

BEST PRACTICES FOR WASTEWATER SCREENING DESIGN

A BRIEF GUIDELINE TO COMMON WEIRS

WEIR APPLICATION – SCREENING FREQUENTLY ASKED QUESTIONS

What is a weir?

A flow control device

Why install a weir?

To help screening equipment capture more and unload debris

When to install a weir?

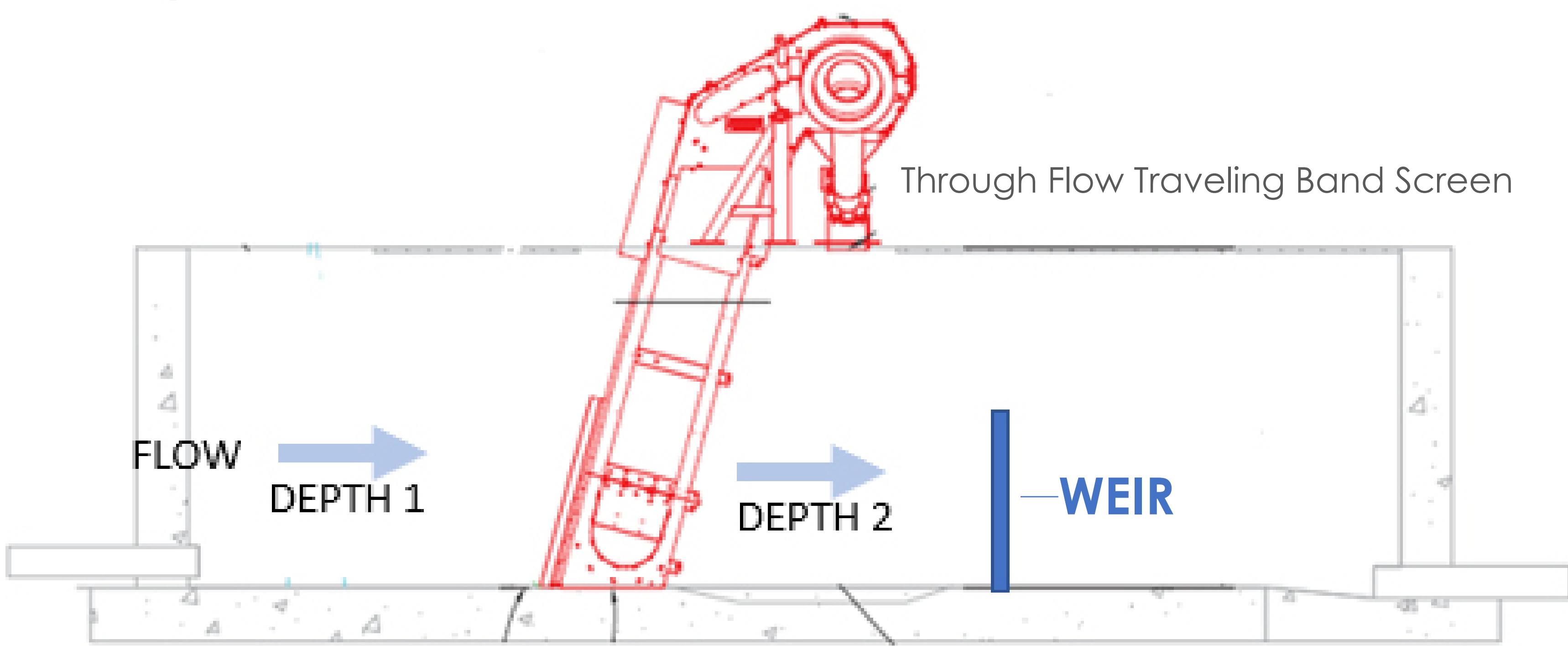
When peak and average flow differ more than 3:1

Where to install a weir?

Commonly installed after screening equipment

What are the common weir types used with screening?

Sutro (Proportional) and Underflow



BENEFITS OF INSTALLING A WEIR

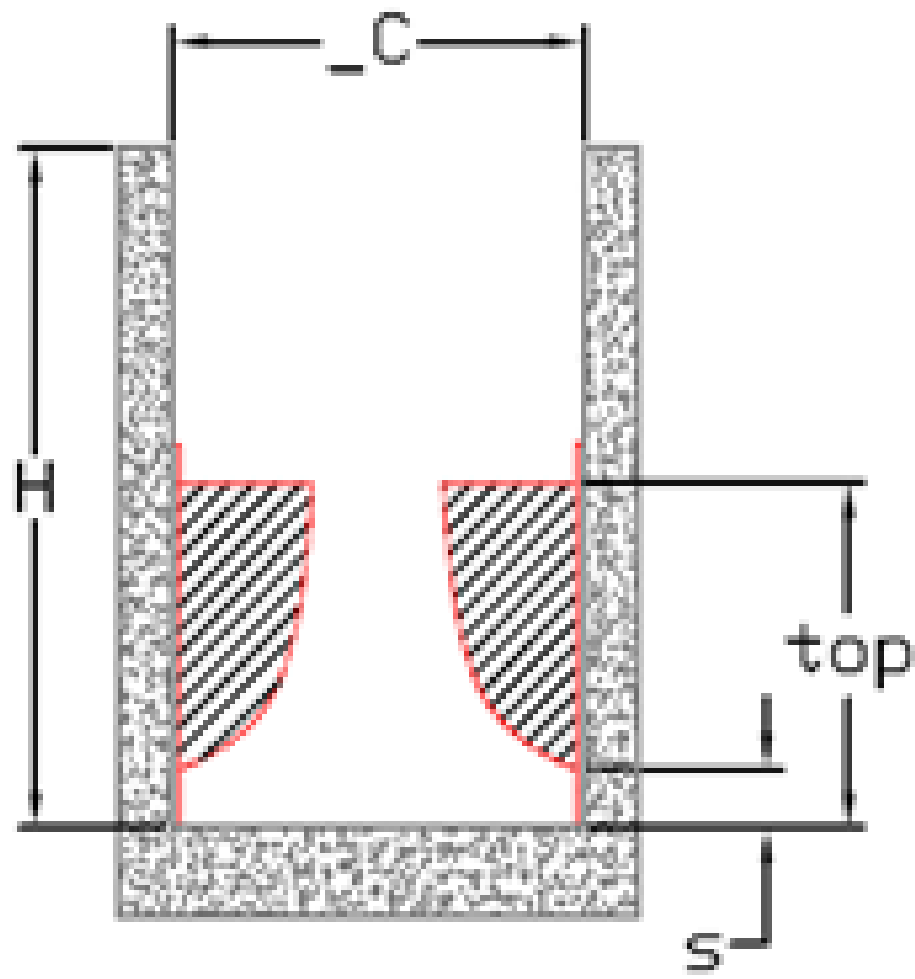
01 More debris is captured by a screen designed with optimum water level in front and back of the screening grid

02 High velocities at peak flow can force debris through the screening grid

03 Low velocities can result in grit deposition

04 Installation of a weir downstream can attenuate velocity shifts with flow rate changes

COMMON WEIR TYPES (FRONT VIEW)



SUTRO (PROPORTIONAL)

FLOW Q IS PROPORTIONAL BY A CONSTANT (S) TO DISCHARGE HEAD: $Q = S * H^D$

Sutro (Proportional) weirs help achieve optimum screening grid velocities at both peak and average flows

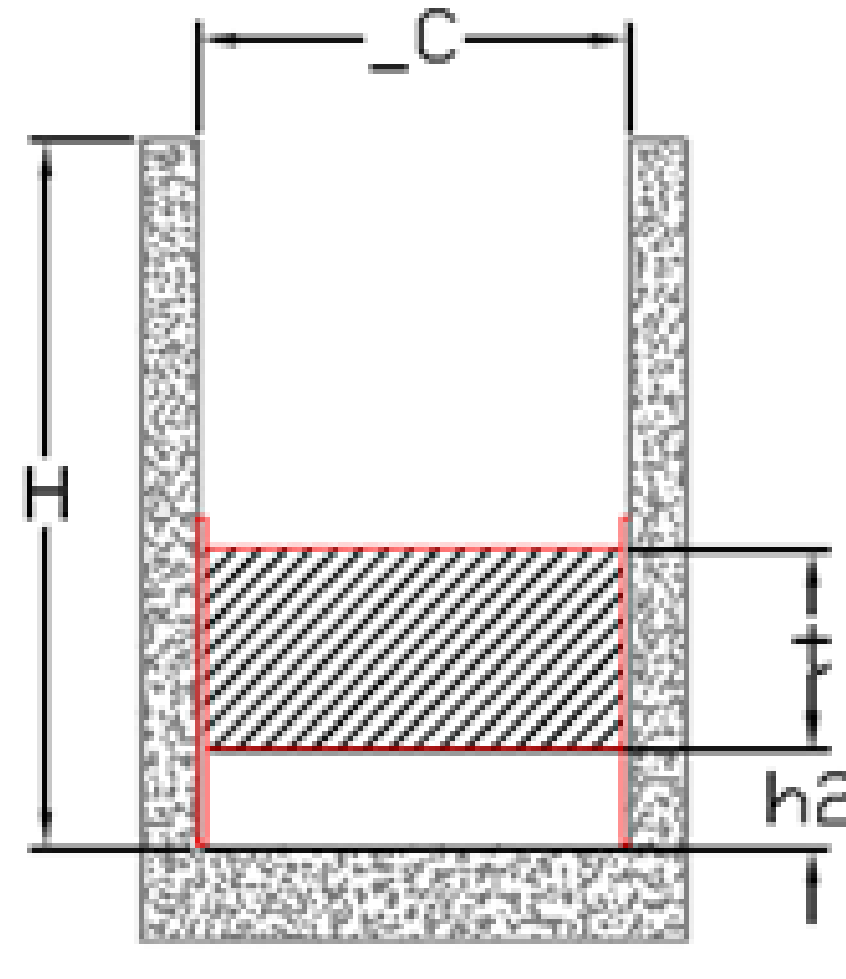
Screen equipment with proper screen grid velocity captures most debris best

Screen equipment with proper screen grid velocity clears best because debris does not get forced into or through the grid

More open space is available as the level drops, allowing velocity to remain near constant

Flow is proportional to discharge head

The parabolic curve is derived to maintain constant mean velocity upstream



UNDERFLOW

AS FLOW INCREASES, MEAN VELOCITY INCREASES

Underflow weirs help achieve optimum screening grid velocities at both peak and average flows

Small solids present in the wastewater flow do not get trapped by the weir

Adjustable so more weir area can be easily added as the flow to a facility increases; adjustability is used to account for plant flow expansion between peak and average flows as water intake grows with population

Generally least expensive option

Rectangular weirs are not constant velocity designs; screen grid velocity increases as flow increases

Since screen grid velocity can increase, this design might not provide best screening conditions for all flow ranges

Want to Learn More?

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