

Appendix 9.2 - Generation of C&D Materials from HATs Stage 2A, Sewage Conveyance System (SCS)

Excavation of Tunnel by Drill & Blast (D&B) Method

Month	Month No.	Tunnel (D&B)		Recycle or Excavated Mat'l from Fill Bank for Backfilling (m ³)	Other C&D Waste (m3)	Others - Inert C&D Materials (eg Broken Concrete) (m3)
		Soil (m3)	Rock (m3)			
Feb-09	1	0	0	0	200	100
Mar-09	2	0	0	0	200	1,300
Apr-09	3	0	0	0	200	1,300
May-09	4	3,700	0	0	540	1,200
Jun-09	5	3,700	0	0	780	1,300
Jul-09	6	4,100	0	0	830	150
Aug-09	7	4,100	0	0	830	150
Sep-09	8	9,200	0	0	870	0
Oct-09	9	23,200	700	0	640	0
Nov-09	10	18,300	7,400	0	470	0
Dec-09	11	14,900	10,000	0	360	0
Jan-10	12	8,000	15,100	0	290	0
Feb-10	13	5,100	14,200	0	230	0
Mar-10	14	6,200	14,000	0	150	0
Apr-10	15	6,900	13,200	0	110	0
May-10	16	900	8,200	0	110	0
Jun-10	17	0	14,600	0	110	0
Jul-10	18	0	14,600	0	110	0
Aug-10	19	0	19,000	0	110	0
Sep-10	20	0	22,000	0	110	0
Oct-10	21	0	25,000	0	110	0
Nov-10	22	0	25,200	0	110	0
Dec-10	23	0	24,600	0	110	0
Jan-11	24	0	24,600	0	110	0
Feb-11	25	0	24,600	0	110	0
Mar-11	26	0	24,600	0	110	0
Apr-11	27	0	24,600	0	110	0
May-11	28	0	24,600	0	110	0
Jun-11	29	0	24,600	0	110	0
Jul-11	30	0	24,600	0	110	0
Aug-11	31	0	22,700	0	110	0
Sep-11	32	0	22,400	0	110	0
Oct-11	33	0	22,400	0	110	0
Nov-11	34	0	22,400	0	100	0
Dec-11	35	0	22,400	0	100	0
Jan-12	36	0	22,400	0	100	0
Feb-12	37	0	22,400	0	100	0
Mar-12	38	0	22,400	0	100	0
Apr-12	39	0	21,300	0	100	0
May-12	40	0	17,300	0	100	0
Jun-12	41	0	17,300	0	100	0
Jul-12	42	0	17,300	0	100	0
Aug-12	43	0	8,900	0	100	0
Sep-12	44	0	3,200	0	100	0
Oct-12	45	0	2,200	0	100	0
Nov-12	46	0	0	0	100	0
Dec-12	47	0	0	0	100	0
Jan-13	48	0	0	0	100	0
Feb-13	49	0	0	0	100	0
Mar-13	50	0	0	0	100	0
Apr-13	51	0	0	0	100	0
May-13	52	0	0	0	100	0
Jun-13	53	0	0	0	100	0
Jul-13	54	0	0	39,000	40	0
Aug-13	55	0	0	39,000	40	0
Sep-13	56	0	0	0	40	0
Total		108,300	667,000	78,000	10,800	5,500

Appendix 9.2 - Generation of C&D Materials from HATs Stage 2A, Sewage Conveyance System (SCS)

Excavation of Tunnel by Tunnel Boring Machine (TBM) Method

Month	Month No.	Tunnel (TBM)		Reuse of Excavated Mat'l for Backfilling(m3)	Other C&D Waste (m3)	Others - Inert C&D Materials (eg Broken Concrete) (m3)
		Soil	Rock (m3)			
Feb-09	1	0	0	0	200	100
Mar-09	2	0	0	0	200	1,300
Apr-09	3	0	0	0	200	1,300
May-09	4	3,700	0	0	540	1,200
Jun-09	5	3,700	0	0	780	1,300
Jul-09	6	4,100	0	0	830	150
Aug-09	7	4,100	0	0	830	150
Sep-09	8	9,200	0	0	870	0
Oct-09	9	23,200	700	0	640	0
Nov-09	10	18,300	7,400	0	470	0
Dec-09	11	14,900	10,400	0	360	0
Jan-10	12	8,000	15,100	0	290	0
Feb-10	13	5,100	14,200	0	230	0
Mar-10	14	6,200	14,000	0	150	0
Apr-10	15	6,900	13,200	0	110	0
May-10	16	900	8,200	0	110	0
Jun-10	17	0	5,100	0	110	0
Jul-10	18	0	12,200	0	110	0
Aug-10	19	0	12,500	0	110	0
Sep-10	20	0	17,100	0	110	0
Oct-10	21	0	21,300	0	110	0
Nov-10	22	0	24,200	0	110	0
Dec-10	23	0	23,600	0	110	0
Jan-11	24	0	23,600	0	110	0
Feb-11	25	0	23,600	0	110	0
Mar-11	26	0	23,600	0	110	0
Apr-11	27	0	23,600	0	110	0
May-11	28	0	23,600	0	110	0
Jun-11	29	0	21,400	0	110	0
Jul-11	30	0	20,800	0	110	0
Aug-11	31	0	20,800	0	110	0
Sep-11	32	0	20,800	0	110	0
Oct-11	33	0	20,800	0	110	0
Nov-11	34	0	20,800	0	100	0
Dec-11	35	0	20,800	0	100	0
Jan-12	36	0	20,800	0	100	0
Feb-12	37	0	20,800	0	100	0
Mar-12	38	0	20,800	0	100	0
Apr-12	39	0	18,500	0	100	0
May-12	40	0	14,800	0	100	0
Jun-12	41	0	12,800	0	100	0
Jul-12	42	0	12,800	0	100	0
Aug-12	43	0	11,900	0	100	0
Sep-12	44	0	9,400	0	100	0
Oct-12	45	0	4,200	0	100	0
Nov-12	46	0	2,900	0	100	0
Dec-12	47	0	500	0	100	0
Jan-13	48	0	0	0	100	0
Feb-13	49	0	0	0	100	0
Mar-13	50	0	0	0	100	0
Apr-13	51	0	0	0	100	0
May-13	52	0	0	0	100	0
Jun-13	53	0	0	0	100	0
Jul-13	54	0	0	39,000	40	0
Aug-13	55	0	0	39,000	40	0
Sep-13	56	0	0	0	40	0
		108,300	613,600	78,000	10,800	5,500

Assumptions:-

- 1 The quantities are based on tunnel excavation by D&B or TBM methods, except Tunnel Q for which horizontal directional drilling is assumed.
- 2 The programme for shaft sinking at each location is based on the draft Preliminary Design Report (PDR).
- 3 Blasting assumptions for each tunnel section are as follows:
- Tunnels J, K, L & M: 1 blasts/day, 2 faces
- Tunnels N, P: 2 blasts/day, 1 face
- 4 The quantities were estimated based on the longest scenario programme in Appendix 9.1 of the draft PDR.
- 5 Quantities are distributed evenly within the programme for the respective tunnel section.
- 6 Bulk Factor is taken to be 1.35 for soil and 1.7 for rock.
- 7 A contingency factor of 10% is allowed for both soil and rock.
- 8 Tunnels J, K and L are assumed to be commenced in February 2009 while that for Tunnels M, N and P in June 2009.
- 9 The time period for contractor's design, plant mobilization and demolition of vehicular ramp for Tunnel J is 5 months.
- 10 For shaft construction, 80% of time is assumed for diaphragm wall construction and the remaining 20% of time is assumed for interior soil excavation (portion within the diaphragm wall).
- 11 2 months lead time approximately is assumed between the completion of production shaft and commencement of tunnel excavation.
- 12 Backshunt with size of 30m in length and 8m diameter is assumed at each production shaft, except at Sai Ying Pun where 3 backshunts are assumed for Tunnels K, L and M.
- 13 For HDD operation for Tunnel Q, a pilot hole will be drilled, and then followed by several reamings to the designated diameter. The volume of the excavated materials for drilling the pilot hole is negligible and included in the subsequent reaming operation.