

Widening Scheme for Main Line															
Design Chainage		Length	Type of C/s	TCS 1	TCS 2	TCS 3	TCS 4	TCS 5	TCS 6	TCS 7	TCS 8	TCS 9	TCS 10	Bridge	Tunnel
From	To														
Flexible Pavement															
	100	100	TCS 4												
100	350	250	TCS 1												
350	2100	1750	TCS 2												
2100	2142.5	42.5	TCS 8												
2142.5	2317.5	175	Bridge												
2317.5	2400	82.5	TCS 6												
2400	3000	600	TCS 3												
3000	3350	350	TCS 4												
3350	3440	90	TCS 5												
3440	3490	50	Bridge												
3490	4200	710	TCS 5												
4200	4320	120	TCS 5												
4320	4870	550	TCS 3												
4870	5000	130	TCS 1												
5000	5250	250	TCS 8												
5250	5340	90	TCS 6												
5340	5480	140	Bridge												
5480	5785	305	TCS 6												
5785	6275	490	Bridge												
6275	6320	45	TCS 6												
6320	6420	100	TCS 4												
6420	6563	143	TCS 8												
6563	6996	433	Tunnel												
6996	7056	60	TCS 8												
7056	7103.5	47.5	TCS 6												
7103.5	7138.5	35	Bridge												
7138.5	7171	32.5	TCS 6												
7171	9099	1928	Tunnel												
9099	9146	47	TCS 8												
9146	9216	70	TCS 4												
9216	9706	490	TCS 6												
9706	9760	54	TCS 4												
9760	9796	36	TCS 8								36.00				
9796	10106	310	TCS 9									310.00			
10106	10146	40	TCS 8								40.00				
10146	10276	130	TCS 6						130.00						
10276	10506	230	TCS 9									230.00			
10506	10566	60	TCS 8								60.00				
10566	11066	500	TCS 6						500.00						
11066	11256	190	TCS 8								190.00				
11256	11506	250	TCS 9									250.00			
11506	11586	80	TCS 8								80.00				
11586	12626	1040	TCS 6						1040.00						
12626	12806	180	TCS 3			180.00									
12806	13006	200	TCS 8								200.00				
13006	13406	400	TCS 9									400.00			
13406	13486	80	TCS 8								80.00				
13486	13876	390	TCS 6						390.00						
13876	13926	50	TCS 5					50.00							
13926	14006	80	TCS 8								80.00				
14006	14356	350	TCS 9									350.00			
14356	14446	90	TCS 8								90.00				
14446	14586	140	TCS 5					140.00							
14586	14656	70	TCS 8								70.00				
14656	14856	200	TCS 9									200.00			
14856	14946	90	TCS 8								90.00				
14946	15036	90	TCS 3			90.00									
15036	15156	120	TCS 6						120.00						
15156	15206	50	TCS 5					50.00							
15206	15306	100	TCS 8								100.00				
15306	15766	460	TCS 9									460.00			
15766	15906	140	TCS 8								140.00				
15906	16226	320	TCS 3			320.00									
16226	16356	130	TCS 5					130.00							
16356	16656	300	TCS 10										300.00		
16656	16806	150	TCS 9									150.00			
16806	16956	150	TCS 10										150.00		
16956	17172.5	216.5	TCS 6						216.50						
17172.5	17307.5	135	Bridge											135.00	
17307.5	17814.5	507	TCS 6						507.00						
Approach road 2		660	TCS 6						660.00						
		8715				590		370	3564		1256	2350	450	135	
Structure Deduction															
		8715				590		370	3564		1256	2350	450	135	
												Cut & Cover	Snow Gallery	Bridges	Tunnel

Pavement Quantity

S. No.	Description	Unit	TCS TYPE 1	TCS TYPE 2	TCS TYPE 3	TCS TYPE 4	TCS TYPE 5	TCS TYPE 6	TCS TYPE 7	TCS TYPE 8	Intersec tions	Extra widening	Total Qty
	TCS Length	m	0	0	590	0	370	3564	0	1256			5780
1	Subgrade	Cum	0	0	4130	0	2590	29399	0	7222	0	560	43901
2	Cement Treated Sub Base	Cum	0	0	1643	0	1030	9882	0	3394	652	270	16871
3	Cement Treated Base	Cum	0	0	788	0	494	4836	0	1574	301	130	8123
4	Aggregate Layer	Cum	0	0	679	0	426	4098	0	1316	215	120	6853
5	BC	Cum	0	0	339	0	213	2049	0	658	107	60	3426
6	Prime coat	Sq.m	0	0	6785	0	4255	40980	0	13157	2619	1120	68916
7	Tack coat over Granular Surface	Sq.m	0	0	6785	0	4255	40980	0	13157	2619	1120	68916
8	Road marking	Sq.m	0	0	472	0	296	3385	0	816			4970
9	Dismantling of Ex. Bituminous Layer	Cum	0	0	0	0	0	0	0	0			0
10	Dismantling of Ex. Granular Layer	Cum	0	0	0	0	0	0	0	0			0
11	Parapet Wall (M-15)	Cum	0	0	0	0	0	0	0	0			0
12	Utility Duct 300 mm Dia	Rmt	0	0	1180	0	370	3564	0	1256			6370
13	EPS Sheet	Sqm	0	0	8113	0	5180	58798	0	14444	2619	1120	90273
14	I Kerb	Cum	0	0	0	0	0	7127	0	0			7127
15	Painting on I Kerb	Sq.m	0	0	0	0	0	2741	0	0			2741
16	Selected Earth Fill	Cum	0	0	1106	0	694	13363	0	0			15163
17	Metal Beam Crash Brrier	Rmt					370	7127	0	0			7497
18	Scarification	Cum	0	0	0								0
19	Clearing and Grubbing	Hectare	-	-	0.89	-	0.23	8.55	-	1.56	-		11.23
20	Chequered tiles	Sqm		0							104		104
21	construction of Reinforced Earth steepened slope	Sqm						71,270					71270
22	Supply and laying of PCC leveling pad of M-15 grade	Cum						214					214
23	Providing and laying of boulders in front of the Reinforced Earth facia	Cum						21,381					21381
24	Needle punched or continuous filament non-woven geotextile	Sqm						1,78,175					178175
25	Drainage board wrapped with non- woven geotextiles (500 mm x 250 mm)	Rm						57,016					57016

TYPICAL CROSS-SECTION (CONCENTRIC WIDENING)**TCS TYPE 1**

INPUTS		MAIN CARRIAGEWAY	
		LHS	RHS
All Data in m	Data Related to Existing Carriageway		
	Carriageway width	3.115	3.115
	Earthen Shoulder	0.000	0.000
	Data Related to Proposed Carriageway		
	Carriageway width	3.500	3.500
	Paved Shoulder	1.500	1.500
	Snow Storage	1.500	0.000
	Drain	0.000	0.900
	Earthen Shoulder	0.000	0.000
	BC	0.050	0.050
	Aggregate layer	0.100	0.100
	CTB	0.115	0.115
	CTSB	0.235	0.235
	Subgrade	0.500	0.500
	Filtermedia	0.600	0.000

CALCULATION

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
1	Dismantling of Ex. Bituminous Layer	cum					
	LHS		1	1800.00	3.115	0.115	644.805
	RHS		1	1800.00	3.115	0.115	644.805
							1289.610
2	Dismantling of Ex. Granular Layer	cum					
	LHS		1	1800.00	3.115	0.500	2803.500
	RHS		1	1800.00	3.115	0.500	2803.500
							5607.000
3	Subgrade	cum					
	LHS		1	1800.00	5.900	0.500	5310.000
	RHS		1	1800.00	5.900	0.500	5310.000
							10620.000
4	CTSB	cum					
	LHS		1	1800.00	6.500	0.235	2749.500
	RHS		1	1800.00	5.000	0.235	2115.000
							4864.500
5	CTB	cum					
	LHS		1	1800.00	6.500	0.115	1345.500
	RHS		1	1800.00	5.000	0.115	1035.000
							2380.500
6	Aggregate layer	cum					
	LHS		1	1800.00	6.500	0.100	1170.000
	RHS		1	1800.00	5.000	0.100	900.000
							2070.000
7	BC	cum					
	LHS		1	1800.00	6.500	0.050	585.000
	RHS		1	1800.00	5.000	0.050	450.000
							1035.000
8	Prime Coat	sqm					
	LHS		1	1800.00	6.500		11700.000
	RHS		1	1800.00	5.000		9000.000
							20700.000
9	Tack Coat over Granular Surface	sqm					
	LHS		1	1800.00	6.500		11700.000
	RHS		1	1800.00	5.000		9000.000
							20700.000
10	Road Marking	sqm					
	Lane marking (broken)						
	Center		600	1.50	0.100		90.000
	Edge marking (solid)						
	LHS		3	1800.00	0.150		810.000
	RHS		2	1800.00	0.150		540.000
							1440.000
11	Parapet wall (M-15)	Cum					
	LHS		1	1800.00	0.450	0.600	486.000
	RHS		0	1800.00	0.450	0.600	0.000
							486.000
12	Utility Duct Pipe (300mm Dia)	Rmt					
	LHS		0	1800.00			0.000
	RHS		1	1800.00			1800.000
							1800.000
13	EPS Sheet	Sqm					

Sl.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
	LHS		1	1800.00	5.900		10620.000
	RHS		1	1800.00	5.900		10620.000
							21240.000
14	Kerb	Rmt					
	LHS		0	1800.00			0.000
	RHS		0	1800.00			0.000
							0.000
15	Selected Earth Fill	Cum					
	LHS		0	1800.00			0.000
	RHS		0	1800.00			0.000
							0.000
16	Scarification	Cum					
	LHS		0	1800.00	3.115		0.000
	RHS		0	1800.00	3.115		0.000
							0.000
17	Clearing and Grubbing	Hect					
	LHS		1	1800.00	3.385		6093.000
	RHS		1	1800.00	2.785		5013.000
							1.111

TYPICAL CROSS-SECTION (CONCENTRIC WIDENING)**TCS TYPE 1**

INPUTS		MAIN CARRIAGEWAY	
		LHS	RHS
All Data in m	Data Related to Existing Carriageway		
	Carriageway width	3.115	3.115
	Earthen Shoulder	0.000	0.000
	Data Related to Proposed Carriageway		
	Carriageway width	3.500	3.500
	Paved Shoulder	1.500	1.500
	Snow Storage	1.500	0.000
	Drain	0.000	0.900
	Earthen Shoulder	0.000	0.000
	BC	0.050	0.050
	Aggregate layer	0.100	0.100
	CTB	0.115	0.115
	CTSB	0.235	0.235
	Subgrade	0.500	0.500
	Filtermedia	0.600	0.000

CALCULATION

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
1	Dismantling of Ex. Bituminous Layer	cum					
	LHS		1	0.00	3.115	0.115	0.000
	RHS		1	0.00	3.115	0.115	0.000
							0.000
2	Dismantling of Ex. Granular Layer	cum					
	LHS		1	0.00	3.115	0.500	0.000
	RHS		1	0.00	3.115	0.500	0.000
							0.000
3	Subgrade	cum					
	LHS		1	0.00	5.900	0.500	0.000
	RHS		1	0.00	5.900	0.500	0.000
							0.000
4	CTSB	cum					
	LHS		1	0.00	6.500	0.235	0.000
	RHS		1	0.00	5.000	0.235	0.000
							0.000
5	CTB	cum					
	LHS		1	0.00	6.500	0.115	0.000
	RHS		1	0.00	5.000	0.115	0.000
							0.000
6	Aggregate layer	cum					
	LHS		1	0.00	6.500	0.100	0.000
	RHS		1	0.00	5.000	0.100	0.000
							0.000
7	BC	cum					
	LHS		1	0.00	6.500	0.050	0.000
	RHS		1	0.00	5.000	0.050	0.000
							0.000
8	Prime Coat	sqm					
	LHS		1	0.00	6.500		0.000
	RHS		1	0.00	5.000		0.000
							0.000
9	Tack Coat over Granular Surface	sqm					
	LHS		1	0.00	6.500		0.000
	RHS		1	0.00	5.000		0.000
							0.000
10	Road Marking	sqm					
	Lane marking (broken)						
	Center		0	1.50	0.100		0.000
	Edge marking (solid)						
	LHS		3	0.00	0.150		0.000
	RHS		2	0.00	0.150		0.000
							0.000
11	Parapet wall (M-15)	Cum					
	LHS		1	0.00	0.450	0.600	0.000
	RHS		0	0.00	0.450	0.600	0.000
							0.000
12	Utility Duct Pipe (300mm Dia)	Rmt					
	LHS		0	0.00			0.000
	RHS		1	0.00			0.000
							0.000
13	EPS Sheet	Sqm					

Sl.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
	LHS		1	0.00	5.900		0.000
	RHS		1	0.00	5.900		0.000
							0.000
14	Kerb	Rmt					
	LHS		0	0.00			0.000
	RHS		0	0.00			0.000
							0.000
15	Selected Earth Fill	Cum					
	LHS		0	0.00			0.000
	RHS		0	0.00			0.000
							0.000
16	Scarification	Cum					
	LHS		0	0.00	3.115		0.000
	RHS		0	0.00	3.115		0.000
							0.000
17	Clearing and Grubbing	Hect					
	LHS		1	0.00	3.385		0.000
	RHS		1	0.00	2.785		0.000
							0.000

TYPICAL CROSS-SECTION BUILT UP AREA (WITH PAVED SHOULDER) (RECONSTRUCTION)

TCS TYPE 2

INPUTS	MAIN CARRIAGEWAY	
	LHS	RHS
All Data in m	Data Related to Existing Carriageway	
	Carriageway width	3.350
	Earthen Shoulder	0.000
	Data Related to Proposed Carriageway	
	Carriageway width	3.500
	Paved Shoulder	1.500
	Snow Storage	0.750
	Drain	1.000
	Earthen Shoulder	0.000
	BC	0.050
	Aggregate layer	0.100
	CTB	0.115
	CTSB	0.235
	Subgrade	0.500

CALCULATION

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
1	Dismantling of Ex. Bituminous Layer	cum					
	LHS		1	0.00	3.350	0.115	0.000
	RHS		1	0.00	3.350	0.115	0.000
							0.000
2	Dismantling of Ex. Granular Layer	cum					
	LHS		1	0.00	3.350	0.500	0.000
	RHS		1	0.00	3.350	0.500	0.000
							0.000
3	Subgrade	cum					
	LHS		1	0.00	5.750	0.500	0.000
	RHS		1	0.00	5.750	0.500	0.000
							0.000
4	CTSB	cum					
	LHS		1	0.00	5.750	0.235	0.000
	RHS		1	0.00	5.750	0.235	0.000
							0.000
5	CTB	cum					
	LHS		1	0.00	5.750	0.115	0.000
	RHS		1	0.00	5.750	0.115	0.000
							0.000
6	Aggregate layer	cum					
	LHS		1	0.00	5.000	0.100	0.000
	RHS		1	0.00	5.000	0.100	0.000
							0.000
7	BC	cum					
	LHS		1	0.00	5.000	0.050	0.000
	RHS		1	0.00	5.000	0.050	0.000
							0.000
8	Prime Coat	sqm					
	LHS		1	0.00	5.000		0.000
	RHS		1	0.00	5.000		0.000
							0.000
9	Tack Coat over Granular Surface	sqm					
	LHS		1	0.00	5.000		0.000
	RHS		1	0.00	5.000		0.000
							0.000
10	Road Marking	sqm					
	Lane marking (broken)						
	Center		0	1.50	0.100		0.000
	Edge marking (solid)						
	LHS		2	0.00	0.150		0.000
	RHS		2	0.00	0.150		0.000
							0.000
11	Parapet wall (M-15)	Cum					
	LHS		0	0.00	0.450	0.600	0.000
	RHS		0	0.00	0.450	0.600	0.000
							0.000
12	Utility Duct Pipe (300mm Dia)	Rmt					
	LHS		1	0.00			0.000
	RHS		1	0.00			0.000
							0.000
13	EPS Sheet	Sqm					
	LHS		1	0.00	5.750		0.000
	RHS		1	0.00	5.750		0.000
							0.000
14	Kerb	Rmt					
	LHS		1	0.00			0.000
	RHS		1	0.00			0.000
							0.000
15	Selected Earth Fill	Cum					
	LHS		1	0.00	0.600	0.225	0.000
	RHS		1	0.00	0.600	0.225	0.000
							0.000
16	Scarification	Cum					
	LHS		0	0.00	3.350		0.000
	RHS		0	0.00	3.350		0.000
							0.000

Sl.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
17	Clearing and Grubbing	Hect					
	LHS		1	0.00	3.400		0.000
	RHS		1	0.00	3.400		0.000
							0.000
18	Chegqured Tiles	Sqm					
	LHS		1	0.00	1.750		0.000
	RHS		1	0.00	1.750		0.000
							0.000

TYPICAL CROSS-SECTION COCENTRIC WIDENING IN RURAL AREA ON MILD SLOPE TERRAIN

TCS TYPE 3

INPUTS	MAIN CARRIAGEWAY	
	LHS	RHS
All Data in m	Data Related to Existing Carriageway	
	Carriageway width	0.000
	Earthen Shoulder	0.000
	Data Related to Proposed Carriageway	
	Carriageway width	3.500
	Paved Shoulder	1.500
	Snow Storage	0.000
	Drain	0.900
	Earthen Shoulder	0.000
	BC	0.050
	Aggregate layer	0.100
	CTB	0.115
	CTSB	0.235
	Subgrade	0.500

CALCULATION

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
1	Dismantling of Ex. Bituminous Layer	cum					
	LHS		1	590.00	0.000	0.115	0.000
	RHS		1	590.00	0.000	0.115	0.000
							0.000
2	Dismantling of Ex. Granular Layer	cum					
	LHS		1	590.00	0.000	0.500	0.000
	RHS		1	590.00	0.000	0.500	0.000
							0.000
3	Subgrade	cum					
	LHS		1	590.00	5.000	0.500	1475.000
	RHS		1	590.00	9.000	0.500	2655.000
							4130.000
4	CTSB	cum					
	LHS		1	590.00	5.000	0.235	693.250
	RHS		1	590.00	6.850	0.235	949.753
							1643.003
5	CTB	cum					
	LHS		1	590.00	5.000	0.115	339.250
	RHS		1	590.00	6.615	0.115	448.828
							788.078
6	Aggregate layer	cum					
	LHS		1	590.00	5.000	0.100	295.000
	RHS		1	590.00	6.500	0.100	383.500
							678.500
7	BC	cum					
	LHS		1	590.00	5.000	0.050	147.500
	RHS		1	590.00	6.500	0.050	191.750
							339.250
8	Prime Coat	sqm					
	LHS		1	590.00	5.000		2950.000
	RHS		1	590.00	6.500		3835.000
							6785.000
9	Tack Coat over Granular Surface	sqm					
	LHS		1	590.00	5.000		2950.000
	RHS		1	590.00	6.500		3835.000
							6785.000
10	Road Marking	sqm					
	Lane marking (broken)						
	Center		197	1.50	0.100		29.500
	Edge marking (solid)						
	LHS		2	590.00	0.150		177.000
	RHS		3	590.00	0.150		265.500
							472.000
11	Parapet wall (M-15)	Cum					
	LHS		0	590.00	0.450	0.600	0.000
	RHS		0	590.00	0.450	0.600	0.000
							0.000
12	Utility Duct Pipe (300mm Dia)	Rmt					
	LHS		1	590.00			590.000
	RHS		1	590.00			590.000
							1180.000
13	EPS Sheet	Sqm					
	LHS		1	590.00	5.000		2950.000
	RHS		1	590.00	8.750		5162.500
							8112.500
14	Kerb	Rmt					
	LHS		0	590.00			0.000
	RHS		0	590.00			0.000
							0.000
15	Selected Earth Fill	Cum					
	LHS		0	590.00			0.000
	RHS		1	590.00	1.875		1106.250
							1106.250
16	Scarification	Cum					
	LHS		0	590.00	0.000		0.000
	RHS		0	590.00	0.000		0.000
							0.000

Sl.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
17	Clearing and Grubbing	Hect					
	LHS		1	590.00	5.900		3481.000
	RHS		1	590.00	9.250		5457.500
							0.894

TYPICAL CROSS-SECTION (NEW CONSTRUCTION WITH HILL SIDE CUT & VALLEY SIDE FILL)**TCS TYPE 4**

INPUTS		MAIN CARRIAGEWAY	
		LHS	RHS
All Data in m	Data Related to Existing Carriageway		
	Carriageway width	0.000	0.000
	Earthen Shoulder	0.000	0.000
	Data Related to Proposed Carriageway		
	Carriageway width	3.500	3.500
	Paved Shoulder	1.500	1.500
	Snow Storage	0.000	1.500
	Drain	0.900	0.000
	Earthen Shoulder	0.000	0.000
	BC	0.050	0.050
	Aggregate layer	0.100	0.100
	CTB	0.115	0.115
	CTSB	0.235	0.235
	Subgrade	0.500	0.500
	Filtermedia	0.000	0.600

CALCULATION

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
1	Dismantling of Ex. Bituminous Layer	cum					
	LHS		1	0.00	0.000	0.115	0.000
	RHS		1	0.00	0.000	0.115	0.000
							0.000
2	Dismantling of Ex. Granular Layer	cum					
	LHS		1	0.00	0.000	0.500	0.000
	RHS		1	0.00	0.000	0.500	0.000
							0.000
3	Subgrade	cum					
	LHS		1	0.00	5.000	0.500	0.000
	RHS		1	0.00	5.900	0.500	0.000
							0.000
4	CTSB	cum					
	LHS		1	0.00	5.000	0.235	0.000
	RHS		1	0.00	6.500	0.235	0.000
							0.000
5	CTB	cum					
	LHS		1	0.00	5.000	0.115	0.000
	RHS		1	0.00	6.500	0.115	0.000
							0.000
6	Aggregate layer	cum					
	LHS		1	0.00	5.000	0.100	0.000
	RHS		1	0.00	6.500	0.100	0.000
							0.000
7	BC	cum					
	LHS		1	0.00	5.000	0.050	0.000
	RHS		1	0.00	6.500	0.050	0.000
							0.000
8	Prime Coat	sqm					
	LHS		1	0.00	5.000		0.000
	RHS		1	0.00	6.500		0.000
							0.000
9	Tack Coat over Granular Surface	sqm					
	LHS		1	0.00	5.000		0.000
	RHS		1	0.00	6.500		0.000
							0.000
10	Road Marking	sqm					
	Lane marking (broken)						
	Center		0	1.50	0.100		0.000
	Edge marking (solid)						
	LHS		2	0.00	0.150		0.000
	RHS		3	0.00	0.150		0.000
							0.000
11	Parapet wall (M-15)	Cum					
	LHS		0	0.00	0.450	0.600	0.000
	RHS		1	0.00	0.450	0.600	0.000
							0.000
12	Utility Duct Pipe (300mm Dia)	Rmt					
	LHS		1	0.00			0.000
	RHS		0	0.00			0.000
							0.000
13	EPS Sheet	Sqm					

Sl.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
	LHS		1	0.00	5.000		0.000
	RHS		1	0.00	5.900		0.000
							0.000
14	Kerb	Rmt					
	LHS		0	0.00			0.000
	RHS		0	0.00			0.000
							0.000
15	Selected Earth Fill	Cum					
	LHS		0	0.00	0.000		0.000
	RHS		0	0.00			0.000
							0.000
16	Clearing and Grubbing	Hect					
	LHS		1	0.00	5.900		0.000
	RHS		1	0.00	6.950		0.000
							0.000

TYPICAL CROSS-SECTION NEW CONSTRUCTION WITH HILL SIDE CUT AND VALLEY SIDE MBCB

TCS TYPE 5

INPUTS		MAIN CARRIAGEWAY	
		LHS	RHS
All Data in m	Data Related to Existing Carriageway		
	Carriageway width	0.000	0.000
	Earthen Shoulder	0.000	0.000
	Data Related to Proposed Carriageway		
	Carriageway width	3.500	3.500
	Paved Shoulder	1.500	1.500
	Snow Storage	0.000	1.500
	Drain	0.900	0.000
	Earthen Shoulder	0.000	1.000
	BC	0.050	0.050
	Aggregate layer	0.100	0.100
	CTB	0.115	0.115
	CTSB	0.235	0.235
	Subgrade	0.500	0.500

CALCULATION

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
1	Dismantling of Ex. Bituminous Layer	cum					
	LHS		1	370.00	0.000	0.115	0.000
	RHS		1	370.00	0.000	0.115	0.000
							0.000
2	Dismantling of Ex. Granular Layer	cum					
	LHS		1	370.00	0.000	0.500	0.000
	RHS		1	370.00	0.000	0.500	0.000
							0.000
3	Subgrade	cum					
	LHS		1	370.00	5.000	0.500	925.000
	RHS		1	370.00	9.000	0.500	1665.000
							2590.000
4	CTSB	cum					
	LHS		1	370.00	5.000	0.235	434.750
	RHS		1	370.00	6.850	0.235	595.608
							1030.358
5	CTB	cum					
	LHS		1	370.00	5.000	0.115	212.750
	RHS		1	370.00	6.615	0.115	281.468
							494.218
6	Aggregate layer	cum					
	LHS		1	370.00	5.000	0.100	185.000
	RHS		1	370.00	6.500	0.100	240.500
							425.500
7	BC	cum					
	LHS		1	370.00	5.000	0.050	92.500
	RHS		1	370.00	6.500	0.050	120.250
							212.750
8	Prime Coat	sqm					
	LHS		1	370.00	5.000		1850.000
	RHS		1	370.00	6.500		2405.000
							4255.000
9	Tack Coat over Granular Surface	sqm					
	LHS		1	370.00	5.000		1850.000
	RHS		1	370.00	6.500		2405.000
							4255.000
10	Road Marking	sqm					
	Lane marking (broken)						
	Center		123	1.50	0.100		18.500
	Edge marking (solid)						
	LHS		2	370.00	0.150		111.000
	RHS		3	370.00	0.150		166.500
							296.000
11	Parapet wall (M-15)	Cum					
	LHS		0	370.00	0.450	0.600	0.000
	RHS		0	370.00	0.450	0.600	0.000
							0.000
12	Utility Duct Pipe (300mm Dia)	Rmt					
	LHS		1	370.00			370.000
	RHS		0	370.00			0.000
							370.000
13	EPS Sheet	Sqm					
	LHS		1	370.00	5.000		1850.000
	RHS		1	370.00	9.000		3330.000
							5180.000
14	Kerb	Rmt					
	LHS		0	370.00			0.000
	RHS		0	370.00			0.000
							0.000
15	Selected Earth Fill	Cum					
	LHS		0	370.00			0.000
	RHS		1	370.00	1.875		693.750
							693.750

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
16	Metal Beam crash Barrier	Rmt					
	LHS		0	370.00			0.000
	RHS		1	370.00			370.000
							370.000
17	Clearing and Grubbing	Hect					
	LHS		1	370.00	5.900		2183.000
	RHS		1	370.00	0.253		93.610
							0.228

TYPICAL CROSS-SECTION NEW CONSTRUCTION ON HIGH EMBANKMENT

TCS TYPE 6

INPUTS		MAIN CARRIAGEWAY	
		LHS	RHS
All Data in m	Data Related to Existing Carriageway		
	Carriageway width	0.000	0.000
	Earthen Shoulder	0.000	0.000
	Data Related to Proposed Carriageway		
	Carriageway width	3.500	3.500
	Paved Shoulder	1.500	1.500
	Snow Storage	0.750	0.750
	Drain	0.000	0.000
	Earthen Shoulder	1.000	1.000
	BC	0.050	0.050
	Aggregate layer	0.100	0.100
	CTB	0.115	0.115
	CTSB	0.235	0.235
	Subgrade	0.500	0.500

CALCULATION

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
1	Dismantling of Ex. Bituminous Layer	cum					
	LHS		1	3563.50	0.000	0.115	0.000
	RHS		1	3563.50	0.000	0.115	0.000
							0.000
2	Dismantling of Ex. Granular Layer	cum					
	LHS		1	3563.50	0.000	0.500	0.000
	RHS		1	3563.50	0.000	0.500	0.000
							0.000
3	Subgrade	cum					
	LHS		1	3563.50	8.250	0.500	14699.438
	RHS		1	3563.50	8.250	0.500	14699.438
							29398.875
4	CTSB	cum					
	LHS		1	3563.50	5.900	0.235	4940.793
	RHS		1	3563.50	5.900	0.235	4940.793
							9881.586
5	CTB	cum					
	LHS		1	3563.50	5.900	0.115	2417.835
	RHS		1	3563.50	5.900	0.115	2417.835
							4835.670
6	Aggregate layer	cum					
	LHS		1	3563.50	5.750	0.100	2049.013
	RHS		1	3563.50	5.750	0.100	2049.013
							4098.025
7	BC	cum					
	LHS		1	3563.50	5.750	0.050	1024.506
	RHS		1	3563.50	5.750	0.050	1024.506
							2049.013
8	Prime Coat	sqm					
	LHS		1	3563.50	5.750		20490.125
	RHS		1	3563.50	5.750		20490.125
							40980.250
9	Tack Coat over Granular Surface	sqm					
	LHS		1	3563.50	5.750		20490.125
	RHS		1	3563.50	5.750		20490.125
							40980.250
10	Road Marking	sqm					
	Lane marking (broken)						
	Center		1188	1.50	0.100		178.175
	Edge marking (solid)						
	LHS		3	3563.50	0.150		1603.575
	RHS		3	3563.50	0.150		1603.575
							3385.325
11	Parapet wall (M-15)	Cum					
	LHS		0	3563.50	0.450	0.600	0.000
	RHS		0	3563.50	0.450	0.600	0.000
							0.000
12	Utility Duct Pipe (300mm Dia)	Rmt					
	LHS		1	3563.50			3563.500
	RHS		0	3563.50			0.000
							3563.500
13	EPS Sheet	Sqm					
	LHS		1	3563.50	8.250		29398.875
	RHS		1	3563.50	8.250		29398.875
							58797.750
14	Kerb	Rmt					
	LHS		1	3563.50			3563.500
	RHS		1	3563.50			3563.500
							7127.000
15	Selected Earth Fill	Cum					
	LHS		1	3563.50	1.875		6681.563
	RHS		1	3563.50	1.875		6681.563
							13363.125

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
16	Metal Beam crash Barrier	Rmt					
	LHS		1	3563.50			3563.500
	RHS		1	3563.50			3563.500
							7127.000
17	Clearing and Grubbing	Hect					
	LHS		1	3563.50	12.000		42762.000
	RHS		1	3563.50	12.000		42762.000
							8.552
18	construction of Reinforced Earth steepened slope	Sqm					
	LHS		1	3563.50	10.000		35635.000
	RHS		1	3563.50	10.000		35635.000
							71270.00
19	Supply and laying of PCC leveling pad of M-15 grade	Cum					
	LHS		1	3563.50	0.150	0.200	106.905
	RHS		1	3563.50	0.150	0.200	106.905
							213.810
20	Providing and laying of boulders in front of the Reinforced Earth facia	Cum					
	LHS		1	3563.50	10.000	0.300	10690.500
	RHS		1	3563.50	10.000	0.300	10690.500
							21,381.00
21	Needle punched or continuous filament non-woven geotextile	Sqm					
	LHS		1	3563.50	10.000	2.500	89087.500
	RHS		1	3563.50	10.000	2.500	89087.500
							1,78,175.00
22	Drainage board wrapped with non-woven geotextiles (500 mm x 250 mm)	Rm					
	LHS		1	3563.50	10.000	0.800	28508.000
	RHS		1	3563.50	10.000	0.800	28508.000
							57016.00

TYPICAL CROSS-SECTION NEW CONSTRUCTION ON HIGH EMBANKMENT

TCS TYPE 7

INPUTS		MAIN CARRIAGEWAY	
		LHS	RHS
All Data in m	Data Related to Existing Carriageway		
	Carriageway width	0.000	0.000
	Earthen Shoulder	0.000	0.000
	Data Related to Proposed Carriageway		
	Carriageway width	3.500	3.500
	Paved Shoulder	1.500	1.500
	Snow Storage	0.750	0.750
	Drain	0.000	0.000
	Earthen Shoulder	0.000	0.000
	BC	0.050	0.050
	Aggregate layer	0.100	0.100
	CTB	0.115	0.115
	CTSB	0.235	0.235
	Subgrade	0.500	0.500

CALCULATION

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
1	Dismantling of Ex. Bituminous Layer	cum					
	LHS		1	0.00	0.000	0.115	0.000
	RHS		1	0.00	0.000	0.115	0.000
							0.000
2	Dismantling of Ex. Granular Layer	cum					
	LHS		1	0.00	0.000	0.500	0.000
	RHS		1	0.00	0.000	0.500	0.000
							0.000
3	Subgrade	cum					
	LHS		1	0.00	5.750	0.500	0.000
	RHS		1	0.00	5.750	0.500	0.000
							0.000
4	CTSB	cum					
	LHS		1	0.00	5.750	0.235	0.000
	RHS		1	0.00	5.750	0.235	0.000
							0.000
5	CTB	cum					
	LHS		1	0.00	5.750	0.115	0.000
	RHS		1	0.00	5.750	0.115	0.000
							0.000
6	Aggregate layer	cum					
	LHS		1	0.00	5.750	0.100	0.000
	RHS		1	0.00	5.750	0.100	0.000
							0.000
7	BC	cum					
	LHS		1	0.00	5.750	0.050	0.000
	RHS		1	0.00	5.750	0.050	0.000
							0.000
8	Prime Coat	sqm					
	LHS		1	0.00	5.750		0.000
	RHS		1	0.00	5.750		0.000
							0.000
9	Tack Coat over Granular Surface	sqm					
	LHS		1	0.00	5.750		0.000
	RHS		1	0.00	5.750		0.000
							0.000
10	Road Marking	sqm					
	Lane marking (broken)						
	Center		0	1.50	0.100		0.000
	Edge marking (solid)						
	LHS		3	0.00	0.150		0.000
	RHS		3	0.00	0.150		0.000
							0.000
11	Parapet wall (M-15)	Cum					
	LHS		0	0.00	0.450	0.600	0.000
	RHS		0	0.00	0.450	0.600	0.000
							0.000
12	Utility Duct Pipe (300mm Dia)	Rmt					
	LHS		1	0.00			0.000
	RHS		0	0.00			0.000
							0.000
13	EPS Sheet	Sqm					
	LHS		1	0.00	5.750		0.000
	RHS		1	0.00	5.750		0.000
							0.000
14	Kerb	Rmt					
	LHS		0	0.00			0.000
	RHS		0	0.00			0.000
							0.000
15	Selected Earth Fill	Cum					
	LHS		0	0.00			0.000
	RHS		0	0.00	0.125		0.000
							0.000

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
16	Metal Beam crash Barrier	Rmt					
	LHS		0	0.00			0.000
	RHS		0	0.00			0.000
							0.000
17	Clearing and Grubbing	Hect					
	LHS		1	0.00	6.250		0.000
	RHS		1	0.00	6.250		0.000
							0.000
18	Precast concrete fascia panels of M35 grade						
	LHS	Sqm	1	0.00	9.000		-
	RHS		1	0.00	8.500		-
							-
19	RCC crash barrier with friction slab						
	LHS	Lm	1	0.00			-
	RHS		1	0.00			-
							-
20	Granular Earth Fill						
		Cum	1	0.00	8.100	8.750	-
							-
							-

TYPICAL CROSS-SECTION NEW CONSTRUCTION ON HIGH EMBANKMENT

TCS TYPE 8

INPUTS		MAIN CARRIAGEWAY	
		LHS	RHS
All Data in m	Data Related to Existing Carriageway		
	Carriageway width	0.000	0.000
	Earthen Shoulder	0.000	0.000
	Data Related to Proposed Carriageway		
	Carriageway width	3.500	3.500
	Paved Shoulder	1.500	1.500
	Snow Storage	0.000	1.500
	Drain	0.900	0.600
	Earthen Shoulder	0.000	0.000
	BC	0.050	0.050
	Aggregate layer	0.100	0.100
	CTB	0.115	0.115
	CTSB	0.235	0.235
	Subgrade	0.500	0.500

CALCULATION

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
1	Dismantling of Ex. Bituminous Layer	cum					
	LHS		1	1256.00	0.000	0.115	0.000
	RHS		1	1256.00	0.000	0.115	0.000
							0.000
2	Dismantling of Ex. Granular Layer	cum					
	LHS		1	1256.00	0.000	0.500	0.000
	RHS		1	1256.00	0.000	0.500	0.000
							0.000
3	Subgrade	cum					
	LHS		1	1256.00	5.000	0.500	3140.000
	RHS		1	1256.00	6.500	0.500	4082.000
							7222.000
4	CTSB	cum					
	LHS		1	1256.00	5.000	0.235	1475.800
	RHS		1	1256.00	6.500	0.235	1918.540
							3394.340
5	CTB	cum					
	LHS		1	1256.00	5.000	0.115	722.200
	RHS		1	1256.00	5.900	0.115	852.196
							1574.396
6	Aggregate layer	cum					
	LHS		1	1256.00	5.000	0.100	628.000
	RHS		1	1256.00	5.475	0.100	687.660
							1315.660
7	BC	cum					
	LHS		1	1256.00	5.000	0.050	314.000
	RHS		1	1256.00	5.475	0.050	343.830
							657.830
8	Prime Coat	sqm					
	LHS		1	1256.00	5.000		6280.000
	RHS		1	1256.00	5.475		6876.600
							13156.600
9	Tack Coat over Granular Surface	sqm					
	LHS		1	1256.00	5.000		6280.000
	RHS		1	1256.00	5.475		6876.600
							13156.600
10	Road Marking	sqm					
	Lane marking (broken)						
	Center		419	1.50	0.100		62.800
	Edge marking (solid)						
	LHS		2	1256.00	0.150		376.800
	RHS		2	1256.00	0.150		376.800
							816.400
11	Parapet wall (M-15)	Cum					
	LHS		0	1256.00	0.450	0.600	0.000
	RHS		0	1256.00	0.450	0.600	0.000
							0.000
12	Utility Duct Pipe (300mm Dia)	Rmt					
	LHS		1	1256.00			1256.000
	RHS		0	1256.00			0.000
							1256.000
13	EPS Sheet	Sqm					
	LHS		1	1256.00	5.000		6280.000
	RHS		1	1256.00	6.500		8164.000
							14444.000
14	Kerb	Rmt					
	LHS		0	1256.00			0.000
	RHS		0	1256.00			0.000
							0.000
15	Selected Earth Fill	Cum					
	LHS		0	1256.00			0.000
	RHS		0	1256.00	0.125		0.000
							0.000

SI.NO.	Item Description	Unit	No.	Length (m)	Width (m)	Depth (m)	Quantity
16	Metal Beam crash Barrier	Rmt					
	LHS		0	1256.00			0.000
	RHS		0	1256.00			0.000
							0.000
17	Clearing and Grubbing	Hect					
	LHS		1	1256.00	5.900		7410.400
	RHS		1	1256.00	6.500		8164.000
							1.557

RATE ANALYSIS OF PRECAST SEGMENTAL ARCHES

Item No.	Description of Items	Unit	No	L	B	D	Quantity
1	Designing, providing construction drawing and supplying moulds , spreader beams, lifting eyes, lifting anchors, load chain, consumables that includes lifting anchors, non-woven geotextile, water-proofing membrane for arch joints, including technical assistance during precasting and installation of precast arch units as per technical specification and construction manual of technology provider. Contractor shall tie - up with an executing agency before the pre-bid with adequate similar work experience in Indian conditions.	Lm	1	2350			2350.00
2	Providing and supplying of concrete of M 45 Grade for precasting segmental arches at casting yard including demoulding , stacking and curing as per site conditions .	cum	1	2350	10.87		25544.50
3	Providing & Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications for Precast ARCH.	MT	1	2350	1.79		4206.50
4	Providing and supplying of M35 Concrete for casting Stitch Beams and Collar	cum	1	2350	0.35		822.50
5	Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications for Stitch Beams and Collar.	MT		80			65.80
6	Providing and supplying of concrete of M35 Concrete for casting of raft and foundation beams for erection of segmental arches including all spaces , opening for utilities like wire ducts , embedded drainage pipes etc. as per the final construction drawings	cum	1	2350	0.5	15.6	18330.00
7	Providing and supplying of geosynthetic clay liner for sealing at the top of the precast segmental arch , to restrict the penetration of precipitated water into the filled strata and per enclosed drawing and specifications.	sqm	1	2350	35		82250.00
8	Providing and supplying of Grade M15 for guide slab (Provisional)	cum	1	280	0.125	80	2800
9	Providing of 80MT crane with fuel and operator for casting	Month	1	12			12.00
10	80MT crane with fuel and operator for erection	Month	1	12			12.00
11	Trailer with fuel and operator	Month	1	12			12.00
12	Installation of Arch units using 80 MT crane along with tools tackles , manpower etc.	Lm	1	2350			2350
13	Providing , filling and compacting of selected earth fill as per technical specifications by filling earth in layers of 250 mm and compacting to 95% of proctor density , with the ambit of technical specification and direction of engineer - in - charge	Cum	1	2350			279650
	Deduct for Opening portion 101 sqm		1	2350	101	area	279650
14	Clearing and grubbing road land including uprooting wild vegetation, grass, bushes, shrubs, saplings and trees of girth upto 300 mm, removal of stumps of such trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned, for all leads including removal and disposal of top organic soil not exceeding 150 mm in thickness as per Technical Specification Clause 201.	Hectare	1	2350	16		3.76
15	Excavation in soil in hilly area by mechanical means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 1000 metres or as per Technical Specification Clause 301, 302 & 303.	Cum	1	2350	16	13.75	517000

Preliminary Costing- This is only an Indicative figure based on preliminary design. Costing of only major components is performed herein. One shall do a detailed design and cost estimation to obtain more realistic figures.

Work: SOLDIER PILING FOR WHOLE 2.3 km LENGTH

TOTAL LENGTH (m)	2350
TOTAL LENGTH OF OPEN FRONTS (m)	588

B: Sheet Piles

Soldier Piles UB 610X305X238 spacing (m)	Total Length- L-(m)	Total Length of both sides [2xL]-(m)	Total No of Piles	Length of Sheet pile (m)	Total Length of Soldier Pile(m)= Total Boring Length	Weight per m (kg)	Total weight per m in TON	Cost of Per m boring	Total Boring Cost	Per ton cost of UB	Total Cost of soldier piles	Total Cost
1	587.5	1175	1175	21.31	25042	238	5960.040625	₹ 4,000	₹ 10,01,68,750	₹ 65,000	₹ 38,74,02,641	₹ 48,75,71,391

B: Waler Beam

UB 1016X305X584	Total Length- L-(m)	No of Layers	Total Length of Waler Beam	Weight of Waler(KG/m)	Total Weight (ton)	Cost of Waler/ton	Total Cost
	1175	8	9400	584	5489.6	₹ 65,000.00	₹ 35,68,24,000

C: STRUTS

Struts 1m OD, 0.3mm thick	Total Length- L-(m)	No of Layers	Total Length of Struts (m)	Spacing (m)	Total Length (m)	Weight (TON)	Cost of Strut/ton	Total Cost
	587.5	1	15	4	2203.125	815.8005704	₹ 65,000.00	₹ 5,30,27,037
	587.5	1	15	6	1469	543.8670469	₹ 65,000.00	₹ 3,53,51,358
	587.5	1	15	8	1101.5625	407.9002852	₹ 65,000.00	₹ 2,65,13,519
	587.5	1	15	10	881.25	326.3202282	₹ 65,000.00	₹ 2,12,10,815
								₹ 13,61,02,728

D: LAGGING

Lagging (wooden)	Dimension	Total Area of Lagging protection (m2)	Total Volume of Lagging protection (m3)	Cost per m3	Total cost
	75 mm thick	14981.25	1123.59375	₹ 72,000.00	₹ 8,08,98,750

Total Cost	A+B+C+D+E
	₹ 1,06,13,96,869 +E
overhead	₹ 1,14,63,08,618.65
Contractor Profit	₹ 1,26,09,39,480.52

Summary (Snow Galary)

S No.	Item	Unit	Qty
1	Clearing and Grubbing	Hct	0.59
2	Earth Work in Excavation	Cum	9980.45
3	PCC M15 grade Below Foundation	Cum	595.85
4	RCC M25 grade in Bottom slab	Cum	9372.87
5	RCC M25 grade in Sub structure	Cum	3823.95
6	RCC M25 grade in Top Slab	Cum	2109.33
7	Reinforcement	Tonne	1913.27
8	Wearing Coat	Sqm	4500.00
9	Filtermedia	Cum	4479.19
10	Metal beam Crash barrier	Rm	900.00
11	Weephole	No	3223
12	Perforated Pipe	Rmt	450

Input Data for Snow Gallery

No. of carriageways	1.00	For 1 Segment	
Slab Angle	12.00	Clear Span	5.00
Skew Factor	0.98	No Of segment	90
Clear Span	11.10		
Top Slab thickness (a)	0.80	Catch Water Drain	
Length of Snow Gallery	450.00	Length	450.00
Foundation		Width	1.000
Length of Foundation	451.40	Depth	1.000
Width of Foundation	13.10	Thickness of wall	0.100
Depth For the foundation	1.20		
Bottom foundation bottom width	0.75	Wearing Coat	10.00
Bottom foundation top width	1.50		
Bottom foundation Height	2.10		
Column			
No of column	91		
Length of Column	1.00		
Width of Column	1.20		
Height	5.50		
Beam			
Length of Beam	11.35		
Width of Beam	0.60		
Depth of Beam	1.20		
Wall			
Length of Wall	450.00		
Width of wall	1.00		
Height of Wall	7.16		
Slab			
Length	450.00		
Length for 1 Slab Segment	13.39		
Width for 1 Slab Segment			
Thickness of Slab	0.35		

Quantity calculation for Snow Gallery

S No.	Item	Unit	No	Length	Width	Height	Qty
1	Clearing and Grubbing	Hct					
	Foundation		1	450.00	13.10		0.59
							0.59
2	Earth Work in Excavation	Cum					
	Foundation		1	451.40	13.20	1.30	7,746.02
			2	451.40	1.13	2.20	2,234.43
							9,980.45
3	PCC M15 grade Below Foundation	Cum					
	Foundation		1	451.40	13.20	0.10	595.85
							595.85
4	RCC M25 grade in Bottom slab	Cum					
	Foundation		1	451.40	13.10	1.20	7,096.01
	Bottom Foundation		2	451.40	1.13	2.10	2,132.87
	Drain Base slab		1	450.00	1.20	0.10	54.00
	Drain side wall		2	450.00	1.00	0.10	90.00
							9,372.87
5	RCC M25 grade in Sub structure	Cum					
	Column		91	1.00	1.20	5.50	600.60
	Wall		1	450.00	1.00	7.16	3,223.35
							3,823.95
6	RCC M25 grade in Top Slab	Cum					
	Slab		1	13.39	450.00	0.35	2,109.33
	Beam		91	11.35	0.60	0.45	278.82
							2,109.33
7	Reinforcement	Tonne					
	Foundation		@ 125 kg per cum of concrete				1,171.61
	Substructure		@ 125 kg per cum of concrete				477.99
	Slab		@ 125 kg per cum of concrete				263.67
							1,913.27
8	Wearing Coat	Cum					
			1.00	450.00	10.00		4,500.00
							4,500.00
9	Filtermedia	Cum					
			1.00	450.00	1.25	7.96	4,479.19
							4,479.19
10	Metal Beam Crash Barrier	Rm					
			2.00	450.00			900.00
							900.00
11	Weep Hole	No.					
	100mm dia		1.00	3,223			3,223.00
							3,223.00
12	Drain with perforated pipe	Lm					
	600mm dia		1.00	450			450.00
							450.00