you

deserve to use the latest technology and the best know how?

MOVABLE WEIRS

		TYPE 1				
Width of Weir Crest	34 cm	45 cm	56 cm	83 cm	100 cm	130 cm
Width of Channel	136 cm	180 cm	224 cm	332 cm	[illegible] cm	520 cm
Height of Crest above Channel bottom	80 cm	80 cm	[illegible] cm	80 cm	8[illegible] cm	80 cm
Height of water level above Crest	55 cm	5[illegible]	[illegible]	[illegible]	[illegible] cm	55 cm
0	0.250	0.[illegible]	[illegible]250	0.250	[illegible]50	0.250
h/Z	0.600	[illegible]	[illegible]	0.688	0.688	0.688
C	0.587	0.587	0.587	0.587	0.587	0.587
delta_L	0.00[illegible]	[illegible]	[illegible]	[illegible]	0.008	0.008
Lo	0.348	[illegible]458	0.568	[illegible]938	1.008	1.308
ho	0.553	0.[illegible]3	0.553	[illegible]553	0.553	0.553
2g^,5	4.429	4.42[illegible]	4.429	[illegible]429	4.429	4.429
ho^1,5	0.411	[illegible]0.411	0.411	[illegible].411	0.411	0.411
Maximum Discharge in m3 per Second	0.25 m3/s[illegible]	[illegible]0.33 m3/sec	[illegible]40 m3	[illegible]#######	0.72 m3/sec	0.93 m3/sec
		TYPE 2				
Width of Weir Crest	1[illegible]			[illegible]04 cm	260 cm	297 cm
Width of Channel				[illegible]16 cm	1,040 cm	1,188 cm
Height of Crest above Channel b[illegible]				[illegible]0 cm	90 cm	90 cm
Height of water level abo[illegible]				[illegible]4 cm	84 cm	84 cm
Lw/Lc	0.[illegible]			[illegible].250	0.250	0.250
h/Z	[illegible]00			[illegible].933	0.933	0.933
C	0.5[illegible]			[illegible].587	0.587	0.587
delta_L	0.008			[illegible].008	0.008	0.008
Lo	1.008			[illegible]2.048	2.608	2.978
ho	0.843	0.84[illegible]		[illegible].843	0.843	0.843
2g^,5	4.429	4.429	4.429	[illegible].429	4.429	4.429
ho^1,5	0.774	0.774	0.774	0.774	0.774	0.774
Maximum Discharge in m3 per Second	1.35 m3/sec	1.75 m3/sec	2.25 m3/sec	#######	3.50 m3/sec	4.00 m3/sec

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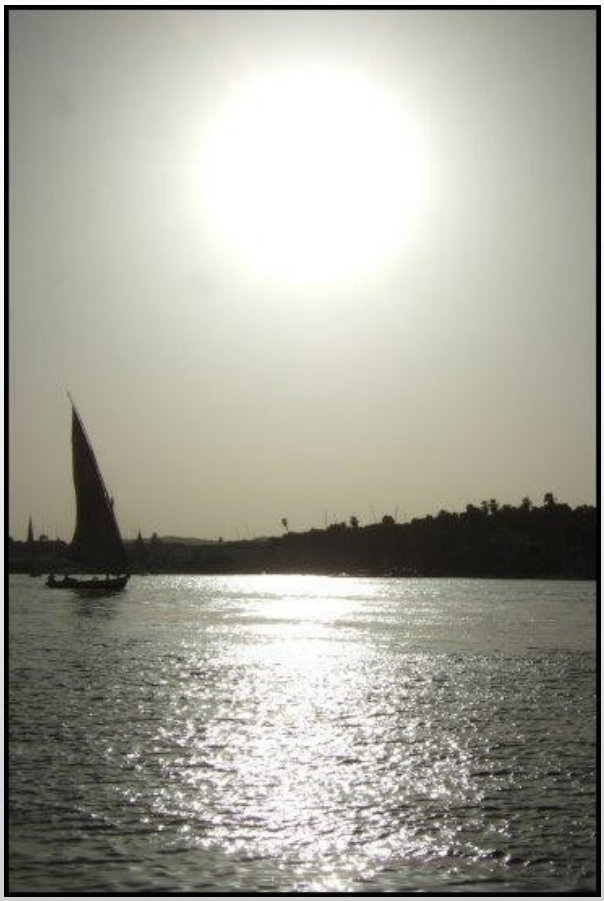
Introduction



Underwater steel structures are structures that are to resist forces due to stagnant or flowing waters. The static forces can be acting on the structures as direct loads, side pressure forces or buoyancy forces. Dynamic forces are forces due to flowing water and movement of the structures themselves in connection with driving mechanisms.

Underwater steel structures are normally encountered in water and hydraulic energy plants and in water born transport facilities.

The reason for the need for underwater steel structures lies in the increasing demand of the industry and the world for the water itself and the need to rational use of the available quantities and its resources. The applications underwater structure are mainly, control structures like weirs, dams, energy generating plants, pump stations and the like.

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Definitions

A weir is a dam over which liquids are forced to flow. Weirs are used to measure the flow of liquids in open channels or in conduits, which do not flow full: i.e. there is a free liquid surface. Weirs almost exclusively used for measuring water flow, through small ones have been used for measuring flow of other liquids. Weirs are classified according to their notch or opening of flow as follows:-

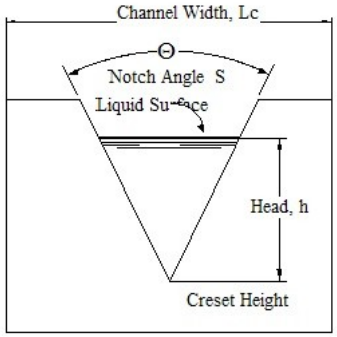

Figure for : Triangular Weir

1. Rectangular notch (Original form).
2.V– or triangular notch.
3.Trapezoidal notch, which designed with end sloped with one horizontal to four vertical and is called **Cipolletti Weir**.
4.Hyperbolic weir designed to give a constant coefficient of discharge.
5.Parabolic weir designed to give a linear relationship of head to flow.

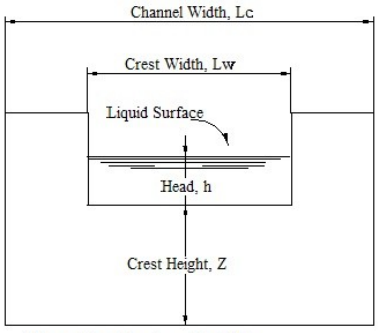

Figure for : Rectangular Weir

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General Description Of Movable Weir

The movable weirs are of welded construction design, designed of two skin supported and stiffened structures sliding across the face of each other, one fixed and the other is movable, maintaining water level up-stream between the certain minimum and maximum and maximum level.

The thickness of steel skin is accordance with DIN standard 19704 & 19705 for underwater structures. All other structural members and steel sections used in the design are also complying with above German Standard. The movable part is bolted to U- sections steel to fit with the guide groove, again the movable part is bent to a certain angle allowing water to fall in low and stiffened with a steel angle 50×5 mm. Both weirs on the same frame; the fixed and movable run in guide channels carefully designed to allow for free movement and lending a strong anchor into brickwork or concrete forming the sides and bottom sill. The movable weir gate is operated through a geared—mechanical lifting system.

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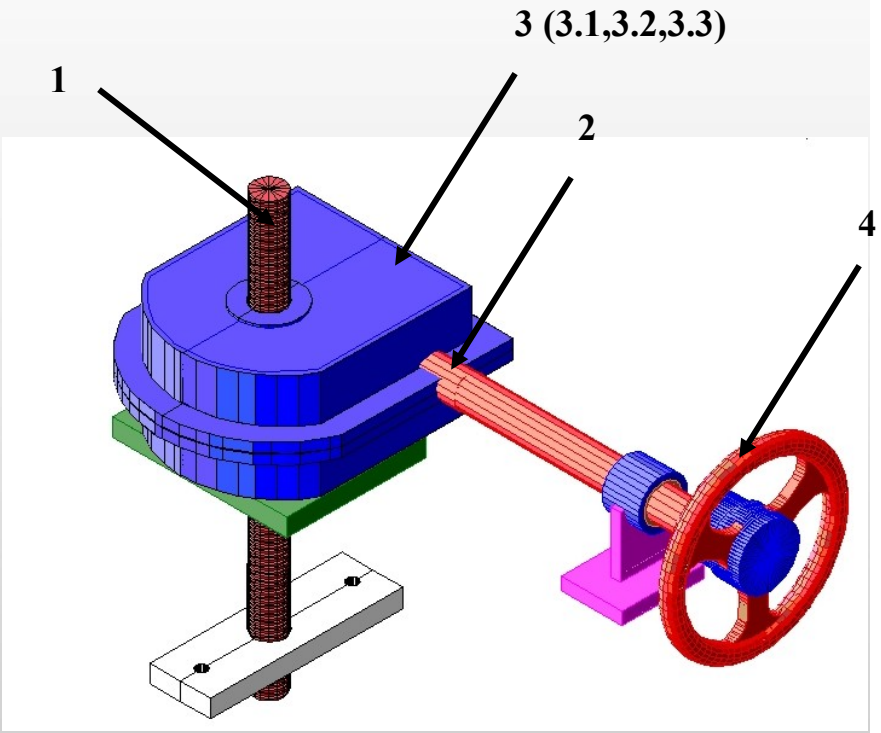
Construction Parts Of Movable Weir

1. Gear Box:-

The mechanical actuation system consist of the main below element:-

Drive: Ratio I = 6.75 Worm Gear hand drive with limit stops for both final positions (load responsive). The worm boss is in face hardened steel and the worm wheel in mild steel.

Hand Wheel: the moving hand wheel is 40 cm in diameter to ensure ease of handling.



1. Threaded spindle .

2. Straight worm shaft.

3. Housing:

3.1. Worm gear.

3.2. Threaded nut

3.3. Thrust bearing

4. Hand wheel.

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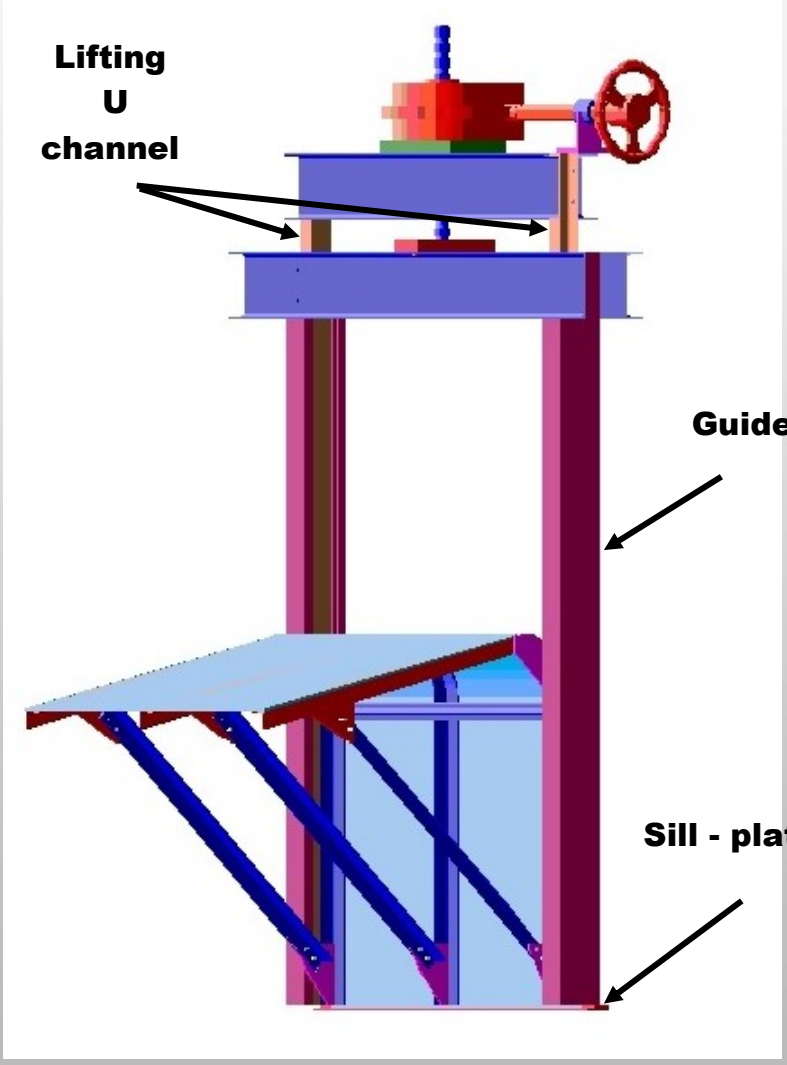
2. Guide Channels and its Elements:-

The guide channels are made out of cast iron GG 25;the two side channels are mounted on a bottom sill out of cast iron. The guide channels are connected together as the top with U– sections at each side out of steel St.37 to fasten the whole structure.



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3. Movable and Fixed skin:-

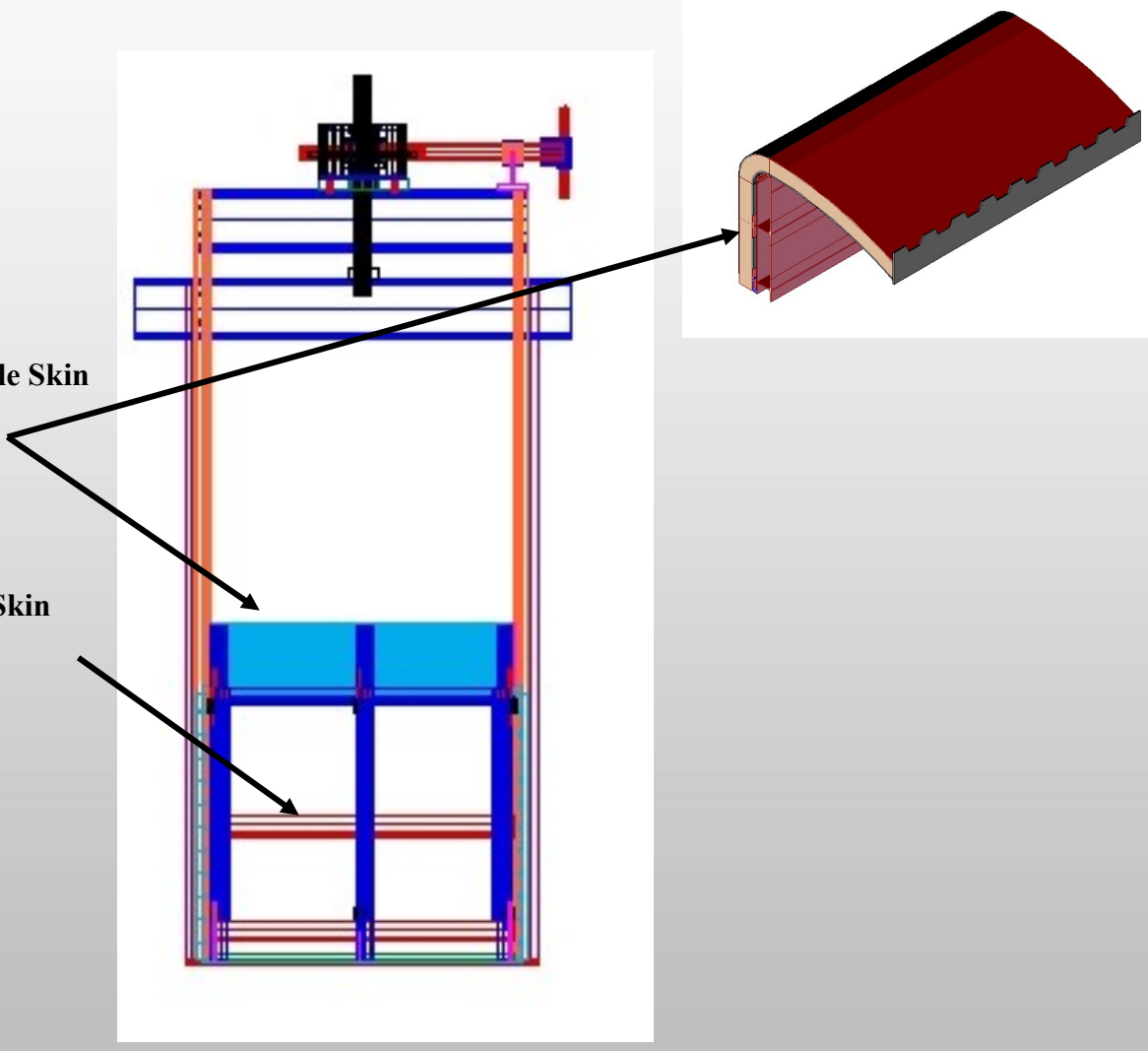

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Table showing the Maximum Discharge of our Type 1 and 2 of movable weirs:

$$Q = (2/3) \cdot C \cdot La \cdot \sqrt{2g} \cdot ha^{3/2}$$

Type 1

Width of Weir Crest	34 cm	45 cm	56 cm	83 cm	100 cm	130 cm
Width of Channel	136 cm	180 cm	224 cm	332 cm	400 cm	520 cm
Height of Crest above Channel bottom	80 cm	80 cm	80 cm	80 cm	80 cm	80 cm
Height of water level above Crest	55 cm	55 cm	55 cm	55 cm	55 cm	55 cm
Lw/Lc	0.250	0.250	0.250	0.250	0.250	0.250
h/Z	0.600	0.688	0.688	0.688	0.688	0.688
C	0.587	0.587	0.587	0.587	0.587	0.587
delta_L	0.008	0.008	0.008	0.008	0.008	0.008
La	0.348	0.458	0.568	0.838	1.008	1.308
ha	0.553	0.553	0.553	0.553	0.553	0.553
2g^,5	4.429	4.429	4.429	4.429	4.429	4.429
ha^1,5	0.411	0.411	0.411	0.411	0.411	0.411
Maximum Discharge in m3 per Second	0.25 m3/sec	0.33 m3/sec	0.40 m3/sec	0.60 m3/sec	0.72 m3/sec	0.93 m3/sec

Type 2

Width of Weir Crest	100 cm	130 cm	167 cm	204 cm	260 cm	297 cm
Width of Channel	400 cm	520 cm	668 cm	816 cm	1,040 cm	1,188 cm
Height of Crest above Channel bottom	90 cm	90 cm	90 cm	90 cm	90 cm	90 cm
Height of water level above Crest	84 cm	84 cm	84 cm	84 cm	84 cm	84 cm
Lw/Lc	0.250	0.250	0.250	0.250	0.250	0.250
h/Z	0.600	0.933	0.933	0.933	0.933	0.933
C	0.587	0.587	0.587	0.587	0.587	0.587
delta_L	0.008	0.008	0.008	0.008	0.008	0.008
La	1.008	1.308	1.678	2.048	2.608	2.978
ha	0.843	0.843	0.843	0.843	0.843	0.843
2g^,5	4.429	4.429	4.429	4.429	4.429	4.429
ha^1,5	0.774	0.774	0.774	0.774	0.774	0.774
Maximum Discharge in m3 per Second	1.35 m3/sec	1.75 m3/sec	2.25 m3/sec	2.75 m3/sec	3.50 m3/sec	4.00 m3/sec

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