APPENDIX F NOISE AND VIBRATION PREDICTION MODEL OUTPUTS

Table A.1: Construction Noise Predictions - Summary

Alternative No. LPA/Baseline

Description EPBM Bored tunnels to 4th St, C&C from 4th St to 7th/Metro

		LI	PA	Alterna	ative A	Alterna	ative B
		Noise	(dBA)	Noise	(dBA)	Noise	(dBA)
ID	REC	Lmax	LeqSum	Lmax	LeqSum	Lmax	LeqSum
1	Standard Hotel	85	86	85	90	85	90
2	City National Plaza	84	86	84	90	84	90
3	California Club	85	86	85	90	85	90
4	Los Angeles Public Library	70	71	70	78	70	77
5	Los Angeles Public Library Park	85	86	87	94	87	94
6	Citi Group Center	76	77	76	83	76	80
7	Westin Bonaventure Hotel	89	91	92	97	89	91
8	Hynes Property	79	81	79	85	79	81
9	Savoy Apartments (Little Tokyo)	68	83	68	89	68	89

Predicted exceedance

NB1: LeqDAY applied to evening period between 6-10PM (daytime construction is exempt).

NB2: Equipment reference noise levels were taken from the FHWA RCNM database, Table 1 (pg. 3).

Table A.2: Construction Vibration Predictions - Summary

Alternative No. LPA/Baseline

Description EPBM Bored tunnels to 4th St, C&C from 4th St to 7th/Metro

		LI	PA	Altern	ative A	Altern	ative B
		Vibration I	_evel (Max)	Vibration I	_evel (Max)	Vibration I	_evel (Max)
ID	REC	VdB	PPV (in/s)	VdB	PPV (in/s)	VdB	PPV (in/s)
1	Standard Hotel	78	0.031	78	0.031	78	0.031
2	City National Plaza	77	0.027	77	0.027	77	0.027
3	California Club	78	0.031	78	0.031	78	0.031
4	Los Angeles Public Library	55	0.002	61	0.003	60	0.003
5	Los Angeles Public Library Park	78	0.031	78	0.031	78	0.031
6	Citi Group Center	64	0.006	70	0.010	69	0.009
7	Westin Bonaventure Hotel	85	0.068	91	0.118	85	0.068
8	Hynes Property	69	0.012	75	0.018	72	0.013
9	Savoy Apartments (Little Tokyo)	65	0.006	65	0.006	65	0.006

Predicted exceedance

NB1: LeqDAY applied to evening period between 6-10PM (daytime construction is exempt).

NB2: Equipment reference noise levels were taken from the FHWA RCNM database, Table 1 (pg. 3).

Table A.3: Receptor Distances

				I	Distance (ft)			
ID	REC	Description	4th St - 6th St	5th St 6th St.	4th St 5th St.	5th St 6th St.	4th St 5th St.	Little Tokyo Portal
			General Construction	Grouting Plant 1	Grouting Plant 2	Grouting Rigs 1	Grouting Rigs 2	Muck Removal
1	R1	Standard Hotel	50	320	880	50	550	N/A
2	R2	City National Plaza	55	90	500	55	192	N/A
3	R3	California Club	50	160	715	50	400	N/A
4	R4	Los Angeles Public Library	285	265	480	285	300	N/A
5	R5	Los Angeles Public Library Park	50	30	390	50	108	N/A
6	R6	Citi Group Center	145	240	155	240	145	N/A
7	R7	Westin Bonaventure Hotel	30	345	65	278	20	N/A
8	R8	Hynes Property	97	477	117	417	97	N/A
9	R9	Savoy Apartments (Little Tokyo)	N/A	N/A	N/A	N/A	N/A	130

<u> </u>																		
Table A.4: Construction	Noise and Vibration Prediction	ctions - R1																
Receiver No.	1																	
ID	R1																	
	Standard Hotel																	
Dista	ance (ft)												GB-NZ: Typical Soil					
General Construction	50												-35		TDH Convert	ted RMS to PI	PV	
Grouting Plant 1	320																	
Grouting Plant 2	880																	
Grouting Rigs 1	50			L														
Grouting Rigs 2	550																	
Little Tokyo Muck Remov	/ N/A																	
			L	<u> </u>														
			NC	DISE										VIE	RATION	N.		
									<u>Maximum</u>	Cumulative						Max VdB	Max PPV	Max GBNZ
Alternative No.	LPA/Baseline								85.0	86.4						78.0	0.031	43.0
Description	EPBM Bored tunnels to 4th	St, C&C from 4th St to 7th	/Metro															
									e Levels (in dE									
No.	Equipment Grouping	Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	4	8	7							5	3			
1	General Construction	Bulldozer	Dozer	1	50	40%	85	0	85.0	81.0	29%		Small Bulldozer	58	0.003	49.0	0.001	
2	General Construction	Excavator	Excavator	1	50		85	0	85.0	81.0	29%		Large Bulldozer	87	0.089	78.0	0.031	
3	General Construction	Crane	Crane	1	50	16%	85	0	85.0	77.0	12%		MIN (Sm. Dozer)	79	0.035	70.0	0.012	35.0
4	General Construction	Drill Rig	Drill Rig Truck	1	50	20%	84	0	84.0	77.0	12%		Caisson drilling	87	0.089	78.0	0.031	43.0
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	50		79	0	79.0	75.0	7%		Loaded Trucks	86	0.076	77.0	0.027	
6	General Construction	Muck Removal	Dump Truck	3	50	40%	76	0	76.0	77.1	12%		Loaded Trucks	86	0.076	77.0	0.027	42.0
				L					<u>Maximum</u>	Cumulative						Max VdB	Max PPV	Max GBNZ
Alternative No.			hield/SEM Profile Alterna						85.0	89.6						78.0	0.0	43.0
Description		EPBM bored tunnels on LPA aligns	ment to 4th street shaft, open face s	shield tunnel excav	vation on 5th St sh	aft abandoning					tro mucking through L	tunnel						
									e Levels (in dE									
No.	Powered By	Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	4	8	7							5	3			
1	General Construction	Bulldozer	Dozer	1	50	40%	85	0	85.0	81.0	14%		Small Bulldozer	58	0.003	49.0	0.001	14.0
2	General Construction	Excavator	Excavator	1	50		85	0	85.0	81.0	14%		Large Bulldozer	87	0.089	78.0	0.031	43.0
3	General Construction	Crane	Crane	1	50		85	0	85.0	77.0	6%		MIN (Sm. Dozer)	79	0.035	70.0	0.012	35.0
4	General Construction	Drill Rig	Drill Rig Truck	1	50		84	0	84.0	77.0	6%		Caisson drilling	87	0.089	78.0	0.031	43.0
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	50		79		79.0	75.0	3%		Loaded Trucks	86	0.076	77.0	0.027	42.0
- 6	General Construction	Muck Removal	Dump Truck	1	50	40%	76		76.0	72.0	2%		Loaded Trucks	86	0.076	77.0	0.027	
7	Grouting Plant 1	Compressor 1	Compressor (air)	1	320	100%	80	0	63.9	63.9	0%		Small Bulldozer	58	0.003	24.8	0.000	0.0
8	Grouting Plant 1	High-Pressure Pump 1	Pumps	1	320	100%	77		60.9	60.9	0%		Small Bulldozer Small Bulldozer	58	0.003	24.8	0.000	0.0
9	Grouting Plant 1	Diesel Generator 1	Generator	1	320	100%	82	0	65.9	65.9	0%							
10	Grouting Plant 1													58	0.003	24.8		
11		Mixing Plant 1	Concrete Batch Plant	1	320	100%	83	0	66.9	66.9	1%		Small Bulldozer	58	0.003	24.8	0.000	0.0
12	Grouting Plant 2	Compressor 2	Compressor (air)	1	320 880	100%	80	0	66.9 55.1	55.1	1% 0%		Small Bulldozer Small Bulldozer	58 58	0.003 0.003	24.8 11.6	0.000	0.0
	Grouting Plant 2	Compressor 2 High-Pressure Pump 2	Compressor (air) Pumps	1	320 880 880	100% 100%	80 77	0	66.9 55.1 52.1	55.1 52.1	1% 0% 0%		Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58	0.003 0.003 0.003	24.8 11.6 11.6	0.000 0.000 0.000	0.0
13	Grouting Plant 2 Grouting Plant 2	Compressor 2 High-Pressure Pump 2 Diesel Generator 2	Compressor (air) Pumps Generator	1	320 880 880 880	100% 100% 100%	80 77 82	0 0	66.9 55.1 52.1 57.1	55.1 52.1 57.1	1% 0% 0% 0%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58	0.003 0.003 0.003 0.003	24.8 11.6 11.6 11.6	0.000 0.000 0.000 0.000	0.0 0.0 0.0
14	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2	Compressor (air) Pumps Generator Concrete Batch Plant	1 1 1	320 880 880 880 880	100% 100% 100% 100%	80 77 82 83	0 0 0 0	66.9 55.1 52.1 57.1 58.1	55.1 52.1 57.1 58.1	1% 0% 0% 0% 0%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58 58	0.003 0.003 0.003 0.003 0.003	24.8 11.6 11.6 11.6 11.6	0.000 0.000 0.000 0.000 0.000	0.0 0.0 0.0 0.0
14 15	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 2	320 880 880 880 880	100% 100% 100% 100% 100%	80 77 82 83 84	0 0 0 0	66.9 55.1 52.1 57.1 58.1 84.0	55.1 52.1 57.1 58.1 87.0	1% 0% 0% 0% 0% 55%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.008	24.8 11.6 11.6 11.6 11.6 57.0	0.000 0.000 0.000 0.000 0.000 0.003	0.0 0.0 0.0 0.0 22.0
14 15 16	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck	1 1 1	320 880 880 880 880 50 550	100% 100% 100% 100% 100% 100%	80 77 82 83 84 84	0 0 0 0 0	66.9 55.1 52.1 57.1 58.1 84.0 63.2	55.1 52.1 57.1 58.1 87.0 66.2	1% 0% 0% 0% 0% 0% 55%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 66 66	0.003 0.003 0.003 0.003 0.003 0.008 0.008	24.8 11.6 11.6 11.6 11.6 57.0 25.7	0.000 0.000 0.000 0.000 0.000 0.003 0.000	0.0 0.0 0.0 0.0 22.0
14 15	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 2	320 880 880 880 880 50 550	100% 100% 100% 100% 100%	80 77 82 83 84	0 0 0 0	66.9 55.1 52.1 57.1 58.1 84.0	55.1 52.1 57.1 58.1 87.0	1% 0% 0% 0% 0% 55%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.008	24.8 11.6 11.6 11.6 11.6 57.0	0.000 0.000 0.000 0.000 0.000 0.003	0.0 0.0 0.0 0.0 22.0
14 15 16	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck	1 1 1 1 2	320 880 880 880 880 50 550	100% 100% 100% 100% 100% 100%	80 77 82 83 84 84	0 0 0 0 0	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A	55.1 52.1 57.1 58.1 87.0 66.2 N/A	1% 0% 0% 0% 0% 0% 55%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 66 66	0.003 0.003 0.003 0.003 0.003 0.008 0.008	24.8 11.6 11.6 11.6 11.6 57.0 25.7 52.6	0.000 0.000 0.000 0.000 0.000 0.003 0.000 0.001	0.0 0.0 0.0 0.0 22.0 0.0 17.6
14 15 16 17	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	1 1 1 1 2	320 880 880 880 880 50 550	100% 100% 100% 100% 100% 100%	80 77 82 83 84 84	0 0 0 0 0	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A	55.1 52.1 57.1 58.1 87.0 66.2 N/A	1% 0% 0% 0% 0% 0% 55%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 66 66	0.003 0.003 0.003 0.003 0.003 0.008 0.008	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB	0.000 0.000 0.000 0.000 0.000 0.003 0.000 0.001	0.0 0.0 0.0 0.0 22.0 0.0 17.6
14 15 16 17 Alternative No.	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A gnment Alternative	1 1 1 2 2 2 1 1	320 880 880 880 50 550 555	100% 100% 100% 100% 100% 100% N/A	80 77 82 83 84 84 N/A	0 0 0 0 0 0 0 0 N/A	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6	1% 0% 0% 0% 0% 0% 55% 0%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 66 66	0.003 0.003 0.003 0.003 0.003 0.008 0.008	24.8 11.6 11.6 11.6 11.6 57.0 25.7 52.6	0.000 0.000 0.000 0.000 0.000 0.003 0.000 0.001	0.0 0.0 0.0 0.0 22.0 0.0 17.6
14 15 16 17	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	1 1 1 2 2 2 1 1	320 880 880 880 50 550 555	100% 100% 100% 100% 100% 100% N/A	80 77 82 83 84 84 N/A	0 0 0 0 0 0 0 N/A	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 letro. Mucking through	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 th L tunnel to M.	1% 0% 0% 0% 0% 0% 55% 0%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 66 66	0.003 0.003 0.003 0.003 0.003 0.008 0.008	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB	0.000 0.000 0.000 0.000 0.000 0.003 0.000 0.001	0.0 0.0 0.0 0.0 22.0 0.0 17.6
14 15 16 17 Alternative No. Description	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A pment Alternative ment to south of 5th street, remove	1 1 1 2 2 2 1 1	320 880 880 880 50 555 555	100% 100% 100% 100% 100% 100% N/A	80 77 82 83 84 N/A ***********************************	0 0 0 0 0 0 0 N/A street shaft to 7th/M	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 letero. Mucking through	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 sh L tunnel to Ma	1%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 58 58 66 66 66 93	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0	0.000 0.000 0.000 0.000 0.000 0.003 0.000 0.001 Max PPV 0.0	0.0 0.0 0.0 0.0 0.0 22.0 0.0 17.6 Max GBNZ 43.0
14 15 16 17 Alternative No.	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A gnment Alternative	1 1 1 2 2 2 1 1	320 880 880 880 50 550 555	100% 100% 100% 100% 100% 100% N/A	80 77 82 83 84 N/A ***********************************	0 0 0 0 0 0 0 N/A	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 letero. Mucking through	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 th L tunnel to M.	1% 0% 0% 0% 0% 0% 55% 0%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 66 66	0.003 0.003 0.003 0.003 0.003 0.008 0.008	24.8 11.6 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0	0.000 0.000 0.000 0.000 0.000 0.003 0.000 0.001 Max PPV 0.0	0.0 0.0 0.0 0.0 22.0 0.0 17.6
14 15 16 17 Alternative No. Description	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A priment Alternative ment to south of 5th street, remove FHWA Equiv	1 1 1 1 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1	320 880 880 880 50 550 555 555	100% 100% 100% 100% 100% 100% N/A	80 77 82 83 84 84 N/A N/A A-w LmaxRef	0 0 0 0 0 0 0 N/A	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 letro. Mucking through the Levels (in dE LmaxCalc	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 gh L tunnel to Mi	1%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM	58 58 58 58 58 66 66 93	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142	24.8 11.6 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 Max PPV 0.0	0.0 0.0 0.0 0.0 0.0 22.0 0.0 17.6 Max GBNZ 43.0
14 15 16 17 Alternative No. Description No.	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By S General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Bulldozer	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A nment Alternative unent to south of 5th street, remove FHWA Equiv 6 Dozer	1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	320 880 880 880 50 555 555 Distance 4	100% 100% 100% 100% 100% 100% N/A N/A Usage 8	80 77 82 83 84 84 N/A ** ** ** ** ** ** ** ** ** ** ** ** **	0 0 0 0 0 0 0 0 N/A street shaft to 7th/M eighted Noise Shielding	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 letro. Mucking through the Levels (in dE LmaxCalc) 85.0	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 sh L tunnel to Mi	1% 09% 0% 0% 0% 0% 0% 0% N/A 0% N/A 0% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer	58 58 58 58 58 66 66 93 LvRef (RMS) 5	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 Max PPV 0.0 PPV (ips)	0.0 0.0 0.0 0.0 0.0 17.6 Max GBNZ 43.0 GBNZ (dBA)
14 15 16 17 Alternative No. Description No. 1	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By S General Construction General Construction General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep aller Surface Equipment 2 Bulldozer Excavator	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A priment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator	1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	320 880 880 880 500 555 555 Distance	100% 100% 100% 100% 100% 100% N/A SEM tunnel cor Usage 40% 40%	80 77 82 83 84 84 N/A N/A struction from 5th A-w LmaxRef 7 85	0 0 0 0 0 0 0 0 N/A street shaft to 7th/h eighted Noise Shielding 0 0	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 Maximum 85.0 Levels (in dE LmaxCalc 85.0 85.0	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 ht. Lunnel to Mi A) Leq	1%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer	58 58 58 58 66 66 66 93 LvRef (RMS) 5 58	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.089	24.8 11.6 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0 Lv (VdB)	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 Max PPV 0.0 PPV (ips) 0.001	0.0 0.0 0.0 0.0 0.0 0.0 17.6 Max GBNZ 43.0
14 15 16 17 Alternative No. Description No. 1 2 3	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction General Construction General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Inment Alternative whent to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane	1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	320 880 880 880 50 555 555 Distance 4 50 50	100% 100% 100% 100% 100% 100% N/A SEM tunnel corr Usage 8 40% 40% 16%	80 77 82 83 84 84 N/A N/A Struction from 5th A-w LmaxRef 85 85	0 0 0 0 0 0 N/A N/A street shaft to 7th/h eighted Noise Shielding 0 0	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum Maximum B Levels (in dE LmaxCalc 85.0 85.0 85.0	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 gh L tunnel to Mit- iA) Leq 81.0 81.0	1%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer MIN (Sm. Dozer)	58 58 58 58 58 66 66 66 93 LvRef (RMS) 5 58 87	0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.089 0.089	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0 Lv (VdB)	0.000 0.000 0.000 0.000 0.000 0.001 0.001 Max PPV 0.0 PPV (ips) 0.001 0.001	0.0 0.0 0.0 0.0 22.0 17.6 Max GBNZ 43.0 GBNZ (dBA)
14 15 16 17 Alternative No. Description No. 1	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By General Construction General Construction General Construction General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alls EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck N/A Drill Rig Truck N/A pment Alternative ment to south of 5th street, remove FHWA Equiv Excavator Crane Drill Rig Truck	1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	320 880 880 880 880 500 550 555 Distance 4 50 500 500	100% 100% 100% 100% 100% 100% 100% VA 100% N/A Usage 8 40% 40% 40% 20%	80 777 82 83 84 84 N/A Struction from 5th A-w LmaxRef 7 85 85 85	0 0 0 0 0 0 0 0 N/A street shaft to 7th/h eighted Noise Shielding 0 0	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 Maximum 85.0 Levels (in dE LmaxCalc 85.0 85.0 85.0 84.0	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 sh L tunnel to Milia) Leq 81.0 81.0 77.0	1% 0% 0% 0% 0% 55% 0% N/A Style N/A Contribution 14% 6% 6%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling	58 58 58 58 66 66 93 LvRef (RMS) 5 58 87 79	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.089	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0 Lv (VdB) 49.0 78.0 78.0	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 Max PPV 0.0 PPV (ips) 0.001 0.001 0.001 0.001	0.0 0.0 0.0 0.0 0.0 0.0 0.0 17.6 Max GBNZ 43.0 GBNZ (dBA) 14.0 43.0 43.0
14 15 16 17 Alternative No. Description No. 1 2 3 4 5	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck N/A grament Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck	1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	320 880 880 880 500 550 555 Distance 4 50 50 50 50 50 50 50 50 50 50 50 50 50	100% 100% 100% 100% 100% 100% 100% 100%	80 777 82 83 84 84 N/A *** *** *** *** *** *** *** *** *** *	0 0 0 0 0 0 0 0 N/A street shaft to 7th/h eighted Noise Shielding 0 0	66.9 55.1 55.1 57.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 betro. Musking through the Levels (in dE LemaxCalc) 85.0 85.0 85.0 85.0 85.0 85.0 79.0	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 th L turnel to Mi 4A) Leq 81.0 81.0 77.0 77.0 75.0	1%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Min (Sm. Dozer) Caisson drilling Loaded Trucks	58 58 58 58 66 66 93 LvRef (RMS) 5 58 87 79 86	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.003 0.003 0.003 0.003	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0 Lv (VdB) 49.0 70.0 77.0	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.003 0.000 0.001 Max PPV 0.0 PPV (ips) 0.031 0.012 0.031	0.0 0.0 0.0 0.0 0.0 0.0 17.6 Max GBNZ 43.0 GBNZ (dBA) 14.0 43.0 43.0 43.0 43.0
14 15 16 17 Alternative No. Description No. 1 2 3	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Right 2 Grouting Right 2 Grouting Right 2 General Construction Powered By Fowered By General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Inment Alternative Internative Open Internative	### 1 1 1 2 2 2 1 1 1 1	320 880 880 880 880 500 500 500 500 500 50	100% 100% 100% 100% 100% 100% 100% N/A SEM tunnel cor Usage 8 40% 40% 40% 40% 40%	80 777 822 833 844 N/A N/A N/A LmaxRef 7 85 85 85 84 79	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	66.9 55.1 57.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 1.2 levels (in del LumaCalc 85.0 85.0 84.0 79.0 84.0 76.0	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 91. t unnel to M. IA) Leq 81.0 77.0 77.0 77.0 77.0	1%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Caisson drilling Loaded Trucks Loaded Trucks	58 58 58 58 66 66 93 LvRef (RMS) 5 8 87 79 87 86	0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.008 0.089 0.089	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max. VdB 78.0 1.0 49.0 78.0 78.0 77.0 77.0	0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 Max PPV 0.0 PPV (ips) 0.001 0.031 0.031 0.032 0.031 0.027	0.0 0.0 0.0 0.0 0.0 17.6 0.0 17.6 Max GBNZ 43.0 43.0 43.0 43.4 43.4 43.4 43.4 4
14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A priment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air)	1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	320 8808 8808 8800 500 555 555 Distance 4 500 500 500 500 320	100% 100% 100% 100% 100% 100% 100% N/A SEM tunnel cor Usage 8 40% 40% 40% 40% 100%	80 77 82 83 84 84 N/A ***********************************	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	66.9 55.1 57.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 85.0 85.0 85.0 85.0 85.0 85.0 85.0	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 h Lunnel to Mil/A) Leq 81.0 81.0 77.0 75.0 71.1 63.9	1%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Loaded Trucks Loaded Trucks Small Bulldozer	58 58 58 58 66 66 93 LVRef (RMS) 5 58 87 79 86 86 86	0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0 Lv (VdB) 49.0 70.0 77.0 77.0 24.8	0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 Max PPV 0.0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001	0.0 0.0 0.0 0.0 0.0 0.0 0.0 17.6 Max GBNZ 43.0 43.0 43.0 43.0 42.0 0.0 0.0
14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction Grouting Plant 1 Grouting Plant 1	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A A A A A A A A A A A A A	1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	320 880 880 880 880 550 550 555 555 555 55	100% 100% 100% 100% 100% 100% 100% N/A **EM tunnel cor Usage 8 40% 40% 40% 40% 100%	80 77 82 83 84 N/A N/A 	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	66.9 55.1 52.1 57.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 12 level's (in dE LmaxCalc 85.0 85.0 85.0 85.0 86.0 36.0 36.0 36.0 36.0 36.0 36.0 36.0 3	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 h) Lunnel to Mil A) Leq 81.0 81.0 77.0 77.0 75.0 71.1 63.9 60.9	1%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58 58 66 66 66 93 LvRef (RMS) 5 58 87 79 87 86 86 86	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV Ref 3 0.003 0.089 0.036 0.089 0.076 0.076	24.8 11.6 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0 Lv (VdB) 49.0 78.0 77.0 77.0 77.0 24.8 24.8	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002	0.0 0.0 0.0 0.0 0.0 0.0 17.6 0.0 17.6 Max GBNZ 43.0 14.0 43.0 43.0 43.0 43.0 43.0 63.0 42.0 42.0 0.0
14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8 9	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alls EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A prill Rig Truck N/A prill Rig Truck N/A FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Compressor (air) Pumps Generator	1 1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	320 880 880 880 880 550 555 555 555 555 55	100% 100% 100% 100% 100% 100% N/A SEM tunnel cor Usage 8 40% 40% 40% 40% 40% 100%	80 77 82 83 844 84 N/A struction from 5th A-w LmaxRef ⁷ 7 5 85 85 85 84 79 76 80 80 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	66.9 55.1 52.1 57.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 beto Musking through the Musk	55.1 52.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 99.6 81.0 81.0 81.0 77.0 77.0 77.0 77.0 77.0 63.9 60.9 65.9	1%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58 66 66 93 LvRef (RMS) 5 88 87 79 86 86 58 58	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.089 0.089 0.076 0.003 0.003 0.003	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0 24.0 49.0 78.0 77.0 77.0 77.0 24.8 24.8	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 Max PPV 0.0 PPV (ips)	0.0 0.0 0.0 0.0 0.0 0.0 0.0 17.6 Max GBNZ 43.0 14.0 43.0 43.0 43.0 6BNZ (dBA)
14 15 16 17 Alternative No. Description No. 1 2 3 3 4 5 6 7 8 9 10	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A priment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant	1 1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	320 8800 8800 8800 8800 5550 5550 5550 55	100% 100% 100% 100% 100% 100% N/A Usage 8 40% 40% 40% 100% 100% 100% 100%	80 77 82 83 84 N/A N/A 	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	66.9 55.1 52.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 1	55.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 91.1 1A) Leq 81.0 81.0 77.0 77.0 77.0 77.0 75.0 75.0 76.9 66.9 66.9	1%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	58 58 58 58 66 66 93 LVRef (RMS) 5 58 87 79 87 86 86 86 86 86 85 85 85 85 86	0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	24.8 11.6 11.6 11.6 57.0 52.6 Max VdB 78.0 Lv (VdB) 49.0 78.0 70.0 77.0 77.0 24.8 24.8 24.8	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 Max PPV 0.0 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 17.6 Max GBNZ 43.0 43.0 43.0 42.0 0.0 0.0 0.0
14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8 9 10 11	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 General Construction Fowered By S General Construction Grouting Plant 1	Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Hydraulic Drill Rig 1	Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A prill Rig Truck N/A prill Rig Truck N/A FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Compressor (air) Pumps Generator	1 1 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	320 880 880 880 880 500 500 500 500 500 320 320 500 500 500 500 500 500 500 500 500 5	100% 100% 100% 100% 100% N/A SEM tunnel cor Usage 8 40% 40% 40% 40% 100% 100% 100% 100%	80 77 82 83 844 84 N/A struction from 5th A-w LmaxRef ⁷ 7 5 85 85 85 84 79 76 80 80 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	66.9 55.1 52.1 57.1 57.1 58.1 84.0 63.2 N/A Maximum 85.0 beto Musking through the Musk	55.1 52.1 52.1 57.1 58.1 87.0 66.2 N/A Cumulative 89.6 99.6 81.0 81.0 81.0 77.0 77.0 77.0 77.0 77.0 63.9 60.9 65.9	1%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58 66 66 93 LvRef (RMS) 5 88 87 79 86 86 58 58	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.089 0.089 0.076 0.003 0.003 0.003	24.8 11.6 11.6 11.6 57.0 25.7 52.6 Max VdB 78.0 24.0 49.0 78.0 77.0 77.0 77.0 24.8 24.8	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 Max PPV 0.0 PPV (ips)	0.0 0.0 0.0 0.0 0.0 0.0 17.6 Max GBNZ 43.0 14.0 43.0 43.0 42.0 0.0 0.0 0.0 22.0

Table A.5: Construction	Noise and Vibration Prediction	ctions - R2																
Receiver No.	2																	
ID	R2																	
	City National Plaza																	
	ance (ft)												GB-NZ: Typical Soil					
General Construction	55												-35		TDH Convert	ed RMS to Pr	PV	
Grouting Plant 1	90																	
Grouting Plant 2	500																	
Grouting Rigs 1	55																	
Grouting Rigs 2	192																	
Little Tokyo Muck Remov	/ N/A					-												
	L												_	l .	l			
			NC	ISE									4	VIE	RATION			
	1																	
	+								Maximum	Cumulative						Max VdB	Max PPV	Max GBNZ
Alternative No.	LPA/Baseline								84.2	85.6						76.7	0.027	41.7
Description	EPBM Bored tunnels to 4th	St C&C from 4th St to 7th	/Metro						04.2	00.0						70.7	0.021	71.7
Description	ET DIVI BOICG (GITTICIS TO 401	01, 040 110111 411 01 10 711	I				Δ-w	eighted Noise	e Levels (in dE	(Δ)								
No.	Equipment Grouping	Surface Equipment	FHWA Equiv	Amount	Distance	Usage			LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	A	8	7	omoramy	Linaxouio	=04	CONTRIBUTION		- Tri Eduit	5	3	27 (142)	(.po)	OBITE (UBIT)
1	General Construction	Bulldozer	Dozer	1	55	40%	. 85	0	84.2	80.2	29%		Small Bulldozer	58	0.003	47.7	0.001	12.7
2	General Construction	Excavator	Excavator	1	55		85	0	84.2	80.2	29%		Large Bulldozer	87	0.089	76.7	0.027	41.7
3	General Construction	Crane	Crane	1	55	16%	85	0	84.2	76.2	12%		MIN (Sm. Dozer)	79	0.035	68.7	0.011	33.7
4	General Construction	Drill Rig	Drill Rig Truck	1	55	20%	84	0	83.2	76.2	11%		Caisson drilling	87	0.089	76.7	0.027	41.7
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	55		79	0	78.2	74.2	7%		Loaded Trucks	86	0.076	75.7	0.023	40.7
6	General Construction	Muck Removal	Dump Truck	3	55	40%	76	0	75.2	76.2	12%		Loaded Trucks	86	0.076	75.7	0.023	40.7
									Maximum	Cumulative						Max VdB	Max PPV	Max GBNZ
Alternative No.		A - EPBM/Open-Face Si	hield/SEM Profile Altern	ative					84.2	89.7						76.7	0.0	41.7
Description		EPBM bored tunnels on LPA align	ment to 4th street shaft, open face	shield tunnel excar	vation on 5th St sh	aft abandoning	shields undergrou	nd, SEM tunnel cor	struction from 5th S	shaft to 7th Me	tro mucking through L	tunnel						
							A-w	eighted Noise	e Levels (in dE	SA)								
No.	Powered By	Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	4	8	7							5	3			
1	General Construction	Bulldozer	Dozer	1	55	40%	85	0	84.2	80.2	11%		Small Bulldozer	58	0.003	47.7	0.001	12.7
2	General Construction	Excavator	Excavator	1	55		85	0	84.2	80.2	11%		Large Bulldozer	87	0.089	76.7	0.027	41.7
3	General Construction	Crane	Crane	1	55		85	0	84.2	76.2	4%		MIN (Sm. Dozer)	79	0.035	68.7	0.011	33.7
4	General Construction	Drill Rig	Drill Rig Truck	1	55		84	0	83.2	76.2	4%		Caisson drilling	87	0.089	76.7	0.027	41.7
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	55		79		78.2	74.2	3%		Loaded Trucks	86	0.076	75.7	0.023	40.7
6	General Construction	Muck Removal	Dump Truck	1	55	7070	76		75.2	71.2	1%		Loaded Trucks	86	0.076	75.7	0.023	40.7
7	Grouting Plant 1	Compressor 1	Compressor (air)	1	90	100%	80	0	74.9	74.9	3%		Small Bulldozer	58	0.003	41.3	0.000	6.3
8	Grouting Plant 1 Grouting Plant 1	High-Pressure Pump 1 Diesel Generator 1	Pumps Generator	1	90	100% 100%	77 82	0	71.9 76.9	71.9 76.9	2% 5%		Small Bulldozer Small Bulldozer	58 58	0.003	41.3 41.3	0.000	6.3
10	Grouting Plant 1	Mixing Plant 1	Concrete Batch Plant	1	90	100%	82	0	76.9	76.9	7%		Small Buildozer Small Bulldozer	58	0.003	41.3	0.000	6.3
11	Grouting Plant 1	Compressor 2	Concrete Batch Plant Compressor (air)	1	500	100%	80	0	60.0	60.0	0%		Small Buildozer Small Buildozer	58	0.003	19.0	0.000	0.0
12	Grouting Plant 2	High-Pressure Pump 2	Pumps	1	500	100%	77	0	57.0	57.0	0%		Small Bulldozer	58	0.003	19.0	0.000	0.0
13	Grouting Plant 2	Diesel Generator 2	Generator	1	500		82	0	62.0	62.0	0%		Small Bulldozer	58	0.003	19.0	0.000	0.0
14	Grouting Plant 2	Mixing Plant 2	Concrete Batch Plant	1		100%		0									0.000	
15	Grouting Rigs 1						83		63.0	63.0	∩%		Small Bulldozer	58	0.003		0 000	0.0
16		Hydraulic Drill Rig 1		<u> </u>	500 55		00	0	63.0 83.2	63.0 86.2	0% 44%		Small Bulldozer Hydromill (slurry wall), in soil	58 66	0.003	19.0	0.000	0.0 20.7
		Hydraulic Drill Rig 1 Hydraulic Drill Rig 2	Drill Rig Truck	2	500 55 192	100%	83 84 84	_	83.2	86.2	0% 44% 4%		Hydromill (slurry wall), in soil	66	0.003 0.008 0.008	19.0 55.7	0.002	20.7
17	Grouting Rigs 2	Hydraulic Drill Rig 2	Drill Rig Truck Drill Rig Truck	2	55 192	100% 100%	84	0	83.2 72.3	86.2 75.3	44% 4%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil		0.008	19.0		20.7 4.4
17			Drill Rig Truck	2	55 192	100%	84 84	0	83.2	86.2	44%		Hydromill (slurry wall), in soil	66 66	0.008 0.008	19.0 55.7 39.4	0.002 0.000	20.7
17	Grouting Rigs 2	Hydraulic Drill Rig 2	Drill Rig Truck Drill Rig Truck	2	55 192	100% 100%	84 84	0	83.2 72.3	86.2 75.3	44% 4%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	66 66	0.008 0.008	19.0 55.7 39.4	0.002 0.000	20.7 4.4
17 Alternative No.	Grouting Rigs 2 General Construction	Hydraulic Drill Rig 2	Drill Rig Truck Drill Rig Truck N/A	2	55 192	100% 100%	84 84	0	83.2 72.3 N/A	86.2 75.3 N/A	44% 4%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	66 66	0.008 0.008	19.0 55.7 39.4 66.5	0.002 0.000 0.007	20.7 4.4 31.5
	Grouting Rigs 2 General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig	Drill Rig Truck Drill Rig Truck N/A	2 2 1	55 192 191	100% 100% N/A	84 84 N/A	0 0 N/A	83.2 72.3 N/A Maximum 84.2	86.2 75.3 N/A Cumulative 89.5	44% 4% N/A		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	66 66	0.008 0.008	19.0 55.7 39.4 66.5 Max VdB	0.002 0.000 0.007 Max PPV	20.7 4.4 31.5 <u>Max GBNZ</u>
Alternative No.	Grouting Rigs 2 General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align	Drill Rig Truck Drill Rig Truck N/A nment Alternative	2 2 1	55 192 191	100% 100% N/A	84 84 N/A	0 0 N/A	83.2 72.3 N/A Maximum 84.2	86.2 75.3 N/A Cumulative 89.5 sh L tunnel to Ma	44% 4% N/A		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	66 66	0.008 0.008	19.0 55.7 39.4 66.5 Max VdB	0.002 0.000 0.007 Max PPV 0.0	20.7 4.4 31.5 <u>Max_GBNZ</u> 41.7
Alternative No.	Grouting Rigs 2 General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig	Drill Rig Truck Drill Rig Truck N/A nment Alternative	2 2 1	55 192 191	100% 100% N/A	84 N/A N/A	0 0 N/A N/A street shaft to 7th/N eighted Noise	83.2 72.3 N/A Maximum 84.2 letro. Mucking through	86.2 75.3 N/A Cumulative 89.5 sh L tunnel to Ma	44% 4% N/A		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	66 66	0.008 0.008	19.0 55.7 39.4 66.5 Max VdB 76.7	0.002 0.000 0.007 Max PPV 0.0	20.7 4.4 31.5 <u>Max GBNZ</u>
Alternative No. Description	Grouting Rigs 2 General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align	Drill Rig Truck Drill Rig Truck N/A nment Alternative ment to south of 5th street, remove	2 2 1	55 192 191 mangrove portal, S	100% 100% N/A SEM tunnel cor Usage	84 84 N/A sstruction from 5th A-w LmaxRef 7	0 0 N/A N/A street shaft to 7th/N eighted Noise	83.2 72.3 N/A Maximum 84.2 letro. Mucking througe a Levels (in dE LmaxCalc	86.2 75.3 N/A Cumulative 89.5 th L tunnel to Mit	44% 4% N/A		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM	66 66 93 LvRef (RMS)	0.008 0.008 0.142 PPV_Ref	19.0 55.7 39.4 66.5 Max VdB 76.7	0.002 0.000 0.007 Max PPV 0.0	20.7 4.4 31.5 Max GBNZ 41.7
Alternative No. Description	Grouting Rigs 2 General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align	Drill Rig Truck Drill Rig Truck N/A nment Alternative ment to south of 5th street, remove	2 2 1	55 192 191 191 mangrove portal, \$ Distance 4 55	100% 100% N/A SEM tunnel cor Usage 8 40%	84 N/A struction from 5th A-w LmaxRef 7 85	0 0 N/A N/A street shaft to 7th/h eighted Noise Shielding	83.2 72.3 N/A Maximum 84.2 letro. Mucking througe E Levels (in dE LmaxCalc	86.2 75.3 N/A Cumulative 89.5 sh L tunnel to Mr 6A) Leq	44% 4% N/A angrove portal Contribution		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM	66 66 93 LvRef (RMS) 5	0.008 0.008 0.142 PPV_Ref 3 0.003	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB)	0.002 0.000 0.007 Max PPV 0.0 PPV (ips)	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA)
Alternative No. Description	Grouting Rigs 2 General Construction Powered By 5	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2	Drill Rig Truck Drill Rig Truck N/A nment Alternative ment to south of 5th street, remove FHWA Equiv	2 2 1 1 EPBM's through Amount 3 1	55 192 191 mangrove portal, \$ Distance 4 55 55	100% 100% N/A SEM tunnel cor Usage 8 40% 40%	84 84 N/A struction from 5th A-w LmaxRef 7 85 85	0 0 N/A street shaft to 7th/h eighted Noise Shielding 0	83.2 72.3 N/A Maximum 84.2 letro. Mucking throug a Levels (in dE LmaxCalc 84.2 84.2	86.2 75.3 N/A Cumulative 89.5 gh L tunnel to Mr 6A) Leq 80.2 80.2	44% 4% N/A		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer	66 66 93 LvRef (RMS) 5 58 87	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB)	0.002 0.000 0.007 Max PPV 0.0 PPV (ips)	20.7 4.4 31.5 <u>Max GBNZ</u> 41.7 GBNZ (dBA)
Alternative No. Description No. 1 2 3	Grouting Rigs 2 General Construction Powered By 5 General Construction General Construction General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane	Drill Rig Truck Drill Rig Truck N/A Imment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane	2 2 1 1 EPBM's through Amount 3 1 1	55 192 191 191 Distance 4 55 55 55	100% 100% N/A N/A SEM tunnel cor Usage 8 40% 40% 16%	84 84 N/A N/A Struction from 5th A-w LmaxRef 7 85 85	0 0 N/A N/A street shaft to 7th/h eighted Noise Shielding	83.2 72.3 N/A Maximum 84.2 1etro. Mucking through the Levels (in dE LmaxCalc 84.2 84.2 84.2 84.2	86.2 75.3 N/A Cumulative 89.5 sh L tunnel to Mi (A) Leq 80.2 80.2 76.2	44% A% N/A Contribution 11% 4%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer)	66 66 93 LvRef (RMS) 5 58 87 79	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.035	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB) 47.7 76.7 68.7	0.002 0.000 0.007 Max PPV 0.0 PPV (ips) 0.001 0.027 0.011	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA) 12.7 41.7 33.7
Alternative No. Description No. 1 2	Grouting Rigs 2 General Construction Powered By General Construction General Construction General Construction General Construction General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig	Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remove FHWA Equiv Dozer Excavator Crane Drill Rig Truck	2 2 1 1 EPBM's through Amount 3 1	55 192 191 191 Distance 4 55 55 55	100% 100% N/A SEM tunnel cor Usage 8 40% 40% 16% 20%	84 84 N/A N/A A-w LmaxRef 7 85 85 85	0 0 N/A N/A street shaft to 7th/N eighted Noise Shielding 0 0	83.2 72.3 N/A Maximum 84.2 letro. Mucking throug a Levels (in dE LmaxCalc 84.2 84.2 83.2	86.2 75.3 N/A Cumulative 89.5 sh L tunnel to Mr 6A) Leq 80.2 80.2 76.2	44% A% N/A angrove portal Contribution 11% 41% 4% 4%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson dilling	66 66 93 LVRef (RMS) 5 58 87 79 87	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.035 0.089	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB) 47.7 76.7 68.7 76.7	0.002 0.000 0.007 Max PPV 0.0 PPV (ips) 0.001 0.027 0.011	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA) 12.7 41.7 33.7 41.7
Alternative No. Description No. 1 2 3 4 5	Grouting Rigs 2 General Construction Powered By General Construction General Construction General Construction General Construction General Construction General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck	Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck	2 2 1 1 EPBM's through Amount 3 1 1 1 1 1	55 192 191 Distance 4 55 55 55 55 55 55	100% 100% N/A SEM tunnel cor Usage 8 40% 40% 16% 20% 40%	84 84 N/A struction from 5th A-w LmaxRef 7 85 85 84 79	0 0 N/A N/A street shaft to 7th/h eighted Noise Shielding 0 0 0 0	83.2 72.3 N/A Maximum 84.2 letro. Mucking througe Levels (in dE LmaxCalc 84.2 84.2 84.2 84.2 78.2	86.2 75.3 N/A Cumulative 89.5 sh L tunnel to Mi A) Leq 80.2 80.2 80.2 76.2 76.2 74.2	44% A% N/A angrove portal Contribution 11% 4% 4% 3%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks	66 66 93 LvRef (RMS) 5 58 87 79 87	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.035 0.089 0.076	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB) 47.7 76.7 68.7 76.7 75.7	0.002 0.000 0.007 Max PPV 0.0 PPV (ips) 0.001 0.027 0.011 0.027 0.023	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA) 12.7 41.7 33.7 41.7 40.7
Alternative No. Description No. 1 2 3	Grouting Rigs 2 General Construction Powered By For General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Drill Rig Truck Drill Rig Truck N/A Imment Alternative Imment south of 5th street, remove FHWA Equiv Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck	2 2 1 1 EPBM's through Amount 3 1 1	55 192 191 191 Distance 4 55 55 55 55 55	100% 100% N/A SEM tunnel cor Usage 8 40% 40% 16% 20% 40% 40%	84 84 N/A N/A A-w LmaxRef 7 85 85 84 79 76	0 0 N/A N/A street shaft to 7th/h eighted Noist Shielding 0 0 0 0 0	83.2 72.3 NVA Maximum 84.2 fetro. Mucking through the Levels (in dE LmaxCalc 84.2 84.2 84.2 83.2 75.2	86.2 75.3 N/A Cumulative 89.5 h L tunnel to Mi A) Leq 80.2 80.2 76.2 76.2 74.2 70.2	44% 4% N/A Ingrove portal Contribution 11% 4% 4% 4% 11%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks	66 66 93 LvRef (RMS) 5 58 87 79 87 86 86	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.035 0.089 0.076	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB) 47.7 76.7 68.7 76.7 75.7 75.7	0.002 0.000 0.007 Max PPV 0.0 PPV (ips) 0.001 0.027 0.011 0.027 0.023 0.023	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA) 12.7 41.7 33.7 41.7 40.7
Alternative No. Description No. 1 2 3 4 5 6 7	Grouting Rigs 2 General Construction Powered By 5 General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep slight Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air)	2 2 1 1 EPBM's through Amount 3 1 1 1 1 1	55 192 191 Distance 4 55 55 55 55 55 90	100% 100% N/A N/A Usage 8 40% 40% 40% 40% 40%	84 84 N/A N/A *******************************	0 0 N/A N/A street shaft to 7th/h/eighted Noise Shielding 0 0 0 0 0 0	83.2 72.3 N/A Maximum 84.2 letro. Mucking throug a Levels (in dE LmaxCalc 84.2 84.2 84.2 84.2 75.2 75.2 74.9	86.2 75.3 N/A Cumulative 89.5 jb, Lunnel to Mi iA) Leq 80.2 80.2 76.2 76.2 74.2 70.2 74.9	44% A% N/A Agrove portal Contribution 11% 4% 4% 4% 3% 3% 3% 3%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	66 66 93 LvRef (RMS) 5 58 87 79 86 86 86 58	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.076 0.076 0.003	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB) 47.7 76.7 68.7 75.7 75.7 74.1	0.002 0.000 0.007 Max PPV 0.0 PPV (ips) 0.001 0.027 0.011 0.027 0.023 0.023 0.023	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA) 12.7 41.7 33.7 41.7 40.7 40.7 6.3
Alternative No. Description No. 1 2 3 4 5 6 7 8	Grouting Rigs 2 General Construction Powered By General Construction Grouting Plant 1 Grouting Plant 1	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps	2 2 1 1 EPBM's through Amount 3 1 1 1 1 1 1 1 1 1 1	55 192 191 191 Distance 4 55 55 55 55 55 90	100% 100% N/A N/A Usage 8 40% 40% 16% 20% 40% 100% 100%	84 N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	0 0 N/A N/A street shaft to 7th/h eighted Noist Shielding 0 0 0 0 0 0 0	83.2 72.3 NVA Maximum 84.2 letro. Mucking through E Levels (in dE LmaxCalc 84.2 84.2 84.2 83.2 75.2 74.9 71.9	86.2 75.3 N/A Cumulative 89.5 sh L turnel to Mi (A) Leq 80.2 80.2 76.2 76.2 74.2 70.2 74.9	44% N/A N/A N/A Contribution 11% 41% 45% 31% 33% 25%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer	66 66 93 LvRef (RMS) 5 58 87 79 87 86 86 58	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.035 0.089 0.076 0.076 0.076	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB) 47.7 68.7 76.7 75.7 75.7 41.3	0.002 0.000 0.007 Max PPV 0.0 PPV (ips) 0.001 0.027 0.011 0.027 0.023 0.023 0.000 0.000	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA) 12.7 41.7 41.7 40.7 40.7 6.3 6.3
Alternative No. Description No. 1 2 3 4 5 6 7 8 9	Grouting Rigs 2 General Construction Powered By General Construction Grouting Plant 1 Grouting Plant 1	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remove fHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator	2 2 2 1 1	555 1920 191 191 191 Distance 4 555 555 555 900 900	100% 100% N/A SEM tunnel cor 8 40% 40% 40% 40% 40% 100% 100%	84 N/A 84 N/A 84 N/A 84 N/A 85 85 85 85 86 87 76 80 77 87 82	0 0 N/A N/A Street shall to 78% A Shelding Shielding 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.2 72.3 N/A Maximum 84.2 letro. Mucking throug Levels (in dE LmaxCalc 84.2 84.2 84.2 84.2 84.2 75.2 74.9 71.9 76.9	86.2 75.3 N/A Cumulative 89.5 sh L turnet to Mi IA) Leq 80.2 80.2 76.2 76.2 74.2 70.2 74.9 71.9 76.9	44% N/A Angrove portal Contribution 11% 41% 45% 45% 45% 45% 45% 45% 55%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	66 66 93 LvRef (RMS) 5 58 87 79 87 86 86 58 58	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.089 0.076 0.076 0.003	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB) 47.7 76.7 68.7, 75.7 75.7 41.3 41.3	0.002 0.000 0.007 Max PPV 0.0 PPV (ips) 0.001 0.027 0.011 0.027 0.023 0.023 0.023 0.000 0.000	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA) 12.7 41.7 40.7 40.7 6.3 6.3 6.3
Alternative No. Description No. 1 2 3 4 5 6 7 8 9 10	Grouting Rigs 2 General Construction Powered By 5 General Construction General Construction	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1	Drill Rig Truck Drill Rig Truck N/A NA Inment Alternative ment to south of 5th street, remove fHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant	2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	555 1922 1911 1911 1912	100% 100% N/A Wage 8 40% 40% 16% 200% 100% 100% 100% 100%	84 N/A 84 N/A 84 N/A 84 N/A 85 85 85 84 4 79 76 80 777 82 83 83 83 83 84 84 88 88 88 88 88 88 88 88 88 88 88	0 0 0 N/A N/A N/A Shieteling 0 0 0 0 0 0	83.2 72.3 N/A Maximum 84.2 letro. Musking through 1 Levels (in dE LmaxCalc 84.2 84.2 83.2 75.2 75.2 74.9 71.9 76.9	86.2 75.3 N/A N/A 89.5 ph L tunnel to Mil A) Leq 80.2 80.2 80.2 76.2 76.2 74.9 71.9 77.9	44% N/A N/A Angrove portal Contribution 11% 4% 4% 5% 5% 7%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	66 66 93 LVRef (RMS) 5 58 87 79 87 86 86 86 58 58	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.076 0.076 0.076 0.003 0.003	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB) 47.7 68.7 76.7 75.7 75.7 41.3 41.3 41.3	0.002 0.000 0.007 Max PPV 0.0 PPV (ips) 0.011 0.027 0.011 0.027 0.023 0.023 0.000 0.000 0.000	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA) 12.7 41.7 40.7 40.7 6.3 6.3 6.3
Alternative No. Description No. 1 2 3 4 5 6 7 8 9 10 11	Grouting Rigs 2 General Construction Powered By 5 General Construction Grouting Plant 1 Grouting Rigs 1	Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Hydraulic Drill Rig 1	Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remove fHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator	2 2 2 1 1	555 192 191 191 191 191 191 191 191 191 191	100% 100% N/A SEM tunnel cor Usage 8 40% 40% 40% 100% 100% 100% 100%	84 N/A 84 N/A 84 N/A 84 N/A 85 85 85 85 86 87 76 80 77 87 82	0 0 N/A N/A Street shall to 78% A Shelding Shielding 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	83.2 72.3 N/A Maximum 84.2 letro. Mucking throug Levels (in dE LmaxCalc 84.2 84.2 84.2 84.2 84.2 75.2 74.9 71.9 76.9	86.2 75.3 N/A Cumulative 89.5 sh L turnet to Mi IA) Leq 80.2 80.2 76.2 76.2 74.2 70.2 74.9 71.9 76.9	44% N/A Angrove portal Contribution 11% 41% 45% 45% 45% 45% 45% 45% 55%		Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	66 66 93 LvRef (RMS) 5 58 87 79 87 86 86 58 58	0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.089 0.076 0.076 0.003	19.0 55.7 39.4 66.5 Max VdB 76.7 Lv (VdB) 47.7 76.7 68.7, 75.7 75.7 41.3 41.3	0.002 0.000 0.007 Max PPV 0.0 PPV (ips) 0.001 0.027 0.011 0.027 0.023 0.023 0.023 0.000 0.000	20.7 4.4 31.5 Max GBNZ 41.7 GBNZ (dBA) 12.7 41.7 41.7 40.7 40.7 6.3 6.3

Table A 6: Construction																		
Table A.o. Constructio	on Noise and Vibration Pre	dictions - R3																
Danis and No	-		1	1										 				
Receiver No.	3 R3		-	-		\vdash								-				
Description Description	R3 California Club	+	1	1							1			+				
	stance (ft)			1									GB-NZ: Typical Soil	 				
General Construction	50												-35		TDH Conver	ted RMS to F	PP\/	
Grouting Plant 1	160												-50		1 DI I CONVCI	ICC ITING IOT	1	
Grouting Plant 2	715																	
Grouting Rigs 1	50																	
Grouting Rigs 2	400																	
Little Tokyo Muck Remo																		
Entary Forty of Widol Credition																		
	*	•	NC	OISE		-								VIE	RATION	١		
l									Maximum	Cumulative	2					Max VdB	Max PPV	Max GBNZ
Alternative No.	LPA/Baseline								85.0	86.4						78.0	0.031	43.0
Description	EPBM Bored tunnels to 4t	h St, C&C from 4th St to 7th	n/Metro															
									e Levels (in de									
No.	Equipment Groupin	g Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	4	8	7		05.0	010	0001		0 "0 "1	5	3	40.0		
1	General Construction	Bulldozer	Dozer	1	50		85		85.0	81.0	29%		Small Bulldozer	58	0.003	49.0		
2	General Construction	Excavator	Excavator	-	50		85		85.0	81.0	29%		Large Bulldozer	87	0.089	78.0		
3	General Construction	Crane	Crane	1	50		85		85.0 84.0	77.0 77.0	12% 12%		MIN (Sm. Dozer)	79	0.035	70.0		
4	General Construction	Drill Rig	Drill Rig Truck	1	50		84						Caisson drilling	87	0.089			
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	50 50		79		79.0	75.0	7% 12%		Loaded Trucks	86	0.076	77.0 77.0		
6	General Construction	Muck Removal	Dump Truck	3	50	40%	76	0	76.0	77.1	12%		Loaded Trucks	86	0.076	//.0	0.027	42.0
									Mandania	O						Maria MalD	Max PPV	Max GBNZ
Alternative No.		A EDDM/Onen Fees C	hield/SEM Profile Altern	notive.					Maximum 0F 0	Cumulative 89.8	1					78.0	0.0	43.0
Alternative No.									85.0							78.0	0.0	43.0
Description		EPBM bored tunnels on LPA align	ment to 4th street shaft, open face	shield tunnel excav	vation on 5th St sha	ift abandoning sh					ro mucking through L t	unnel						
No.	Dawered B	Sy Surface Equipment	FHWA Equiv	Amount	Distance	Hoose		Shielding	e Levels (in de LmaxCalc		Contribution		FTA Equiv	LvRef (RMS)	PPV Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
NO.	Fowered B	Sy Surface Equipment	rnwa Equiv	Amount	Distance	Usage	LiliaxRei	Sillelaing	LillaxCalc	Leq	Contribution		FTA Equiv	LVKei (KIVIS)	FFV_Rei	LV (VUB)	FFV (ips)	GBNZ (UBA)
1	Conoral Construction	Bulldozer 2	Donor 6	3	4 50	40%	7 85	0	85.0	81.0	13%		Small Bulldozer	58	0.003	49.0	0.001	14.0
2	General Construction General Construction	Excavator	Dozer Excavator	1	50		85		85.0	81.0	13%		Large Bulldozer	87	0.003	78.0		43.0
				- 1														
3	General Construction	Crane	Crane	1	50	16%	85	0	85.0	77.0	5%		MIN (Sm. Dozer)	79	0.035	70.0	0.012	35.0
4	General Construction General Construction	Crane Drill Rig	Crane Drill Rig Truck	1	50 50	16% 20%	85 84	0	85.0 84.0	77.0 77.0	5% 5%		MIN (Sm. Dozer) Caisson drilling	79 87	0.035 0.089	70.0 78.0	0.012	35.0 43.0
4 5	General Construction General Construction General Construction	Crane Drill Rig Concrete Truck	Crane Drill Rig Truck Concrete Mixer Truck	1 1	50 50 50	16% 20% 40%	85 84 79	0 0	85.0 84.0 79.0	77.0 77.0 75.0	5% 5% 3%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks	79 87 86	0.035 0.089 0.076	70.0 78.0 77.0	0.012 0.031 0.027	35. 43. 42.
4 5 6	General Construction General Construction General Construction General Construction	Crane Drill Rig Concrete Truck Muck Removal	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck	1 1 1	50 50 50 50	16% 20% 40% 40%	85 84 79 76	0 0 0	85.0 84.0 79.0 76.0	77.0 77.0 75.0 72.0	5% 5% 3% 2%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks	79 87 86 86	0.035 0.089 0.076 0.076	70.0 78.0 77.0 77.0	0.012 0.031 0.027 0.027	35.0 43.0 42.0 42.0
4 5 6 7	General Construction General Construction General Construction General Construction Grouting Plant 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air)	1 1	50 50 50 50 160	16% 20% 40% 40% 100%	85 84 79 76 80	0 0 0 0	85.0 84.0 79.0 76.0 69.9	77.0 77.0 75.0 72.0 69.9	5% 5% 3% 2% 1%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 58	0.035 0.089 0.076 0.076 0.003	70.0 78.0 77.0 77.0 33.8	0.012 0.031 0.027 0.027 0.000	35.0 43.0 42.0 42.0 0.0
4 5 6 7 8	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps	1 1 1 1 1	50 50 50 50 160	16% 20% 40% 40% 100%	85 84 79 76 80	0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9	77.0 77.0 75.0 72.0 69.9 66.9	5% 5% 3% 2% 1%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer	79 87 86 86 58 58	0.035 0.089 0.076 0.076 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8	0.012 0.031 0.027 0.027 0.000 0.000	35.0 43.0 42.1 42.0 0.0
4 5 6 7 8 9	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator	1 1 1 1 1 1	50 50 50 50 160 160	16% 20% 40% 40% 100% 100%	85 84 79 76 80 77 82	0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9	77.0 77.0 75.0 72.0 69.9 66.9 71.9	5% 5% 3% 2% 1% 1%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer	79 87 86 86 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8	0.012 0.031 0.027 0.027 0.000 0.000	35.0 43.0 42.0 42.0 0.0 0.0 0.0
4 5 6 7 8 9	General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant	1 1 1 1 1	50 50 50 50 160 160 160	16% 20% 40% 40% 100% 100% 100%	85 84 79 76 80 77 82 83	0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9	77.0 77.0 75.0 72.0 69.9 66.9 71.9	5% 5% 3% 2% 1% 1% 2% 2%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	79 87 86 86 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8 33.8	0.012 0.031 0.027 0.027 0.000 0.000 0.000	35.0 43.1 42.1 42.1 0.1 0.1 0.1
4 5 6 7 8 9 10	General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air)	1 1 1 1 1 1	50 50 50 50 160 160 160 160 715	16% 20% 40% 40% 100% 100% 100% 100%	85 84 79 76 80 77 82 83	0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9	77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9	5% 5% 3% 2% 1% 1% 2% 2%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8 33.8 14.3	0.012 0.031 0.027 0.027 0.000 0.000 0.000 0.000 0.000	35.4 43.4 42.4 42.6 0.0 0.0 0.0 0.0 0.0 0.0
4 5 6 7 8 9 10 11	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps	1 1 1 1 1 1	50 50 50 50 160 160 160 715 715	16% 20% 40% 40% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80	0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9 53.9	77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9	5% 5% 3% 2% 1% 1% 2% 2% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8 33.8 14.3	0.012 0.031 0.027 0.027 0.000 0.000 0.000 0.000 0.000	35.1 43.1 42.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1
4 5 6 7 8 9 10 11 12	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Generator	1 1 1 1 1 1	50 50 50 50 160 160 160 715 715	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77	0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9	77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9	5% 5% 3% 2% 11% 2% 2% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Buldozer	79 87 86 86 58 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8 33.8 14.3 14.3	0.012 0.031 0.027 0.027 0.000 0.000 0.000 0.000 0.000 0.000	35.1 43.3 42.1 0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0
4 5 6 7 8 9 10 11 12 13	General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Concrete Batch Plant	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 50 160 160 160 715 715 715	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83	0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9	77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9	5% 5% 3% 2% 1% 1% 2% 2% 0% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8 33.8 14.3 14.3	0.012 0.031 0.027 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	35.43.3 442.42.2 442.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0
4 5 6 7 8 9 10 11 12 13 14 15	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 3	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 50 160 160 160 715 715 715 715 50	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83 80 80 80	0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 84.0	77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 59.9 87.0	5% 5% 3% 2% 11% 12% 2% 0% 0% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (Sulrury wall), in soil	79 87 86 86 58 58 58 58 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 33.8 33.8 33.8 14.3 14.3 14.3	0.012 0.031 0.027 0.027 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	35.1 43.3 42.2 42.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0
4 5 6 7 8 9 10 11 12 13 14 15 16	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Riant 2 Grouting Riant 3 Grouting Riant 3 Grouting Riant 3 Grouting Riant 3	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Length Pressure Pump 2 High-Pressure Pump 3 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 50 160 160 160 715 715 715 50 400	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83 84	0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9 58.9 59.9 84.0	77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 87.0 68.9	5% 5% 3%, 2% 1% 1% 2% 0% 0% 0% 0% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 33.8 33.8 33.8 14.3 14.3 14.3 57.0	0.012 0.031 0.027 0.027 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	35.1 43.1 42.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0
4 5 6 7 8 9 10 11 12 13 14 15	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 3	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 50 160 160 160 715 715 715 50 400	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83 80 80 80	0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 84.0 65.9 N/A	77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 87.0 68.9 N/A	5% 5% 3% 2% 11% 12% 2% 0% 0% 0% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (Sulrury wall), in soil	79 87 86 86 58 58 58 58 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 33.8 33.8 33.8 14.3 14.3 14.3 57.0 29.9	0.012 0.031 0.027 0.027 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	35.0 43.0 42.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
4 5 6 7 8 9 10 11 12 2 13 14 15 16	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Riant 2 Grouting Riant 3 Grouting Riant 3 Grouting Riant 3 Grouting Riant 3	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 1 Tight Right 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Crane Drill Rig Truck Conorete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NA	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 50 160 160 160 715 715 715 50 400	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83 84	0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 56.9 58.9 58.9 59.9 84.0 65.9 N/A	77.0 77.0 75.0 75.0 72.0 66.9 71.9 72.9 56.9 53.9 58.9 59.9 87.0 68.9 N/A	5% 5% 3%, 2% 1% 1% 2% 0% 0% 0% 0% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8 33.8 14.3 14.3 14.3 57.0 29.9 56.9	0.012 0.031 0.027 0.027 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	35.43.35.443.3442.442.442.442.442.442.442.442.44
4 5 6 7 8 9 10 11 12 13 14 15 16 17	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Riant 2 Grouting Riant 3 Grouting Riant 3 Grouting Riant 3 Grouting Riant 3	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Lompressor 2 Mixing Plant 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alfg.	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A pument Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 50 160 160 160 715 715 715 715 400 400	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 799 76 80 80 877 82 83 83 80 777 82 83 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 84.0 65.9 N/A	77.0 77.0 75.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 87.0 68.9 N/A	5% 5% 3% 2% 1% 2% 2% 0% 0% 0% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 33.8 33.8 33.8 14.3 14.3 14.3 57.0 29.9	0.012 0.031 0.027 0.027 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	35.1 43.3 42.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1
4 5 6 7 8 9 10 11 12 13 14 15 16	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Riant 2 Grouting Riant 3 Grouting Riant 3 Grouting Riant 3 Grouting Riant 3	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 1 Tight Right 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A pument Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 50 160 160 160 715 715 715 715 400 400	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 79 76 80 80 80 77 82 83 83 80 77 82 83 83 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 56.9 53.9 58.9 59.9 84.0 65.9 N/A Maximum	77.0 77.0 75.0 69.9 66.9 71.9 72.9 56.9 53.9 59.9 87.0 68.9 N/A	5% 5% 3% 2% 1% 2% 2% 0% 0% 0% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8 33.8 14.3 14.3 14.3 57.0 29.9 56.9	0.012 0.031 0.027 0.027 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	35.43.35.443.3442.442.442.442.442.442.442.442.44
4 5 5 6 6 7 7 8 9 9 10 11 12 12 13 14 15 16 17 7	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 TBM B - EPBM/SEM Low Alig EPBM bored furnish on deep align	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck NIA Drill Rig Truck NIA Drill Rig Truck NIA Drill Rig Truck Drill Rig Truck NIA Drill Rig Truck Drill Rig Truck NIA Drill Rig Truck NIA Drill Rig Truck Drill Rig Truck NIA Drill Rig Truck Drill Rig Truck NIA Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck NIA Drill Rig Truck Drill Rig Truck NIA Drill Rig Truck Drill Ri	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 1600 1600 1600 71515 7151 7151 4000 4000	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 799 766 800 777 82 82 83 83 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9 56.9 58.9 84.0 65.9 N/A Maximum 85.0	77.0 77.0 75.0 69.9 66.9 71.9 56.9 53.9 58.9 87.0 68.9 N/A Cumulative 89.8 ht. turnel to Mi	5% 5% 3% 2% 1% 1% 2% 0% 0% 0% 0% N/A		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Buldozer TSmall Buldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	79 87 86 86 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.00 776.00 776.00 777.00 777.00 777.00 778.00 33.80 33.80 14.3.31 14	0.012 0.031 0.027 0.027 0.027 0.000	35.1 43.3 442.4 42.4 42.4 42.4 42.4 42.4 42.
4 5 6 7 8 9 10 11 12 13 14 15 16 17	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Lompressor 2 Mixing Plant 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alfg.	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A pument Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 50 160 160 160 715 715 715 715 400 400	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 799 766 800 777 82 82 83 83 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 56.9 53.9 58.9 59.9 84.0 65.9 N/A Maximum	77.0 77.0 75.0 69.9 66.9 71.9 72.9 56.9 53.9 59.9 87.0 68.9 N/A	5% 5% 3% 2% 1% 2% 2% 0% 0% 0% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 33.8 33.8 33.8 14.3 14.3 14.3 57.0 29.9 56.9	0.012 0.031 0.027 0.027 0.027 0.000	35. 43. 42. 42. 0. 0. 0. 0. 0. 0. 0. 22. 42. Max GBNZ
4 5 5 6 6 7 7 8 8 9 10 11 11 12 13 14 15 16 17 7 Mo. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 Tigh Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 Diesel Genera	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Jument Alternative ment to south of 5th street, remove FHWA Equiv 6	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 50 160 160 180 1715 715 715 400 400 Distance	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 79 76 800 777 82 83 80 80 77 82 83 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 77.9 55.9 53.9 84.0 65.9 N/A Maximum 85.0 95.9 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10	77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 87.0 68.9 N/A Cumulative 89.8 h L tunnel to Mil	5% 5% 3% 2% 1% 1% 2% 2% 0% 0% 0% 1% 53% 1%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer TSmall Sulfozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 66 66 93	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.004 0.004 0.004 0.005 0.	70.0 78.0 77.0 78.0 77.0 77.0 77.0 77.0	0.0121 0.027 0.027 0.027 0.000	35. 43. 42. 42. 0. 0. 0. 0. 0. 0. 0. 2. 2. 43. 43.0 GBNZ (dBA)
4 5 6 7 7 8 8 9 9 10 111 12 13 14 15 16 17 7 8 16 17 7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Bulldozer	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorcete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A priment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 799 766 80 80 777 82 83 83 80 777 822 83 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 79.0 76.0 89.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 84.0 85.0 Maximum 85.0 LmaxCalc	77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 87.0 68.9 N/A Cumulative 89.8 h, tunnel to Mi	5% 5% 3% 2% 1% 1% 1% 2% 0% 0% 0% 1% 0% 0% Contribution 13%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromil (slurry wall), in soil TBM	79 87 86 86 86 58 58 58 58 58 58 58 66 66 66 66 93	0.035 0.089 0.076 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 78.0 77.0 77.0 77.0 77.0	0.0121 0.027 0.027 0.027 0.000	35. 43. 42. 0. 0. 0. 0. 0. 0. 0. 20. 21. Max GBNZ (dBA)
4 5 5 6 7 7 8 8 9 10 11 11 12 13 14 15 16 17 7	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBMSEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Excavator	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck Drill Ri	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 84 79 76 800 777 82 83 80 80 80 80 80 80 80 80 80 80 80 80 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 66.9 35.9 86.9 84.0 Maximum Ma	77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 87.0 68.9 N/A Cumulative 89.8 h L tunnel to M/A) Leq 81.0	5% 5% 5% 3% 2% 1% 1% 2% 2% 0% 0% 0% 0% 53% 1% K/A		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 93	0.035 0.089 0.076 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.008 0.008	70.0 78.0 77.0 77.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.027 0.000	35.1 43.1 42.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0
4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered B 5 General Construction General Construction General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Excavator Crane	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck NIA Drill Rig Truck NIA Drill Rig Truck Dril	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 40% 16% 16% 40% 100% 100% 100% 100% 100% 100% 100%	85 84 84 79 76 80 80 80 80 80 80 77 822 833 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 779.0 76.0 99.9 66.9 77.9 76.9 96.9 96.9 97.9 96.9 96	77.0 77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 87.0 68.9 N/A Cumulative 89.8 h. tunnet to Mi A) Leq 81.0 81.0	5% 5% 3% 2% 1% 1% 2% 0% 0% 0% 0% 0% 53% 1% N/A **Contribution 13% 13% 5% 5%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Buldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Buldozer Large Buldozer Large Buldozer Large Buldozer Large Buldozer	79 87 86 86 58 58 58 58 58 58 66 66 93	0.035 0.089 0.076 0.076 0.003	70.0 78.0 77.0 77.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.000	35. 43. 42. 42. 0. 0. 0. 0. 0. 0. 0. 0. 22. 0. 21. Max GBNZ (dBA) 14. 43. 35.
4 5 6 6 7 7 8 8 9 9 10 11 11 12 13 14 15 16 17 7 17 17 18 18 19 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment 2 Bulldozer Excavator Crane Drill Rig	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorcete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Truck Drill Rig Truck N/A FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 84 79 76 80 80 80 80 80 77 77 82 83 83 84 84 84 84 84 84 85 85 85 85 85 85 85 85 85 85 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 779.0 76.0 69.9 66.9 77.9 56.9 55.9 56.9 59.9 84.0 Maximum 85.0 Maximum 85.0 Maximum 85.0 85.0 85.0	77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 87.0 68.9 N/A Cumulative 89.8 h L turnel to Mid- A) Leq 81.0 81.0 77.0	5% 5% 3% 2% 1% 1% 2% 0% 0% 0% 0% 0% 1% 1% 1% 1% 13/ 13/ 13/ 5%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer (Caisson drilling	79 87 86 86 86 58 58 58 58 58 58 66 66 67 93	0.035 0.089 0.076 0.076 0.076 0.003 0.	70.0 78.0 77.0 78.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.000	35. 43. 42. 42. 0. 0. 0. 0. 0. 0. 22. 43.0 Max GBNZ (dBA) 14. 43.
4 5 5 6 6 7 7 8 8 9 10 11 11 12 13 14 15 16 17 7 Mo. Alternative No. Description No. 1 2 2 3 4 4 5 5	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction General Construction General Construction General Construction General Construction General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NIA Drill Rig Truck NIA Imment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavalor Crane Drill Rig Truck Concrete Batch Plant Drill Rig Truck Dozer Excavalor Crane Drill Rig Truck Concrete Mixer Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	855 844 799	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 56.9 53.9 84.0 65.9 N/A Maximum 85.0 85.0 85.0 85.0 85.0	77.0 77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 87.0 68.9 N/A Cumulative 89.8 h L tunnel to Mr. A) Leq 81.0 77.0 77.0	5% 5% 3% 2% 1% 1% 2% 6% 2% 0% 0% 0% 0% 1% 1% 1% N/A Contribution 13% 5% 5%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling Loaded Trucks	79 87 86 86 86 58 58 58 58 58 58 66 66 67 77 87	0.035 0.089 0.076 0.076 0.076 0.003	70.0 78.0 77.0 78.0 77.0 78.0 77.0 77.0	0.0121 0.027 0.027 0.027 0.000	35, 43, 42, 42, 0, 0, 0, 0, 0, 0, 0, 21, Max GBNZ (dBA) 14, 43, 35, 43,
4 5 6 6 7 7 8 8 9 10 111 12 13 14 15 16 17 7 8 16 17 7 8 16 17 17 17 18 18 17 17 18 18 18 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Fowered B S General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorcete Batch Plant Compressor (air) Pumps Generator Conorcete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A priment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Drill Rig Truck Concrete Mixer Truck Drill Rig Truck Concrete Mixer Truck Concrete Mixer Truck Dump Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 80 80 80 777 82 83 83 84 84 84 84 84 84 84 84 84 84 85 85 85 85 85 84 79 76 6	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 89.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 84.0 Maximum 85.0 Maximum 85.0 85.0 85.0 84.0 79.0 84.0 79.0	77.0 77.0 77.0 77.0 77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 72.9 56.9 53.9 58.9 59.9 87.0 88.8 N/A Leq 81.0 81.0 77.0 77.0 77.0	5% 5% 3% 2% 1% 1% 1% 2% 0% 0% 0% 0% 1% Contribution 13% 13% 5% 5% 5% 5%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Caisson drilling Loaded Trucks Loaded Trucks	79 87 86 86 86 58 58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 87 79 86	0.035 0.089 0.076 0.076 0.003 0.	70.0 78.0 77.0 78.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	35, 43. 42. 42. 0. 0. 0. 0. 0. 0. 0. 22. 0. 21. Max GBNZ (dBA) 14. 43. 35. 43.
4 5 5 6 6 7 7 8 8 9 9 10 11 11 12 13 13 14 15 16 17 Alternative No. Description No. 1 2 2 3 4 4 5 6 6 7 7	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Grouting Construction General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alfg EPBM bored tumele on deep align by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Crane Drill Rig Truck Conorete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Internative ment to south of 5th street, remove FHWA Equiv 6 Dozer Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Concrete Mixer Truck Dump Truck Conpressor (air)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	855 844 799 76 800 777 822 833 840 777 82 834 844 84 84 84 85 85 85 844 79 76 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 71.9 72.9 66.9 53.9 85.0 85.0 85.0 85.0 85.0 85.0 85.0 85.0	77.0 77.0 77.0 77.0 75.0 72.0 66.9 66.9 71.9 56.9 53.9 58.9 58.9 87.0 68.9 N/A Cumulative 89.8 b. Lannel to Mi A) Leq 81.0 81.0 77.0 75.0 71.1	5% 5% 5% 3% 2% 1% 1% 2% 2% 0% 0% 0% 53% 1% Contribution 13% 5% 5% 5% 5% 3% 1%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Grand Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 93 LVRef (RMS) 58 87 79 86 86 86 86 87	0.035 0.089 0.076 0.076 0.076 0.003	70.0 78.0 77.0 78.0 77.0 78.0 77.0 77.0	0.0121 0.027 0.027 0.027 0.0000 0.000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	35, 43. 42. 42. 0. 0. 0. 0. 0. 0. 0. 21. Max GBNZ (dBA) 14. 43. 35. 43. 42.
4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck Compressor (air) Dozer Excavator Crane Drill Rig Truck Compressor (air) Drill Rig Truck Compressor (air)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	S00 S00	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 84 85 85 84 84 79 76 85 85 84 84 80 77 76 80 85 85 86 86 87 77 8 87 87 87 87 87 87 87 87 87 87 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 779.0 76.0 99.9 66.9 71.9 72.9 72.9 72.9 56.9 53.9 93.9 94.0 95.9 N/A Maximum 85.0 85.0 85.0 84.0 77.0 96.9 96.9	77.0 77.0 77.0 77.0 77.0 77.0 77.0 77.0	5% 5% 3% 2% 1% 1% 2% 0% 0% 0% 0% 53% 1% N/A **Contribution 13% 13% 5% 5% 11% 14% 15% 14%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Buldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Buldozer Large Buldozer Large Buldozer Large Sudicozer Large Sudicozer Large Sudicozer Large Sudicozer Loaded Trucks Loaded Trucks Small Buldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 93 LVRef (RMS) 5 8 87 79 87 86 86 86 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008	70.0 78.0 77.0 77.0 78.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.000	35. 43. 42. 42. 0. 0. 0. 0. 0. 0. 0. 0. 0. 22. 0. 21. Max GBNZ (dBA) 14. 43. 35. 42. 43. 0. 0.
4 5 6 6 7 7 8 8 9 9 10 111 15 16 16 17 17 18 16 17 17 18 18 16 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Pumps Generator FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer renow Crane Crane Concrete Mixer Truck Drill Rig Truck Concrete Mixer Truck Compressor (air) Pumps Generator Concrete Mixer Truck Compressor (air) Pumps Generator	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 1600 160	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 79 76 80 80 80 80 80 80 80 80 80 80 80 80 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 66.9 77.9 66.9 67.9 56.9 53.9 58.9 59.9 84.0 65.9 NA Maximum 85.0 Minimum 85.0 85.0 85.0 85.0 85.0 85.0 85.0 85.0	77.0 77.0 77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 56.9 55.9 58.9 59.9 87.0 68.9 N/A Currulative 89.8 h.t. turnet to M/A) Leq 81.0 81.0 77.0 77.0 77.0 77.0 77.0 77.0 77.0 7	5% 5% 5% 3% 2% 1% 1% 2% 0% 0% 0% 0% 1% 1% 1% 1% 1% 1% 13% 13% 13% 13% 13%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 8 87 79 86 86 86 58 58	0.035 0.089 0.076 0.076 0.076 0.076 0.076 0.003	70.0 78.0 77.0 78.0 77.0 77.0 78.0 77.0 77	0.0121 0.027 0.027 0.000	35.4 43.1 42.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 22.2 0.0 21.1 Max GBNZ 43.0 GBNZ (dBA) 14.1 43.1 43.1 43.0 42.1 42.1 42.1 0.0
4 5 5 6 7 8 8 9 10 11 14 15 16 16 17 17 18 18 19 10 10 10 10 10 10 10 10 10 10 10 10 10	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBMSEM Low Alig EPBM bored turnels on deep align ty Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Oncrete South of 5th sitest, remover Example of the Concrete Mixer Truck Dump Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Condered Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	855 85 84 479 76 800 777 822 83 85 85 85 84 84 84 84 84 84 84 85 85 85 85 85 85 85 85 85 85 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 69.9 66.9 77.2 9 76.9 56.9 53.9 84.0 65.9 N/A Maximum 85.0 Maximum 85.0 85.0 85.0 85.0 86.0 85.0 86.0 87.0 86.0 87.0 87.0 87.0	77.0 77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 56.9 55.9 87.0 68.9 N/A Cumulative 89.8 h1 turnel to Mi A) Leq 81.0 81.0 77.0 77.0 77.0 77.0 77.0 71.1 69.9 66.9 71.9	5% 5% 5% 3% 2% 1% 1% 1% 2% 6% 6% 6% 6% 6% 6% 6% 6% 6% 6% 6% 6% 6%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 67 87 88 87 87 86 86 86 86 88 87 87 88 86 88 88 88 88 88 88 88 88 88 88 88	0.035 0.089 0.076 0.076 0.076 0.076 0.073 0.003	70.0 78.0 77.0 77.0 78.0 77.0 77.0 77.0	0.0121 0.027 0.027 0.000	35.6 43.6 42.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0
4 5 6 7 8 8 9 9 10 111 115 16 17 17 18 1 18 1 18 1 18 1 18 1 18 1	General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Pumps Generator FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer renow Crane Crane Concrete Mixer Truck Drill Rig Truck Concrete Mixer Truck Compressor (air) Pumps Generator Concrete Mixer Truck Compressor (air) Pumps Generator	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 1600 1600 1600 1600 500 500 500 500 1600 16	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 80 80 80 80 80 80 80 80 80 80 80 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 66.9 77.9 66.9 67.9 56.9 53.9 58.9 59.9 84.0 65.9 NA Maximum 85.0 Minimum 85.0 85.0 85.0 85.0 85.0 85.0 85.0 85.0	77.0 77.0 77.0 77.0 77.0 75.0 72.0 69.9 66.9 71.9 56.9 55.9 58.9 59.9 87.0 68.9 N/A Currulative 89.8 h.t. turnet to M/A) Leq 81.0 81.0 77.0 77.0 77.0 77.0 77.0 77.0 77.0 7	5% 5% 5% 3% 2% 1% 1% 2% 0% 0% 0% 0% 1% 1% 1% 1% 1% 1% 13% 13% 13% 13% 13%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 8 87 79 86 86 86 58 58	0.035 0.089 0.076 0.076 0.076 0.076 0.076 0.003	70.0 78.0 77.0 78.0 77.0 77.0 78.0 77.0 77	0.0121 0.027 0.027 0.000	35.6 43.6 42.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0

Table A.7: Constructi															,			
	ion Noise and Vibration Pred	lictions - R4																
Receiver No.	4 R4																	
Description	Los Angeles Public Library																	
	stance (ft)												GB-NZ: Typical Soil					
General Construction	285												-35		TDH Conver	ted RMS to F	PPV	
Grouting Plant 1	265												30		12110011101	tou ramo to r		
Grouting Plant 2	480																	
Grouting Rigs 1	285																	
Grouting Rigs 2	300																	
Little Tokyo Muck Rem	nov N/A																	
			NO	DISE										VIE	RATION	1		
		T	1		I				1					1		-	1	
	_								Maximum	Cumulative						Max VdB	Max PPV	Max GBNZ
Alternative No.	I PΔ/Raseline								69.9	71.3						55.3	0.002	20.3
Description	EPBM Bored tunnels to 4th	St. C&C from 4th St to 7th	/Metro						05.5	71.0						00.0	0.002	20.0
							A-w	eighted Nois	e Levels (in dB	BA)								
No.	Equipment Grouping	Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	4	8	7						•	5	3	, ,	11.	` '
1	General Construction	Bulldozer	Dozer	1	285	40%	85		69.9	65.9	29%		Small Bulldozer	58	0.003	26.3		
2	General Construction	Excavator	Excavator	1	285	40%	85		69.9	65.9	29%		Large Bulldozer	87	0.089	55.3		
3	General Construction	Crane	Crane	1	285	16%	85		69.9	61.9	12%		MIN (Sm. Dozer)	79	0.035	47.3		12.3
4	General Construction	Drill Rig	Drill Rig Truck	1	285	20%	84		68.9	61.9	11%	(Caisson drilling	87	0.089	55.3		
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	285	40%	79		63.9	59.9	7%		Loaded Trucks	86	0.076	54.3		
6	General Construction	Muck Removal	Dump Truck	3	285	40%	76	0	60.9	62.0	12%		Loaded Trucks	86	0.076	54.3	0.002	19.3
	_								Maximum	Cumulative						Max VdB	Max PPV	Max GBNZ
Alternative No.		A - EPBM/Open-Face S	hield/SFM Profile Alteri	native					69.9	78.2						60.6	0.0	25.6
Description		EPBM bored tunnels on LPA alignr			ation on 5th St sha	ft ahandoning sh	hields undergroun	nd SEM tunnel con			ro mucking through I tunnel					00.0	0.0	20.0
-30000									e Levels (in dB									
No.	Powered By	Surface Equipment	FHWA Equiv	Amount	Distance	Usage		Shielding		Leq	Contribution	- 1	FTA Equiv	LvRef (RMS)	PPV Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	4	8	7						•	5	3			
1	General Construction	Bulldozer	Dozer	1	285	40%	85	0	69.9	65.9	6%	;	Small Bulldozer	58	0.003	26.3		0.0
2	General Construction	Excavator	Excavator	1	285	40%	85		69.9	65.9	6%		Large Bulldozer	87	0.089	55.3		20.3
3	General Construction	Crane	Crane	1	285	16%	85		69.9	61.9	2%		MIN (Sm. Dozer)	79	0.035	47.3		
4	General Construction	Drill Rig	Drill Rig Truck	1	285	20%	84		68.9	61.9	2%		Caisson drilling	87	0.089	55.3		
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	285	40%	79		63.9	59.9	1% 1%		Loaded Trucks	86	0.076	54.3		
6	General Construction Grouting Plant 1	Muck Removal Compressor 1	Dump Truck Compressor (air)	1	285 265	40% 100%	76 80		60.9 65.5	56.9 65.5	1% 5%		Loaded Trucks Small Bulldozer	86 58	0.076	54.3 27.2		
8	Grouting Plant 1	High-Pressure Pump 1	Pumps	1	265	100%	77		62.5	62.5	3%		Small Bulldozer	58	0.003	21.2		
9	Grouting Plant 1	Diesel Generator 1	Generator	1	265	100%	82		67.5	67.5					0.003	27.2		
10	Grouting Plant 1										9%	:	Small Bulldozer		0.003	27.2		
11		Mixing Plant 1	Concrete Batch Plant	1	265	100%	83	0	68.5	68.5	9% 11%		Small Bulldozer Small Bulldozer	58 58	0.003 0.003 0.003	27.2 27.2 27.2	0.000	0.0
1.1	Grouting Plant 2			1	265 480									58	0.003	27.2	2 0.000 2 0.000	0.0
12	Grouting Plant 2 Grouting Plant 2	Mixing Plant 1	Concrete Batch Plant	1 1 1	480 480	100% 100% 100%	83 80 77	0	68.5 60.4 57.4	68.5 60.4 57.4	11% 2% 1%	;	Small Bulldozer	58 58 58 58	0.003 0.003 0.003 0.003	27.2 27.2 19.5 19.5	2 0.000 2 0.000 5 0.000 5 0.000	0.0 0.0 0.0 0.0
12 13	Grouting Plant 2 Grouting Plant 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2	Concrete Batch Plant Compressor (air) Pumps Generator	1 1 1	480 480 480	100% 100% 100% 100%	83 80 77 82	0 0	68.5 60.4 57.4 62.4	68.5 60.4 57.4 62.4	11% 2% 1% 3%	:	Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58 58	0.003 0.003 0.003 0.003 0.003	27.2 27.2 19.5 19.5	2 0.000 2 0.000 5 0.000 5 0.000 5 0.000	0.0 0.0 0.0 0.0 0.0
12 13 14	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant	1 1 1 1	480 480 480 480	100% 100% 100% 100% 100%	83 80 77 82 83	0 0 0 0	68.5 60.4 57.4 62.4 63.4	68.5 60.4 57.4 62.4 63.4	11% 2% 1% 3% 3%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58 58 58	0.003 0.003 0.003 0.003 0.003 0.003	27.2 27.2 19.5 19.5 19.5	2 0.000 2 0.000 5 0.000 5 0.000 5 0.000 5 0.000	0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 2 2	480 480 480 480 285	100% 100% 100% 100% 100% 100%	83 80 77 82 83 84	0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9	68.5 60.4 57.4 62.4 63.4 71.9	11% 2% 1% 3% 3% 23%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.003 0.003	27.2 27.2 19.5 19.5 19.5 19.5	2 0.000 2 0.000 5 0.000 5 0.000 5 0.000 5 0.000 6 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck	2	480 480 480 480 285 300	100% 100% 100% 100% 100% 100% 100%	83 80 77 82 83 84 84	0 0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.4	68.5 60.4 57.4 62.4 63.4 71.9 71.4	11% 2% 1% 3% 3% 23% 21%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008	27.2 27.2 19.5 19.5 19.5 19.5 34.3 33.6	2 0.000 2 0.000 5 0.000 6 0.000 6 0.000 6 0.000 8 0.000 8 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck		480 480 480 480 285 300	100% 100% 100% 100% 100% 100% 100%	83 80 77 82 83 84	0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9	68.5 60.4 57.4 62.4 63.4 71.9	11% 2% 1% 3% 3% 23%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.003 0.003	27.2 27.2 19.5 19.5 19.5 19.5	2 0.000 2 0.000 5 0.000 6 0.000 6 0.000 6 0.000 8 0.000 8 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck	2	480 480 480 480 285 300	100% 100% 100% 100% 100% 100% 100%	83 80 77 82 83 84 84	0 0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A	11% 2% 1% 3% 3% 23% 21%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008	27.2 27.2 19.5 19.5 19.5 19.5 34.3 33.6 60.6	2 0.000 2 0.000 5 0.000 6 0.000 6 0.000 8 0.000 8 0.000 6 0.000 6 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	2	480 480 480 480 285 300	100% 100% 100% 100% 100% 100% 100%	83 80 77 82 83 84 84	0 0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A	11% 2% 1% 3% 3% 23% 21%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008	27.2 27.2 19.5 19.5 19.5 34.3 33.6 60.6	2 0.000 2 0.000 5 0.000 6 0.000 6 0.000 8 0.000 8 0.000 6 0.000 8 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	2 1	480 480 480 480 285 300 301	100% 100% 100% 100% 100% 100% 100% N/A	83 80 77 82 83 84 84 84	0 0 0 0 0 0 0 N/A	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6	11% 2% 1% 3% 3% 23% 21% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008	27.2 27.2 19.5 19.5 19.5 19.5 34.3 33.6 60.6	2 0.000 2 0.000 5 0.000 6 0.000 6 0.000 8 0.000 8 0.000 6 0.000 6 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	2 1	480 480 480 480 285 300 301	100% 100% 100% 100% 100% 100% 100% N/A	83 80 77 82 83 84 84 N/A	0 0 0 0 0 0 N/A	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6	11% 2% 1% 3% 3% 23% 21% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008	27.2 27.2 19.5 19.5 19.5 34.3 33.6 60.6	2 0.000 2 0.000 5 0.000 5 0.000 5 0.000 5 0.000 5 0.000 6 0.000 6 0.000 6 0.000 7 0.000 8 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	2 1	480 480 480 480 285 300 301	100% 100% 100% 100% 100% 100% 100% N/A	83 80 77 82 83 84 84 N/A	0 0 0 0 0 0 N/A	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6	11% 2% 1% 3% 3% 23% 21% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 58 58 58 58 66	0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008	27.2 27.2 19.5 19.5 19.5 34.3 33.6 60.6	2 0.000 2 0.000 5 0.000 5 0.000 5 0.000 5 0.000 5 0.000 6 0.000 6 0.000 6 0.000 7 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No.	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alik EPBM broad turnels on deep align (Surface Equipment)	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Manuent Alternative ment to south of 5th street, remove FHWA Equiv 6	2 1 e EPBM's through r	480 480 480 285 300 301	100% 100% 100% 100% 100% 100% 100% N/A N EM tunnel const Usage 8	83 80 77 82 83 84 84 N/A truction from 5th A-w LmaxRef	0 0 0 0 0 0 N/A street shaft to 7th/seighted Nois	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9 detro. Mucking throug e Levels (in dE LmaxCalc	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulativy 76.6 h L tunnel to M SA)	11% 2% 1% 3% 3% 23% 21% N/A Langrove portal Contribution		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM	58 58 58 58 58 58 66 66 93	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142	27.2 27.2 19.5 19.5 19.5 34.3 33.6 60.6 Max VdB 60.2	2 0.000 2 0.000 5 0.000 5 0.000 6 0.000 8 0.000 8 0.000 8 0.000 8 0.000 9 0.000 9 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No.	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align y Surface Equipment 2 Bulldozer	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NIA griment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer	2 1 1 e EPBM's through r Amount 3 1	480 480 480 285 300 301 Distance	100% 100% 100% 100% 100% 100% 100% N/A N	83 80 77 82 83 84 84 84 N/A truction from 5th A-w LmaxRef 7	0 0 0 0 0 0 N/A street shaft to 7th/eighted Nois Shielding 0	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9 detr. Musking brouge e Levels (in dB LmaxCalc	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 th L turnel to M	11% 2% 1% 3% 3% 23% 21% N/A 21% N/A Contribution 6%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (sturry wall), in soil Hydromill (sturry wall), in soil TBM FTA Equiv Small Bulldozer	58 58 58 58 58 58 66 66 93	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003	27.2 27.2 19.5 19.5 19.5 34.3 33.6 60.6 Max VdB 60.2 Lv (VdB)	2 0.000 2 0.000 5 0.000 5 0.000 6 0.000 8 0.000 8 0.000 8 0.000 8 0.000 9 0.000 9 0.000 PPV (ips)	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No.	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alix EPBM bored turnels on deep align V Surface Equipment 2 Bulldozer Excavator	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Jument Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator	2 1 1 e EPBM's through r	480 480 480 480 300 301 mangrove portal. S Distance 4 285 285	100% 100% 100% 100% 100% 100% 100% 100%	83 80 77 82 83 84 84 84 N/A truction from 5th A-w LmaxRef 7	0 0 0 0 0 0 0 N/A street shaft to 7th/ eighted Nois Shielding 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9 detro. Mucking throug e Levels (in dB LmaxCalc	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 h L tunnel to M 3A) Leq 65.9	11% 2% 1% 3% 3% 23% 23% 21% N/A Contribution 6% 6%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer	58 58 58 58 58 66 66 93 LvRef (RMS) 5 8	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003	27.2 27.2 27.2 19.5 19.5 19.5 19.5 34.3 33.6 60.6 Max VdB 60.2	2 0.000 2 0.000 5 0.000 5 0.000 6 0.000 6 0.000 6 0.000 8 0.000 6 0.000 8 0.000 9 0.000 PPV (ips) 8 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3	Grouting Plant 2 Grouting Plant 2 Grouting Plant 12 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align y Surface Equipment 2 Bulldozer Excavator Crane	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Amment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane	2 1 1 e EPBM's through r Amount 3 1	480 480 480 480 285 300 301 Distance 4 285 285 285	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 N/A truction from 5th truction from 5th A-w LmaxRef 7 85 85	0 0 0 0 0 0 N/A street shaft to 7th/eighted Nois Shielding 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9 eletro. Mucking throug e Levels (in dB LmaxCalc 69.9 69.9	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 ht. turnel to M 3A) Leq 65.9 65.9 61.9	11% 2% 1% 3% 3% 23% 23% 21% N/A 2 Contribution 6% 6% 2%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer	58 58 58 58 58 66 66 93 LVRef (RMS) 5 8 77	0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.003	27.2 27.2 27.2 27.2 27.2 27.2 27.2 27.2	2 0.000 5 0.000 5 0.000 5 0.000 5 0.000 6 0.000 6 0.000 8 0.000 8 0.000 9 0.000 PPV (ips) 9 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction General Construction General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align / Surface Equipment 2 Bulldozer Excavator Crane Drill Rig	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Imment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck	2 1 1 e EPBM's through r Amount 3 1	480 480 480 480 480 301 301 Distance 4 285 285 285	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 84 N/A LmaxRef 7 85 85	0 0 0 0 0 N/A street shalf to 7th/A street shalf to 7th/A 0 0 Shielding 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9 detro. Mucking stroug e Levels (in dB LmaxCalc 69.9 69.9 69.9 69.9	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 h L tunnel to M 3A) Leq 65.9 65.9 61.9	11% 2% 1% 3% 3% 23% 21% N/A 21% Contribution 6% 6% 6% 2% 2%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromili (sturry wall), in soil Hydromili (sturry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Sulldozer Caisson drilling	58 58 58 58 58 66 66 93 LvRef (RMS) 5 58 87	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.008 0.008 0.008	27.2 27.2 19.5 19.5 19.5 34.3 33.6 60.2 Max VdB 60.2 Lv (VdB)	2 0.000 2 0.000 5 0.000 5 0.000 5 0.000 5 0.000 6 0.000 6 0.000 7 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig. EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A N/A N/A Imment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Concrete Mixer Truck	2 1 1 e EPBM's through r Amount 3 1	480 480 480 480 480 300 301 Distance 4 285 285 285 285	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 N/A truction from 5th A-w LmaxRef 7 85 85 85 84	0 0 0 0 0 N/A street shaft to 7th/ elighted Nois Shielding 0 0 0 0 0 0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.9 68.4 N/A Maximum 69.9 deto. Musking brouge e Levels (in dE LmaxCalc 69.9 69.9 69.9 68.9 68.9	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 th Lunnel to M BA) Leq 65.9 65.9 61.9 61.9 59.9	11% 2% 1% 3% 3% 23% 23% 21% N/A **Contribution 6% 6% 6% 6% 2% 2% 1%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks	58 58 58 58 58 66 66 93 LVRef (RMS) 5 58 87 79 87	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.008 0.035 0.008 0.003	27.2 27.2 19.5 19.5 19.5 34.3 33.6 60.6 Max VdB 60.2 Lv (VdB) 26.3 55.3 55.3 55.3	2 0.0000 5 0.000 6 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6	Grouting Plant 2 Grouting Plant 12 Grouting Plant 12 Grouting Plant 12 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align y Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NIA Internative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck	2 1 1 e EPBM's through r Amount 3 1	480 480 480 480 480 300 301 301 Distance 4 285 285 285 285 285	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 V/A struction from 5th A-w LmaxRef 7 7 85 85 85 84 79	0	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9 detro. Mucking throug e Levels (in dB LmaxCalc 69.9 69.9 69.9 63.9 63.9 63.9 60.9	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 th Lunnel to M 8A) Leq 65.9 65.9 61.9 61.9 55.9	11% 2% 1% 3% 3% 23% 21% N/A N/A Contribution 6% 6% 2% 2% 1% 1%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer	58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 8 87 79 87 86 86	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.008 0.008 0.008 0.008 0.008 0.008 0.008 0.008 0.008 0.008 0.003 0.003	27.2 27.2 27.2 19.5 19.5 19.5 19.5 19.5 24.3 34.3 33.6 60.6 60.2 Lv (VdB) 26.3 55.3 55.3 54.3 54.3 54.3 54.3 54.3 54	2 0.000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align / Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck N/A Drill Rig Truck N/A A A A B B B B B B B B B B	2 1 1 e EPBM's through r Amount 3 1	480 480 480 480 480 285 300 301 Distance 4 285 285 285 285 285 285	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 833 844 84 N/A 84 M/A 85 85 85 85 84 99 76 80 80 80 80 80 80 80 80 80 80 80 80 80	0 0 0 0 0 0 N/A street shaft to 7th/10 eighted Nois Shielding 0 0 0 0 0 0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.9 68.4 N/A Maximum 69.9 detro. Musking strong e Levels (in dB LmaxCalc 69.9 69.9 69.9 69.9 60.9 63.9 60.9 65.5	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 ht. turnel to M 3A) Leq 65.9 65.9 61.9 59.9 55.9 65.5	11% 2% 1% 3% 3% 3% 23% 21% N/A **Contribution 6% 6% 6% 2% 1% 1% 5%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Small Bulldozer Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer	58 58 58 58 58 66 66 93 LVRef (RMS) 5 8 7 79 87 86 86 86 86	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.089 0.089 0.035 0.089 0.090 0.000 0.	27.2 27.2 19.5 19.5 19.5 19.5 19.5 19.5 19.5 19.5	2 0.0000 5 0.000 6 0.000 6 0.000 6 0.000 6 0.000 6 0.000 6 0.000 7 0.000 8 0.000 8 0.000 8 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000 9 0.000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction Grouting Plant 1	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM boxed turnels on deep align y Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NIA Internative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck	2 1 1 e EPBM's through r Amount 3 1	480 480 480 480 480 480 480 480 480 480	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 82 83 84 84 N/A but truction from 5th A-w LmaxRef 7 85 85 85 84 79 76 80 777	0 0 0 0 0 0 0 N/A street shaft to 7th/16 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9 detro. Mucking througe Levels (in dB LmaxCalc 69.9 69.9 69.9 68.9 60.9 65.5 62.5	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 ht turnel to M 3A) Leq 65.9 65.9 61.9 65.9 65.9 65.9 65.9 65.9	11% 2% 1% 3% 3% 23% 21% N/A 21% N/A Contribution 6% 6% 2% 2% 1% 1% 1% 5% 3%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil FTA Equiv FTA Equiv Small Bulldozer Large Bulldozer Min (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 8 87 79 87 86 86 58	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.008 0.008 0.008	27.2 27.2 19.5 19.5 19.5 19.5 19.5 19.5 19.5 19.5	2 0.000 0 0.00	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8 9	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Fowered By S General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck N/A Drill Rig Truck N/A FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Dump Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator	2 1 1 e EPBM's through r Amount 3 1	480 480 480 480 480 480 480 480 480 480	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 833 844 84 N/A 84 M/A 85 85 85 85 84 99 76 80 80 80 80 80 80 80 80 80 80 80 80 80	0 0 0 0 0 0 0 N/A street shaft to 7th/ eighted Nois Shielding 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.9 68.4 N/A Maximum 69.9 etero. Musking stroug e Levels (in dB LmaxCalc 69.9 69.9 69.9 63.9 63.9 63.9 63.9 63.9	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 ht. turnel to M 3A) Leq 65.9 65.9 61.9 59.9 55.9 65.5	11% 2% 1% 3% 3% 3% 23% 21% N/A **Contribution 6% 6% 6% 2% 1% 1% 5%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58 58 66 66 93 LvRef (RMS) 5 58 87 79 87 86 86 58 58	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.008 0.008 0.008 0.009 0.000 0.	27.2 27.2 27.2 27.2 27.2 27.2 27.2 27.2	2 0.0000 5 0.000 6 0.000 6 0.000 6 0.000 6 0.000 6 0.000 6 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.000 7 0.0000 7 0.0000 7 0.0000 7 0.0000	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction Grouting Plant 1	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM boxed turnels on deep align y Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck N/A Drill Rig Truck Enter to south of 5th street, remover to south of 5th street, remover to south of 5th street, remover to the south o	2 1 1 e EPBM's through r Amount 3 1	480 480 480 480 480 480 480 480 480 480	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 N/A truction from 5th A-we LmaxRef 7 85 85 84 79 76 80 77 82	0 0 0 0 0 NI/A street shalf to 7th/16 eighted Nois Shielding 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	68.5 60.4 57.4 62.4 63.4 68.9 68.4 N/A Maximum 69.9 detro. Mucking througe Levels (in dB LmaxCalc 69.9 69.9 69.9 68.9 60.9 65.5 62.5	68.5 60.4 57.4 62.4 63.4 71.9 71.4 N/A Cumulative 76.6 hit turnel to M 8A) Leq 65.9 65.9 61.9 59.9 59.9 65.5 62.5	11% 2% 1% 3% 3% 3% 23% 21% N/A Contribution 6% 6% 2% 1% 1% 1% 5% 3% 9%		Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil FTA Equiv FTA Equiv Small Bulldozer Large Bulldozer Min (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 8 87 79 87 86 86 58	0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.008 0.008 0.008	27.2 27.2 19.5 19.5 19.5 19.5 19.5 19.5 19.5 19.5	2 0.0000 0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

Table A 8: Construction													1					
Table A.o. Constructio	on Noise and Vibration Pre	dictions - R5																
Receiver No.	6		+											 				
Receiver No.	R5																	
Description	Los Angeles Public Librar	v Park																
	stance (ft)	y I dik											GB-NZ: Typical Soil					
General Construction	50												-35		TDH Conver	ted RMS to F	PPV	
Grouting Plant 1	30												-				ĺ	
Grouting Plant 2	390																	
Grouting Rigs 1	50																	
Grouting Rigs 2	108																	
Little Tokyo Muck Remo																		
•																		
	•	•	NC	DISE										VIE	RATION	1		•
*** **									Maximum	Cumulative	2					Max VdB	Max PPV	Max GBNZ
Alternative No.	LPA/Baseline	h St. C&C from 4th St to 7th	(0.4 - 4						85.0	86.4						78.0	0.031	43.0
Description	EPBM Bored tunnels to 4t	n St, C&C from 4th St to 7th	n/Metro					aladata d Mada	a Lavada da alf									
N-	F	Of	FIDALA Familia		Distance	Heres			e Levels (in de LmaxCalc				ETA Familia	LD-((DMC)	PPV_Ref	L () (-ID)	PPV (ips)	ODNZ (JDA)
No.	Equipment Groupin	g Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
1	Conoral Construction	2 Bulldozer	6 Dozer	1	4 50	8 40%	7	0	85.0	81.0	29%	 	Small Bulldozer	5	0.003	10.0	0.001	
	General Construction						85							58		49.0		
2	General Construction	Excavator	Excavator	1	50		85		85.0	81.0	29%		Large Bulldozer	87	0.089	78.0		
3	General Construction	Crane	Crane	1	50		85		85.0 84.0	77.0 77.0	12% 12%		MIN (Sm. Dozer)	79	0.035	70.0		
4	General Construction	Drill Rig	Drill Rig Truck	1	50		84						Caisson drilling	87	0.089			
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	50 50	40%	79		79.0	75.0	7% 12%		Loaded Trucks	86	0.076	77.0 77.0		
- 6	General Construction	Muck Removal	Dump Truck	3	50	40%	76	0	76.0	77.1	12%		Loaded Trucks	86	0.076	//.0	0.027	42.0
	_								Mandanian	O						Max VdB	Max PPV	Max GBNZ
Alternative No		A EDDM/Onen Fees C	hield/SEM Profile Altern	nathra					Maximum 97.4	Cumulative 93.9	1					78.0	0.0	43.0
Alternative No.					I				87.4			L .				78.0	0.0	43.0
Description		EPBM bored tunnels on LPA align	ment to 4th street shaft, open face	shield tunnel excav	vation on 5th St sha	ift abandoning sh					ro mucking through L t	tunnel						
					B				e Levels (in dE						DD1 / D /		BB1///	
No.	Powered B	Sy Surface Equipment	FHWA Equiv	Amount	Distance	Usage	Lmaxket	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
1	5	Bulldozer 2	6	3	4 50	40%	7 85	0	85.0	81.0	F0/		O D -	5	0.003	49.0	0.001	44.0
2	General Construction General Construction	Excavator	Dozer	1	50		85 85	0	85.0 85.0	81.0	5% 5%		Small Bulldozer	58 87	0.003	78.0		14.0 43.0
			Excavator										Large Bulldozer					
3	General Construction	Crane	Crane	1	50	16%	85	0	85.0	77.0	2%		MIN (Sm. Dozer)	79	0.035	70.0	0.012	35.0
4	General Construction General Construction	Crane Drill Rig	Crane Drill Rig Truck	1	50 50	16% 20%	85 84	0	85.0 84.0	77.0 77.0	2% 2%		MIN (Sm. Dozer) Caisson drilling	79 87	0.035 0.089	70.0 78.0	0.012	35.0 43.0
4 5	General Construction General Construction General Construction	Crane Drill Rig Concrete Truck	Crane Drill Rig Truck Concrete Mixer Truck	1 1	50 50 50	16% 20% 40%	85 84 79	0 0	85.0 84.0 79.0	77.0 77.0 75.0	2% 2% 1%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks	79 87 86	0.035 0.089 0.076	70.0 78.0 77.0	0.012 0.031 0.027	35.0 43.0 42.0
4 5 6	General Construction General Construction General Construction General Construction	Crane Drill Rig Concrete Truck Muck Removal	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck	1 1 1	50 50 50 50	16% 20% 40% 40%	85 84 79 76	0 0 0	85.0 84.0 79.0 76.0	77.0 77.0 75.0 72.0	2% 2% 1% 1%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks	79 87 86 86	0.035 0.089 0.076 0.076	70.0 78.0 77.0 77.0	0.012 0.031 0.027 0.027	35.0 43.0 42.0 42.0
4 5 6 7	General Construction General Construction General Construction General Construction Grouting Plant 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air)	1 1 1 1	50 50 50 50 30	16% 20% 40% 40% 100%	85 84 79 76 80	0 0 0 0	85.0 84.0 79.0 76.0 84.4	77.0 77.0 75.0 72.0 84.4	2% 2% 1% 1% 11%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 58	0.035 0.089 0.076 0.076 0.003	70.0 78.0 77.0 77.0 55.6	0.012 0.031 0.027 0.027 0.002	35.0 43.0 42.0 42.0 20.6
4 5 6 7 8	General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps	1 1 1 1 1 1	50 50 50 50 30 30	16% 20% 40% 40% 100%	85 84 79 76 80	0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4	77.0 77.0 75.0 72.0 84.4 81.4	2% 2% 1% 1% 11% 6%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer	79 87 86 86 58 58	0.035 0.089 0.076 0.076 0.003 0.003	70.0 78.0 77.0 77.0 55.6	0.012 0.031 0.027 0.027 0.002 0.002	35.0 43.0 42.1 42.0 20.0 20.0
5 6 7 8 9	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator	1 1 1 1 1 1 1 1	50 50 50 50 30 30 30	16% 20% 40% 40% 100% 100%	85 84 79 76 80 77 82	0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4	77.0 77.0 75.0 72.0 84.4 81.4 86.4	2% 2% 1% 1% 11% 6% 18%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer	79 87 86 86 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003	70.0 78.0 77.0 77.0 55.6 55.6	0.012 0.031 0.027 0.027 0.002 0.002 0.002	35.0 43.0 42.0 42.0 20.0 20.0 20.0
4 5 6 7 8 9	General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant	1 1 1 1 1 1	50 50 50 50 30 30 30 30	16% 20% 40% 40% 100% 100% 100%	85 84 79 76 80 77 82 83	0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4	77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4	2% 2% 1% 11% 11% 6% 18% 23%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	79 87 86 86 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 55.6 55.6 55.6	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.002	35.0 43.0 42.0 42.0 20.6 20.6 20.6 20.6
4 5 6 7 8 9 10	General Construction General Construction General Construction General Construction Grouting Plant 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air)	1 1 1 1 1 1 1 1	50 50 50 50 30 30 30 30 30	16% 20% 40% 40% 100% 100% 100% 100%	85 84 79 76 80 77 82 83	0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2	77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2	2% 2% 1% 19% 11% 6% 18% 23%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 55.6 55.6 55.6 22.2	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.002 0.002	35.1 43.1 42.1 42.1 20.1 20.1 20.1 20.1 0.1
4 5 6 7 8 9 10 11	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps	1 1 1 1 1 1 1 1	50 50 50 50 30 30 30 30 30 390	16% 20% 40% 40% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80	0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2	77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 59.2	2% 2% 1% 11% 11% 6% 23% 0%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 55.6 55.6 55.6 22.2	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.002 0.002 0.000	35.4 43.4 42.4 20.4 20.4 20.4 20.4 0.4 0.0
4 5 6 7 8 9 10 11 12	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Generator	1 1 1 1 1 1 1 1	50 50 50 50 30 30 30 30 30 390 390	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77	0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2	77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2	2% 2% 1% 11% 11% 6% 18% 23% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Buldozer	79 87 86 86 58 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 55.6 55.6 55.6 22.2 22.2	0.012 0.031 0.027 0.002 0.002 0.002 0.002 0.002 0.000 0.000	35.4 43.4 42.4 20.1 20.1 20.1 20.1 0.1 0.1
4 5 6 7 8 9 10 11 12 13	General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Concrete Batch Plant	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 30 30 30 30 390 390 390	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83	0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2	77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2	2% 2% 1% 11% 11% 6% 18% 23% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 55.6 55.6 55.6 22.2 22.2 22.2	0.012 0.031 0.027 0.002 0.002 0.002 0.002 0.000 0.000 0.000	35.6 43.6 42.6 20.6 20.6 20.6 0.6 0.6
4 5 6 7 8 9 10 11 12 13 14 15	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 3 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 30 30 30 390 390 390 390 390 50	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83 80 80 80	0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 84.0	77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0	2% 2% 1% 11% 111% 6% 23% 0% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 58 58 58 58 58 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 55.6 55.6 55.6 22.2 22.2 22.2 22.2	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.000	35.1 43.3 42.1 42.0 20.1 20.1 20.1 20.1 0.1 0.1 0.1
4 5 6 7 8 9 10 11 12 13 14 15 16	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Lompressor 2 High-Pressure Pump 2 High-Pressure Pump 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 30 30 30 390 390 390 50	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83 84	0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 84.0 77.3	77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0 80.3	2% 2% 1% 11% 11% 6%, 23% 0% 0% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 55.6 55.6 55.6 22.2 22.2 22.2 46.9	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.000	35.0 43.0 42.0 20.6 20.6 20.6 0.0 0.0 0.0 22.0 11.5
4 5 6 7 8 9 10 11 12 13 14 15	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 3 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 30 30 30 390 390 390 50	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83 80 80 80	0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 84.0 77.3 N/A	77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 65.2 87.0 80.3 N/A	2% 2% 1% 11% 111% 6% 23% 0% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 58 58 58 58 58 58 58 58 58 58	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 55.6 55.6 55.6 22.2 22.2 22.2 22.2 46.9 74.7	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.000 0.001	35.0 43.0 42.0 20.6 20.6 20.6 0.0 0.0 0.0 1.1 39.7
4 5 6 7 8 9 10 11 12 2 13 14 15 16	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 1 Tight Right 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck NA	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 30 30 30 390 390 390 50	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 77 82 83 80 77 82 83 84	0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 84.0 77.3 N/A	77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0 80.3 N/A	2% 2% 1% 11% 11% 6%, 23% 0% 0% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 55.6 55.6 55.6 22.2 22.2 22.2 46.9 74.7	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.001 0.001 0.001	35.(43.3) 43.3 42.2 20.0 20.0 20.0 20.0 0.0 0.0 0.1 3.3 39.3
4 5 6 7 7 8 9 10 11 12 13 14 15 16 17	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Lower Service Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alfg. B - EPBM/SEM Low Alfg.	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A pument Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 30 30 30 390 390 390 390 50 108	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 799 76 80 80 777 82 83 83 80 777 82 83 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 84.0 77.3 N/A	77.0 77.0 75.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0 80.3 N/A	2% 2% 1% 11% 6% 6% 0% 0% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 55.6 55.6 55.6 22.2 22.2 22.2 22.2 46.9 74.7	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.000 0.001	35.0 43.1 42.1 20.0 20.0 20.0 0.0 0.0 0.0 20.0 1.0 20.0 20
4 5 6 7 8 9 10 11 12 2 13 14 15 16	General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 1 Tight Right 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A pument Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 30 30 30 390 390 390 390 50 108	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 79 76 80 80 80 77 82 83 83 80 77 82 83 83 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 84.0 77.3 N/A Maximum Maximum Metro. Mucking throug	77.0 77.0 77.0 75.0 84.4 81.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0 80.3 N/A Cumulative 93.6 h L tunnel to M	2% 2% 1% 11% 6% 6% 0% 0% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 55.6 55.6 55.6 22.2 22.2 22.2 46.9 74.7	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.001 0.001 0.001	35.(43.3) 43.3 42.2 20.0 20.0 20.0 20.0 0.0 0.0 0.1 3.3 39.3
4 5 6 7 8 9 10 11 12 13 14 15 16 17	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Lower Service Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 TBM B - EPBM/SEM Low Alig EPBM bored furnish on deep align	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck Drill Rig Truck N/A	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 1 1 1 1 1 1 1 1 2 2 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 799 766 80 80 777 82 82 83 83 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4	77.0 77.0 77.0 75.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0 80.3 N/A Cumulative 93.6 ht. turnel to M	2% 2% 1% 11% 11% 6% 23% 0% 0% 0% 0% 4% N/A		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM	79 87 86 86 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.00 77.0.0 77.0.0 77.0.0 77.0.0 77.0.0 55.6 55.6 55.6 22.2 22.2 22.2 22.2 22.2	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002	35.1 43.6 42.6 20.0 20.0 20.0 0.0 0.0 0.0 42.1 11.5 39.3 Max GBNZ 43.0
4 5 6 7 8 9 10 11 12 13 14 15 16 17	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Lower Service Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alfg. B - EPBM/SEM Low Alfg.	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A pument Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 50 50 30 30 30 390 390 390 390 50 108	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 799 766 80 80 777 82 82 83 83 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 84.0 77.3 N/A Maximum Maximum Metro. Mucking throug	77.0 77.0 77.0 75.0 84.4 81.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0 80.3 N/A Cumulative 93.6 h L tunnel to M	2% 2% 1% 11% 6% 6% 0% 0% 0% 0%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	79 87 86 86 86 58 58 58 58 58 58 58 58 66 66	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	70.0 78.0 77.0 77.0 55.6 55.6 55.6 22.2 22.2 22.2 46.9 74.7	0.012 0.031 0.027 0.027 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002	35.4 43.1 42.1 42.1 20.1 20.1 20.1 0.1 0.1 0.1 0.2 22.1 11.1 39.
4 5 5 6 6 7 7 8 9 9 10 11 12 12 13 14 15 16 17 7 Maternative No. Description	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Tight Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Jument Alternative ment to south of 5th street, remove FHWA Equiv 6	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 1 1 1 1 1 1 1 1 2 2 1	50 50 50 50 50 30 30 30 30 390 390 390 108 102	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 79 76 800 777 82 83 80 80 77 82 83 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4 Limburga throose e Levels (in de LmaxCalc	77.0 77.0 77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0 80.3 N/A Cumulative 93.6 ht tunnel to MiA) Leq	2% 2% 1% 11% 11% 6% 23% 0% 0% 23% 4% N/A N/A Contribution		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer TSmall Sildry wall), in soil Hydromill (slurry wall), in soil TBM	79 87 86 86 58 58 58 58 58 58 58 66 66 66 93	0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.004 0.004 0.004 0.005 0.	70.0 78.0 77.0 78.0 77.0 77.0 77.0 77.0	0.0121 0.027 0.027 0.027 0.0020 0.0020 0.0020 0.0020 0.0020 0.0020 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	35.1 43.1 42.1 42.1 20.1 20.1 20.1 0.1 0.1 0.1 0.1 21.1 339.1 Max GBNZ (dBA)
4 5 6 6 7 7 8 8 9 10 111 12 13 14 15 16 17 7 8 16 17 7 8 17 17 8 18 17 17 8 18 18 18 18 18 18 18 18 18 18 18 18 1	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 5 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Bulldozer	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A priment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 799 766 80 80 777 82 83 83 84 84 84 84 84 M/A 84 M/A 85 85 85 86 86 87 85 88 86 87 88 88 88 88 88 88 88 88 88 88 88 88	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 99.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4 detro. Muching through the Level's (ind EL Level's (ind EL Level's Canada and EL Level's Canada and EL Level's (ind EL Level's Canada and EL Level's (ind EL Level's Canada and EL Level's Canada and EL Level's (ind EL Level's Canada and EL Level's Canada and EL Level's (ind EL Level's Canada and EL Level's Canada and EL Level's (ind EL Level's Canada and EL Level's Can	77.0 77.0 77.0 75.0 84.4 81.4 86.4 87.4 62.2 65.2 64.2 65.2 87.0 80.3 N/A Cumulative 93.6 h.L. turnel to M.A.) Leq	2% 2% 1% 11% 6% 11% 6% 23% 0% 0% 0% 4% N/A 2contribution		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromil (slurry wall), in soil TBM	79 87 86 86 86 58 58 58 58 58 58 66 66 66 93	0.035 0.089 0.076 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 PV_Ref 3	70.0 78.0 77.0 77.0 77.0 77.0 77.0 77.0	0.0121 0.027 0.027 0.027 0.0020 0.0020 0.0020 0.0020 0.0020 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	35. 43. 42. 42. 20. 20. 20. 0. 0. 0. 0. 43. 43. 42. 20. 20. 20. 30. 43. 64. 43.0 65. 65. 65. 66. 66. 66. 66. 66. 66. 66.
4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBMSEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Excavator	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck Drill Ri	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	50 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 84 79 76 800 777 82 83 80 80 80 80 80 80 80 80 80 80 80 80 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4 62.2 85.0 85.0 85.0	77.0 77.0 77.0 77.0 75.0 72.0 84.4 86.4 87.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0 80.3 N/A Cumulative 93.6 ht unnel to M A) Leq 81.0	2% 2% 2% 11% 11% 6% 23% 0% 0% 23% 0% 0% 4% N/A Contribution 5% 5%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 93	0.035 0.089 0.076 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.008 0.008 0.008	70.0 78.0 77.0 77.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.027 0.002 0.002 0.002 0.002 0.002 0.000	35.1 43.1 42.1 42.1 20.1 20.1 20.1 0.1 0.1 0.1 0.1 39.1 43.0 GBNZ (dBA)
4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered B 5 General Construction General Construction General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Excavator Crane	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck N/A Comment Alternative miner ts south of Shi street, remove FHWA Equiv 6 Dozer Excavator Crane	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 84 79 76 80 80 80 80 80 80 777 822 833 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 81.4 81.4 82.4 87.4 82.2 64.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4 Miniming through the Level's (Ind EL Level's (Ind EL Level's Called Level's (Ind EL Level's (Ind EL Level's Called Level's (Ind EL Level's (I	77.0 77.0 77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 59.2 65.2 87.0 80.3 N/A Cumulative 93.6 bit turnet to M A) Leq 81.0 81.0 81.0 77.0	2% 2% 1% 11% 6% 11% 6% 23% 0% 0% 0% 20% 4% N/A **Contribution 5% 5% 2%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer	79 87 86 86 58 58 58 58 58 58 66 66 93	0.035 0.089 0.076 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.008 0.009 0.000	70.0 78.0 77.0 77.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.002 0.002 0.002 0.002 0.002 0.000	35. 43. 42. 42. 20. 20. 20. 0. 0. 0. 20. 43. 43. 43. 43. 43.0 GBNZ (dBA)
4 5 6 6 7 7 8 8 9 9 10 11 11 12 13 14 15 16 17 7 16 17 17 18 18 19 10 10 10 10 10 10 10 10 10 10 10 10 10	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 3 Grouting Plant 4 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment 2 Bulldozer Excavator Crane Drill Rig	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Truck Drill Rig Truck N/A FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 84 79 76 80 80 80 80 80 777 82 83 83 84 84 84 84 84 84 85 85 85 85 85 85 85 85 85 85 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 78.0 78.0 84.4 81.4 86.4 87.4 62.2 65.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4 Maximum 87.4 Maximum 87.4 Maximum 88.0 85.0 85.0	77.0 77.0 77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 59.2 64.2 65.2 87.0 80.3 N/A Cumulative 93.6 ht turnel to M A) Leq 81.0 81.0 77.0	2% 2% 11% 11% 6% 6% 23% 0% 0% 0% 0% 0% 4% N/A Contribution 5% 5% 2%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromil (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Guisen drilling	79 87 86 86 86 58 58 58 58 58 58 66 66 67 93	0.035 0.089 0.076 0.076 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.008	70.0 78.0 77.0 77.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.0020 0.0020 0.0020 0.0020 0.0020 0.0020 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	35. 43. 42. 20. 20. 20. 0. 0. 0. 0. 43. 43. 43.0 Max GBNZ (dBA) 14. 43. 43. 43.
4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction General Construction General Construction General Construction General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck N/A ### Alternative ment to south of 5th street, remov #### FHWA Equiv 6 Dozer Excavalor Crane Drill Rig Truck Oncrete Batch Plant Drill Rig Truck Dozer Excavalor Crane Drill Rig Truck Concrete Mixer Truck Drill Rig Truck Concrete Mixer Truck Concrete Mixer Truck	### 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	855 844 799	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 81.4 86.2 64.2 64.2 64.2 64.2 84.0 777.3 N/A Maximum 87.4 62.2 84.0 777.3 N/A Maximum 87.4 65.2 84.0 85.0 85.0 85.0 85.0 85.0 85.0	77.0 77.0 77.0 77.0 75.0 72.0 84.4 81.4 86.4 81.4 62.2 59.2 64.2 65.2 65.2 64.2 65.3 N/A Cumulative 93.6 ht.turnet to MiA) Leq 81.0 77.0 77.0	2% 2% 1% 11% 11% 6% 18% 23% 0% 0% 0% 20% 4% N/A **Contribution Contribution 5% 2% 2% 2% 1%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling Loaded Trucks	79 87 86 86 86 58 58 58 58 58 58 66 66 67 77 87	0.035 0.089 0.076 0.076 0.076 0.003	70.0 78.0 77.0 78.0 77.0 77.0 78.0 77.0 77	0.0121 0.027 0.027 0.027 0.0020 0.0020 0.0020 0.0020 0.0020 0.0020 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	35. 43. 42. 42. 20. 20. 20. 0. 0. 0. 0. 21. 11. 39. Max GBNZ (dBA) 14. 43. 35. 43.
4 5 6 6 7 7 8 8 9 9 10 111 12 13 14 15 16 17 7 8 8 19 10 11 12 13 14 15 16 17 7 8 8 16 17 8 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 5 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Conorcete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck MA Alternative FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Concrete Mixer Truck Concrete Mixer Truck Drill Rig Truck Concrete Mixer Truck Drill Rig Truck Concrete Mixer Truck Drill Rig Truck Concrete Mixer Truck Dump Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 79 76 80 777 82 83 83 84 84 84 84 84 84 84 84 84 84 85 85 85 85 84 79 76 6	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 86.4 87.4 62.2 99.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4 detro. Muching through a classified to the control of	77.0 77.0 77.0 77.0 77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 65.2 65.2 65.2 80.3 N/A Cumulative 93.6 ht turnel to M A) Leq 81.0 81.0 77.0 75.0 771.1	2% 2% 1% 11% 6% 11% 6% 23% 0% 0% 0% 4% N/A Contribution 5% 5% 2% 2% 2%		MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromili (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Sunding Loaded Trucks Loaded Trucks Loaded Trucks	79 87 86 86 86 58 58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 87 79 87	0.035 0.089 0.076 0.076 0.003 0.	70.0 78.0 77.0 77.0 78.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.002 0.0020 0.0020 0.0020 0.00000 0.00000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000	35. 43. 42. 42. 20. 20. 20. 0. 0. 0. 0. 22. 11. 39. Max GBNZ 43.0 GBNZ (dBA) 14. 43. 43.
4 5 5 6 6 7 7 8 8 9 9 10 11 12 13 14 15 16 17 7 17 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alfg EPBM bored tumele palign by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Crane Drill Rig Truck Conorete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NA A A A A A A A A A B B B B	### 1	50 50 50 50 50 50 50 50 50 50 50 50 50 5	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	855 844 799 76 800 777 822 833 840 777 82 834 844 84 84 84 85 85 85 844 79 76 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 81.4 86.4 87.4 62.2 64.2 65.2 84.0 77.0 Maximum 87.4 Maximum 87.4 Maximum 87.4 86.6 85.0 85.0 85.0 85.0 85.0 85.0 84.0 84.0 84.4	77.0 77.0 77.0 77.0 77.0 75.0 72.0 84.4 81.4 81.4 86.4 87.4 62.2 59.2 65.2 80.3 N/A Cumulative 93.6 ht unred to M A) Leq 81.0 81.0 77.0 75.0 77.1	2% 2% 1% 11% 6% 6% 23% 0% 0% 0% 20% 4% N/A **Contribution Contribution 5% 2% 11% 11% 11%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Buldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Buldozer Large Buldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Buldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 93 LVRef (RMS) 58 87 79 86 86 86 86 87	0.035 0.089 0.076 0.076 0.076 0.003	70.0 78.0 77.0 78.0 77.0 78.0 77.0 77.0	0.0121 0.027 0.027 0.027 0.027 0.0020 0.0020 0.0020 0.0020 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.001 0.010 0.011 0.011 0.011 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012 0.012	35. 43. 42. 42. 20. 20. 20. 0. 0. 0. 0. 0. 21. 11. 39. Max GBNZ (dBA) 14. 43. 35. 43. 42.
4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck Concrete Batch Plant Generator Concrete Mixer Truck Dump Truck Compressor (air) Pumps	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 84 84 85 85 84 84 79 76 85 85 84 84 89 76 80 80 77 76 85 85 86 86 87 77 8 87 87 87 87 87 87 87 87 87 87 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 81.4 81.4 86.2 86.4 87.4 87.7 82.2 64.2 64.2 64.2 64.2 64.2 65.0 85.0 85.0 85.0 84.0 77.3 85.0 85.0 84.0 77.0 85.0 84.1	77.0 77.0 77.0 77.0 77.0 75.0 72.0 84.4 81.4 86.4 87.4 62.2 65.2 64.2 65.2 67.0 80.3 N/A Cumulative 93.6 ht turnel to M A) Leq 81.0 81.0 77.0 77.0 77.0 71.1 84.4	2% 2% 1% 11% 6% 18% 6% 23% 0% 0% 0% 20% 4% N/A **Contribution 5% 5% 2% 2% 11% 11% 6% 6%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large sund Small Bulldozer Large Small Bulldozer Large Bulldozer Large Bulldozer Large Small Bulldozer Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 93 LVRef (RMS) 5 8 87 79 86 86 86 58	0.035 0.089 0.076 0.076 0.003	70.0 78.0 77.0 77.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.027 0.002 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.000 0.000 0.001	35.1 43.1 42.1 42.1 20.1 20.1 20.1 0.1 0.1 0.1 0.1 11.1 3.9 43.0 GBNZ (dBA) 14.1 43.1 43.1 42.1 42.1 20.1
4 5 6 6 7 7 8 8 9 9 10 111 15 16 17 17 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 3 Grouting Plant 3 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Pumps Generator FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Fruck Drill Rig Truck Compressor (air)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 300 300 300	16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 84 84 79 76 82 83 80 777 82 82 83 84 84 84 84 84 84 85 85 85 85 85 85 86 80 77 78 82 85 85 85 85 86 80 77 78 82 80 77 82 80 80 77 78 82	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 779.0 76.0 84.4 81.4 86.4 81.4 86.4 87.4 62.2 65.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4 detro. Muching through one of the control o	77.0 77.0 77.0 77.0 77.0 77.0 78.0 84.4 81.4 86.4 87.4 62.2 65.2 65.2 87.0 80.3 N/A Example 10 Miles 1	2% 2% 1% 11% 6% 11% 6% 23% 0% 0% 0% 4% N/A Contribution 5% 5% 2% 11% 6% 11% 6%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 8 87 79 86 86 58 58 58	0.035 0.089 0.076 0.076 0.076 0.076 0.076 0.003	70.0 78.0 77.0 78.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.000 0.001 0.017 Max PPV 0.0 PPV (ips) 0.012 0.031 0.031 0.032 0.002 0.002 0.003 0.003 0.001 0.003 0.003 0.001 0.001 0.001 0.002 0.002 0.002	35.4 43.1 42.4 20.1 20.1 20.1 20.1 20.1 20.1 20.1 3.1 3.2 3.2 43.0 43.1 43.1 43.1 43.1 43.1 43.1 43.1 43.1
4 5 5 6 6 7 7 8 8 9 10 10 No.	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Right 2 Grouting Right 2 Grouting Right 3 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBMSEM Low Alig EPBM bored turnels on deep align ty Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Oncrete South of 5th sitest, remover the sitest plant of 5th sitest, remover the south of 5th sitest, remover the south of 5th sitest, remover the sitest plant of 5th sitest plant of 5th sitest, remover the sitest plant of 5th sit	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500 500 500 500 500 500 500 500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	855 85 84 479 76 800 777 822 83 85 85 85 84 84 84 84 84 84 84 85 85 85 85 85 85 85 85 85 85 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 79.0 76.0 84.4 81.4 81.4 81.4 86.2 64.2 64.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4 LmaxCatc 85.0 85.0 85.0 84.0 77.0 85.0 84.0 77.0 85.0 86.0 86.0 87.0	77.0 77.0 77.0 77.0 77.0 75.0 84.4 81.4 86.4 87.4 62.2 64.2 65.2 87.0 80.3 N/A Cumulative 93.6 ht turnel to M A) Leq 81.0 81.0 77.0 77.0 77.0 77.0 77.1 84.4 81.4 86.4	2% 2% 1% 11% 6% 118% 6% 23% 0% 0% 20% 4% N/A 20% 20% 4% N/A Contribution 5% 2% 14% 15% 6% 18% 24% 15% 25% 25% 26% 27% 28% 28% 28% 28% 28% 28% 28% 28% 28% 28		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv FMA Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 66 66 67 87 88 87 87 86 86 86 86 88 87 87 88 86 88 88 88 88 88 88 88 88 88 88 88	0.035 0.089 0.076 0.076 0.076 0.076 0.073 0.003	70.0 78.0 77.0 77.0 77.0 77.0 77.0 77.0	0.0121	35.0 43.0 42.0 42.0 20.6 20.6 20.6 20.6 20.6 20.6 30.7 43.0 43.0 43.0 43.0 43.0 43.0 42.0 42.0 42.0 42.0 42.0 42.0 42.0 42
4 5 6 6 7 7 8 8 9 9 10 111 15 16 17 17 18 18 16 17 17 18 18 16 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 3 Grouting Plant 3 Grouting Rigs 2 General Construction	Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Pumps Generator FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Fruck Drill Rig Truck Compressor (air)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	500 500	16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 84 84 79 76 82 83 80 777 82 82 83 84 84 84 84 84 84 85 85 85 85 85 85 86 80 77 78 82 85 85 85 85 86 80 77 78 82 80 77 82 80 80 77 78 82	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85.0 84.0 779.0 76.0 84.4 81.4 86.4 81.4 86.4 87.4 62.2 65.2 64.2 65.2 84.0 77.3 N/A Maximum 87.4 detro. Muching through one of the control o	77.0 77.0 77.0 77.0 77.0 77.0 78.0 84.4 81.4 86.4 87.4 62.2 65.2 65.2 87.0 80.3 N/A Example 10 Miles 1	2% 2% 1% 11% 6% 11% 6% 23% 0% 0% 0% 4% N/A Contribution 5% 5% 2% 11% 6% 11% 6%		MMN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	79 87 86 86 86 58 58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 8 87 79 86 86 58 58 58	0.035 0.089 0.076 0.076 0.076 0.076 0.076 0.003	70.0 78.0 77.0 78.0 77.0 77.0 77.0 77.0	0.0121 0.031 0.027 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.000 0.000 0.000 0.000 0.000 0.001 0.002	35.0 43.0 42.0 42.0 20.6 20.6 20.6 0.0 0.0 0.0 22.0 111.9 39.7 Max GBNZ 43.0 43.0 42.0 20.6 20.6 20.6 20.6 20.6 20.6 20.6 2

Table A.9: Construction	n Noise and Vibration Predic	ctions - R6																
											ĺ							
Receiver No.	6																	
ID	R6																	
Description	Citi Group Center																	
Dist:	tance (ft)										ĺ		GB-NZ: Typical Soil					
General Construction	145	İ			1								-35		TDH Conver	ted RMS to PI	Pγ	
Grouting Plant 1	240	İ			1													
Grouting Plant 2	155	İ			1								Ì					
Grouting Rigs 1	240	İ			1								Ì					
Grouting Rigs 2	145				1							1						
Little Tokyo Muck Remov					1							1						
Entire Forty's Widek Fromov	1771				1							1						
												1				-		
			NC	DISE										VIE	RATION	N .		
					I						1		1					
	İ	İ			1				Maximum	Cumulative			Ì			Max VdB	Max PPV	Max GBNZ
Alternative No.	LPA/Baseline	İ			1				75.8	77.2			Ì			64.1	0.006	29.1
Description	EPBM Bored tunnels to 4th	St. C&C from 4th St to 7th	/Metro		İ								1					
		T .			İ		A-w	eighted Nois	Levels (in di	BA)			1					
No.	Equipment Grouping	Surface Equipment	FHWA Equiv	Amount	Distance	Usage		Shielding		Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	4	8	7					1		5	3		(.p)	(42.1)
1	General Construction	Bulldozer	Dozer	1	145	40%	, 85	0	75.8	71.8	29%	t	Small Bulldozer	58	0.003	35.1	0.000	0.1
2	General Construction	Excavator	Excavator	1	145		85	0	75.8	71.8	29%	+	Large Bulldozer	87	0.089	64.1	0.006	29.1
3	General Construction	Crane	Crane	1	145		85	0	75.8	67.8	11%	+	MIN (Sm. Dozer)	79	0.035	56.1	0.003	21.1
4	General Construction	Drill Rig	Drill Rig Truck	1	145		84	0	74.8	67.8	11%	 	Caisson drilling	87	0.033	64.1	0.003	29.1
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	145		79	0	69.8	65.8	7%	+	Loaded Trucks	86	0.089	63.1	0.005	28.1
6	General Construction	Muck Removal	Dump Truck	3	145		76	0	66.8	67.8	12%	+	Loaded Trucks	86	0.076	63.1	0.005	28.1
- 6	General Construction	WILLER REITIOVAL	Durip Huck	3	143	40%	76	- 0	00.0	07.0	1270	 	Loaded Hucks	00	0.076	03.1	0.005	20.1
	+	+	1	-	1	-			Maximum	Cumulative	-	 	+		-	Max VdB	Max PPV	Max GBNZ
Alternative No.	+	A EDBM/Onen Fees C	hield/SEM Profile Altern	otivo	1	-			75.8	83.1	-	 	+		-	70.0	0.0	35.0
					L											70.0	0.0	33.0
Description		EPBM bored tunnels on LPA aligni	ment to 4th street shaft, open face	shield tunnel excar	vation on 5th St sha	att abandoning	shields undergrou	ind, SEM tunnel co	struction from 5th S	t shatt to 7th Me	ro mucking through L	tunnel						
		0 (- : .			51.4				Levels (in di			.		1 0 ((0110)	DDV D (DDV (*)	00117 (10.4)
No.	Powered By	Surface Equipment	FHWA Equiv	Amount	Distance	Usage	Lmaxket	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	4	8	7							5	3			
1	General Construction	Bulldozer	Dozer	1	145	40%	85	0	75.8	71.8	7%		Small Bulldozer	58	0.003	35.1	0.000	0.1
2	General Construction	Excavator	Excavator	1	145	40%	85	0	75.8	71.8	7%		Large Bulldozer	87	0.089	64.1	0.006	29.1
3	General Construction	Crane	Crane	1 1	145	16%	85	0	75.8	67.8	3%		MIN (Sm. Dozer)	79	0.035	56.1	0.003	21.1
4	General Construction	Drill Rig	Drill Rig Truck	1	145	20%	84		74.8	67.8	3%		Caisson drilling	87	0.089	64.1	0.006	29.1
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	145	40%	79	0	74.8 69.8	67.8 65.8	3% 2%		Loaded Trucks	87 86	0.089 0.076	64.1 63.1	0.005	28.1
5	General Construction General Construction	Concrete Truck Muck Removal	Concrete Mixer Truck Dump Truck	1	145 145	40% 40%	79 76	0	74.8 69.8 66.8	67.8 65.8 62.8	3% 2% 1%		Loaded Trucks Loaded Trucks	87 86 86	0.089 0.076 0.076	64.1 63.1 63.1	0.005 0.005	28.1 28.1
5	General Construction General Construction Grouting Plant 1	Concrete Truck Muck Removal Compressor 1	Concrete Mixer Truck	1	145 145 240	40% 40% 100%	79 76 80	0	74.8 69.8 66.8 66.4	67.8 65.8 62.8 66.4	3% 2% 1% 2%		Loaded Trucks Loaded Trucks Small Bulldozer	87 86 86 58	0.089 0.076 0.076 0.003	64.1 63.1 63.1 28.5	0.005 0.005 0.000	28.1 28.1 0.0
5 6 7 8	General Construction General Construction Grouting Plant 1 Grouting Plant 1	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps	1 1 1	145 145 240 240	40% 40% 100% 100%	79 76 80 77	0 0 0 0	74.8 69.8 66.8 66.4 63.4	67.8 65.8 62.8 66.4 63.4	3% 2% 1% 2% 1%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer	87 86 86 58 58	0.089 0.076 0.076 0.003 0.003	64.1 63.1 63.1 28.5 28.5	0.005 0.005 0.000 0.000	28.1 28.1 0.0 0.0
5 6 7 8 9	General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator	1 1 1	145 145 240 240 240	40% 40% 100% 100%	79 76 80 77 82	0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4	67.8 65.8 62.8 66.4 63.4 68.4	3% 2% 1% 2% 1% 3%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58	0.089 0.076 0.076 0.003 0.003 0.003	64.1 63.1 63.1 28.5 28.5 28.5	0.005 0.005 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0
5 6 7 8 9	General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant	1 1 1 1 1 1 1	145 145 240 240 240 240	40% 40% 100% 100% 100% 100%	79 76 80 77 82 83	0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4	67.8 65.8 62.8 66.4 63.4 68.4 69.4	3% 2% 1% 2% 1% 3% 4%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58 58	0.089 0.076 0.076 0.003 0.003 0.003 0.003	64.1 63.1 63.1 28.5 28.5 28.5 28.5	0.005 0.005 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0
5 6 7 8 9 10	General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air)	1 1 1	145 145 240 240 240 240 240	40% 40% 100% 100% 100% 100% 100%	79 76 80 77 82 83	0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2	3% 2% 1% 2% 1% 3% 4% 5%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58 58 58	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003	64.1 63.1 63.1 28.5 28.5 28.5 28.5 34.2	0.005 0.005 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0
5 6 7 8 9 10 11	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps	1 1 1 1 1 1 1	145 145 240 240 240 240 240 155	40% 40% 100% 100% 100% 100% 100%	79 76 80 77 82 83 80 77	0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2	3% 2% 1% 2% 1% 3% 4% 5% 3%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58 58 58 58	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2	0.005 0.005 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0
5 6 7 7 8 9 10 11 12 13	General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Generator	1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 240 240 240 240 240 155 155	40% 40% 100% 100% 100% 100% 100% 100%	79 76 80 77 82 83 80 77 82	0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2	3% 2% 1% 2% 1% 3% 4% 5% 3%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58 58 58 58 58	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2 34.2	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0
5 6 7 8 9 10 11 12 13	General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Concrete Batch Plant	1 1 1 1 1 1 1 1 1 1 1	145 145 240 240 240 240 155 155 155 155	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 77 82 83	0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2	3% 2% 19% 2% 19% 3% 4% 5% 3% 8%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58 58 58 58 58 58	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
5 6 7 8 9 10 11 12 13 14	General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 2	145 145 240 240 240 240 155 155 155 240	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 77 82 83 80	0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 68.4 69.4 70.2 67.2 72.2 73.2 70.4	67.8 65.8 62.8 66.4 63.4 68.4 70.2 67.2 72.2 73.2 73.4	3% 2% 1% 2% 1% 3% 4% 5% 33% 8% 10%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58 58 58 58 58 58 58 58	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5
5 6 7 8 9 10 11 12 13 14 15	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 240 240 240 250 155 155 155 240	40% 40% 100% 100% 100% 100% 100% 100% 100% 100% 100%	79 76 80 77 82 83 80 77 82 83 84 84	0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 74.8	67.8 65.8 62.8 66.4 63.4 69.4 70.2 67.2 72.2 73.2 73.4 77.8	3% 2% 1% 2% 1% 3% 4% 5% 3% 8% 10% 11% 29%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	87 86 86 58 58 58 58 58 58 58 58 58 66 66	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 34.2 36.5 43.1	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5
5 6 7 8 9 10 11 12 13 14	General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 2	145 145 240 240 240 250 155 155 155 240	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 77 82 83 80	0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 68.4 69.4 70.2 67.2 72.2 73.2 70.4	67.8 65.8 62.8 66.4 63.4 68.4 70.2 67.2 72.2 73.2 73.4	3% 2% 1% 2% 1% 3% 4% 5% 33% 8% 10%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58 58 58 58 58 58 58 58	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5
5 6 7 8 9 10 11 12 13 14 15	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 240 240 240 250 155 155 155 240	40% 40% 100% 100% 100% 100% 100% 100% 100% 100% 100%	79 76 80 77 82 83 80 77 82 83 84 84	0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 72.2 70.4 74.8 N/A	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 73.4 77.8 N/A	3% 2% 1% 2% 1% 3% 4% 5% 3% 8% 10% 11% 29%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	87 86 86 58 58 58 58 58 58 58 58 58 66 66	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 34.2 36.5	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1
5 6 7 8 9 10 11 12 13 14 15 16	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Ligh-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NA	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 240 240 240 250 155 155 155 240	40% 40% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100%	79 76 80 77 82 83 80 77 82 83 84 84	0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 69.4 70.2 67.2 72.2 73.2 74.8 N/A	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 73.4 77.8 N/A	3% 2% 1% 2% 1% 3% 4% 5% 3% 8% 10% 11% 29%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	87 86 86 58 58 58 58 58 58 58 58 58 66 66	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 34.2 36.5 43.1 70.0	0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.010	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1 35.0
5 6 7 8 9 10 11 12 13 14 15 16 17	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Iligh-Pressure Pump 2 Diesel Generator 2 Tiphydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alighted B - EPBM/SEM Low Alig	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A pument Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2	145 145 240 240 240 155 155 155 145 240 146	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 77 82 83 84 84 N/A	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 69.4 70.2 67.2 72.2 73.2 70.4 74.8 N/A Maximum 75.8	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 73.4 77.8 N/A	3% 2% 1% 2% 1% 3% 4% 5%% 3% 8% 10% 11%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	87 86 86 58 58 58 58 58 58 58 58 58 66 66	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 34.2 36.5	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1
5 6 7 8 9 10 11 12 13 14 15 16	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Iligh-Pressure Pump 2 Diesel Generator 2 Tiphydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alighted B - EPBM/SEM Low Alig	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NA	1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2	145 145 240 240 240 155 155 155 145 240 146	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 77 82 83 80 77 82 83 84 N/A	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 63.4 69.4 70.2 67.2 72.2 73.2 73.2 70.4 74.8 N/A Maximum 75.8 letro. Mucking throu	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 73.4 77.8 N/A	3% 2% 1% 2% 1% 3% 4% 5%% 3% 8% 10% 11%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	87 86 86 58 58 58 58 58 58 58 58 58 66 66	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 34.2 36.5 43.1 70.0	0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.010	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1 35.0
5 6 7 8 9 10 111 12 13 14 15 16 17 Alternative No. Description	General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Concrete Truck Muck Removal Compressor 1 mp 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Ligh-Pressure Pump 2 Light Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Comment Alternative Institute Control of Sih street, remove	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 240 240 240 240 155 155 155 146 146	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 77 82 83 84 N/A 84 N/A	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 N/A	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 72.2 70.4 74.8 N/A Maximum 75.8 b Levels (in dif	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 73.2 73.4 77.8 N/A Cumulative 79.6 gh L turnet to M	3% 2% 1% 2% 1% 3% 4% 5% 10% 10% 11% 29% N/A		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM	87 86 86 58 58 58 58 58 58 58 58 66 66 66	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 36.5 43.1 70.0	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.010	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0
5 6 7 8 9 10 11 12 13 14 15 16 17	General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Iligh-Pressure Pump 2 Diesel Generator 2 Tiphydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alighted B - EPBM/SEM Low Alig	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A pument Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2	145 145 240 240 240 155 155 155 145 240 146	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 77 82 83 80 77 82 83 84 N/A	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 N/A	74.8 69.8 66.8 66.4 63.4 63.4 69.4 70.2 67.2 72.2 73.2 73.2 70.4 74.8 N/A Maximum 75.8 letro. Mucking throu	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 73.4 77.8 N/A	3% 2% 1% 2% 1% 3% 4% 5%% 3% 8% 10% 11%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	87 86 86 58 58 58 58 58 58 58 58 58 66 66	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	64.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 34.2 36.5 43.1 70.0	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.010	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1 35.0
5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Lompressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NVA Interest of State Plant Interest of State P	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1455 1461 1471 1481 1481 1481 1481 1481 1481 148	40% 40% 40% 100% 100% 100% 100% 100% 100	79 76 80 77 82 83 80 77 82 83 84 N/A 84 N/A	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 N/A	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 70.4 74.8 N/A Maximum 75.8 Levels (in di LmaxCalc	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 72.2 73.2 73.4 77.8 N/A Cumulative 79.6 9h L turnel to M	3% 2% 1% 1% 2% 1% 3% 3% 4% 5% 10% 11% 29% N/A		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Index Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM	87 86 86 58 58 58 58 58 58 58 66 66 93	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.102 0.008 0.142	64.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 36.5 43.1 70.0 Max VdB 68.6	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.010 Max PPV 0.0	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1.1 35.0 Max GBNZ 33.6
5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 Diesel Generator 2 Mixing Plant 1 Ligh-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Bulldozer	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck M/A priment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 145 145 145 145 145 145 145 145	40% 40% 40% 100% 100% 100% 100% 100% 100	79 76 80 77 822 83 80 777 82 83 84 84 N/A 84 N/A LmaxRef 7 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 70.4 74.8 N/A Maximum 75.8 bette Muking through	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 73.2 73.2 77.8 N/A Cumulative 79.6 gh, Lunnel to M	3% 2% 11% 28% 15% 3% 45% 45% 45% 10% 29% N/A Contribution 7%		Loaded Trucks Loaded Trucks Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Hydromili (slurry wall), in soil Hydromili (slurry wall), in soil TBM FTA Equiv Small Buildozer	87 86 86 58 58 58 58 58 58 58 66 66 66 93	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142	64.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 36.5 68.6 Lv (VdB)	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 Max PPV 0.0	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0
5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Right 1 Grouting Right 2 Grouting Right 2 Grouting Right 2 Grouting Right 3 Grouting Ri	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alik EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Inment Alternative Inment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 145 145 145 145 145 145 145 145	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 00 77 82 83 84 84 84 N/A 84 LmaxRef 7 85 85 85 85 85 85 85 85 85 85 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 63.4 69.4 70.2 67.2 72.2 73.2 70.4 N/A Maximum 75.8 terto. Mucking throus Levels (in dt LmaxCalc	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 77.2 73.2 73.4 77.8 N/A Cumulative 79.6 sh L turnel to M SA) Leq	3% 2% 1% 1% 2% 19% 3% 4% 5% 3% 8% 10% 10% Contribution 7% 7%		Loaded Trucks Loaded Trucks Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Buildozer Small Buildozer	87 86 86 58 58 58 58 58 58 58 66 66 93	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.004 0.008 0.142	64.1 63.1 63.1 28.5 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 54.3 43.1 70.0 Max VdB 68.6 Lv (VdB)	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.010 Max PPV 0.0 PPV (ips)	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0
5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 Diesel Generator 2 Mixing Plant 1 Ligh-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Bulldozer	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck M/A priment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 145 145 145 145 145 145 145 145	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 822 83 80 777 82 83 84 84 N/A 84 N/A LmaxRef 7 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 70.4 74.8 N/A Maximum 75.8 bette Muking through	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 73.2 73.2 77.8 N/A Cumulative 79.6 gh, Lunnel to M	3% 2% 11% 28% 15% 3% 45% 45% 45% 10% 29% N/A Contribution 7%		Loaded Trucks Loaded Trucks Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Hydromili (slurry wall), in soil Hydromili (slurry wall), in soil TBM FTA Equiv Small Buildozer	87 86 86 58 58 58 58 58 58 58 66 66 66 93	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142	64.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 36.5 68.6 Lv (VdB)	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 Max PPV 0.0	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0
5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Right 1 Grouting Right 2 Grouting Right 2 Grouting Right 2 Grouting Right 3 Grouting Ri	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alik EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Inment Alternative Inment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 145 145 145 145 145 145 145 145	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 00 77 82 83 84 84 84 N/A 84 LmaxRef 7 85 85 85 85 85 85 85 85 85 85 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 63.4 69.4 70.2 67.2 72.2 73.2 70.4 N/A Maximum 75.8 terto. Mucking throus Levels (in dt LmaxCalc	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 77.2 73.2 73.4 77.8 N/A Cumulative 79.6 sh L turnel to M SA) Leq	3% 2% 1% 1% 2% 19% 3% 4% 5% 3% 8% 10% 10% Contribution 7% 7%		Loaded Trucks Loaded Trucks Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Small Buildozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Buildozer Small Buildozer	87 86 86 58 58 58 58 58 58 58 66 66 93	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.004 0.008 0.142	64.1 63.1 63.1 28.5 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 54.3 43.1 70.0 Max VdB 68.6 Lv (VdB)	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.010 Max PPV 0.0 PPV (ips)	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0
5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Lormpressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bornd turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Comment Alternative FHWA Equiv FHWA Equiv Excavator Excavator Crane	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 145 145 145 145 145 145 145 145	40% 40% 40% 100% 100% 100% 100% 100% 100	79 76 80 77 82 2 83 80 777 82 84 84 84 N/A 84 N/A 85 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 70.4 74.8 N/A Maximum 75.8 8 Levels (in di LmaxCalc	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 73.2 73.2 73.2 73.4 77.8 N/A Cumulative 79.6 9.1 Lurnel to M 3A) Leq 71.8 67.8	3% 2% 1% 2% 1% 3% 4% 5% 10% 10% 11% 29% N/A Contribution 7% 3%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Mint (Sm. Dozer)	87 86 86 58 58 58 58 58 58 58 66 66 93	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142	64.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 34.2 34.2 34.2	0.005 0.005 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1 35.0 Max GBNZ (dBA) 0.1 29.1 21.1 29.1
5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By General Construction General Construction General Construction General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Diesel Generator 2 Mixing Plant 2 Tigh-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Tigh-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Tigh-Pressure Pump 3 Diesel Generator 2 Mixing Plant 3 Tigh-Proving Plant 3 Tigh-Proving Plant 3 Tigh-Proving Plant 3 Tigh-Pressure Pump 4 Tigh-Pressure Plant 3 Tigh-Pressure P	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Inment Alternative Internative In	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 145 145 145 145 145 145 145 145	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 822 83 80 77 82 83 84 84 N/A 85 85 85 84 79 76 6	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 68.4 69.4 70.2 67.2 73.2 73.2 73.4 74.8 N/A Maximum 75.8 etc. Mucking through the table (in diff LmaxCalc LmaxCalc 75.8 75.8 75.8	67.8 65.8 66.2.8 66.4 63.4 68.4 69.4 70.2 67.2 73.2 73.2 73.2 77.8 N/A Cumulation M 3A) Leq 71.8 67.8 67.8 67.8 67.8 65.8	3% 2% 11% 2% 11% 3% 4% 3% 4% 5% 10% 10% 10% 10% 70% 3% 8% 30% 30% 30% 30% 29%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromili (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Caisson drilling	87 86 86 58 58 58 58 58 58 58 66 66 93	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.008 0.142	64.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 34.2 36.5 68.6 43.1 70.0 Max VdB 68.6 4.1 64.1 64.1 64.1 64.1 64.1 64.1 64.	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 Max PPV 0.0 PPV (ips) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1 35.0 Max GBNZ 33.6 GBNZ (dBA) 0.1 29.1 29.1 29.1 28.1
5 6 7 8 9 10 10 11 11 12 13 14 15 16 17 7 18 17 17 17 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavalor Crane Drill Rig Concrete Truck	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Pumps Truck N/A FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Concrete Batch Plant Drill Rig Truck Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 145 145 145 145 145 145 145 145	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 83 80 77 82 83 84 84 84 85 85 85 84 79 79	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 70.4 74.8 N/A Maximum 75.8 Levels (in di LmaxCalc 75.8 75.8 75.8 75.8 75.8 76.8	67.8 65.8 62.8 66.4 63.4 68.4 69.4 70.2 77.2 73.2 73.4 77.8 N/A Cumulative 79.6 3p.1 turnel to M 3A) Leq 71.8 67.8 67.8	3% 2% 2% 1% 3% 1% 3% 3% 4% 5% 10% 11% 29% N/A Contribution 7% 3% 3% 3% 3% 3% 3% 29%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks	87 86 86 58 58 58 58 58 58 66 66 93 LVRef (RMS) 5 8 87 79	0.089 0.076 0.076 0.003	64.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 36.5 43.1 70.0 Max VdB 68.6 Lv (VdB) 35.1 64.1 64.1 64.1	0.005 0.005 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1 35.0 Max GBNZ (dBA) 0.1 29.1 21.1 29.1
5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 General Construction Powered By 5 General Construction General Construction General Construction General Construction General Construction General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Ligh-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Concrete Mixer Truck Concrete Mixer Truck Dump Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	145 145 145 145 145 145 145 145 145 145	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 822 83 80 77 82 83 84 84 N/A 85 85 85 84 79 76 6	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 68.4 69.4 70.2 67.2 73.2 70.4 74.8 N/A Maximum 75.8 etere. Mucking through the part of the part	67.8 65.8 66.2.8 66.4 63.4 68.4 69.4 70.2 67.2 73.2 73.2 73.2 77.8 N/A Cumulation M 3A) Leq 71.8 67.8 67.8 67.8 67.8 65.8	3% 2% 11% 2% 11% 3% 4% 3% 4% 5% 10% 10% 10% 10% 70% 3% 8% 30% 30% 30% 30% 29%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large during Small Bulldozer Large during Small Bulldozer Large during Small Bulldozer Large during Small Bulldozer Large during Small Bulldozer Large Bulldozer Large During Small Bulldozer	87 86 86 58 58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 8 87 79	0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008 0.142	64.1 63.1 28.5 28.5 28.5 34.2 34.2 34.2 34.2 36.5 68.6 43.1 70.0 Max VdB 68.6 4.1 64.1 64.1 64.1 64.1 64.1 64.1 64.	0.005 0.005 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 Max PPV 0.0 PPV (ips) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	28.1 28.1 28.1 28.1 28.1 28.1 28.1 28.1
5 6 7 8 9 10 10 11 11 12 13 14 15 16 16 17 7 No. Alternative No. Description 1 2 3 3 4 4 5 5 6 7 7	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Right 2 Grouting Right 2 Grouting Right 2 Grouting Right 2 Grouting Right 2 Grouting Right 3 Grouting Right 3 Grouting Right 3 Grouting Right 3 Grouting Right 3 Grouting Right 3 Grouting Right 3 General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air)	1	145 145 145 145 145 145 145 145 145 145	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 76 82 83 80 77 77 82 83 80 77 77 82 83 84 84 84 84 85 85 85 85 85 85 85 85 86 80 80 80 80 80 80 80 80 80 80 80 80 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 63.4 69.4 70.2 67.2 72.2 73.2 70.4 74.8 N/A Maximum 75.8 4 75.8 75.8 75.8 75.8 69.8 66.4	67.8 65.8 66.4 63.4 68.4 69.4 70.2 73.2 73.2 73.4 77.8 N/A Cumulative 79.6 gh L turnet to M 3A) Leq 71.8 67.8 67.8 65.8 61.8	3% 2% 11% 2% 3% 3% 4% 5% 3% 4% 5% 8% 10% 29% N/A Contribution 7% 7% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer	87 86 86 58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 8 79 87	0.089 0.076 0.076 0.003	64.1 63.1 63.1 28.5 28.5 28.5 28.5 28.5 28.5 28.5 28.5	0.005 0.005 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1 35.0 Max GBNZ (dBA) 0.1 29.1 21.1 29.1 28.1
5 6 7 8 9 10 11 12 13 14 15 16 17 7	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 General Construction Powered By 5 General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 1 Mixing Plant 1 Lormpressor 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alis EPBM boned humels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck Drill Rig Truck N/A Pumment Alternative FHWA Equiv Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Concrete Mixer Truck Dump Truck Compressor (air) Pumps	1	145 145 145 145 145 145 145 145 145 145	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 80 77 82 2 83 3 84 84 84 85 85 85 84 47 99 76 80 77 76 80 80 77 76 80 80 77 76 80 80 77 76 80 80 77 77	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 72.2 73.2 70.4 74.8 N/A Maximum 75.8 et Levels (in di LmaxCalc 75.8 75.8 75.8 74.8 66.8 66.4 63.4	67.8 65.8 62.8 66.4 63.4 69.4 70.2 67.2 73.2 73.2 73.2 73.2 73.4 77.8 N/A Cumulative 79.6 3h L turnel to M 3A) Leq 71.8 67.8 67.8 65.8 61.8 66.4 63.4	3% 2% 11% 2% 11% 3% 4% 5% 10% 10% 29% N/A Contribution 7% 7% 3% 3% 3% 10% 111% 11% 11% 11% 11% 11% 11% 11% 1		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Sulldozer Large Sulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Small Bulldozer Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58 58 58 58 58 66 66 66 93 LvRef (RMS) 5 8 8 7 79 87 86 86 86 87	0.089 0.076 0.076 0.003	64.1 63.1 28.5 28.5 28.5 28.5 34.2 34.2 34.2 34.2 34.2 36.5 43.1 70.0 Max VdB 68.6 4.1 64.1 64.1 64.1 63.1 63.1 63.1 63.1 63.1	0.005 0.005 0.000	28.1 28.1 28.1 28.1 28.1 28.1 28.1 28.1
5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8 9 9	General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction	Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored tunnels on deep align Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Dill Right Truck Drill Right Truck N/A Inment Alternative Internative	1	145 145 145 145 145 145 145 145 145 145	40% 40% 100% 100% 100% 100% 100% 100% 10	79 76 800 777 822 83 84 84 N/A 85 85 85 84 79 76 800 777 82 85 800 777 882 800 777 82 800 800 777 882	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	74.8 69.8 66.8 66.4 63.4 68.4 69.4 70.2 67.2 77.2 72.2 73.2 74.8 N/A Maximum 75.8 etero. Mucoling through the value of the	67.8 65.8 62.8 66.4 63.4 68.4 69.4 770.2 67.2 73.2 73.2 73.2 73.4 N/A Cumulative 79.6 ph L. turnel to M 14.3 15.8 67.8 67.8 67.8 67.8 67.8 67.8 67.8 67	3% 2% 1% 2% 11% 3% 3% 4% 5% 3% 10% 10% 11% Contribution 7% 7% 3% 3% 29% 14% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3%		Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 86 86 58 58 58 58 58 58 58 66 66 93 LvRef (RMS) 5 5 8 87 79 86 86 58 58	0.089 0.076 0.003	64.1 63.1 63.1 28.5 28.5 28.5 28.5 28.5 28.5 28.5 28.5	0.005 0.005 0.000	28.1 28.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.5 8.1 35.0 Max GBNZ (dBA) 0.1 29.1 21.1 29.1 28.1 0.0 0.0 0.0

Table A.10: Construct	tion Noise and Vibration Pre	dictions - R7																
												1					1	
Receiver No.	7																	
ID:	R7																	
Description	Westin Bonaventure Hotel												GB-NZ: Typical Soil					
General Construction	30												-35		TDH Conver	tod DMS to E	DD\/	
Grouting Plant 1	345												-30		1 DIT CONVE	led KING to F	- F V	
Grouting Plant 2	65																	
Grouting Rigs 1	278																	
Grouting Rigs 2	20																	
Little Tokyo Muck Remo																		
	·		NO	DISE									-	VIE	RATION	1		
										Cumulative	e					Max VdB		Max GBNZ
Alternative No.	LPA/Baseline	0.0007 41.00.							89.4	90.8						84.6	0.068	49.6
Description	EPBM Bored tunnels to 4th	St, C&C from 4th St to 7th	n/Metro					-1-1-41 11-1-	- II- (I dF									
No.	F	. O	FHWA Equiv	Amount	Distance	Heren I		Shielding	e Levels (in dE LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
NO.	Equipment Grouping	Surface Equipment	FHWA Equiv	Amount	Distance	Usage	Lmaxker	Snielding	LmaxCaic	Leq	Contribution		F I A Equiv	LVRef (RIVIS)	PPV_Ref	LV (VaB)	PPV (ips)	GBNZ (GBA)
1	General Construction	Bulldozer	Dozer 6	1	30	40%	7 85	0	89.4	85.5	29%		Small Bulldozer	58	0.003	55.6	0.002	20.6
2	General Construction	Excavator	Excavator	1	30		85		89.4	85.5	29%		Large Bulldozer	87	0.003	84.6		
3	General Construction	Crane	Crane	1	30		85		89.4	81.5	12%		MIN (Sm. Dozer)	79	0.035	76.6		41.6
4	General Construction	Drill Rig	Drill Rig Truck	1	30		84		88.4	81.4	12%		Caisson drilling	87	0.089	84.6		
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	30	40%	79		83.4	79.5	7%		Loaded Trucks	86	0.076	83.6		
6	General Construction	Muck Removal	Dump Truck	3	30	40%	76		80.4	81.5	12%		Loaded Trucks	86	0.076	83.6		
						.070												
									Maximum	Cumulative	e					Max VdB	Max PPV	Max GBNZ
Alternative No.		A - EPBM/Open-Face S	hield/SEM Profile Alteri	native					92.0	96.6						91.4	0.1	56.4
Description		EPBM bored tunnels on LPA align	ment to 4th street shaft, open face	shield tunnel excava	ation on 5th St sha	ft abandoning shi	ields undergroun	d, SEM tunnel cor	struction from 5th St	haft to 7th Met	tro mucking through L tunnel							
							A-w	eighted Nois	e Levels (in dE	A)								
No.	Powered By	y Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
	5	2	6	3	4	8	7							5	3			
1	General Construction	Bulldozer	Dozer	1	30	40%	85	0	89.4	85.5	8%		Small Bulldozer	58	0.003	55.6		20.6
2	General Construction	Excavator	Excavator	1	30		85		89.4	85.5	8%		Large Bulldozer	87	0.089	84.6		
3	General Construction	Crane	Crane	1	30		85		89.4	81.5	3%		MIN (Sm. Dozer)	79	0.035	76.6		
4	General Construction	Drill Rig	Drill Rig Truck	1	30		84		88.4	81.4	3%		Caisson drilling	87	0.089	84.6		
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	30		79		83.4	79.5	2%		Loaded Trucks	86	0.076	83.6		
6	General Construction	Muck Removal	Dump Truck	1	30		76		80.4	76.5	1%		Loaded Trucks	86	0.076	83.6		
8	Grouting Plant 1	Compressor 1	Compressor (air)	1	345		80 77		63.2	63.2	0%		Small Bulldozer	58	0.003	23.8		
9	Grouting Plant 1	High-Pressure Pump 1	Pumps	1	345 345		82		60.2 65.2	60.2 65.2	0%		Small Bulldozer	58 58	0.003	23.8		
10	Grouting Plant 1				345			U						58				
11	Crouting Dlant 1	Diesel Generator 1	Generator	1	245			۸					Small Bulldozer	58		23.8		
	Grouting Plant 1	Mixing Plant 1	Concrete Batch Plant	1	345	100%	83		66.2	66.2	0%		Small Bulldozer		0.003	23.8	0.000	0.0
	Grouting Plant 2	Mixing Plant 1 Compressor 2	Concrete Batch Plant Compressor (air)	1 1	65	100% 100%	83 80	0	66.2 77.7	66.2 77.7	0% 1%		Small Bulldozer Small Bulldozer		0.003	23.8 45.6	0.000 0.001	0.0 10.6
12	Grouting Plant 2 Grouting Plant 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2	Concrete Batch Plant Compressor (air) Pumps	1 1 1	65 65	100% 100% 100%	83 80 77	0	66.2 77.7 74.7	66.2 77.7 74.7	0% 1% 1%		Small Bulldozer Small Bulldozer Small Bulldozer	58	0.003 0.003	23.8 45.6 45.6	0.000 0.001 0.001	0.0 10.6 10.6
12 13	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2	Concrete Batch Plant Compressor (air) Pumps Generator	1 1 1 1 1	65 65 65	100% 100% 100% 100%	83 80 77 82	0 0 0	66.2 77.7 74.7 79.7	66.2 77.7 74.7 79.7	0% 1% 1% 2%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58	0.003 0.003 0.003	23.8 45.6 45.6 45.6	3 0.000 5 0.001 6 0.001 6 0.001	0.0 10.6 10.6 10.6
12 13 14	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant	1 1 1 1 1 2	65 65 65 65	100% 100% 100% 100% 100%	83 80 77 82 83	0 0 0 0	66.2 77.7 74.7 79.7 80.7	66.2 77.7 74.7 79.7 80.7	0% 1% 1% 2% 3%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58	0.003 0.003 0.003 0.003	23.8 45.6 45.6 45.6 45.6	3 0.000 6 0.001 6 0.001 6 0.001 6 0.001	0.0 10.6 10.6 10.6 10.6
12 13 14 15	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	2	65 65 65 65 278	100% 100% 100% 100% 100% 100%	83 80 77 82 83 84	0 0 0 0	66.2 77.7 74.7 79.7 80.7 69.1	66.2 77.7 74.7 79.7 80.7 72.1	0% 1% 1% 2% 3% 0%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	58 58 58 58 66	0.003 0.003 0.003 0.003 0.008	23.8 45.6 45.6 45.6 45.6 34.6	3 0.000 5 0.001 5 0.001 6 0.001 6 0.001 6 0.000	0.0 10.6 10.6 10.6 10.6 0.0
12 13 14 15 16	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck	<u> </u>	65 65 65 65 278 20	100% 100% 100% 100% 100% 100%	83 80 77 82 83 84 84	0 0 0 0 0	66.2 77.7 74.7 79.7 80.7 69.1 92.0	66.2 77.7 74.7 79.7 80.7 72.1 95.0	0% 11% 11% 2% 33% 0% 69%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 58 66 66	0.003 0.003 0.003 0.003 0.008	23.8 45.6 45.6 45.6 45.6 34.6 68.9	3 0.000 5 0.001 6 0.001 6 0.001 6 0.001 6 0.000 9 0.011	0.0 10.6 10.6 10.6 10.6 0.0 33.9
12 13 14 15	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	2 2	65 65 65 65 278 20	100% 100% 100% 100% 100% 100%	83 80 77 82 83 84 84	0 0 0 0	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A	0% 1% 1% 2% 3% 0% 69% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 58 66	0.003 0.003 0.003 0.003 0.008	23.8 45.6 45.6 45.6 45.6 34.6 68.9 91.4	3 0.000 5 0.001 5 0.001 6 0.001 6 0.001 6 0.000 7 0.000 9 0.011 4 0.118	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4
12 13 14 15 16 17	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	2 2	65 65 65 65 278 20	100% 100% 100% 100% 100% 100%	83 80 77 82 83 84 84	0 0 0 0 0	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A	0% 1% 1% 2% 3% 0% 69% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 66 66	0.003 0.003 0.003 0.003 0.008	23.8 45.6 45.6 45.6 45.6 34.6 68.9 91.4	3 0.000 5 0.001 6 0.001 6 0.001 6 0.001 6 0.001 7 0.000 9 0.011 4 0.118	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4
12 13 14 15 16 17	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	2 2 1	65 65 65 65 278 20 28	100% 100% 100% 100% 100% 100% 100% N/A N	83 80 77 82 83 84 84 84	0 0 0 0 0 0 0 N/A	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A Maximum 89.4	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative	0% 1% 1% 1% 2% 3% 0% 69% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 66 66	0.003 0.003 0.003 0.003 0.008	23.8 45.6 45.6 45.6 45.6 34.6 68.9 91.4	3 0.000 5 0.001 5 0.001 6 0.001 6 0.001 6 0.000 7 0.000 9 0.011 4 0.118	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4
12 13 14 15 16 17	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	2 2 1	65 65 65 65 278 20 28	100% 100% 100% 100% 100% 100% 100% N/A N	83 80 77 82 83 84 84 84	0 0 0 0 0 0 N/A	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A Maximum 89.4 detro. Mucking throug	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 h L tunnel to M	0% 1% 1% 1% 2% 3% 0% 69% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 66 66	0.003 0.003 0.003 0.003 0.008	23.8 45.6 45.6 45.6 45.6 34.6 68.9 91.4	3 0.000 5 0.001 6 0.001 6 0.001 6 0.001 6 0.001 7 0.000 9 0.011 4 0.118	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4
12 13 14 15 16 17 Alternative No. Description	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A grament Alternative meet to south of 5th street, renov	2 2 1	65 65 65 278 20 28	100% 100% 100% 100% 100% 100% 100% N/A N	83 80 77 82 83 84 84 84 //A	0 0 0 0 0 0 N/A	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A Maximum 89.4 Alero. Musking througe e Levels (in dE	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 h L tunnel to M	0% 19% 19% 196 29% 39% 0% 69% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM	58 58 58 66 66 93	0.003 0.003 0.003 0.003 0.008 0.008 0.142	23.8 45.6 45.6 45.6 34.6 68.9 91.4 Max VdB 84.6	8 0.000 6 0.001 6 0.001 6 0.001 6 0.001 6 0.000 9 0.011 4 0.118 Max PPV 0.1	0.0 10.6 10.6 10.6 0.0 33.9 56.4 Max GBNZ 49.6
12 13 14 15 16 17	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	2 2 1	65 65 65 65 278 20 28	100% 100% 100% 100% 100% 100% 100% N/A N	83 80 77 82 83 84 84 84	0 0 0 0 0 0 N/A	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A Maximum 89.4 detro. Mucking throug	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 h L tunnel to M	0% 1% 1% 1% 2% 3% 0% 69% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil	58 58 58 66 66	0.003 0.003 0.003 0.003 0.008	23.8 45.6 45.6 45.6 34.6 68.9 91.4 Max VdB 84.6	8 0.000 6 0.001 6 0.001 6 0.001 6 0.001 6 0.000 9 0.011 4 0.118 Max PPV 0.1	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4
12 13 14 15 16 17 Alternative No. Description	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alfs EPBM bored turnels on deep align y Surface Equipment 2	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NA NA Imment Alternative ment to south of 5th street, remove FHWA Equiv 6	2 2 1 1 Amount	65 65 65 278 20 28 Distance	100% 100% 100% 100% 100% 100% 100% N/A N SEM tunnel constr	83 80 77 82 83 84 84 84 84 M/A	0 0 0 0 0 0 N/A street shaft to 7th/h	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A Maximum 89.4 detro. Mucking throug e Levels (in dE LmaxCalc	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 b L tunnel to M	0% 19% 19% 196 29% 396 0% 69% N/A		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM	58 58 58 66 66 93	0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref	23.8 45.6 45.6 45.6 34.6 68.9 91.4 Max VdB 84.6	8 0.000 6 0.001 6 0.001 6 0.001 6 0.001 8 0.000 9 0.011 4 0.118 Max PPV 0.1	0.0 10.6 10.6 10.6 10.6 10.6 0.0 33.9 56.4 Max GBNZ 49.6
12 13 14 15 16 17 Alternative No. Description No.	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align y Surface Equipment 2 Bulldozer	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A priment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer	2 2 1 1 1 e EPBM's through r Amount 3 1	65 65 65 278 20 28 28 Distance	100% 100% 100% 100% 100% 100% 100% N/A N SEM turnel constr Usage 8 40%	83 80 77 82 83 84 84 84 84 84 M/A Maxwelion from 5th A-w LmaxRef 7	0 0 0 0 0 0 N/A street shaft to 7th/eighted Nois Shielding	66.2 77.7 79.7 80.7 69.1 92.0 N/A Maximum 89.4 detro. Musking throug e Levels (in dE LmaxCalc	66.2 77.7 74.7 79.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 hL tunnel to M A) Leq	0% 11% 11% 196 296 396 0% 6996 N/A B Contribution 8%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer	58 58 58 66 66 93 LvRef (RMS) 5	0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003	23.8 45.6 45.6 45.6 34.6 68.9 91.4 Max VdB 84.6	8 0.000 6 0.001 6 0.001 6 0.001 6 0.001 6 0.001 7 0.001 9 0.011 1 0.118 Max PPV 0.1 PPV (ips) 6 0.002	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4 Max GBNZ 49.6 GBNZ (dBA)
12 13 14 15 16 17 Alternative No. Description No. 1 2	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alls EPBM bored turnels on deep align y Surface Equipment 2 Buildozer Excavator	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Jument Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator	2 2 1 1 Amount	65 65 65 278 20 28 28 Distance 4 30	100% 100% 100% 100% 100% 100% 100% 100%	83 80 77 82 83 84 84 84 84 84 84 1/A LmaxRef 7	0 0 0 0 0 0 0 N/A street shaft to 7th/ eighted Nois Shielding 0 0	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A Maximum 89.4 detro. Mucking througe Levels (in dE LmaxCalc 89.4 89.4	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 hL tunnel to M A) Leq 85.5	0% 19% 19% 19% 29% 39% 0% 69% N/A Contribution 8% 8%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer	58 58 58 66 66 93 LvRef (RMS) 5 58	0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.008	23.8 45.6 45.6 45.6 34.6 68.9 91.4 Max VdB 84.6	8 0.000 6 0.001 6 0.001 6 0.001 6 0.001 6 0.001 6 0.000 9 0.011 4 0.118 Max PPV 0.1 PPV (ips) 6 0.002 6 0.002 6 0.003	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4 Max GBNZ 49.6 GBNZ (dBA)
12 13 14 15 16 17 Alternative No. Description No.	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By General Construction General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align y Surface Equipment 2 Bulldozer Excavator Crane	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Amment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane	2 2 1 1 1 e EPBM's through r Amount 3 1	65 65 65 278 20 28 Distance 4 30 30	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 84 84 WA LmaxRef 7 85 85	0 0 0 0 0 0 N/A street shaft to 7th/eighted Nois Shielding 0 0	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A Maximum Masimum Masimum Bushaft through the color of the	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 h L tunnel to M iA) Leq 85.5 85.5 81.5	0% 11% 11% 196 296 396 096 6996 N/A Be Contribution 8% 8% 3%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer MiNl (Sm. Dozer)	58 58 58 66 66 66 93 LvRef (RMS) 5 58 87	0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.089 0.035	23.8 45.6 45.6 45.6 54.6 34.6 88.9 91.4 Max VdB 84.6 Lv (VdB) 55.6 88.4.8	8 0.000 6 0.001 6 0.001 6 0.001 6 0.001 6 0.001 6 0.000 9 0.011 4 0.118 Max PPV 0.1 PPV (ips) 6 0.002 6 0.006 6 0.006 6 0.006	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4 Max GBNZ 49.6 20.6 49.6 41.6
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By General Construction General Construction General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align y Surface Equipment 2 Bulldozer Excavator Crane Drill Rig	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Imment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck	2 2 1 1 1 e EPBM's through r Amount 3 1	655 655 655 278 20 20 28 Distance 4 30 30 30	100% 100% 100% 100% 100% 100% 100% N/A N SEM tunnel constr Usage 8 40% 40% 16% 20%	83 80 777 82 83 84 84 84 84 84 84 84 85 85 85 85	0 0 0 0 0 N/A street shalf to 7th/A	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A Maximum 89.4 detro. Mucking througe e Levels (in dE LmaxCalc 89.4 89.4 89.4 88.4	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 hL tunnel to M iA) Leq 85.5 85.5 81.5 81.4	0% 11% 11% 11% 12% 33% 0% 69% N/A E Contribution 8% 8% 8% 3% 3% 3%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling	58 58 58 66 66 93 LvRef (RMS) 5 58 87 79	0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.008 0.089 0.089	23.8 45.6 45.6 45.6 45.6 45.6 34.6 68.9 91.4 Max VdB 84.6 Lv (VdB) 55.6 44.6 84.6 84.6	8 0.000 6 0.001 6 0.001 6 0.001 6 0.001 6 0.001 7 0.000 9 0.011 4 0.118 Max PPV 0.1 PPV (ips) 6 0.002 6 0.006 6 0.068 7 0.068	0.0 10.6 10.6 10.6 10.8 0.0 33.9 56.4 Max GBNZ 49.6 GBNZ (dBA) 20.6 49.6 49.6
12 13 14 15 16 17 Alternative No. Description No. 1 2 3	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered B 5 General Construction General Construction General Construction General Construction General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBMSEM Low Alls EPBM bored turnels on deep sign y Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NA Ma Manuent Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck	2 2 1 1 1 e EPBM's through r Amount 3 1	655 655 655 278 200 28 Distance 4 30 30 30 30 30	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 84 84 84 84 85 85 85 85 85	0 0 0 0 0 N/A N/A Street shaft to 7th/ eighted Nois Shielding 0 0 0 0 0 0 0 0	66.2 77.7 74.7 79.7 80.7 69.1 92.0 N/A Maximum 89.4 detro. Musking througe e Levels (in dE LmaxCalc 89.4 89.4 89.4 89.4 88.4 88.4	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 h L turnel to M (A) Leq 85.5 85.5 81.5 81.4 79.5	0% 19% 19% 19% 29% 39% 0% 69% N/A E Contribution 89% 89% 39% 39% 39%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling Loaded Trucks	58 58 66 66 93 LVRef (RMS) 5 58 87 79 87	0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.008 0.008 0.003 0.003 0.003 0.003	23.8 45.6 45.6 45.6 45.6 45.6 45.6 45.6 45.6	3 0.000 0.001 0.002 0.001 0.002 0.008 0.00	0.0 10.6 10.6 10.6 0.0 33.9 66.4 Max GBNZ (dBA) 20.6 49.6 49.6 49.6 49.6
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction General Construction General Construction General Construction General Construction General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align y Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck	2 2 1 1 1 e EPBM's through r Amount 3 1	655 655 655 655 655 655 655 655 655 655	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 84 84 85 85 85 85 84 79	0	66.2 777.7 74.7 79.7 80.7 80.7 69.1 92.0 N/A Maximum 89.4 et velves (in delivery revous delivery revous delivery deliver	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 h L turnel to M (A) Leq 85.5 81.5 81.4 79.5 75.5	0% 11% 11% 11% 12% 39% 0% 69% N/A Contribution 8% 8% 39% 39% 39% 29% 11%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling Loaded Trucks	58 58 66 66 93 LvRef (RMS) 5 5 87 79 87 86	0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.089 0.089 0.089	23.8 45.6 45.6 45.6 45.6 34.6 83.9 91.4 Max VdB 84.6 Lv (VdB) 55.6 84.6 83.6 83.6 83.6 83.6	3 0.0000 0.001 0.0	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4 Max GBNZ 49.6 GBNZ (dBA) 20.6 49.6 49.6 49.6 49.6 49.6
12 13 14 15 16 17 Atternative No. Description No. 1 2 3 4 5 6	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction Fowered By S General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align y Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Amment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer 6 Dozer 6 Dozer 1 Dozer 1 Dozer 1 Dozer 1 Dozer 1 Dozer 1 Dozer 1 Crane Dozer 1 Crane Dozer Crane Concrete Mixer Truck Dump Truck Concrete Mixer Truck Dump Truck Compressor (air)	2 2 1 1 1 e EPBM's through r Amount 3 1	655 655 655 655 655 655 655 655 655 655	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 84 84 84 84 85 85 85 85 85	0 0 0 0 0 0 N/A street shaft to 7th/10 eighted Nois Shielding 0 0 0 0 0 0 0	66.2 77.7 74.7 79.7 80.7 80.7 99.1 92.0 N/A Maximum 89.4 48to. Musling through the object of the distribution of the distribut	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 h L turnel to M (A) Leq 85.5 85.5 81.5 81.4 79.5	0% 19% 19% 19% 19% 29% 39% 0% 69% N/A Contribution 8% 8% 8% 39% 39% 2% 19% 0%6		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling Loaded Trucks	58 58 66 66 93 LvRef (RMS) 58 87 79 87 86 86	0.003 0.003 0.003 0.003 0.008 0.142 PPV_Ref 3 0.003 0.008 0.008 0.003 0.003 0.003 0.003	23.8 45.6 45.6 45.6 34.6 68.9 91.4 Max VdB 84.6 Lv (VdB) 55.6 84.6 83.6 83.6	0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.008 0.00	0.0 10.6 10.6 10.6 0.0 33.9 56.4 Max GBNZ 49.6 GBNZ (dBA) 20.6 49.6 49.6 49.6 48.6 48.6
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By 5 General Construction General Construction General Construction General Construction General Construction General Construction General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align y Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck	2 2 1 1 1 e EPBM's through r Amount 3 1	655 655 655 655 655 655 655 655 655 655	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 84 84 84 85 85 85 85 85 86 86 80	0 0 0 0 0 0 0 N/A street shaft to 7th/the 10 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	66.2 777.7 74.7 79.7 80.7 80.7 69.1 92.0 N/A Maximum 89.4 et velves (in delivery revous delivery revous delivery deliver	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 ht. turnel to M A) Leq 85.5 85.5 81.4 79.5 63.2	0% 11% 11% 11% 12% 39% 0% 69% N/A Contribution 8% 8% 39% 39% 39% 29% 11%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer	58 58 66 66 93 LvRef (RMS) 5 5 87 79 87 86	0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV Ref 3 0.003 0.008 0.009 0.009 0.009 0.009 0.009	23.8 45.6 45.6 45.6 45.6 34.6 83.9 91.4 Max VdB 84.6 Lv (VdB) 55.6 84.6 83.6 83.6 83.6 83.6	3 0.000 0.001 0.00	0.0 10.6 10.6 10.6 10.6 0.0 33.9 56.4 Max GBNZ 49.6 49.6 49.6 48.6 48.6 48.6 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBMSEM Low Alig EPBM bored turvels on deep align y Surface Equipment 2 Bulldozer Excavator Corane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck N/A Drill Rig Truck Enter to south of 5th street, remover FHWA Equiv Excavator Crane Drill Rig Truck Compressor (air) Pumps Pumps	2 2 1 1 1 e EPBM's through r Amount 3 1	655 656 656 656 656 656 656 656 656 656	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 83 84 84 84 84 86 85 85 85 85 85 86 87 76	0	66.2 77.7 79.7 79.7 80.7 60.1 92.0 N/A Maximum 89.4 bet-wels (in dE LmaxCalc 89.4 89.4 89.4 89.4 89.4 80.4 63.2 60.2	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 ht turnel to Mix A) Leq 85.5 81.5 81.5 81.5 81.5 63.2 60.2	0% 19% 19% 19% 29% 39% 09% 69% N/A Be Contribution 8% 8% 8% 39% 39% 19% 09% 09%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 66 66 66 93 LvRef (RMS) 5 5 8 87 79 87 86 86 86 58	0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.003 0.035 0.089 0.076 0.076	23.8 45.6 45.6 45.6 45.6 45.6 45.6 45.6 45.6	3 0.000 0 0.001 0 0.00	0.0 10.6 10.6 10.6 0.0 33.9 56.4 Max GBNZ (dBA) 20.6 49.6 41.6 49.6 48.6 48.6 0.0 0.0
12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8 9	Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered By General Construction	Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alls EPBM bored turnels on deep align y Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A Inment Alternative ment to south of 5th street, remov FHWA Equiv 6 Dozer Excavator Crane Drill Rig Truck Dump Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator	2 2 1 1 1 e EPBM's through r Amount 3 1	655 655 655 655 655 655 655 655 655 655	100% 100% 100% 100% 100% 100% 100% 100%	83 80 777 82 833 844 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 N/A street shaft to 7th/ 10 10 10 10 10 10 10 10 10 10 10 10 10	66.2 77.7 74.7 79.7 80.7 80.7 80.1 92.0 N/A Maximum 89.4 89.4 89.4 89.4 89.4 80.4 80.4 80.4 80.4 80.4 80.6 80.2 60.2	66.2 77.7 74.7 79.7 80.7 72.1 95.0 N/A Cumulative 90.5 ht.turnet to M A Leq 85.5 85.5 81.4 79.5 63.2 60.2 66.2	0% 19% 19% 19% 19% 29% 39% 0% 699% N/A E Contribution 89% 89% 39% 39% 19% 09% 09%		Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MiN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	58 58 66 66 93 LvRef (RMS) 5 58 87 79 86 86 86 88 58	0.003 0.003 0.003 0.003 0.008 0.008 0.142 PPV_Ref 3 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	23.8 45.6 45.6 45.6 45.6 45.6 45.6 45.6 45.6	0.000 0.001 0.000 0.00	0.0 10.8 10.6 10.6 10.6 0.0 33.9 66.4 Max GBNZ (dBA) 20.6 49.6 49.6 41.6 48.6 6.0 0.0 0.0

Table A.11: Constructi	ion Noise and Vibration Pre	edictions - R8																
	_			1														
Receiver No.	8	+		1							+					-	1	
Docarintion	R8	+		1		+					+							
Description Dist	Hynes Property tance (ft)			1							+		GB-NZ: Typical Soil					
General Construction	97												-35		TDH Conver	ted RMS to F	PP\/	
Grouting Plant 1	477												-35		1 Di l'Colivei	led KINIO IO F	T V	
Grouting Plant 2	117																	
Grouting Rigs 1	417																	
Grouting Rigs 2	97																	
Little Tokyo Muck Remo	ov N/A																	
			NC	DISE									_	VIE	RATION	1		
									Maximum	Cumulative	9					Max VdB	Max_PPV 0.012	Max GBNZ
Alternative No. Description	LPA/Baseline	h St. C&C from 4th St to 7th	. // / - /						79.2	80.6						69.3	0.012	34.3
Description	EPBIVI Bored tunnels to 4th	n St, C&C from 4th St to 7th	n/ivietro				Λ	aightad Nais	e Levels (in dE	ΙΔ)								
No.	Equipment Groupin	g Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef		LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
NO.	Equipment Groupin	g Surface Equipment	rnwa Equiv	Amount	Distance	osaye	7	Sillelaling	LiliaxCaic	Leq	Contribution		FTA Equiv	EVICEI (KWS)	PFV_Kei	LV (VUB)	FFV (ips)	GBNZ (GBA)
1	General Construction	Bulldozer	Dozer	1	97	40%	85	0	79.2	75.3	29%		Small Bulldozer	58	0.003	40.3	0.000	5.3
2	General Construction	Excavator	Excavator	1	97	40%	85		79.2	75.3	29%		Large Bulldozer	87	0.089	69.3		
3	General Construction	Crane	Crane	1	97	16%	85		79.2	71.3	12%		MIN (Sm. Dozer)	79	0.035	61.3		
4	General Construction	Drill Rig	Drill Rig Truck	1	97	20%	84	0	78.2	71.3	12%		Caisson drilling	87	0.089	69.3	0.012	34.3
5	General Construction	Concrete Truck	Concrete Mixer Truck	1	97	40%	79	0	73.2	69.3	7%		Loaded Trucks	86	0.076	68.3	0.010	
6	General Construction	Muck Removal	Dump Truck	3	97	40%	76	0	70.2	71.3	12%		Loaded Trucks	86	0.076	68.3	0.010	33.3
									Maximum	Cumulative	2					Max VdB	Max PPV	Max GBNZ
Alternative No.			hield/SEM Profile Altern						79.2	85.4						75.1	0.0	40.1
Description		EPBM bored tunnels on LPA align	ment to 4th street shaft, open face	shield tunnel excav	vation on 5th St sha	ft abandoning s					ro mucking through L t	unnel						
N.	Dames d D	Of Fl	FIDA(A F	A	Distance	Heres			e Levels (in de				ETA E	L. D((DMO)	DDV D-6	L () (-ID)	DDV (!)	ODNZ (-IDA)
No.	Powered B	Sy Surface Equipment	FHWA Equiv	Amount	Distance	Usage	Lmaxker	Shielding	LmaxCalc	Leq	Contribution		FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
1	General Construction	Bulldozer	D	3	97	40%								5	3			
2			Dozer	1			85 85	0	79.2	75.3 75.3	10%		Small Bulldozer	58 87	0.003	40.3	0.000	
2	General Construction	Excavator	Excavator	1 1	97	40%	85	0	79.2	75.3	10%		Large Bulldozer	87	0.089	69.3	0.012	34.3
	General Construction General Construction	Excavator Crane	Excavator Crane		97 97	40% 16%	85 85	0	79.2 79.2	75.3 71.3	10% 4%		Large Bulldozer MIN (Sm. Dozer)	87 79	0.089	69.3 61.3	0.012	34.3 26.3
3	General Construction General Construction General Construction	Excavator Crane Drill Rig	Excavator Crane Drill Rig Truck	1	97	40% 16% 20%	85	0 0	79.2 79.2 78.2	75.3 71.3 71.3	10% 4% 4%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling	87 79 87	0.089 0.035 0.089	69.3 61.3 69.3	0.012 0.005 0.012	34.3 26.3 34.3
3 4	General Construction General Construction General Construction General Construction	Excavator Crane	Excavator Crane Drill Rig Truck Concrete Mixer Truck	1 1	97 97 97	40% 16% 20%	85 85 84	0 0 0 0	79.2 79.2	75.3 71.3	10% 4%		Large Bulldozer MIN (Sm. Dozer)	87 79 87 86	0.089	69.3 61.3 69.3 68.3	0.012 0.005 0.012 0.010	34.3 26.3 34.3 33.3
3 4 5	General Construction General Construction General Construction	Excavator Crane Drill Rig Concrete Truck	Excavator Crane Drill Rig Truck	1 1	97 97 97 97	40% 16% 20% 40% 40%	85 85 84 79	0 0 0 0	79.2 79.2 78.2 73.2	75.3 71.3 71.3 69.3	10% 4% 4% 2%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks	87 79 87	0.089 0.035 0.089 0.076	69.3 61.3 69.3	0.012 0.005 0.012 0.010 0.010	34.3 26.3 34.3 33.3 33.3
3 4 5 6 7 8	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck	1 1 1	97 97 97 97 97 97 477	40% 16% 20% 40% 40% 100%	85 85 84 79 76 80	0 0 0 0 0	79.2 79.2 78.2 73.2 70.2 60.4 57.4	75.3 71.3 71.3 69.3 66.3 60.4 57.4	10% 4% 4% 2% 1% 0%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer	87 79 87 86 86 58 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003	69.3 61.3 69.3 68.3 68.3 19.6	0.012 0.005 0.012 0.010 0.010 0.000	34.3 26.3 34.3 33.3 33.3 0.0
3 4 5 6 7 8	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator	1 1 1 1 1 1 1	97 97 97 97 97 97 477 477	40% 16% 20% 40% 40% 100% 100%	85 85 84 79 76 80 77	0 0 0 0 0 0	79.2 79.2 78.2 73.2 70.2 60.4 57.4 62.4	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4	10% 4% 4% 2% 11% 0% 0%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 58 58 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003	69.3 61.3 69.3 68.3 68.3 19.6 19.6	0.012 0.005 0.012 0.010 0.010 0.010 0.000 0.000	34.3 26.3 34.3 33.3 33.3 0.0 0.0
3 4 5 6 7 8 9	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant	1 1 1 1 1 1	97 97 97 97 97 97 477 477 477	40% 16% 20% 40% 40% 100% 100% 100%	85 85 84 79 76 80 77 82	0 0 0 0 0 0 0 0	79.2 79.2 78.2 73.2 70.2 60.4 57.4 62.4 63.4	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4	10% 4% 4% 2% 11% 0% 0% 11%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 58 58 58 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003	69.3 61.3 69.3 68.3 68.3 19.6 19.6	0.012 0.005 0.012 0.010 0.010 0.010 0.000 0.000 0.000	34.3 26.3 34.3 33.3 0.0 0.0 0.0
3 4 5 6 7 8 9	General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air)	1 1 1 1 1 1 1	97 97 97 97 97 97 477 477 477 477	40% 16% 20% 40% 40% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83	0 0 0 0 0 0 0 0 0	79.2 79.2 78.2 73.2 70.2 60.4 57.4 62.4 63.4 72.6	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6	10% 4% 4% 2% 11% 0% 0% 11% 15%		Large Bulldozer MIN (Sm. Dozer) Calsson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 58 58 58 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003	69.3 61.3 69.3 68.3 68.3 19.6 19.6 19.6	0.012 0.005 0.012 0.010 0.010 0.000 0.000 0.000 0.000	34.3 26.3 34.3 33.3 33.3 0.0 0.0 0.0 0.0 2.9
3 4 5 6 7 8 9 10 11	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps	1 1 1 1 1 1 1	97 97 97 97 97 97 477 477 477 477 117	40% 16% 20% 40% 40% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80	0 0 0 0 0 0 0 0 0 0	79.2 79.2 78.2 73.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6	10% 4% 4% 2% 11% 0% 0% 11% 5% 3%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 58 58 58 58 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003	69.3 69.3 69.3 68.3 68.3 19.6 19.6 19.6 37.9	0.012 0.005 0.012 0.010 0.010 0.000 0.000 0.000 0.000 0.000	34.3 26.3 34.2 33.3 33.3 0.0 0.0 0.0 0.0 2.9
3 4 5 6 7 8 9 10 111 12	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Compressor (air)	1 1 1 1 1 1 1	97 97 97 97 97 97 477 477 477 117 117	40% 16% 20% 40% 40% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80 77	0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 78.2 73.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 74.6	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6	10% 4% 4% 2% 0% 0% 0 1% 15% 5 3% 8 8%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 58 58 58 58 58 58 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003	69.3 69.3 69.3 68.3 19.6 19.6 19.6 37.9 37.9	0.012 0.005 0.012 0.010 0.010 0.000 0.000 0.000 0.000 0.000 0.000	34.3 26.3 34.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9
3 4 5 6 7 8 9 10 11 12 13	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing plant 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 97 477 477 477 117 117 117	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80 77 82	0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 78.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6	10% 4% 4% 2% 11% 0% 1% 5% 3% 8%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 58 58 58 58 58 58 58 58 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003	69.3 69.3 68.3 19.6 19.6 19.6 37.9 37.9 37.9	0.012 0.005 0.012 0.010 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	34.3 26.3 34.3 33.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9
3 4 5 5 6 7 7 8 9 9 10 11 12 13 13 14 15 15	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 97 477 477 477 117 117 117 117	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80 77 82 83 80	0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 78.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6	10% 4% 4% 2% 11% 0% 0% 3% 11% 5% 3% 8%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 58 58 58 58 58 58 58 58 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	69.3 69.3 69.3 68.3 68.3 19.6 19.6 19.6 37.9 37.9 37.9	0.012 0.005 0.012 0.010 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	34.3 26.3 34.3 33.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0
3 4 5 6 7 8 9 10 11 12 13 14 15	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Compressor (air) Pumps Generator Compressor (air) Pumps Compressor (air) Pumps Drill Rig Truck Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 477 477 477 477 117 117 117 117 117	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80 77 82 83 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 78.2 78.2 70.2 60.4 62.4 63.4 72.6 69.6 74.6 75.6 65.6 78.2	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6 88.6 81.3	10% 4% 4% 2% 11% 0% 11% 5% 3% 8% 8111% 2% 38%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurny wall), in soil	87 79 87 86 86 86 58 58 58 58 58 58 58 58 58 66 66	0.089 0.035 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	69.3 69.3 68.3 68.3 19.6 19.6 19.6 37.9 37.9 37.9 29.3 48.3	0.012 0.005 0.012 0.010 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	34.3 26.3 34.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9 2.9 0.0
3 4 5 5 6 7 7 8 8 9 10 11 12 12 13 14 15	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 477 477 477 477 117 117 117 117 117	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80 77 82 83 80	0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6 65.6 78.2 N/A	75.3 71.3 71.3 69.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6 88.6 81.3 N/A	10% 4% 4% 2% 11% 0% 0% 3% 11% 5% 3% 8%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 58 58 58 58 58 58 58 58 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	69.3 69.3 69.3 68.3 68.3 19.6 19.6 19.6 37.9 37.9 37.9 29.3 48.3 75.1	0.012 0.012 0.010 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	33.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0 13.3 40.1
3 4 5 6 7 8 9 10 11 12 13 14 15 16	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 477 477 477 477 117 117 117 117 117	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80 77 82 83 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6 65.6 78.2 N/A	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6 88.6 81.3	10% 4% 4% 2% 11% 0% 11% 5% 3% 8% 8111% 2% 38%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurny wall), in soil	87 79 87 86 86 86 58 58 58 58 58 58 58 58 58 66 66	0.089 0.035 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	69.3 61.3 68.3 68.3 19.6 19.6 19.6 19.6 37.9 37.9 37.9 37.9 48.3 75.1	0.012 0.005 0.012 0.010 0.010 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	34.3 26.3 34.3 33.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0 13.3 40.1
3 4 5 6 7 8 9 10 11 12 13 14 15	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A griment Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 97 4777 4777 4777 117 117 117 417 97	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 84 79 76 80 777 82 83 80 777 82 83 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 73.2 70.2 60.4 63.4 63.4 72.6 69.6 75.6 65.6 75.6 65.6 78.2 N/A Maximum 79.2 detro. Mucking throug the root of the roo	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6 68.6 81.3 N/A	10% 4% 4% 2% 1% 0% 0% 1% 18% 18% 28% 18% 8% 8% 8% 11% 28% 38%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurny wall), in soil	87 79 87 86 86 86 58 58 58 58 58 58 58 58 58 66 66	0.089 0.035 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	69.3 69.3 69.3 68.3 68.3 19.6 19.6 19.6 37.9 37.9 37.9 29.3 48.3 75.1	0.012 0.012 0.010 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	34.3 26.3 34.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9 2.9 0.0 13.3 40.1
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 2 General Construction	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Tompressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 3 Diesel Generator 2 High-Pressure Pump 3 Diesel Generator 2 High-Pressure Pump 4 Diesel Generator 2 High-Pressure Pump 5 Diesel Generator 2 High-Pressure Pump 7 Diesel Generator 2 High-Pressure Pump 1 Diesel Generator 2 High-Pressure Pump 1 Diesel Generator 2 Diesel Generator 2 Diesel Generator 2 Diesel Generator 2 Diesel Generator 2 Diesel Generator 3 Die	Excavator Crane Orane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NIA grament Alternative ment to south of 5th street, remove	1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 1 1 1 1	97 97 97 97 97 477 477 477 477 117 117 117 117 99	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80 77 82 83 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 73.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 65.6 78.6 65.6 78.2 N/A Maximum 79.2 Hetto Mudaing throusy minus fin delayed in dela	75.3 71.3 71.3 69.3 66.3 60.4 62.4 63.4 72.6 69.6 74.6 68.6 81.3 N/A Cumulative 80.7	10% 4% 4% 2% 13% 0% 0% 1% 5% 4% 1% 2% 1% 5% 3% 8% N/A		Large Bulldozer MIN (Sm. Dozer) Caisson driling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hall Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil	87 79 87 86 86 86 58 58 58 58 58 58 58 66 66	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	69.3 61.3 69.3 68.3 68.3 68.3 19.6 19.6 19.6 37.9 37.9 29.3 75.1 Max VdB 72.3	0.012 0.012 0.005 0.012 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	34.3 26.3 34.3 33.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 0.0 13.3 40.1 Max GBNZ 37.3
3 4 4 5 5 6 7 7 8 8 9 10 11 12 13 13 14 15 16 17 7 17 17 17 17 17 17 17 17 17 17 17 1	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 2 General Construction	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Lompressor 2 High-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 TBM B - EPBM/SEM Low Alig	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A griment Alternative	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 97 4777 4777 4777 117 117 117 417 97	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80 77 82 83 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 73.2 70.2 60.4 63.4 63.4 72.6 69.6 75.6 65.6 75.6 65.6 78.2 N/A Maximum 79.2 detro. Mucking throug the root of the roo	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6 68.6 81.3 N/A	10% 4% 4% 2% 1% 0% 0% 1% 18% 18% 28% 18% 8% 8% 8% 11% 28% 38%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurny wall), in soil	87 79 87 86 86 86 58 58 58 58 58 58 58 58 58	0.089 0.035 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	69.3 61.3 68.3 68.3 19.6 19.6 19.6 19.6 37.9 37.9 37.9 37.9 48.3 75.1	0.012 0.012 0.005 0.012 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	34.3 34.3 33.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0 13.3 40.1
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep slign by Surface Equipment	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck N/A Jument Alternative ment to south of 5th street, remove FHWA Equiv	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 477 477 477 117 117 117 97 99 margrove portal, S Distance	40% 16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 85 84 79 76 80 777 82 83 80 777 82 83 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 78.2 70.2 60.4 67.4 62.4 63.4 72.6 69.6 74.6 75.6 65.6 74.6 75.0 Maximum 79.2 Maximum Ma	75.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6 68.6 81.3 N/A Cumulative 80.7 h L tunnel to M	10% 4% 4% 2% 11% 0% 0% 1% 18% 3% 3% 3% 8% 11% 2% 38% N/A		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil TBM	87 79 87 86 86 86 58 58 58 58 58 58 58 66 66 93	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003	69.3 61.3 69.3 68.3 19.6 68.3 19.6 19.6 19.6 19.6 37.9 29.3 37.9 29.3 75.1 Max VdB 72.3	0.012 0.005 0.012 0.005 0.012 0.010 0.000	34.3 26.3 33.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0 13.3 40.1 Max GBNZ 37.3
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 3 Grouting Plant 4 Grouting Plant 3 Grouting Plant 4 Grouting Plant 4 Grouting Plant 4 Grouting Plant 5 Grouting Plant 5 Grouting Plant 5 Grouting Plant 4 Grouting Plant 5 Grouting Plant 5 Grouting Plant 5 Grouting Plant 5 Grouting Plant 5 Grouting Plant 5 Grouting Plant 5 Grouting Plant 5 Grouting Plant 6 Grouting Plant 6 Grouting Plant 7 Grouting Plant 8 Grouting Pla	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Loop Pressure Pump 2 Diesel Generator 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck N/A FHWA Equiv 6 Dozer	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 4777 4777 4777 117 117 117 99 Distance 4 97	40% 16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 85 84 79 76 80 77 82 83 80 77 82 83 84 84 84 84 84 84 84 84 86 86 87 87 88 88 88 88 88 88 88 88 88 88 88	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 78.2 78.2 78.2 70.2 60.4 65.7 62.4 63.4 72.6 69.6 65.6 75.8 65.8 78.2 N/A Maximum 79.2 etce levels (ind elivery prove detection) provide technique provided LmaxCalc	75.3 71.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 74.6 75.6 68.6 81.3 N/A Cumulative 80.7 ht turnel to M A) Leq	10% 4% 4% 2% 1% 0% 1% 5% 3% 11% 2% 11% 5% 3% ANA 11% Contribution		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromilt (slurry wall), in soil Hydromilt (slurry wall), in soil TBM	87 79 87 86 86 58 58 58 58 58 58 58 66 66 66	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.008 0.	69.3 61.3 69.3 68.3 19.6 68.3 19.6 19.6 19.6 37.9 37.9 29.3 48.3 75.1 Max VdB 72.3 Lv (VdB)	0.012 0.005 0.012 0.010 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001	34.1 26.6 34.3 33.3 33.0 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0 13.3 40.0 Max GBNZ 37.3
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 3 Grouting Rigs 3 Grouting Rigs 3 Grouting Rigs 2 General Construction	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Excavator	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck N/A Drill Rig Truck N/A gument Alternative ment b south of 5th street, remove FHWA Equiv 6 Dozer Excavator	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 4777 4777 4777 117 117 117 97 99 Distance 4 97	40% 16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 85 85 84 47 99 76 68 800 77 77 82 83 80 77 77 82 84 84 84 84 84 84 84 84 84 84 84 84 84	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 75.6 75.6 75.6 75.7 78.2 NVA Maximum 79.2 LmaxCalc	75.3 71.3 71.3 71.3 69.3 69.3 60.4 57.4 63.4 72.6 63.4 72.6 69.6 74.6 74.6 81.3 N/A Cumulative 80.7 ht unred to M A) Leq 75.3	10% 4% 4% 2% 1% 0% 0% 1% 1% 1% 1% 2% 3% 8% 11% 2% 21% Contribution		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Small Bulldozer	87 79 87 86 86 86 58 58 58 58 58 58 66 66 93	0.089 0.035 0.089 0.076 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.008 0.142	69.3 61.3 69.3 68.3 19.6 68.3 19.6 19.6 19.6 19.6 19.6 19.6 19.6 19.6	0.012 0.005 0.012 0.010 0.010 0.000	34.3 26.5 34.3 33.3 0.0 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0 13.3 40.1 Max GBNZ 37.3 GBNZ (dBA)
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 3 Grouting Plant 3 Grouting Plant 4 Grouting Plant 5 Grouting Plant 5 Grouting Plant 6 Grouting Plant 6 Grouting Plant 7 Grouting Plant 8 Grouting Plant 9 Grouting Pla	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 3 Diesel Generator 2 High-Pressure Pump 3 Diesel Generator 2 High-Pressure Pump 3 Diesel Generator 3 Diesel Generat	Excavator Crane Orane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NIA NIA Mament Alternative ment to south of 5th steet, remove FHWA Equiv Dozer Excavator Crane	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 97 477 477 477 117 117 117 117 99 Distance 4 97	40% 16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 85 84 79 766 80 77 82 83 80 77 82 83 84 84 84 84 84 84 84 84 84 84 85 86 86 86 86 86 86 86 86 86 86 86 86 86	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 65.6 74.6 75.8 40.6 65.6 10.7 8.2 40.6 40.6 40.6 40.6 40.6 40.6 40.6 40.6	75.3 71.3 71.3 71.3 69.3 66.3 60.4 57.4 62.4 63.4 72.6 69.6 75.6 81.3 N/A Cumulative 80.7 ht turnet to M A) Leq 75.3 75.3 75.3	10% 4% 4% 2% 13% 0% 0% 15% 5% 8% 11% 2% 28% 11% 26% 11% 10% 10% 10%		Large Bulldozer MIN (Srn. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer	87 79 87 86 86 86 58 58 58 58 58 58 66 66 66 66 86 87 79	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.008 0.142	69.3 61.3 61.3 61.3 61.3 61.3 61.3 61.3 61.3	0.012 0.005 0.012 0.005 0.012 0.0101 0.000	34.3 26.3 33.3 33.3 0.6 0.0 0.0 0.0 2.9 2.8 2.8 0.0 13.3 40.1 Max GBNZ (dBA) 5.3 34.3 26.3
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 3 Grouting Plant 3 Grouting Plant 4 Grouting	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Leydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBMSEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Buildozer Excavator Crane Drill Rig	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck NIA Drill Rig Truck NIA grament Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer Excavator Crane	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 4777 4777 4777 117 117 117 117 97 99 Distance 4 97 97	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 85 85 85 85 85 85 85 85 85 85 85 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 75.6 65.6 75.8 65.6 78.2 N/A Maximum 79.2 telto. Mucking throug through the control of the	75.3 71.3 71.3 71.3 69.3 66.3 66.3 60.4 57.4 63.4 72.6 69.6 74.6 69.6 81.3 N/A Cumulative 80.7 ht turnel to M iA) Leq 75.3 75.3 71.3	10% 4% 4% 2% 1% 0% 0% 1% 1% 5% 3% 11% 2% 0.88% N/A 11% 20% 10% 4% 4% 4% 4% 4% 4%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Gulldozer	87 79 87 86 86 58 58 58 58 58 58 58 66 66 93	0.089 0.035 0.089 0.076 0.003 0.076 0.003	69.3 61.3 68.3 68.3 19.6 68.3 19.6 19.6 19.6 19.6 19.6 29.3 77.9 29.3 77.9 29.3 77.9 29.3 75.1 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10	0.012 0.005 0.012 0.005 0.012 0.010 0.001 0.012	34.1 26.5 34.4 33.3 33.3 0.0 0.0 0.0 0.0 0.0 2.9 2.9 2.9 2.1 0.0 40.7 Max GBNZ (dBA) 5.5 34.4 26.5
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 2 General Construction General Construction General Construction General Construction General Construction General Construction	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Diesel Generator 2 Diesel Generator 2 Bulldozer Excavator Crane Drill Rig Concrete Truck	Excavator Crane Orane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Drill Rig Truck N/A Imment Alternative ment to south of 5th street, remove FHWA Equiv 6 Dozer 6 Dozer Concrete Date 0 Drill Rig Truck Drill Rig Truck N/A Drill Rig Truck Drill Rig Truck Drill Rig Truck Drill Rig Truck Oncerte Mixer Truck Concrete Mixer Truck Concrete Mixer Truck Concrete Mixer Truck Concrete Mixer Truck	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 477 477 477 117 117 117 97 99 Distance 4 97 97 97	40% 16% 20% 40% 40% 40% 100% 100% 100% 100% 100%	85 85 84 79 766 80 77 82 83 80 77 82 83 84 84 84 84 84 84 84 85 85 85 85 86 86 86 86 86 86 86 86 86 86 86 86 86	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 78.2 70.2 60.4 67.4 63.4 72.6 69.6 74.6 65.6 75.6 65.6 78.2 N/A Maximum 79.2 delto. Mucking through the delto. Th	75.3 71.3 71.3 71.3 69.3 69.3 66.4 57.4 62.4 63.4 72.6 69.6 74.6 69.6 74.6 80.7 h.t burnet to M.A. Leq 75.3 71.3 71.3 69.3	10% 4% 4% 2% 11% 0% 0% 1% 1% 3% 3% 8% 3% 8% 111% 2% 107 107 4% 4% 4%		Large Bulldozer MIN (Srn. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks	87 79 87 86 86 86 58 58 58 58 58 58 66 66 93 LVRef (RMS) 58 87 79	0.089 0.035 0.089 0.076 0.076 0.076 0.003	69.3 61.3 69.3 68.3 19.6 68.3 19.6 19.6 19.6 19.6 19.6 19.6 19.6 19.6	0.012 0.005 0.012 0.005 0.012 0.010 0.000	34.3 26.3 33.3 33.3 0.0 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0 13.3 40.1 Max GBNZ (dBA) 5.3 34.4 26.3 34.3
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No.	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered B General Construction General Construction General Construction General Construction General Construction General Construction	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alife EPBM bored turnels on deep slign by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NIA ### Alternative #### Alternative ####################################	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 4777 4777 4777 117 117 117 117 97 99 Distance 4 97 97	40% 16% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10	85 85 85 85 85 84 84 84 84 84 84 84 84 84 84 84 84 85 85 85 85 85 85 85 85 85 85 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 75.6 65.6 75.8 65.6 78.2 N/A Maximum 79.2 telto. Mucking throug through the control of the	75.3 71.3 71.3 71.3 69.3 66.3 66.3 60.4 57.4 63.4 72.6 69.6 74.6 69.6 81.3 N/A Cumulative 80.7 ht turnel to M iA) Leq 75.3 75.3 71.3	10% 4% 4% 2% 1% 0% 1% 1% 0% 1% 1% 5% 3% 11% 2% 6 00h 10% 10% 4% 4% 4% 4% 2%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Gulldozer	87 79 87 86 86 58 58 58 58 58 58 58 66 66 93 LVRef (RMS) 5 8 87 79	0.089 0.035 0.089 0.076 0.003 0.076 0.003	69.3 61.3 68.3.3 68.3.3 19.6 19.6 19.6 19.6 19.6 19.6 29.3 77.9 29.3 77.9 29.3 75.1 Max VdB 72.3 Lv (VdB)	0.012 0.012 0.005 0.012 0.010 0.010 0.001 0.010	34.3 26.6 34.3 33.3 0.0 0.0 0.0 0.0 0.0 2.8 2.9 2.9 0.0 13.3 40.1 Max GBNZ 37.3 GBNZ (dBA) 5.3 34.3 33.3 33.3
3 4 4 5 5 6 7 7 8 8 9 10 10 11 12 13 13 14 15 16 17 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 3 Grouting Plant 3 Grouting Plant 4 Grouting Plant 5 Grouting Plant 5 Grouting Plant 6 Grouting Plant 6 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 3 Grouting Plant 3 Grouting Plant 3 Grouting Plant 4 Grouting Plant 5 Grouting Plant 5 Grouting Plant 6 Grouting Plant 8 Grouting Pla	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck N/A Drill Rig Truck N/A Generator FHWA Equiv 6 Dozer Excavator Crane 6 Dozer Crane Concrete Mixer Truck Dump Truck Concrete Mixer Truck Dump Truck Concrete Mixer Truck Dump Truck Concrete Mixer Truck Dump Truck Concrete Mixer Truck Dump Truck Concrete Mixer Truck Dump Truck Compressor (air)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 4777 4777 117 117 117 117 97 99 Distance 4 97 97 97 97 97 97 97	40% 16% 40% 40% 40% 40% 40% 40% 40% 40% 40% 40	85 85 85 85 85 85 85 85 85 85 85 85 85 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 78.2 70.2 60.4 57.4 63.4 72.6 69.6 65.6 75.6 75.6 75.6 76.2 NVA Maximum 79.2 detects Mucking through the control of the contr	75.3 71.3 71.3 69.3 66.3 60.4 57.4 63.4 72.6 69.6 74.6 68.6 81.3 N/A Cumulative 80.7 t. turnet to M A) Leq 75.3 71.3 71.3 71.3 69.3 65.3	10% 4% 4% 2% 1% 0% 1% 0% 1% 1% 1% 5% 3% 11% 2% 11% 2% 11% 24% 10% 4% 4% 4% 4% 2% 10%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer	87 79 87 86 86 86 58 58 58 58 58 58 66 66 66 93	0.089 0.035 0.089 0.076 0.076 0.003	69.3 61.3 69.3 68.3 19.6 68.3 19.6 19.6 19.6 19.6 19.6 19.6 19.6 19.6	0.012 0.005 0.012 0.005 0.012 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.010 0.012 0.012 0.012	34.3 26.3 33.3 0.0 0.0 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0 13.3 40.1 Max GBNZ 37.3 GBNZ (dBA) 5.3 44.3 34.3 34.3 35.3 34.3
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7	General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 2 General Construction Powered B General Construction General Construction General Construction General Construction General Construction General Construction	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alife EPBM bored turnels on deep slign by Surface Equipment 2 Buildozer Excavator Crane Drill Rig Concrete Truck Muck Removal	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck Drill Rig Truck NIA ### Alternative #### Alternative ####################################	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 4777 4777 4777 117 117 117 117 97 99 Distance 4 97 97 97	40% 16% 16% 10% 100% 100% 100% 100% 100%	85 85 85 85 85 84 84 84 84 84 84 84 84 84 84 84 84 85 85 85 85 85 85 85 85 85 85 85 85 85	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 75.6 65.6 75.6 75.8 78.2 N/A Maximum 79.2 Jetro. Mudding through the control of the co	76.3 71.3 71.3 69.3 66.3 60.4 62.4 63.4 72.6 69.6 74.6 68.6 75.6 68.6 74.6 81.3 N/A Cumulative 80.7 h L turnel to M A) Leq 75.3 75.3 71.3 69.3	10% 4% 4% 2% 1% 0% 1% 1% 0% 1% 1% 5% 3% 11% 2% 6 00h 10% 10% 4% 4% 4% 4% 2%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Lydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large August Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large August Small Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer	87 79 87 86 86 58 58 58 58 58 58 58 66 66 93 LVRef (RMS) 5 8 87 79	0.089 0.035 0.089 0.076 0.003	69.3 61.3 68.3.3 68.3.3 19.6 19.6 19.6 19.6 19.6 19.6 29.3 77.9 29.3 77.9 29.3 75.1 Max VdB 72.3 Lv (VdB)	0.012 0.005 0.012 0.005 0.012 0.010 0.000	34.3 26.5 34.3 33.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9 2.9 0.0 37.3 40.1 Max GBNZ 37.3 GBNZ (dBA) 5.3 34.3 34.3 36.0 0.0
3 4 4 5 6 7 7 8 8 9 100 111 12 13 13 14 15 16 17 7 17 17 17 17 17 17 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 3 Grouting Plant 3 Grouting Plant 4 Grouting Plant 5 General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 High-Pressure Pump 2 Tight Pressure Pump 3 Diesel Generator 2 High-Pressure Pump 4 Diesel Generator 2 High-Pressure Pump 5 Diesel Generator 2 High-Pressure Pump 1 B - EPBM/SEM Low Alig EPBM bored turnels on deep align ty Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1	Excavator Crane Orane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Compressor (air) Pumps Generator Compressor (air) Pumps Generator Drill Rig Truck N/A N/A Internative Word of 5th street, remove the second of 5th street, remov	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 477 477 477 477 477 477 477 117 117 11	40% 16% 16% 10% 100% 100% 100% 100% 100%	85 85 85 84 79 766 80 77 82 83 80 777 82 83 84 84 84 84 84 84 84 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 78.2 78.2 78.2 78.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 69.6 65.6 65.6 74.6 10.6 10.6 10.6 10.6 10.6 10.6 10.6 10	75.3 71.3 71.3 71.3 69.3 66.3 60.4 57.4 63.4 72.6 69.6 74.6 69.6 74.6 81.3 N/A Cumulative 80.7 h L unrel to M A) Leq 75.3 75.3 71.3 71.3 69.3 65.3 60.4	10% 4% 4% 2% 13% 0% 0% 1% 15% 3% 8% 11% 2% 38% N/A 100% 4% 4% 2% 10% 4% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10		Large Bulldozer MIN (Srn. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer Large Sulldozer Large Sulldozer Large Sulldozer Large Bulldozer Large Bulldozer Large Bulldozer Large Bulldozer Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 86 58 58 58 58 58 58 66 66 93 LVRef (RMS) 58 87 79 87 86 86 86 58	0.089 0.035 0.089 0.076 0.076 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.008	69.3 61.3 69.3 68.3 19.6 68.3 19.6 19.6 19.6 19.6 37.9 29.3 37.9 29.3 48.3 75.1 1 40.3 69.3 69.3 69.3 69.3 69.3 69.3 69.3 69	0.012 0.005 0.012 0.005 0.012 0.010 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.012 0.001 0.012 0.012 0.010	34.3 26.3 34.3 33.3 33.3 0.0 0.0 0.0 0.0 0.0 2.9 2.9 2.9 2.9 3.3 40.1 Max GBNZ 37.3 GBNZ (dBA) 5.3 34.3 34.3 33.3 33.3 0.0 0.0 0.0
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Alternative No. Description No. 1 2 3 4 5 6 7 8 9 9	General Construction General Construction General Construction General Construction General Construction General Construction General Construction General Construction Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 1 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Plant 2 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Rigs 1 Grouting Construction General Construction	Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 Mixing Plant 1 Compressor 2 High-Pressure Pump 2 Diesel Generator 2 Mixing Plant 2 Hydraulic Drill Rig 1 Hydraulic Drill Rig 1 Hydraulic Drill Rig 2 TBM B - EPBM/SEM Low Alig EPBM bored turnels on deep align by Surface Equipment 2 Bulldozer Excavator Crane Drill Rig Concrete Truck Muck Removal Compressor 1 High-Pressure Pump 1 Diesel Generator 1 High-Pressure Pump 1	Excavator Crane Drill Rig Truck Concrete Mixer Truck Dump Truck Compressor (air) Pumps Generator Compressor (air) Pumps Generator Concrete Batch Plant Compressor (air) Pumps Generator Concrete Batch Plant Drill Rig Truck N/A Drill Rig Truck N/A FHWA Equiv FHWA Equiv 6 Dozer Excavator Crane Excavator Crane Compressor (air) Pumps Compressor (air) Pumps Compressor (air) Pumps Compressor (air) Pumps Compressor (air) Pumps Compressor (air)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	97 97 97 97 97 4777 4777 117 117 117 117 117 97 99 90 Distance 4 97 97 97 97 97 97 97 97 97 97 97 97 97	40% 16% 20% 40% 40% 100% 100% 100% 100% 100% 100%	85 85 85 84 4 79 76 80 800 777 822 83 80 84 84 84 84 84 84 84 85 85 85 85 85 84 85 85 86 80 77 78 82 85 85 84 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 77 77 82 85 85 86 80 80 77 77 82 85 85 86 80 80 77 77 85 85 85 86 80 80 80 80 80 80 80 80 80 80 80 80 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	79.2 79.2 79.2 79.2 78.2 78.2 78.2 70.2 60.4 57.4 62.4 63.4 72.6 69.6 75.6 65.6 75.8 65.6 78.2 N/A Maximum 79.2 detro. Mucking through the country of the c	75.3 71.3 71.3 69.3 60.4 57.4 62.4 63.4 72.6 69.6 75.6 69.6 75.6 81.3 N/A Cumulative 80.7 ht tunnel to MiA) Leq 75.3 71.3 71.3 69.3 69.3 69.3 60.4 57.4 60.4	10% 4% 4% 2% 1% 0% 1% 1% 1% 1% 1% 5% 3% 11% 2% 11% 2% 0% 11% 10% 4% 4% 4% 4% 4% 2% 10% 0% 0%		Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Hydromill (slurry wall), in soil TBM FTA Equiv Small Bulldozer Large Bulldozer Large Bulldozer MIN (Sm. Dozer) Caisson drilling Loaded Trucks Loaded Trucks Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer Small Bulldozer	87 79 87 86 86 86 58 58 58 58 58 66 66 93 LVRef (RMS) 5 8 87 79 87 86 86 88 58	0.089 0.035 0.076 0.003	69.3 61.3 68.3 68.3 19.6 68.3 19.6 19.6 19.6 19.6 19.6 19.6 19.6 19.6	0.012 0.005 0.010 0.005 0.010 0.000	34.3 26.3 34.3 33.3 33.3 0.0 0.0 0.0 0.0 2.9 2.9 2.9 0.0 13.3 40.1 Max GBNZ 37.3 GBNZ (dBA) 5.3 34.3 26.3 34.3 33.3 33.3 0.0 0.0 0.0

Table A 12: Construction	on Noise and Vibration Pred	ictions - DO		1	1	1					1	ı —	1	ı	1	1	1	1	
Table A.12. Collstructio	I Noise and Vibration Fred	ictions - Ka	-		-					-	-	-	-	1	-	-	-	-	
Receiver No.	0		ł	 	ł					-	-		 	1	-	1	-	-	
Receiver No.	R9												 	-		ļ	-		
ID December 1													 			ļ	-		-
	Savoy Apartments (Little To	kyo)														ļ	ļ		
	ance (ft)													GB-NZ: Typical Soil					
General Construction	N/A													-35		TDH Conver	ted RMS to F	PV	4
Grouting Plant 1	N/A																		
Grouting Plant 2	N/A																		
Grouting Rigs 1	N/A																		
Grouting Rigs 2	N/A																		
Little Tokyo Muck Remov	130																		
					ĺ														
	•		NC	NCE						•					VIE	DATION			
			NC	DISE										1	VIE	BRATION	N		
													i e						
					İ				Maximum	Cumulative				İ		i e	Max VdB	Max PPV	Max GBNZ
Alternative No.	LPA/Baseline								67.7	82.8				i		i e	64.5	0.006	29.5
	EPBM Bored tunnels to 4th	St. C&C from 4th St to 7th	h/Metro										1						
		.,		1			Δ-ν	eighted Noise	e Levels (in di	BA)			t	FTA Equiv	LvRef (RMS)	PPV Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
No.	Equipment Grouping	Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef	Shielding	LmaxCalc	Lea	Contribution		t		5	3	()	(.p.)	02112 (0211)
	Equipment Grouping	2	6	3	A	8	7	omoramy	Linuxouio	204	CONTRIBUTION					- ŭ			
6	Little Tokyo Muck Removal		Dump Truck	1	130	40	76	0	67.7	82.8	99%		 	Loaded Trucks	86	0.076	64.5	0.006	29.5
- 0	Little Tokyo Wuck Kemovai	IVIUCK IXEIIIOVAI	Dullip Truck		130	40	70	- 0	07.7	02.0	3370		 	Loaded Tideks	- 00	0.070	04.0	0.000	25.5
	+		ł	+	ł				Maximum	Cumulative	-		 	1	+	1	Max VdB	Max PPV	Max GBNZ
Alternative No.		4 FDDM/O F 0	hield/SEM Profile Altern	-41					67.7	88.5			 	-		ļ	64.5		29.5
					L								 	-		ļ	64.5	0.006	29.5
Description		EPBM bored tunnels on LPA aligi	nment to 4th street shaft, open fac-	e shield tunnel exc	avation on 5th St s	shaft abandoni					Metro mucking throug	gh L tunnel	 		((5110)	DD1/ D /		DD14 (1)	00117 (10.4)
									e Levels (in d				<u> </u>	FTA Equiv	LvRef (RMS)	PPV_Ref	rv (AgR)	PPV (ips)	GBNZ (dBA)
No.	Powered By	Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef	Shielding	LmaxCalc	Leq	Contribution		ļ		5	3			
	5	2	6	3	4	8	7												
6	Little Tokyo Muck Removal	Muck Removal	Dump Truck	3	130	40	76	0	67.7	88.5	100%			Loaded Trucks	86	0.076	64.5	0.006	29.5
									Maximum	Cumulative				<u> </u>			Max_VdB	Max_PPV	Max_GBNZ
Alternative No.		B - EPBM/SEM Low Ali	gnment Alternative						67.7	88.8				1			64.5	0.006	29.5
Description		EPBM bored tunnels on deep alig	nment to south of 5th street, remo	ve EPBM's through	mangrove portal,	SEM tunnel o	onstruction from 5	th street shaft to 7t	h/Metro. Mucking th	rough L tunnel to	Mangrove portal								
									e Levels (in di					FTA Equiv	LvRef (RMS)	PPV_Ref	Lv (VdB)	PPV (ips)	GBNZ (dBA)
No.	Powered Bv	Surface Equipment	FHWA Equiv	Amount	Distance	Usage	LmaxRef		LmaxCalc	Leq	Contribution				5	3	i ` '	``'	` ′
	5	2	6	3	4	8	7					i	t -	1	1	<u> </u>	i e		
6	Little Tokyo Muck Removal	Muck Removal	Dump Truck	3	130	40	76	0	67.7	88.8	99%		<u> </u>	Loaded Trucks	86	0.076	64.5	0.006	29.5
	Entro Tonyo Madek Itemovar	muon romovai	Danip Haak		100	40	70		57.7	55.0	3370			200000 110010		0.070	07.0	0.000	20.0

Table A.13: Construction Equipment 50-Foot Noise Emission Limits (FHWA Table 2)

Equipment Category	Lmax Level (dBA, slow)	Туре
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	95	Impact
In situ Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Section 01575 Construction Noise and Vibration Control (February 2009)

Table A.14: CA/T Noise Emission Reference Levels and Usage Factors

		Acoustical	Spec 721.560	Actual Measured	No. of Actual
	Impact	Use Factor	Lmax@50ft	Lmax@50ft	Data Samples
Equipment Description	Device?	(%)	(dBA, slow)	(dBA, slow)	(Count, samples averaged)
All Other Equipment >5 HP	No	50	85	N/A	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
BarBender	No	20	80	N/A	0
Blasting	Yes	N/A	94	N/A	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	N/A	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA,VMSsigns)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	N/A	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	N/A	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	40	55	75	1
Pneumatic Tools	No	50	85	85	90
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper (as hashbas)	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5 1
Slurry Transhing Machine	No	100	78	78	
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No No	50 40	80 84	N/A N/A	0
Tractor					
Vacuum Excavator (Vac-truck) Vacuum Street Sweeper	No No	40	85	85	149
Ventilation Fan		10	80	82	19
	No No	100	85 85	79	13
Vibrating Hopper	No No	50	85	87	1
Vibratory Concrete Mixer		20	80	80	1
Vibratory Pile Driver	No No	20 5	95 85	101	44 12
Walder/Torch		40	73	83 74	
Welder/Torch	No				5

Source: Roadway Construction Noise Model (RCNM 1.0), filename:EQUIPLST.xls (revised: 7/26/05)

Table A.15: Vibration Source Levels for Construction Equipment (FTA Table 12-2)

	PPV at 25 ft (ii	n/sec)	Approx. Lv at 25 ft (VdB		
Equipment	Upper Range	Typical	Upper Range	Typical	
Pile Driver (impact)	1.518	0.644	112	104	
Pile Driver (sonic)	0.734	0.170	105	93	
Clam shovel drop (slurry wall)		0.202		94	
Hydromill (slurry wall), in soil		0.008		66	
Hydromill (slurry wall), in rock		0.017		75	
Vibratory Roller		0.210		94	
Hoe Ram		0.089		87	
Large Bulldozer		0.089		87	
Caisson drilling		0.089		87	
Loaded trucks		0.076		86	
Jackhammer		0.035		79	
Small Bulldozer		0.003		58	
MIN (Sm. Dozer)		0.035		79	
Locomotive		0.126		90	

Note: TDH estimate from FTA FIG 10-1

Table A.16: FTA Construction Equipment Source Reference Levels - Noise

	Typical Noise Level (dBA) 50 ft from
Equipment	Source
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

NB: Table based on an EPA Report (4), measured data from railroad construction equipmenttaken Note: FTA Table 12-1. Construction Equipment Noise Emission Levels

Table A.17: Truck Activity

Alternative	Average Trucks Per	Percent of Excavated Materials Removed from each Location		Estimated Breakdown in Distribution of Average Daily Trucks		Max Hourly Trucks (total/10)	
	Day	Flower Street	Little Tokyo	Flower Street	Little Tokyo	Flower Street	Little Tokyo
Baseline/LPA	40	81%	19%	32	8	3	1
A: EPBM/Open-Face Shield/ SEM Profile Alternative	40	25%	75%	10	30	1	3
B: EPBM/SEM Low Alignment Alternative	40	20%	80%	8	32	1	3

Table A.18: Tunnel Depth Distance Adjustments

Alternative	Min	Max	Adjust_Tunnel_Hgt	Depth
LPA	40	40	20	20
A	40	40	20	20
В	95	105	20	75

	Lateral	LPA	А	В
Standard Hotel	555	555.4	555.4	560.0
City National Plaza	190	191.0	191.0	204.3
California Club	400	400.5	400.5	407.0
Los Angeles Public Library	300	300.7	300.7	309.2
Los Angeles Public Library Park	100	102.0	102.0	125.0
Citi Group Center	145	146.4	146.4	163.2
Westin Bonaventure Hotel	20	28.3	28.3	77.6
Hynes Property	97	99.0	99.0	122.6
Savoy Apartments (Little Tokyo)	N/A	N/A	N/A	N/A

Table A.18: Tunnel Depth Distance Adjustments

Alternative	Min	Max	Adjust_Tunnel_Hgt	Depth
LPA	40	40	20	20
A	40	40	20	20
В	95	105	20	75

	Lateral	LPA	А	В
Standard Hotel	555	555.4	555.4	560.0
City National Plaza	190	191.0	191.0	204.3
California Club	400	400.5	400.5	407.0
Los Angeles Public Library	300	300.7	300.7	309.2
Los Angeles Public Library Park	100	102.0	102.0	125.0
Citi Group Center	145	146.4	146.4	163.2
Westin Bonaventure Hotel	20	28.3	28.3	77.6
Hynes Property	97	99.0	99.0	122.6
Savoy Apartments (Little Tokyo)	N/A	N/A	N/A	N/A