UNITED NATIONS DEVELOPMENT PROGRAMME

FEASIBILITY ASSESSMENT AND DESIGN FOR THE UPGRADE OF IRRIGATION NETWORKS IN NORTH LEBANON AND THE BEKAA

MACHHA
IRRIGATION CANAL

Tender Drawings

14 November 2016

LIST OF DRAWINGS

GENERAL NOTES

1. Particular Specifications
   The present General Notes and the specifications shown on the present set of drawings are to be considered as Particular Specifications and prevail over the General Specifications.

2. Construction Drawings
   The present set of drawings is for tendering purpose only and therefore is not suitable for construction.
   It is the Contractor's responsibility to prepare his own construction drawings and shop drawings and submit for the approval of the Engineer.

3. Topographical Survey
   The general layouts and longitudinal profiles are given for information only and are not suitable for construction in particular as regards to the levels shown.
   It is the Contractor's responsibility to carry out his own surveying and to approach the relevant Cadastral Authorities in order to get the layout of the public domains and make sure that all the concrete structures shall NOT be constructed on or through private properties.
   It is also the Contractor's responsibility to take his own level measurements and to establish his own Longitudinal Profiles.
   The proposed canal and pipeline Layouts and Longitudinal Profiles shall be submitted for the approval of the Engineer prior to any construction work.

4. Washout and Air Release Valve chambers
   The chambers shall be constructed respectively at the lowest and highest points of the pipeline profile. The exact location of the chambers shall be decided based on the Contractor's approved longitudinal profile.
   The chambers shall shall be designed in full by the Contractor who will submit construction drawings for the approval of the engineer.

5. Dimensions and Levels
   Unless otherwise explicitly mentioned on the drawings, all dimensions are in cm. and all levels are "meters above see level" (masl).

6. Concrete Specifications
   Reinforced concrete for ground slab and walls shall be Class 45 Dosage 400 kg/m³.
   Lean concrete shall be Class 45, Dosage 250 kg/m³

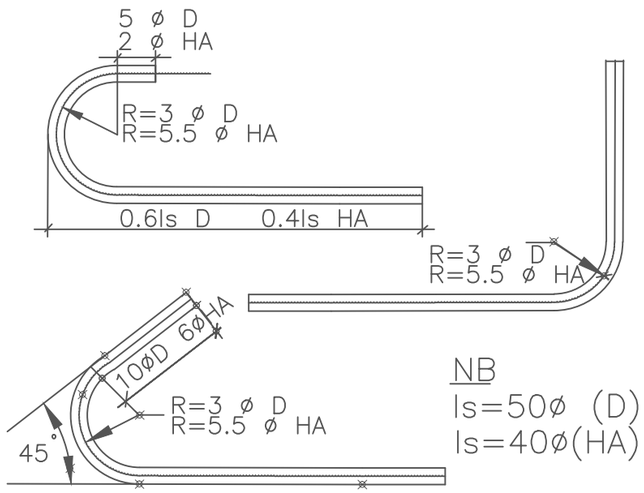
7. Reinforcement Steel
   High Adherence steel (HA) limit of elasticity : 4 000 Kg/cm²
   Mild steel : Limit of elasticity : 2 400 Kg/cm²

8. Reinforcement bars Cover
   Min 5 cm

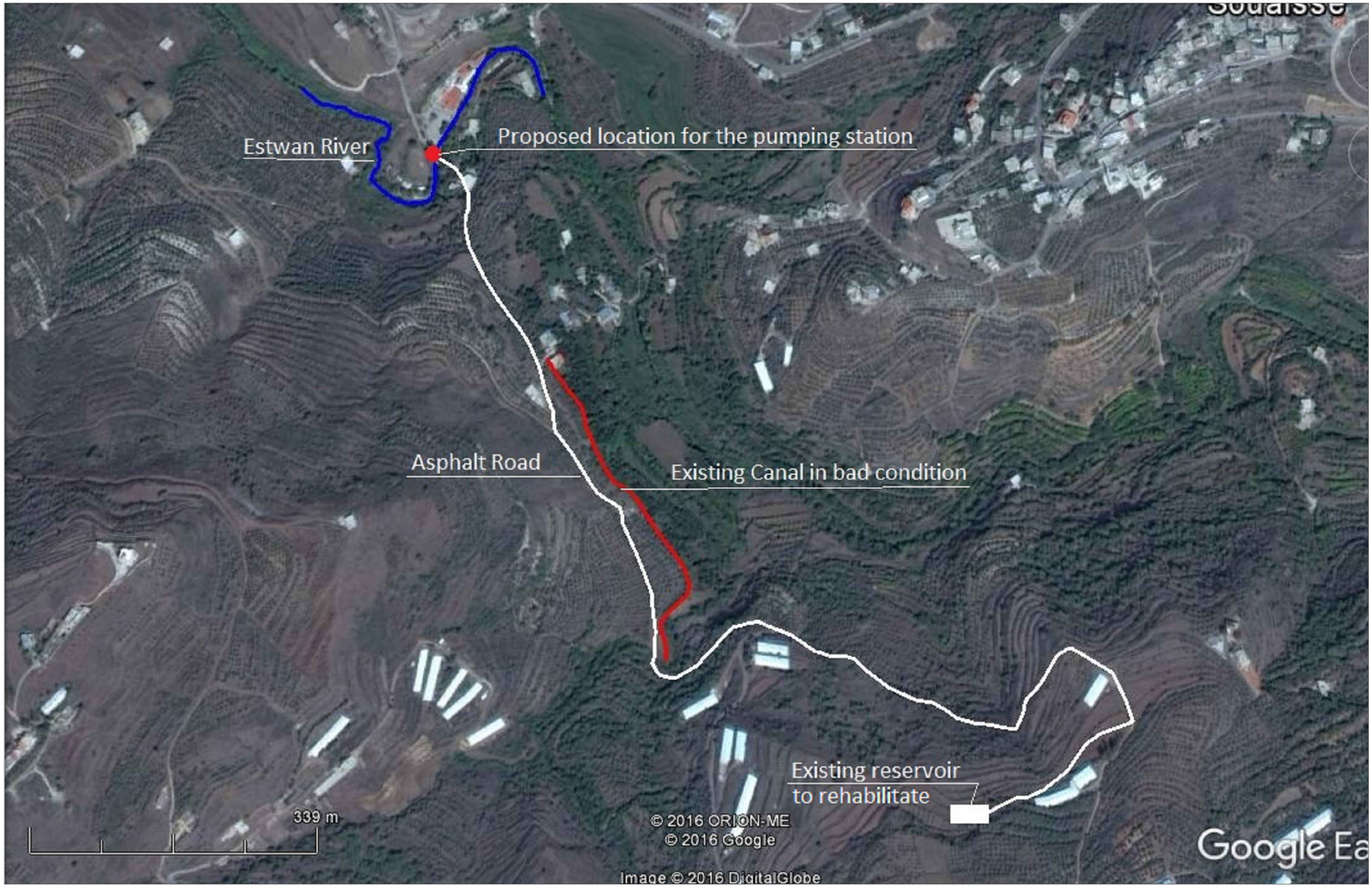
9. Reinforcement bars overlapping
   Min 40 cm

10. Bars Bending
    - Ø > 12 mm : Mechanically
    - Ø <= 12 mm Manually accepted

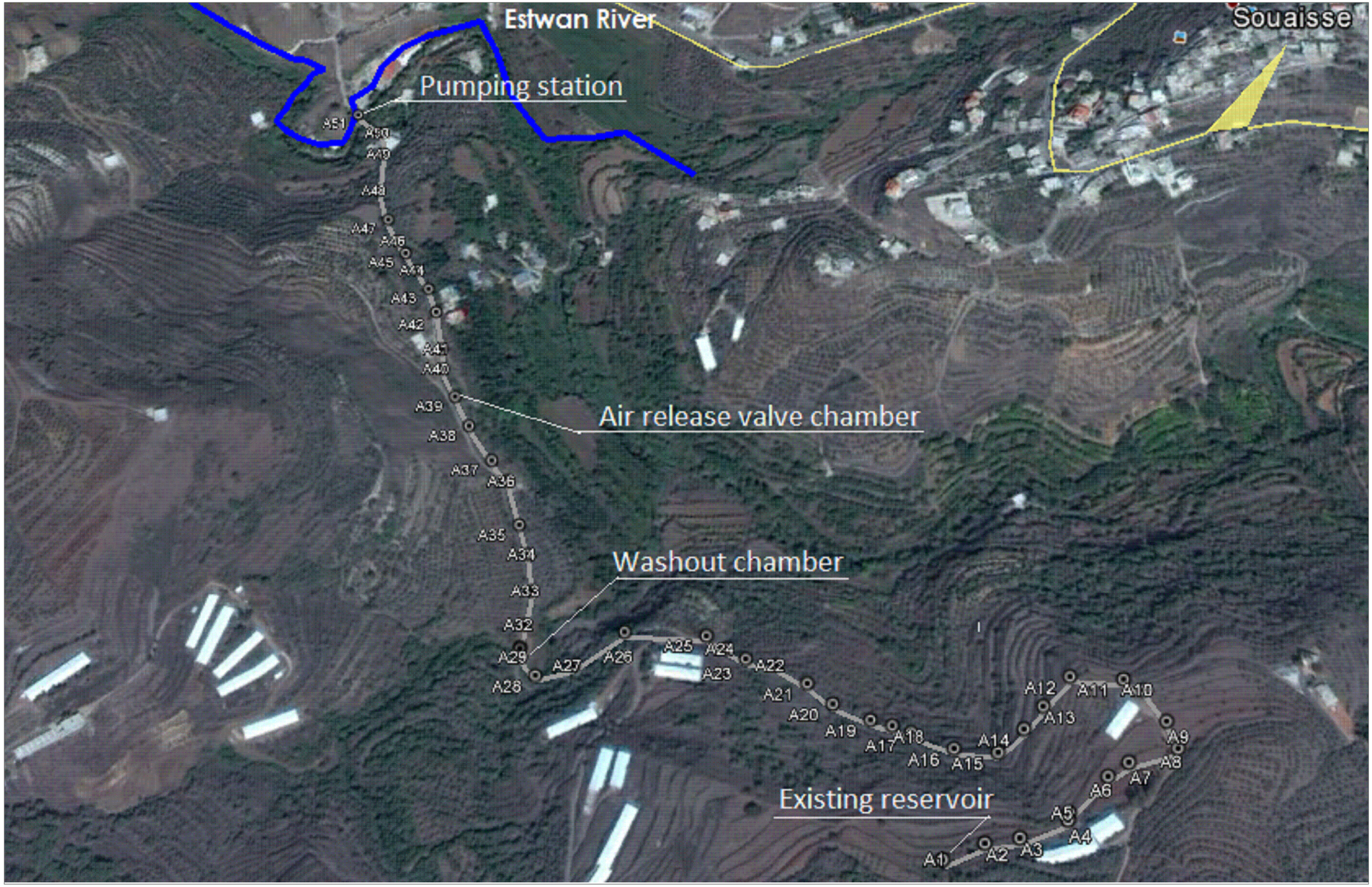
    Unbending is not allowed



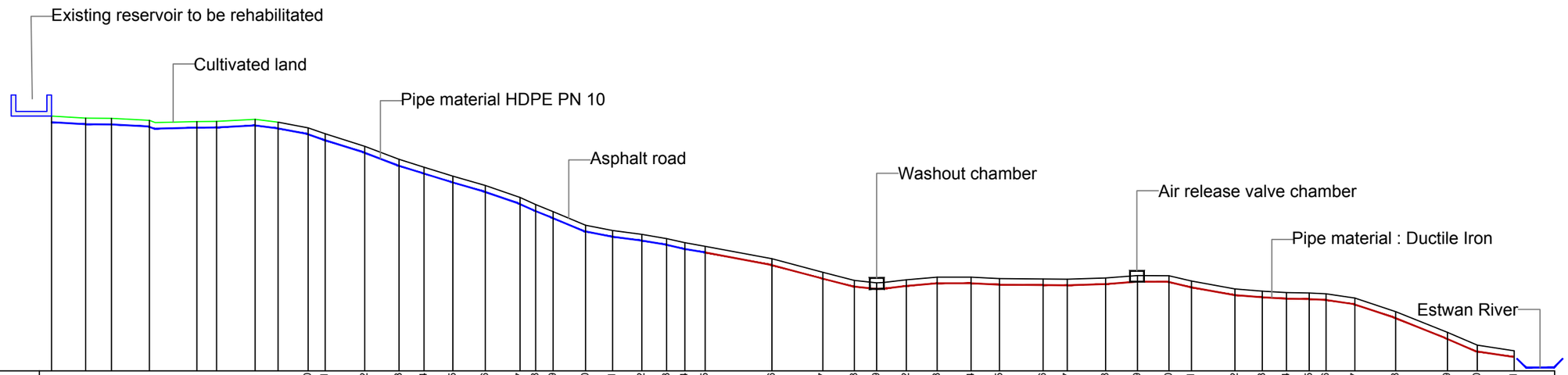
UNITED NATIONS DEVELOPMENT PROGRAMME	FEASIBILITY ASSESSMENT AND DESIGN FOR THE UPGRADE OF IRRIGATION NETWORKS IN NORTH LEBANON AND THE BEKAA TENDER DRAWINGS	MACHHA IRRIGATION CANAL	GENERAL NOTES	14 November 2016



UNITED NATIONS DEVELOPMENT PROGRAMME	FEASIBILITY ASSESSMENT AND DESIGN FOR THE UPGRADE OF IRRIGATION NETWORKS IN NORTH LEBANON AND THE BEKAA **TENDER DRAWINGS**	**MACHHA** **IRRIGATION CANAL**	**EXISTING SITUATION** **GENERAL LAYOUT**	Dwg № 01 14 November 2016 Scale : NTS



UNITED NATIONS DEVELOPMENT PROGRAMME	FEASIBILITY ASSESSMENT AND DESIGN FOR THE UPGRADE OF IRRIGATION NETWORKS IN NORTH LEBANON AND THE BEKAA **TENDER DRAWINGS**	**MACHHA** **IRRIGATION CANAL**	**TRANSFER PIPELINE** **GENERAL LAYOUT**	Dwg № 02 14 November 2016 Scale : NTS



Chainage	A1	A2	A3	A4	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	A32	A33	A34	A35	A36	A37	A38	A39	A40	A41	A42	A43	A44	A45	A46	A47	A48	A49	A50	A51
Cumulated Distance (Partial)	0.00	42.22 (42.22)	74.02 (31.80)	120.85 (46.83)	179.58 (58.74)	203.89 (24.31)	251.48 (47.59)	279.93 (28.44)	316.91 (36.98)	337.94 (21.03)	386.86 (48.93)	429.27 (42.41)	460.15 (30.88)	495.72 (35.57)	535.91 (40.19)	578.75 (42.84)	598.07 (19.32)	619.66 (21.59)	659.82 (40.16)	693.22 (33.40)	729.15 (35.92)	759.85 (30.70)	782.32 (22.47)	807.39 (25.07)	890.03 (82.64)	952.90 (62.87)	991.88 (38.98)	1 019.39 (27.51)	1 055.91 (36.51)	1 094.08 (38.16)	1 136.02 (41.94)	1 171.19 (35.17)	1 225.02 (53.83)	1 254.94 (29.92)	1 302.26 (47.32)	1 341.72 (39.46)	1 380.58 (38.86)	1 408.33 (27.75)	1 462.06 (53.73)	1 495.94 (33.88)	1 525.60 (29.66)	1 553.73 (28.14)	1 574.49 (20.75)	1 610.22 (35.73)	1 660.61 (50.39)	1 724.43 (63.83)	1 761.34 (36.91)	1 806.96 (45.62)
Gradiant (m/Km)	28.19	4.40	28.62	-12.58	-6.99	-26.47					156.77	191.00		154.91	144.58	171.81			95.50	67.09					93.78	133.30		51.64	-43.50	0.95	25.02	4.83	2.67	-15.64	-39.02	3.35	120.00	89.71	31.02			73.32		165.91	200.39	216.20	75.19	
Ground Level	255.63	254.44	254.30	252.96	252.22	252.39	253.65	251.88	248.35	244.67	237.00	228.90	224.09	218.58	212.77	205.41	201.03	196.63	188.15	184.96	182.55	179.96	177.36	175.20	167.45	159.07	154.07	152.56	154.45	156.11	156.07	155.19	154.93	154.85	155.59	157.13	157.00	153.67	148.85	147.50	146.58	146.30	145.80	143.18	134.82	122.03	114.05	110.62
Pipe Material	HDPE PN 10																								DUCTILE IRON C40																							

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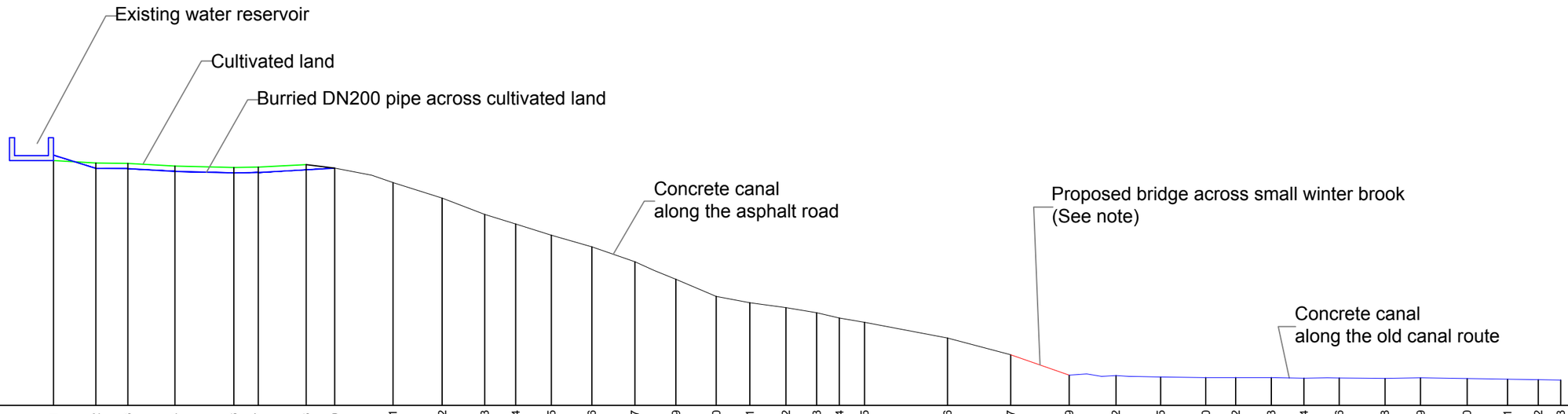
UNITED NATIONS DEVELOPMENT PROGRAMME	FEASIBILITY ASSESSMENT AND DESIGN FOR THE UPGRADE OF IRRIGATION NETWORKS IN NORTH LEBANON AND THE BEKAA **TENDER DRAWINGS**	**MACHHA** **IRRIGATION CANAL**	**TRANSFER PIPELINE** **Longitudinal profile**	Dwg № 03 14 November 2016 Scale : NTS

UNITED NATIONS DEVELOPMENT PROGRAMME	FEASIBILITY ASSESSMENT AND DESIGN FOR THE UPGRADE OF IRRIGATION NETWORKS IN NORTH LEBANON AND THE BEKAA **TENDER DRAWINGS**	**MACHHA** **IRRIGATION CANAL**	**CONCRETE CANAL** **Plan View**	Dwg № 04 14 November 2016 Scale : NTS

Note

The exact location, span, and design of the Bridge across the winter brook shall be set by the Contractor in coordination of the Engineer and to his satisfaction

The pipe above the bridge shall be welded carbon steel 6 mm thickness 300 mm diameter.



Chainage	B1	B2	B3	B4	B6	B7	B8	B9	B11	B12	B13	B14	B15	B16	B17	B19	B20	B21	B22	B23	B24	B25	B26	B27	B29	B32	B35	B40	B42	B43	B44	B46	B48	B49	B50	B51	B52	B53
Cumulated (Partial) Distance	0.00	42.22	74.02	120.85	179.58	203.89	251.48	279.93	337.94	386.86	429.27	460.15	495.72	535.91	578.75	619.66	659.82	693.22	729.15	759.85	782.32	807.39	890.03	952.90	1 011.24	1 057.73	1 102.15	1 147.14	1 176.89	1 212.33	1 244.83	1 279.96	1 325.58	1 361.00	1 407.29	1 447.65	1 478.18	1 500.52
		(42.22)	(31.80)	(46.83)	(58.74)	(24.31)	(47.59)	(28.44)	(58.01)	(48.93)	(42.41)	(30.88)	(35.57)	(40.19)	(42.84)	(40.91)	(40.16)	(33.40)	(35.92)	(30.70)	(22.47)	(25.07)	(82.64)	(62.87)	(58.34)	(46.48)	(44.43)	(44.99)	(29.76)	(35.43)	(32.50)	(35.12)	(45.62)	(35.42)	(46.29)	(40.36)	(30.53)	(22.35)	
Gradiant (m/Km)		28.19	4.40	28.62	-12.61	-6.99	-26.47	62.23	-124.29	156.77	191.00	155.75	154.91	144.58	171.81	-214.62	211.15	95.50	67.09	84.35	115.71	86.14	93.78	133.30	-172.78	-5.17	-14.63	-7.56	0.33	1.98	8.61	3.98	-5.26	-8.19	-13.83	12.39	26.53	18.35	
Ground Level	255.63	254.44	254.30	252.96	252.22	252.39	253.65	251.88	244.67	237.00	228.90	224.09	218.58	212.77	205.41	196.63	188.15	184.96	182.55	179.96	177.36	175.20	167.45	159.07	148.99	148.75	148.13	147.78	144.68	147.64	147.60	147.52	147.32	147.21	146.92	146.80	146.62	146.53
Type of conveyor	HDPE PN10 DN 200 pipe								Concrete Canal																DN 300 pipe (See Note)	Concrete Canal													

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TENDER DRAWINGS

MACHHA

IRRIGATION CANAL

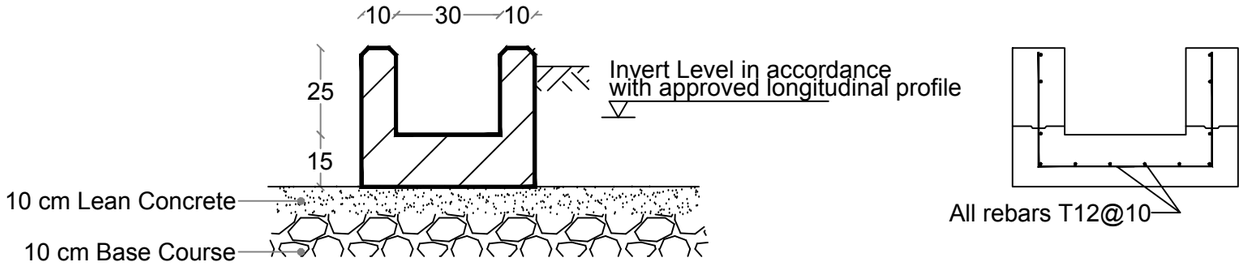
CONCRETE CANAL

Longitudinal profile

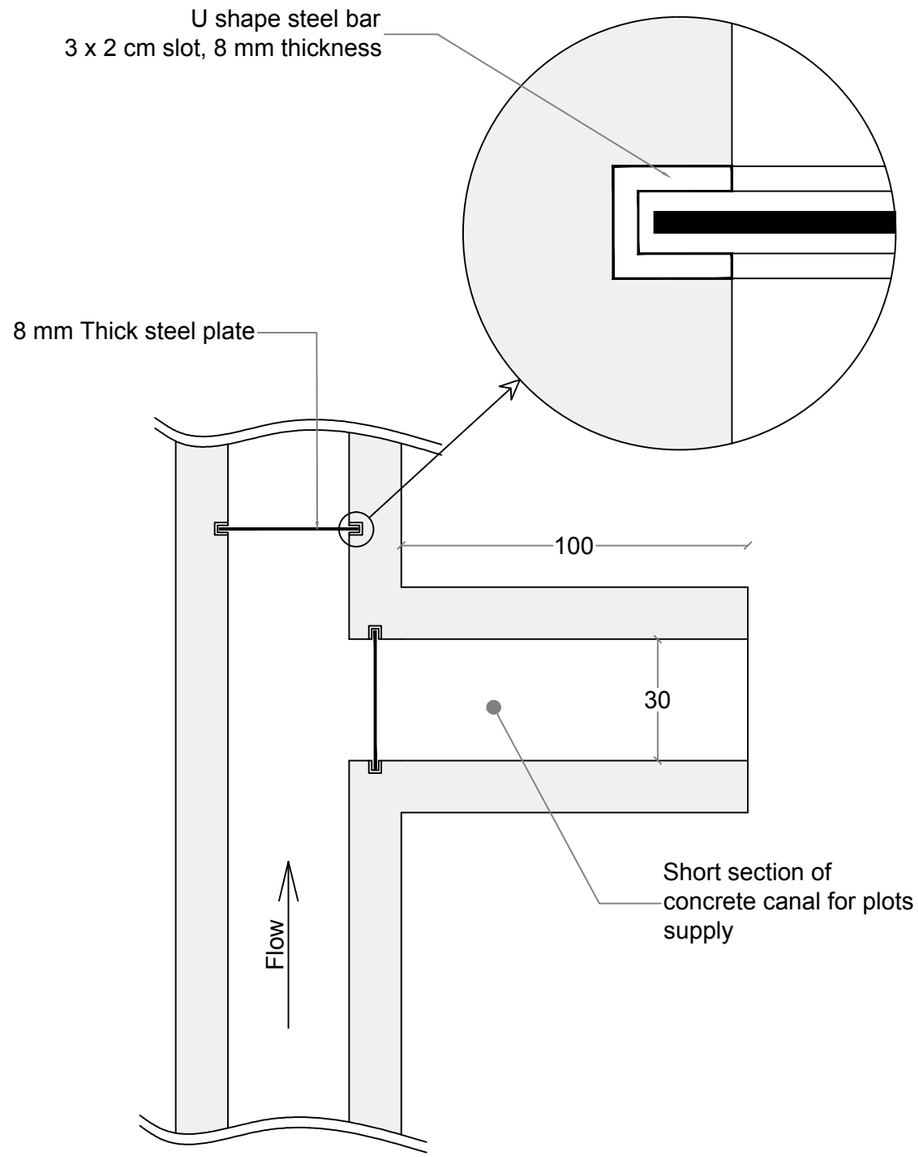
Dwg № 05

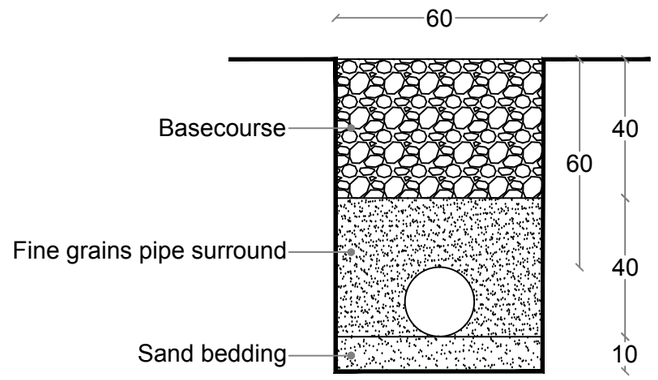
14 November 2016

Scale : NTS



Canal Typical Cross Section





Buried Pipeline Typical Cross Section

Sluice Gate Typical Arrangement
(PlanView)

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