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Presentation a technical solution that can achieve longitudinal connectivity (upstream-downstream) of the Crișul Repede River

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**International Conference on Engineering and
Ecohydrology for *Fish Passage* June 9-11,2014
University of *Wisconsin* -Madison**

**"Presentation of a technical solution to
achieve longitudinal connectivity (upstream-
downstream) of the Crișul Repede River"**

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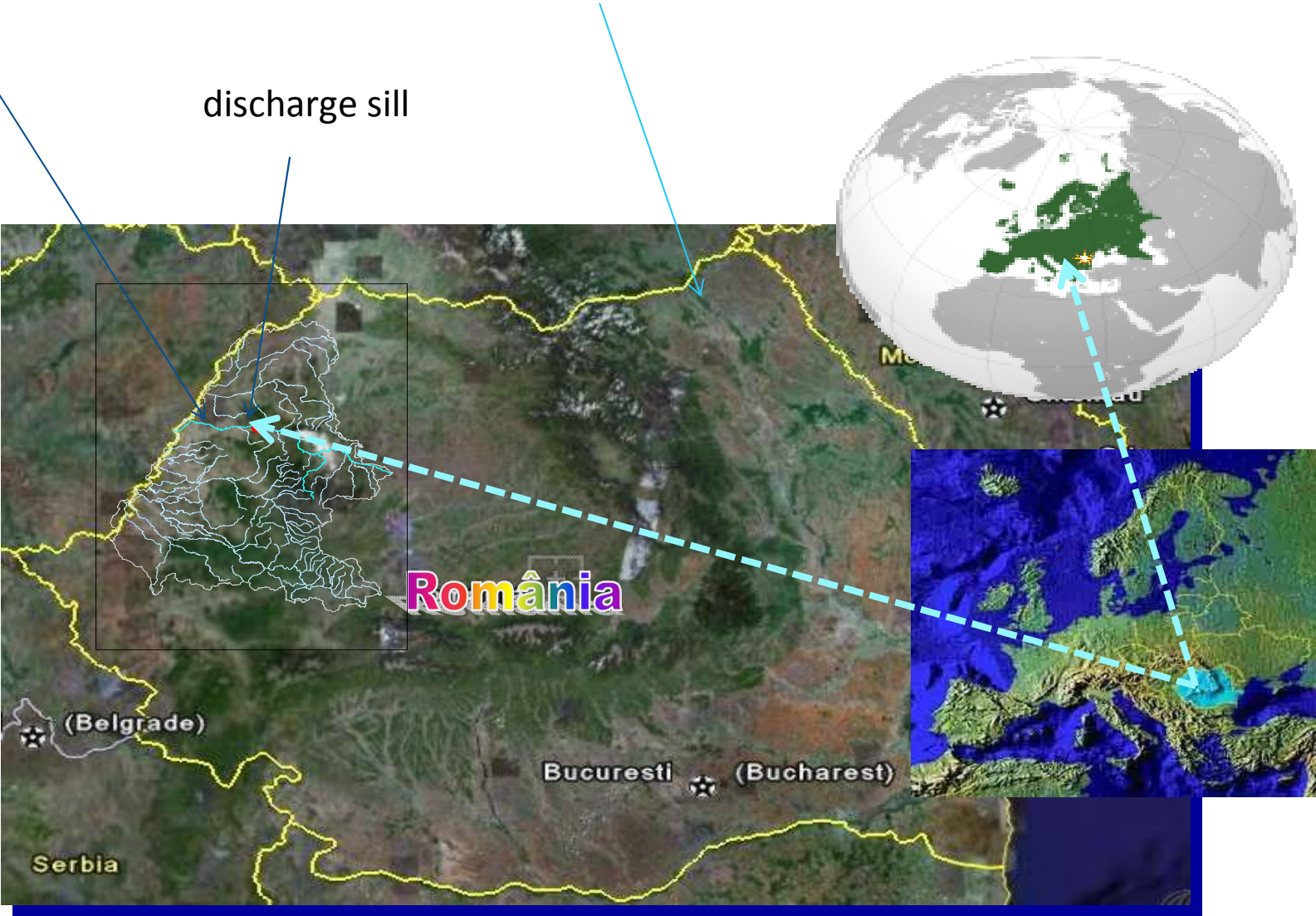


CASE STUDY LOCATION

Crișul Repede River

România

discharge sill



OVERVIEW

The paper presents a case study that proposes practical solutions for the restoration of longitudinal connectivity of Crișul Repede River



In the town of Oradea there are a lot transversal constructions such as discharge sills and small dams, that stops migration process of various fish species.



BACKGROUND

The Crisul Repede River bed width is 50 m at the discharge sill, it has 25.6 m³/s flow rate and its water speed is 0.4 m/s [Source: ABA Crisuri].



The migratory fish species from the area are:

- Nase (*Chondrostoma nasus*) - **protected by Bern Convention (Appendix III).**,
- Barbell (*Barbus barbus*) - **Rare species protected Habitats Directive (Annex V), annex 4A of Low nr.462 and Red List of RBDD)**
- Freshwater bream (*Abramis brama*) - **protected by Bern Convention (Appendix III)**

Dimension for discharge sill
near Ferdinand bridge

$h=1,5\text{m}$ -height $l= 50\text{m}$ -length

h_1 (water fall)= 1m

BACKGROUND



discharge sill near Ferdinand bridge

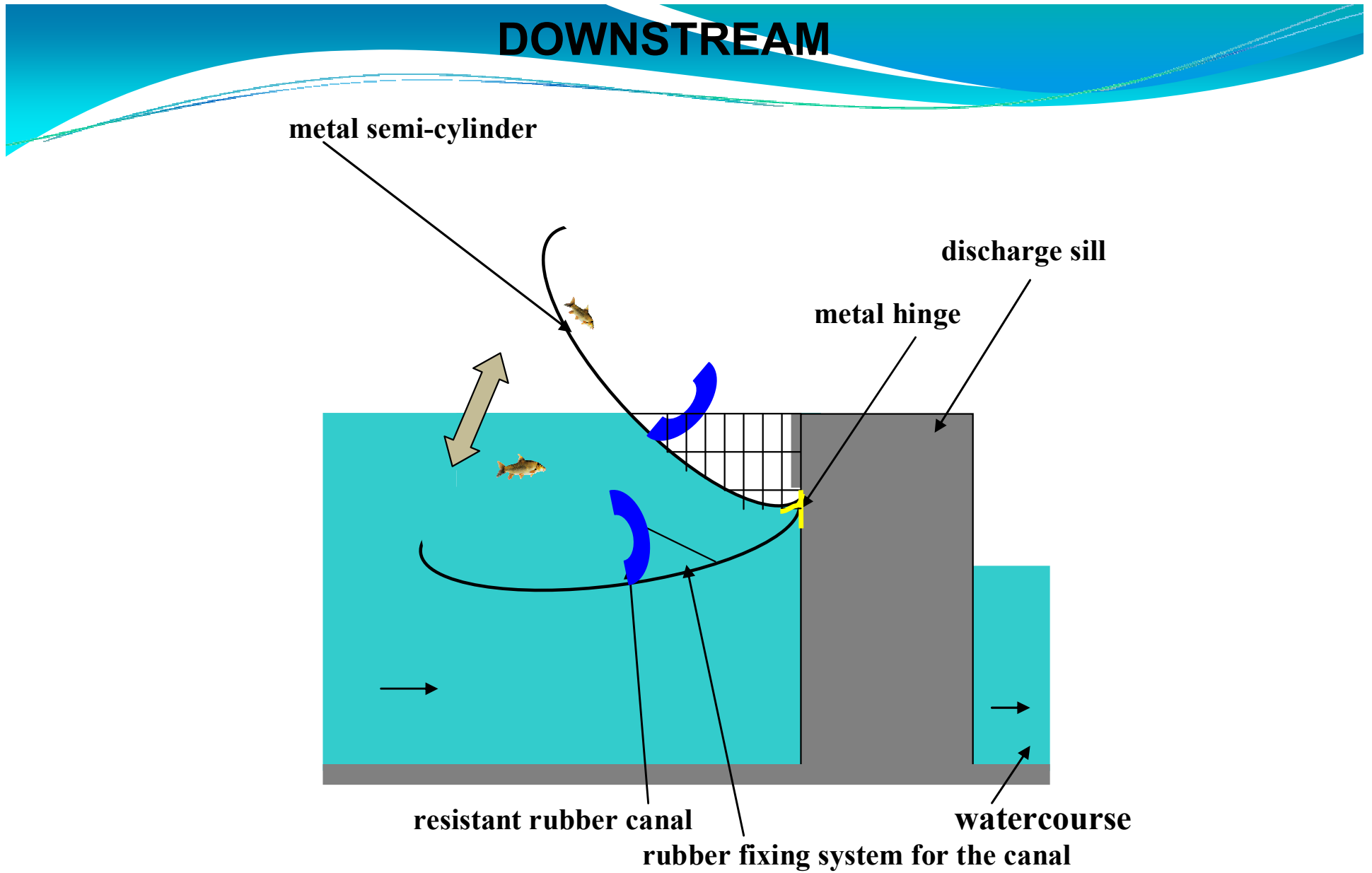


Figure 1 Positioning the metal semi-cylinder – indicative scheme

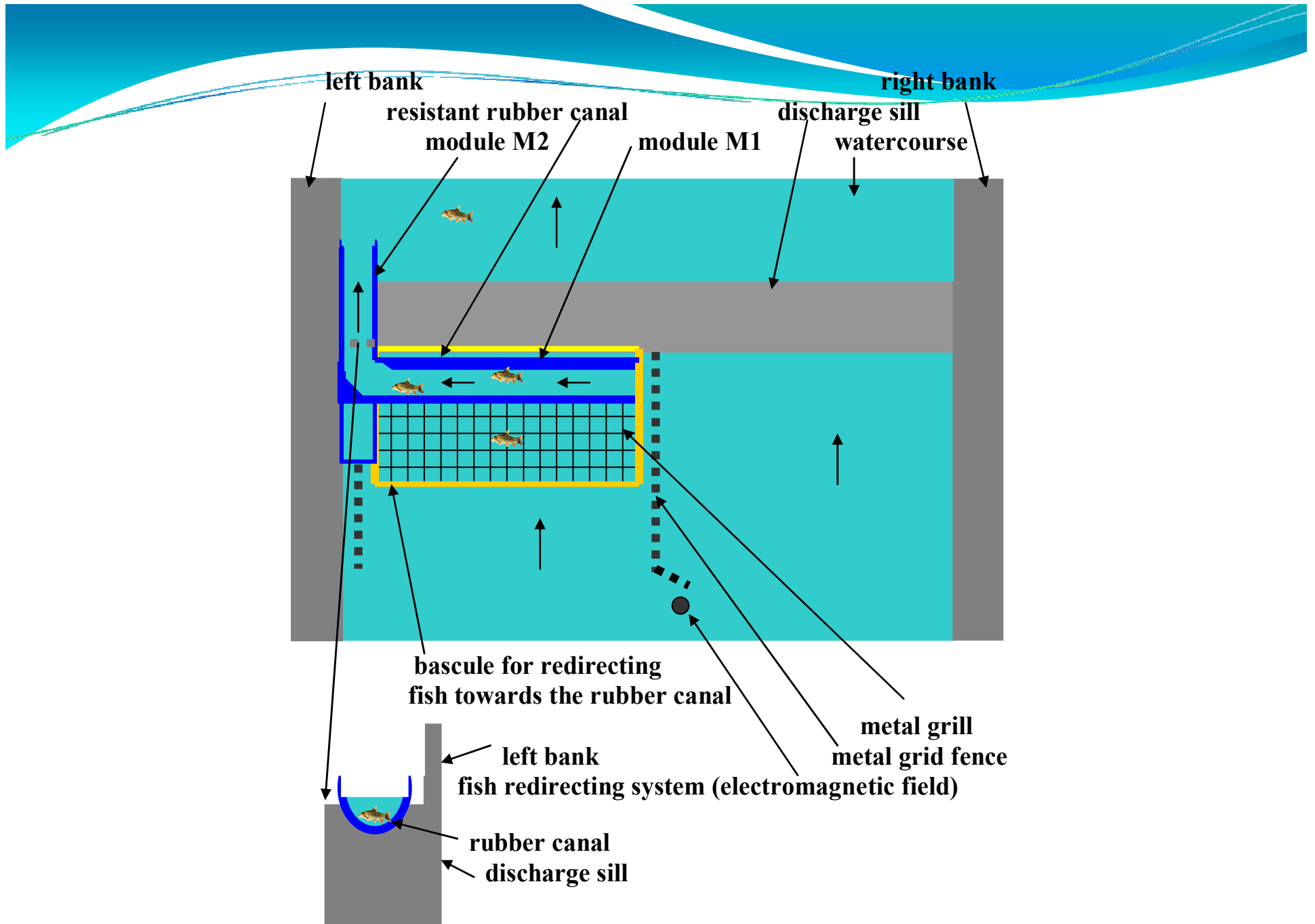


Figure 2 Rubber canal positioning – indicative scheme

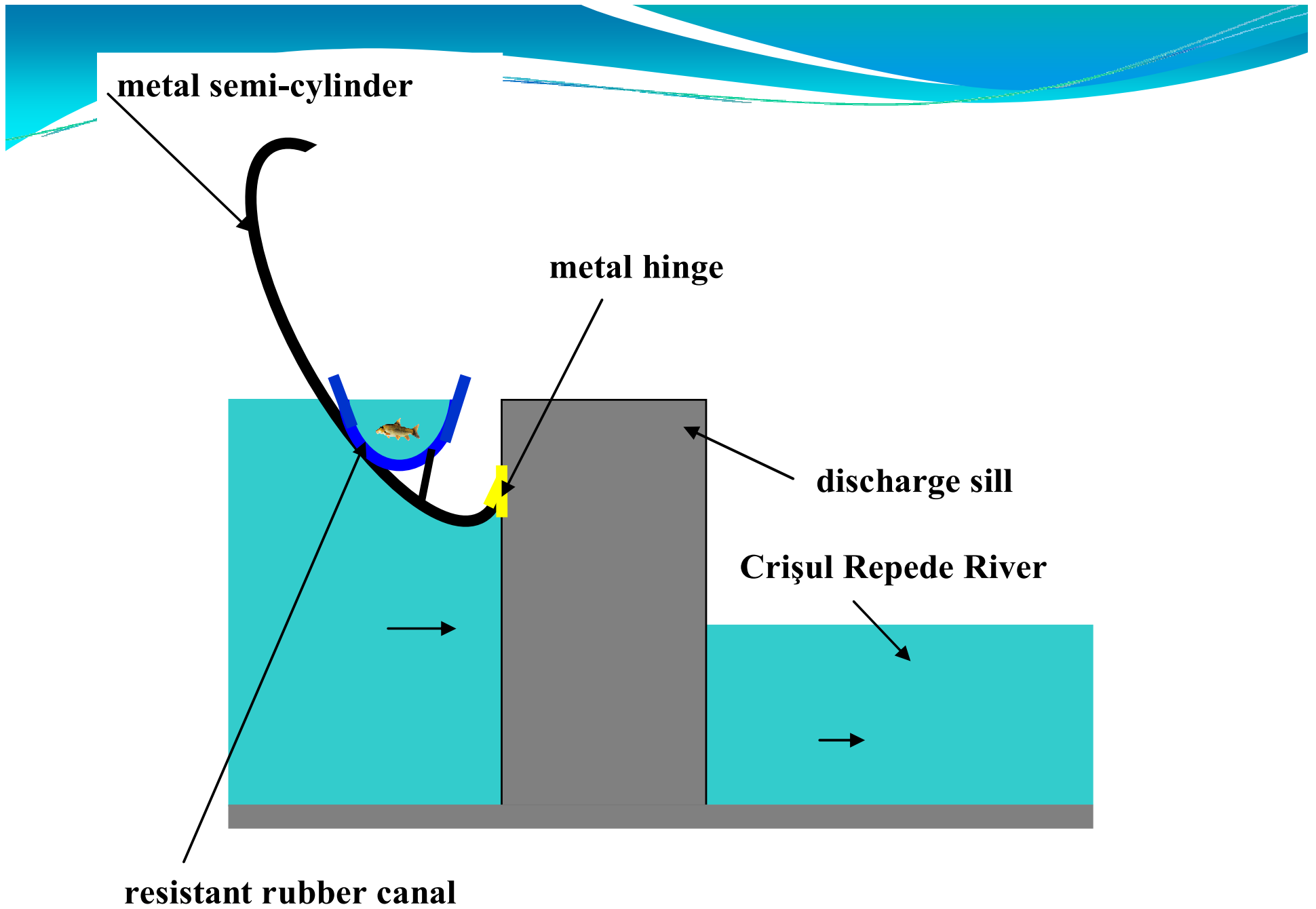


Figure 3 Water level in the rubber canal – indicative scheme

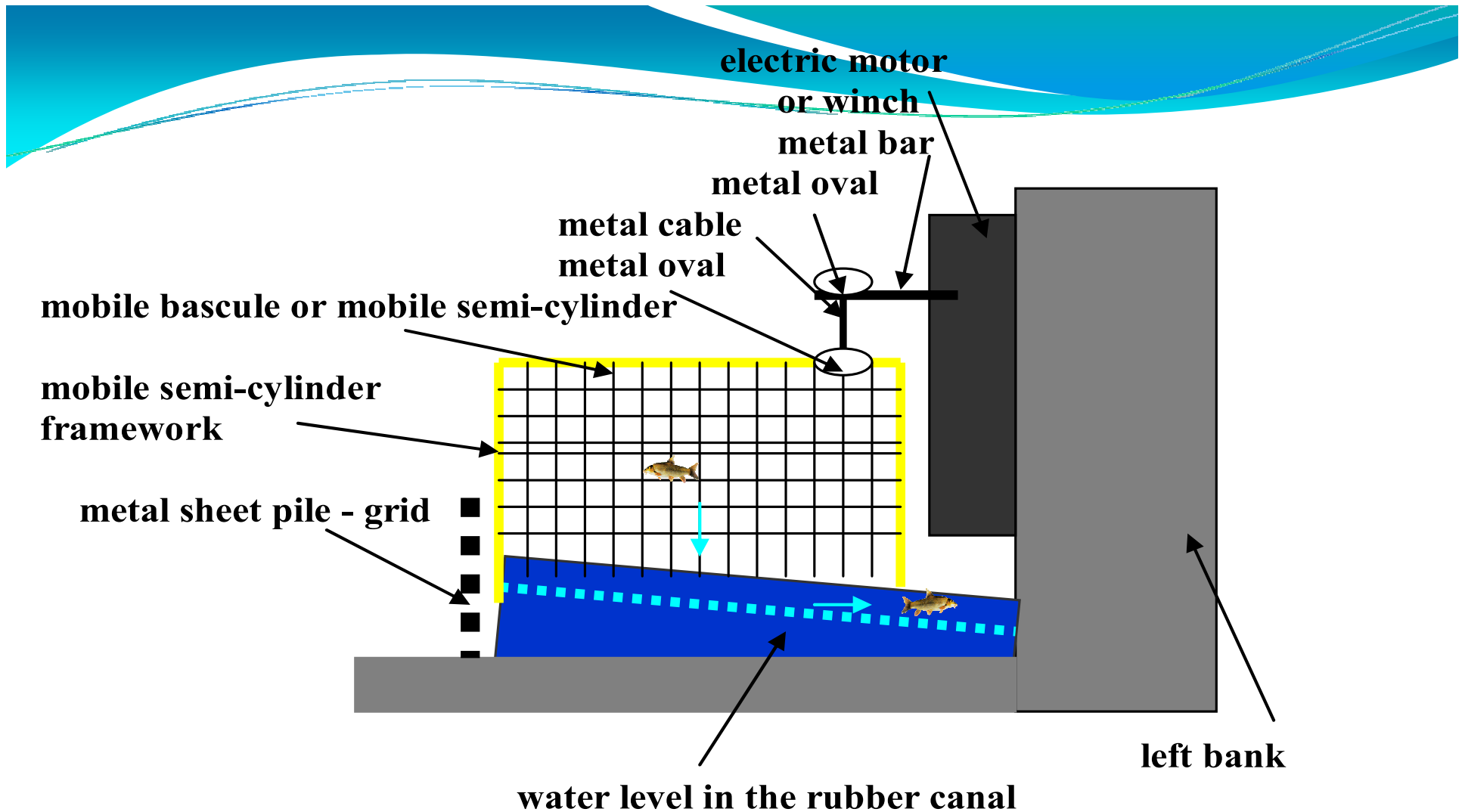
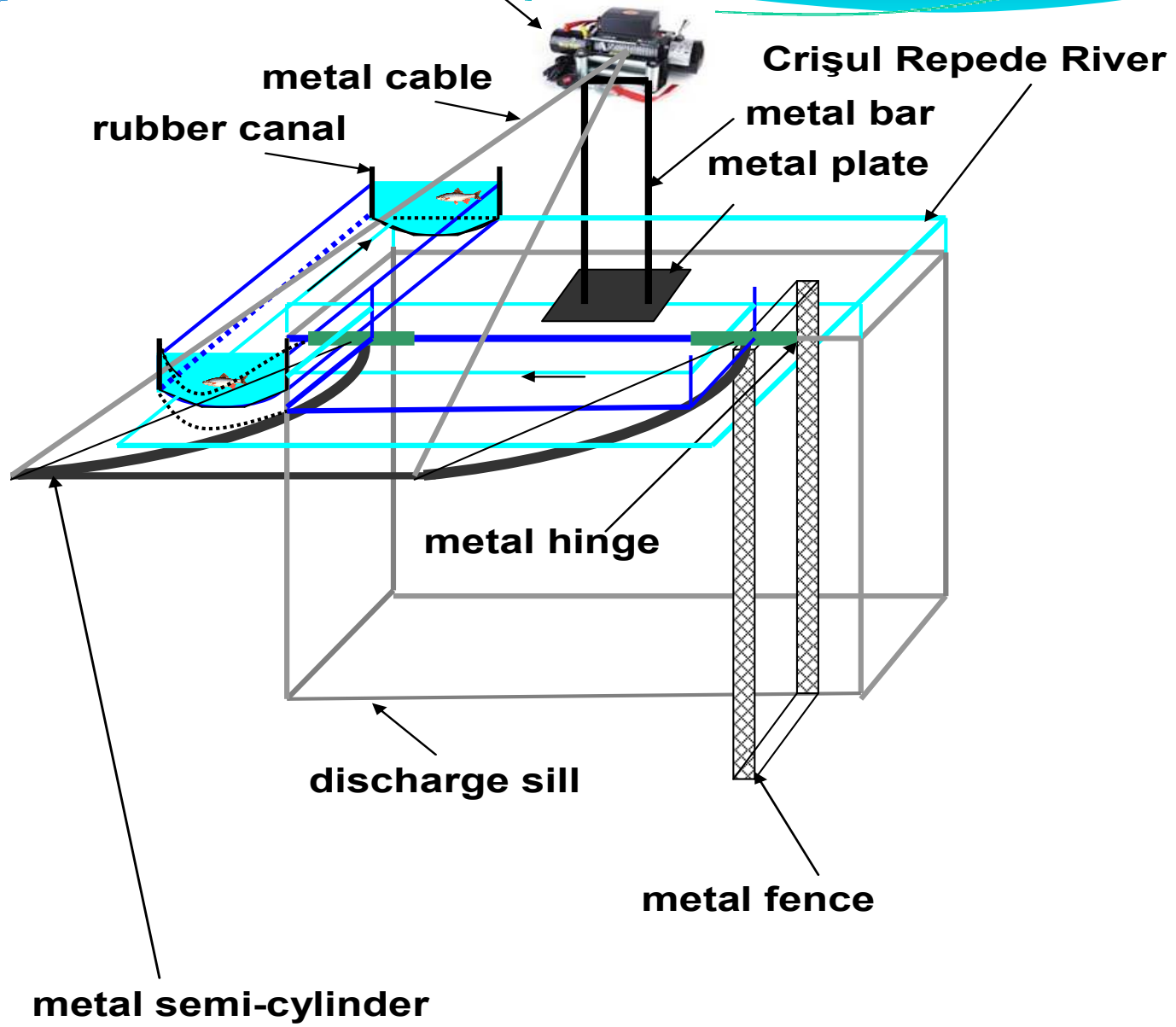


Figure 4 Positioning the electric motor – indicative scheme

electric winch (hc-winch.com)





Conclusions

- ➔ The solution, intended for one river bank only, has the advantage of being used as fish passage system upstream of discharge sill, too.
- ➔ Another advantage of this system is that they can be dismantled and stored (during winter) and used in other areas where rivers are crossed by hydrotechnical works with transversal bars.
- ➔ The costs for these systems are considered reasonable in contrast with conventional systems costs.
- ➔ They can work automatically, as the human intervention is required only when it comes about supervision.



Thank you!
Vă mulțumesc !

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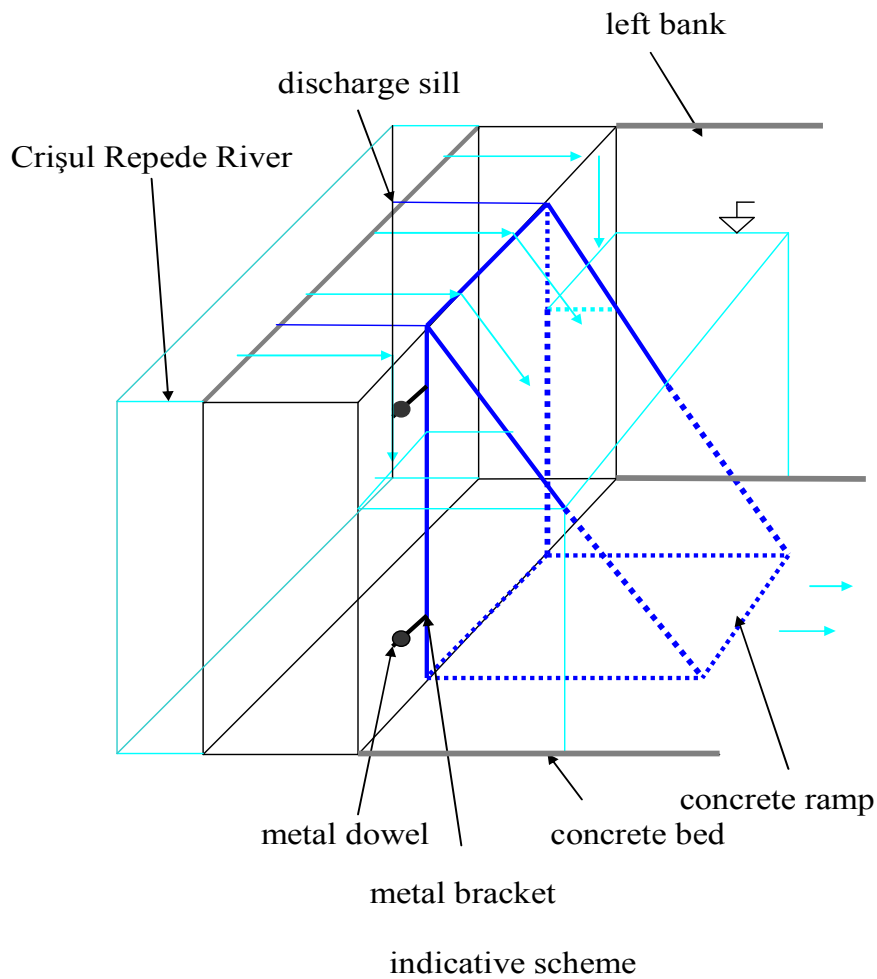
Vassalboro, Maine (Kennebec County)

http://flyfishingonly.net/forum/topic.asp?TOPIC_ID=5967



UPSTREAM SOLUTION

Răzvan G.VOICU, dr.eng.environment



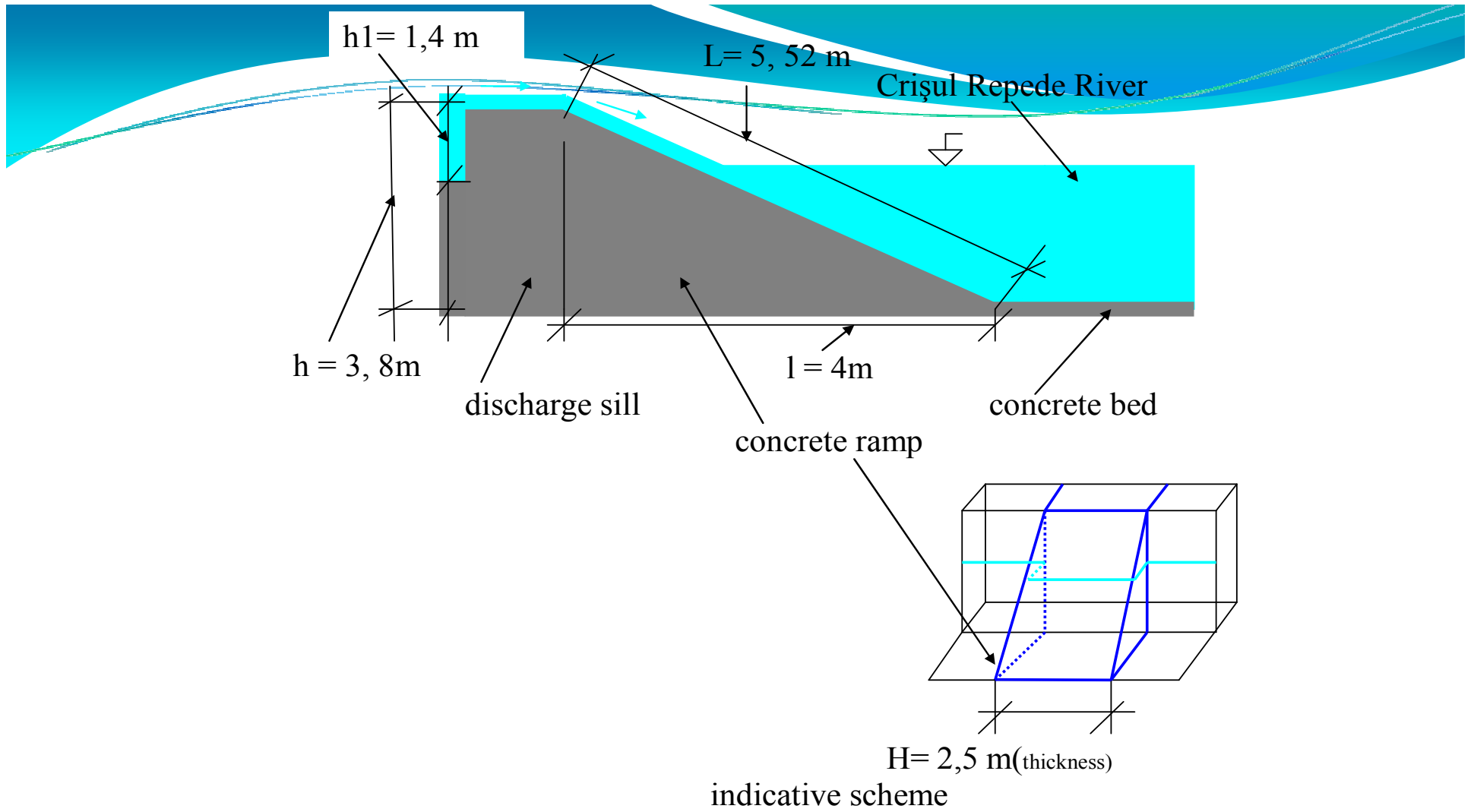
Concrete ramp positioning



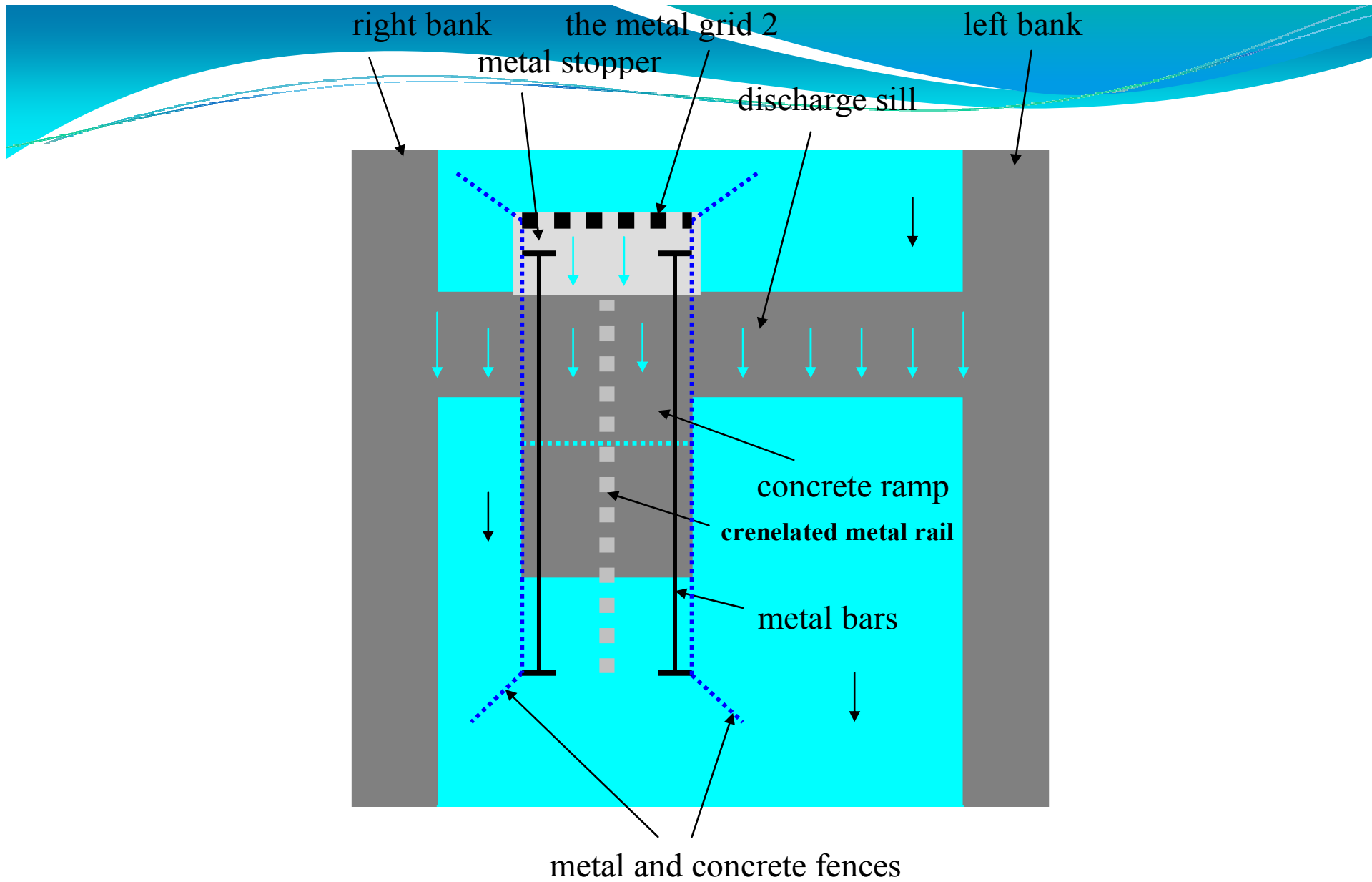
fishtek.co.uk- Fish Pass Design

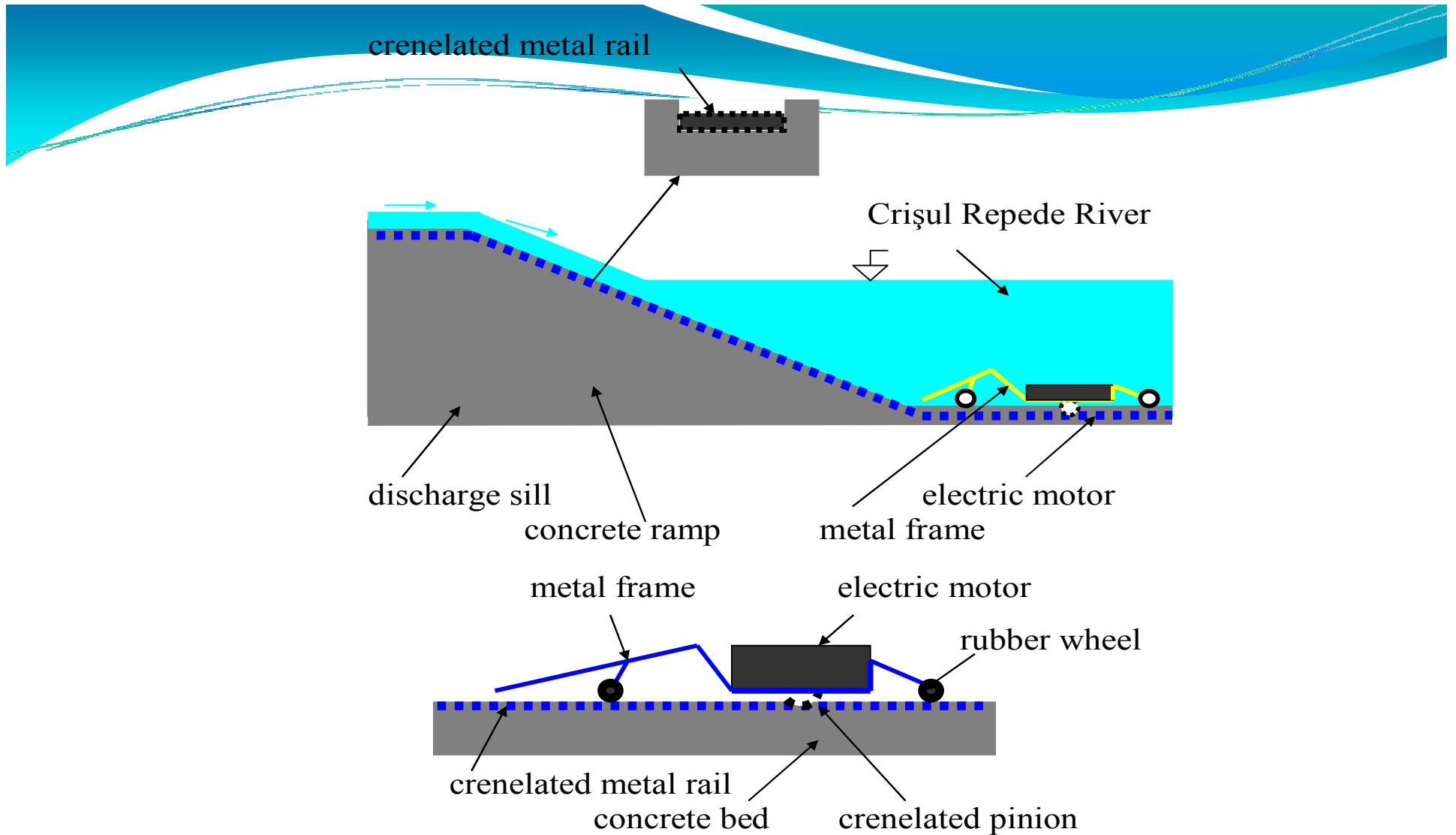


Larinier bottom baffle pass River Neath, Aberdulais (Source: Armstrong et al., 2004)



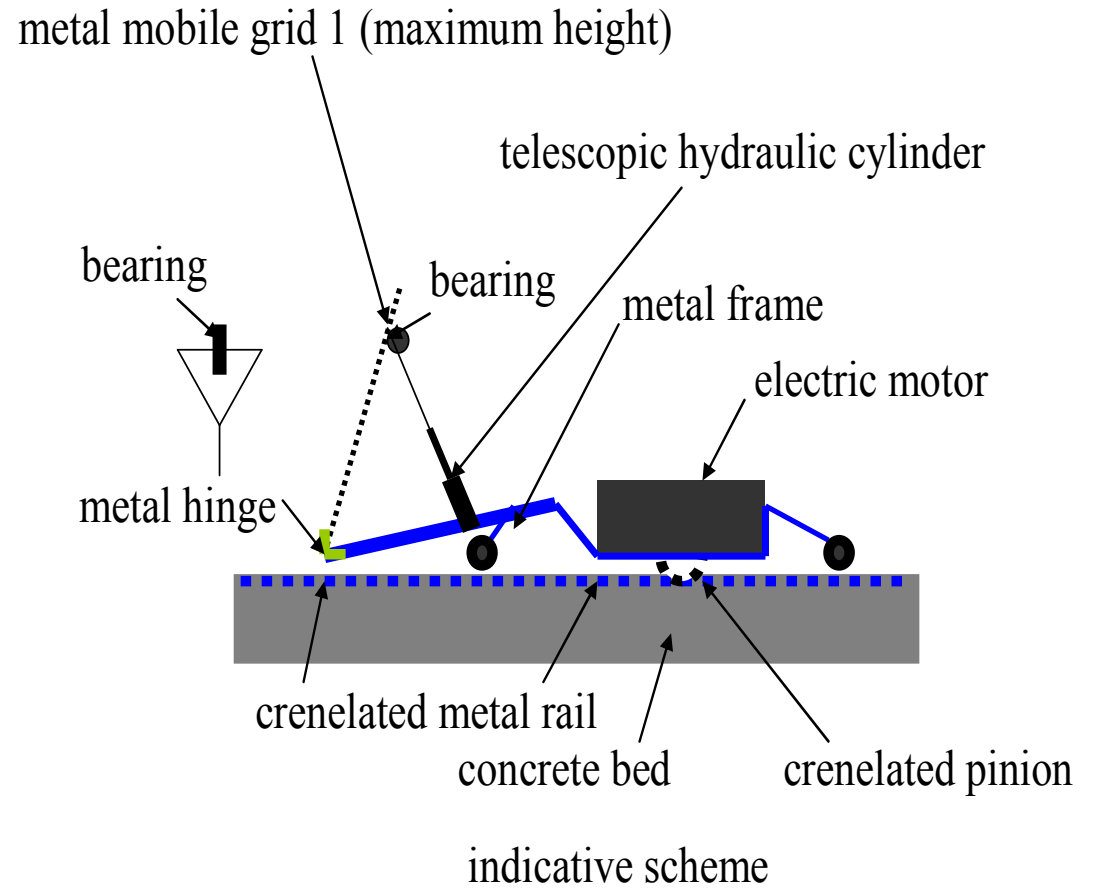
Concrete ramp dimensions



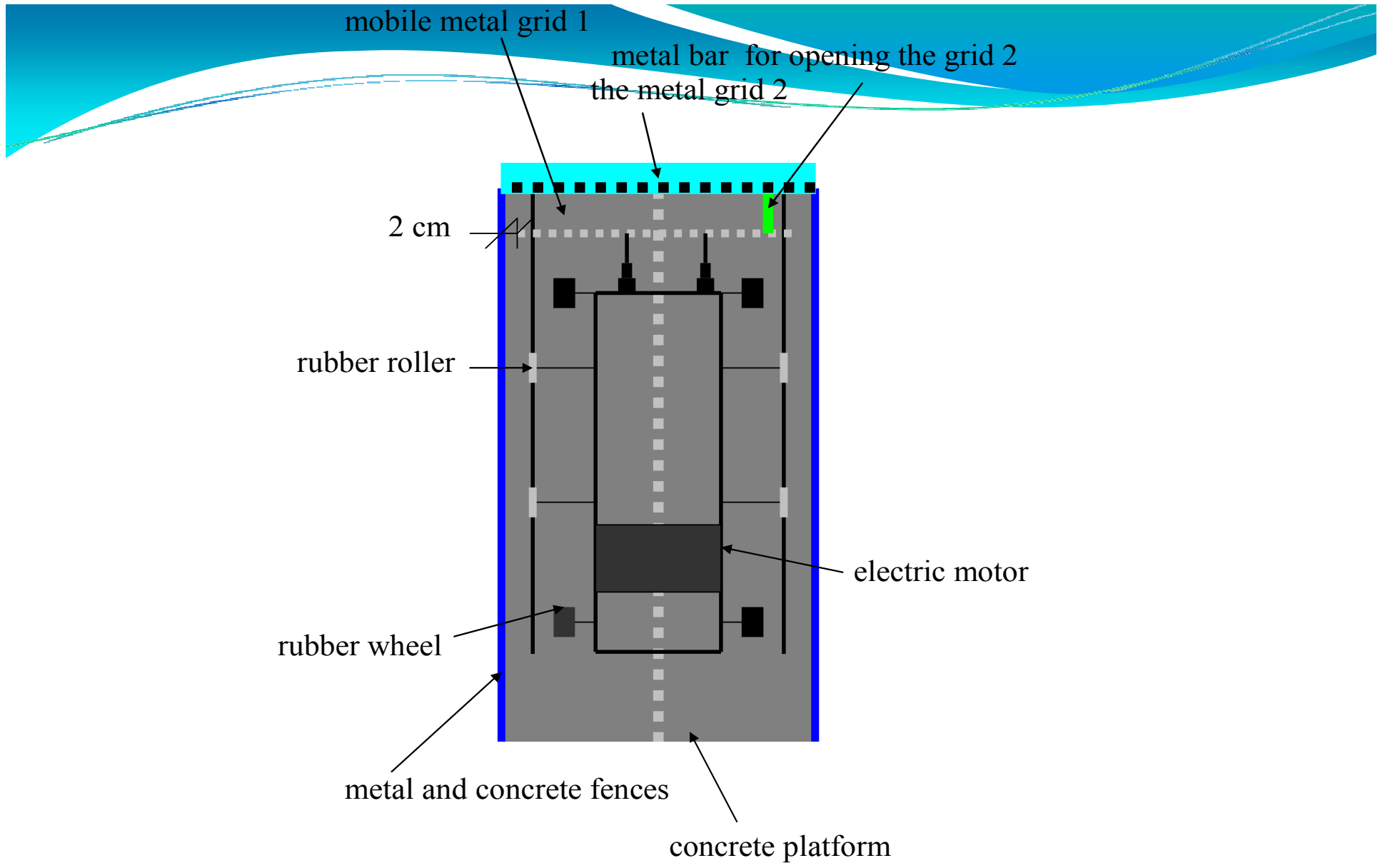


indicative scheme

Crenelated rail positioning inside the concrete ramp



Telescopic hydraulic cylinder positioning on the metal frame and on the metal mobile grid1

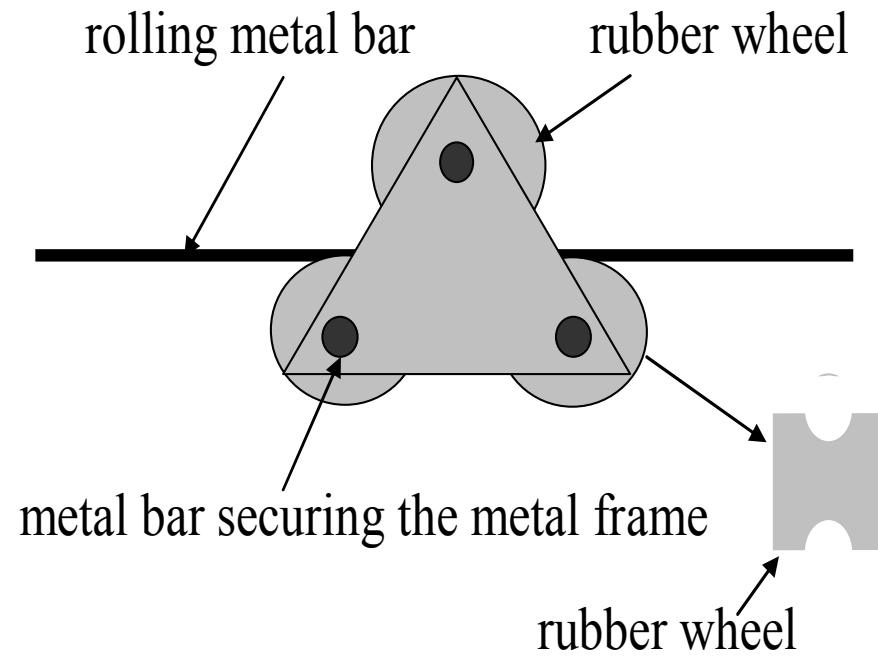


indicative scheme

Metal frame fastening system

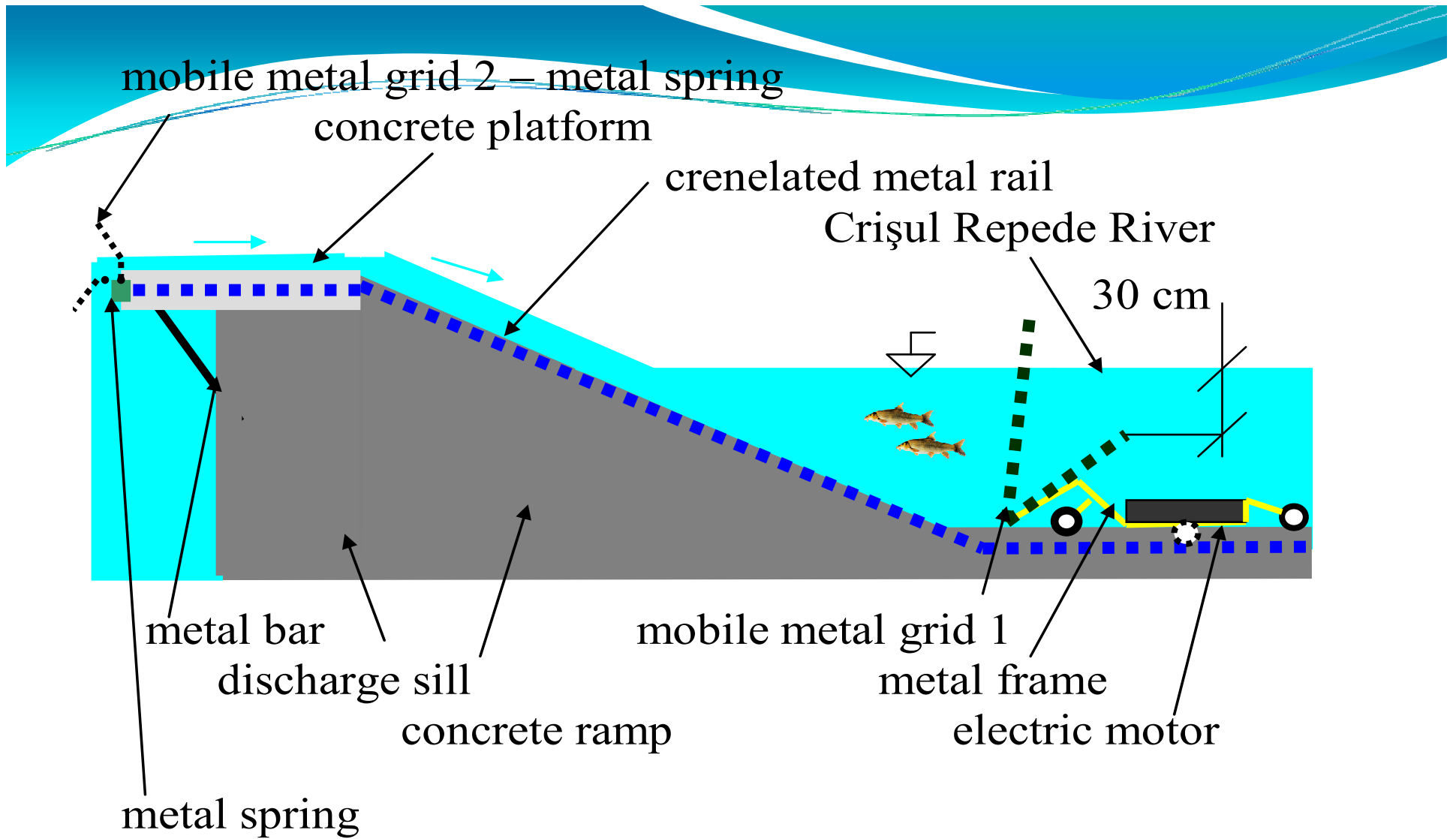


[http://en.wikipedia.org/wiki/Train_\(roller_coaster\)](http://en.wikipedia.org/wiki/Train_(roller_coaster))



indicative scheme

Rollers positioning



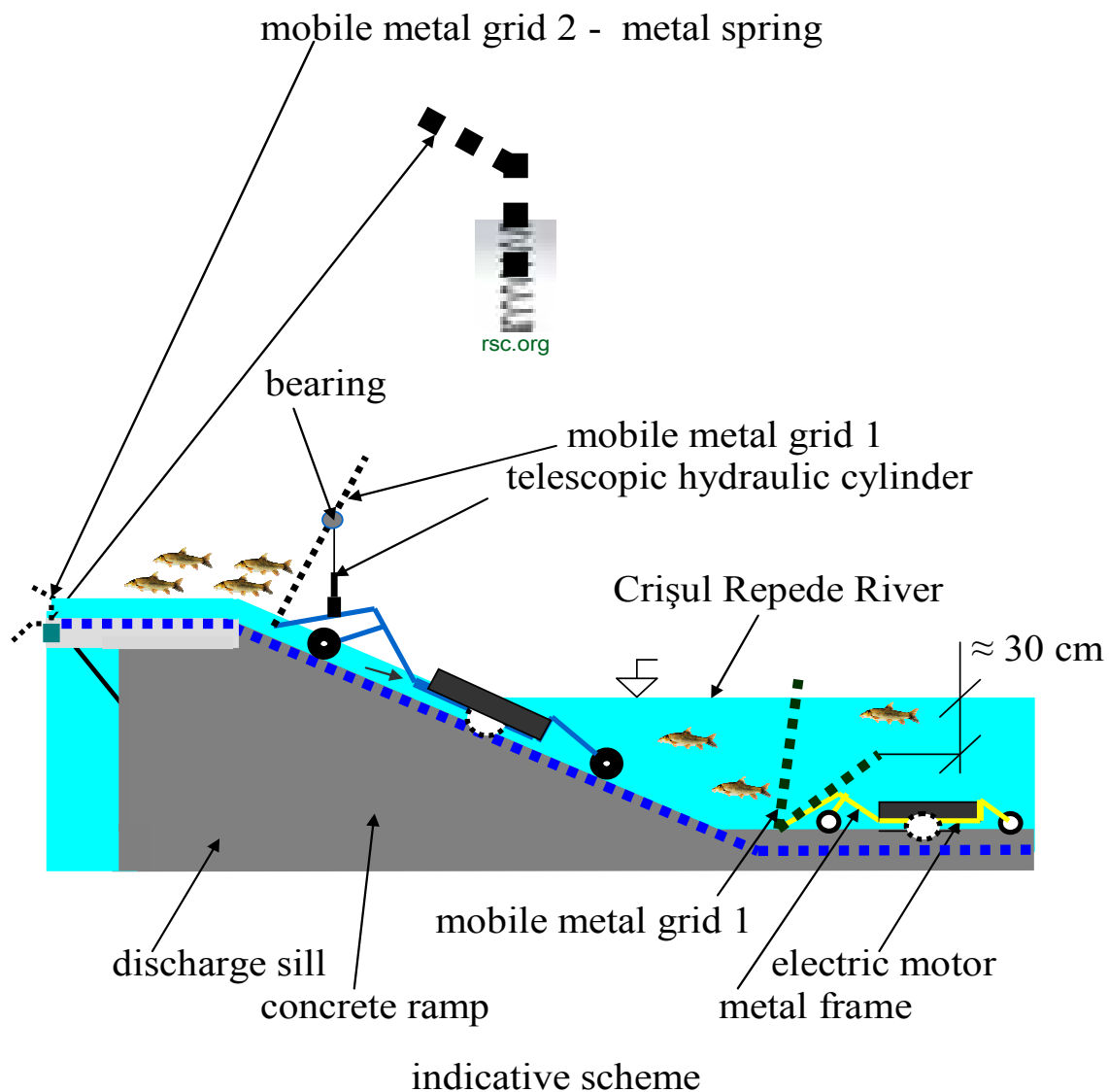
indicative scheme

Minimum and maximum levels of metal mobile grids 1 and 2

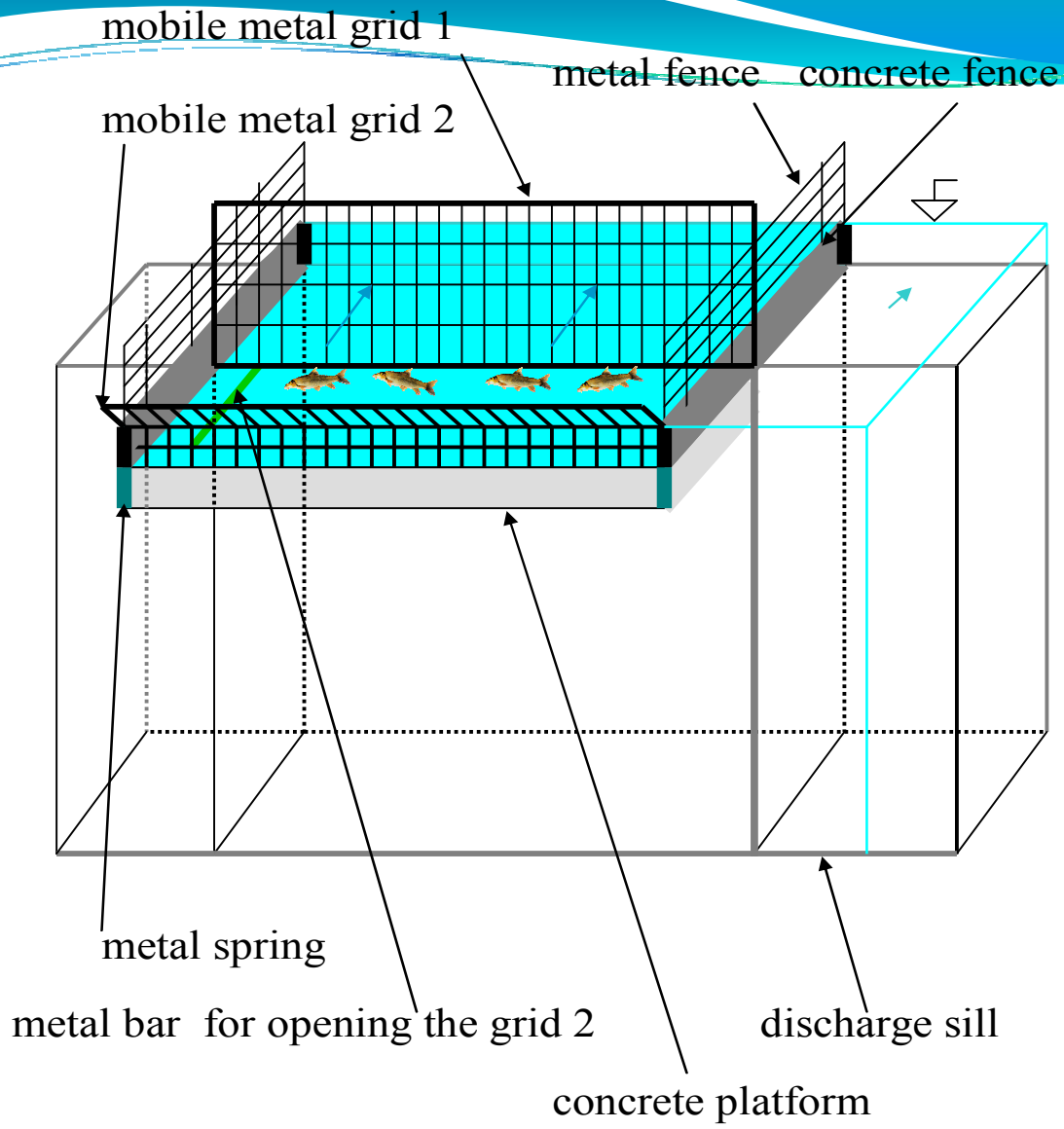
Rack railway



<http://www.connectmums.com/wp-content/uploads/2012/03/Mt-Pilatus-Rack-Railway-3-540300.jpg>



Metal grid refolding and system returning on horizontal surface



indicative scheme

Concrete platform positioning



Conclusions

- ➔ The motor contains unsophisticated software to operate all controls.
- ➔ Power consumption is very low, considering that fish migration does not take place throughout the year and during the winter, when temperatures cause partial freezing of the watercourse, the mobile framework can be detached and stored in a properly place.
- ➔ The costs for these systems are considered reasonable in contrast with conventional systems costs.
- ➔ They can work automatically, as the human intervention is required only when it comes about supervision.



Thank you!

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