

gate-and-jump

6 October 2026, 23:00

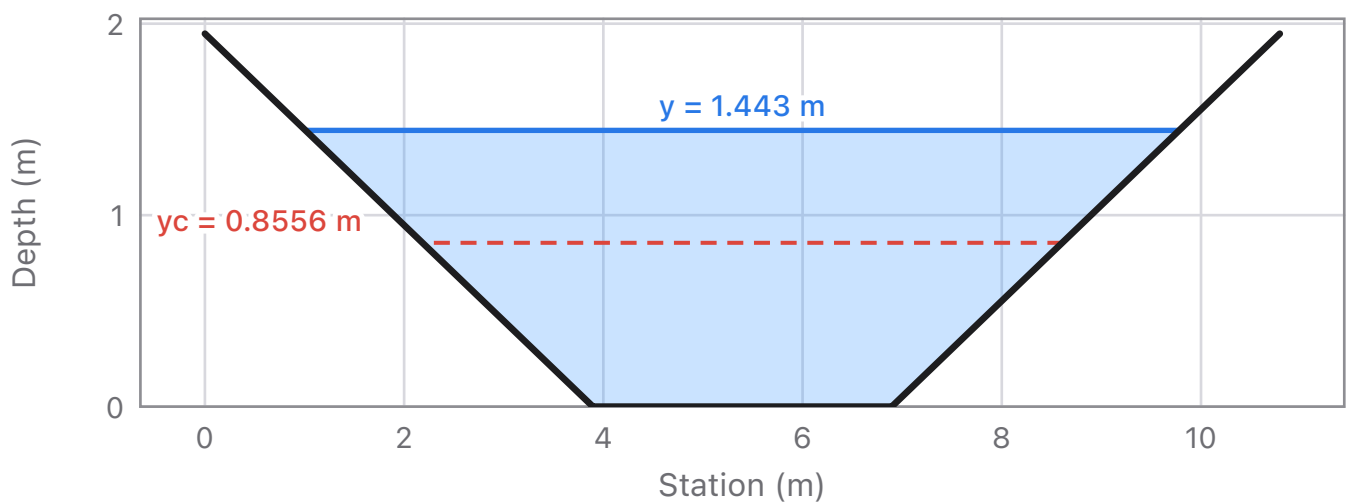
Channel

Section	Trapezoidal	Discharge	10 m ³ /s
Bottom width	3 m	Bed slope	0.001
Side slopes	2 and 2 H:1V	Energy coefficient α	1
Manning's n	0.025	Units	SI

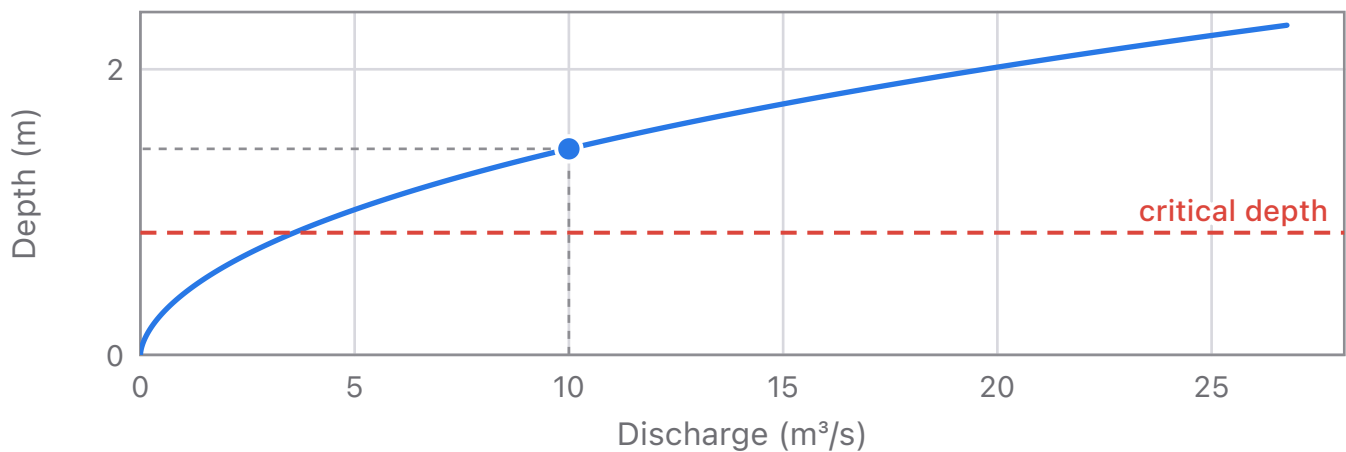
Uniform flow

Discharge	10.000 m ³ /s	Bed shear stress	8.810 N/m ²
Depth	1.443 m	Flow area	8.491 m ²
Bed slope	0.001000	Wetted perimeter	9.452 m
Manning's n	0.0250	Hydraulic radius	0.8983 m
Velocity	1.178 m/s	Top width	8.771 m
Froude number	0.382	Hydraulic depth	0.9681 m
Flow regime	Subcritical	Critical depth	0.8556 m
Specific energy	1.513 m	Critical slope	0.007765

Cross-section

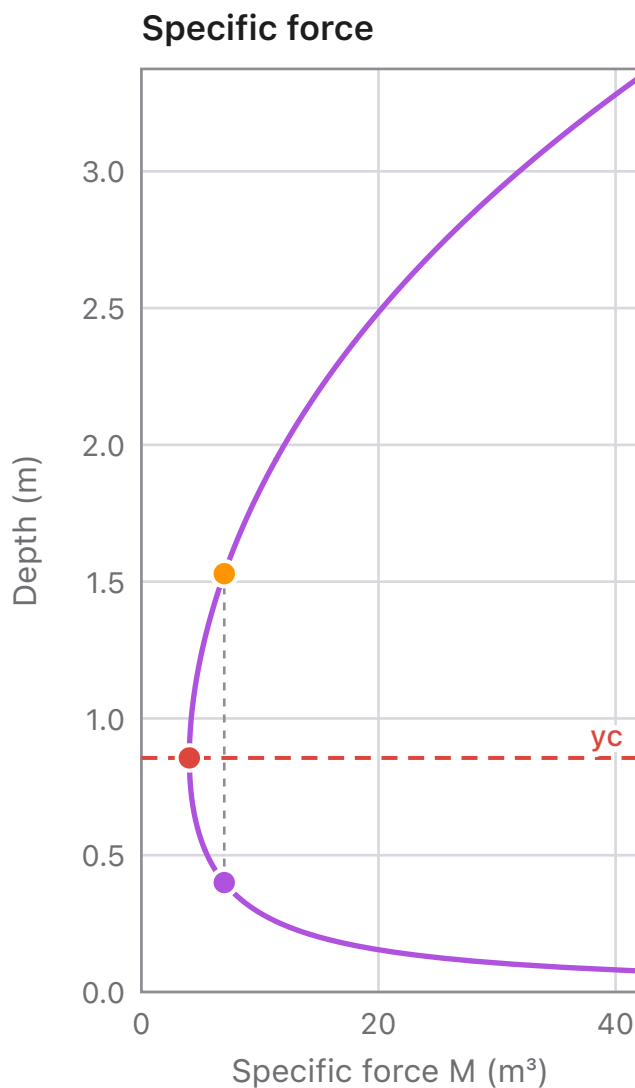
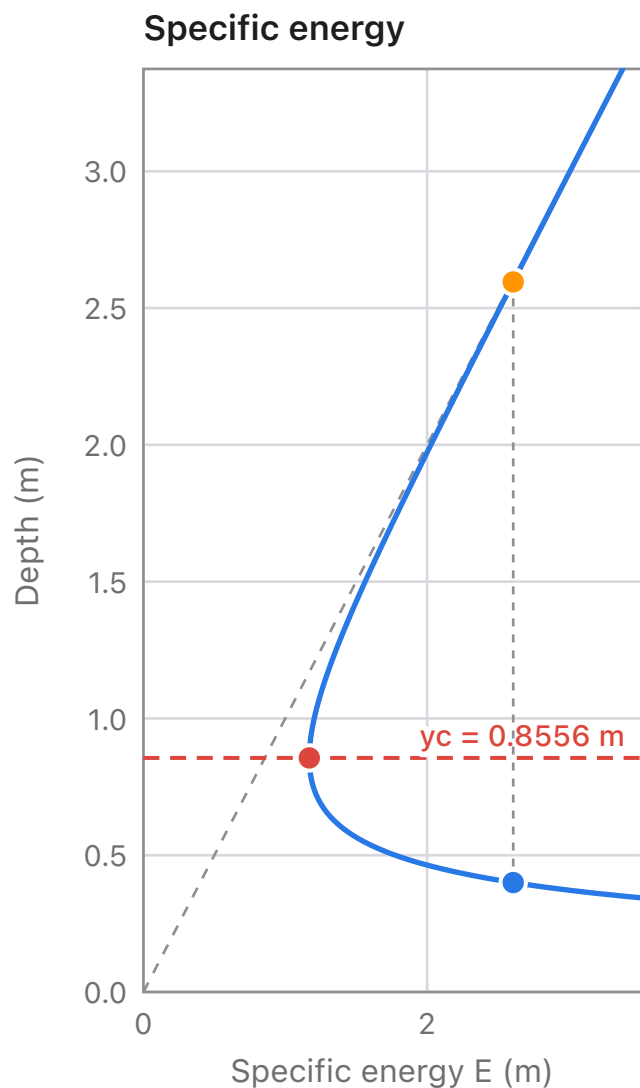


Rating curve (uniform flow)



Specific energy and the hydraulic jump

Critical depth	0.8556 m	Depth before the jump	0.4000 m
Minimum specific energy	1.169 m	Depth after the jump	1.529 m
Depth of flow	0.4000 m	Froude number before	3.655
Froude number	3.655	Energy loss	1.018 m
Specific energy	2.607 m	Efficiency	60.9 %
Specific force	6.991 m ³	Kind of jump	Oscillating jump
Alternate depth	2.596 m		

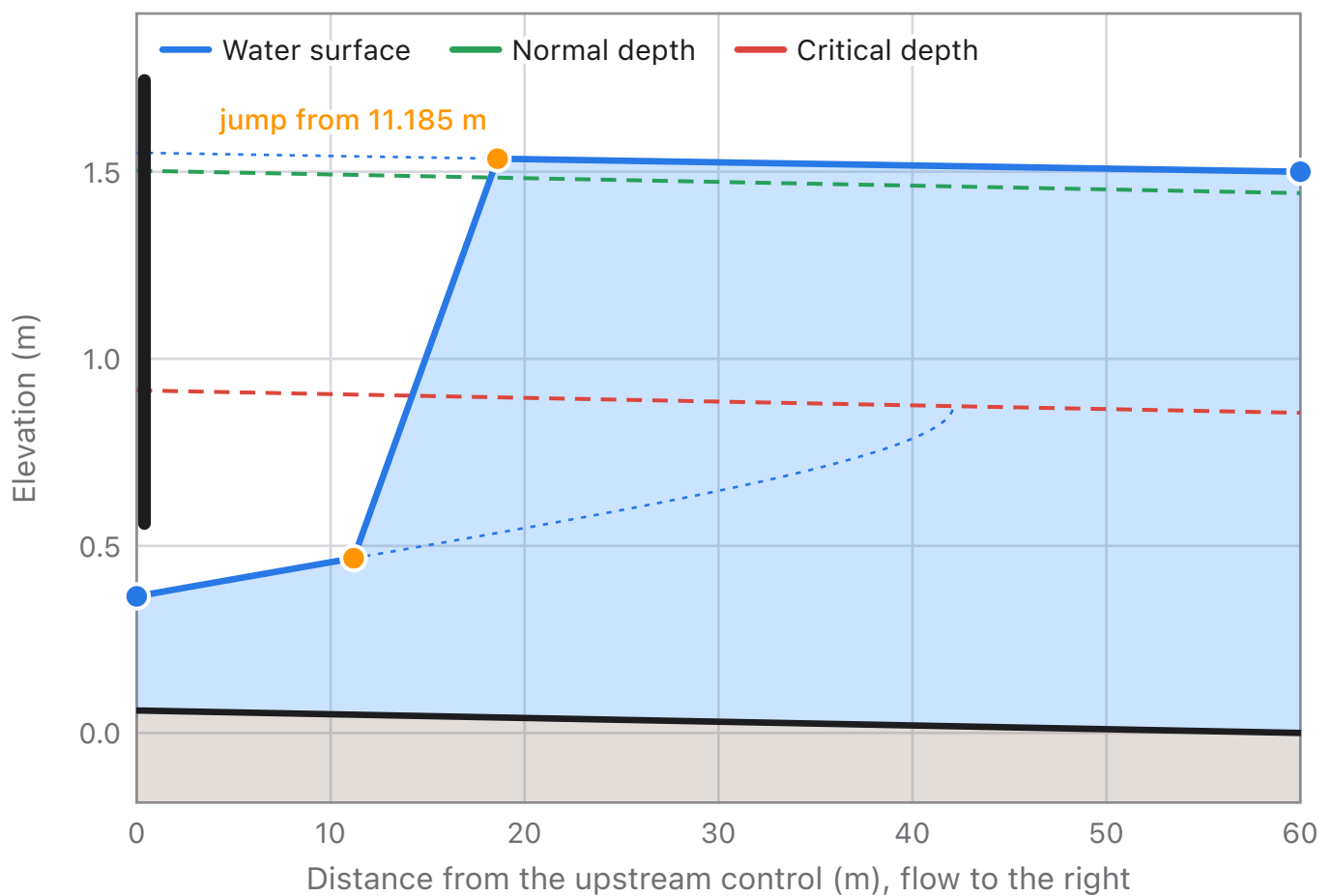


Water surface profile: two controls and a jump

Upstream depth	0.3050 m	Depth before	0.4182 m
Downstream depth	1.500 m	Depth after	1.493 m
Reach length	60.000 m	Froude number before	3.397
Depth below the gate	0.3050 m	Energy loss	0.8421 m
Behind the gate (free flow)	4.509 m	Kind of jump	Oscillating jump
Outcome	Jump in the reach	Profiles	M3 and M1
Jump starts at	11.185 m	Normal depth	1.443 m
Jump ends at	18.604 m	Critical depth	0.8556 m

The jump balances the specific forces with its weight along the bed; its length is 6.9 times its rise.

Jump in the reach: M3 and M1



Water surface profile: table

Distance from upstream control; lengths in m, velocity in m/s

Distance	Depth	Bed	Water surface	Velocity	Energy	Froude
0.00	0.3050	0.0600	0.3650	9.082	4.5107	5.678
0.45	0.3096	0.0596	0.3691	8.925	4.3709	5.543
0.89	0.3142	0.0591	0.3733	8.772	4.2378	5.413
1.34	0.3188	0.0587	0.3774	8.624	4.1110	5.288
1.79	0.3234	0.0582	0.3816	8.481	3.9902	5.167
2.24	0.3279	0.0578	0.3857	8.341	3.8750	5.051
2.69	0.3325	0.0573	0.3898	8.205	3.7652	4.939
3.14	0.3371	0.0569	0.3940	8.073	3.6603	4.830
3.59	0.3417	0.0564	0.3981	7.945	3.5601	4.726
4.04	0.3463	0.0560	0.4023	7.820	3.4645	4.625
4.49	0.3509	0.0555	0.4064	7.699	3.3730	4.527
4.95	0.3555	0.0551	0.4105	7.581	3.2855	4.432
5.40	0.3601	0.0546	0.4147	7.466	3.2018	4.341
5.86	0.3646	0.0541	0.4188	7.354	3.1217	4.252
6.31	0.3692	0.0537	0.4229	7.244	3.0451	4.166
6.77	0.3738	0.0532	0.4271	7.138	2.9716	4.083
7.22	0.3784	0.0528	0.4312	7.034	2.9012	4.002
7.68	0.3830	0.0523	0.4353	6.933	2.8337	3.924
8.14	0.3876	0.0519	0.4395	6.834	2.7690	3.849
8.59	0.3922	0.0514	0.4436	6.738	2.7069	3.775
9.05	0.3968	0.0509	0.4477	6.644	2.6474	3.704
9.51	0.4014	0.0505	0.4518	6.552	2.5902	3.635
9.97	0.4059	0.0500	0.4560	6.462	2.5353	3.567
10.42	0.4105	0.0496	0.4601	6.375	2.4826	3.502
10.88	0.4151	0.0491	0.4642	6.289	2.4319	3.438
11.18	0.4182	0.0488	0.4670	6.233	2.3993	3.397
18.60	1.4934	0.0414	1.5348	1.118	1.5572	0.358
19.59	1.4936	0.0404	1.5340	1.118	1.5573	0.358
21.95	1.4939	0.0380	1.5320	1.118	1.5576	0.358
24.30	1.4943	0.0357	1.5300	1.117	1.5580	0.357
26.63	1.4946	0.0334	1.5280	1.117	1.5583	0.357
28.95	1.4950	0.0311	1.5261	1.117	1.5586	0.357
31.25	1.4954	0.0287	1.5241	1.116	1.5589	0.357
33.54	1.4957	0.0265	1.5222	1.116	1.5592	0.357
35.82	1.4961	0.0242	1.5203	1.115	1.5595	0.357
38.08	1.4964	0.0219	1.5184	1.115	1.5598	0.356
40.33	1.4968	0.0197	1.5165	1.115	1.5601	0.356
42.57	1.4971	0.0174	1.5146	1.114	1.5605	0.356
44.79	1.4975	0.0152	1.5127	1.114	1.5608	0.356
47.00	1.4979	0.0130	1.5109	1.113	1.5611	0.356
49.20	1.4982	0.0108	1.5090	1.113	1.5614	0.356
51.38	1.4986	0.0086	1.5072	1.113	1.5617	0.355
53.56	1.4989	0.0064	1.5054	1.112	1.5620	0.355
55.72	1.4993	0.0043	1.5036	1.112	1.5623	0.355
57.86	1.4996	0.0021	1.5018	1.112	1.5626	0.355
60.00	1.5000	0.0000	1.5000	1.111	1.5629	0.355