

Table C1 **Coordinates of the Sampling Points**

Station	Coordinates	
B1	22°17'31.46"N	114°14'58.67"E
B2	22°17'34.43"N	114°15'01.40"E
B3	22°17'32.09"N	114°15'03.25"E
B4	22°17'34.46"N	114°14'45.67"E
B5	22°17'36.43"N	114°15'32.40"E
B6	22°17'37.09"N	114°15'12.25"E
B7	22°17'35.09"N	114°15'01.25"E

C2.2 *Sampling method*

To survey marine soft bottom benthic fauna, grab sampling of seabed sediment were carried out at a total of 7 sampling sites located along and in vicinity of the proposed CBL alignment. At each sampling sites, five replicates of grab samples over a 0.1 m² area seabed substrate were collected using a van Veen grab and sample were sieved through 0.5 mm sieves and stained with Rose Bengal. Collected organisms were counted, weighed and identified to the lowest practicable taxon as possible.

C2.3 *Data processing*

Abundance, biomass, species diversity H' and evenness J shall be calculated for pooled data, using the formulae:

$$H' = -\sum (N_i / N) \ln (N_i / N); \text{ and}$$

$$J = H' / \ln S$$

where S is the total number of species in the sample, N is the total number of individuals, and N_i is the number of individuals of the i^{th} species.

C3 RESULTS

C3.1 Results of benthic samples

The grab sampling was conducted in both wet and dry seasons in 2009. A total of 83 benthic organisms were recorded in the survey. 29 taxa were recorded, including 6 phyla/subphyla (Nemertea, Annelida, Arthropoda, Phoronida, Hemichordata, and Vertebrata) (**Table C2**). Detailed results of the benthic survey are presented in **Annex C1**. No species of conservation importance was found and none of the species are listed in the IUCN Red List (IUCN 2008).

Table C2. Summary of the benthos recorded in benthic survey

Phylum/Sub-phylum	Number of taxa	%	Number of individual	%	Total biomass	%
Nemertea	1	3.45%	1	1.20%	0.05	1.19%
Annelida	20	68.97%	62	74.70%	1.88	44.76%
Arthropoda	5	17.24%	16	19.28%	1.46	34.76%
Phoronida	1	3.45%	2	2.41%	0.01	0.24%
Hemichordata	1	3.45%	1	1.20%	0.29	6.90%
Vertebrata	1	3.45%	1	1.20%	0.51	12.14%
Total	29	100%	83	100%	4.2	100%

Out of the 29 taxa recorded, 27 taxa were identified to species or genus level. The most diverse phylum was Annelida (20 species, 68.97%) followed by Arthropoda (5 species, 17.24%). There was only one species/taxon from each of the other Phyla (3.45%).

Among the collected individual organisms, 74.7% and 19.28% were Annelida and Arthropoda, 2.41% were Phoronida, while other phyla/subphyla each constituted 1.2%. In terms of biomass, Annelida and Arthropoda were still the dominant groups, contributed 44.76% and 34.76% respectively, followed by Vertebrata (12.14%), Hemichordata (6.90%), Nemertea (1.19%) and Phoronida (0.24%).

Table C3. Summary results of the number and biomass from each taxon collected in survey

No.	Taxa	Individual no.	Biomass (g)
	NEMERTEA		
1	<i>Cerebratulus</i> sp.	1	0.05
	ANNELIDA		
	Polychaeta		
2	<i>Aglaophamus dibranchis</i>	3	0.05
3	<i>Aglaophamus lyrochaeta</i>	5	0.16
4	<i>Amaeana trilobata</i>	1	0.05
5	<i>Diopatra variabilis</i>	2	0.22
6	<i>Eunice indica</i>	7	0.18
7	<i>Glycera convoluta</i>	2	0.01
8	<i>Glycera rouxi</i>	2	0.02
9	<i>Glycinde</i> sp.	1	0.01
10	<i>Haploscoloplos kerguelensis</i>	1	0.01
11	<i>Loimia medusa</i>	1	0.18
12	<i>Lumbrineris latreilli</i>	3	0.03

13	<i>Lumbrineris nagae</i>	8	0.47
14	<i>Nephtys polybranchia</i>	1	0.02
15	<i>Notomastus latericeus</i>	1	0.01
16	<i>Ophelina grandis</i>	8	0.29
17	<i>Paraprionospio pinnata</i>	1	0.01
18	<i>Poecilochaetus serpens</i>	3	0.02
19	<i>Prionospio malmgreni</i>	3	0.03
20	<i>Sigambra hanaokai</i>	3	0.03
21	<i>Tharyx marioni</i>	6	0.08
	ARTHROPODA		
	Crustacea		
	Decapoda		
22	<i>Alpheus</i> sp.	5	0.12
23	<i>Callinassa</i> sp.	2	0.04
24	Hippolytidae	1	0.05
25	<i>Polyonyx</i> sp.	1	0.16
26	<i>Typhlocarcinus nudus</i>	7	1.09
	PHORONIDA		
27	<i>Phoronis australis</i>	2	0.01
	HEMICHORDATA		
	Enteropneusta		
28	<i>Balanoglossus</i> sp.	1	0.29
	VERTEBRATA		
	Osteichthyes		
29	Gobiidae	1	0.51
	Subtotal	83	4.2
	Species number	29	

In terms of species number recorded, the three sampling stations ranged from 13 to 17 species. The individual density varied between 23 to 35 individual/m², while the average biomass was between 2.10 to 3.28 g/m².

Table C4. Diversity index and Evenness index of the three benthic sampling sites

Sampling point	B1	B2	B3	B4	B5	B6	B7	Total
Species number	13	17	13	16	21	18	21	29
Individual number recorded	23	35	25	35	24	21	38	83
Individual density (no./m ²)	46	70	50	60	65	62	69	\
Biomass recorded (g)	1.64	1.05	1.51	1.61	1.38	1.74	2.10	4.2
Average biomass (g./m ²)	3.28	2.10	3.02	2.53	3.10	2.84	3.25	\
Species diversity H'	2.36	2.59	2.32	2.50	2.43	2.38	2.45	\
Species evenness J	0.92	0.91	0.90	0.90	0.91	0.90	0.92	\

The Shannon diversity index ranged from 2.32 to 2.59, while Pielou's Evenness index ranged from 0.90 to 0.92.

A diversity index integrates two components: the total number of species and the distribution of individuals among species, into a single number (H'). H' is usually high (e.g. >3 or 4) in environmentally undisturbed benthic communities, and low (e.g. <1) in highly disturbed communities. Values for richness, diversity, and evenness would be high, with H'>3 and J (evenness) >0.8 for a diverse community structure. In benthic habitats where organic matter is concentrated or dissolved oxygen is low, such values are low, with H'<2, and J<0.5. Results in above paragraphs show that the survey stations were is of moderate diversity, and high evenness. No species of conservation importance was recorded. The only known benthic macrofauna species of conservation interest in Hong Kong, the cephalochordate *Branchiostoma belcheri* was not found in the survey. This area is therefore not of special conservation importance in terms of benthic communities.

C4 DISCUSSIONS

Benthic surveys were conducted along and near the CBL alignment inside Junk Bay. A total of 83 benthic organisms from 29 taxa were recorded in the survey. No species of conservation importance was found during the survey and none of the species are listed in the IUCN Red List (IUCN 2008).

The construction of the proposed CBL might involve construction of bridge piers and thus cause loss of subtidal seabed habitats. As indicated by the results from benthic surveys however, the benthic infauna communities in the area are not of species ecological value due to no record of conservation important species. Although the diversity index was considered moderate while the evenness index was considered high, the loss of small area of seabed habitats would not constitute insurmountable impacts.

While direct loss of seabed habitat could not be mitigated, indirect impacts during the construction on the infauna in nearby seabed areas should be avoided by control the site runoff and associated water quality impacts. Silt curtains could be established during the filling process to contain the sediment plumes.

Photo Plate C1



Grab sampling



Sediment sample



Sample processing

Annex C1 Results of Benthic Survey

B1

Sample replicates	B1-A		B1-B		B1-C		B1-D		B1-E		Sampling Point B1	
	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass
NEMERTEA												
<i>Cerebratulus</i> sp.											0	0
ANNELIDA											0	0
Polychaeta											0	0
<i>Aglaophamus dibranthis</i>	1	0.01	2	0.04							3	0.05
<i>Aglaophamus lyrochaeta</i>	2	0.09					1	0.02			3	0.11
<i>Amaeana trilobata</i>											0	0
<i>Diopatra variabilis</i>											0	0
<i>Eunice indica</i>											0	0
<i>Glycera convoluta</i>											0	0
<i>Glycera rouxi</i>											0	0
<i>Glycinde</i> sp.											0	0
<i>Haploscoloplos kerguelensis</i>							1	0.01			1	0.01
<i>Loimia medusa</i>											0	0
<i>Lumbrineris latreilli</i>									1	0.01	1	0.01
<i>Lumbrineris nagae</i>	1	0.09					2	0.09			3	0.18
<i>Nephtys polybranchia</i>					1	0.02					1	0.02
<i>Notomastus latericeus</i>											0	0
<i>Ophelina grandis</i>											0	0

<i>Paraprionospio pinnata</i>									1	0.01	1	0.01
<i>Poecilochaetus serpens</i>											0	0
<i>Prionospio malmgreni</i>									1	0.01	1	0.01
<i>Sigambra hanaokai</i>							1	0.01			1	0.01
<i>Tharyx marioni</i>											0	0
ARTHROPODA											0	0
Crustacea											0	0
Decapoda											0	0
<i>Alpheus</i> sp.											0	0
<i>Callianassa</i> sp.									1	0.03	1	0.03
Hippolytidae	1	0.05									1	0.05
<i>Polyonyx</i> sp.											0	0
<i>Typhlocarcinus nudus</i>	1	0.17			1	0.46	2	0.17	1	0.06	5	0.86
PHORONIDA											0	0
<i>Phoronis australis</i>											0	0
HEMICHORDATA											0	0
Enteropneusta											0	0
<i>Balanoglossus</i> sp.							1	0.29			1	0.29
VERTEBRATA											0	0
Osteichthyes											0	0
Gobiidae											0	0
Subtotal	6	0.41	2	0.04	2	0.48	8	0.59	5	0.12	23	1.64
Species number	5		1		2		6		5		13	

B2

Sample replicates	B2-A		B2-B		B2-C		B2-D		B2-E		Sampling Point B2	
	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass
NEMERTEA												
<i>Cerebratulus</i> sp.	1	0.05									1	0.05
ANNELIDA											0	0
Polychaeta											0	0
<i>Aglaophamus dibranthis</i>											0	0
<i>Aglaophamus lyrochaeta</i>											0	0
<i>Amaeana trilobata</i>							1	0.05			1	0.05
<i>Diopatra variabilis</i>	1	0.08									1	0.08
<i>Eunice indica</i>					1	0.01	4	0.04			5	0.05
<i>Glycera convoluta</i>											0	0
<i>Glycera rouxi</i>			2	0.02							2	0.02
<i>Glycinde</i> sp.			1	0.01							1	0.01
<i>Haploscoloplos kerguelensis</i>											0	0
<i>Loimia medusa</i>											0	0
<i>Lumbrineris latreilli</i>			2	0.02							2	0.02
<i>Lumbrineris nagae</i>	3	0.13	1	0.11							4	0.24
<i>Nephtys polybranchia</i>											0	0
<i>Notomastus latericeus</i>							1	0.01			1	0.01
<i>Ophelina grandis</i>			1	0.03							1	0.03
<i>Paraprionospio pinnata</i>											0	0

<i>Poecilochaetus serpens</i>											0	0
<i>Prionospio malmgreni</i>											0	0
<i>Sigambra hanaokai</i>			1	0.01							1	0.01
<i>Tharyx marioni</i>	1	0.03	1	0.01	1	0.01	2	0.01			5	0.06
ARTHROPODA											0	0
Crustacea											0	0
Decapoda											0	0
<i>Alpheus</i> sp.			1	0.01			4	0.11			5	0.12
<i>Callinassa</i> sp.			1	0.01							1	0.01
Hippolytidae											0	0
<i>Polyonyx</i> sp.			1	0.16							1	0.16
<i>Typhlocarcinus nudus</i>							1	0.12			1	0.12
PHORONIDA											0	0
<i>Phoronis australis</i>	2	0.01									2	0.01
HEMICHORDATA											0	0
Enteropneusta											0	0
<i>Balanoglossus</i> sp.											0	0
VERTEBRATA											0	0
Osteichthyes											0	0
Gobiidae											0	0
Subtotal	8	0.3	12	0.39	2	0.02	13	0.34	0	0	35	1.05
Species number	5		10		2		6		0		17	

B3

Sample replicates	B3-A		B3-B		B3-C		B3-D		B3-E		Sampling Point B3	
	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass
NEMERTEA												
<i>Cerebratulus</i> sp.											0	0
ANNELIDA												
Polychaeta												
<i>Aglaophamus dibranthis</i>											0	0
<i>Aglaophamus lyrochaeta</i>			1	0.03					1	0.02	2	0.05
<i>Amaeana trilobata</i>											0	0
<i>Diopatra variabilis</i>							1	0.14			1	0.14
<i>Eunice indica</i>			1	0.12	1	0.01					2	0.13
<i>Glycera convoluta</i>							2	0.01			2	0.01
<i>Glycera rouxi</i>											0	0
<i>Glycinde</i> sp.											0	0
<i>Haploscoloplos kerguelensis</i>											0	0
<i>Loimia medusa</i>									1	0.18	1	0.18
<i>Lumbrineris latreilli</i>											0	0
<i>Lumbrineris nagae</i>			1	0.05							1	0.05
<i>Nephtys polybranchia</i>											0	0
<i>Notomastus latericeus</i>											0	0
<i>Ophelina grandis</i>			3	0.11	1	0.03	2	0.08	1	0.04	7	0.26
<i>Paraprionospio pinnata</i>											0	0

<i>Poecilochaetus serpens</i>					1	0.01			2	0.01	3	0.02
<i>Prionospio malmgreni</i>			1	0.01			1	0.01			2	0.02
<i>Sigambra hanaokai</i>			1	0.01							1	0.01
<i>Tharyx marioni</i>							1	0.02			1	0.02
ARTHROPODA												
Crustacea												
Decapoda												
<i>Alpheus</i> sp.											0	0
<i>Callinassa</i> sp.											0	0
Hippolytidae											0	0
<i>Polyonyx</i> sp.											0	0
<i>Typhlocarcinus nudus</i>									1	0.11	1	0.11
PHORONIDA												
<i>Phoronis australis</i>											0	0
HEMICHORDATA												
Enteropneusta												
<i>Balanoglossus</i> sp.											0	0
VERTEBRATA												
Osteichthyes											0	0
Gobiidae					1	0.51					1	0.51
Subtotal	0	0	8	0.33	4	0.56	7	0.26	6	0.36	25	1.51
Species number	0		6		4		5		5		13	

B4

Sample replicates	B1-A		B1-B		B1-C		B1-D		B1-E		Sampling Point B1	
	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass
NEMERTEA												
<i>Cerebratulus</i> sp.											0	0
ANNELIDA											0	0
Polychaeta											0	0
<i>Aglaophamus dibranthis</i>	1	0.01	2	0.04							3	0.05
<i>Aglaophamus lyrochaeta</i>	2	0.09					1	0.02			3	0.11
<i>Amaeana trilobata</i>											0	0
<i>Diopatra variabilis</i>											0	0
<i>Eunice indica</i>											0	0
<i>Glycera convoluta</i>											0	0
<i>Glycera rouxi</i>											0	0
<i>Glycinde</i> sp.											0	0
<i>Haploscoloplos kerguelensis</i>							1	0.01			1	0.01
<i>Loimia medusa</i>											0	0
<i>Lumbrineris latreilli</i>									1	0.01	1	0.01
<i>Lumbrineris nagae</i>	1	0.09					2	0.09			3	0.18
<i>Nephtys polybranchia</i>					1	0.02					1	0.02
<i>Notomastus latericeus</i>											0	0
<i>Ophelina grandis</i>											0	0
<i>Paraprionospio pinnata</i>									1	0.01	1	0.01

<i>Poecilochaetus serpens</i>											0	0
<i>Prionospio malmgreni</i>								1	0.01		1	0.01
<i>Sigambra hanaokai</i>						1	0.01				1	0.01
<i>Tharyx marioni</i>											0	0
ARTHROPODA											0	0
Crustacea											0	0
Decapoda											0	0
<i>Alpheus</i> sp.											0	0
<i>Callianassa</i> sp.								1	0.03		1	0.03
Hippolytidae	1	0.05									1	0.05
<i>Polyonyx</i> sp.											0	0
<i>Typhlocarcinus nudus</i>	1	0.17		1	0.46	2	0.17	1	0.06		5	0.86
PHORONIDA											0	0
<i>Phoronis australis</i>											0	0
HEMICHORDATA											0	0
Enteropneusta											0	0
<i>Balanoglossus</i> sp.						1	0.29				1	0.29
VERTEBRATA											0	0
Osteichthyes											0	0
Gobiidae											0	0
Subtotal	6	0.41	2	0.04	2	0.48	8	0.59	5	0.12	23	1.64
Species number	5		1		2		6		5		13	

B5

Sample replicates	B2-A		B2-B		B2-C		B2-D		B2-E		Sampling Point B2	
	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass
NEMERTEA												
<i>Cerebratulus</i> sp.	1	0.05									1	0.05
ANNELIDA											0	0
Polychaeta											0	0
<i>Aglaophamus dibranthis</i>											0	0
<i>Aglaophamus lyrochaeta</i>											0	0
<i>Amaeana trilobata</i>							1	0.05			1	0.05
<i>Diopatra variabilis</i>	1	0.08									1	0.08
<i>Eunice indica</i>					1	0.01	4	0.04			5	0.05
<i>Glycera convoluta</i>											0	0
<i>Glycera rouxi</i>			2	0.02							2	0.02
<i>Glycinde</i> sp.			1	0.01							1	0.01
<i>Haploscoloplos kerguelensis</i>											0	0
<i>Loimia medusa</i>											0	0
<i>Lumbrineris latreilli</i>			2	0.02							2	0.02
<i>Lumbrineris nagae</i>	3	0.13	1	0.11							4	0.24
<i>Nephtys polybranchia</i>											0	0
<i>Notomastus latericeus</i>							1	0.01			1	0.01
<i>Ophelina grandis</i>			1	0.03							1	0.03
<i>Paraprionospio pinnata</i>											0	0

<i>Poecilochaetus serpens</i>											0	0
<i>Prionospio malmgreni</i>											0	0
<i>Sigambra hanaokai</i>			1	0.01							1	0.01
<i>Tharyx marioni</i>	1	0.03	1	0.01	1	0.01	2	0.01			5	0.06
ARTHROPODA											0	0
Crustacea											0	0
Decapoda											0	0
<i>Alpheus</i> sp.			1	0.01			4	0.11			5	0.12
<i>Callinassa</i> sp.			1	0.01							1	0.01
Hippolytidae											0	0
<i>Polyonyx</i> sp.			1	0.16							1	0.16
<i>Typhlocarcinus nudus</i>							1	0.12			1	0.12
PHORONIDA											0	0
<i>Phoronis australis</i>	2	0.01									2	0.01
HEMICHORDATA											0	0
Enteropneusta											0	0
<i>Balanoglossus</i> sp.											0	0
VERTEBRATA											0	0
Osteichthyes											0	0
Gobiidae											0	0
Subtotal	8	0.3	12	0.39	2	0.02	13	0.34	0	0	35	1.05
Species number	5		10		2		6		0		17	

B6

Sample replicates	B3-A		B3-B		B3-C		B3-D		B3-E		Sampling Point B3	
	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass
NEMERTEA												
<i>Cerebratulus</i> sp.											0	0
ANNELIDA												
Polychaeta												
<i>Aglaophamus dibranthis</i>											0	0
<i>Aglaophamus lyrochaeta</i>			1	0.03					1	0.02	2	0.05
<i>Amaeana trilobata</i>											0	0
<i>Diopatra variabilis</i>							1	0.14			1	0.14
<i>Eunice indica</i>			1	0.12	1	0.01					2	0.13
<i>Glycera convoluta</i>							2	0.01			2	0.01
<i>Glycera rouxi</i>											0	0
<i>Glycinde</i> sp.											0	0
<i>Haploscoloplos kerguelensis</i>											0	0
<i>Loimia medusa</i>									1	0.18	1	0.18
<i>Lumbrineris latreilli</i>											0	0
<i>Lumbrineris nagae</i>			1	0.05							1	0.05
<i>Nephtys polybranchia</i>											0	0
<i>Notomastus latericeus</i>											0	0
<i>Ophelina grandis</i>			3	0.11	1	0.03	2	0.08	1	0.04	7	0.26
<i>Paraprionospio pinnata</i>											0	0

<i>Poecilochaetus serpens</i>					1	0.01			2	0.01	3	0.02
<i>Prionospio malmgreni</i>			1	0.01			1	0.01			2	0.02
<i>Sigambra hanaokai</i>			1	0.01							1	0.01
<i>Tharyx marioni</i>							1	0.02			1	0.02
ARTHROPODA												
Crustacea												
Decapoda												
<i>Alpheus</i> sp.											0	0
<i>Callinassa</i> sp.											0	0
Hippolytidae											0	0
<i>Polyonyx</i> sp.											0	0
<i>Typhlocarcinus nudus</i>									1	0.11	1	0.11
PHORONIDA												
<i>Phoronis australis</i>											0	0
HEMICHORDATA												
Enteropneusta												
<i>Balanoglossus</i> sp.											0	0
VERTEBRATA												
Osteichthyes											0	0
Gobiidae					1	0.51					1	0.51
Subtotal	0	0	8	0.33	4	0.56	7	0.26	6	0.36	25	1.51
Species number	0		6		4		5		5		13	

B7

Sample replicates	B3-A		B3-B		B3-C		B3-D		B3-E		Sampling Point B3	
	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass	Number	Biomass
NEMERTEA												
<i>Cerebratulus</i> sp.											0	0
ANNELIDA												
Polychaeta												
<i>Aglaophamus dibranthis</i>											0	0
<i>Aglaophamus lyrochaeta</i>			1	0.03					1	0.02	2	0.05
<i>Amaeana trilobata</i>											0	0
<i>Diopatra variabilis</i>							1	0.14			1	0.14
<i>Eunice indica</i>			1	0.12	1	0.01					2	0.13
<i>Glycera convoluta</i>							2	0.01			2	0.01
<i>Glycera rouxi</i>											0	0
<i>Glycinde</i> sp.											0	0
<i>Haploscoloplos kerguelensis</i>											0	0
<i>Loimia medusa</i>									1	0.18	1	0.18
<i>Lumbrineris latreilli</i>											0	0
<i>Lumbrineris nagae</i>			1	0.05							1	0.05
<i>Nephtys polybranchia</i>											0	0
<i>Notomastus latericeus</i>											0	0
<i>Ophelina grandis</i>			3	0.11	1	0.03	2	0.08	1	0.04	7	0.26
<i>Paraprionospio pinnata</i>											0	0

<i>Poecilochaetus serpens</i>					1	0.01			2	0.01	3	0.02
<i>Prionospio malmgreni</i>			1	0.01			1	0.01			2	0.02
<i>Sigambra hanaokai</i>			1	0.01							1	0.01
<i>Tharyx marioni</i>							1	0.02			1	0.02
ARTHROPODA												
Crustacea												
Decapoda												
<i>Alpheus</i> sp.											0	0
<i>Callinassa</i> sp.											0	0
Hippolytidae											0	0
<i>Polyonyx</i> sp.											0	0
<i>Typhlocarcinus nudus</i>									1	0.11	1	0.11
PHORONIDA												
<i>Phoronis australis</i>											0	0
HEMICHORDATA												
Enteropneusta												
<i>Balanoglossus</i> sp.											0	0
VERTEBRATA												
Osteichthyes											0	0
Gobiidae					1	0.51					1	0.51
Subtotal	0	0	8	0.33	4	0.56	7	0.26	6	0.36	25	1.51
Species number	0		6		4		5		5		13	