

ANEXO V.3: PLANIFICACIÓN DE AVANCE EN ML DE TÚNEL POR MES

OBRA: TÚNEL DE DESVÍO DEL RÍO ASANA

Actividad	Longitud de tramo (ml)	Rendimiento (m/mes)	2013																								Total (m)		
			2013		2014																								
			Nov	Dic	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct			
M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24						
TÚNEL PRINCIPAL	3416.90																												
Tramo 1	55.90	140	55.90																										
Tramo 2	185.30	150	60.00	125.30																									
Tramo 3	1032.00	168		16.66	168.00	157.00	168.00	157.00	157.00	168.00	40.34																		
Tramo 4	82.50	84									52.83	29.67																	
Tramo 5	411.50	162										104.78	151.00	155.72															
Tramo 6	876.80	174											6.75	163.00	163.00	163.00	174.00	163.00	44.05										
Tramo 7	596.50	136																	101.57	125.00	136.00	125.00	108.93						
Tramo 8	176.40	106																			21.10	95.00	60.30						
ESTOCADAS																													
Estocadas cada 250m	143.00	80		11		11		11	11		11		11		11	11	11		11		11		11		11				
ML EXCAVACION (CON ESTOCADAS)		3,560	115.90	152.96	168.00	168.00	168.00	168.00	168.00	168.00	104.17	134.45	162.00	162.47	174.00	174.00	174.00	174.00	145.62	136.00	136.00	136.00	130.03	106.00	60.30	3,559.90			
AVANCE POR MES ml a excavar TÚNEL			115.90	141.96	168.00	157.00	168.00	157.00	157.00	168.00	93.17	134.45	151.00	162.47	163.00	163.00	163.00	174.00	163.00	145.62	125.00	136.00	125.00	130.03	95.00	60.30	3,559.90		
AVANCE ACUMULADO ml a excavar TÚNEL			115.90	257.86	425.86	582.86	750.86	907.86	1,064.86	1,232.86	1,326.03	1,460.48	1,611.48	1,773.95	1,936.95	2,099.95	2,262.95	2,436.95	2,599.95	2,745.57	2,870.57	3,006.57	3,131.57	3,261.60	3,356.60	3,416.90			

SALDO	EJERCICIO	Total (m)
2014	2015	
		55.90
		185.30
365.34	-	1,032.00
82.50	-	82.50
411.50	-	411.50
332.75	544.05	876.80
-	596.50	596.50
-	176.40	176.40
-		
55.00	55.00	143.00
1,247.08	1,371.95	3,559.90
1,192.08	1,316.95	3,416.90
2,099.95	3,416.90	

PROYECCIÓN DE ML POR TIPO DE ROCA

Avances por Tipo Roca	
Rx I	
Rx II	
Rx III	
Rx IV	
Rx V	
Rx VI A	
ESTOCADA	

M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	TOTAL	
5.59	1.67	16.80	15.70	16.80	15.70	15.70	16.80	4.03	10.48	15.10	16.25	16.30	16.30	16.30	17.40	16.30	4.41	-	-	-	-	-	-	237.62	
9.00	22.13	33.60	31.40	33.60	31.40	31.40	33.60	15.99	41.12	52.85	57.20	65.20	65.20	65.20	69.60	65.20	37.93	25.00	27.20	25.00	22.84	4.75	3.02	869.43	
43.36	51.35	75.60	70.65	75.60	70.65	70.65	75.60	18.15	31.43	45.30	49.08	57.05	57.05	57.05	60.90	57.05	45.89	37.50	40.80	37.50	36.90	19.00	12.06	1,196.17	
46.57	60.55	42.00	39.25	42.00	39.25	39.25	42.00	28.58	31.34	30.20	32.16	24.45	24.45	24.45	26.10	24.45	45.20	47.50	51.68	47.50	49.83	38.00	24.12	900.87	
11.39	6.27	-	-	-	-	-	-	18.49	15.62	7.55	7.79	-	-	-	-	-	10.16	12.50	13.60	12.50	17.22	28.50	18.09	179.67	
-	-	-	-	-	-	-	-	7.92	4.45	-	-	-	-	-	-	-	2.03	2.50	2.72	2.50	3.23	4.75	3.02	33.12	
-	11.00	-	11.00	-	11.00	11.00	-	11.00	-	11.00	-	11.00	11.00	11.00	-	11.00	-	11.00	-	11.00	-	11.00	-	-	143.00

Saldo 2014	2015	Total (m)
110.96	54.41	469.65
362.57	345.74	1,729.87
404.31	404.65	2,348.99
252.42	378.84	1,755.18
49.45	112.57	347.95
12.38	20.75	66.25
55.00	55.00	286.00

PROYECCIÓN DE CANTIDADES POR PARTIDA

EXCAVACIONES SUBTERRANEAS TÚNEL P	AREA
Rx I	22.641
Rx II	22.641
Rx III	22.641
Rx IV	22.641
Rx V	22.641
Rx VI A	22.641
ESTOCADA	22.641
SOSTENIMIENTO EN ROCA EN TÚNEL PRINCIPAL	
Pernos	
Pernos Sellados, D=22 mm, L=3 m	
Pernos de Fibra de Vidrio, D=25 mm, L=3 m	
PERNOS SELLADOS, D=22 mm, L=3 m - Nicho	
Marchiavantis	KG
Marchiavantis, D=32 mm, L=4 m	28.0125
Concreto Lanzado (Shotcrete)	PERÍMETRO
Concreto Lanzado (e=5.0 cm)	12.985
Concreto Lanzado con Fibra Plástica (e=5.0 cm)	12.895
Capa Adicional de Concreto Lanzado	12.985
Capa Adicional de Concreto Lanzado con F	12.895
Concreto Lanzado con fibra Nichos	12.895
Malla de Alambre Soldado	
Malla de Alambre 150x150x6 mm	12.985
Marcos Reticulados	
Marcos Reticulados de Acero	
Marcos Reticulados Galvanizados en Caliente	
Equipamiento	
Barbacana PVC 2"	
Drenes -Perforación y PVC D= 2" ranurad	

M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	TOTAL	
126.56	37.73	380.37	355.46	380.37	355.46	355.46	380.37	91.33	237.23	341.88	367.84	369.05	369.05	369.05	393.95	369.05	99.73	-	-	-	-	-	109.05	5,489.00	
203.77	501.00	760.74	710.93	760.74	710.93	710.93	760.74	362.09	931.07	1,196.58	1,295.07	1,476.19	1,476.19	1,476.19	1,575.81	1,476.19	858.86	566.03	615.84	566.03	517.14	107.54	467.42	20,084.00	
981.71	1,162.70	1,711.66	1,599.59	1,711.66	1,599.59	1,599.59	1,711.66	411.00	711.69	1,025.64	1,111.15	1,291.67	1,291.67	1,291.67	1,378.84	1,291.67	1,038.96	849.04	923.75	849.04	835.42	430.18	823.46	27,633.00	
1,054.28	1,370.94	950.92	888.66	950.92	888.66	888.66	950.92	646.98	709.58	683.76	728.04	553.57	553.57	553.57	590.93	553.57	1,023.47	1,075.45	1,170.09	1,075.45	1,128.27	860.36	960.40	20,811.00	
257.77	141.85	-	-	-	-	-	-	418.64	353.73	170.94	176.28	-	-	-	-	-	229.96	283.01	307.92	283.01	389.94	645.27	492.68	4,151.00	
-	-	-	-	-	-	-	-	179.42	100.76	-	-	-	-	-	-	-	45.99	56.60	61.58	56.60	73.21	107.54	83.28	765.00	
-	243.46	-	243.46	-	243.46	243.46	-	243.46	-	243.46	-	243.46	243.46	243.46	-	243.46	-	243.46	-	243.46	0.02	243.46	-	3,165.00	
489.00	590.00	538.00	503.00	538.00	503.00	503.00	538.00	454.00	526.00	495.00	530.00	475.00	475.00	475.00	507.00	475.00	576.00	551.00	599.00	551.00	596.00	523.00	707.00	12,717.00	
-	98.00	-	98.00	-	98.00	98.00	-	98.00	-	98.00	-	98.00	98.00	98.00	-	98.00	-	98.00	-	98.00	-2.00	98.00	-	100.00	
28.01	28.01	28.01	15.96																					100.00	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,422.45	1,809.14	1,949.72	1,822.06	1,949.72	1,822.06	1,822.06	1,949.72	1,149.41	1,598.61	1,752.43	1,885.49	1,891.70	1,891.70	1,324.19	1,413.55	1,513.36	1,456.78	1,289.50	1,402.98	1,289.50	1,341.38	980.02	629.47	37,357.00	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
44.70	47.12	27.08	25.31	27.08	25.31	25.31	27.08	42.27	40.35	14.60	15.39	7.88	7.88	7.88	8.41	7.88	21.12	23.37	25.43	23.37	27.17	30.63	21.38	574.00	
-	27.28	-	12.72																					40.00	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	1,545.00	1,736.00	-	-	-	-	-	-	-	396.00	976.00	1,060.00	777.00	631.00	926.00	588.00	8,635.00	
								860.00																860.00	
324.00	398.00	470.00	440.00	470.00	440.00	440.00	470.00	254.00	372.00	422.00	454.00	456.00	456.00	456.00	488.00	456.00	406.00	348.00	378.00	348.00	290.00	198.00	166.00	9,400.00	
30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	800.00

SALDO 2014	2015	TOTAL
2,512.21	1,340.83	5,489.00
8,208.85	8,227.05	20,084.00
9,154.06	9,712.03	27,633.00
5,715.08	8,991.55	20,811.00
1,119.60	2,631.79	4,151.00
280.18	484.82	