Chriesbach restoration and Eawag outdoor lab

April 2014

Thomas Lichtensteiger
Head Corporate Services
Head Eawag Eco-Team

Eawag: Swiss Federal Institute of Aquatic Science and Technology

History of Eawag ponds in DD

1971 –
July 2004 frog removal

2004 – 2008

2008 plant removal

2008 plant removal

2008 – 2??? new pond

2010 Grotto Ticino

Chriesbach – historical situation

Wildkarte

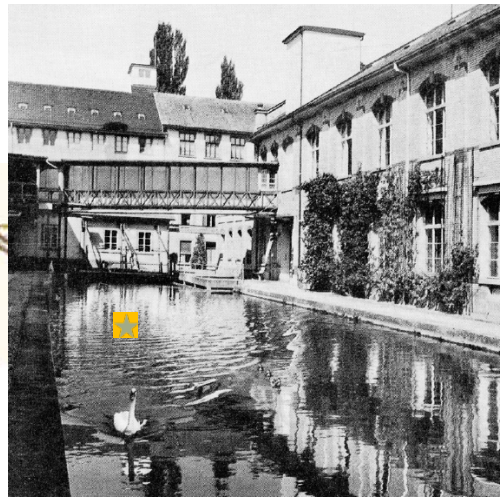
1850

Chriesbach was a swamp creek

with well developed meanders:
length 40 – 70 m,
amplitude 10 – 15 m on both sides of creek axis

Chriesbach restoration – an initiative by Eawag started in 2003

Perimeter of restoration project



1839-1973
Water for textile industry Zwicky & Co

Chronology

when	what	who
1972	Start monitoring water quality	Jürg Zobrist
1979	Chriesbach lowering, construction of walls to reduce flood risks	Canton Zurich
1980 -	Several groundwater and limnological studies	Eawag researchers, Canton Zurich
1993	ETH Zurich Diploma Thesis on restoration Chriesbach	Tania Schellenberg, Limnology Eawag
2003	Planning Forum Chriesbach including the creek Chriesbach → first suggestions for restoration, outdoor lab with arena around the creek	Eawag FC planning team
2004	Eawag proposal submitted to Canton Zurich Construction Department	Ueli Bundi
2005	Approval by Canton Zurich to start a project on the restoration of the Chriesbach	Dorothée Fierz, Cantonal Councellor
2006	Preproject, Report	asp Landschafts-architekten AG on behalf of AWEL
2007	Eawag confirms financial support → CHF 475'000;	Roland Schertenleib

when	what	who
2008	Thomas Lichtensteiger elected as contact person and responsible for internal moderation; Chris Robinson as scientific coordinator	Decision by the Directorate of Eawag
2008	Dossier Eawag with extended description of outdoor lab (Naturlabor)	Eawag Chriesbach team
2009	Detailed planning project «Aufwertung Chriesbach» accepted by the city of Dubendorf and all other competent authorities	Flussbau AG on behalf of AWEL
2009	Approval of financial support by the city of Dubendorf: CHF 300’000	City Council Dubendorf
2010	Project start postponed due to financial restrictions by the Canton Zurich	Cantonal Council Zurich
2010	Construction of the new bike and foot path along the Chriesbach; in parallel to the path, first restoration section financed by «Ökostromfonds» of the power company Zurich City EWZ: CHF 500’000	Canton Zurich, engineering department and AWEL

when	what	who
2012	Decision of BAFU to give financial support to the Chriebach restoration project – as an example of a restoration project in an urban context in collaboration with Eawag (CHF ~1 Mio. by BAFU)	BAFU, based on the renewed water protection law
2012 April	Approvel by the Canton Zurich to start the full restoration project (CHF ~1.5 Mio. by Canton)	Cantonal Council Zurich
2012 July	Construction tendering, implementation plan	ARP consortium on behalf of AWEL
2012 Dec.	Start restoration from the already restored section up to the mouth in the Glatt	BG/ARP consortium on behalf of AWEL
2013 May	Installation of the construction access between Eawag Lab and new Guesthouse Seidenstrasse	BG/ARP consortium on behalf of AWEL
2013 May	Start main restoration from the Kriesbachstrasse downstream	BG/ARP consortium on behalf of AWEL
2013 July-2014 March	Construction Eawag outdoor lab, completition of restoration	BG/ARP consortium on behalf of AWEL in collaboration with Eawag
2014	Opening event, May	Eawag, AWEL

Project lead: Dr. Christian Marti, AWEL, department hydraulic engineering
AWEL team: Ivo Isenring (river maintenance), Adrian Gnädinger (monitoring), Alfred Senteler (fisheries officer)

Lead engineering consortium:
Lejla Müller, Julien Gendre, Heiko Wehse, **BG** Ingénieurs Conseils SA Bern / ARP **A**ndré **R**otzetter + **P**artner Zurich AG
Member of consortium: Lukas Boller, AquaPlus
Construction company: Toneatti AG

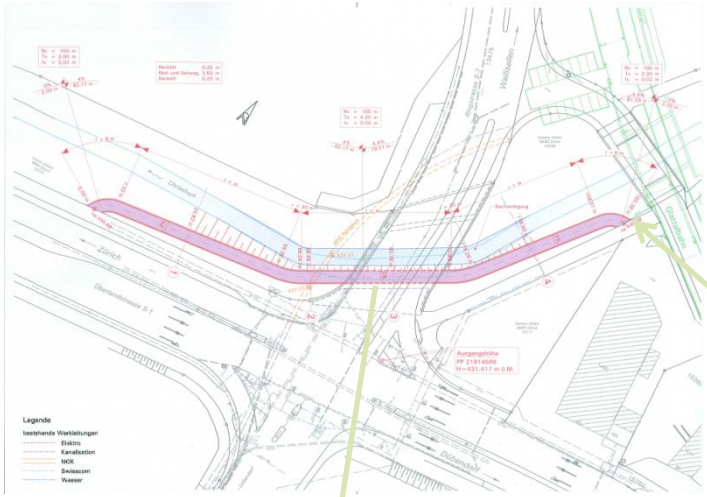
Eawag team: Thomas Lichtensteiger (lead), Christopher Robinson, Mario Schirmer, Anne-Marie Kurth, Andri Bryner, Max Mauz, Armin Peter, Marc Böhler, Hansi Mosler, Sam Derrer, Tom Gonser, Robert Tobias, Michael Berg, Wouter Pronk, Peter Penicka, Evelin Vogler, Regula Hediger
+ **Empa Technical Services**
+ **SWO:** Thomas Winter, Andreas Wolf

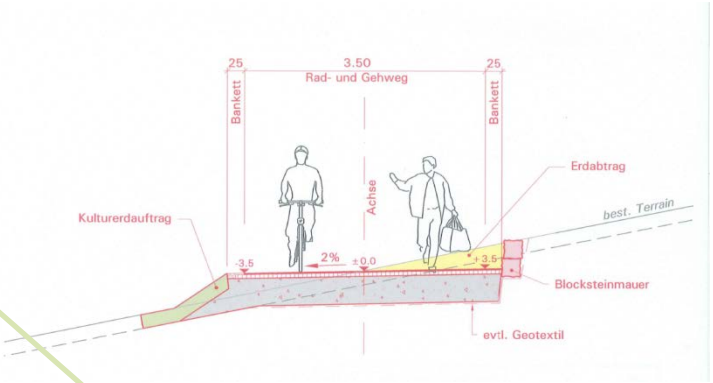
Main intention of Eawag: Demonstration, teaching, outreach

Project budget:
CHF 3.6 Mio.
Eawag contribution: CHF 345’000 of 3.6 Mio.
+ CHF 130’000 for measuring technology, aquarium, equipment

Bike and foot path (part of cantonal bike path), in place since 2010

Initiative by Eawag, project with Canton Zurich (Engineering Department), Chriesbach restoration in this section was paid by ewz *naturemade star* fonds

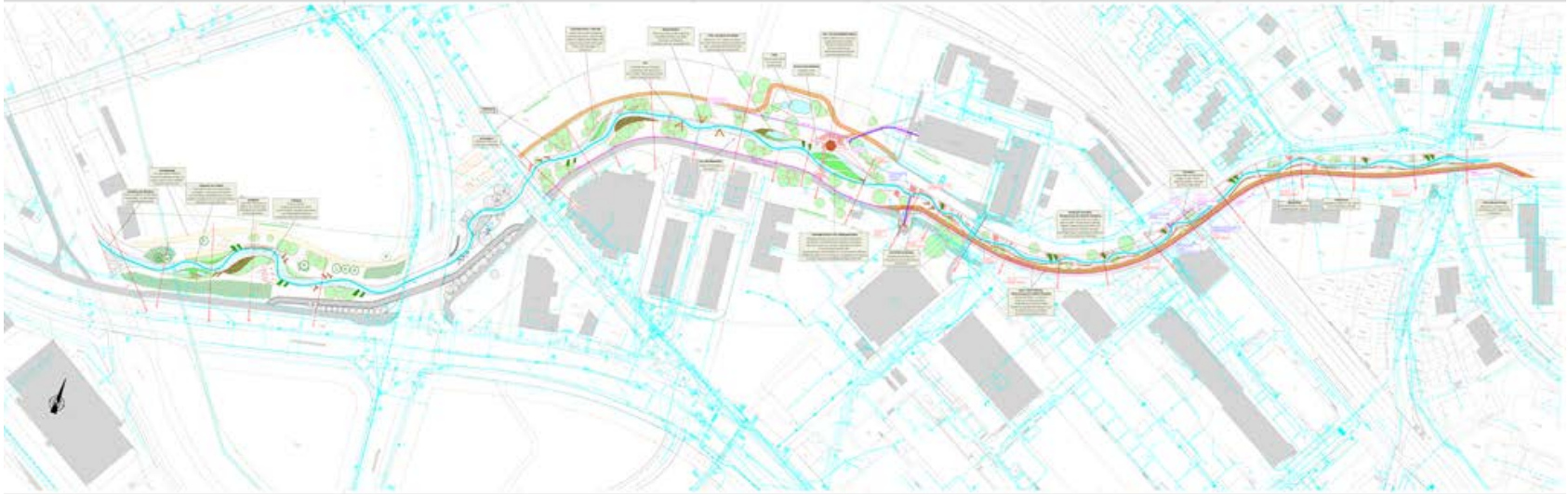




view upstream

view downstream

Overview implementation plan, July 2012

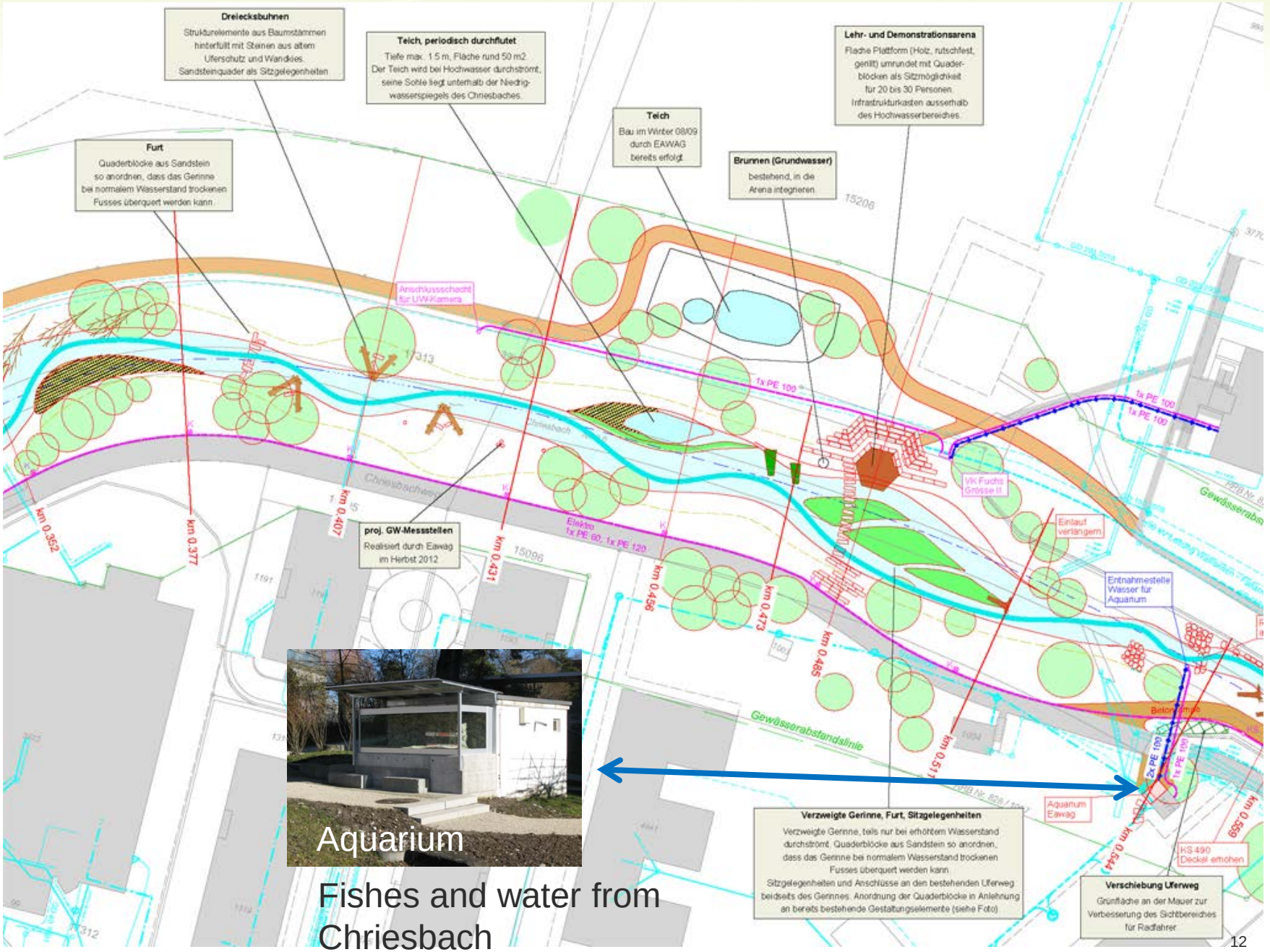


ARP/BG consortium

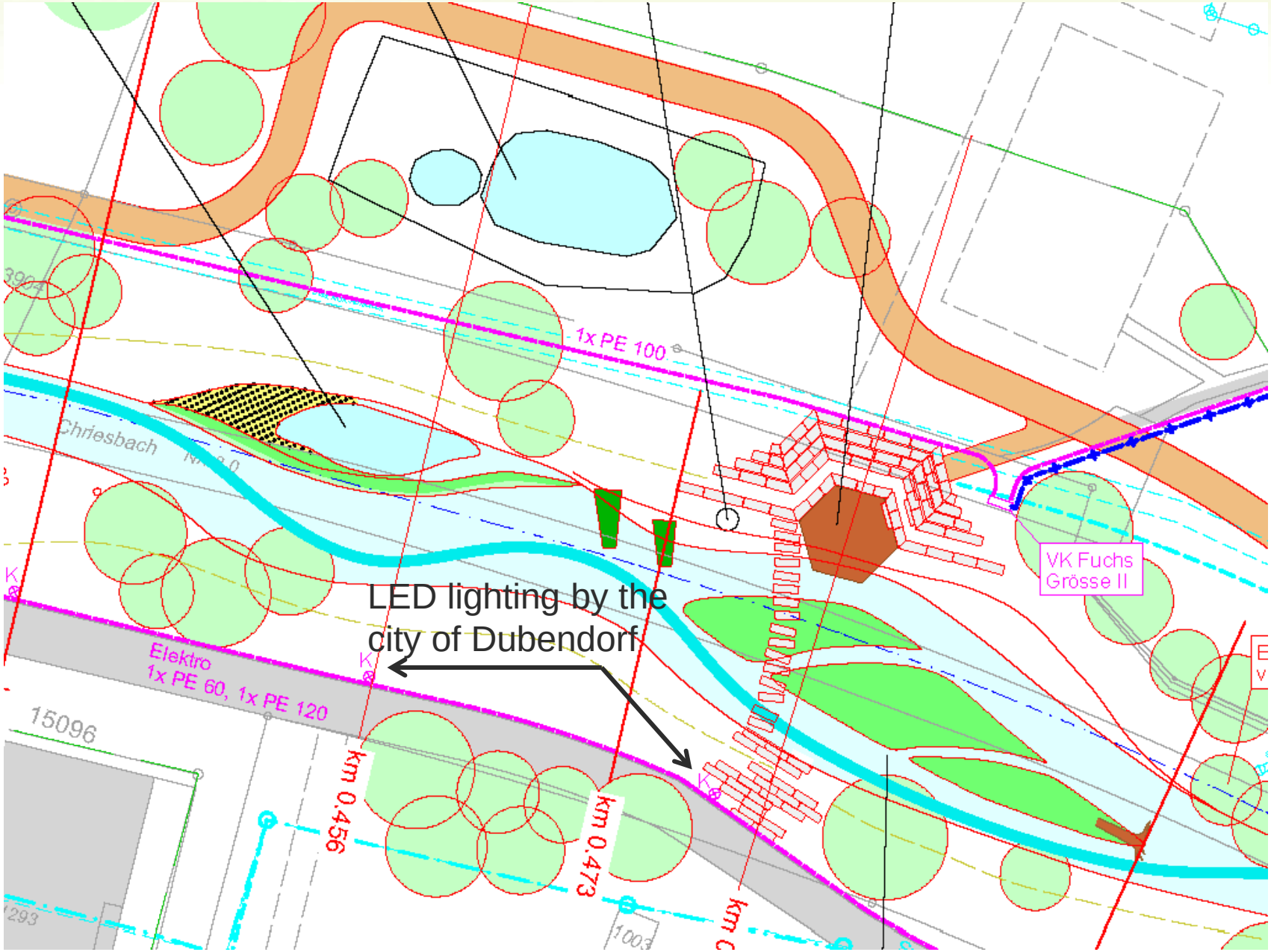
Eawag outdoor lab with ponds

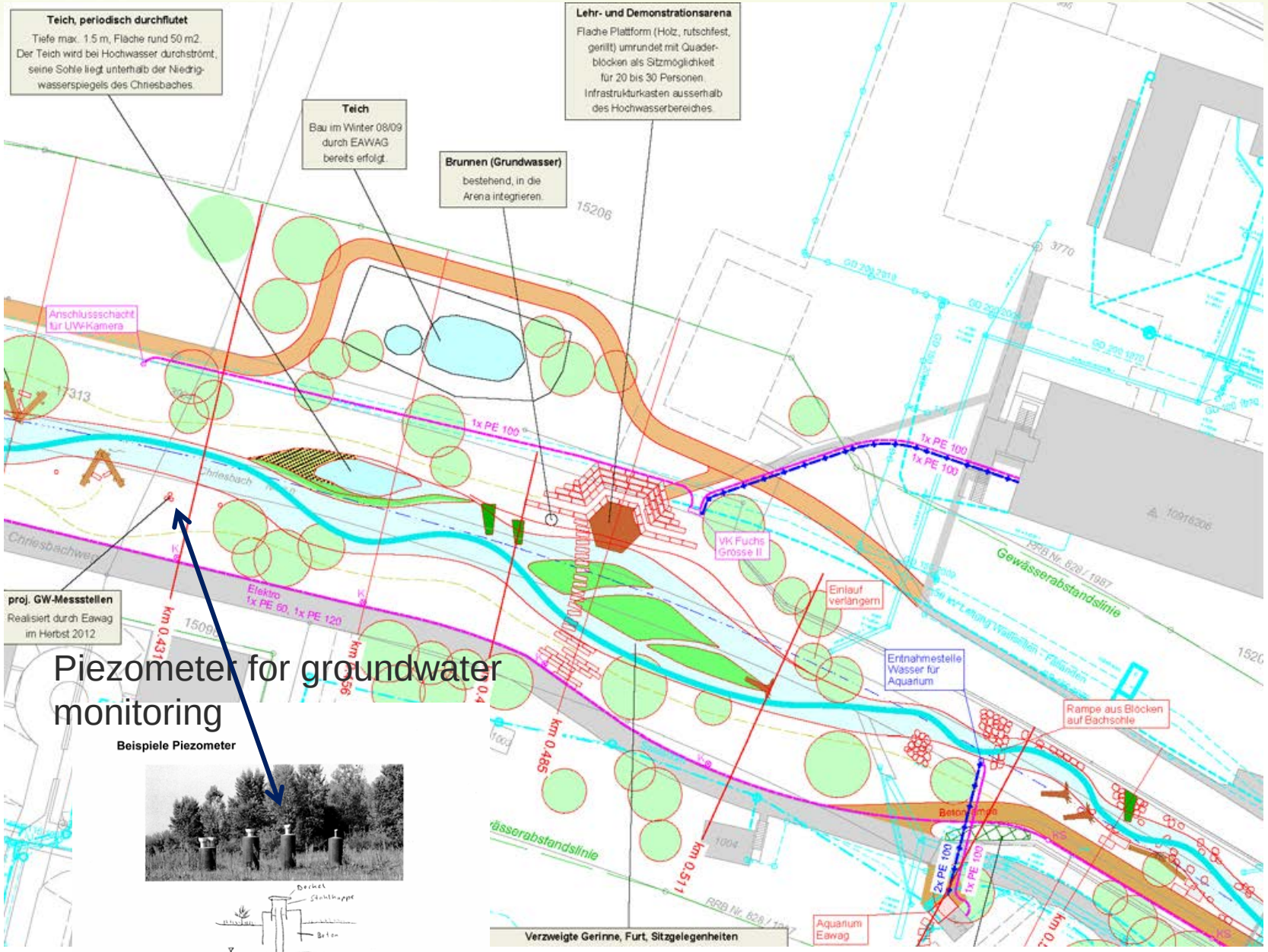
early draft

↔ Pond 2008
with bridge



Fishes and water from Chriesbach

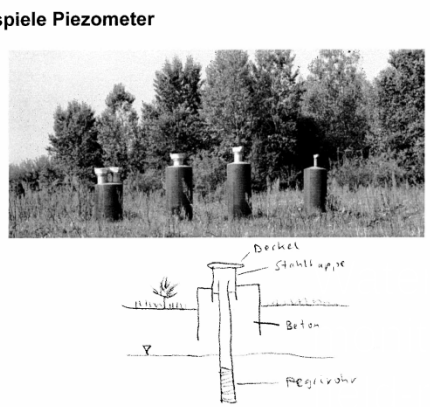

1x PE 100
Chriesbach
VK Fuchs
Grösse II
LED lighting by the
city of Dubendorf
Elektro
1x PE 60, 1x PE 120
15096
km 0.456
km 0.473


Teich, periodisch durchflutet
Tiefe max. 1.5 m, Fläche rund 50 m2. Der Teich wird bei Hochwasser durchströmt, seine Sohle liegt unterhalb der Niedrigwasserspiegels des Chriesbaches.
Teich
Bau im Winter 08/09 durch EAWAG bereits erfolgt.
Brunnen (Grundwasser)
bestehend, in die Arena integrieren.
Lehr- und Demonstrationsarena
Flache Plattform (Holz, rutschfest, geriilt) umrundet mit Quaderblöcken als Sitzmöglichkeit für 20 bis 30 Personen. Infrastrukturkasten ausserhalb des Hochwasserbereiches.
Anschlussschacht für UW-Kamera
proj. GW-Messstellen
Realisiert durch Eawag im Herbst 2012
Piezometer for groundwater monitoring
Beispiele Piezometer
Einlauf verlängern
Entnahmestelle Wasser für Aquarium
Rampe aus Blöcken auf Bachsohle
Verzweigte Gerinne, Furt, Sitzgelegenheiten
Aquarium Eawag
Gewässerabstandslinie
Chriesbach
1x PE 100
Elektro 1x PE 60, 1x PE 120
VK Fuchs Grösse II
km 0.431
km 0.485
km 0.511
15206
17313
15096
1004

Monitoring equipment (online data transfer) → Teaching

Groundwater monitoring

Projects by Mario Schirmer:



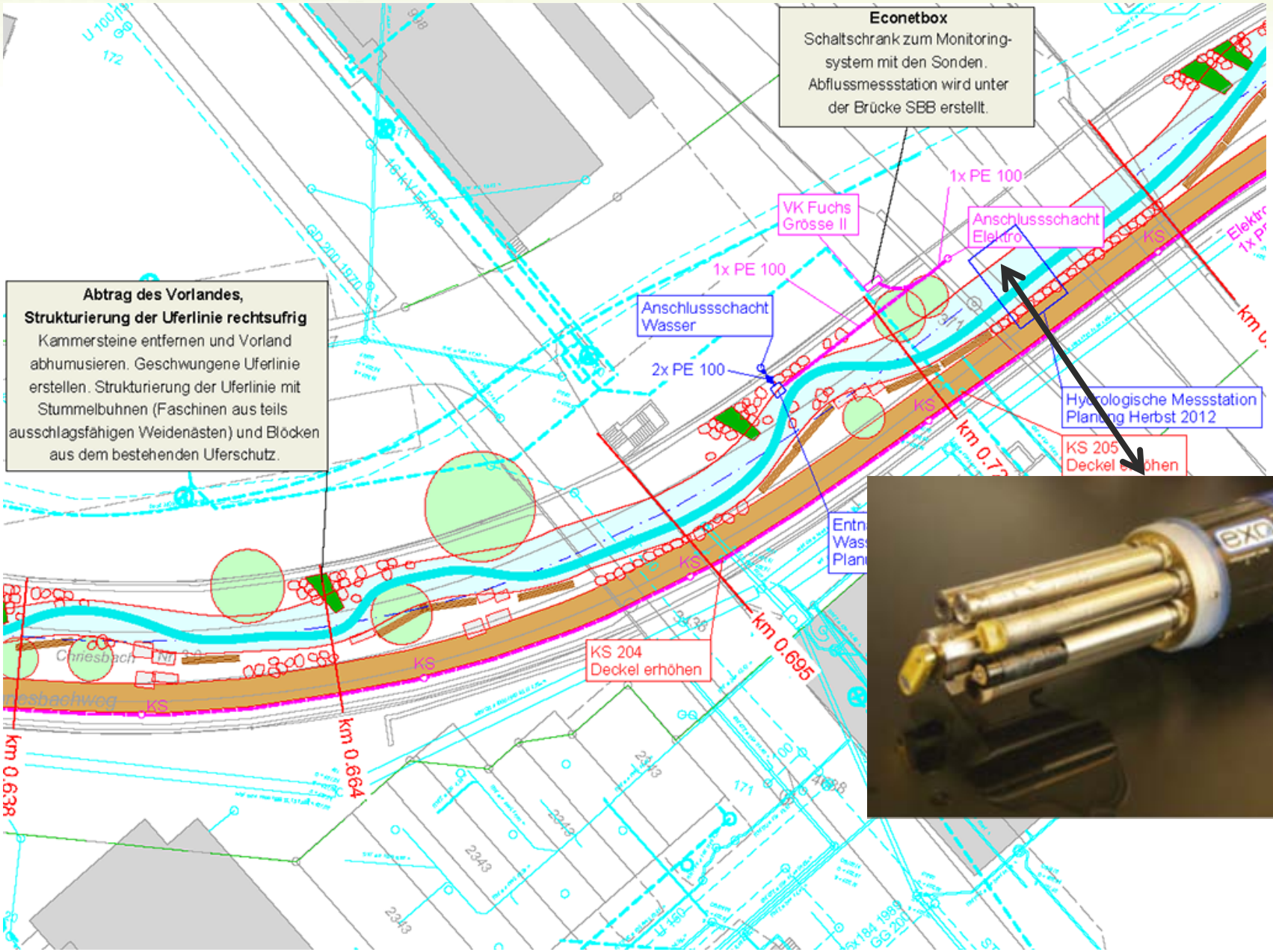
- 5 piezometer (STS sondes)
- meteostation

PhD project Anne-Marie Kurth:

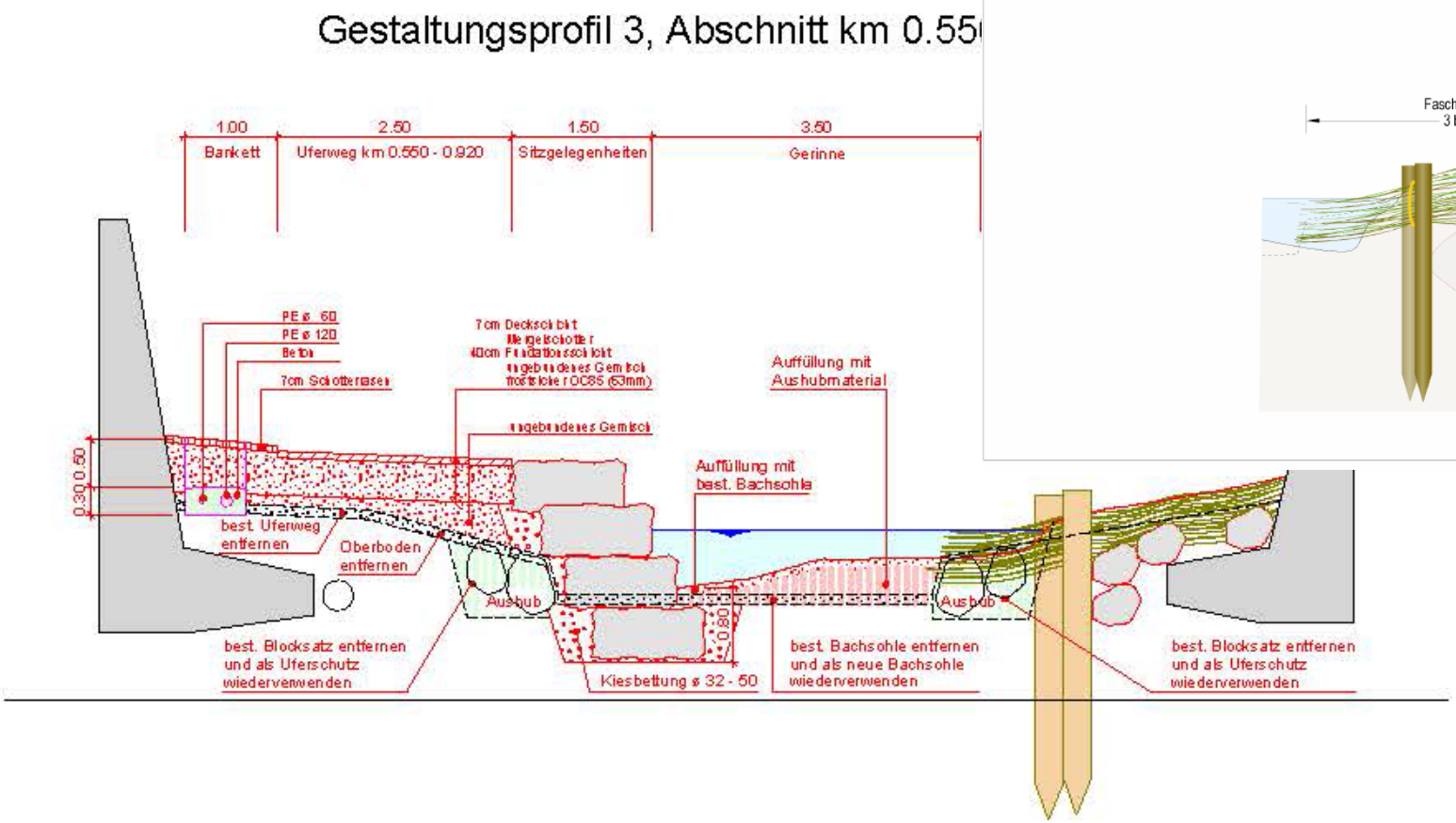
- DTS (distributed temperature sensing)

EXO Sonde (WTW/Hunter&Caprez)

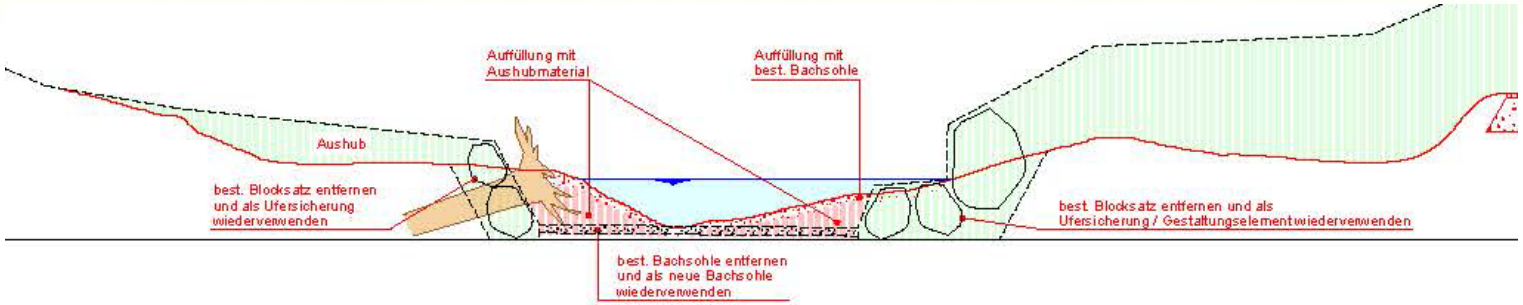
www.EXOwater.com


Econetbox
Schaltschrank zum Monitoring-system mit den Sonden. Abflussmessstation wird unter der Brücke SBB erstellt.
Abtrag des Vorlandes, Strukturierung der Uferlinie rechtsufrig
Kammersteine entfernen und Vorland abhumusieren. Geschwungene Uferlinie erstellen. Strukturierung der Uferlinie mit Stummelbuhnen (Faschinen aus teils ausschlagsfähigen Weidenästen) und Blöcken aus dem bestehenden Uferschutz.
VK Fuchs Grösse II
1x PE 100
Anschlussschacht Elektro
1x PE 100
Anschlussschacht Wasser
2x PE 100
Hydrologische Messstation Planung Herbst 2012
KS 205 Deckel erhöhen
KS 204 Deckel erhöhen
km 0.695
km 0.664
km 0.638
KS
Chriesbach
Chriesbachweg

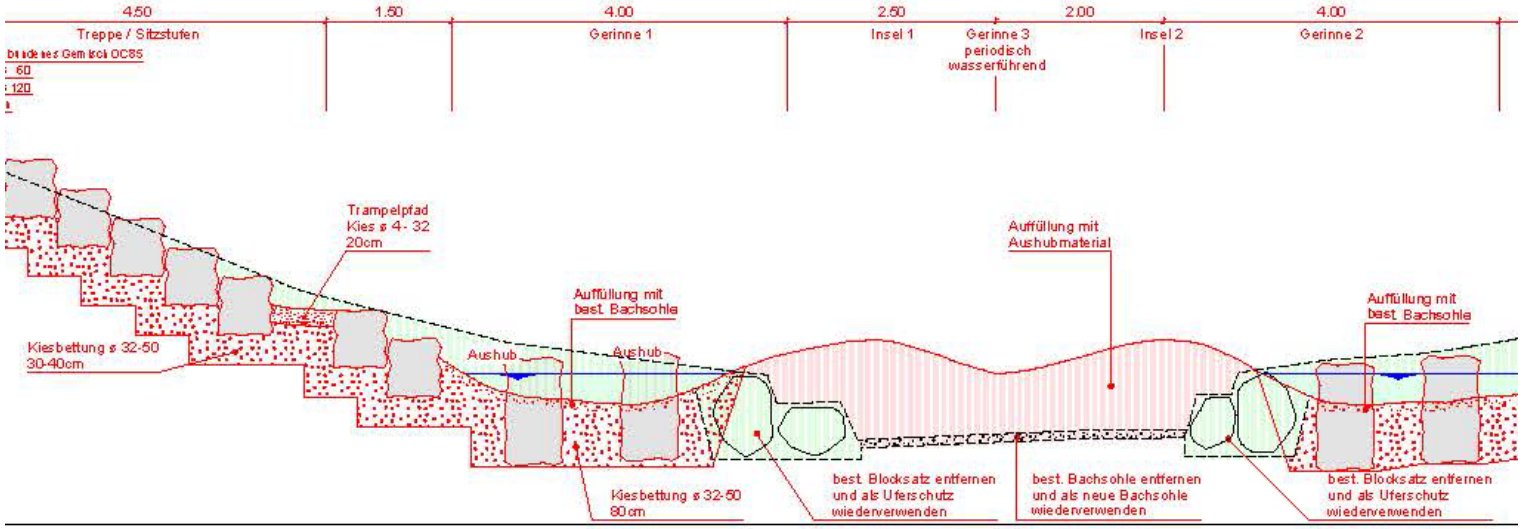
Profile, section between the walls , view downstream



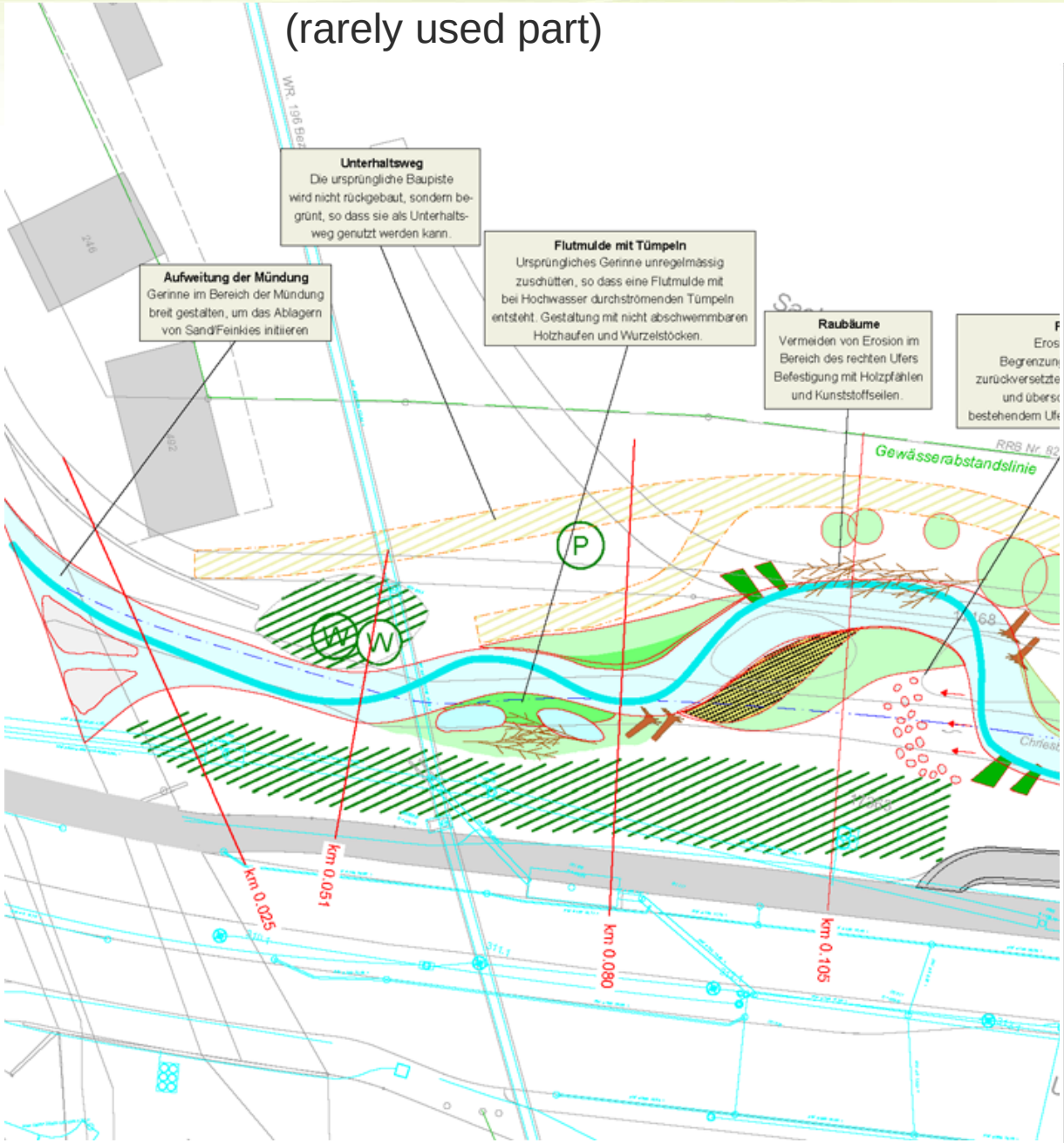
Profile through the section close to the mouth of the Glatt

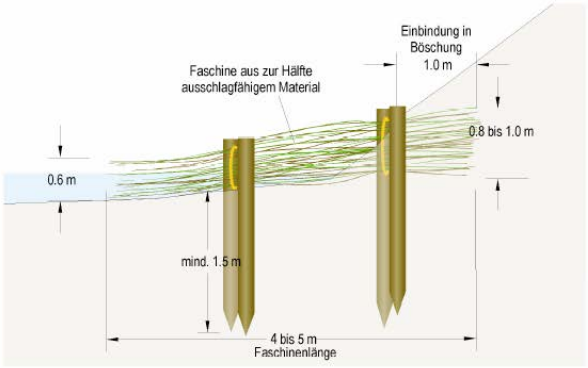


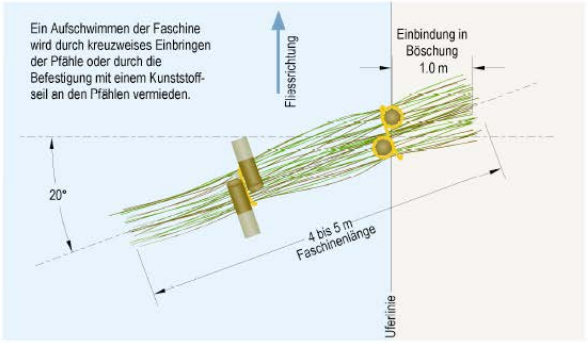
Profile through a section with a ford (furt)



Section close to the mouth of the Glatt (rarely used part)



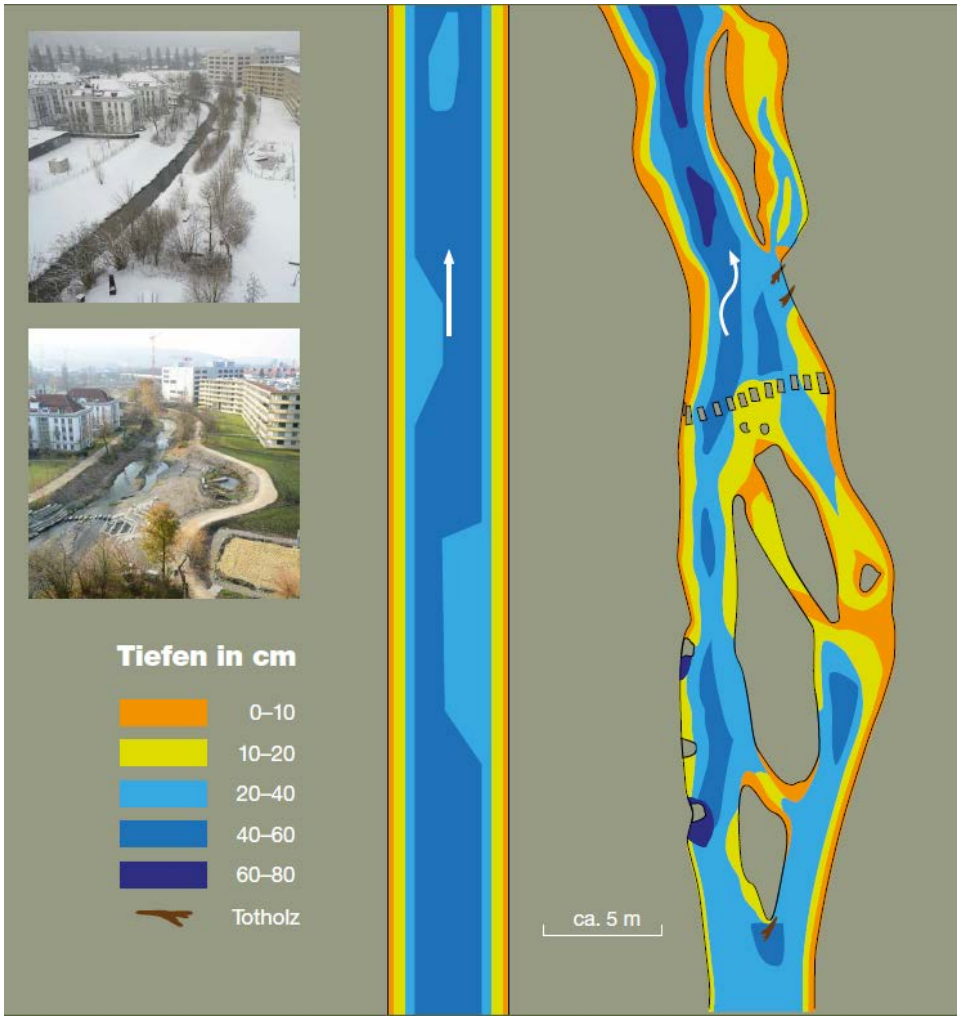




Issue	Responsible	Period
Electrofishing	Armin Peter	fall 2011 fall 2012 + periodically after restoration
Benthos, etc.	Chris Robinson	fall 2011 fall 2012 + periodically after restoration
Habitat	Armin Peter and Chris Robinson	fall 2011 fall 2012 + two times after restoration
Vegetation (water, brooksides)	Barbara Känel, AWEL Thomas Winter, SWO Andreas Wolf, SWO	summer 2012 + after restoration
Fotodocumentation **+ Webcam,** **+ Underwater camera**	Peter Penicka Raoul Schaffner Raoul Schaffner	periodically permanent for special events

Issue	Responsible	Periode
Chemical and physical monitoring, permanent installations (Econet Box, discharge measurement)	Chris Robinson, Sam Derrer (Aua Lab), Michael Berg Hydraulic monitoring together with AWEL	permanent, beginning summer 2013 as from August 2012 preparation, including collection of reference values
Sampling with mobile equipment for P and other nutrients and for TIC	Sam Derrer (Aua Lab), POC has to be analyzed elsewhere	periodically as from fall 2012
Meteostation (Monitoring Group Hydrogeology / W+T)	Mario Schirmer	
Piezometer with STS sondes (Monitoring Group Hydrogeology / W+T)	Mario Schirmer	permanent, beginning fall 2012
DTS (distributed temperature sensing), PhD thesis hydrogeology	Anne-Marie Kurth, Mario Schirmer	fall 2012 - 2014
Aquarium with water from Chriesbach and small fishes from Chriesbach	Hansi Mosler and Marc Boehler	permanent, beginning April 2014 preparation as from August 2012
Social science study: questionnaire relating the perception by residents and employees of Empa, Eawag and local companies as well as pupils of the International School	Eike von Lindern (WSL) with Robert Tobias (Eawag)	beginning March 2013 + periodically after restoration

Waterdepth before and after restoration



A. Bryner

Opening event: 16, 17 May 2014

Visit the restored creek – you are very welcome!