLATE SCREEN
PLAN VIEW

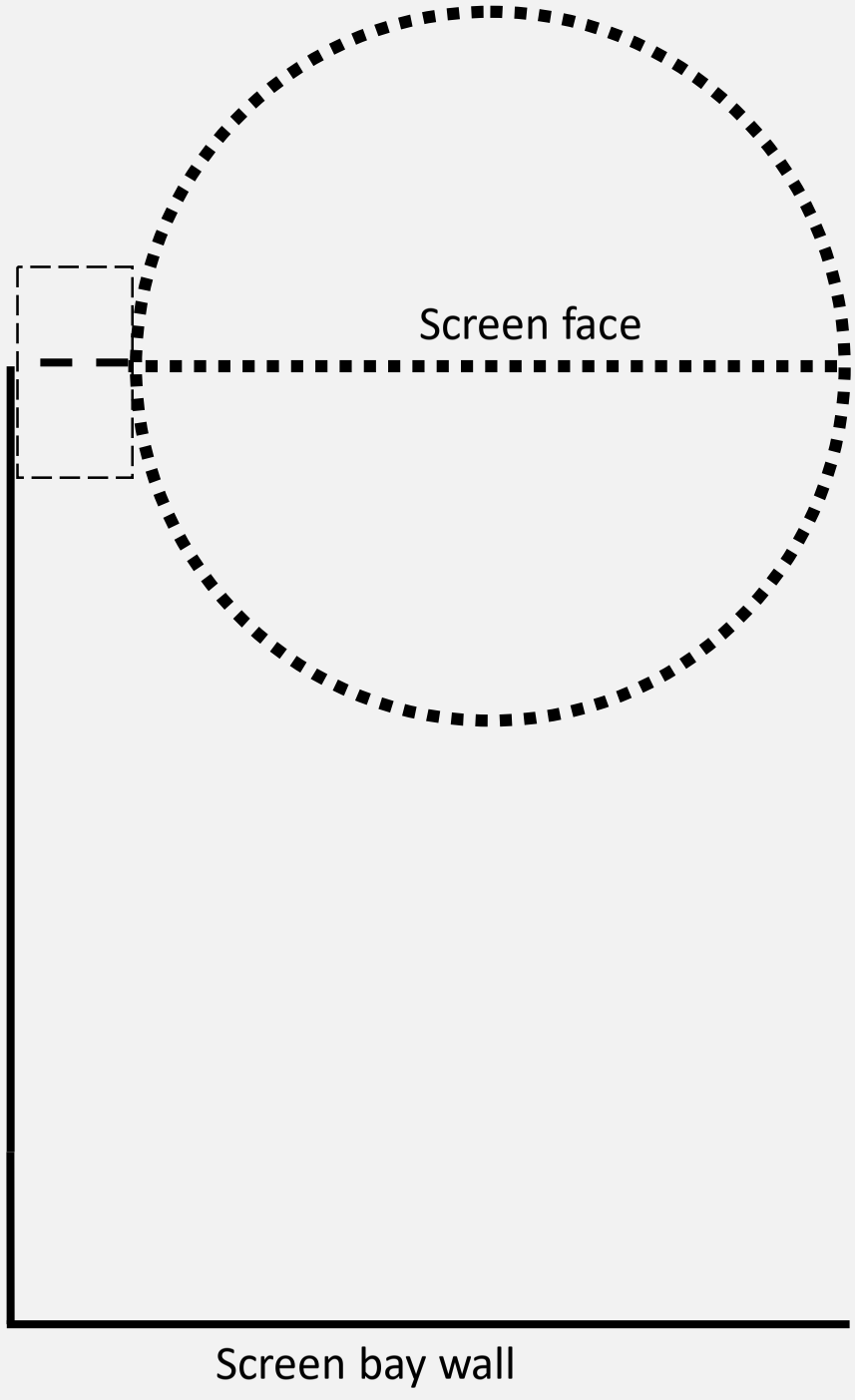


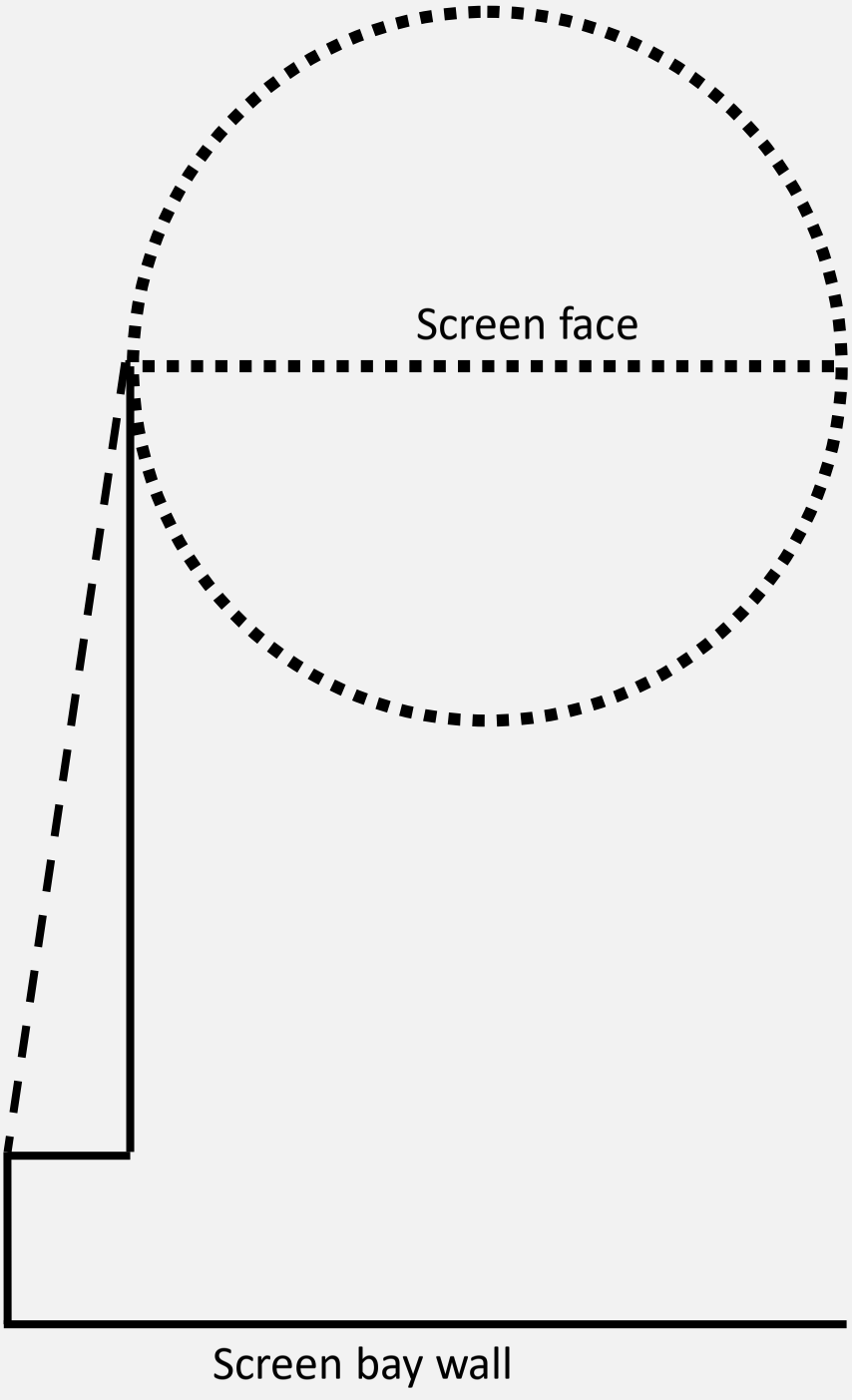
PLAN VIEW
#4 REBAR TYP.

7ea. GALV BOTTOM CHANNEL

Discussion

- NMFS require acceleration of flow past screen. By increasing velocity, that reduces contact time. Equal or better contact time and reducing incidences and time where sediment has to get hogged out by machine reduces impacts to target and other species.
- Turn drums/plate parallel with flow – reduces possibility of impingement, increases possibility of flow past screen sweeping debris off screen. Reduces screen bay width (rarely have lots of space, reduces site impacts (trees, oversteepened banks), reduces cost
- Need elevation, flow for bypass, velocity, bypass check boards not blocking the end of screen bay
- Ramp gate instead of stop logs (gets pulled to help manage sediment more frequency, less volume (air compressor)
- Pull stop logs during the off season
- Not so tight that you can't get an excavator bucket/shovel down there, rounded edges help with eddy formation and will reduce deposition over time (increased construction cost but reduced maintenance costs)
- Sluice after shutdown (volume available, degrade water quality, fast and shallow will convey better, oversize gate + pipe, during winter flows?)
- Sediment groove/low flow channel/slope that notch so floor still easy to work with
- Additional hydraulic modeling upfront (physical, 1 or 2-D)
- Other ideas? What have you done? How did it work? Lessons learned positive/negative?


Screen face
Screen bay wall


Screen face
Screen bay wall