

LEGEND OF THE DEAD ARM		LEGEND OF DAM INTAKE NO. 1	
EXISTING SITUATION	DESIGNED WORKS	EXISTING SITUATION	DESIGNED WORKS
Natural riverbed Road Bridge Boundary of the built-up area Boundary of the UAT (Territorial Administrative Unit)	Weir equipped with flat sluice gate 0.80x0.60m - 2 pieces	Natural riverbed Road Bridge Boundary of the built-up area Boundary of the UAT (Territorial Administrative Unit)	Double sluice gate L=10m, H=1.2+3.5m – opening 1.4 – 2 pieces Flat sluice gate L=15m, H=1.2m – opening 2.5 – 2 pieces Flat sluice gate L=18m, H=1.2m – opening 3 – 1 piece Bubbling system – 1 piece Unclogging of the Mureș riverbed upstream of the dam L=50m Securing the dissipation basin – 1 piece Cofferdam stage 1 – L=65m Cofferdam stage 2 – L=80m Floaters collection platform - 1 piece Technological road L=380m
LEGEND OF DAM INTAKE NO. 2		LEGEND OF TURBINE CANAL	
EXISTING SITUATION	DESIGNED WORKS	EXISTING SITUATION	DESIGNED WORKS
Natural riverbed Road Bridge Boundary of the built-up area Boundary of the UAT (Territorial Administrative Unit)	Segment sluice gate L=14m, H=3.5m – 6 pieces Segment sluice gate with flap L=14m, H=3.9m – 1 piece Segment sluice gate with flap L=4m, H=3.9m – 2 pieces Cofferdams L=14m, H=1.25m – 7 pieces Cofferdams L=4m, H=1.4m – 2 pieces Bubbling system – 1 piece Weir valve B=2m, H=2.5m – 8 pieces Weir valve B=2m, H=0.8m - 4 pieces Weir valve B=1m, H=0.6m - 1 piece Weir valve B=1m, H=0.6m - 2 pieces Weir valve B=1m, H=0.6m - 1 piece Securing the dissipation basin – 1 piece Cofferdam stage 1 – L=95m Cofferdam stage 2 – L=110m	Natural riverbed Road Bridge Boundary of the built-up area Boundary of the UAT (Territorial Administrative Unit)	Unclogging of the Turbine Canal L=3000m Access weir, flat valves L=3m, H=3m – 4 pieces Outlet weir, double flat sluice gate L=2.68m, H=3.2m+1.7m – 1 piece Sludge bubbling system – 1 piece Bypass canal (natural branch of the Mureș River, Insulei Street – Mureș River) – 1 piece Oversize sorting – 1 piece Reversed fish ladder – MHC – 1 piece

Stavilă braț mort = *Dead arm weir*

Baraj plutitor = *Floating dam*

Baraj priza nr. 1 = *Dam intake no. 1*

Scara de pești întoarsă – MHC = *Reversed fish ladder - MHC*

Baraj priza nr. 2 = *Dam intake no. 2*

Radier aval pod de cale ferată = *Railway bridge downstream weir*

Decolmatare canal turbină = 3000m = *Unclogging of the Turbine Canal*

Project: „Improving the safe operating conditions of the hydrotechnical node on the Mureş River in Târgu Mureş municipality, Mureş County”

Beneficiary: **NATIONAL ADMINISTRATION „APELE ROMÂNE” (ROMANIAN WATERS)**
MUREŞ WATER BASIN ADMINISTRATION

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	Hydrotechnical constructions	Eng. Adrian MURESAN	
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	Hydrotechnical constructions	Eng. Dragos PARIAN	

Stam of the company AQUA PROCIV PROIECT S.R.L. in Cluj – Romania

Sheet / No. 1 **Sheet name:** Overall site plan











Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:25000	2



Cofferdam STAGE 1 L=95m Cofferdam STAGE 2 L=110m	Securing the dissipation basin	Segment sluice gate L=14m, H=3.5m – 6 pieces Segment sluice gate with flap L=14m, H=3.9m – 1 piece Segment sluice gate with flap L=4m, H=3.9m – 2 pieces Cofferdams L=14m, H=1.25m – 7 pieces Cofferdams L=4m, H=1.4m – 2 pieces Bubbling system
		Weir valves B=2m, H=2.5m – 8 pieces Weir valves B=2m, H=0.8m - 4 pieces Weir valve B=1m, H=0.6m - 1 piece Weir valve B=1m, H=0.6m - 2 pieces Weir valve B=1m, H=0.6m - 1 piece Weir valve with fish ladder B=0.8m, H=0.6m – 1 piece Cofferdams with discharge valves B=2m, H=1.55m – 8 pieces

LEGEND OF DAM INTAKE NO. 2		LEGEND OF TURBINE CANAL	
EXISTING SITUATION	DESIGNED WORKS	EXISTING SITUATION	DESIGNED WORKS
Natural riverbed Road Bridge Existing works Pillar	Segment sluice gate L=14m, H=3.5m – 6 pieces Segment sluice gate with flap L=14m, H=3.9m – 1 piece Segment sluice gate with flap L=4m, H=3.9m – 2 pieces Cofferdams L=14m, H=1.25m – 7 pieces Cofferdams L=4m, H=1.4m – 2 pieces Bubbling system – 1 piece Weir valve B=2m, H=2.5m – 8 pieces Weir valve B=2m, H=0.8m - 4 pieces Weir valve B=1m, H=0.6m - 1 piece Weir valve B=1m, H=0.6m - 2 pieces Weir valve B=1m, H=0.6m - 1 piece Securing the dissipation basin – 1 piece Cofferdam stage 1 – L=95m Cofferdam stage 2 – L=110m	Natural riverbed Road Bridge Existing works Pillar	Unclogging of the Turbine Canal L=3000m Access weir, flat valves L=3m, H=3m – 4 pieces Outlet weir, double flat sluice gate L=2.68m, H=3.2m+1.7m – 1 piece Sludge bubbling system – 1 piece Bypass canal (natural branch of the Mureș River, Insulei Street – Mureș River) – 1 piece Oversize pieces sorting – 1 piece Reversed fish ladder – MHC – 1 piece

Refuz de ciur	Oversize pieces sorting
Realizare radier aval pod cale ferată	Realization of the downstream bed of the railway bridge
Asigurare conectivitate longitudinală	Ensuring longitudinal connectivity
Decolmatare Canal turbină L = 3000m	Unclogging of the turbine canal L = 3000m
Torcret zid beton	Shotcrete concrete wall
Scara de pesti întoarsă – MHC	Reversed fish ladder - MHC
Stăvilă ieșire în canalul turbinei	Outlet weir in the turbine canal
Stăvilă plană dublă L=2.68,H=3,2+1,7m	Double flat sluice gate L=2.68, H=3.2+1.7m
Plantare arbori și vegetație autohtonă	Planting trees and native vegetation
Decolmatare canal turbină L=3000m	Unclogging of the turbine canal L=3000m
Stăvilă echipat cu stăvilă plană 0.80x0.60m	Weir equipped with a flat sluice gate 0.80x0.60m
Platformă de colectare a plutitorilor	Float collection platform
Drum tehnologic	Technological road
Baraj plutitor	Floating dam
Batardou ETAPA 1 L=65m	Cofferdam STAGE 1 L=65m
Batardou ETAPA 2 L=80m	Cofferdam STAGE 2 L=80m
Punere în siguranță bazin disipator	Securing the dissipation basin
Stăvilă dublă L=10m, H=1.2+3.5m – deschidere 1.4 – 2 buc.	Double sluice gate L=10m, H=1.2+3.5m – opening 1.4 – 2 pcs.
Stăvilă plană L=15m, H=1.2m – deschidere 2.5 – 2 buc.	Flat sluice gate L=15m, H=1.2m – opening 2.5 – 2 pcs.
Stăvilă plană L=18m, H=1.2m – deschidere 3 – 1 buc.	Flat sluice gate L=18m, H=1.2m – opening 3 – 1 pc.
Sistem de barbotare	Bubbling system
Decolmatare albie râu Mureș	Unclogging the Mureș Riverbed
Stăvilă de acces în canalul turbine, vane plane L=3m, H=3m	Access weir in the turbine canal, flat valves L=3m, H=3m
Sistem de barbotare a nămolului	Sludge bubbling system

LEGEND OF DAM INTAKE NO. 1		LEGEND OF THE DEAD ARM	
EXISTING SITUATION	DESIGNED WORKS	EXISTING SITUATION	DESIGNED WORKS
 Natural riverbed  Road  Bridge  Existing works  Pillar	Double sluice gate L=10m, H=1.2+3.5m – opening 1.4 – 2 pieces Flat sluice gate L=15m, H=1.2m – opening 2.5 – 2 pieces Flat sluice gate L=18m, H=1.2m – opening 3 – 1 piece Bubbling system – 1 piece Unclogging of the Mureş riverbed upstream of the dam L=50m Securing the dissipation basin – 1 piece Cofferdam stage 1 – L=65m Cofferdam stage 2 – L=80m Floaters collection platform - 1 piece Technological road L=380m	 Natural riverbed  Road  Bridge  Existing works  Pillar	Weir equipped with flat sluice gate 0.80x0.60m - 2 pieces

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Sheet / No. 2.1 Sheet name: Site plan – Option 1

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:2000	2













Cofferdam STAGE 1 L=95m	Securing the dissipation basin	Segment sluice gate L=14m, H=3.5m – 6 pieces Segment sluice gate with flap L=14m, H=3.9m – 1 piece Segment sluice gate with flap L=4m, H=3.9m – 2 pieces Cofferdams L=14m, H=1.25m – 7 pieces Cofferdams L=4m, H=1.4m – 2 pieces Bubbling system
Cofferdam STAGE 2 L=110m	Fish ladder with siphoning through opening no.1	Weir valves B=2m, H=2.5m – 8 pieces Weir valves B=2m, H=0.8m - 4 pieces Weir valve B=1m, H=0.6m - 1 piece Weir valve B=1m, H=0.6m - 2 pieces Weir valve B=1m, H=0.6m - 1 piece Weir valve with fish ladder B=0.8m, H=0.6m – 1 piece Cofferdams with discharge valves B=2m, H=1.55m – 8 pieces

LEGEND OF DAM INTAKE NO. 2		LEGEND OF TURBINE CANAL	
EXISTING SITUATION	DESIGNED WORKS	EXISTING SITUATION	DESIGNED WORKS
Natural riverbed Road Bridge Existing works Pillar	Segment sluice gate L=14m, H=3.5m – 6 pieces Segment sluice gate with flap L=14m, H=3.9m – 1 piece Segment sluice gate with flap L=4m, H=3.9m – 2 pieces Cofferdams L=14m, H=1.25m – 7 pieces Cofferdams L=4m, H=1.4m – 2 pieces Bubbling system – 1 piece Weir valve B=2m, H=2.5m – 8 pieces Weir valve B=2m, H=0.8m - 4 pieces Weir valve B=1m, H=0.6m - 1 piece Weir valve B=1m, H=0.6m - 2 pieces Weir valve B=1m, H=0.6m - 1 piece Fish ladder with siphoning – 1 piece Sluice gate B=0.8m, H=0.6m – 1 piece Securing the dissipation basin – 1 piece Cofferdam stage 1 – L=95m Cofferdam stage 2 – L=110m	Natural riverbed Road Bridge Existing works Pillar	Unclogging of the Turbine Canal L=3000m Access weir, flat valves L=3m, H=3m – 4 pieces Outlet weir, double flat sluice gate L=2.68m, H=3.2m+1.7m – 1 piece Sludge bubbling system – 1 piece

Torcret zid beton	Shotcrete concrete wall
Decolmatare Canal turbină L = 3000m	Unclogging of the turbine canal L = 3000m
Stăvilă ieșire în canalul turbinei	Outlet weir in the turbine canal
Stăvilă plană dublă L=2.68, H=3.2+1.7m	Double flat sluice gate L=2.68, H=3.2+1.7m
Plantare arbori și vegetație autohtonă	Planting trees and native vegetation
Decolmatare canal turbină L=3000m	Unclogging of the turbine canal L=3000m
Canal Bypass	Bypass Canal
Stăvilă echipat cu stăvilă plană 2.20x2.20m	Weir equipped with a flat sluice gate 2.20x2.20m
Stăvilă echipat cu stăvilă plană 0.80x0.60m	Weir equipped with a flat sluice gate 0.80x0.60m
Drum tehnologic	Technological road
Platformă de colectare a plutitorilor	Float collection platform
Baraj plutitor	Floating dam
Punere în siguranță bazin disipator	Securing the dissipation basin
Batardou ETAPA 1 L=65m	Cofferdam STAGE 1 L=65m
Batardou ETAPA 2 L=80m	Cofferdam STAGE 2 L=80m
Stăvilă dublă L=10m, H=1.2+3.5m – deschidere 1.4 – 2 buc.	Double sluice gate L=10m, H=1.2+3.5m – opening 1.4 – 2 pcs.
Stăvilă plană L=15m, H=1.2m – deschidere 2.5 – 2 buc.	Flat sluice gate L=15m, H=1.2m – opening 2.5 – 2 pcs.
Stăvilă plană L=18m, H=1.2m – deschidere 3 – 1 buc.	Flat sluice gate L=18m, H=1.2m – opening 3 – 1 pc.
Sistem de barbotare	Bubbling system
Decolmatare albie râu Mureș	Unclogging the Mureș Riverbed

Stăvilă de acces în canalul turbinei, vane plane L=3m, H=3m	Access weir in the turbine canal, flat valves L=3m, H=3m
Sistem de barbotare a nămolului	Sludge bubbling system

LEGEND OF DAM INTAKE NO. 1		LEGEND OF THE DEAD ARM	
EXISTING SITUATION	DESIGNED WORKS	EXISTING SITUATION	DESIGNED WORKS
 Natural riverbed  Road  Bridge  Existing works  Pillar	Double sluice gate L=10m, H=1.2+3.5m – opening 1.4 – 2 pieces Flat sluice gate L=15m, H=1.2m – opening 2.5 – 2 pieces Flat sluice gate L=18m, H=1.2m – opening 3 – 1 piece Bubbling system – 1 piece Unclogging of the Mureș riverbed upstream of the dam L=50m Bypass canal L=350m Weir equipped with a flat sluice gate 2.20x2.20m – 1 piece Securing the dissipation basin – 1 piece Cofferdam stage 1 – L=65m Cofferdam stage 2 – L=80m Floaters collection platform - 1 piece Technological road L=380m	 Natural riverbed  Road  Bridge  Existing works  Pillar	Weir equipped with flat sluice gate 0.80x0.60m - 2 pieces

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MUREȘ WATER BASIN ADMINISTRATION

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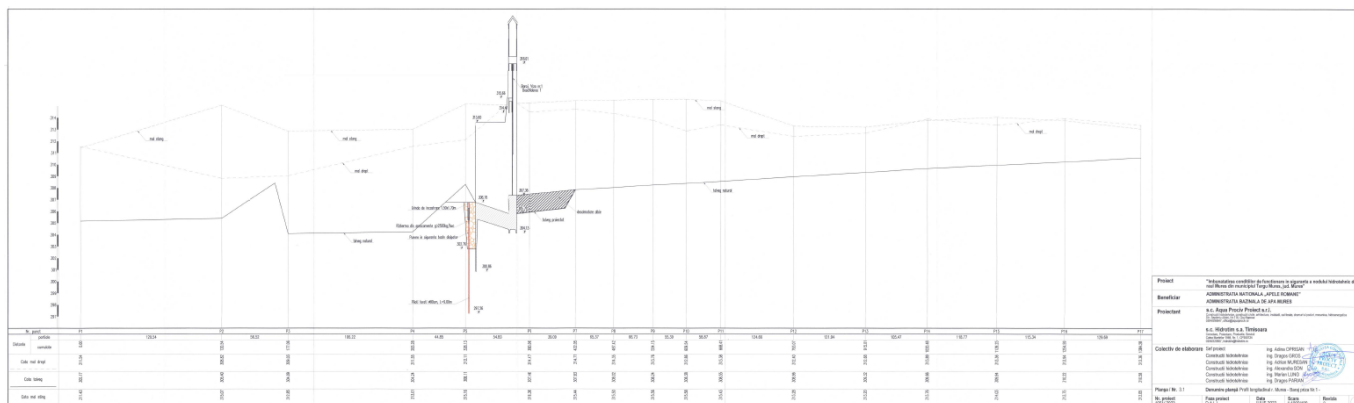
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Sheet / No. 2.2 Sheet name: Site plan – Option 2

Project no. 1051/2023	Project phase D.A.L.I.	Date JULY 2023	Scale 1:2000	Revision 2
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Nr. punct	Point no.
Distante partiale	Partial distances
Distante cumulate	Cumulative distances
Cota mal drept	Right bank elevation
Cota talveg	Thalweg elevation
Cota mal sting	Left bank elevation
Mal stang	Left bank
Mal drept	Right bank
Talveg natural	Natural thalweg
Baraj Priza nr. 1 / Deschiderea 1	Dam intake no. 1 / Opening 1
Grinda de incastare 1.50x1.70m	1.50x1.70m embedding beam
Rizberma din anrocamente g>2500kg/buc	Rockfill embankment g>2500kg/pc
Punere in siguranta bazin disipator	Securing the dissipation basin
Piloti forati ø80cm, L=9.00m	Bored piles ø80cm, L=9.00m
Talveg proiectat	Designed thalweg
Decolmatare albie	Riverbed unclogging

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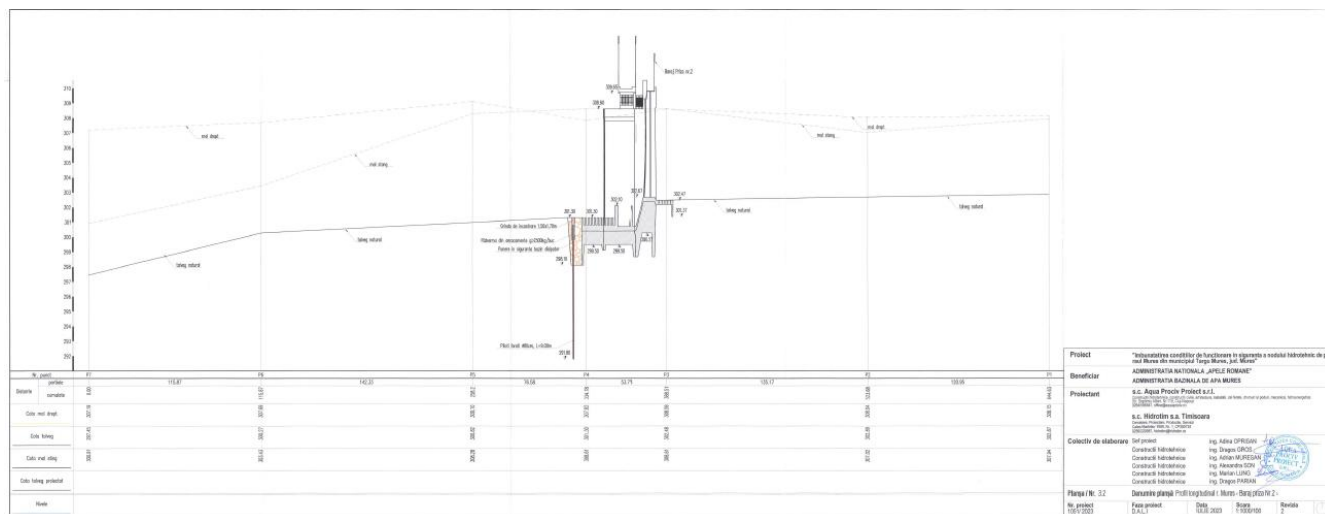
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Sheet / No. 3.1 **Sheet name:** Longitudinal profile of the Mureș River – Dam intake No. 1 –

Project no. 1051/2023	Project phase D.A.L.I.	Date JULY 2023	Scale 1:1000/100	Revision 2
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Nr. punct	Point no.
Distanțe parțiale	Partial distances
Distanțe cumulate	Cumulative distances
Cota mal drept	Right bank elevation
Cota talveg	Thalweg elevation
Cota mal stâng	Left bank elevation
Cota talveg proiectat	Designed thalweg elevation
Nivele	Levels
Mal drept	Right bank
Mal stâng	Left bank
Talveg natural	Natural thalweg
Baraj Priza nr. 2	Dam intake no. 2
Grinda de încadrare 1.50x1.70m	1.50x1.70m embedding beam
Rizberma din anrocamente g>2500kg/buc	Rockfill embankment g>2500kg/pc
Punere în siguranță bazin disipator	Securing the dissipation basin
Piloți forati ø80cm, L=9.00m	Bored piles ø80cm, L=9.00m

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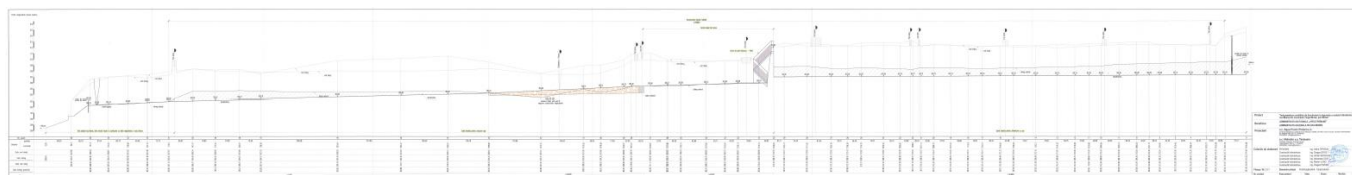
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Sheet / No. 3.2 Sheet name: Longitudinal profile of the Mureș River – Dam intake No. 2 –

Project no. 1051/2023	Project phase D.A.L.I.	Date JULY 2023	Scale 1:1000/100	Revision 2
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Profil longitudinal – Canal turbina	Longitudinal profile – Turbine canal
Nr. punct	Point no.
Distanțe parțiale	Partial distances
Distanțe cumulate	Cumulative distances
Cota mal drept	Right bank elevation
Cota talveg	Thalweg elevation
Cota mal stâng	Left bank elevation
Cota talveg proiectat	Designed thalweg elevation
Panta	Slope
Pod beton	Concrete bridge
Mal drept	Right bank
Mal stâng	Left bank
Grinda din beton	Concrete beam
Canal bypass	Bypass canal
Talveg natural	Natural thalweg
Brat natural rau Mures, între strada Insulei și confluența cu albia regularizată a râului Mures	Natural branch of the Mures River, between Insulei Street and the confluence with the regulated bed of the Mures River
Decolmatare	Unclogging
Canal deschis pentru evacuare apă	Open canal for water discharge
Confluența r. Poclos	Poclos River Confluence
Pod CFR	CFR (Romanian Railways) bridge
refuz de ciur realizare radier aval pod CF	oversize pieces sorting construction of a foundation frame downstream of the CF (railway) bridge
asigurare conectivitate longitudinală	ensuring longitudinal connectivity
radier existent	existing foundation frame
Decolmatare Canalul Turbinei L=3000m	Unclogging the Turbine Canal L=3000m
Torcret ziduri din beton	Concrete wall shotcrete
Scara de pești întoarsă – MHC	Reversed fish ladder - MHC
Canal deschis pentru alimentare cu apă	Open canal for water supply
Stavilă de acces în canalul turbine	Access weir in the turbine canal
r. Mures	Mures River

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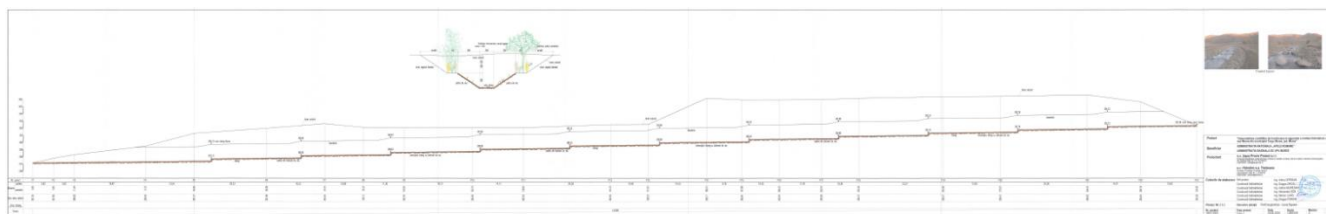
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Sheet / No. 3.3.1 Sheet name: Longitudinal profile – Turbine Canal –

Project no. 1051/2023	Project phase D.A.L.I.	Date JULY 2023	Scale 1:2000/100	Revision 2
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Nr. punct	Point no.
Distanțe parțiale	Partial distances
Distanțe cumulate	Cumulative distances
Cota teren natural	Natural terrain elevation
Cota talveg	Thalweg elevation
Panta	Slope
Teren natural	Natural terrain
Cota talveg Mureș	Mureș thalweg elevation
Talveg	Thalweg
Cadere din bolovani de rau	Waterfall made of river boulders
Bancheta	Bench
Amenajare talveg cu bolovani de rau	Riverbed arrangement with river boulders
Secțiune transversală canal bypass scară 1:100	Bypass canal cross-section scale 1:100
Variabil	Variable
Strat vegetal înierbat	Grassed vegetation layer
Piatră de rau	River stone
Plantare arbori autohtoni	Planting native trees
Canalul bypass	Bypass canal
Cota talveg canal turbină	Turbine canal thalweg elevation

Project: „Improving the safe operating conditions of the hydrotechnical node on the Mureș River in Târgu Mureș municipality, Mureș County”

Beneficiary: NATIONAL ADMINISTRATION „APELE ROMÂNE” (ROMANIAN WATERS)
MUREȘ WATER BASIN ADMINISTRATION

Designer: **s.c. Aqua Prociv Proiect s.r.l.**
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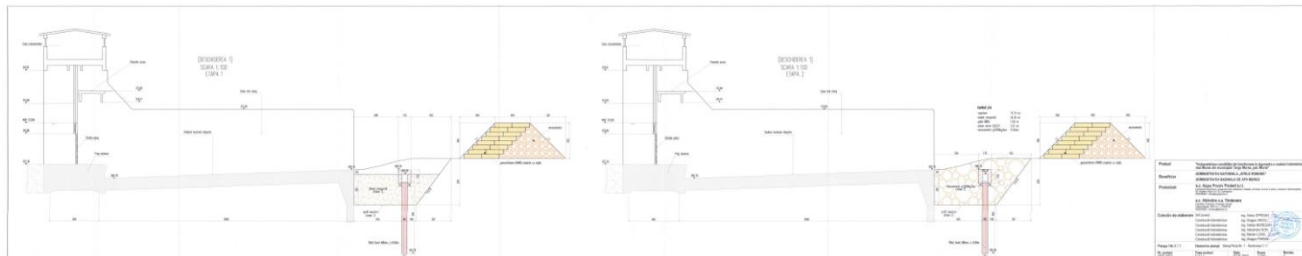
Design Team

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Hydrotechnical constructions	Eng. Adrian MURESAN	<i>illegible signatures</i>
Hydrotechnical constructions	Eng. Alexandra SON	
Hydrotechnical constructions	Eng. Marian LUNG	
Hydrotechnical constructions	Eng. Dragos PARIAN	

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Sheet / No. 3.3.2 Sheet name: Longitudinal profile – Bypass Canal –

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:200/100	2



(OPENING 1)
SCALE 1:100
STAGE 1

Casa mecanismelor	House of machines
Pasarela acces	Access walkway
Stavila plana	Flat sluice gate
Prag deversor	Discharge sill
Culee mal stang	Left bank bridge abutment
Radierul bazinului disipator	Dissipation basin foundation frame
Balast compactat (etapa 1)	Compacted ballast (stage 1)
Profil sapatura (etapa 1)	Excavation profile (stage 1)
Piloti forati ø80cm, L=9.00m	Bored piles ø80cm, L=9.00m
Anrocamente	Rockfill
Geocontainere DN800 umplute cu argila	DN800 geocontainers filled with clay

(OPENING 1)
SCALE 1:100
STAGE 2

Quantities / linear meter

- excavation 74.74 m³
- compacted ballast 29.30 m³
- piles ø800 11.92 m
- reinforced concrete C30/37 2.25 m³
- rockfill g>2500kg/piece 41.63 m³

Anrocamente g>2500kg/buc (etapa 2)	Rockfill g>2500kg/pc (stage 2)
Profil sapatura	Excavation profile
Piloti forati ø80cm, L=9.00m	Bored piles ø80cm, L=9.00m

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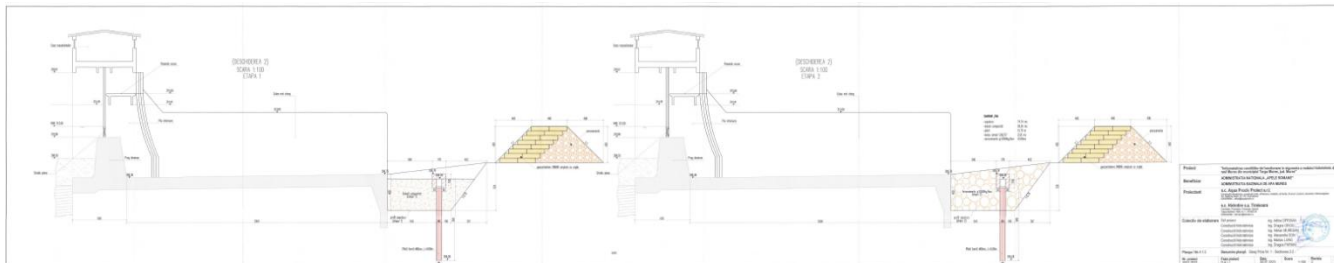
Design Team

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Sheet / No. 4.1.1 Sheet name: Dam intake No. 1 – Section 1-1 -

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:100	2



(OPENING 2)
SCALE 1:100
STAGE 1

Casa mecanismelor	House of machines
Pasarela acces	Access walkway
Pile inferioare	Lower piles
Stavila plana	Flat sluice gate
Prag deversor	Discharge sill
Culee mal stang	Left bank bridge abutment
Balast compactat (etapa 1)	Compacted ballast (stage 1)
Profil sapatura (etapa 1)	Excavation profile (stage 1)
Piloti forati ø80cm, L=9.00m	Bored piles ø80cm, L=9.00m
Anrocamente	Rockfill
Geocontainere DN800 umplute cu argila	DN800 geocontainers filled with clay

(OPENING 2)
SCALE 1:100
STAGE 2

Quantities / linear meter

- excavation 74.74 m³
- compacted ballast 29.30 m³
- piles 12.75 m
- reinforced concrete C30/37 2.25 m³
- rockfill g>2500kg/piece 41.65 m³

Anrocamente g>2500kg/buc (etapa 2)	Rockfill g>2500kg/pc (stage 2)
Profil sapatura (etapa 2)	Excavation profile (stage 2)
Piloti forati ø80cm, L=9.00m	Bored piles ø80cm, L=9.00m

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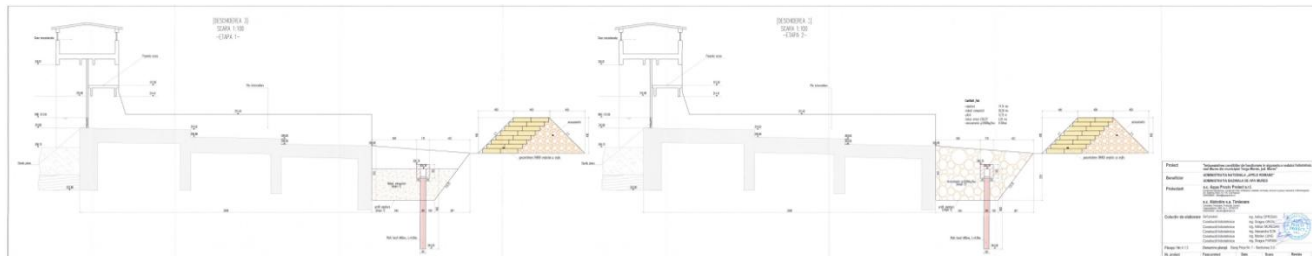
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Sheet / No. 4.1.2 Sheet name: Dam intake No. 1 – Section 2-2 -

Project no. 1051/2023	Project phase D.A.L.I.	Date JULY 2023	Scale 1:100	Revision 2
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(OPENING 3)
SCALE 1:100
-STAGE 1-

Casa mecanismelor	House of machines
Pasarela acces	Access walkway
Stavila plană	Flat sluice gate
Pila intermediară	Intermediate pile
Balast compactat (etapa 1)	Compacted ballast (stage 1)
Profil sapatură (etapa 1)	Excavation profile (stage 1)
Piloți forati ø80cm, L=9.00m	Bored piles ø80cm, L=9.00m
Anrocamente	Rockfill
Geocontainere DN800 umplute cu argila	DN800 geocontainers filled with clay

(OPENING 3)
SCALE 1:100
-STAGE 2-

Quantities / linear meter

- excavation 74.74 m³
- compacted ballast 29.30 m³
- piles 12.75 m
- reinforced concrete C30/37 2.25 m³
- rockfill g>2500kg/piece 41.65 m³

Anrocamente g>2500kg/buc (etapa 2)	Rockfill g>2500kg/pc (stage 2)
Profil sapatură (etapa 2)	Excavation profile (stage 2)
Piloți forati ø80cm, L=9.00m	Bored piles ø80cm, L=9.00m

Project: „Improving the safe operating conditions of the hydrotechnical node on the Mureș River in Târgu Mureș municipality, Mureș County”

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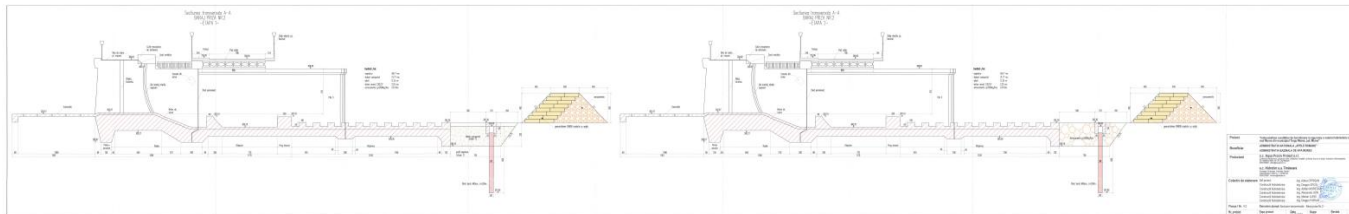
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Sheet / No. 4.1.3 Sheet name: Dam intake No. 1 – Section 3-3 -

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:100	2



Cross section A-A
DAM INTAKE NO.2

-STAGE 1-

Avanradier	Upstream floor
Sine de rulare pt. macara	Crane running rails
Cutie mecanisme de antrenare	Drive mechanism box
Scari metalice	Metal stairs
Ghidaj batardou	Cofferdam guide
Gol montaj stavila segment	Segment dam assembly hole
Consola din beton	Concrete console
Beton de uzura	Hard covering
Pinten amonte	Upstream spur
Radier	Foundation frame
Trotuar	Sidewalk
Pod rutier	Road bridge
Stalp electric pt. iluminat	Electric pole for lighting
Rost permanent	Permanent expansion joint
Disipator	Dissipator
Prag șicanat	Baffled sill
Pila 3	Pile 3
Rizberma	Downstream floor
Ballast compactat (etapa 1)	Compacted ballast (stage 1)
Profil sapatura (etapa 1)	Excavation profile (stage 1)
Piloti forati ø80cm, L=9.00m	Bored piles ø80cm, L=9.00m
Anrocamente	Rockfill
Geocontainere DN800 umplute cu argila	DN800 geocontainers filled with clay

Cross section A-A
DAM INTAKE NO.2

-STAGE 2-

Quantities / linear meter

- excavation 48.17 m³
- compacted ballast 21.77 m³
- piles 11.25 m
- reinforced concrete C30/37 2.25 m³
- rockfill g>2500kg/piece 23.13 m³

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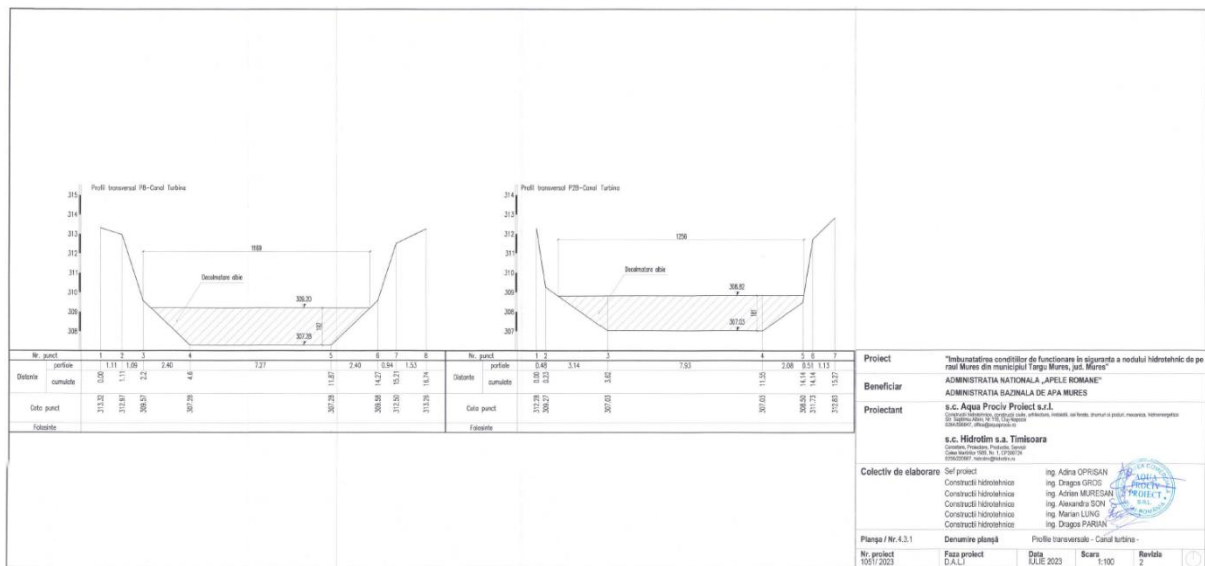
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Sheet / No. 4.2 Sheet name: Cross section - Dam intake No. 2 -

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:100	2



Transverse profile P8-Turbine canal

Decolmatare albie	<i>Riverbed unclogging</i>
Nr. punct	<i>Point no.</i>
Distanțe partiale	<i>Partial distances</i>
Distanțe cumulate	<i>Cumulative distances</i>
Cota punct	<i>Point elevation</i>
Folosințe	<i>Uses</i>

Transverse profile P28-Turbine canal

Decolmatare albie	<i>Riverbed unclogging</i>
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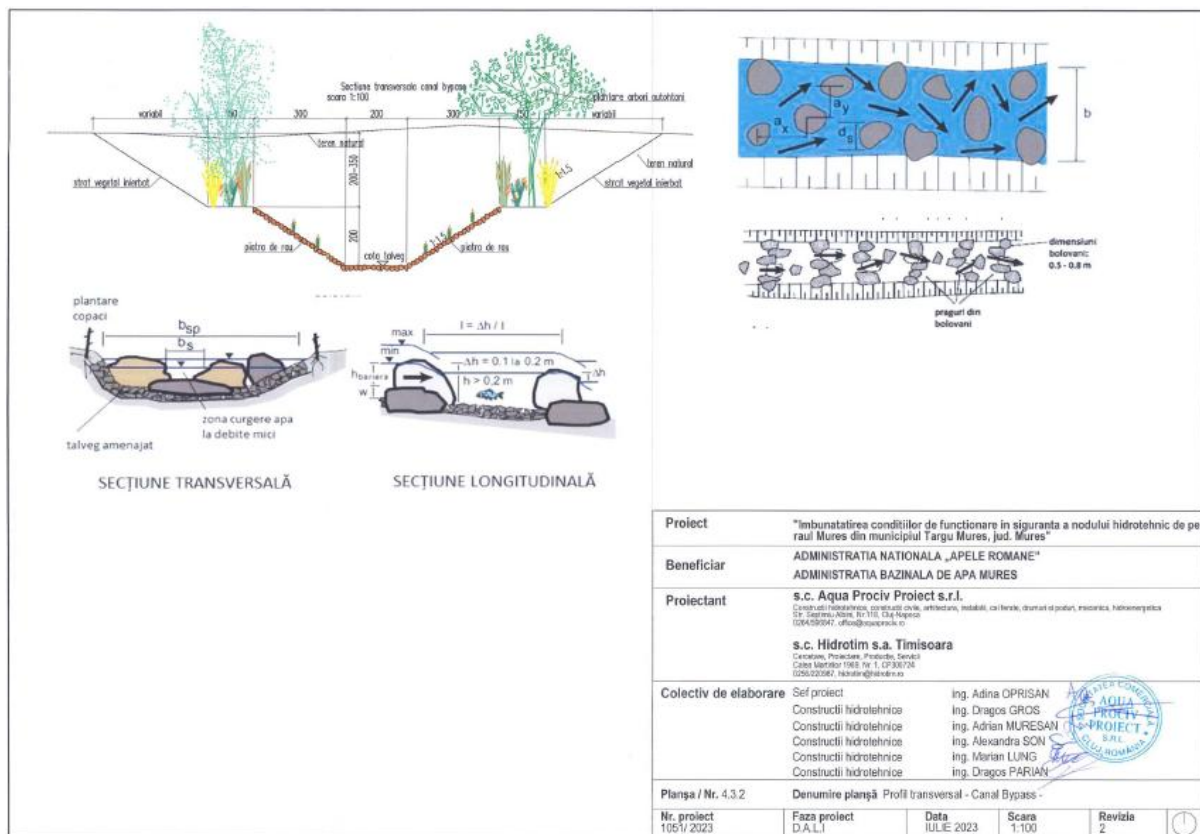
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Sheet / No. 4.3.1 Sheet name: Transverse profiles – Turbine canal -

Project no. 1051/2023	Project phase D.A.L.I.	Date JULY 2023	Scale 1:100	Revision 2
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Cross section of bypass canal
Scale 1:100

variabil	Variable
Strat vegetal inierbat	Grassed vegetation layer
Teren natural	Natural terrain
Piatra de rau	River stone
Plantare arbori autohtoni	Planting native trees
Plantare copaci	Planting trees
Talveg amenajat	Arranged thalweg
Zona curgere apa la debite mici	Low flow water area
SECTIUNE TRANSVERSALĂ	CROSS-SECTION
Barieră	Barrier
SECTIUNE LONGITUDINALĂ	LONGITUDINAL SECTION
Dimensiuni bolovani 0.5 – 0.8 m	Boulder dimensions 0.5 – 0.8 m
Praguri din bolovani	Boulder sills

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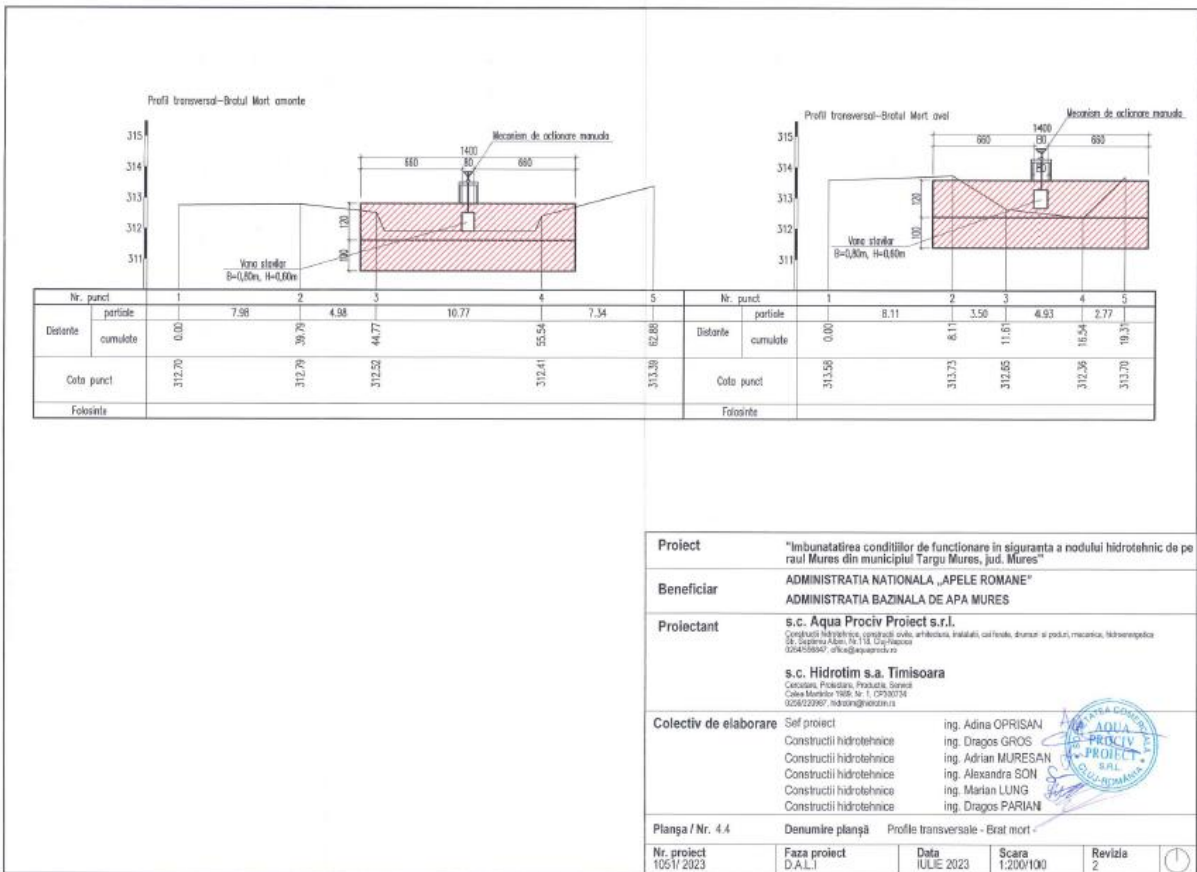
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Sheet / No. 4.3.2 Sheet name: Transverse profile – Bypass canal -

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:100	2



Transverse profile – Upstream dead arm

Vana stavilar	Weir valve
Mecanism de actionare manuala	Manual operating mechanism
Nr. punct	Point no.
Distanțe partiale	Partial distances
Distanțe cumulate	Cumulative distances
Cota punct	Point elevation
Folosințe	Uses

Transverse profile – Downstream dead arm

Vana stavilar	Weir valve
Mecanism de actionare manuala	Manual operating mechanism

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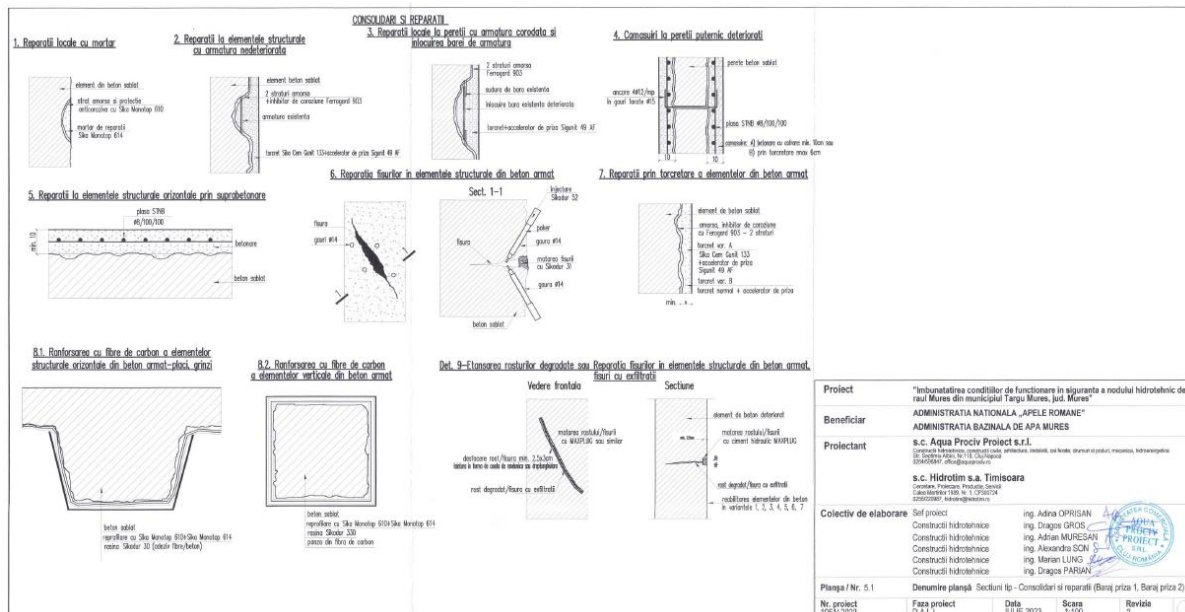
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Sheet / No. 4.4 **Sheet name:** Transverse profiles – Dead arm -

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:200/100	2



REINFORCEMENTS AND REPAIRS

1. Local repairs with mortar

- sandblasted concrete element
- priming layer and anti-corrosion protection with Sika Monotop 610
- repair mortar Sika Monotop 614

2. Structural element repairs with undamaged reinforcement

- sandblasted concrete element
- 2 coats of primer + corrosion inhibitor Ferrogard 903
- existing reinforcement
- Sika Cem Gunit 133 shotcrete + Sigunit 49 AF setting accelerator

3. Local repairs to walls with corroded reinforcement and replacement of reinforcement bar

- 2 coats of Ferrogard 903 primer
- welding of existing bar
- replacing damaged existing bar
- shotcrete + setting accelerator Sigunit 49 AF

4. Lining of heavily damaged walls

- sandblasted concrete wall
- 4012/sqm anchors in Ø15 drilled holes
- STNB mesh Ø8/100/100
- lining: A) concreting with formwork min. 10cm or B) by shotcrete max. 6cm

5. Repairs to horizontal structural elements by overconcreting

- STNB mesh
- concreting
- sandblasted concrete

6. Crack repair in reinforced concrete structural elements

- crack
- holes Ø14

Section 1-1

- injection of Sikadur 52
- packer
- hole Ø14
- crack
- filling the crack with Sikadur 31
- hole Ø14
- sandblasted concrete

7. Repairs by shotcrete of reinforced concrete elements

- sandblasted concrete element
- primer, corrosion inhibitor with Ferrogard 903 – 2 layers
- shotcrete variant A / Sika Cem Gunit 133 + setting accelerator Sigunit 49 AF
- shotcrete variant B / normal shotcrete + setting accelerator

8.1. Carbon fiber reinforcement of horizontal reinforced concrete structural elements – slabs, beams

- sandblasted concrete
- reprofiling with Sika Monotop 610 + Sika Monotop 614
- Sikadur 30 resin (fibre/concrete adhesive)

8.2. Carbon fiber reinforcement of vertical reinforced concrete elements

- sandblasted concrete
- reprofiling with Sika Monotop 610 + Sika Monotop 614
- Sikadur 30 resin
- carbon fibre cloth

Detail 9 – Sealing degraded joints or Repairing cracks in reinforced concrete structural elements, cracks with exfiltration

Front view

- filling the joint/crack with MAXPLUG or similar
- opening the joint/crack min. 2.5x3cm / dovetail or rectangular cut
- degraded joint/crack with exfiltration

Section

- damaged concrete element
- filling the joint/crack with MAXPLUG hydraulic cement
- degraded joint/crack with exfiltration
- rehabilitation of concrete elements in variants 1, 2, 3, 4, 5, 6, 7

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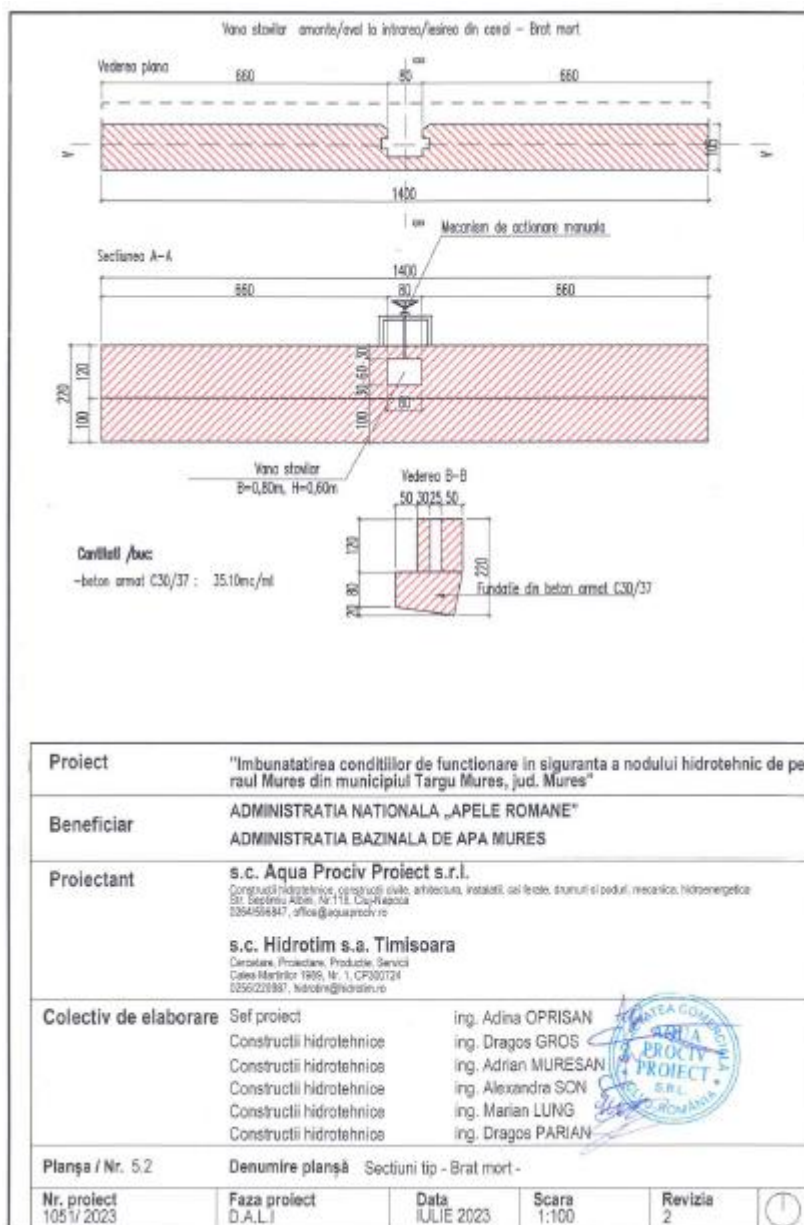
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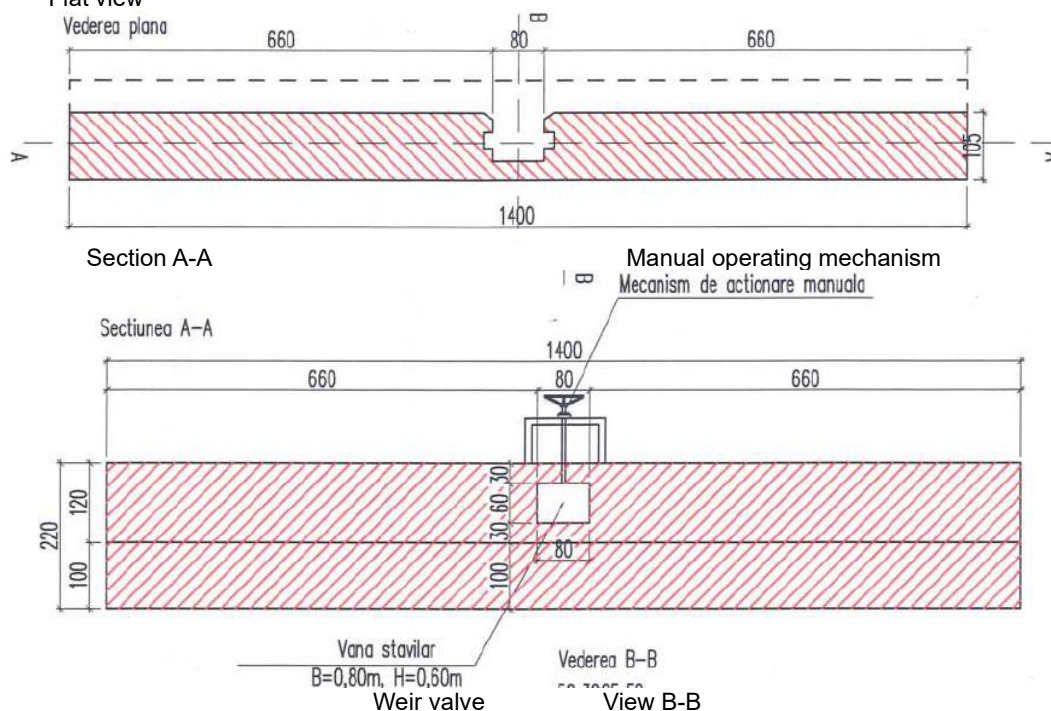
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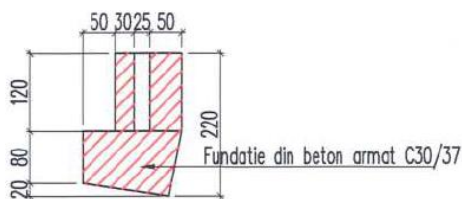
Sheet / No. 5.1 Sheet name: Standard sections – Reinforcements and repairs (Dam intake 1, Dam intake 2)

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:100	2



Weir valve upstream/downstream at the entrance/exit of the canal – Dead arm
Flat view



Quantities / piece:-reinforced concrete C30/37 : 35.10m³/lm

Reinforced C30/37 concrete foundation

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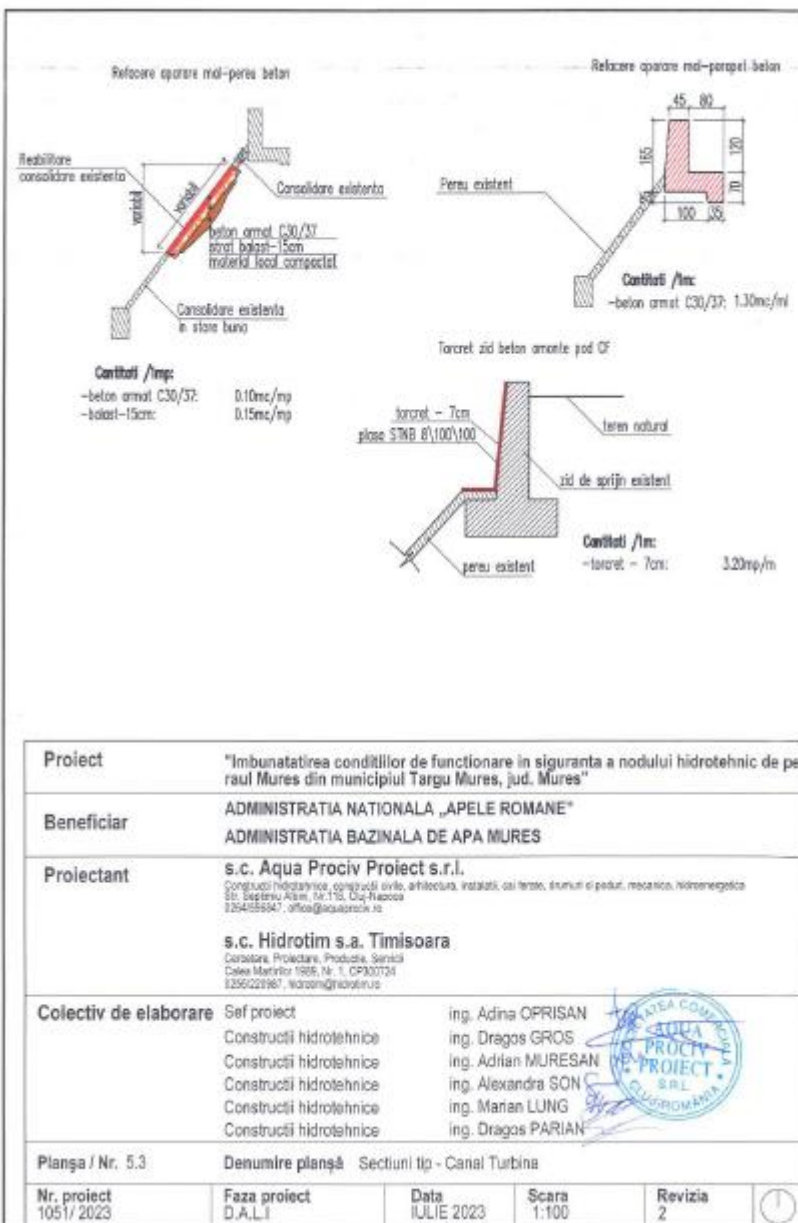
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Sheet / No. 5.2 **Sheet name:** Standard sections – Dead arm -

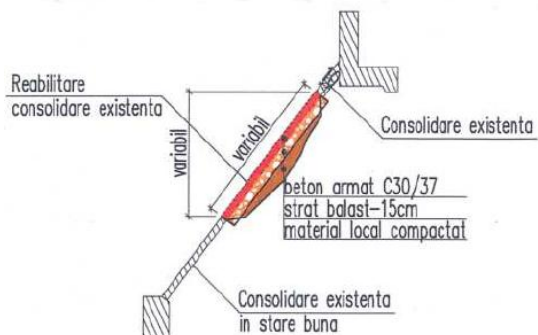
Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:100	2



Riverbank protection restoration – concrete wall

-Rehabilitation of existing consolidation
-variable

-Existing consolidation



-reinforced concrete C30/37
-ballast layer – 15cm
-local compacted material

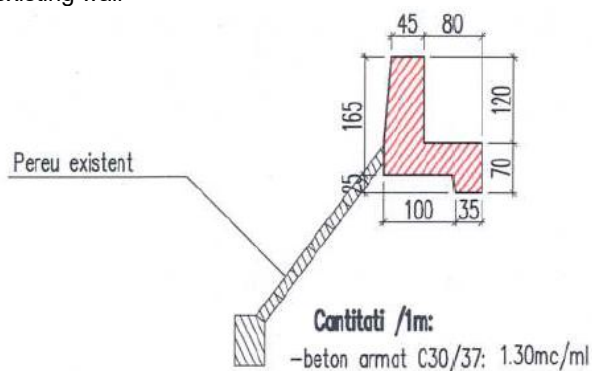
-Existing consolidation in good condition

Quantities /1sqm

-reinforced concrete C30/37: 0.10m³/sqm
-ballast-15cm: 0.15m³/sqm

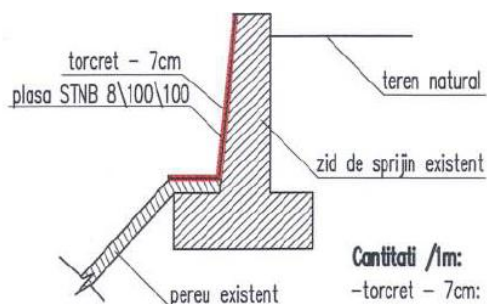
Riverbank protection restoration – concrete parapet

-existing wall



Quantities/1m: -reinforced concrete C30/37: 1.30m³/1m

Shotcrete concrete wall upstream of the railway bridge



-shotcrete – 7cm
-STNB mesh 8\100\100
-existing wall

-natural terrain
-existing abutment wall
Quantities/1m: -shotcrete – 7cm: 3.20sqm/m

Project: „Improving the safe operating conditions of the hydrotechnical node on the Mureș River in Târgu Mureș municipality, Mureș County”

Beneficiary: NATIONAL ADMINISTRATION „APELE ROMÂNE” (ROMANIAN WATERS)
MUREȘ WATER BASIN ADMINISTRATION

Designer: s.c. Aqua Prociv Proiect s.r.l.
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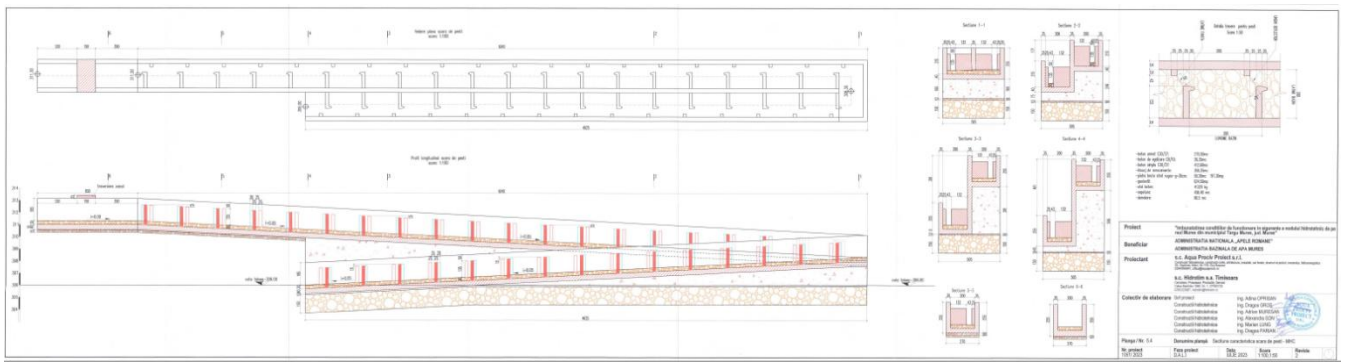
Design Team

Project Manager	Eng. Adina OPRISAN	<i>illegible signatures</i>
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Hydrotechnical constructions	Eng. Adrian MURESAN	
Hydrotechnical constructions	Eng. Alexandra SON	
Hydrotechnical constructions	Eng. Marian LUNG	
Hydrotechnical constructions	Eng. Dragos PARIAN	

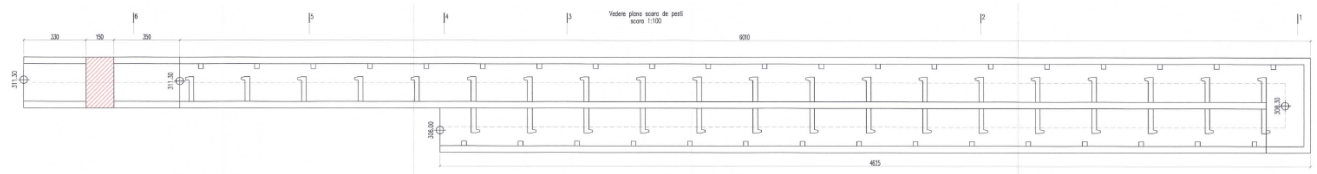
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Sheet / No. 5.3 **Sheet name:** Standard sections – Turbine Canal

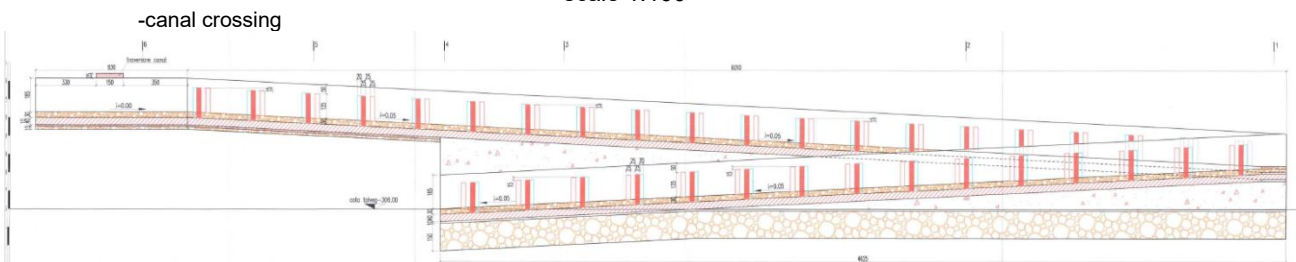
Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:100	2



Flat view of the fish ladder
scale 1:100

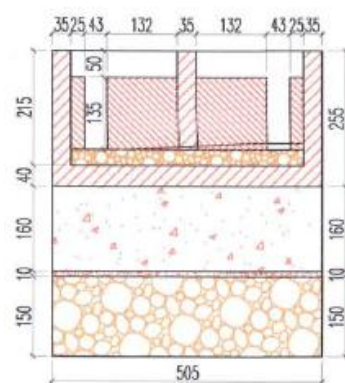


Longitudinal profile of the fish ladder
scale 1:100

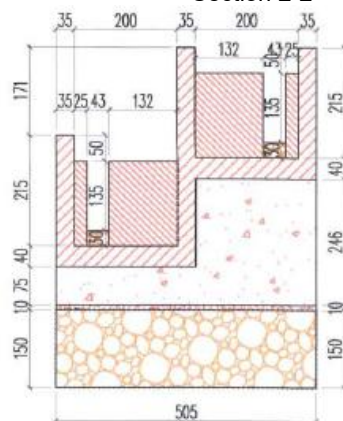


-thalweg elevation

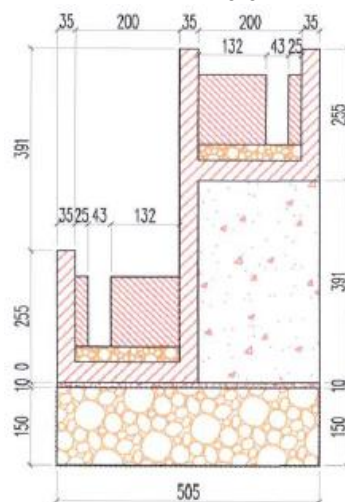
Section 1-1



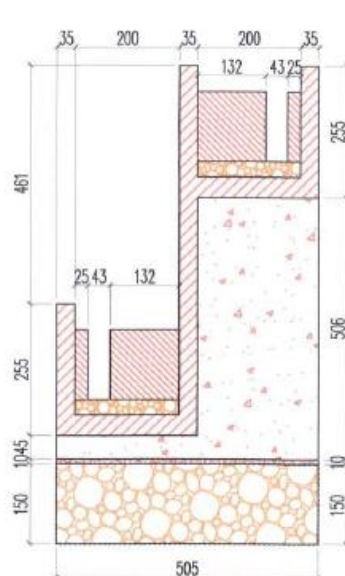
Section 2-2

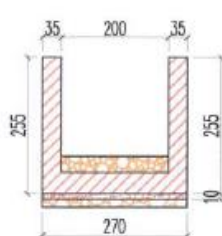
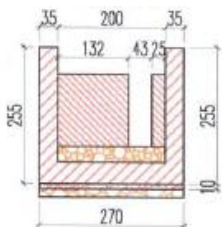


Section 3-3



Section 4-4

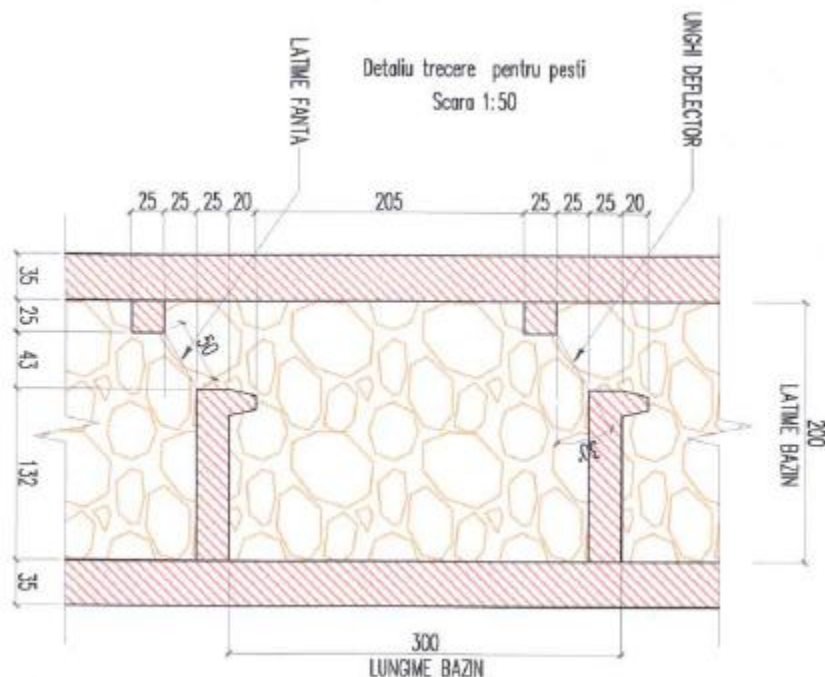




Fish passage detail
Scale 1:50

- slot width

- deflector angle



-pool length (300)

- pool width (200)

-reinforced concrete C30/37:	275.50m ³
-leveling concrete C8/10:	29.35m ³
-plain concrete C30/37:	412.60m ³
-rockfill block:	359.35m ³
-rough rock layer – thickness=30cm:	59.20m ³ 197.30sqm
-geotextile:	624.50sqm
-concrete iron:	41320 kg
-excavation:	456.40m ³
-demolition:	80.5 m ³

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Hydrotechnical constructions

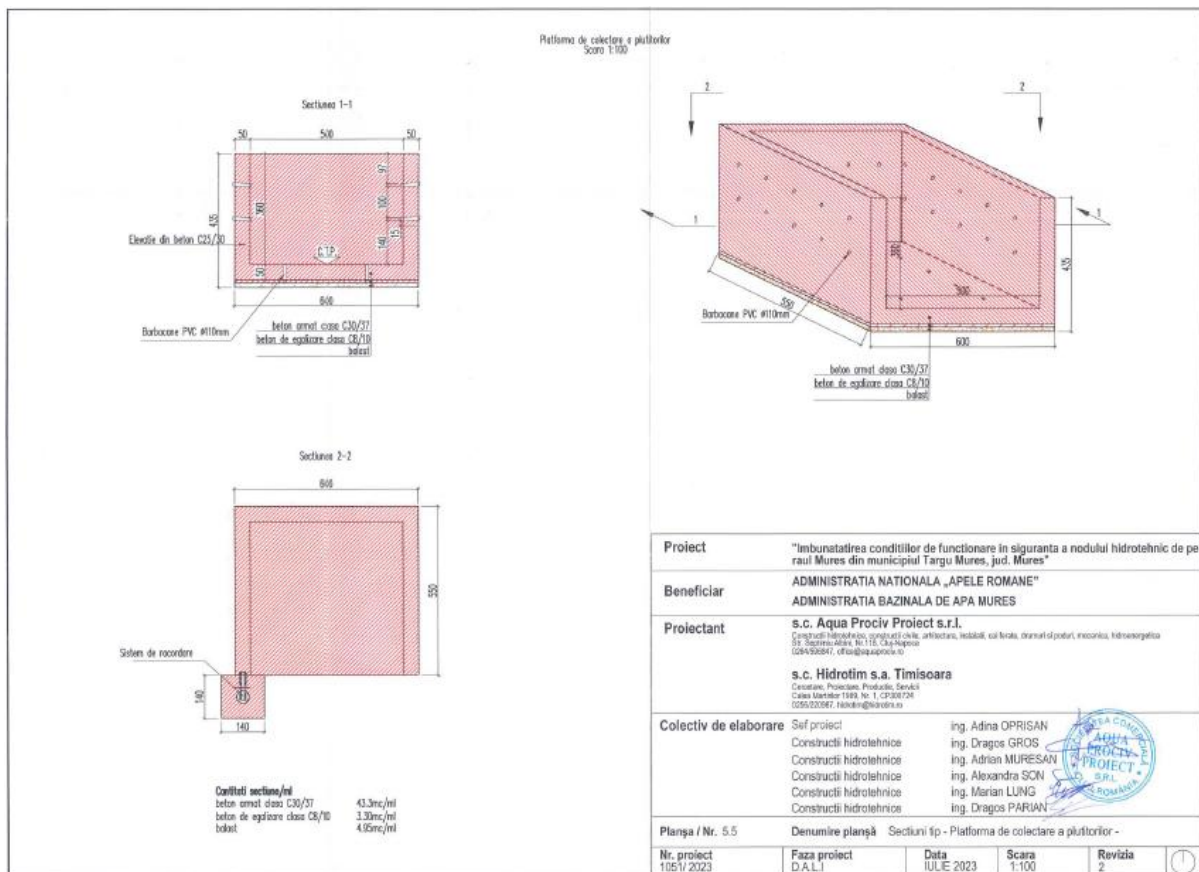
Eng. Dragos PARIAN

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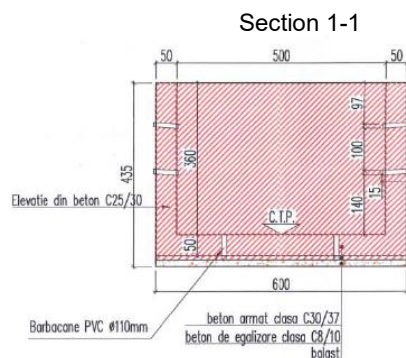
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Sheet / No. 5.4 Sheet name: Cross-sectional characteristics of the fish ladder - MHC

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:100, 1:50	2

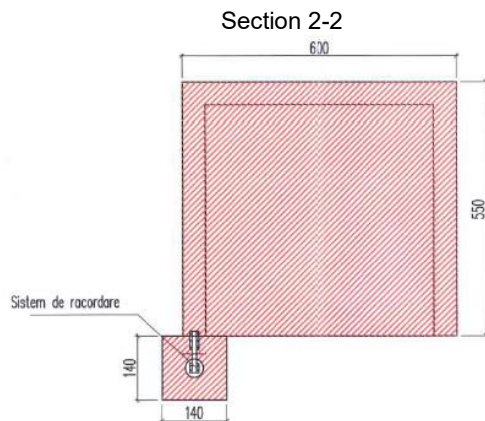


Floaters collection platform
Scale 1:100



-Concrete elevation C25/30
-PVC Ø110mm barbacans

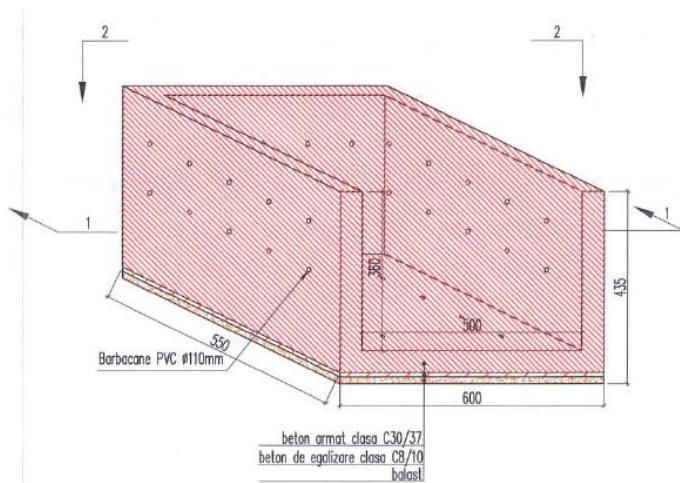
-reinforced concrete class C30/37
-levelling concrete class C8/10
-ballast



-Connection system

Quantities section/1m

Reinforced concrete class C30/37	43.3m ³ /1m
Levelling concrete class C8/10	3.30m ³ /1m
Ballast	4.95m ³ /1m



-PVC Ø110mm barbicans

-reinforced concrete class C30/37
-levelling concrete class C8/10
-ballast

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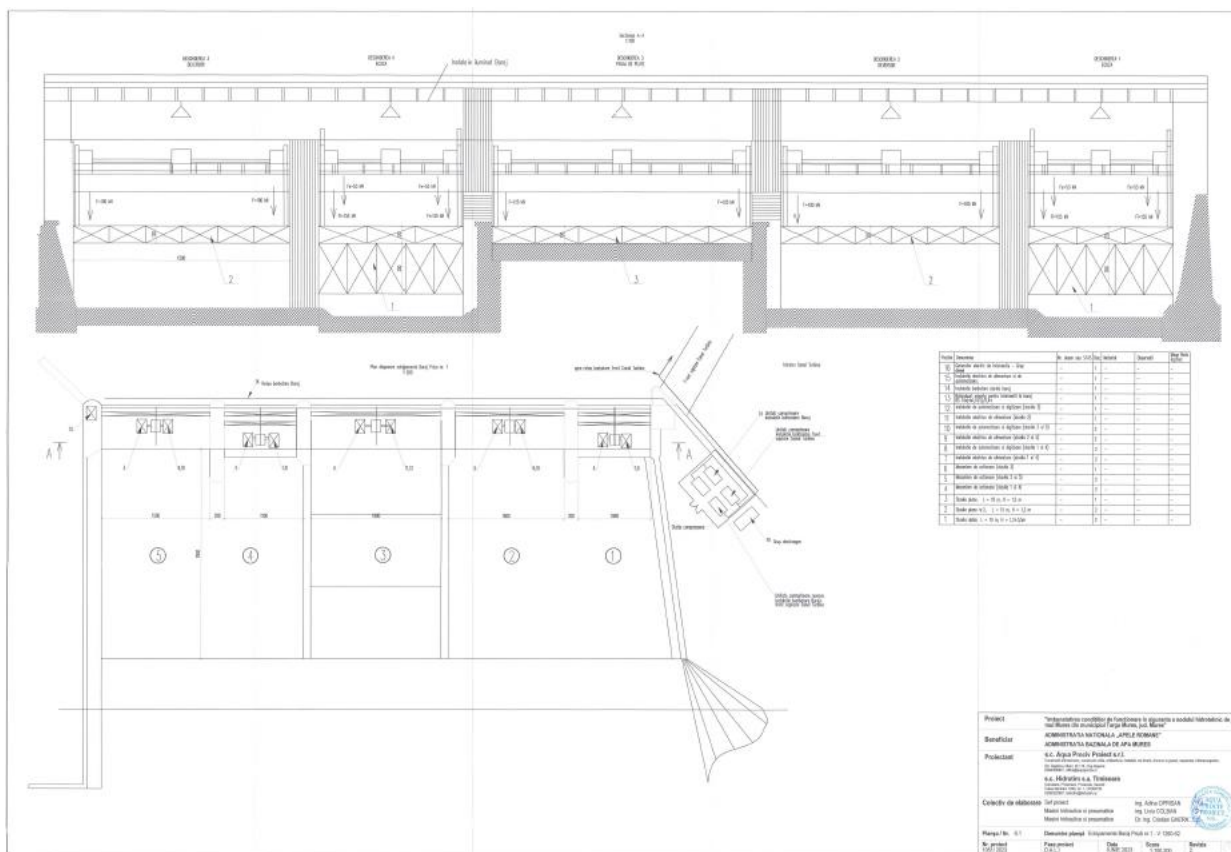
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	Hydrotechnical constructions	Eng. Dragos PARIAN	

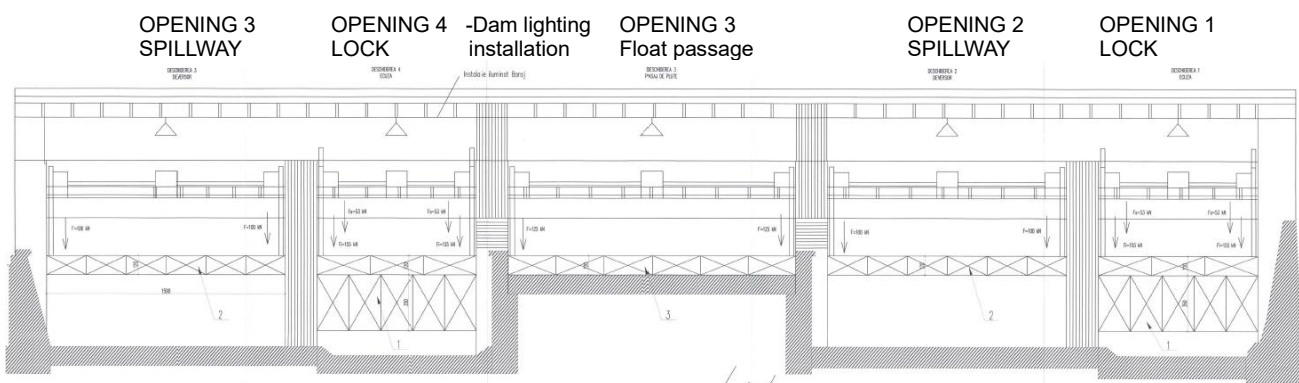
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Sheet / No. 5.5 Sheet name: Standard sections – Floaters collection platform -

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JULY 2023	1:100	2



Section A-A
1:100



Equipment layout plan of Dam intake no. 1
1:200

Rețea barbotare baraj	Dam bubbling network
spre rețea barbotare front Canal Turbina	to the bubbling network of the Turbine Canal front
Front captare Canal Turbina	Turbine Canal catchment front
Intrare Canal Turbina	Turbine canal inlet
Unitati comprimare	Compression units
Instalatie barbotare baraj	Dam bubbling installation
Unitati comprimare	Compression units
Instalatie barbotare front captare Canal Turbina	Bubbling installation for the Turbine Canal catchment front
Statie compresoare	Compressor station
Grup electrogen	Generator group
Unitate comprimare rezerva	Reserve compression unit
Instalatie barbotare baraj + front captare Canal Turbina	Bubbling installation for the dam + Turbine Canal catchment front

Position	Name	Drawing no. or STAS	Piece(s)	Material	Observations	Net weight kg/pc
16	Emergency electric generator – Diesel group	-	1	-	-	-
15	Electrical power supply and automation system	-	1	-	-	-
14	Dam sluice bubbling system	-	1	-	-	-
13	Upstream bollards for dam interventions BS 10x(4x1.675)/6.44	-	1	-	-	-
12	Automation and digitization system (sluice 3)	-	1	-	-	-
11	Electrical power supply system (sluice 3)	-	1	-	-	-
10	Automation and digitization system (sluice 2 and 5)	-	2	-	-	-
9	Electrical power supply system (sluice 2 and 5)	-	2	-	-	-
8	Automation and digitization system (sluice 1 and 4)	-	2	-	-	-
7	Electrical power supply system (sluice 1 and 4)	-	2	-	-	-
6	Actuating mechanism (sluice 3)	-	1	-	-	-
5	Actuating mechanism (sluice 2 and 5)	-	2	-	-	-
4	Actuating mechanism (sluice 1 and 4)	-	2	-	-	-
3	Flat sluices L = 18 m, H = 1.2 m	-	1	-	-	-
2	Flat sluices no. 2, L = 15 m, H = 1.2 m	-	2	-	-	-
1	Double sluice L = 10 m, H = 1.2+3.5m	-	2	-	-	-

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MUREŞ WATER BASIN ADMINISTRATION

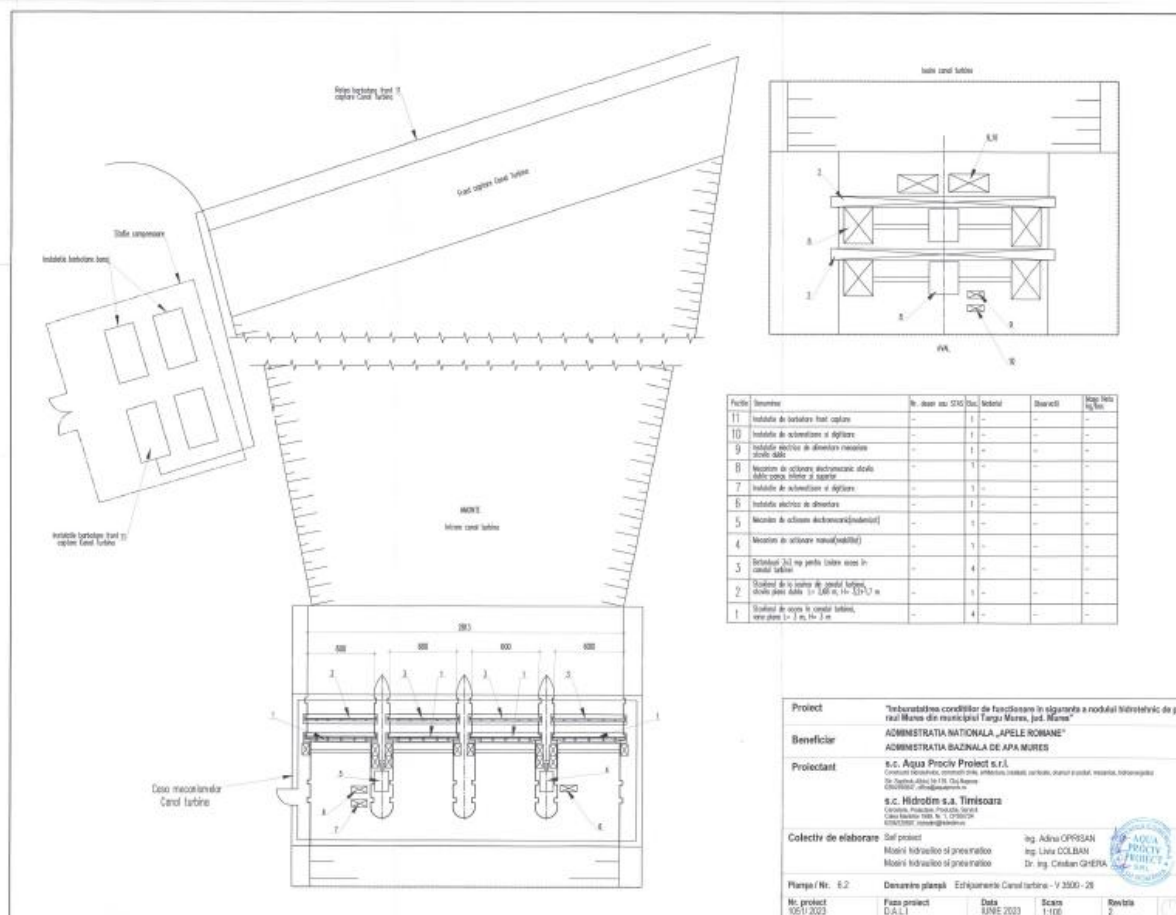
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Hydraulic and pneumatic machines PhD Eng. Cristian GHERA - *illegible signatures*
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Sheet / No. 6.1 Sheet name: Equipment of Dam intake no. 1 – V 1260-62

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JUNE 2023	1:100,200	2



Rețea barbotare front captare Canal Turbina	<i>Bubbling network of the Turbine Canal catchment front</i>
Front captare Canal Turbina	<i>Turbine Canal catchment front</i>
Statie compresoare	<i>Compressor station</i>
Instalatie barbotare baraj	<i>Dam bubbling installation</i>
Instalatie barbotare front captare Canal Turbina	<i>Bubbling installation for the Turbine Canal catchment front</i>
AMONTE	<i>UPSTREAM</i>
Intrare canal turbina	<i>Turbine canal entryway</i>
Casa mecanismelor Canal turbina	<i>House of machines of the Turbine canal</i>
Iesire canal turbina	<i>Turbine canal exit</i>
AVAL	<i>DOWNSTREAM</i>

Position	Name	Drawing no. or STAS	Piece(s)	Material	Observations	Net weight kg/pc
11	Bubbling installation for the catchment front	-	1	-	-	-
10	Automation and digitization system	-	1	-	-	-
9	Electrical installation for power supply of double sluice mechanism	-	1	-	-	-
8	Electromechanical drive mechanism for double sluice – lower and upper panel	-	1	-	-	-
7	Automation and digitization system	-	1	-	-	-
6	Electrical power supply installation	-	1	-	-	-
5	Electromechanical drive mechanism (modernized)	-	1	-	-	-
4	Manual drive mechanism (rehabilitated)	-	1	-	-	-
3	3x3 m2 bollards for isolating access to the turbine canal	-	4	-	-	-
2	Sluice gate at the turbine canal exit, double flat sluice L = 2.68 m, H = 3.2+1.7m	-	1	-	-	-
1	Sluice gate at the turbine canal access, flat gates L = 3 m, H = 3 m	-	4	-	-	-

Project: „Improving the safe operating conditions of the hydrotechnical node on the Mureş River in Târgu Mureş municipality, Mureş County”

Beneficiary: NATIONAL ADMINISTRATION „APELE ROMÂNE” (ROMANIAN WATERS)
MUREŞ WATER BASIN ADMINISTRATION

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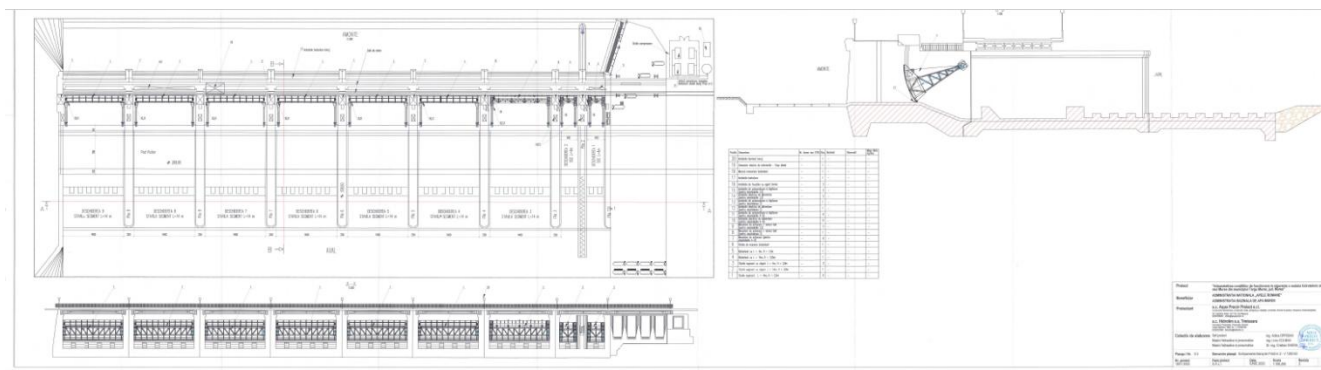
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Sheet / No. 6.2 **Sheet name:** Equipment of the Turbine Canal – V 3500 - 26

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JUNE 2023	1:100	2



UPSTREAM
1:200

Instalație barbotare baraj	<i>Dam bubbling installation</i>
Cale de rulare	<i>Rolling track</i>
Pod rutier	<i>Road bridge</i>
DESCHIDEREA 9 (n)	<i>OPENING 9 (n)</i>
STAVILA SEGMENT L = 14 m	<i>SEGMENT SLUICE L = 14 m</i>
Pila 9 (n)	<i>Pile 9 (n)</i>
Stație compresoare	<i>Compressor station</i>
Unități comprimare instalație barbotare stavile Baraj Priza nr. 2	<i>Compression units for dam bubbling installation of Dam intake no. 2</i>
AMONTE	<i>UPSTREAM</i>
AVAL	<i>DOWNSTREAM</i>

DOWNSTREAM

Position	Name	Drawing no. or STAS	Piece(s)	Material	Observations	Net weight kg/pc
20	Dam lighting installation	-	1	-	-	-
19	Emergency electric generator – Diesel group	-	1	-	-	-
18	Cofferdam handling crane	-	1	-	-	-
17	Bubbling installation	-	1	-	-	-
16	Heating installation with heat carrier	-	3	-	-	-
15	Automation and digitization system (for openings 1,2)	-	2	-	-	-
14	Electrical power supply system (for openings 1,2)	-	2	-	-	-
13	Automation and digitization system (for opening 3)	-	1	-	-	-
12	Electrical power supply system (for opening 3)	-	1	-	-	-
11	Automation and digitization system (for openings 4-9)	-	6	-	-	-
10	Electrical power supply system (for openings 4-9)	-	6	-	-	-
9	Drive mechanism + Gall chains (for openings 1,2)	-	2	-	-	-
8	Drive mechanism + Gall chains (for openings 4-9)	-	1	-	-	-
7	Drive mechanism (for openings 1,2)	-	6	-	-	-
6	Cofferdam handling beam	-	1	-	-	-
5	Cofferdams with L = 4m, H = 1.4m	-	1	-	-	-
4	Cofferdams with L = 14m, H = 1.25m	-	1	-	-	-
3	Segment sluice gate with flap: L = 4m, H = 3.9m	-	2	-	-	-
2	Segment sluice gate with flap: L = 14m, H = 3.9m	-	1	-	-	-
1	Segment sluice gates: L = 14m, H = 3.5m	-	6	-	-	-

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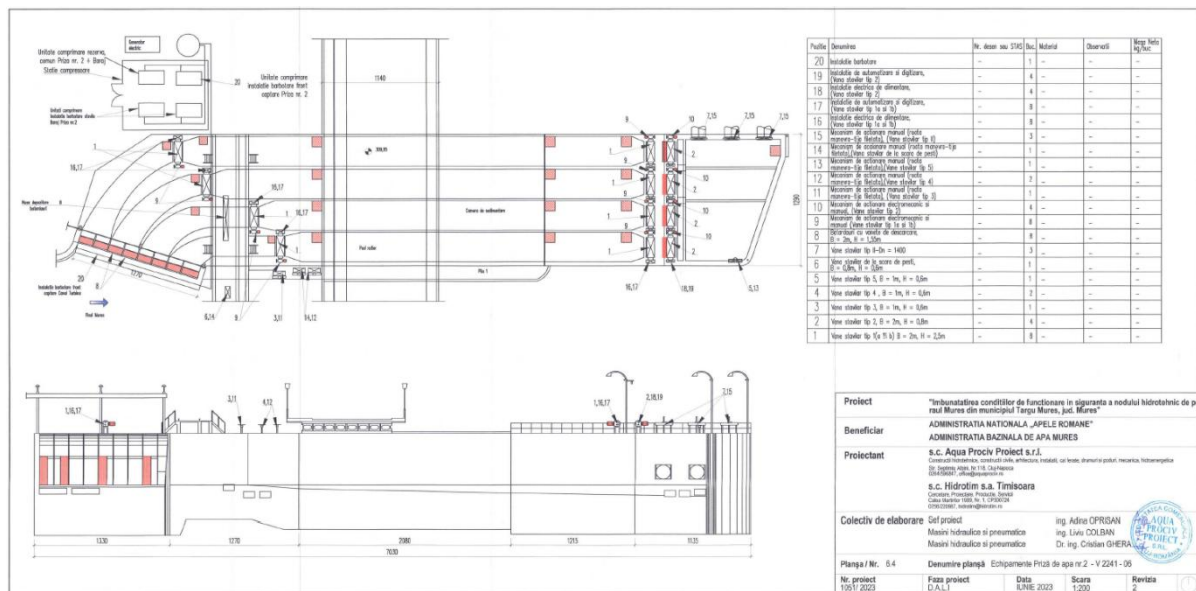
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Sheet / No. 6.3 Sheet name: Equipment of Dam intake no. 2 – V 1260-63

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JUNE 2023	1:100,200	2



Generator electric	Electric generator
Unitate comprimare rezervă, comun Priza nr. 2 + Baraj	Reserve compression unit, in common with Intake no.2 + Dam
Stație compresoare	Compressor station
Unități comprimare instalație barbotare stavile Baraj Priza nr. 2	Compression units for sluice gate bubbling installation Dam Intake no. 2
Unitate comprimare instalație barbotare front captare Priza nr. 2	Compression unit for bubbling installation of Intake no. 2 catchment front
Nișă depozitare batardouri	Cofferdam storage niche
Instalație barbotare front captare Canal Turbina	Bubbling installation of the Turbine Canal catchment front
Camera de sedimentare	Sedimentation chamber
Pod rutier	Road bridge
Pila 1	Pile 1

Position	Name	Drawing no. or STAS	Piece(s)	Material	Observations	Net weight kg/pc
20	Bubbling installation	-	1	-	-	-
19	Automation and digitization system (type 2 sluice valve)	-	4	-	-	-
18	Electrical power supply system (type 2 sluice valve)	-	4	-	-	-
17	Automation and digitization system (type 1a and 1b sluice valves)	-	8	-	-	-
16	Electrical power supply system (type 1a and 1b sluice valves)	-	8	-	-	-
15	Manual drive mechanism (handwheel - threaded rod), (type II sluice valves)	-	3	-	-	-
14	Manual drive mechanism (handwheel - threaded rod), (sluice valve from the fish ladder)	-	1	-	-	-
13	Manual drive mechanism (handwheel - threaded rod), (type 5 sluice valves)	-	1	-	-	-
12	Manual drive mechanism (handwheel - threaded rod), (type 4 sluice valves)	-	0	-	-	-
11	Manual drive mechanism (handwheel - threaded rod), (type 3 sluice valves)	-	1	-	-	-
10	Electromechanical and manual drive mechanism (type 2 sluice valves)	-	4	-	-	-
9	Electromechanical and manual drive mechanism (type 1a and 1b sluice valves)	-	8	-	-	-
8	Cofferdams with discharge sluice gates, B = 2m, H = 1.55m	-	8	-	-	-
7	Type II sluice valves – Dn = 1400	-	3	-	-	-
6	Sluice valve at the fish ladder, B = 0.8m, H = 0.6m	-	1	-	-	-
5	Type 5 sluice valves, B = 1m, H = 0.6m	-	1	-	-	-
4	Type 4 sluice valves, B = 1m, H = 0.6m	-	2	-	-	-
3	Type 3 sluice valves, B = 1m, H = 0.6m	-	1	-	-	-
2	Type 2 sluice valves, B = 2m, H = 0.8m	-	4	-	-	-
1	Type 1 (a and b) sluice valves B = 2m, H = 2.5m	-	8	-	-	-

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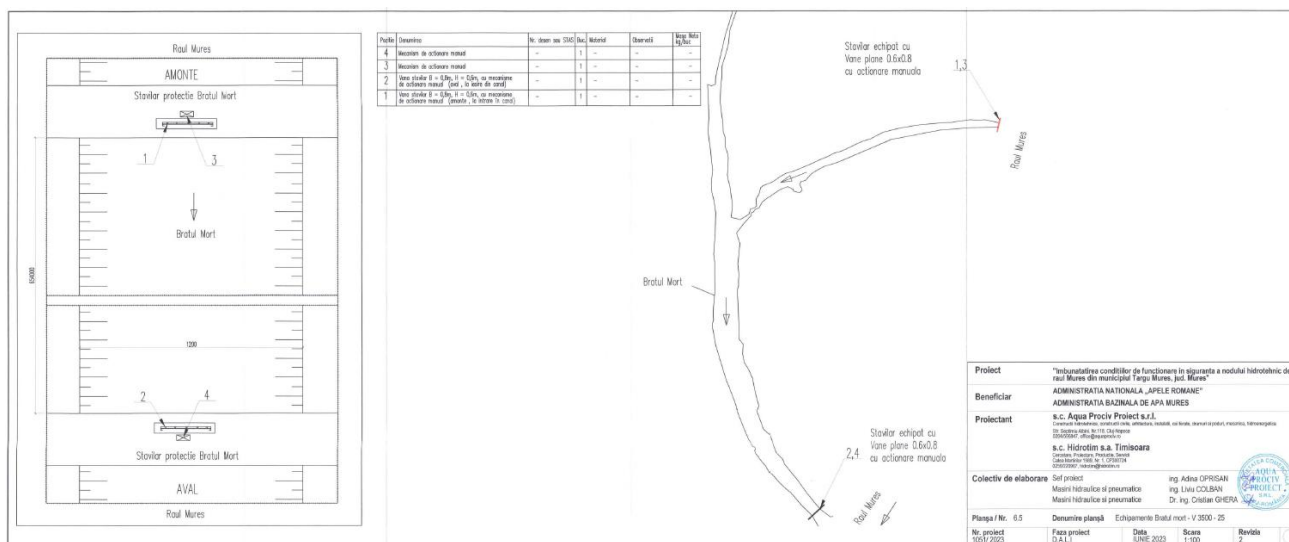
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Sheet / No. 6.4 Sheet name: Equipment of Water Intake no. 2 – V 2241 - 06

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JUNE 2023	1:200	2



Mureș River
UPSTREAM
Dead Arm protection gate
↓
Dead Arm
Dead Arm protection gate
DOWNSTREAM
Mureș River

Position	Name	Drawing no. or STAS	Piece(s)	Material	Observations	Net weight kg/pc
4	Manual drive mechanism	-	1	-	-	-
3	Manual drive mechanism	-	1	-	-	-
2	Sluice valve B = 0.8m, H = 0.6m, with manual operating mechanisms (downstream, at the exit of the canal)	-	1	-	-	-
1	Sluice valve B = 0.8m, H = 0.6m, with manual operating mechanisms (upstream, at the entrance of the canal)	-	1	-	-	-

-Weir equipped with flat valves 0.6x0.8 with manual operation 1,3
-Mureș River
←
Dead Arm
↓
2,4 Weir equipped with flat valves 0.6x0.8 with manual operation
←
Mureș River

Project: „Improving the safe operating conditions of the hydrotechnical node on the Mureș River in Târgu Mureș municipality, Mureș County”

Beneficiary: NATIONAL ADMINISTRATION „APELE ROMÂNE” (ROMANIAN WATERS)
MUREȘ WATER BASIN ADMINISTRATION

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Sheet / No. 6.5 Sheet name: Equipment of the Dead arm – V 3500 - 25

Project no.	Project phase	Date	Scale	Revision
1051/2023	D.A.L.I.	JUNE 2023	1:100	2