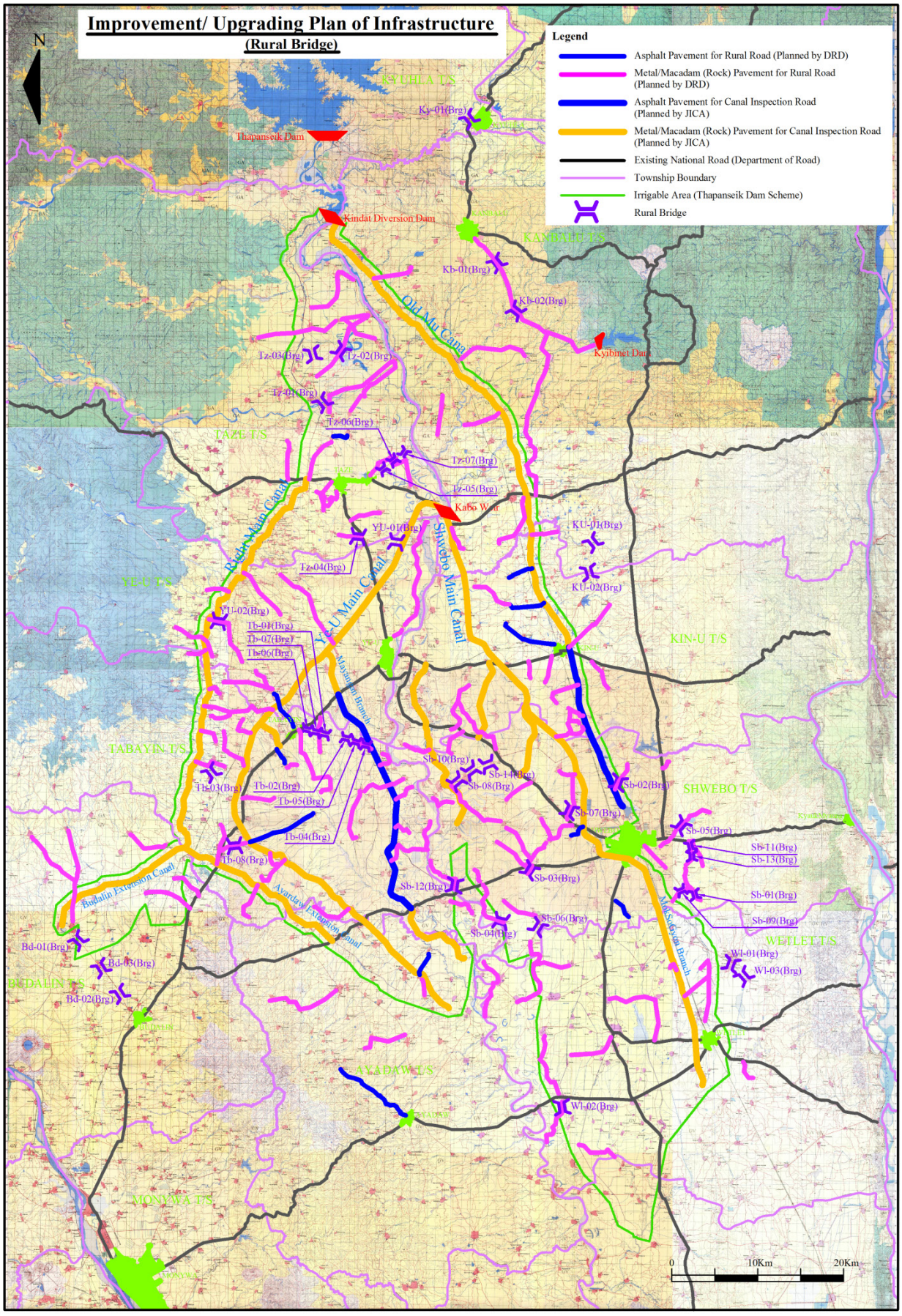
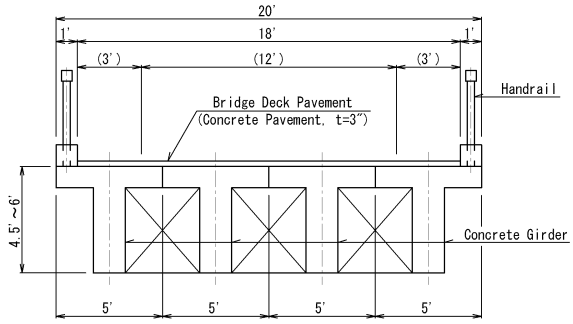
VI.2 RURAL BRIDGE (DRD)

VI.2.1 Map of Rural Bridge

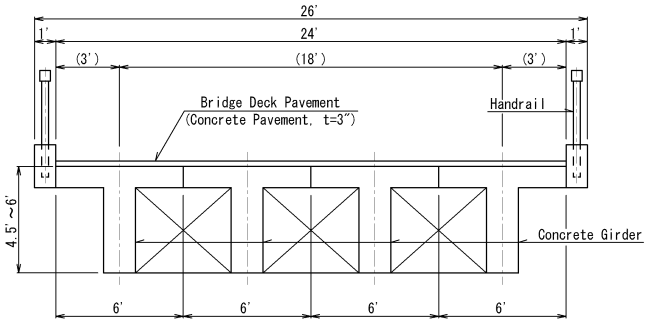


VI.2.2 Typical Cross Section of Rural Bridge

【Bridge Length＜100'】

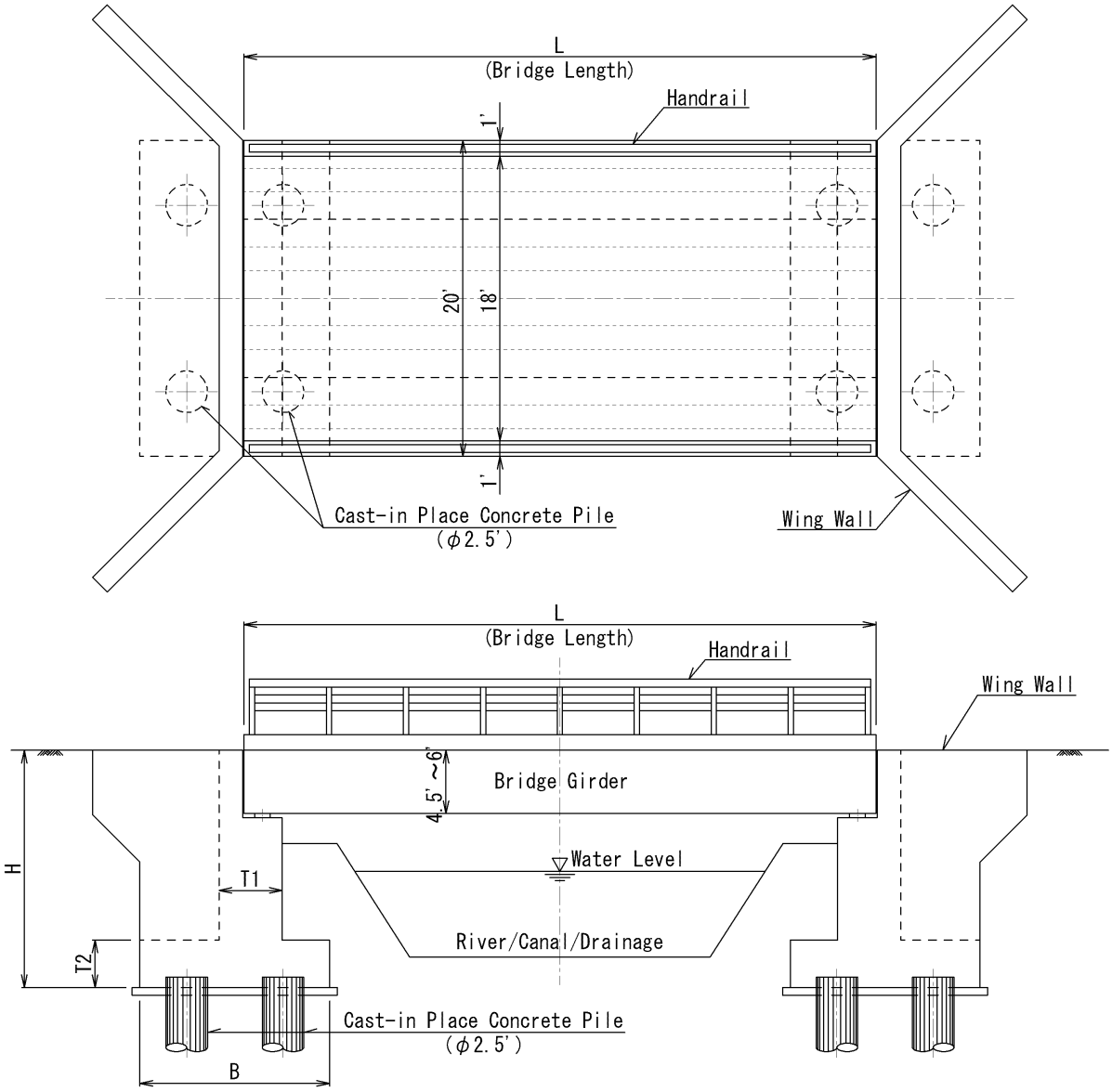


【Bridge Length≧100'】

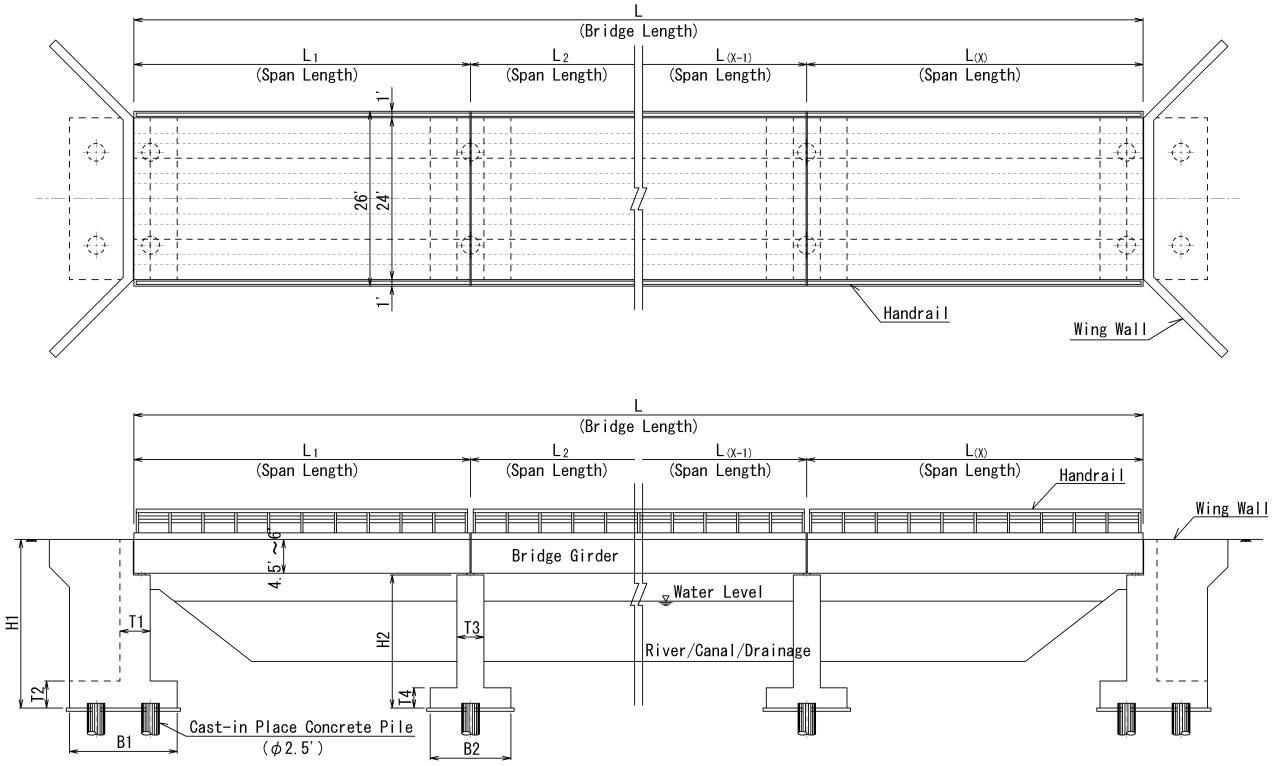


VI.2.3 Plan and Profile of Rural Bridge

【Single Span】



【2～10 Span】

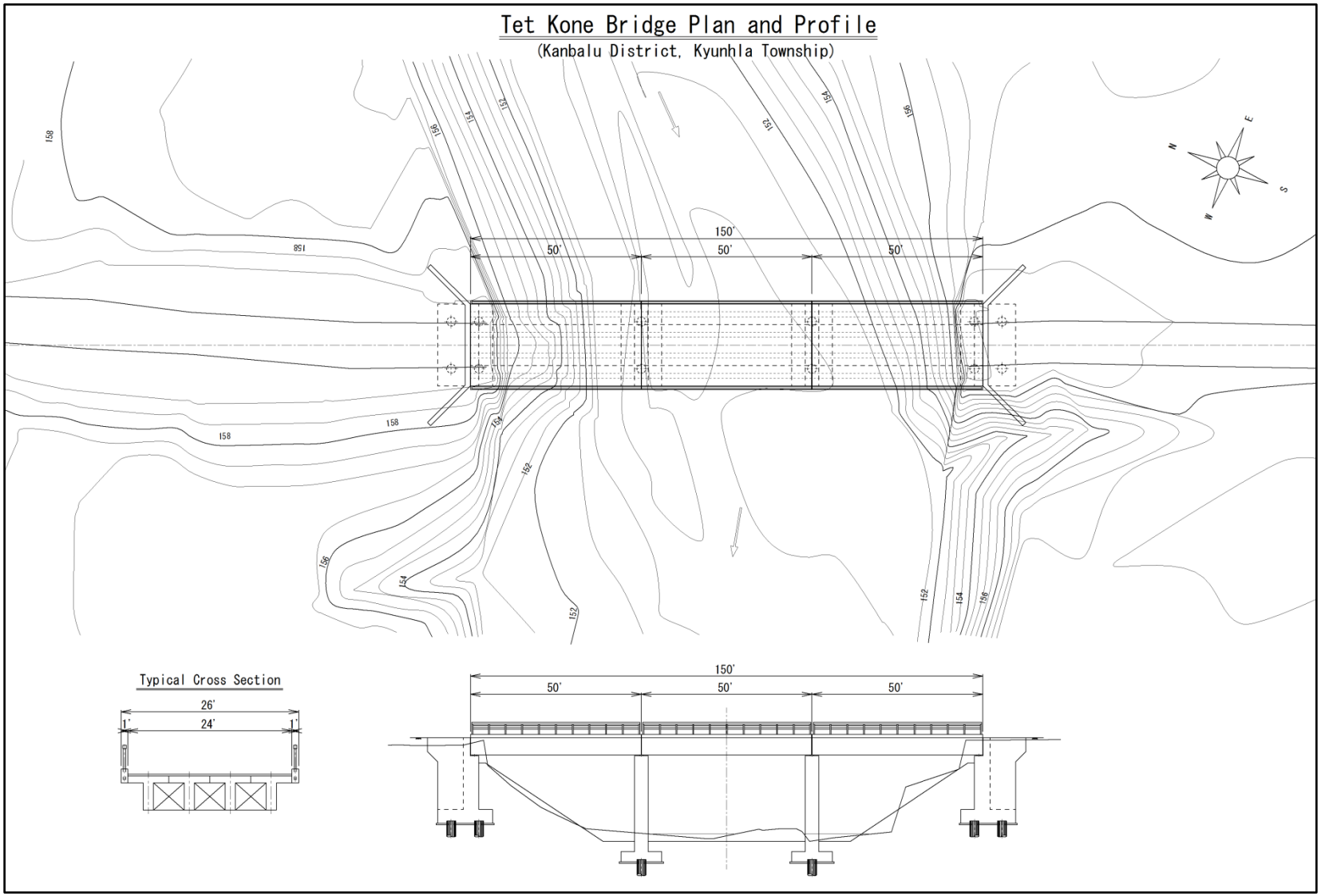

L
(Bridge Length)
L1
(Span Length)
L2
(Span Length)
L(X-1)
(Span Length)
L(X)
(Span Length)
1'
26'
24'
1'
Handrail
Wing Wall
L
(Bridge Length)
L1
(Span Length)
L2
(Span Length)
L(X-1)
(Span Length)
L(X)
(Span Length)
Handrail
Wing Wall
2'-6"
4'-5"
Bridge Girder
Water Level
H1
T1
H2
T3
River/Canal/Drainage
T2
T4
B1
Cast-in Place Concrete Pile
(φ2.5')
B2

VI.2.4 Rural Bridge List and Construction Cost

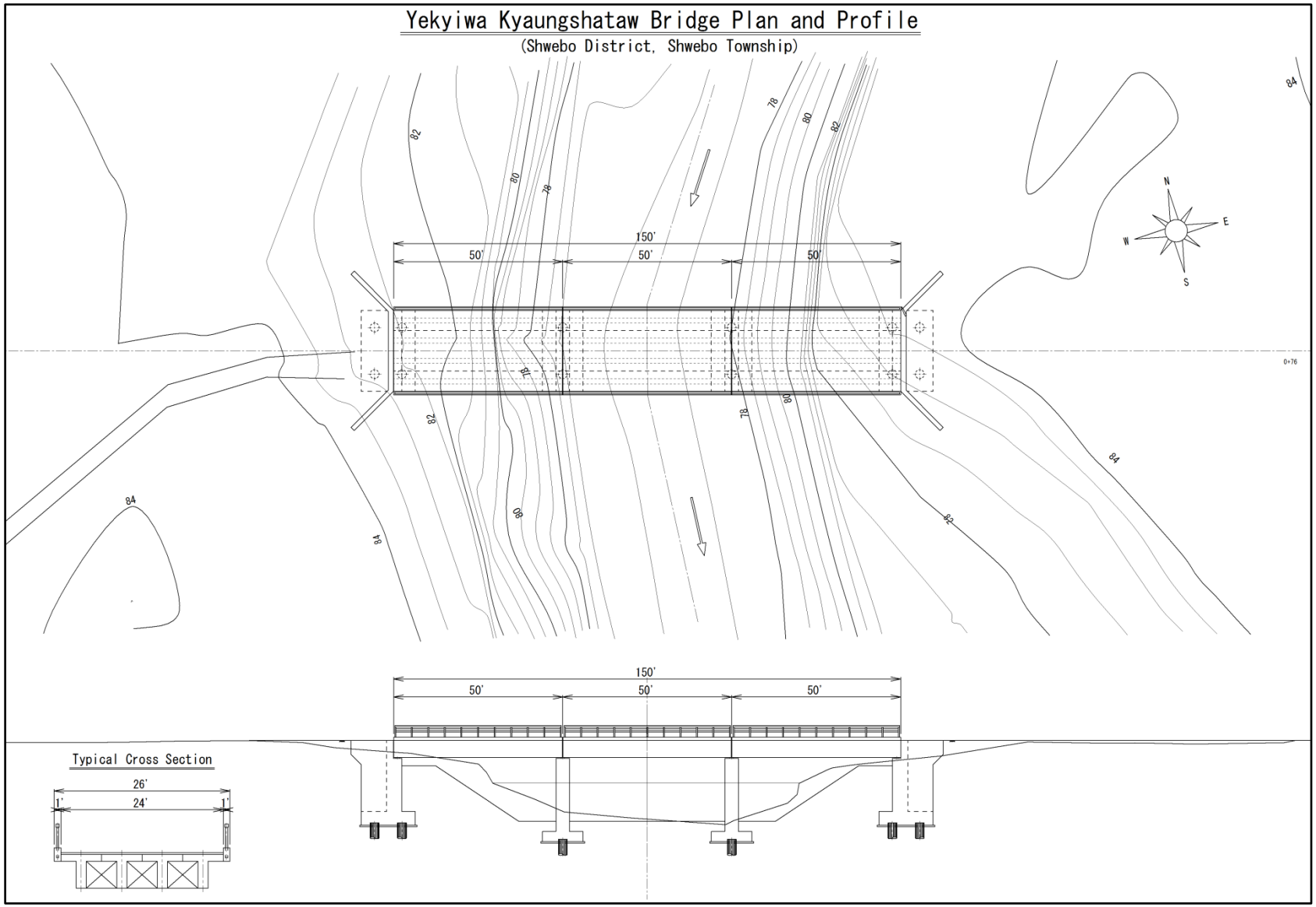
District	Township	No.	Description	Bridge Length (feet)	Effected Village	Effected House Hold	Effected Population	Cost (million kyat)
Kanbalu	Kanbalu	Kb-01(Brg)	Kanbulu-Nga Toe-Kyay Pin Act-Nga Pyaw Tine Road Bridge (1)	30 ft	6	1,923	8,022	
		Kb-02(Brg)	Kanbulu-Nga Toe-Kyay Pin Act-Nga Pyaw Tine Road Bridge (2)	90 ft	6	1,923	8,022	
	Kyunhla	Ky-01(Brg)	Tet Kone Bridge	150 ft	4	687	2,250	
Shwebo	Kin-U	KU-01(Brg)	Ywar Thit - Ywar Thar's Road (1) (Bridge)	60 ft	7	1,691	8,394	
		KU-02(Brg)	Ywar Thit - Ywar Thar's Road (2) (Bridge)	60 ft	7	1,691	8,394	
	Shwebo	Sb-01(Brg)	Kyaung Pan Kan - Thike Ka Taw's Road (Bridge)	30 ft	2	126	525	
		Sb-02(Brg)	Year Made Thar to Mahar Nandar Kan's Road (Bridge)	40 ft	1	233	1,072	
		Sb-03(Brg)	Sate Kon to Htun Zin Village's Road (Bridge)	30 ft	2	197	840	
		Sb-04(Brg)	Than Pu Yar Chan Bridge	90 ft	2	355	1,599	
		Sb-05(Brg)	Sin Kut Village out line bridge	40 ft	1	139	670	
		Sb-06(Brg)	PaLaing - Kun Seik Bridge	60 ft	3	1,134	2,588	
		Sb-07(Brg)	Ywar Taw Bridge	20 ft	1	118	731	
		Sb-08(Brg)	Myin Si Bridge (1)	250 ft	5	2,202	11,670	
		Sb-09(Brg)	Thit Pin Cho Bridge (Concrete Floor and Access Road)	130 ft	4	299	1,380	
		Sb-10(Brg)	Myin Si Bridge (2)	50 ft	5	2,202	11,670	
		Sb-11(Brg)	Min Pay Bridge	160 ft	4	664	2,729	
		Sb-12(Brg)	Yekyiwa Kyaungshataw Bridge	150 ft	2	380	1,930	
		Sb-13(Brg)	Minpay Bridge	200 ft	4	664	2,729	
		Sb-14(Brg)	Myinsi Bridge	150 ft	5	2,202	11,670	
	Wetlet	Wl-01(Brg)	Han Lin Village Entrance (S) Cause way Repair (Bridge)	60 ft	2	1,168	1,250	
		Wl-02(Brg)	Shwe Pan Kone Village (S) -Kee Canal Bridge	110 ft	4	1,041	5,145	
		Wl-03(Brg)	Han Lin - Sar Taung Gyi Village Entrance Bridge	50 ft	2	1,380	6,383	
	Taze	Tz-01(Brg)	Si Tone Lone Chaung Bridge	610 ft	3	1,132	2,668	
		Tz-02(Brg)	I Aye Inn bridge on Bay Yin - Thae Sar's Road	40 ft	9	1,206	6,300	
		Tz-03(Brg)	Cross Phout Chaung bridge on Nga Bat Kyi - Kyun Lae's Road	90 ft	7	669	3,794	
		Tz-04(Brg)	Si Sar village entrance bridge	30 ft	1	133	468	
		Tz-05(Brg)	Ma Aye bridge on Taze - Toke Ta Loke's Road (Bridge)	40 ft	6	682	3,825	
		Tz-06(Brg)	Nat Kyi Sin bridge on Taze - Toke Ta Loke's Road (Bridge)	30 ft	6	682	3,825	
		Tz-07(Brg)	Phyut Chaung Bridge	100 ft	3	897	1,911	
	Ye-U	YU-01(Brg)	Ku Za La Stream Bridge on Mon Tine Pin - Hlae Twin Road	40 ft	10	1,413	6,718	
		YU-02(Brg)	Pone Paw Stream Bridge on Oak Pho - Aung Kae Zin Road	90 ft	19	1,578	8,483	
	Tabayin	Tb-01(Brg)	Tabayin-Nyaung Hla Road (On) Ywar Shae (Near) Bridge Construction	30 ft	6	1,403	7,353	
		Tb-02(Brg)	Tabayin-Nyaung Hla Bridge Construction	20 ft	6	1,403	7,353	
		Tb-03(Brg)	Kyun Taw (S) Ywar Lae Chaung Canal Bridge Construction	30 ft	1	346	750	
		Tb-04(Brg)	Tabayin -Naung Hla	60 ft	6	1,403	7,353	
		Tb-05(Brg)	Tabayin-Naung Hla	40 ft	6	1,403	7,353	
		Tb-06(Brg)	Tabayin -Naung Hla	30 ft	6	1,403	7,353	
		Tb-07(Brg)	Tabayin -Naung Hla	30 ft	6	1,403	7,353	
		Tb-08(Brg)	YMC-Tha Yat Kaung	110 ft	7	1,172	5,052	
Monywa	Budalin	Bd-01(Brg)	Bridge on Maung Htaung Road (1)	30 ft	1	842	3,735	
		Bd-02(Brg)	Bridge on Maung Htaung Road (2)	30 ft	7	1,680	8,568	
		Bd-03(Brg)	Sae Wa Village Entrance Bridge	80 ft	4	268	1,701	
							Total	

VI.2.5 Outline Design of Rural Bridges

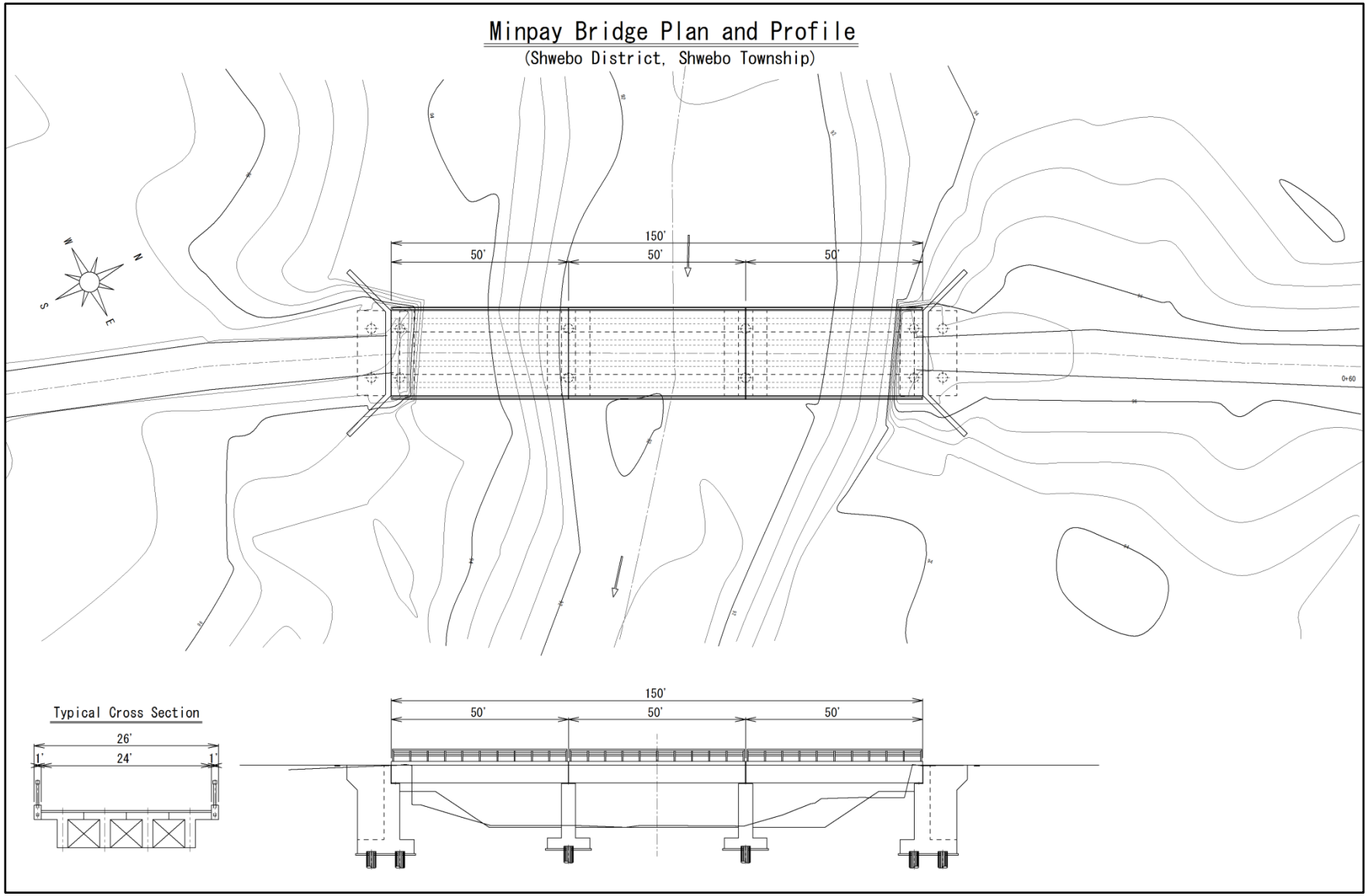
(1) Tet Kone Bridge (Kanbaru District Kyunhla Township)



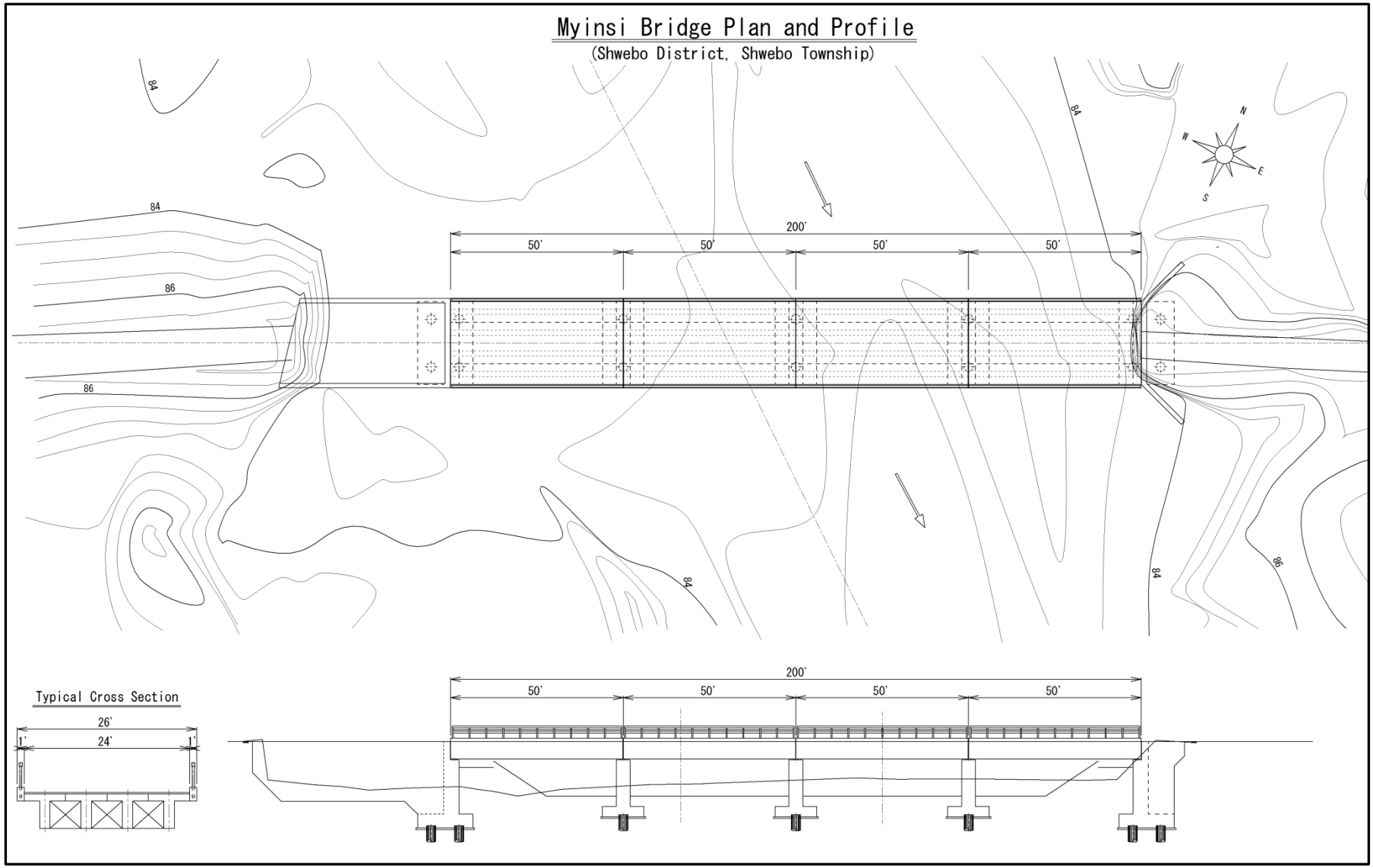
(2) Yekyiwa Kyaungshataw Bridge (Shwebo District Shwebo Township)



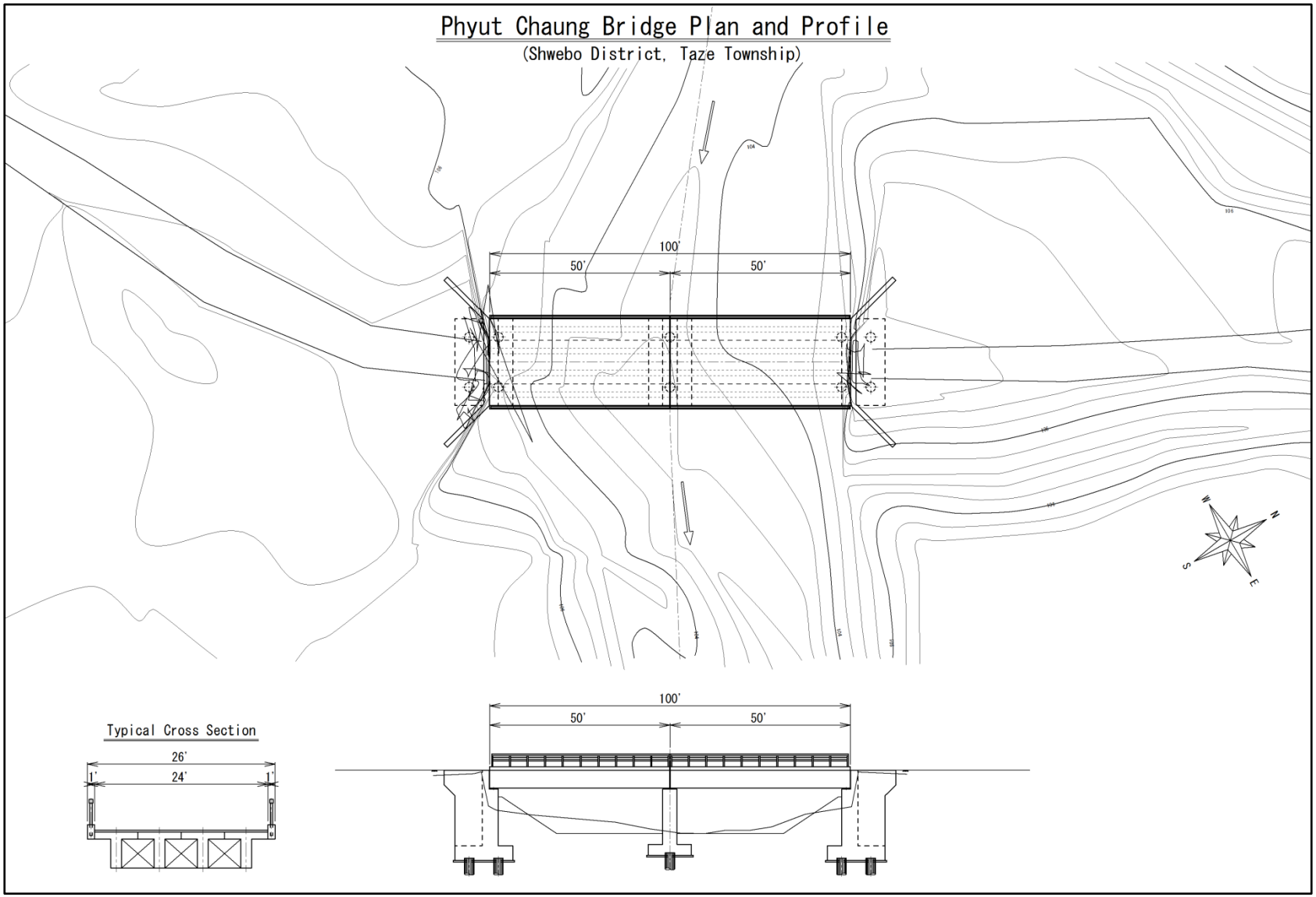
(3) Minpay Bridge (Shwebo District Shwebo Township)



(4) Myinsi Bridge (Shwebo District Shwebo Township)

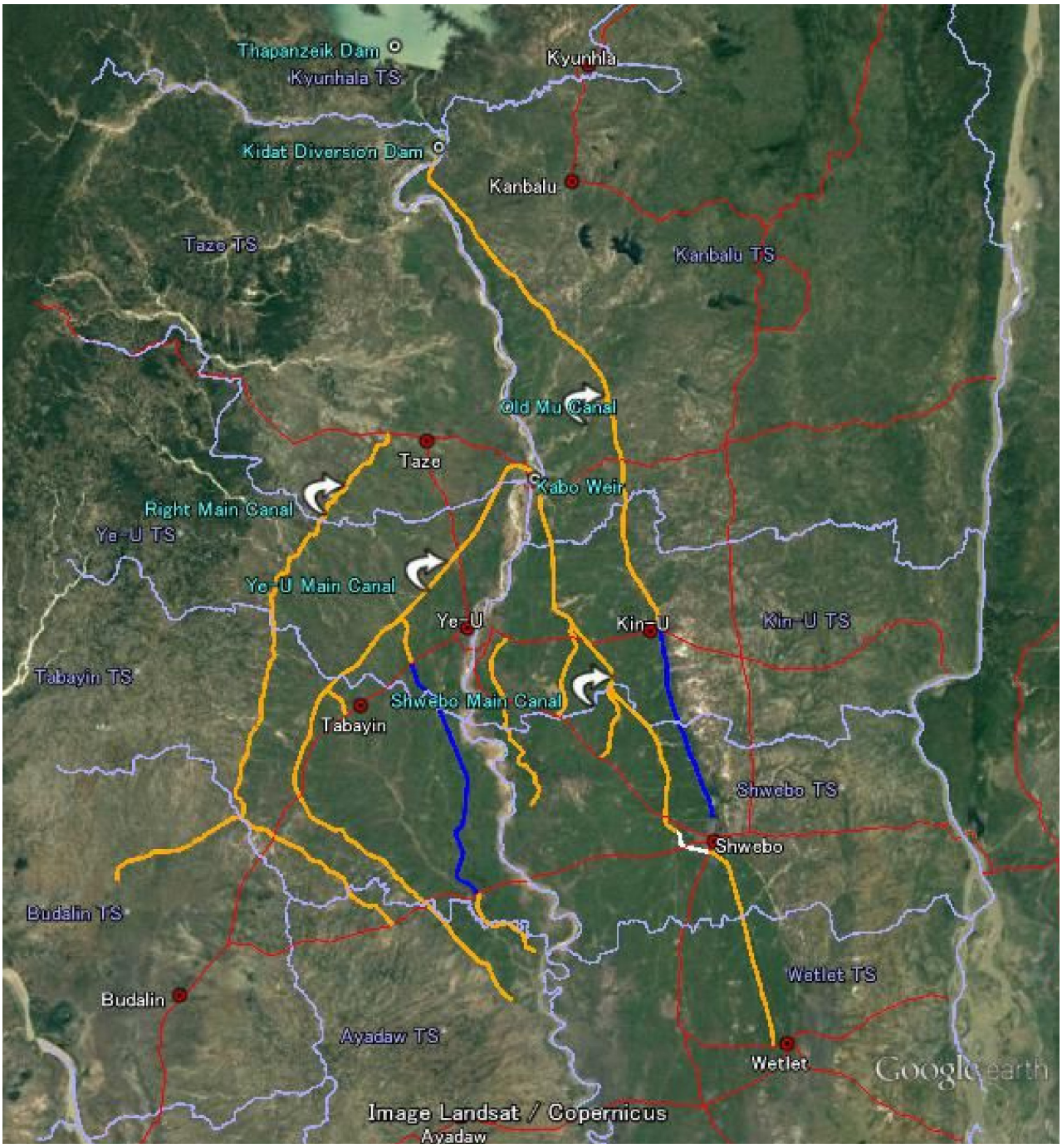


(5) Phyut Chaung Bridge (Shwebo District Taze Township)



VI.3 CANAL INSPECTION ROAD (IWUMD)

VI.3.1 Map of Canal Inspection Road

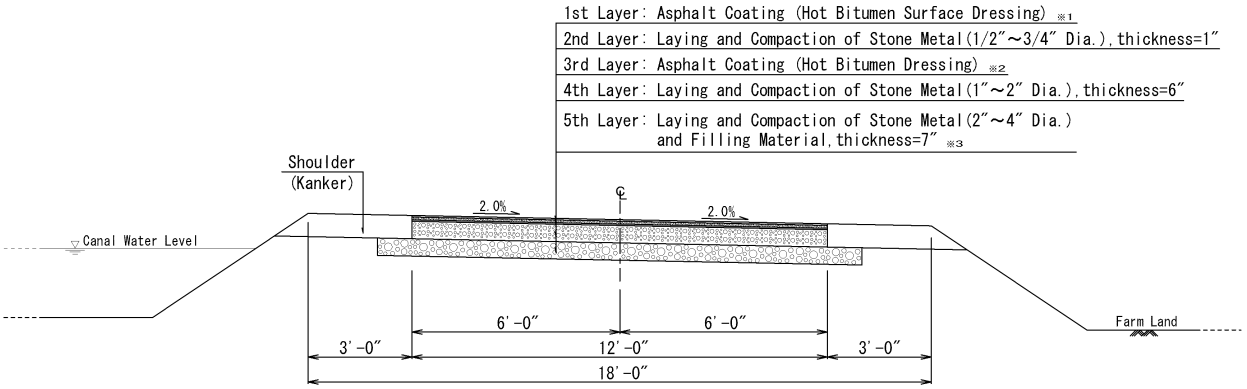


Legend

	Asphalt Pavement for Canal Inspection Road (Planed by JICA)
	Metal / Macadam (Rock) Pavement for Canal Inspection Road (Planed by JICA)
	Existing National Road (Road Department)
	Township Boundary

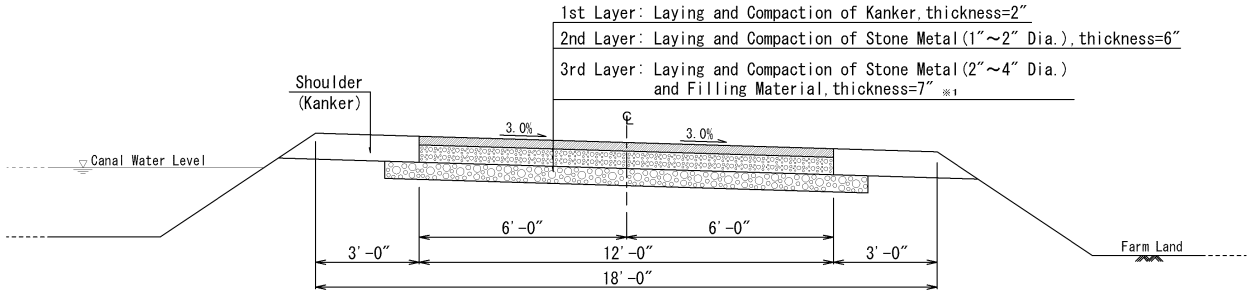
VI.3.2 Typical Cross Section of Canal Inspection Road

(1) Upgrade the Earth or Kanker Pavement to Asphalt Pavement



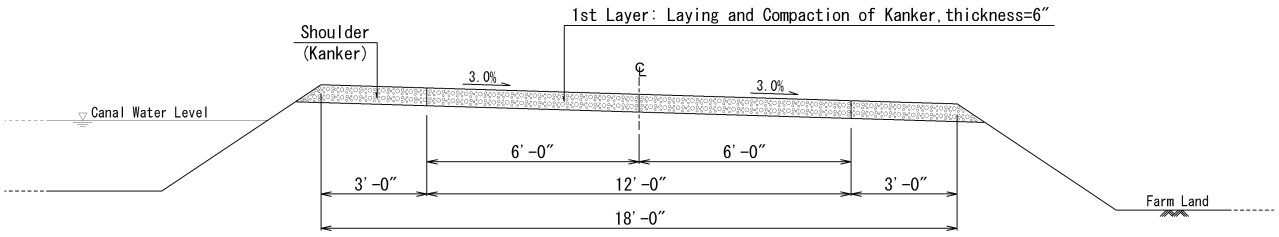
※1 Quantity of Bitumen: 8ton/mile at 12'pavement width, 12ton/mile at 18'pavement width.
※2 Quantity of Bitumen: 21ton/mile at 12'pavement width, 31.5ton/mile at 18'pavement width.
※3 Filling material consists of sand and chipping stone(1″～2″, 3/4″, 3/8″etc.).
Mixing volume rate between Metal/Macadam and Filling Materials is 4:1.

(2) Upgrade the Earth or Kanker Pavement to Metal/Macadam (Rock) Pavement



※1 Filling material consists of sand and chipping stone(1″～2″, 3/4″, 3/8″etc.).
Mixing volume rate between Metal/Macadam and Filling Materials is 4:1.

(3) Upgrade the Earth Pavement to Kanker Pavement (or Kanker Repair)



VI.3.3 Canal Inspection Road List and Construction Cost (Plan A ~ C)

(1) Plan A

System	Canal Name	Station No.(ft)	Canal Length		Condition of Pavement			Unit Cost (million kyat/mile)	Construction Cost (million kyat)
			(mile)	(km)	Type of Pavement	Roadway Width	Shoulder Width		
Right Main Canal System	Right Main Canal (RMC)	RD 0 + 000 - RD 114 + 800	21.74	34.99	Metal/Macadam	12 feet	3 feet		
	Right Main Canal (RMC)	RD 114 + 800 - RD 275 + 650	30.46	49.03	Metal/Macadam	12 feet	3 feet		
	Ayardaw Extension Canal	RD 0 + 000 - RD 17 + 200	3.26	5.24	Metal/Macadam	12 feet	3 feet		
	Ayardaw Extension Canal	RD 17 + 200 - RD 83 + 400	12.54	20.18	Metal/Macadam	12 feet	3 feet		
	Ayardaw Extension Canal	RD 83 + 400 - RD 122 + 000	7.31	11.77	Metal/Macadam	12 feet	3 feet		
	Budalin Extension Canal	RD 0 + 000 - RD 60 + 000	11.36	18.29	Metal/Macadam	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (RMC)		**0.00**	**0.00**					
	Sub-total Length of Metal/Macadam Pavement (RMC)		**86.67**	**139.49**					
	Sub-total Length of Kanker Pavement (RMC)		**0.00**	**0.00**					
	Sub-total Length of Kanker Repair (RMC)		**0.00**	**0.00**					
	Sub-total Length of Upgrading (RMC)		**86.67**	**139.49**					
Old Mu Canal System	Old Mu Canal (OMC)	RD 0 + 000 - RD 70 + 000	13.26	21.34	Metal/Macadam	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 70 + 000 - RD 125 + 200	10.45	16.82	Metal/Macadam	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 125 + 200 - RD 184 + 300	11.19	18.01	Metal/Macadam	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 184 + 300 - RD 264 + 000	15.09	24.29	Asphalt	12 feet	3 feet		
	Thayat Kan DY	RD 1 + 200 - RD 19 + 200	3.41	5.49	Earth to Kanker	12 feet	3 feet		
	DY-1	RD 1 + 200 - RD 4 + 000	0.53	0.85	Earth to Kanker	12 feet	3 feet		
	DY-4	RD 2 + 000 - RD 3 + 000	0.19	0.30	Earth to Kanker	12 feet	3 feet		
	DY-7	RD 1 + 000 - RD 2 + 000	0.19	0.30	Earth to Kanker	12 feet	3 feet		
	DY-9	RD 2 + 000 - RD 3 + 800	0.34	0.55	Earth to Kanker	12 feet	3 feet		
	DO-5	RD 0 + 000 - RD 38 + 000	7.20	11.58	Earth to Kanker	12 feet	3 feet		
	Lay Tote DY	RD 0 + 000 - RD 19 + 500	3.69	5.94	Earth to Kanker	12 feet	3 feet		
	DO-4	RD 0 + 000 - RD 32 + 000	6.06	9.75	Earth to Kanker	12 feet	3 feet		
	DO-3	RD 0 + 000 - RD 18 + 000	3.41	5.49	Earth to Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (OMC)		**15.09**	**24.29**					
	Sub-total Length of Metal/Macadam Pavement (OMC)		**34.90**	**56.17**					
	Sub-total Length of Kanker Pavement (OMC)		**25.02**	**40.25**					
	Sub-total Length of Kanker Repair (OMC)		**0.00**	**0.00**					
	Sub-total Length of Upgrading (OMC)		**75.01**	**120.72**					
Ye-U Main Canal	Ye-U Main Canal (YMC)	RD 0 + 000 - RD 131 + 000	24.81	39.93	Metal/Macadam	12 feet	3 feet		
	Ye-U Main Canal (YMC)	RD 131 + 000 - RD 183 + 000	9.85	15.85	Metal/Macadam	12 feet	3 feet		
	Ye-U Main Canal (YMC)	RD 183 + 000 - RD 223 + 000	7.58	12.19	Metal/Macadam	12 feet	3 feet		
	Ma Ya Kan Branch of YMC	RD 0 + 000 - RD 11 + 400	2.16	3.47	Metal/Macadam	12 feet	3 feet		
	Ma Ya Kan Branch of YMC	RD 11 + 400 - RD 72 + 300	11.53	18.56	Asphalt	12 feet	3 feet		
	Ma Ya Kan Branch of YMC	RD 72 + 300 - RD 95 + 500	4.39	7.07	Metal/Macadam	12 feet	3 feet		

System	Canal Name	Station No.(ft)	Canal Length		Condition of Pavement			Unit Cost (million kyat/mile)	Construction Cost (million kyat)
			(mile)	(km)	Type of Pavement	Roadway Width	Shoulder Width		
Ye-U Main Canal System	DY-11	RD 0 + 000 - RD 12 + 200	2.31	3.72	Metal/Macadam	12 feet	3 feet		
	DY-7	RD 0 + 000 - RD 37 + 900	7.18	11.55	Earth to Kanker	12 feet	3 feet		
	DY-9	RD 0 + 000 - RD 20 + 500	3.88	6.25	Earth to Kanker	12 feet	3 feet		
	DY-11	RD 12 + 200 - RD 25 + 400	2.50	4.02	Earth to Kanker	12 feet	3 feet		
	DY-15	RD 0 + 000 - RD 28 + 400	5.38	8.66	Earth to Kanker	12 feet	3 feet		
	DY-15 A	RD 0 + 000 - RD 15 + 200	2.88	4.63	Earth to Kanker	12 feet	3 feet		
	DY-16	RD 0 + 000 - RD 18 + 000	3.41	5.49	Earth to Kanker	12 feet	3 feet		
	DY-18	RD 0 + 000 - RD 22 + 000	4.17	6.71	Earth to Kanker	12 feet	3 feet		
	DY-19	RD 0 + 000 - RD 18 + 700	3.54	5.70	Earth to Kanker	12 feet	3 feet		
	T.D.Y	RD 0 + 000 - RD 41 + 000	7.77	12.50	Earth to Kanker	12 feet	3 feet		
	DY-21	RD 0 + 000 - RD 11 + 000	2.08	3.35	Earth to Kanker	12 feet	3 feet		
	DY-23	RD 0 + 000 - RD 6 + 000	1.14	1.83	Earth to Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (YMC)		**11.53**	**18.56**					
	Sub-total Length of Metal/Macadam Pavement (YMC)		**51.10**	**82.24**					
	Sub-total Length of Kanker Pavement (YMC)		**43.93**	**70.69**					
	Sub-total Length of Kanker Repair (YMC)		**0.00**	**0.00**					
	Sub-total Length of Upgrading (YMC)		**106.56**	**171.49**					
Shwebo Main Canal System	Shwebo Main Canal (SMC)	RD 0 + 000 - RD 143 + 400	27.16	43.71	Metal/Macadam	12 feet	3 feet		
	Mode Soe Chone Branch Canal	RD 15 + 000 - RD 90 + 000	14.20	22.86	Metal/Macadam	12 feet	2 feet		
	DY-1	RD 47 + 000 - RD 117 + 400	13.33	21.46	Metal/Macadam	12 feet	3 feet		
	DY-3	RD 0 + 000 - RD 35 + 400	6.70	10.79	Metal/Macadam	12 feet	3 feet		
	DY-4	RD 0 + 000 - RD 29 + 300	5.55	8.93	Metal/Macadam	8 feet	1 feet		
	DY-1	RD 82 + 000 - RD 123 + 500	7.86	12.65	Earth to Kanker	12 feet	3 feet		
	DY-3	RD 35 + 000 - RD 47 + 345	2.34	3.76	Earth to Kanker	12 feet	3 feet		
	DY-4	RD 0 + 000 - RD 19 + 000	3.60	5.79	Earth to Kanker	12 feet	3 feet		
	DY-5	RD 0 + 000 - RD 29 + 000	5.49	8.84	Earth to Kanker	12 feet	3 feet		
	DY-6	RD 0 + 000 - RD 12 + 000	2.27	3.66	Earth to Kanker	12 feet	3 feet		
	DY-6	RD 19 + 000 - RD 53 + 000	6.44	10.36	Earth to Kanker	12 feet	3 feet		
	DY-7	RD 0 + 000 - RD 53 + 000	10.04	16.15	Earth to Kanker	12 feet	3 feet		
	DY-8	RD 0 + 000 - RD 19 + 100	3.62	5.82	Earth to Kanker	12 feet	3 feet		
	DY-8	RD 24 + 500 - RD 43 + 660	3.63	5.84	Earth to Kanker	12 feet	3 feet		
	MBC DY-1	RD 0 + 000 - RD 13 + 800	2.61	4.21	Earth to Kanker	12 feet	3 feet		
	MBC DY-2	RD 0 + 000 - RD 23 + 300	4.41	7.10	Earth to Kanker	12 feet	3 feet		
	MBC DY-3	RD 0 + 000 - RD 20 + 000	3.79	6.10	Earth to Kanker	12 feet	3 feet		
	HBC DY-1	RD 0 + 000 - RD 28 + 000	5.30	8.53	Earth to Kanker	12 feet	3 feet		
	HBC DY-2	RD 0 + 000 - RD 12 + 000	2.27	3.66	Earth to Kanker	12 feet	3 feet		
	DY-2	RD 0 + 000 - RD 21 + 000	3.98	6.40	Earth to Kanker	12 feet	3 feet		
	HBC	RD 74 + 000 - RD 100 + 350	4.99	8.03	Repair of Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (SMC)		**0.00**	**0.00**					
	Sub-total Length of Metal/Macadam Pavement (SMC)		**66.94**	**107.75**					
	Sub-total Length of Kanker Pavement (SMC)		**67.65**	**108.87**					
	Sub-total Length of Kanker Repair (SMC)		**4.99**	**8.03**					
	Sub-total Length of Upgrading (SMC)		**139.58**	**224.65**					
Total of Asphalt Pavement (RMC+OMC+YMC+SMC)			**26.62**	**42.85**					
Total of Metal/Macadam Pavement (RMC+OMC+YMC+SMC)			**239.61**	**385.65**					
Total of Kanker Pavement (RMC+OMC+YMC+SMC)			**136.60**	**219.81**					
Total of Kanker Repair (RMC+OMC+YMC+SMC)			**4.99**	**8.03**					
Total of Upgrading (RMC+OMC+YMC+SMC)			**407.82**	**656.34**					

※ Unit Cost consists of pavement cost and re-sectioning work cost (= million kyat/mile)

(2) Plan B

System	Canal Name	Station No.(ft)	Canal Length (mile)	Canal Length (km)	Condition of Pavement: Type of Pavement	Condition of Pavement: Roadway Width	Condition of Pavement: Shoulder Width	Unit Cost (million kyat/mile)	Construction Cost (million kyat)
Right Main Canal System	Right Main Canal (RMC)	RD 114 + 800 - RD 275 + 650	30.46	49.03	Metal/Macadam	12 feet	3 feet		
	Ayardaw Extension Canal	RD 0 + 000 - RD 17 + 200	3.26	5.24	Metal/Macadam	12 feet	3 feet		
	Ayardaw Extension Canal	RD 17 + 200 - RD 83 + 400	12.54	20.18	Metal/Macadam	12 feet	3 feet		
	Budalin Extension Canal	RD 0 + 000 - RD 60 + 000	11.36	18.29	Metal/Macadam	12 feet	2 feet		
	Ayataw Extension Canal	RD 95 + 000 - RD 122 + 000	5.11	8.23	Earth to Kanker	12 feet	3 feet		
	Ayataw Extension Canal	RD 83 + 400 - RD 90 + 000	1.25	2.01	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 0 + 000 - RD 4 + 000	0.76	1.22	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 4 + 000 - RD 4 + 450	0.09	0.14	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 4 + 450 - RD 8 + 600	0.79	1.26	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 8 + 600 - RD 9 + 700	0.21	0.34	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 9 + 700 - RD 42 + 000	6.12	9.85	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 50 + 000 - RD 56 + 000	1.14	1.83	Repair of Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (RMC)		**0.00**	**0.00**					
	Sub-total Length of Metal/Macadam Pavement (RMC)		**57.62**	**92.74**					
	Sub-total Length of Kanker Pavement (RMC)		**5.11**	**8.23**					
	Sub-total Length of Kanker Repair (RMC)		**10.36**	**16.65**					
	Sub-total Length of Upgrading (RMC)		**73.09**	**117.62**					
Old Mu Canal System	Old Mu Canal (OMC)	RD 0 + 000 - RD 70 + 000	13.26	21.34	Metal/Macadam	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 70 + 000 - RD 125 + 200	10.45	16.82	Metal/Macadam	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 125 + 200 - RD 184 + 300	11.19	18.01	Metal/Macadam	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 184 + 300 - RD 264 + 000	15.09	24.29	Asphalt	12 feet	3 feet		
	Thayat Kan DY	RD 1 + 200 - RD 19 + 200	3.41	5.49	Earth to Kanker	12 feet	3 feet		
	DY-1	RD 1 + 200 - RD 4 + 000	0.53	0.85	Earth to Kanker	12 feet	3 feet		
	DY-4	RD 2 + 000 - RD 3 + 000	0.19	0.30	Earth to Kanker	12 feet	3 feet		
	DY-7	RD 1 + 000 - RD 2 + 000	0.19	0.30	Earth to Kanker	12 feet	3 feet		
	DY-9	RD 2 + 000 - RD 3 + 800	0.34	0.55	Earth to Kanker	12 feet	3 feet		
	DO-5	RD 0 + 000 - RD 38 + 000	7.20	11.58	Earth to Kanker	12 feet	3 feet		
	Lay Tote DY	RD 0 + 000 - RD 19 + 500	3.69	5.94	Earth to Kanker	12 feet	3 feet		
	DO-4	RD 0 + 000 - RD 32 + 000	6.06	9.75	Earth to Kanker	12 feet	3 feet		
	DO-3	RD 0 + 000 - RD 18 + 000	3.41	5.49	Earth to Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (OMC)		**15.09**	**24.29**					
	Sub-total Length of Metal/Macadam Pavement (OMC)		**34.90**	**56.17**					
	Sub-total Length of Kanker Pavement (OMC)		**25.02**	**40.25**					
	Sub-total Length of Kanker Repair (OMC)		**0.00**	**0.00**					
	Sub-total Length of Upgrading (OMC)		**75.01**	**120.72**					
Ye-U Main Canal	Ye-U Main Canal (YMC)	RD 0 + 000 - RD 131 + 000	24.81	39.93	Metal/Macadam	12 feet	3 feet		
	Ye-U Main Canal (YMC)	RD 131 + 000 - RD 183 + 000	9.85	15.85	Metal/Macadam	12 feet	3 feet		
	Ye-U Main Canal (YMC)	RD 183 + 000 - RD 223 + 000	7.58	12.19	Metal/Macadam	12 feet	3 feet		
	Ma Ya Kan Branch of YMC	RD 0 + 000 - RD 11 + 400	2.16	3.47	Metal/Macadam	12 feet	3 feet		
	Ma Ya Kan Branch of YMC	RD 11 + 400 - RD 72 + 300	11.53	18.56	Asphalt	12 feet	3 feet		
	Ma Ya Kan Branch of YMC	RD 72 + 300 - RD 95 + 500	4.39	7.07	Metal/Macadam	12 feet	3 feet		

System	Canal Name	Station No.(ft)	Canal Length (mile)	Canal Length (km)	Condition of Pavement: Type of Pavement	Condition of Pavement: Roadway Width	Condition of Pavement: Shoulder Width	Unit Cost (million kyat/mile)	Construction Cost (million kyat)
Ye-U Main Canal System	DY-11	RD 0 + 000 - RD 12 + 200	2.31	3.72	Metal/Macadam	12 feet	3 feet		
	DY-7	RD 0 + 000 - RD 37 + 900	7.18	11.55	Earth to Kanker	12 feet	3 feet		
	DY-9	RD 0 + 000 - RD 20 + 500	3.88	6.25	Earth to Kanker	12 feet	3 feet		
	DY-11	RD 12 + 200 - RD 25 + 400	2.50	4.02	Earth to Kanker	12 feet	3 feet		
	DY-15	RD 0 + 000 - RD 28 + 400	5.38	8.66	Earth to Kanker	12 feet	3 feet		
	DY-15 A	RD 0 + 000 - RD 15 + 200	2.88	4.63	Earth to Kanker	12 feet	3 feet		
	DY-16	RD 0 + 000 - RD 18 + 000	3.41	5.49	Earth to Kanker	12 feet	3 feet		
	DY-18	RD 0 + 000 - RD 22 + 000	4.17	6.71	Earth to Kanker	12 feet	3 feet		
	DY-19	RD 0 + 000 - RD 18 + 700	3.54	5.70	Earth to Kanker	12 feet	3 feet		
	T.D.Y	RD 0 + 000 - RD 41 + 000	7.77	12.50	Earth to Kanker	12 feet	3 feet		
	DY-21	RD 0 + 000 - RD 11 + 000	2.08	3.35	Earth to Kanker	12 feet	3 feet		
	DY-23	RD 0 + 000 - RD 6 + 000	1.14	1.83	Earth to Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (YMC)		**11.53**	**18.56**					
	Sub-total Length of Metal/Macadam Pavement (YMC)		**51.10**	**82.24**					
	Sub-total Length of Kanker Pavement (YMC)		**43.93**	**70.69**					
	Sub-total Length of Kanker Repair (YMC)		**0.00**	**0.00**					
	Sub-total Length of Upgrading (YMC)		**106.56**	**171.49**					
Shwebo Main Canal System	Shwebo Main Canal (SMC)	RD 0 + 000 - RD 143 + 400	27.16	43.71	Metal/Macadam	12 feet	3 feet		
	Mode Soe Chone Branch Canal	RD 15 + 000 - RD 90 + 000	14.20	22.86	Metal/Macadam	12 feet	2 feet		
	DY-1	RD 47 + 000 - RD 117 + 400	13.33	21.46	Metal/Macadam	12 feet	3 feet		
	DY-3	RD 0 + 000 - RD 35 + 400	6.70	10.79	Metal/Macadam	12 feet	3 feet		
	DY-4	RD 0 + 000 - RD 29 + 300	5.55	8.93	Metal/Macadam	8 feet	1 feet		
	DY-1	RD 82 + 000 - RD 123 + 500	7.86	12.65	Earth to Kanker	12 feet	3 feet		
	DY-3	RD 35 + 000 - RD 47 + 345	2.34	3.76	Earth to Kanker	12 feet	3 feet		
	DY-4	RD 0 + 000 - RD 19 + 000	3.60	5.79	Earth to Kanker	12 feet	3 feet		
	DY-5	RD 0 + 000 - RD 29 + 000	5.49	8.84	Earth to Kanker	12 feet	3 feet		
	DY-6	RD 0 + 000 - RD 12 + 000	2.27	3.66	Earth to Kanker	12 feet	3 feet		
	DY-6	RD 19 + 000 - RD 53 + 000	6.44	10.36	Earth to Kanker	12 feet	3 feet		
	DY-7	RD 0 + 000 - RD 53 + 000	10.04	16.15	Earth to Kanker	12 feet	3 feet		
	DY-8	RD 0 + 000 - RD 19 + 100	3.62	5.82	Earth to Kanker	12 feet	3 feet		
	DY-8	RD 24 + 500 - RD 43 + 660	3.63	5.84	Earth to Kanker	12 feet	3 feet		
	MBC DY-1	RD 0 + 000 - RD 13 + 800	2.61	4.21	Earth to Kanker	12 feet	3 feet		
	MBC DY-2	RD 0 + 000 - RD 23 + 300	4.41	7.10	Earth to Kanker	12 feet	3 feet		
	MBC DY-3	RD 0 + 000 - RD 20 + 000	3.79	6.10	Earth to Kanker	12 feet	3 feet		
	HBC DY-1	RD 0 + 000 - RD 28 + 000	5.30	8.53	Earth to Kanker	12 feet	3 feet		
	HBC DY-2	RD 0 + 000 - RD 12 + 000	2.27	3.66	Earth to Kanker	12 feet	3 feet		
	DY-2	RD 0 + 000 - RD 21 + 000	3.98	6.40	Earth to Kanker	12 feet	3 feet		
	HBC	RD 74 + 000 - RD 100 + 350	4.99	8.03	Repair of Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (SMC)		**0.00**	**0.00**					
	Sub-total Length of Metal/Macadam Pavement (SMC)		**66.94**	**107.75**					
	Sub-total Length of Kanker Pavement (SMC)		**67.65**	**108.87**					
	Sub-total Length of Kanker Repair (SMC)		**4.99**	**8.03**					
	Sub-total Length of Upgrading (SMC)		**139.58**	**224.65**					
Total of Asphalt Pavement (RMC+OMC+YMC+SMC)			**26.62**	**42.85**					
Total of Metal/Macadam Pavement (RMC+OMC+YMC+SMC)			**210.56**	**338.89**					
Total of Kanker Pavement (RMC+OMC+YMC+SMC)			**141.71**	**228.04**					
Total of Kanker Repair (RMC+OMC+YMC+SMC)			**15.35**	**24.68**					
Total of Upgrading (RMC+OMC+YMC+SMC)			**394.24**	**634.47**					

※ Unit Cost consists of pavement cost and re-sectioning work cost (= million kyat/mile)

(3) Plan C

System	Canal Name	Station No.(ft)	Canal Length (mile)	Canal Length (km)	Condition of Pavement: Type of Pavement	Condition of Pavement: Roadway Width	Condition of Pavement: Shoulder Width	Unit Cost (million kyat/mile)	Construction Cost (million kyat)
Right Main Canal System	Right Main Canal (RMC)	RD 114 + 800 - RD 275 + 650	30.46	49.03	Metal/Macadam	12 feet	3 feet		
	Ayardaw Extension Canal	RD 0 + 000 - RD 17 + 200	3.26	5.24	Metal/Macadam	12 feet	3 feet		
	Ayardaw Extension Canal	RD 0 + 000 - RD 60 + 000	11.36	18.29	Metal/Macadam	12 feet	2 feet		
	Ayataw Extension Canal	RD 25 + 000 - RD 30 + 000	0.95	1.52	Earth to Kanker	12 feet	3 feet		
	Ayataw Extension Canal	RD 54 + 000 - RD 65 + 000	2.08	3.35	Earth to Kanker	12 feet	3 feet		
	Ayataw Extension Canal	RD 73 + 000 - RD 75 + 000	0.38	0.61	Earth to Kanker	12 feet	3 feet		
	Ayataw Extension Canal	RD 95 + 000 - RD 122 + 000	5.11	8.23	Earth to Kanker	12 feet	3 feet		
	Ayataw Extension Canal	RD 42 + 000 - RD 52 + 000	1.89	3.05	Repair of Kanker	12 feet	3 feet		
	Ayataw Extension Canal	RD 67 + 000 - RD 70 + 000	0.57	0.91	Repair of Kanker	12 feet	3 feet		
	Ayataw Extension Canal	RD 79 + 000 - RD 83 + 400	0.83	1.34	Repair of Kanker	12 feet	3 feet		
	Ayataw Extension Canal	RD 83 + 400 - RD 90 + 000	1.25	2.01	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 0 + 000 - RD 4 + 000	0.76	1.22	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 4 + 000 - RD 4 + 450	0.09	0.14	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 4 + 450 - RD 8 + 600	0.79	1.26	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 8 + 600 - RD 9 + 700	0.21	0.34	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 9 + 700 - RD 42 + 000	6.12	9.85	Repair of Kanker	12 feet	3 feet		
	Right Main Canal (RMC)	RD 50 + 000 - RD 56 + 000	1.14	1.83	Repair of Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (RMC)		**0.00**	**0.00**					
	Sub-total Length of Metal/Macadam Pavement (RMC)		**45.08**	**72.56**					
	Sub-total Length of Kanker Pavement (RMC)		**8.52**	**13.71**					
	Sub-total Length of Kanker Repair (RMC)		**13.65**	**21.95**					
	Sub-total Length of Upgrading (RMC)		**67.25**	**108.22**					
Old Mu Canal System	Old Mu Canal (OMC)	RD 0 + 000 - RD 70 + 000	13.26	21.34	Metal/Macadam	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 70 + 000 - RD 125 + 200	10.45	16.82	Metal/Macadam	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 125 + 200 - RD 184 + 300	11.19	18.01	Metal/Macadam	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 184 + 300 - RD 264 + 000	15.09	24.29	Asphalt	12 feet	3 feet		
	Thayat Kan DY	RD 1 + 200 - RD 19 + 200	3.41	5.49	Earth to Kanker	12 feet	3 feet		
	DY-1	RD 1 + 200 - RD 4 + 000	0.53	0.85	Earth to Kanker	12 feet	3 feet		
	DY-4	RD 2 + 000 - RD 3 + 000	0.19	0.30	Earth to Kanker	12 feet	3 feet		
	DY-7	RD 1 + 000 - RD 2 + 000	0.19	0.30	Earth to Kanker	12 feet	3 feet		
	DY-9	RD 2 + 000 - RD 3 + 800	0.34	0.55	Earth to Kanker	12 feet	3 feet		
	DO-5	RD 0 + 000 - RD 38 + 000	7.20	11.58	Earth to Kanker	12 feet	3 feet		
	Lay Tote DY	RD 0 + 000 - RD 19 + 500	3.69	5.94	Earth to Kanker	12 feet	3 feet		
	DO-4	RD 0 + 000 - RD 32 + 000	6.06	9.75	Earth to Kanker	12 feet	3 feet		
	DO-3	RD 0 + 000 - RD 18 + 000	3.41	5.49	Earth to Kanker	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 37 + 000 - RD 46 + 000	1.70	2.74	Repair of Kanker	12 feet	3 feet		
	Old Mu Canal (OMC)	RD 46 + 000 - RD 62 + 000	3.03	4.88	Repair of Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (OMC)		**15.09**	**24.29**					
	Sub-total Length of Metal/Macadam Pavement (OMC)		**34.90**	**56.17**					
	Sub-total Length of Kanker Pavement (OMC)		**25.02**	**40.25**					
	Sub-total Length of Kanker Repair (OMC)		**4.73**	**7.62**					
	Sub-total Length of Upgrading (OMC)		**79.74**	**128.34**					
Ye-U Main Canal	Ye-U Main Canal (YMC)	RD 0 + 000 - RD 131 + 000	24.81	39.93	Metal/Macadam	12 feet	3 feet		
	Ye-U Main Canal (YMC)	RD 131 + 000 - RD 183 + 000	9.85	15.85	Metal/Macadam	12 feet	3 feet		
	Ye-U Main Canal (YMC)	RD 183 + 000 - RD 223 + 000	7.58	12.19	Metal/Macadam	12 feet	3 feet		
	Ma Ya Kan Branch of YMC	RD 0 + 000 - RD 11 + 400	2.16	3.47	Metal/Macadam	12 feet	3 feet		
	Ma Ya Kan Branch of YMC	RD 11 + 400 - RD 72 + 300	11.53	18.56	Metal/Macadam	12 feet	3 feet		
	Ma Ya Kan Branch of YMC	RD 72 + 300 - RD 95 + 500	4.39	7.07	Metal/Macadam	12 feet	3 feet		

System	Canal Name	Station No.(ft)	Canal Length (mile)	Canal Length (km)	Condition of Pavement: Type of Pavement	Condition of Pavement: Roadway Width	Condition of Pavement: Shoulder Width	Unit Cost (million kyat/mile)	Construction Cost (million kyat)
Ye-U Main Canal System	DY-11	RD 0 + 000 - RD 12 + 200	2.31	3.72	Metal/Macadam	12 feet	3 feet		
	DY-7	RD 0 + 000 - RD 37 + 900	7.18	11.55	Earth to Kanker	12 feet	3 feet		
	DY-9	RD 0 + 000 - RD 20 + 500	3.88	6.25	Earth to Kanker	12 feet	3 feet		
	DY-11	RD 12 + 200 - RD 25 + 400	2.50	4.02	Earth to Kanker	12 feet	3 feet		
	DY-15	RD 0 + 000 - RD 28 + 400	5.38	8.66	Earth to Kanker	12 feet	3 feet		
	DY-15 A	RD 0 + 000 - RD 15 + 200	2.88	4.63	Earth to Kanker	12 feet	3 feet		
	DY-16	RD 0 + 000 - RD 18 + 000	3.41	5.49	Earth to Kanker	12 feet	3 feet		
	DY-18	RD 0 + 000 - RD 22 + 000	4.17	6.71	Earth to Kanker	12 feet	3 feet		
	DY-19	RD 0 + 000 - RD 18 + 700	3.54	5.70	Earth to Kanker	12 feet	3 feet		
	Tail DY	RD 0 + 000 - RD 41 + 000	7.77	12.50	Earth to Kanker	12 feet	3 feet		
	DY-21	RD 0 + 000 - RD 11 + 000	2.08	3.35	Earth to Kanker	12 feet	3 feet		
	DY-23	RD 0 + 000 - RD 6 + 000	1.14	1.83	Earth to Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (YMC)		**0.00**	**0.00**					
	Sub-total Length of Metal/Macadam Pavement (YMC)		**62.63**	**100.80**					
	Sub-total Length of Kanker Pavement (YMC)		**43.93**	**70.69**					
	Sub-total Length of Kanker Repair (YMC)		**0.00**	**0.00**					
	Sub-total Length of Upgrading (YMC)		**106.56**	**171.49**					
Shwebo Main Canal System	Shwebo Main Canal (SCM)	RD 0 + 000 - RD 143 + 400	27.16	43.71	Metal/Macadam	12 feet	3 feet		
	Mode Soe Chone Branch Canal	RD 15 + 000 - RD 90 + 000	14.20	22.86	Metal/Macadam	12 feet	2 feet		
	DY-1	RD 47 + 000 - RD 117 + 400	13.33	21.46	Metal/Macadam	12 feet	3 feet		
	DY-3	RD 0 + 000 - RD 35 + 400	6.70	10.79	Metal/Macadam	12 feet	3 feet		
	DY-4	RD 0 + 000 - RD 29 + 300	5.55	8.93	Metal/Macadam	8 feet	1 feet		
	DY-1	RD 82 + 000 - RD 123 + 500	7.86	12.65	Earth to Kanker	12 feet	3 feet		
	DY-3	RD 35 + 000 - RD 47 + 345	2.34	3.76	Earth to Kanker	12 feet	3 feet		
	DY-4	RD 0 + 000 - RD 19 + 000	3.60	5.79	Earth to Kanker	12 feet	3 feet		
	DY-5	RD 0 + 000 - RD 29 + 000	5.49	8.84	Earth to Kanker	12 feet	3 feet		
	DY-6	RD 0 + 000 - RD 12 + 000	2.27	3.66	Earth to Kanker	12 feet	3 feet		
	DY-6	RD 19 + 000 - RD 53 + 000	6.44	10.36	Earth to Kanker	12 feet	3 feet		
	DY-7	RD 0 + 000 - RD 53 + 000	10.04	16.15	Earth to Kanker	12 feet	3 feet		
	DY-8	RD 0 + 000 - RD 19 + 100	3.62	5.82	Earth to Kanker	12 feet	3 feet		
	DY-8	RD 24 + 500 - RD 43 + 660	3.63	5.84	Earth to Kanker	12 feet	3 feet		
	MBC DY-1	RD 0 + 000 - RD 13 + 800	2.61	4.21	Earth to Kanker	12 feet	3 feet		
	MBC DY-2	RD 0 + 000 - RD 23 + 300	4.41	7.10	Earth to Kanker	12 feet	3 feet		
	MBC DY-3	RD 0 + 000 - RD 20 + 000	3.79	6.10	Earth to Kanker	12 feet	3 feet		
	HBC DY-1	RD 0 + 000 - RD 28 + 000	5.30	8.53	Earth to Kanker	12 feet	3 feet		
	HBC DY-2	RD 0 + 000 - RD 12 + 000	2.27	3.66	Earth to Kanker	12 feet	3 feet		
	DY-2	RD 0 + 000 - RD 21 + 000	3.98	6.40	Earth to Kanker	12 feet	3 feet		
	HBC	RD 74 + 000 - RD 100 + 350	4.99	8.03	Repair of Kanker	12 feet	3 feet		
	Sub-total Length of Asphalt Pavement (SMC)		**0.00**	**0.00**					
	Sub-total Length of Metal/Macadam Pavement (SMC)		**66.94**	**107.75**					
	Sub-total Length of Kanker Pavement (SMC)		**67.65**	**108.87**					
	Sub-total Length of Kanker Repair (SMC)		**4.99**	**8.03**					
	Sub-total Length of Upgrading (SMC)		**139.58**	**224.65**					
Total of Asphalt Pavement (RMC+OMC+YMC+SMC)			**15.09**	**24.29**					
Total of Metal/Macadam Pavement (RMC+OMC+YMC+SMC)			**209.55**	**337.28**					
Total of Kanker Pavement (RMC+OMC+YMC+SMC)			**145.12**	**233.52**					
Total of Kanker Repair (RMC+OMC+YMC+SMC)			**23.37**	**37.60**					
Total of Upgrading (RMC+OMC+YMC+SMC)			**393.13**	**632.69**					

※ Unit Cost consists of pavement cost and re-sectioning work cost (= million kyat/mile)

VI.3.3.2 Unit Construction Quantity of Canal Inspection Road (per mile)

(1) Upgrade the Earth or Kanker Pavement to Asphalt Pavement

Unit Quantity of Asphalt Pavement (per mile)

1. Conditions

(1) Pavement : Asphalt	(2) Ground Condition : Hard or Normal
(3) Roadway Width : 12 ft (3.66 m)	(4) Shoulder Width : 3.0 ft (0.91 m)

2. Quantity (1/ 3)

Particulars	Measurement	Unit	Quantity	Remarks
1. Road Work				
1-1. Asphalt Pavement				
	Pavement Material & Thickness : 1st Layer ; - (Asphalt Coating)			
	2nd Layer ; 1" (1/2" to 3/4" Chipping)			
	3rd Layer ; - (Asphalt Coating)			
	4th Layer ; 6" (1" to 2" Chipping)			
	5th Layer ; 6" (2" to 4" Chipping)			
1-1-1. Pavement of 5th Layer				
※ 5th Layer consist of 2" to 4" chipping and filling material (sand and chipping stone(1" to 2",3/4" and 3/8"etc.)). Mixing volume rate between 2" to 4" chipping and filling Material is 4 (80%):1 (20%). 2" to 4" chipping should be made by crushing 6" to 9" chipping at construction site by manual.				
(1) Volume Quantity of Material				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.95
a) Volume Quantity of 2" to 4" Chipping				
(Section Area)	13' - 0" × 6" × 0.80 =	sq-ft	5.20	80% of volume
(Section Area)	3.96m × 0.152m × 0.80 =	m2	0.483	80% of volume
Unit Quantity (Volume)	(5.20 × 5,280' / 0.95) × 1.05 / 100 =	sud	303	1mile=5,280ft
Unit Quantity (Volume)	(0.483 × 1,609.34m / 0.95) × 1.05 =	m3	859	
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)				
	Rate for swell of soil compaction =			1.20
	303 × 1.20 =	sud	364	
	859 × 1.20 =	m3	1,031	
c) Volume Quantity of Filling Material				
(Section Area)	13' - 0" × 6" × 0.20 =	sq-ft	1.30	20% of volume
(Section Area)	3.96m × 0.152m × 0.20 =	m2	0.121	20% of volume
Unit Quantity (Volume)	(1.30 × 5,280' / 0.95) × 1.05 / 100 =	sud	76	1mile=5,280ft
Unit Quantity (Volume)	(0.121 × 1,609.34m / 0.95) × 1.05 =	m3	215	
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)				
	Same as volume quantity of 6" to 9" chipping	sud	364	
	Same as volume quantity of 6" to 9" chipping	m3	1,031	
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)				
	(303 + 76) / 1.05 =	sud	361	
	(859 + 215) / 1.05 =	m3	1,023	

2. Quantity (2/ 3)

Particulars	Measurement	Unit	Quantity	Remarks
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)				
	(303 + 76) / 1.05 =	sud	361	
	(859 + 215) / 1.05 =	m3	1,023	
1-1-2. Pavement of 4th Layer				
(1) Volume Quantity of 1" to 2" Chipping				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.95
(Section Area)	12' - 0" × 6" =	sq-ft	6.00	
(Section Area)	3.66m × 0.152m =	m2	0.557	
Unit Quantity (Volume)	(6.00 × 5,280' / 0.95) × 1.05 / 100 =	sud	350	1mile=5,280ft
Unit Quantity (Volume)	(0.557 × 1,609.34m / 0.95) × 1.05 =	m3	991	
(2) Spreading of 1" to 2" Chipping (by Manual)				
	6.00 × 5,280' / 0.95 / 100 =	sud	333	1mile=5,280ft
	0.557 × 1,609.34m / 0.95 =	m3	944	
(3) Compaction of 1" to 2" Chipping (by Road Roller)				
	6.00 × 5,280' / 0.95 / 100 =	sud	333	1mile=5,280ft
	0.557 × 1,609.34m / 0.95 =	m3	944	
1-1-3. Asphalt Coating of 3rd Layer				
(1) Hot Bitumen Surface Dressing (1st Coat: 40Lb per %sq-ft)		mile	1.0	W = 12 ft
		km	1.609	W = 3.66 m
(2) Hot Bitumen Surface Dressing (2nd Coat: 30Lb per %sq-ft)		mile	1.0	W = 12 ft
		km	1.609	W = 3.66 m
1-1-4. Pavement of 2nd Layer				
(1) Volume Quantity of 1/2" to 3/4" Chipping				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.95
(Section Area)	12' - 0" × 1" =	sq-ft	1.00	
(Section Area)	3.66m × 0.025m =	m2	0.093	
Unit Quantity (Volume)	(1.00 × 5,280' / 0.95) × 1.05 / 100 =	sud	58	1mile=5,280ft
Unit Quantity (Volume)	(0.093 × 1,609.34m / 0.95) × 1.05 =	m3	165	
(2) Spreading of 1/2" to 3/4" Chipping (by Manual)				
	1.00 × 5,280' / 0.95 / 100 =	sud	56	1mile=5,280ft
	0.093 × 1,609.34m / 0.95 =	m3	158	
(3) Compaction of 1/2" to 3/4" Chipping (by Road Roller)				
	1.00 × 5,280' / 0.95 / 100 =	sud	56	1mile=5,280ft
	0.093 × 1,609.34m / 0.95 =	m3	158	

2. Quantity (3/ 3)

Particulars	Measurement	Unit	Quantity	Remarks
1-1-5. Asphalt Coating of 1st Layer				
(1) Hot Bitumen Surface Dressing (1st Coat: 30Lb per %sq-ft)		mile	1.0	W = 12 ft
		km	1.609	W = 3.66 m
1-2. Shoulder				
(1) Volume Quantity of Kanker				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.90
(Section Area)	(3' - 0" × 7") × 2 =	sq-ft	3.500	
(Section Area)	(0.914m × 0.178m) × 2 =	m2	0.325	
Unit Quantity (Volume)	(3.50 × 5,280' / 0.90) × 1.05 / 100 =	sud	216	1mile=5,280ft
Unit Quantity (Volume)	(0.325 × 1,609.34m / 0.90) × 1.05 =	m3	610	
(2) Laying and Compaction of Shoulder				
	3.50 × 5,280' / 0.90 / 100 =	sud	205	1mile=5,280ft
	0.325 × 1,609.34m / 0.90 =	m3	581	
2. Other Related Works				
(1) Survey and Profile Work				
(2) Site Clearing Work (by Manual)				
(3) Transporting and Shifting of Heavy Machinery				
(4) Labor Transporting Work				
(5) Loading and Unloading of Materials		set	1	
(6) Repairing of Machinery				
(7) Welfare Charges for Worker				
(Temporary Rest Station, Temporary Latrine etc.)				
(8) Miscellaneous				

(2) Upgrade the Earth or Kanker Pavement to Metal/Macadam (Rock) Pavement

Unit Quantity of Metal/Macadam (Rock) Pavement (per mile)

1. Conditions

(1) Pavement : Metal/Macadam (Rock)	(2) Ground Condition : Hard or Normal
(3) Roadway Width : 12 ft (3.66 m)	(4) Shoulder Width : 3.0 ft (0.91 m)

2. Quantity (1/ 3)

Particulars	Measurement	Unit	Quantity	Remarks
1. Road Work				
1-1. Metal / Macadam (Rock) Pavement				
	Pavement Material & Thickness : 1st Layer ; 2"			(Kanker)
	2nd Layer ; 6"			(1" to 2" Chipping)
	3rd Layer ; 6"			(2" to 4" Chipping)
1-1-1. Pavement of 3rd Layer				
※ 3rd Layer consist of 2" to 4" chipping and filling material (sand and chipping stone(1" to 2",3/4" and 3/8"etc.)). Mixing volume rate between 2" to 4" chipping and filling Material is 4 (80%):1 (20%). 2" to 4" chipping should be made by crushing 6" to 9" chipping at construction site by manual.				
(1) Volume Quantity of Material				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.95
a) Volume Quantity of 2" to 4" Chipping				
(Section Area)	13' - 0" × 6" × 0.80 =	sq-ft	5.20	80% of volume
(Section Area)	3.96m × 0.152m × 0.80 =	m2	0.483	80% of volume
Unit Quantity (Volume)	(5.20 × 5,280' / 0.95) × 1.05 / 100 =	sud	303	1mile=5,280ft
Unit Quantity (Volume)	(0.483 × 1,609.34m / 0.95) × 1.05 =	m3	859	
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)				
	Rate for swell of soil compaction =			1.20
	303 × 1.20 =	sud	364	
	859 × 1.20 =	m3	1,031	
c) Volume Quantity of Filling Material				
(Section Area)	13' - 0" × 6" × 0.20 =	sq-ft	1.30	20% of volume
(Section Area)	3.96m × 0.152m × 0.20 =	m2	0.121	20% of volume
Unit Quantity (Volume)	(1.30 × 5,280' / 0.95) × 1.05 / 100 =	sud	76	1mile=5,280ft
Unit Quantity (Volume)	(0.121 × 1,609.34m / 0.95) × 1.05 =	m3	215	
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)				
	Same as volume quantity of 6" to 9" chipping	sud	364	
	Same as volume quantity of 6" to 9" chipping	m3	1,031	
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)				
	(303 + 76) / 1.05 =	sud	361	
	(859 + 215) / 1.05 =	m3	1,023	
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)				
	(303 + 76) / 1.05 =	sud	361	
	(859 + 215) / 1.05 =	m3	1,023	

2. Quantity (2/ 3)

Particulars	Measurement	Unit	Quantity	Remarks
1-1-2. Pavement of 2nd Layer				
(1) Volume Quantity of 1" to 2" Chipping				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.95
(Section Area)	12' - 0" × 6" =	sq-ft	6.00	
(Section Area)	3.66m × 0.152m =	m2	0.557	
Unit Quantity (Volume)	(6.00 × 5,280' / 0.95) × 1.05 / 100 =	sud	350	1mile=5,280ft
Unit Quantity (Volume)	(0.557 × 1,609.34m / 0.95) × 1.05 =	m3	991	
(2) Spreading of 1" to 2" Chipping (by Manual)				
	6.00 × 5,280' / 0.95 / 100 =	sud	333	1mile=5,280ft
	0.557 × 1,609.34m / 0.95 =	m3	944	
(3) Compaction of 1" to 2" Chipping (by Road Roller)				
	6.00 × 5,280' / 0.95 / 100 =	sud	333	1mile=5,280ft
	0.557 × 1,609.34m / 0.95 =	m3	944	
1-1-3. Pavement of 1st Layer				
(1) Volume Quantity of Kanker				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.90
(Section Area)	12' - 0" × 2" =	sq-ft	2.00	
(Section Area)	3.66m × 0.051m =	m2	0.186	
Unit Quantity (Volume)	(2.00 × 5,280' / 0.90) × 1.05 / 100 =	sud	123	1mile=5,280ft
Unit Quantity (Volume)	(0.186 × 1,609.34m / 0.90) × 1.05 =	m3	349	
(2) Spreading of Kanker (by Manual)				
	2.00 × 5,280' / 0.90 / 100 =	sud	117	1mile=5,280ft
	0.186 × 1,609.34m / 0.90 =	m3	333	
(3) Compaction of Kanker (by Road Roller)				
	2.00 × 5,280' / 0.90 / 100 =	sud	117	1mile=5,280ft
	0.186 × 1,609.34m / 0.90 =	m3	333	
1-2. Shoulder				
(1) Volume Quantity of Kanker				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.90
(Section Area)	(3' - 0" × 8") × 2 =	sq-ft	4.000	
(Section Area)	(0.914m × 0.203m) × 2 =	m2	0.372	
Unit Quantity (Volume)	(4.00 × 5,280' / 0.90) × 1.05 / 100 =	sud	246	1mile=5,280ft
Unit Quantity (Volume)	(0.372 × 1,609.34m / 0.90) × 1.05 =	m3	698	
(2) Laying and Compaction of Shoulder				
	4.00 × 5,280' / 0.90 / 100 =	sud	235	1mile=5,280ft
	0.372 × 1,609.34m / 0.90 =	m3	665	

2. Quantity (3/ 3)

Particulars	Measurement	Unit	Quantity	Remarks
2. Other Related Works				
(1) Survey and Profile Work				
(2) Site Clearing Work (by Manual)				
(3) Transporting and Shifting of Heavy Machinery				
(4) Labor Transporting Work				
(5) Loading and Unloading of Materials		set	1	
(6) Repairing of Machinery				
(7) Welfare Charges for Worker				
(Temporary Rest Station, Temporary Latrine etc.)				
(8) Miscellaneous				

(3) Upgrade the Earth Pavement to Kanker Pavement

Unit Quantity of Kanker Pavement (per mile)

1. Conditions

(1) Pavement : Kanker	(2) Ground Condition : Hard or Normal
(3) Roadway Width : 12 ft (3.66 m)	(4) Shoulder Width : 3.0 ft (0.91 m)

2. Quantity (1/ 2)

Particulars	Measurement	Unit	Quantity	Remarks
1. Road Work				
Kanker Pavement				
	Pavement Material & Thickness : 1st Layer ; 6" (Kanker)			
1-1. Pavement of 1st Layer				
(1) Volume Quantity of Kanker				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.90
(Section Area)	12' - 0" × 6" =	sq-ft	6.00	
(Section Area)	3.66m × 0.152m =	m2	0.557	
Unit Quantity (Volume)	(6.00 × 5,280' / 0.90) × 1.05 / 100 =	sud	370	1mile=5,280ft
Unit Quantity (Volume)	(0.557 × 1,609.34m / 0.90) × 1.05 =	m3	1,046	
(2) Spreading of Kanker (by Manual)				
	6.00 × 5,280' / 0.90 / 100 =	sud	352	1mile=5,280ft
	0.557 × 1,609.34m / 0.90 =	m3	996	
(3) Compaction of Kanker (by Road Roller)				
	6.00 × 5,280' / 0.90 / 100 =	sud	352	1mile=5,280ft
	0.557 × 1,609.34m / 0.90 =	m3	996	
1-2. Shoulder				
(1) Volume Quantity of Kanker				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.90
(Section Area)	(3' - 0" × 6") × 2 =	sq-ft	3.000	
(Section Area)	(0.914m × 0.152m) × 2 =	m2	0.279	
Unit Quantity (Volume)	(3.00 × 5,280' / 0.90) × 1.05 / 100 =	sud	185	1mile=5,280ft
Unit Quantity (Volume)	(0.279 × 1,609.34m / 0.90) × 1.05 =	m3	524	
(2) Laying and Compaction of Shoulder				
	3.00 × 5,280' / 0.90 / 100 =	sud	176	1mile=5,280ft
	0.279 × 1,609.34m / 0.90 =	m3	499	

2. Quantity (2/ 2)

Particulars	Measurement	Unit	Quantity	Remarks
2. Other Related Works				
(1) Survey and Profile Work		set	1	
(2) Site Clearing Work (by Manual)				
(3) Transporting and Shifting of Heavy Machinery				
(4) Labor Transporting Work				
(5) Loading and Unloading of Materials				
(6) Repairing of Machinery				
(7) Welfare Charges for Worker				
(Temporary Rest Station, Temporary Latrine etc.)				
(8) Miscellaneous				

(4) Repair of Kanker Pavement

Unit Quantity of Kanker Pavement (per mile)

1. Conditions

(1) Pavement : Kanker	(2) Ground Condition : Hard or Normal
(3) Roadway Width : 12 ft (3.66 m)	(4) Shoulder Width : 3.0 ft (0.91 m)

2. Quantity (1/ 2)

Particulars	Measurement	Unit	Quantity	Remarks
1. Road Work				
Kanker Pavement				
	Pavement Material & Thickness : 1st Layer ;	3"	(Kanker: New Laying)	
		3"	(Existing Use)	
1-1. Pavement of 1st Layer				
(1) Volume Quantity of Kanker				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.90
(Section Area)	12' - 0" × 3" =	sq-ft	3.00	
(Section Area)	3.66m × 0.076m =	m2	0.279	
Unit Quantity (Volume)	(3.00 × 5,280' / 0.90) × 1.05 / 100 =	sud	185	1mile=5,280ft
Unit Quantity (Volume)	(0.279 × 1,609.34m / 0.90) × 1.05 =	m3	524	
(2) Spreading of Kanker (by Manual)				
	3.00 × 5,280' / 0.90 / 100 =	sud	176	1mile=5,280ft
	0.279 × 1,609.34m / 0.90 =	m3	499	
(3) Compaction of Kanker (by Road Roller)				
	3.00 × 5,280' / 0.90 / 100 =	sud	176	1mile=5,280ft
	0.279 × 1,609.34m / 0.90 =	m3	499	
1-2. Shoulder				
(1) Volume Quantity of Kanker				
	Rate of material loss (during transportation and keeping in stock yard etc.) =			5 % of volume
	Rate for shrinkage of soil compaction =			0.90
(Section Area)	(3' - 0" × 3") × 2 =	sq-ft	1.500	
(Section Area)	(0.914m × 0.076m) × 2 =	m2	0.139	
Unit Quantity (Volume)	(1.50 × 5,280' / 0.90) × 1.05 / 100 =	sud	92	1mile=5,280ft
Unit Quantity (Volume)	(0.139 × 1,609.34m / 0.90) × 1.05 =	m3	261	(Existing Use)
(2) Laying and Compaction of Shoulder				
	1.50 × 5,280' / 0.90 / 100 =	sud	88	1mile=5,280ft
	0.139 × 1,609.34m / 0.90 =	m3	249	

2. Quantity (2/ 2)

Particulars	Measurement	Unit	Quantity	Remarks
2. Other Related Works				
(1) Survey and Profile Work				
(2) Site Clearing Work (by Manual)				
(3) Transporting and Shifting of Heavy Machinery				
(4) Labor Transporting Work				
(5) Loading and Unloading of Materials		set	1	
(6) Repairing of Machinery				
(7) Welfare Charges for Worker				
(Temporary Rest Station, Temporary Latrine etc.)				
(8) Miscellaneous				

VI.3.3.1 Unit Construction Cost of Canal Inspection Road (per mile)

1. Right Main Canal System

(1) Metal/ Macadam (Rock) Pavement (RMC, AEC)

Unit Construction Cost of Metal/Macadam (Rock) Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Metal / Macadam (Rock) Pavement				
1-1-1. Pavement of 3rd Layer				
(1) Volume Quantity of Material				
a) Volume Quantity of 2" to 4" Chipping	303	sud		
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)	364	sud		
c) Volume Quantity of Filling Material	76	sud		
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)	364	sud		
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)	361	sud		
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)	361	sud		
1-1-2. Pavement of 2nd Layer				
(1) Volume Quantity of 1" to 2" Chipping	350	sud		
(2) Spreading of 1" to 2" Chipping (by Manual)	333	sud		
(3) Compaction of 1" to 2" Chipping (by Road Roller)	333	sud		
1-1-3. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	123	sud		
(2) Spreading of Kanker (by Manual)	117	sud		
(3) Compaction of Kanker (by Road Roller)	117	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	246	sud		
(2) Laying and Compaction of Shoulder	235	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

(2) Metal/ Macadam (Rock) Pavement (BEC)

Unit Construction Cost of Metal/Macadam (Rock) Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Metal / Macadam (Rock) Pavement				
1-1-1. Pavement of 3rd Layer				
(1) Volume Quantity of Material				
a) Volume Quantity of 2" to 4" Chipping	303	sud		
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)	364	sud		
c) Volume Quantity of Filling Material	76	sud		
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)	364	sud		
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)	361	sud		
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)	361	sud		
1-1-2. Pavement of 2nd Layer				
(1) Volume Quantity of 1" to 2" Chipping	350	sud		
(2) Spreading of 1" to 2" Chipping (by Manual)	333	sud		
(3) Compaction of 1" to 2" Chipping (by Road Roller)	333	sud		
1-1-3. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	123	sud		
(2) Spreading of Kanker (by Manual)	117	sud		
(3) Compaction of Kanker (by Road Roller)	117	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	164	sud		
(2) Laying and Compaction of Shoulder	156	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

※ Not including re-sectioning work cost (= million kyat/mile)

(3) Kanker Pavement (AEC)

Unit Construction Cost of Kanker Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	370	sud		
(2) Spreading of Kanker (by Manual)	352	sud		
(3) Compaction of Kanker (by Road Roller)	352	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	185	sud		
(2) Laying and Compaction of Shoulder	176	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

(4) Repair of Kanker Pavement (RMC, AEC)

Unit Construction Cost of Kanker Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	185	sud		
(2) Spreading of Kanker (by Manual)	176	sud		
(3) Compaction of Kanker (by Road Roller)	176	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	92	sud		
(2) Laying and Compaction of Shoulder	88	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

※ Not including re-sectioning work cost (= million kyat/mile)

2. Old Mu Canal System

(1) Asphalt Pavement (OMC)

Unit Construction Cost of Asphalt Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Asphalt Pavement				
1-1-1. Pavement of 5th Layer				
(1) Volume Quantity of Material				
a) Volume Quantity of 2" to 4" Chipping	303	sud		
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)	364	sud		
c) Volume Quantity of Filling Material	76	sud		
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)	364	sud		
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)	361	sud		
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)	361	sud		
1-1-2. Pavement of 4th Layer				
(1) Volume Quantity of 1" to 2" Chipping	350	sud		
(2) Spreading of 1" to 2" Chipping (by Manual)	333	sud		
(3) Compaction of 1" to 2" Chipping (by Road Roller)	333	sud		
1-1-3. Asphalt Coating of 3rd Layer				
(1) Hot Bitumen Surface Dressing (1st Coat: 40Lb per %sq-ft)	1.0	mile		
(2) Hot Bitumen Surface Dressing (2nd Coat: 30Lb per %sq-ft)	1.0	mile		
1-1-4. Pavement of 2nd Layer				
(1) Volume Quantity of 1/2" to 3/4" Chipping	58	sud		
(2) Spreading of 1/2" to 3/4" Chipping (by Manual)	56	sud		
(3) Compaction of 1/2" to 3/4" Chipping (by Road Roller)	56	sud		
1-1-5. Asphalt Coating of 1st Layer				
(1) Hot Bitumen Surface Dressing (1st Coat: 30Lb per %sq-ft)	1.0	mile		
1-2. Shoulder				
(1) Volume Quantity of Kanker	216	sud		
(2) Laying and Compaction of Shoulder	205	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

(2) Metal/ Macadam (Rock) Pavement (OMC)

Unit Construction Cost of Metal/Macadam (Rock) Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Metal / Macadam (Rock) Pavement				
1-1-1. Pavement of 3rd Layer				
(1) Volume Quantity of Material				
a) Volume Quantity of 2" to 4" Chipping	303	sud		
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)	364	sud		
c) Volume Quantity of Filling Material	76	sud		
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)	364	sud		
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)	361	sud		
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)	361	sud		
1-1-2. Pavement of 2nd Layer				
(1) Volume Quantity of 1" to 2" Chipping	350	sud		
(2) Spreading of 1" to 2" Chipping (by Manual)	333	sud		
(3) Compaction of 1" to 2" Chipping (by Road Roller)	333	sud		
1-1-3. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	123	sud		
(2) Spreading of Kanker (by Manual)	117	sud		
(3) Compaction of Kanker (by Road Roller)	117	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	246	sud		
(2) Laying and Compaction of Shoulder	235	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

※ Not including re-sectioning work cost (= million kyat/mile)

(3) Kanker Pavement (DY Canal)

Unit Construction Cost of Kanker Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	370	sud		
(2) Spreading of Kanker (by Manual)	352	sud		
(3) Compaction of Kanker (by Road Roller)	352	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	185	sud		
(2) Laying and Compaction of Shoulder	176	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

3. Ye-U Main Canal System

(1) Asphalt Pavement (MBC)

Unit Construction Cost of Asphalt Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Asphalt Pavement				
1-1-1. Pavement of 5th Layer				
(1) Volume Quantity of Material				
a) Volume Quantity of 2" to 4" Chipping	303	sud		
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)	364	sud		
c) Volume Quantity of Filling Material	76	sud		
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)	364	sud		
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)	361	sud		
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)	361	sud		
1-1-2. Pavement of 4th Layer				
(1) Volume Quantity of 1" to 2" Chipping	350	sud		
(2) Spreading of 1" to 2" Chipping (by Manual)	333	sud		
(3) Compaction of 1" to 2" Chipping (by Road Roller)	333	sud		
1-1-3. Asphalt Coating of 3rd Layer				
(1) Hot Bitumen Surface Dressing (1st Coat: 40Lb per %sq-ft)	1.0	mile		
(2) Hot Bitumen Surface Dressing (2nd Coat: 30Lb per %sq-ft)	1.0	mile		
1-1-4. Pavement of 2nd Layer				
(1) Volume Quantity of 1/2" to 3/4" Chipping	58	sud		
(2) Spreading of 1/2" to 3/4" Chipping (by Manual)	56	sud		
(3) Compaction of 1/2" to 3/4" Chipping (by Road Roller)	56	sud		
1-1-5. Asphalt Coating of 1st Layer				
(1) Hot Bitumen Surface Dressing (1st Coat: 30Lb per %sq-ft)	1.0	mile		
1-2. Shoulder				
(1) Volume Quantity of Kanker	216	sud		
(2) Laying and Compaction of Shoulder	205	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

※ Not including re-sectioning work cost (= million kyat/mile)

(2) Metal/ Macadam (Rock) Pavement (YMC, MBC, DY Canal)

Unit Construction Cost of Metal/Macadam (Rock) Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Metal / Macadam (Rock) Pavement				
1-1-1. Pavement of 3rd Layer				
(1) Volume Quantity of Material				
a) Volume Quantity of 2" to 4" Chipping	303	sud		
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)	364	sud		
c) Volume Quantity of Filling Material	76	sud		
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)	364	sud		
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)	361	sud		
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)	361	sud		
1-1-2. Pavement of 2nd Layer				
(1) Volume Quantity of 1" to 2" Chipping	350	sud		
(2) Spreading of 1" to 2" Chipping (by Manual)	333	sud		
(3) Compaction of 1" to 2" Chipping (by Road Roller)	333	sud		
1-1-3. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	123	sud		
(2) Spreading of Kanker (by Manual)	117	sud		
(3) Compaction of Kanker (by Road Roller)	117	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	246	sud		
(2) Laying and Compaction of Shoulder	235	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

(3) Kanker Pavement (DY Canal)

Unit Construction Cost of Kanker Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	370	sud		
(2) Spreading of Kanker (by Manual)	352	sud		
(3) Compaction of Kanker (by Road Roller)	352	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	185	sud		
(2) Laying and Compaction of Shoulder	176	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

※ Not including re-sectioning work cost (= million kyat/mile)

4. Shwebo Main Canal System

(1) Metal/ Macadam (Rock) Pavement (SMC, MBC)

Unit Construction Cost of Metal/Macadam (Rock) Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Metal / Macadam (Rock) Pavement				
1-1-1. Pavement of 3rd Layer				
(1) Volume Quantity of Material				
a) Volume Quantity of 2" to 4" Chipping	303	sud		
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)	364	sud		
c) Volume Quantity of Filling Material	76	sud		
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)	364	sud		
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)	361	sud		
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)	361	sud		
1-1-2. Pavement of 2nd Layer				
(1) Volume Quantity of 1" to 2" Chipping	350	sud		
(2) Spreading of 1" to 2" Chipping (by Manual)	333	sud		
(3) Compaction of 1" to 2" Chipping (by Road Roller)	333	sud		
1-1-3. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	123	sud		
(2) Spreading of Kanker (by Manual)	117	sud		
(3) Compaction of Kanker (by Road Roller)	117	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	164	sud		
(2) Laying and Compaction of Shoulder	156	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

(2) Metal/ Macadam (Rock) Pavement (DY-1, 3 Canal)

Unit Construction Cost of Metal/Macadam (Rock) Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Metal / Macadam (Rock) Pavement				
1-1-1. Pavement of 3rd Layer				
(1) Volume Quantity of Material				
a) Volume Quantity of 2" to 4" Chipping	303	sud		
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)	364	sud		
c) Volume Quantity of Filling Material	76	sud		
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)	364	sud		
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)	361	sud		
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)	361	sud		
1-1-2. Pavement of 2nd Layer				
(1) Volume Quantity of 1" to 2" Chipping	350	sud		
(2) Spreading of 1" to 2" Chipping (by Manual)	333	sud		
(3) Compaction of 1" to 2" Chipping (by Road Roller)	333	sud		
1-1-3. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	123	sud		
(2) Spreading of Kanker (by Manual)	117	sud		
(3) Compaction of Kanker (by Road Roller)	117	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	246	sud		
(2) Laying and Compaction of Shoulder	235	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =			**(million kyat/mile)**	

※ Not including re-sectioning work cost (= million kyat/mile)

(3) Metal/ Macadam (Rock) Pavement (DY-4 Canal)

Unit Construction Cost of Metal/Macadam (Rock) Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Metal / Macadam (Rock) Pavement				
1-1-1. Pavement of 3rd Layer				
(1) Volume Quantity of Material				
a) Volume Quantity of 2" to 4" Chipping	210	sud		
b) Volume Quantity of 6" to 9" Chipping (before breaking into 2" to 4" chipping)	252	sud		
c) Volume Quantity of Filling Material	53	sud		
(2) Breaking 2" to 4" Chipping from 6" to 9" Chipping at Construction Site (by Manual)	252	sud		
(3) Spreading and Mixing of 2" to 4" Chipping & Filling Material (by Manual)	250	sud		
(4) Compaction of 2" to 4" Chipping & Filling Material (by Road Roller)	250	sud		
1-1-2. Pavement of 2nd Layer				
(1) Volume Quantity of 1" to 2" Chipping	233	sud		
(2) Spreading of 1" to 2" Chipping (by Manual)	222	sud		
(3) Compaction of 1" to 2" Chipping (by Road Roller)	222	sud		
1-1-3. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	82	sud		
(2) Spreading of Kanker (by Manual)	78	sud		
(3) Compaction of Kanker (by Road Roller)	78	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	82	sud		
(2) Laying and Compaction of Shoulder	78	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

(4) Kanker Pavement (AEC)

Unit Construction Cost of Kanker Road (per mile)

【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	370	sud		
(2) Spreading of Kanker (by Manual)	352	sud		
(3) Compaction of Kanker (by Road Roller)	352	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	185	sud		
(2) Laying and Compaction of Shoulder	176	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

※ Not including re-sectioning work cost (= million kyat/mile)

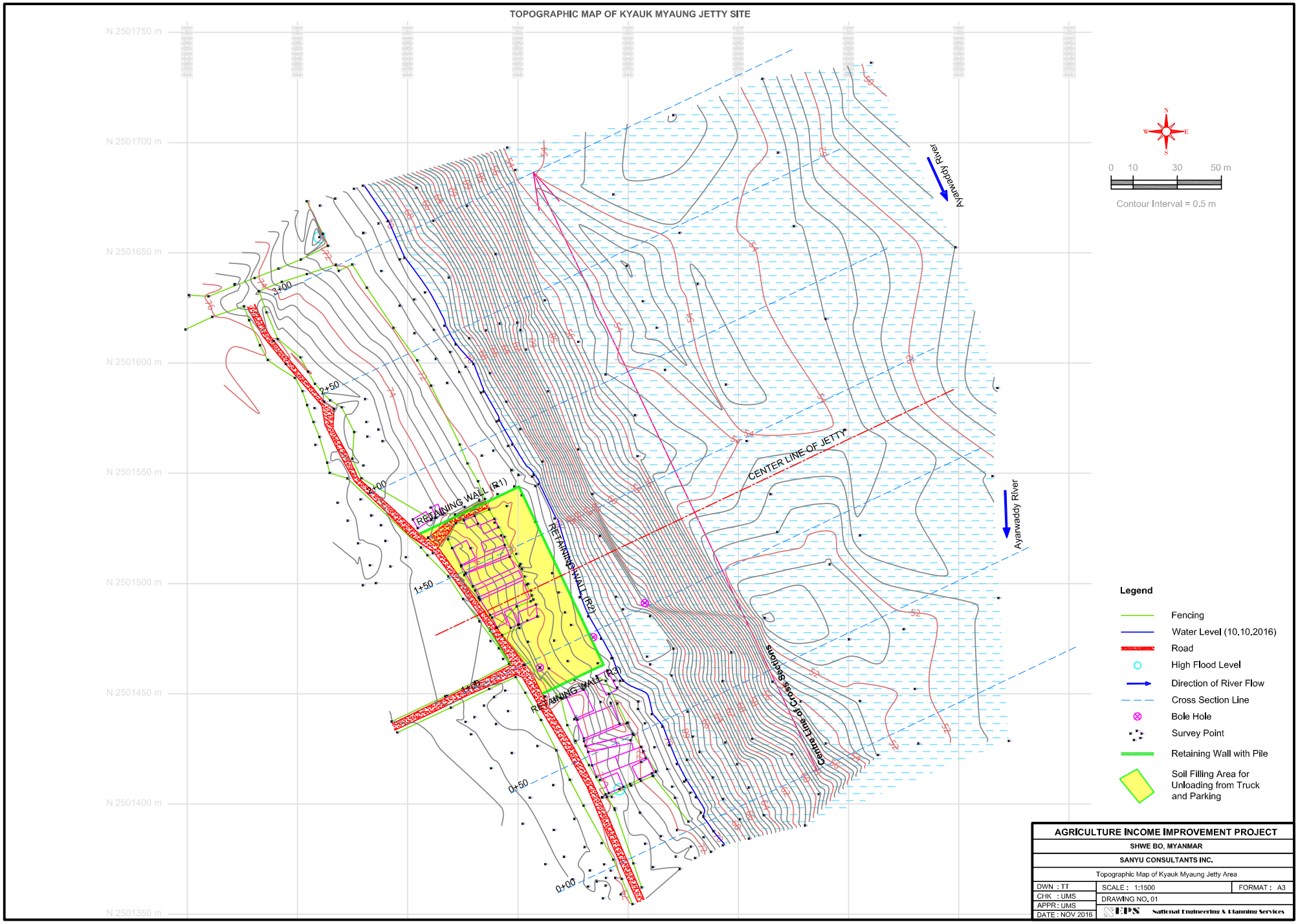
(5) Repair of Kanker Pavement (RMC, AEC)

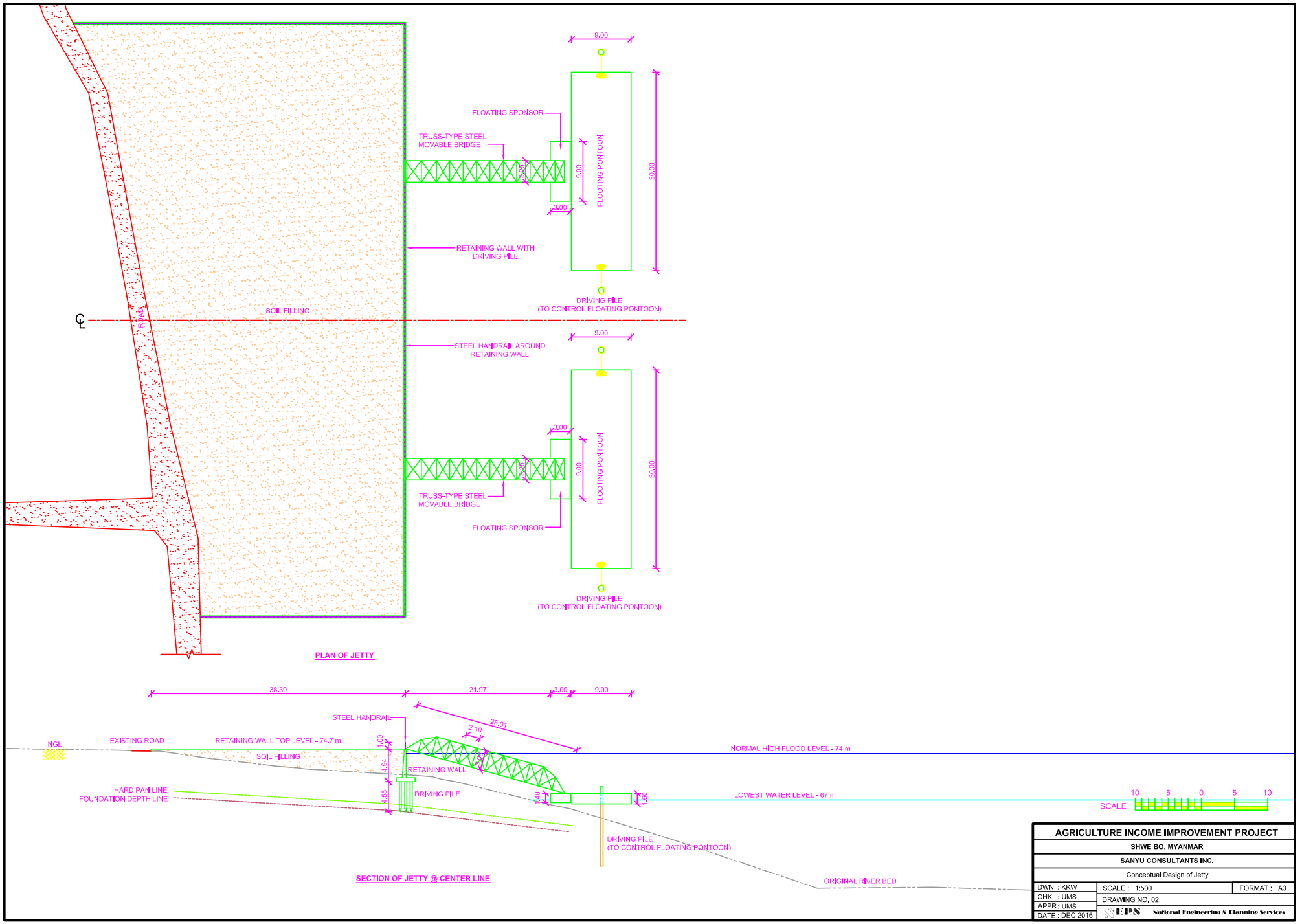
Unit Construction Cost of Kanker Road (per mile)

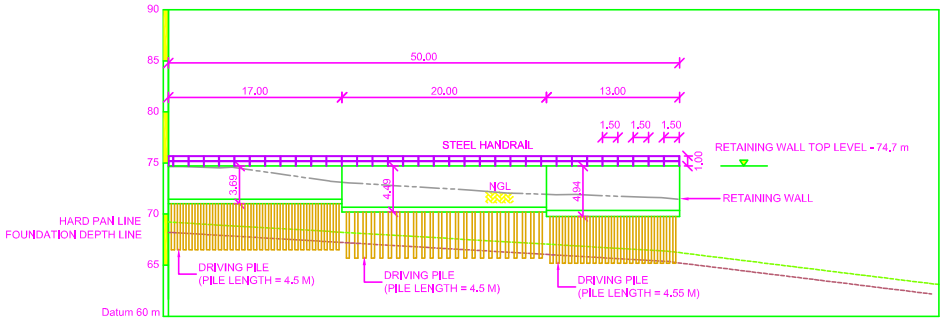
【Rural Road】

Work Item	Quantity	Unit	Unit Price (kyat)	Cost (kyat)
1. Road Work				
1-1. Pavement of 1st Layer				
(1) Volume Quantity of Kanker	185	sud		
(2) Spreading of Kanker (by Manual)	176	sud		
(3) Compaction of Kanker (by Road Roller)	176	sud		
1-2. Shoulder				
(1) Volume Quantity of Kanker	92	sud		
(2) Laying and Compaction of Shoulder	88	sud		
2. Other Related Works	1	set		
			Total	
Unit Construction Cost =		**(million kyat/mile)**		

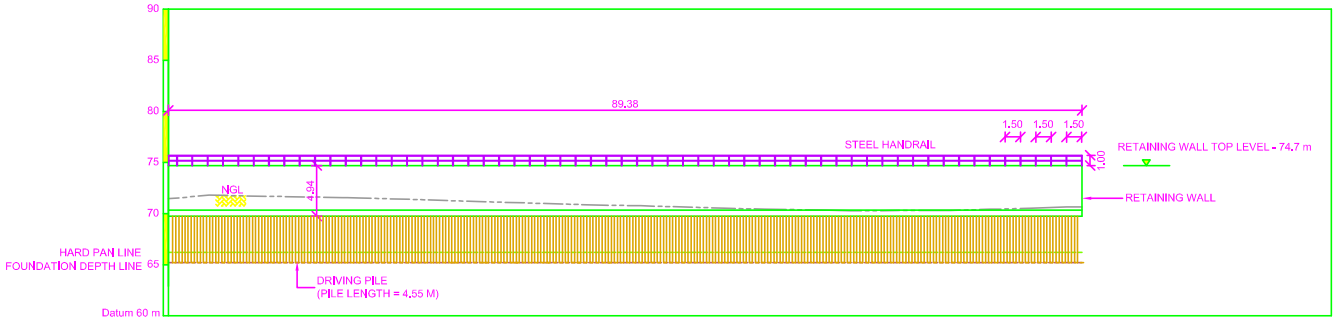
※ Not including re-sectioning work cost (= million kyat/mile)


TOPOGRAPHIC MAP OF KYAUK MYAUNG JETTY SITE
N 2501750 m
N 2501700 m
N 2501650 m
N 2501600 m
N 2501550 m
N 2501500 m
N 2501450 m
N 2501400 m
N 2501350 m
Ayarwaddy River
CENTER LINE OF JETTY
Ayarwaddy River
RETAINING WALL (R1)
RETAINING WALL (R2)
RETAINING WALL (R3)
Centre Line of Cross Sections
3+00
2+50
2+00
1+50
1+00
0+50
0+00
N
W
E
S
0 10 30 50 m
Contour Interval = 0.5 m
Legend
Fencing
Water Level (10.10.2016)
Road
High Flood Level
Direction of River Flow
Cross Section Line
Bole Hole
Survey Point
Retaining Wall with Pile
Soil Filling Area for Unloading from Truck and Parking
AGRICULTURE INCOME IMPROVEMENT PROJECT
SHWE BO, MYANMAR
SANYU CONSULTANTS INC.
Topographic Map of Kyauk Myaung Jetty Area
DWN : TT
CHK : UMS
APPR: UMS
DATE : NOV 2016
SCALE : 1:1500
FORMAT : A3
DRAWING NO. 01
NEPS National Engineering & Planning Services

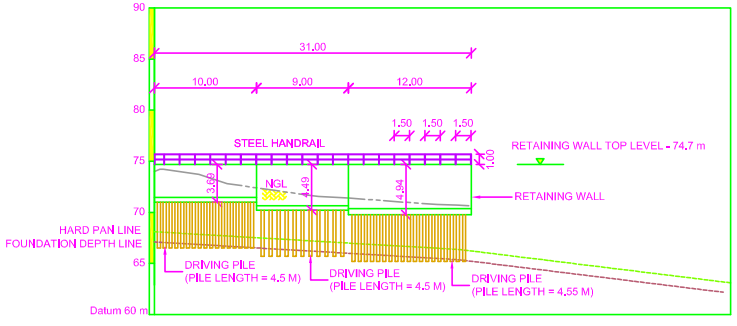

9.00
FLOATING SPONSOR
TRUSS-TYPE STEEL MOVABLE BRIDGE
3.00
9.00
FLOATING PONTOON
30.00
RETAINING WALL WITH DRIVING PILE
DRIVING PILE (TO CONTROL FLOATING PONTOON)
SOIL FILLING
STEEL HANDRAIL AROUND RETAINING WALL
PLAN OF JETTY
38.39
21.97
STEEL HANDRAIL
25.01
2.10
NGL
EXISTING ROAD
RETAINING WALL TOP LEVEL - 74.7 m
NORMAL HIGH FLOOD LEVEL - 74 m
SOIL FILLING
RETAINING WALL
HARD PAN LINE
FOUNDATION DEPTH LINE
DRIVING PILE
LOWEST WATER LEVEL - 67 m
SCALE
DRIVING PILE (TO CONTROL FLOATING PONTOON)
ORIGINAL RIVER BED
SECTION OF JETTY @ CENTER LINE
AGRICULTURE INCOME IMPROVEMENT PROJECT
SHWE BO, MYANMAR
SANYU CONSULTANTS INC.
Conceptual Design of Jetty
DWN : KKW
CHK : UMS
APPR: UMS
DATE : DEC 2016
SCALE : 1:500
FORMAT : A3
DRAWING NO. 02
National Engineering & Planning Services



LS of Retaining Wall (R1)

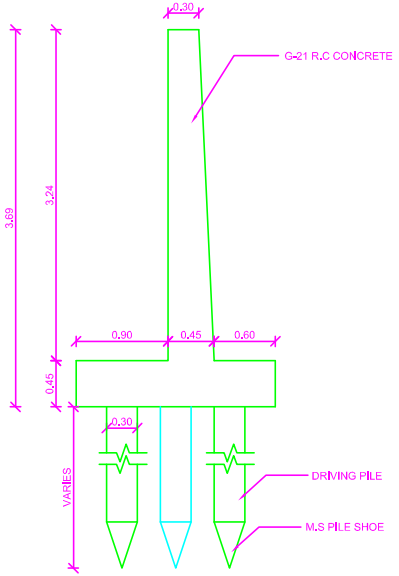


LS of Retaining Wall (R2)

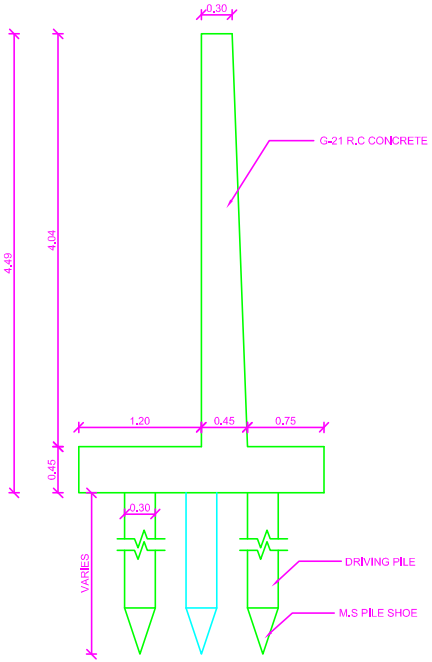


LS of Retaining Wall (R3)

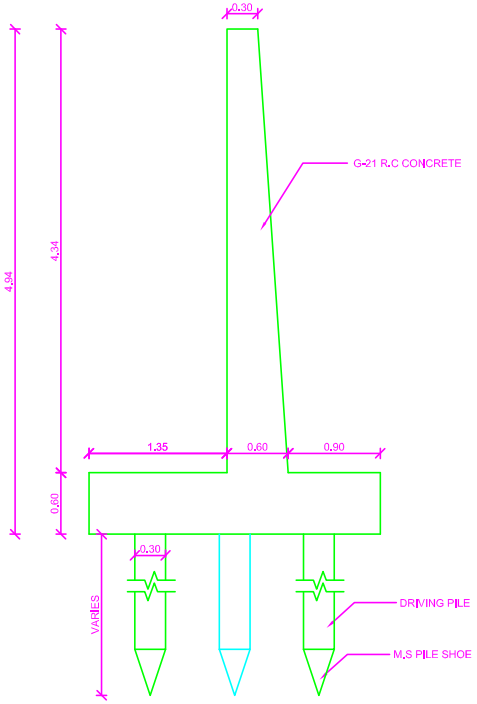
AGRICULTURE INCOME IMPROVEMENT PROJECT		
SHWE BO, MYANMAR		
SANYU CONSULTANTS INC.		
Longitudinal Section of Retaining Wall		
DWN : KKW	SCALE : 1:500	FORMAT : A3
CHK : UMS	DRAWING NO. 03	
APPR : UMS		
DATE : DEC 2016	NEPS National Engineering & Planning Services	



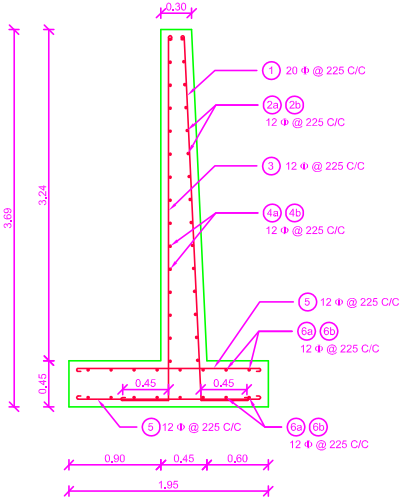
RETAINING WALL FOR HEIGHT 3.69 M



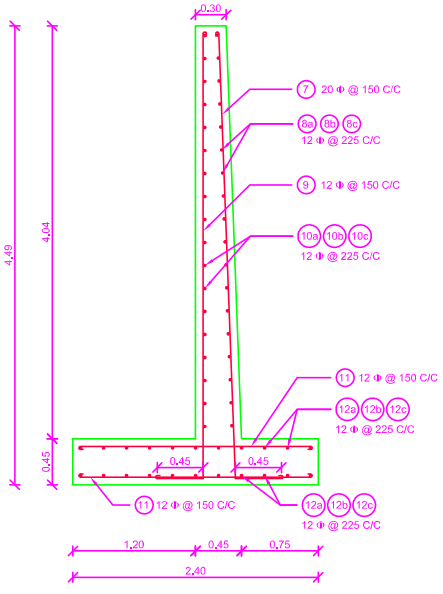
RETAINING WALL FOR HEIGHT 4.49 M



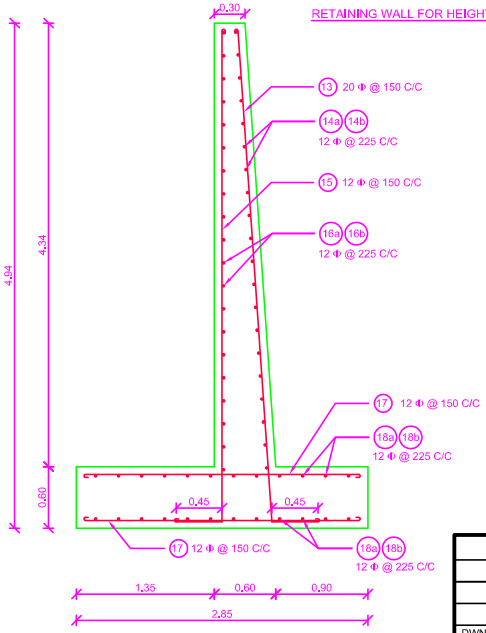
RETAINING WALL FOR HEIGHT 4.94 M



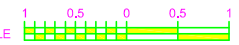
RETAINING WALL FOR HEIGHT 3.69 M
(REINFORCEMENT DETAIL)



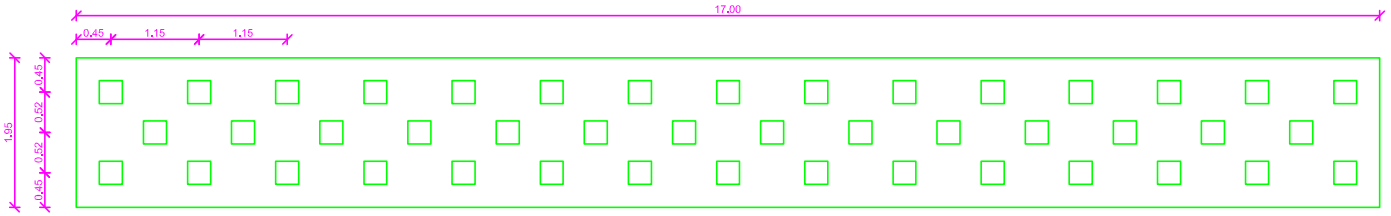
RETAINING WALL FOR HEIGHT 4.49 M
(REINFORCEMENT DETAIL)



RETAINING WALL FOR HEIGHT 4.94 M
(REINFORCEMENT DETAIL)

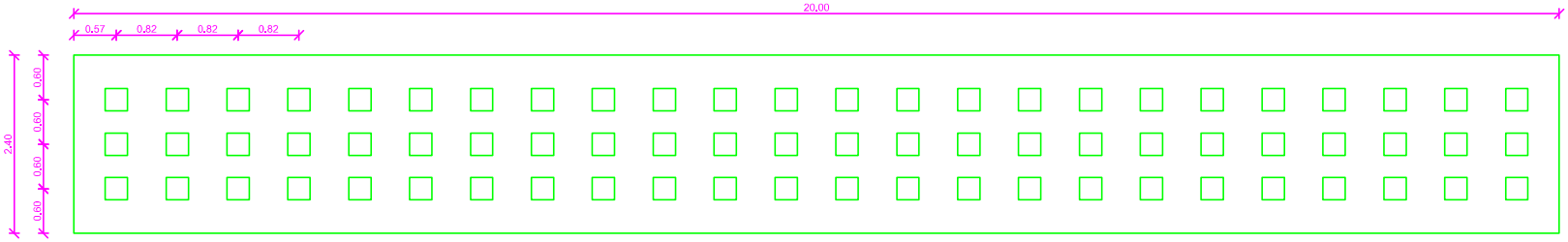


AGRICULTURE INCOME IMPROVEMENT PROJECT		
SHWE BO, MYANMAR		
SANYU CONSULTANTS INC.		
Retaining Wall Detail		
DWN : KKW	SCALE : 1:50	FORMAT : A3
CHK : UMS	DRAWING NO. 04	
APPR : UMS		
DATE : NOV 2016	NEPS National Engineering & Planning Services	



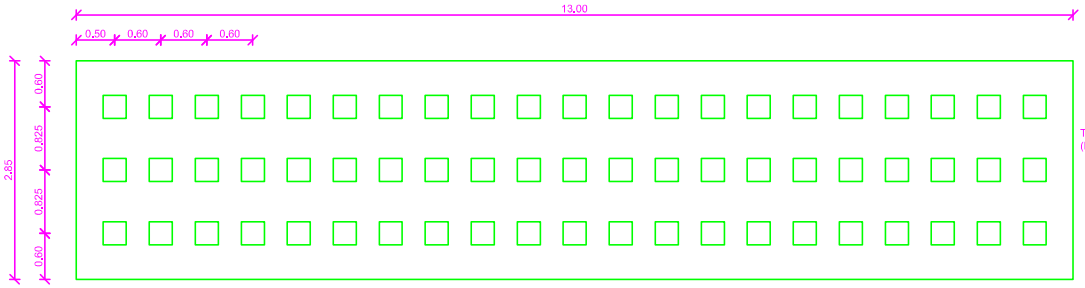
TOTAL NUMBERS OF PILE = 44 NOS.
(PILE LENGTH = 4.5 M)

PILE PLAN FOR R1 (RETAINING WALL HEIGHT = 3.69 M)



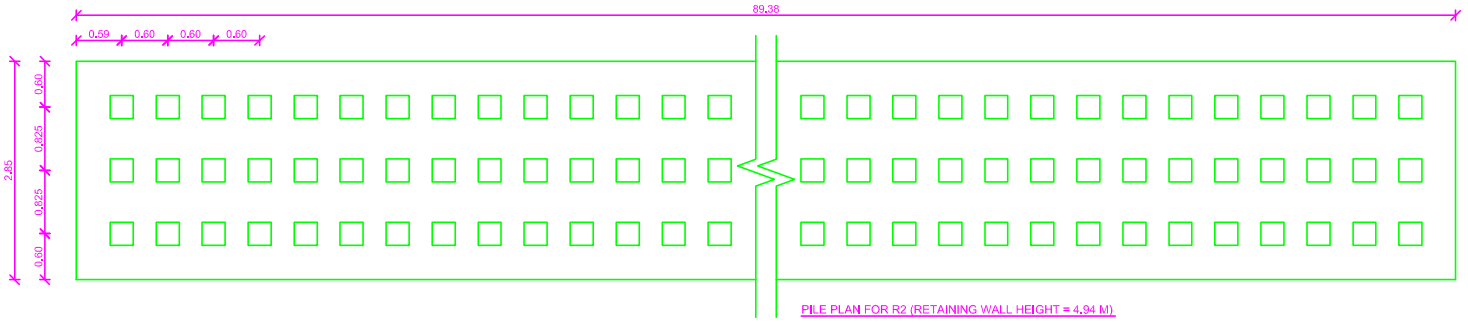
TOTAL NUMBERS OF PILE = 72 NOS.
(PILE LENGTH = 4.5 M)

PILE PLAN FOR R1 (RETAINING WALL HEIGHT = 4.49 M)



TOTAL NUMBERS OF PILE = 63 NOS.
(PILE LENGTH = 4.55 M)

PILE PLAN FOR R1 (RETAINING WALL HEIGHT = 4.94 M)

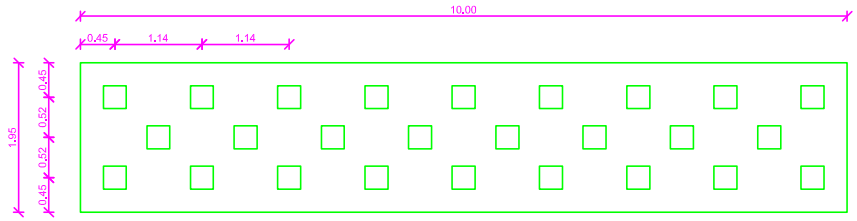


TOTAL NUMBERS OF PILE = 444 NOS.
(PILE LENGTH = 4.55 M)

PILE PLAN FOR R2 (RETAINING WALL HEIGHT = 4.94 M)

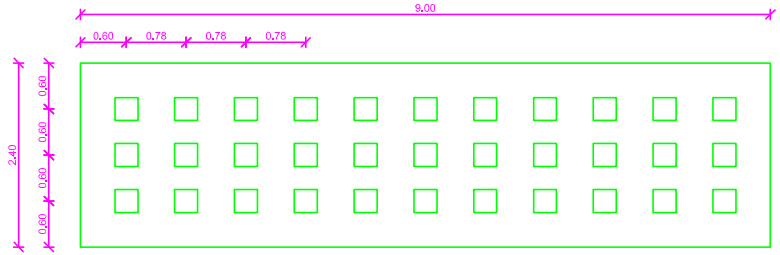
SCALE 2 1 0 1 2

AGRICULTURE INCOME IMPROVEMENT PROJECT		
SHWE BO, MYANMAR		
SANYU CONSULTANTS INC.		
Pile Plan for Retaining Wall		
DWN : KKW	SCALE : 1:50	FORMAT : A3
CHK : UMS	DRAWING NO. 05	
APPR : UMS		
DATE : NOV 2016	NPS National Engineering & Planning Services	



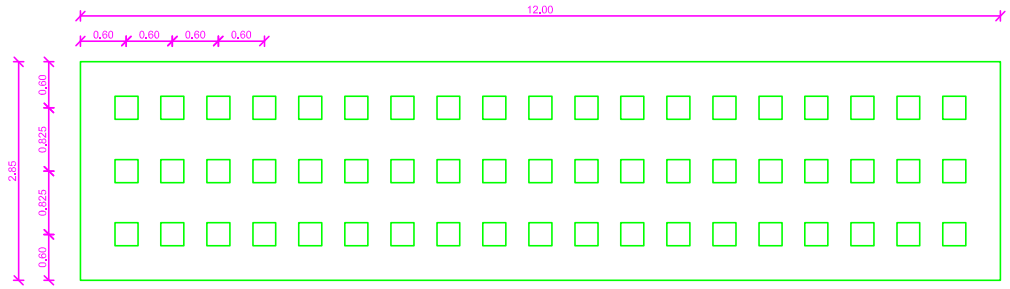
TOTAL NUMBERS OF PILE = 26 NOS.
(PILE LENGTH = 4.5 M)

PILE PLAN FOR R3 (RETAINING WALL HEIGHT = 3.69 M)



TOTAL NUMBERS OF PILE = 33 NOS.
(PILE LENGTH = 4.5 M)

PILE PLAN FOR R3 (RETAINING WALL HEIGHT = 4.49 M)



TOTAL NUMBERS OF PILE = 57 NOS.
(PILE LENGTH = 4.55 M)

PILE PLAN FOR R3 (RETAINING WALL HEIGHT = 4.94 M)

Sr. No.	Pile Length	Pile Number			Total
		R1	R2	R3	
1	4.5 M	116		59	175
2	4.55M	63	444	57	564

SCALE 2 1 0 1 2

AGRICULTURE INCOME IMPROVEMENT PROJECT

SHWE BO, MYANMAR

SANYU CONSULTANTS INC.

Pile Plan for Retaining Wall

DWN : KKW	SCALE : 1:50	FORMAT : A3
CHK : UMS	DRAWING NO. 06	
APPR : UMS	NEPS National Engineering & Planning Services	
DATE : NOV 2016		

Agriculture Income Improvement Project

Conceptual Design of Jetty, Shwe Bo

Abstract of Cost

Sr. No.	Particulars	Qty	Unit	Rate (Ks)	Per	Amount (Ks)
(A)	**Material Cost**					
1	Cement	0.00	Bag.	8,000	Bag.	
2	Sand	0.00	Sud.	15,000	Sud.	
3	Aggregate	0.00	Sud.	118,000	Sud.	
4	Jungle Wood	0.00	Ton.	550,000	Ton.	
5	Fuel	0.00	Gal.	5,000	Gal.	
6	Water	0.00	Drum	500	Drum	
7	Rebar 20 mm Ø	0.00	Ton.	1,000,000	Ton.	
8	Rebar 12 mm Ø	0.00	Ton.	1,000,000	Ton.	
9	Binding Wire	0.00	Lb.	1,000	Lb.	
10	Wire Nail	0.00	Lb.	1,500	Lb.	
11	Lubricant	0.00	Gal.	45,000	Gal.	
12	Grease	0.00	Lb.	5,000	Lb.	
13	Steel hand railing	0.00	m	33,000	m	
Material Cost						
(B)	**Labour Cost**					
1	Mason	0	Manday	15,000	Manday	
2	Carpenter	0	Manday	15,000	Manday	
3	Steel Fixer	0	Manday	15,000	Manday	
4	Machine Driver	0	Manday	15,000	Manday	
5	Worker	0	Manday	8,000	Manday	
Labour Cost						
(C)	**Others**					
1	Site Clearing Work	1	Item		Item	
2	Truss-Type Steel Movable Bridge	0	No.	80,000,000	No.	
3	Floating Sponsor	2	No.	50,000,000	No.	
4	Floating Pontoon	2	No.	120,000,000	No.	
5	Piling Work (Material Cost including Driving Work)	0	No.	375,000	No.	
Other Cost						
(D)	**Transportion**					
	(10 % of Material Cost)					
Total Cost (Material + Labour + Other + Transportion)						

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Conceptual Design of Jetty, Shwe Bo

Bill of Quantities

Sr. No.	Particular	Quantity	Unit	Cement	Sand	Aggregate	Jungle Wood	Fuel	Water	Rebar 20 mm ∅	Rebar 12 mm ∅	Binding Wire	Wire Nail	Steel railing	Truss-Type Steel Movable Bridge	Floating Sponsor	Floating Pontoon	300x300 mm Pile	Lubricant	Grease	Mason	Carpenter	Steel Fixer	Machine Driver	Worker
				Bag.	Sud.	Sud.	Ton.	Gal.	Drum	Ton.	Ton.	Lb.	Lb.	m	No.	No.	No.	No.	Gal.	Lb.	No.	No.	No.	No.	No.
1	Site Clearing Work	1.00	Item																						
2	Earthwork Excavation																								
	Machine	1286.46	m^3																						
3	Soil Filling upto retaining wall top level	6979.88	m^3																						
4	G 21 Concrete Work	550.73	m^3																						
5	Timber Shuttering Work	1630.48	m^2																						
6	Dismantling Shuttering	1630.48	m^2																						
7	Steel Reinforcement Cutting, Bending and Fixing																								
a	20 mm ∅	13.33	Ton.																						
b	12 mm ∅	18.62	Ton.																						
8	Steel railing for retaining wall	170.38	m																						
9	Provision and Installation of Truss-Type Steel Movable Bridge	2	No.																						
10	Provision and Installation of Floating Sponsor	2	No.																						
11	Provision and Installation of Floating Pontoon	2	No.																						
12	Pile Driving Work																								
a	300 x 300 mm RC Pile	739	No.																						
Total																									
Grand Total																									

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Conceptual Design of Jetty, Shwe Bo
Detail of Measurements

Sr. No.	Particulars	No	Measurement L	B	H	Contents	Deduction	Remarks	Total	
1	**Site Clearing Work**								**1.00**	**Item**
2	**Earthwork Excavation**									
	Retaining Wall for Height = 4.94 m									
	R1	1 x 1	13	2.85+6.76 / 2	2.17+1.74 / 2	122.12				
	R2	1 x 1	89.38	2.85+5.49 / 2	2.04+0.6 / 2	491.98				
	R3	1 x 1	12	2.85+5.39 / 2	1.64+0.9 / 2	62.79				
	Retaining Wall for Height = 4.49 m									
	R1	1 x 1	20	2.4+7.03 / 2	2.91+1.72 / 2	218.30				
	R3	1 x 1	9	2.4+5.78 / 2	2.19+1.19 / 2	62.21				
	Retaining Wall for Height = 3.69 m									
	R1	1 x 1	17	1.95+7.71 / 2	3.65+2.11 / 2	236.48				
	R3	1 x 1	10	1.95+6.39 / 2	3+1.44 / 2	92.57				
						1286.46			**1286.46**	**m^3**
3	**Soil Filling upto retaining wall top level**	1 x 1	3381.51		0+3.9 / 2	6593.94				
	Backfilling to retaining wall					385.94				
						6979.88			**6979.88**	**m^3**
4	**G 21 Concrete Work**									
	Retaining Wall for Height = 4.94 m									
	Foundation									
	R1	1 x 1	13	2.85	0.6	22.23				
	R2	1 x 1	89.38	2.85	0.6	152.84				
	R3	1 x 1	12	2.85	0.6	20.52				
	Retaining Wall									
	R1	1 x 1	13	0.45	4.34	25.39				
	R2	1 x 1	89.38	0.45	4.34	174.56				
	R3	1 x 1	12	0.45	4.34	23.44				
	Retaining Wall for Height = 4.49 m									
	Foundation									

Detail of Measurements

Sr. No.	Particulars	No	Measurement			Contents	Deduction	Remarks	Total	
			L	B	H					
	R1	1 x 1	20	2.4	0.45	21.60				
	R3	1 x 1	9	2.4	0.45	9.72				
	Retaining Wall									
	R1	1 x 1	20	0.375	4.04	30.30				
	R3	1 x 1	9	0.375	4.04	13.64				
	Retaining Wall for Height = 3.69 m									
	Foundation									
	R1	1 x 1	17	1.95	0.45	14.92				
	R3	1 x 1	10	1.95	0.45	8.78				
	Retaining Wall									
	R1	1 x 1	17	0.375	3.24	20.66				
	R3	1 x 1	10	0.375	3.24	12.15				
						550.73			550.73	m^3
									550.73	**m^3**
5	**Timber Shuttering Work**									
	Retaining Wall for Height = 4.94 m									
	Foundation									
	R1	2 x 1	13		0.6	15.60				
		2 x 1		2.85	0.6	3.42				
	R2	2 x 1	89.38		0.6	107.26				
		2 x 1		2.85	0.6	3.42				
	R3	2 x 1	12		0.6	14.40				
		2 x 1		2.85	0.6	3.42				
	Retaining Wall									
	R1	2 x 1	13		4.34	112.84				
		2 x 1		0.45	4.34	3.91				
	R2	2 x 1	89.38		4.34	775.82				
		2 x 1		0.45	4.34	3.91				
	R3	2 x 1	12		4.34	104.16				
		2 x 1		0.45	4.34	3.91				
	Retaining Wall for Height = 4.49 m									
	Foundation									
	R1	2 x 1	20		0.45	18.00				
		2 x 1		2.4	0.45	2.16				
	R3	2 x 1	9		0.45	8.10				
		2 x 1		2.4	0.45	2.16				
	Retaining Wall									
	R1	2 x 1	20		4.04	161.60				
		2 x 1		0.375	4.04	3.03				

Detail of Measurements

Sr. No.	Particulars	No	Measurement			Contents	Deduction	Remarks	Total	
			L	B	H					
	R3	2 x 1	9		4.04	72.72				
		2 x 1		0.375	4.04	3.03				
	Retaining Wall for Height = 3.69 m									
	Foundation									
	R1	2 x 1	17		0.45	15.30				
		2 x 1		1.95	0.45	1.76				
	R3	2 x 1	10		0.45	9.00				
		2 x 1		1.95	0.45	1.76				
	Retaining Wall									
	R1	2 x 1	17		3.24	110.16				
		2 x 1		0.375	3.24	2.43				
	R3	2 x 1	10		3.24	64.80				
		2 x 1		0.375	3.24	2.43				
						1630.48			1630.48	m^3
									1630.48	**m^2**
6	**Dismantling Shuttering**									
	(As per Timber shuttering work)								**1630.48**	**m^2**
7	**Steel Reinforcement Cutting, Bending and Fixing**									
	From Bar Bending Schedule								**31.94**	**Ton**
8	**Steel railing for retaining wall**									
	Total Length of Steel Handrail	1 x 1	170.38						**170.38**	**m**
9	**Provision and Installation of Truss-Type Steel Movable Bridge**									
	Steel Movable Bridge		2						**2.00**	**No.**
10	**Provision and Installation of Floating Sponsor**									
	Floating Sponsor		2						**2.00**	**No.**
11	**Provision and Installation of Floating Pontoon**									
	Floating Pontoon		2						**2.00**	**No.**
12	**Pile Driving Work**									
	300 x 300 mm RC Pile	1 x 564	4.55 m length						564	No.
		1 x 175	4.5 m length						175	No.
									739	**No.**

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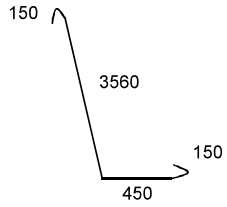
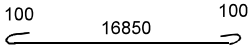
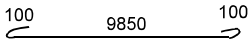
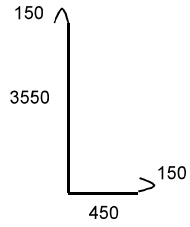
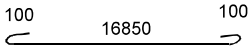
Bar Bending Schedule

Sr. No.	Particulars	Mark	Dia (mm)	C/C (mm)	Total No		Length (mm)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)
	Retaining Wall									
1	**For RW height = 3.69 m**									
	20ϕ @ 225 C/C									
										
	For R1 (Length = 17 m)	1	20Ø	225	1	76	4310.00	327.56	2.47	809.07
	For R3 (Length = 10 m)	1	20Ø	225	1	45	4310.00	193.95	2.47	479.06
	12ϕ @ 225 C/C									
	For R1									
		2a	12 Ø	225	1	15	17050.00	255.75	0.89	227.36
	Lapping (40D)	2a	12 Ø	225	2	15	480.00	14.40	0.89	12.80
	For R3									
		2b	12 Ø	225	1	15	10050.00	150.75	0.89	134.02
	Lapping (40D)	2b	12 Ø	225	1	15	480.00	7.20	0.89	6.40
	12ϕ @ 225 C/C									
										
	For R1 (Length = 17 m)	3	12 Ø	225	1	76	4300.00	326.80	0.89	290.53
	For R3 (Length = 10 m)	3	12 Ø	225	1	45	4300.00	193.50	0.89	172.02
	12ϕ @ 225 C/C									
	For R1									
		4a	12 Ø	225	1	15	17050.00	255.75	0.89	227.36
	Lapping (40D)	4a	12 Ø	225	2	15	480.00	14.40	0.89	12.80

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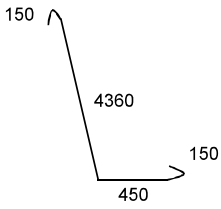
Bar Bending Schedule

Sr. No.	Particulars	Mark	Dia (mm)	C/C (mm)	Total No		Length (mm)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)
	For R3									
	100 9850 100	4b	12 Ø	225	1	15	10050.00	150.75	0.89	134.02
	Lapping (40D)	4b	12 Ø	225	1	15	480.00	7.20	0.89	6.40
	12ϕ @ 225 C/C									
	100 1800 100									
	For R1 (Length = 17 m)	5	12 Ø	225	2	76	2000.00	304.00	0.89	270.26
	For R3 (Length = 10 m)	5	12 Ø	225	2	45	2000.00	180.00	0.89	160.02
	12ϕ @ 225 C/C									
	For R1									
	100 16850 100	6a	12 Ø	225	2	9	17050.00	306.90	0.89	272.83
	Lapping (40D)	6a	12 Ø	225	4	9	480.00	17.28	0.89	15.36
	For R3									
	100 9850 100	6b	12 Ø	225	2	9	10050.00	180.90	0.89	160.82
	Lapping (40D)	6b	12 Ø	225	2	9	480.00	8.64	0.89	7.68
2	**For RW height = 4.49 m**									
	20ϕ @ 150 C/C									
										
	For R1 (Length = 20 m)	7	20Ø	150	1	133	5110.00	679.63	2.47	1678.69
	For R2 (Length = 89.38 m)	7	20Ø	150	1	596	5110.00	3045.56	2.47	7522.53
	For R3 (Length = 9 m)	7	20Ø	150	1	60	5110.00	306.60	2.47	757.30
	12ϕ @ 225 C/C									
	For R1									
	100 19850 100	8a	12 Ø	225	1	18	20050.00	360.90	0.89	320.84
	Lapping (40D)	8a	12 Ø	225	3	18	480.00	25.92	0.89	23.04
	For R2									

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Bar Bending Schedule

Sr. No.	Particulars	Mark	Dia (mm)	C/C (mm)	Total No		Length (mm)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)
	100 89230 100	8b	12 Ø	225	1	18	89430.00	1609.74	0.89	1431.06
	Lapping (40D)	8b	12 Ø	225	14	18	480.00	120.96	0.89	107.53
	For R3									
	100 8850 100	8c	12 Ø	225	1	18	9050.00	162.90	0.89	144.82
	Lapping (40D)	8c	12 Ø	225	1	18	480.00	8.64	0.89	7.68
	12ϕ @ 150 C/C									
	150, 4340, 150, 450									
	For R1 (Length = 20 m)	9	12 Ø	150	1	133	5090.00	676.97	0.89	601.83
	For R2 (Length = 89.38 m)	9	12 Ø	150	1	596	5090.00	3033.64	0.89	2696.91
	For R3 (Length = 9 m)	9	12 Ø	150	1	60	5090.00	305.40	0.89	271.50
	12ϕ @ 225 C/C									
	For R1									
	100 19850 100	10a	12 Ø	225	1	18	20050.00	360.90	0.89	320.84
	Lapping (40D)	10a	12 Ø	225	3	18	480.00	25.92	0.89	23.04
	For R2									
	100 89230 100	10b	12 Ø	225	1	18	89430.00	1609.74	0.89	1431.06
	Lapping (40D)	10b	12 Ø	225	14	18	480.00	120.96	0.89	107.53
	For R3									
	100 8850 100	10c	12 Ø	225	1	18	9050.00	162.90	0.89	144.82
	Lapping (40D)	10c	12 Ø	225	1	18	480.00	8.64	0.89	7.68
	12ϕ @ 150 C/C									
	100 2250 100									
	For R1 (Length = 20 m)	11	12 Ø	150	2	133	2450.00	651.70	0.89	579.36
	For R2 (Length = 89.38 m)	11	12 Ø	150	2	596	2450.00	2920.40	0.89	2596.24
	For R3 (Length = 9 m)	11	12 Ø	150	2	60	2450.00	294.00	0.89	261.37

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Bar Bending Schedule

Sr. No.	Particulars	Mark	Dia (mm)	C/C (mm)	Total No		Length (mm)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)
	12ϕ @ 225 C/C									
	For R1									
	100 19850 100	12a	12 Ø	225	2	11	20050.00	441.10	0.89	392.14
	Lapping (40D)	12a	12 Ø	225	6	11	480.00	31.68	0.89	28.16
	For R2									
	100 89230 100	12b	12 Ø	225	2	11	89430.00	1967.46	0.89	1749.07
	Lapping (40D)	12b	12 Ø	225	28	11	480.00	147.84	0.89	131.43
	For R3									
	100 8850 100	12c	12 Ø	225	2	11	9050.00	199.10	0.89	177.00
	Lapping (40D)	12c	12 Ø	225	2	11	480.00	10.56	0.89	9.39
3	**For RW height = 4.94 m**									
	20ϕ @ 150 C/C									
	150 4810 150 450									
	For R1 (Length = 13 m)	13	20Ø	150	1	87	5560.00	483.72	2.47	1194.79
	For R3 (Length = 12 m)	13	20Ø	150	1	80	5560.00	444.80	2.47	1098.66
	12ϕ @ 225 C/C									
	For R1									
	100 12850 100	14a	12 Ø	225	1	20	13050.00	261.00	0.89	232.03
	Lapping (40D)	14a	12 Ø	225	2	20	480.00	19.20	0.89	17.07
	For R3									
	100 11850 100	14b	12 Ø	225	1	20	12050.00	241.00	0.89	214.25
	Lapping (40D)	14b	12 Ø	225	1	20	480.00	9.60	0.89	8.53
	12ϕ @ 150 C/C									
	150									

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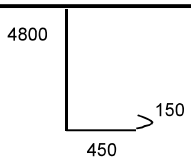
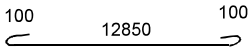
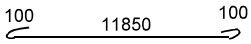
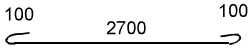
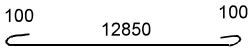
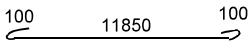
Bar Bending Schedule

Sr. No.	Particulars	Mark	Dia (mm)	C/C (mm)	Total No		Length (mm)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)
										
	For R1 (Length = 13 m)	15	12 Ø	150	1	87	5550.00	482.85	0.89	429.25
	For R3 (Length = 12 m)	15	12 Ø	150	1	80	5550.00	444.00	0.89	394.72
	12ϕ @ 225 C/C									
	For R1									
		16a	12 Ø	225	1	20	13050.00	261.00	0.89	232.03
	Lapping (40D)	16a	12 Ø	225	2	20	480.00	19.20	0.89	17.07
	For R3									
		16b	12 Ø	225	1	20	12050.00	241.00	0.89	214.25
	Lapping (40D)	16b	12 Ø	225	1	20	480.00	9.60	0.89	8.53
	12ϕ @ 150 C/C									
										
	For R1 (Length = 13 m)	17	12 Ø	150	2	87	2900.00	504.60	0.89	448.59
	For R3 (Length = 12 m)	17	12 Ø	150	2	80	2900.00	464.00	0.89	412.50
	12ϕ @ 225 C/C									
	For R1									
		18a	12 Ø	225	2	13	13050.00	339.30	0.89	301.64
	Lapping (40D)	18a	12 Ø	225	4	13	480.00	24.96	0.89	22.19
	For R3									
		18b	12 Ø	225	2	13	12050.00	313.30	0.89	278.52
	Lapping (40D)	18b	12 Ø	225	2	13	480.00	12.48	0.89	11.09
Total Weight of Steel (kg)										**32457.38**
Total Weight of Steel (Ton)										**31.94**
Total Volume of Concrete (m^3)										**550.73**
Total Weight of Steel / Total Volume of Concrete (kg/m^3)										**58.94**