Appendix 7

Water Supply Appraisal

WSP (ASIA) LTD

Section 16 Planning Application for Proposed Minor Relaxation of Plot Ratio Restriction (20% of Nondomestic Plot Ratio Conversion to Domestic Plot Ratio. Total Plot Ratio Remains Unchanged) for Mixed Use Development at Planning Areas 28A and 28B, Hung Shui Kiu

Water Supply Appraisal

May 2025



Project Title: Section 16 Planning Application for Proposed Minor

Relaxation of Plot Ratio Restriction (20% of Non-domestic Plot Ratio Conversion to Domestic Plot Ratio. Total Plot Ratio Remains Unchanged) for Mixed Use Development at

Planning Areas 28A and 28B, Hung Shui Kiu

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Revision 1	Date: Description:	Dec 2024 First Issue	By: Check: Approved:	T C Choi Dave Chung Ben Yuen
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Appendix E - Phasing plan for Mixed Use Development at Planning Areas
28A and 28B of Hung Shui Kiu

1. INTRODUCTION

1.1 Project Background

1.1.1 WSP (Asia) Limited has been commissioned by the MTR Corporation Limited to conduct the Water Supply Appraisal (WSA) in support of Section 16 planning application for the Proposed Minor Relaxation of Plot Ratio Restriction (20% of non-domestic plot ratio conversion to domestic plot ratio. Total plot ratio remains unchanged.) for Mixed Use Development (hereafter refer to as the "Proposed Development") at Hung Shui Kiu at Planning Areas 28A and 28B (hereafter refer to as the "Subject Sites").

1.2 Purpose of this Report

- 1.2.1 This Water Supply Appraisal report aims to outline the planned water supply in the vicinity of the Subject Sites. The report also includes the estimation of the potable and flushing water daily consumptions, proposed water mains lead-in size of each Sites, as well as appraises the potential impact to the government water supply systems arising from the Proposed Development.
- 1.2.2 The development parameters shown in this appraisal are indicative only, which are subject to change during detailed design stage.
- 1.2.3 The details of proposed Fresh Water and Flushing Water mains lead-in location of respective sites are shown in Appendix D.

2. THE PROPOSED DEVELOPMENT

2.1 The Proposed Development

2.1.1 The Proposed Development (Areas 28A and 28B) under this planning application consists of residential units, and non-domestic uses including but not limited to Park-and-Ride facilities and public transport interchange (PTI). The assumed GFA breakdown of the Water Supply Appraisal for the Proposed Development in Planning Areas 28A and 28B is shown in Table 2.1.1 below.



Table 2.1.1 Assumed GFA Breakdown of the Water Supply Appraisal for the Proposed Development in Planning Areas 28A and 28B

	Residential	No. of	Person per	Population	Non-
	GFA (m²)	Flat	Occupied		Domestic
		Units*	Flat^		GFA (m²)
Area 28A	215,005	4,300		12,040	86,002
Area 28B	195,130	3,902	2.8	10,926	78,052
Total	410,135	8,202		22,966	164,054

^{*} An average flat size of 50m² is adopted.

WATER SUPPLY ASSESSMENT

- 3.1 Fresh Water Supply
- 3.1.1 Total fresh water and flushing water demands upon full completion of the Proposed Development are estimated to be about 5,932 m³/day and 1,802 m³/day respectively, based on criteria under Water Supplies Department (WSD)'s Departmental Instruction (DI) No.1309.
- 3.1.2 Existing WSD water supply mains record plans and new CEDD fresh water and flushing water supply mains drawings are shown in Appendix A and Appendix B respectively.

Area 28A

Area 28A comprises residential use, commercial use and a PTI. Fresh water and flushing water will be provided to Area 28A and the water consumption is 3,156m³/day and 940m³/day respectively. The breakdown of the water consumption is listed as below: -



[^] Based on the average domestic household size in Yuen Long District as reported in the 2021 Population Census by the Census and Statistics Department.

Type of Usage	GFA (m²)	Potable water daily consumption (m³/day)	Flushing water daily consumption (m³/day)
Residential	215,005	2,769	843
Commercial	71,002	313	68
PTI *	15,000	74	29
Daily Water Consumption of Area 28A (m³/day)		3,156	940

Remark:

* A PTI GFA of about 15,000m² in Area 28A is assumed, serving only as an assumption for the Water Supply Appraisal.

The detailed breakdown of the estimated potable water and flushing water demand are summarized in Appendix C.

Proposed water lead-in for Area 28A will be branch off from the new water mains at road L15 and road L12. The proposed water mains size for Area 28A will be in form of 1xDN40, 1xDN250 and 2xDN200 (for potable water) and 1xDN40, 1xDN150 and 2xDN100 (for flushing water) to suit future design development layout in Appendix D.

Tentative phasing layout of the Mixed Use Development at Planning Areas 28A and 28B of Hung Shui Kiu in Appendix E is attached for your reference.



Area 28B

Area 28B comprises residential and commercial uses. Fresh water and flushing water will be provided to Area 28B and the water consumption will be 2,776m³/day and 862m³/day respectively. The breakdown of the water consumption is listed as below: -

Type of Usage	GFA (m²)	Potable water daily consumption (m³/day)	Flushing water daily consumption (m³/day)
Residential	195,130	2,513	765
Commercial	78,052	263	97
Daily Water Consumption of Area 28B (m³/day)		2,776	862

The detailed breakdown of the estimated potable water and flushing water demand are summarized in Appendix C.

Proposed water lead-in for Area 28B will be branch off from the newly water mains at Road L12 and road L16. The proposed water mains size for Area 28B will be in form of 3xDN200 and 1xDN150 (for potable water) and 1xDN150, 2xDN100 and 1xDN80 (for flushing water) to suit future design development layout in Appendix D.

Summary of Water Consumption Estimation

	Area 28A	Area 28B
Estimated mean daily fresh water demand (m³)	3,156	2,776
Proposed dia. of fresh water lead-in connection	1x DN250mm 2x DN200mm 1x DN40mm	3x DN200mm 1x DN150mm
Estimated mean daily Flushing water demand (m³)	940	862
Proposed dia. of flushing water lead-in connection	1x DN150mm 2x DN100mm 1x DN40mm	1x DN150mm 2x DN100mm 1x DN80mm



4 CONCLUSION

The daily water consumption of the Proposed Development (Areas 28A and 28B), as well as the proposed fresh water and flushing water lead-in sizes and locations have been reviewed and discussed in Section 3 above.

Fresh Water Supply:

Based on the average domestic household size in Yuen Long District as reported in the 2021 Population Census by the Census and Statistics Department, overall fresh water and flushing water demand upon full completion of the Proposed Development (Areas 28A and 28B) is approximately 5,932 m³/day and 1,802 m³/day respectively; i.e. peak mean flow of potable water is 206 l/s and flushing water is 42 l/s.

For the potable water supply, as a completely new fresh water supply network will be provided by government department for the distribution to the proposed new Planning development Areas 28A and 28B at Hung Shui Kiu. In this connection, taking into consideration of the newly fresh water supply main around the Proposed Development:

ø900mm pipe at road L12 (approximated handling capacity 1900 l/s); Tee-off 3 nos. of branch:-

ø315mm pipe at road L16 (approximated handling capacity 110 l/s);

ø300mm pipe at road L12 opposite side (approximated handling capacity 100 l/s) and;

ø250mm pipe at road L15 (approximated handling capacity 70 l/s);

The total handling capacity of 3 nos. of branch surrounding Areas 28A and 28B will be about 280 l/s and considered larger than the estimated peak mean potable water demand flow of the Proposed Development, ~206 l/s, and hence considered technically feasible from a water supply impact perspective.



Flushing Water Supply:

For the flushing water supply, as a completely new sea water supply network will also be provided by government department for the distribution to the proposed new Planning development Areas 28A and 28B at Hung Shui Kiu. In this connection, taking into consideration of the newly saltwater supply main around the Proposed Development:

ø800mm pipe at junction of road L12 and road L15 (approximated handling capacity 1,000 l/s); Tee-off 2 nos. of branch:

ø180mm pipe at road L15 (approximated handling capacity 35 l/s) and;

ø450mm pipe at road L12 (approximated handling capacity 225 l/s) with sub-branch ø250mm pipe at road L16;

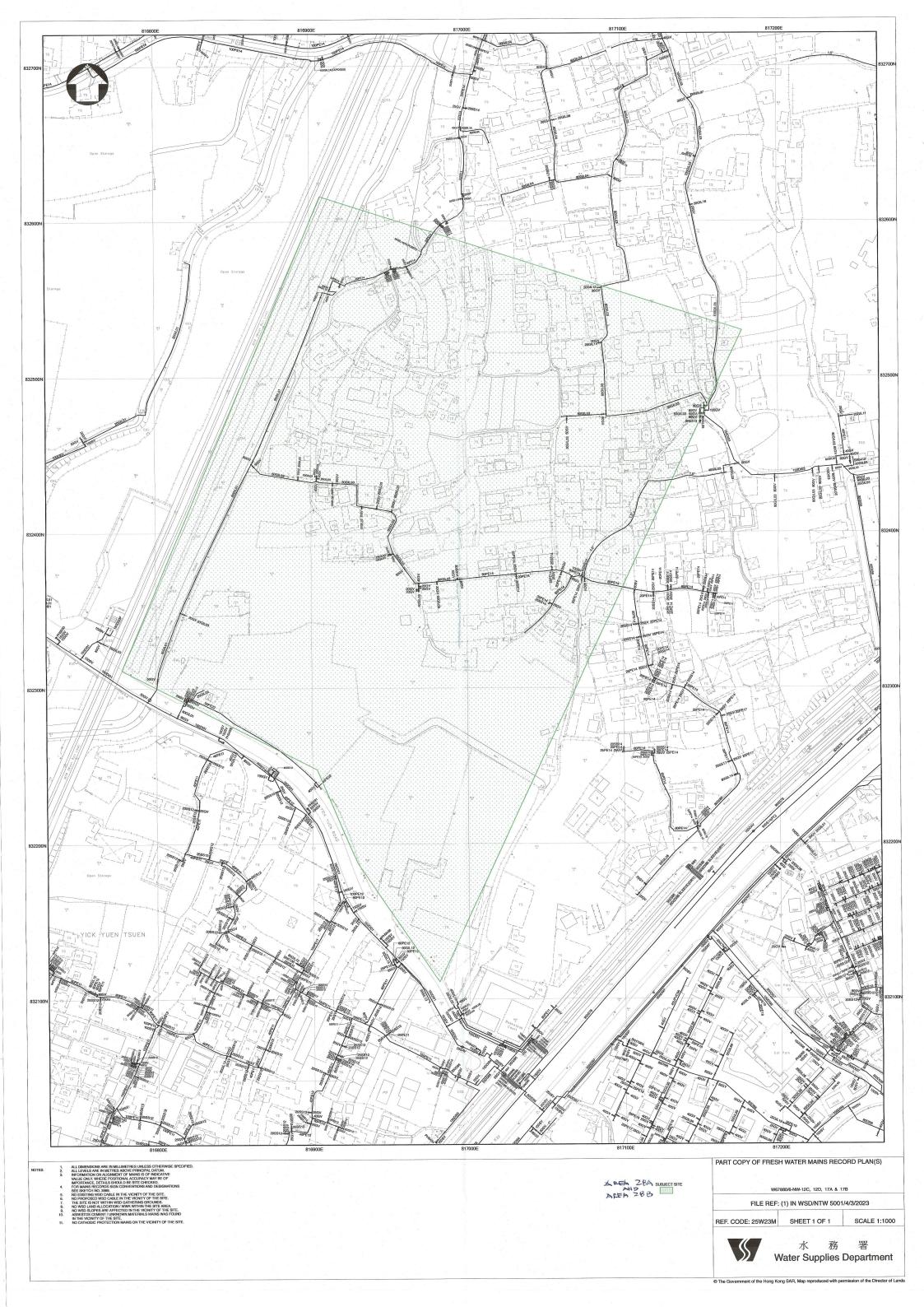
The total handling capacity of 2 nos. of branch surrounding Areas 28A and 28B will be about 260 l/s and considered larger than the estimated peak mean flushing water demand flow of the Proposed Development, \sim 42 l/s and hence considered technically feasible from a water supply impact perspective.

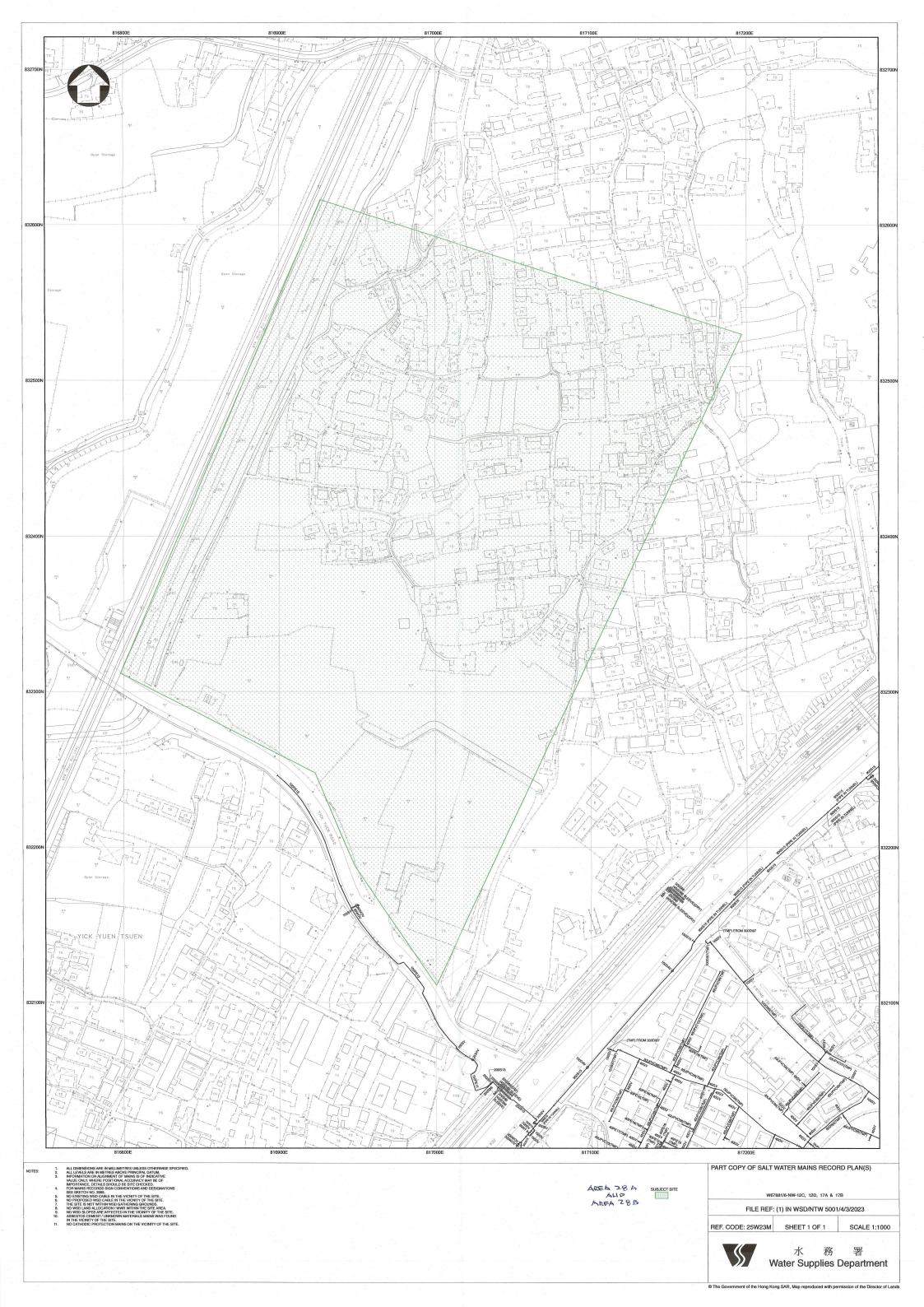
The above assessments are for preliminary planning and reference only. The lead-in arrangement will be subject to the requirements of the respective utility companies and government departments. Actual locations of interfacing points for utilities services will be subject to the detailed design and agreement with the utilities companies and government authorities. Application for water supply would be made to WSD in accordance with the Waterworks Ordinance and Regulations at the detailed design stage.



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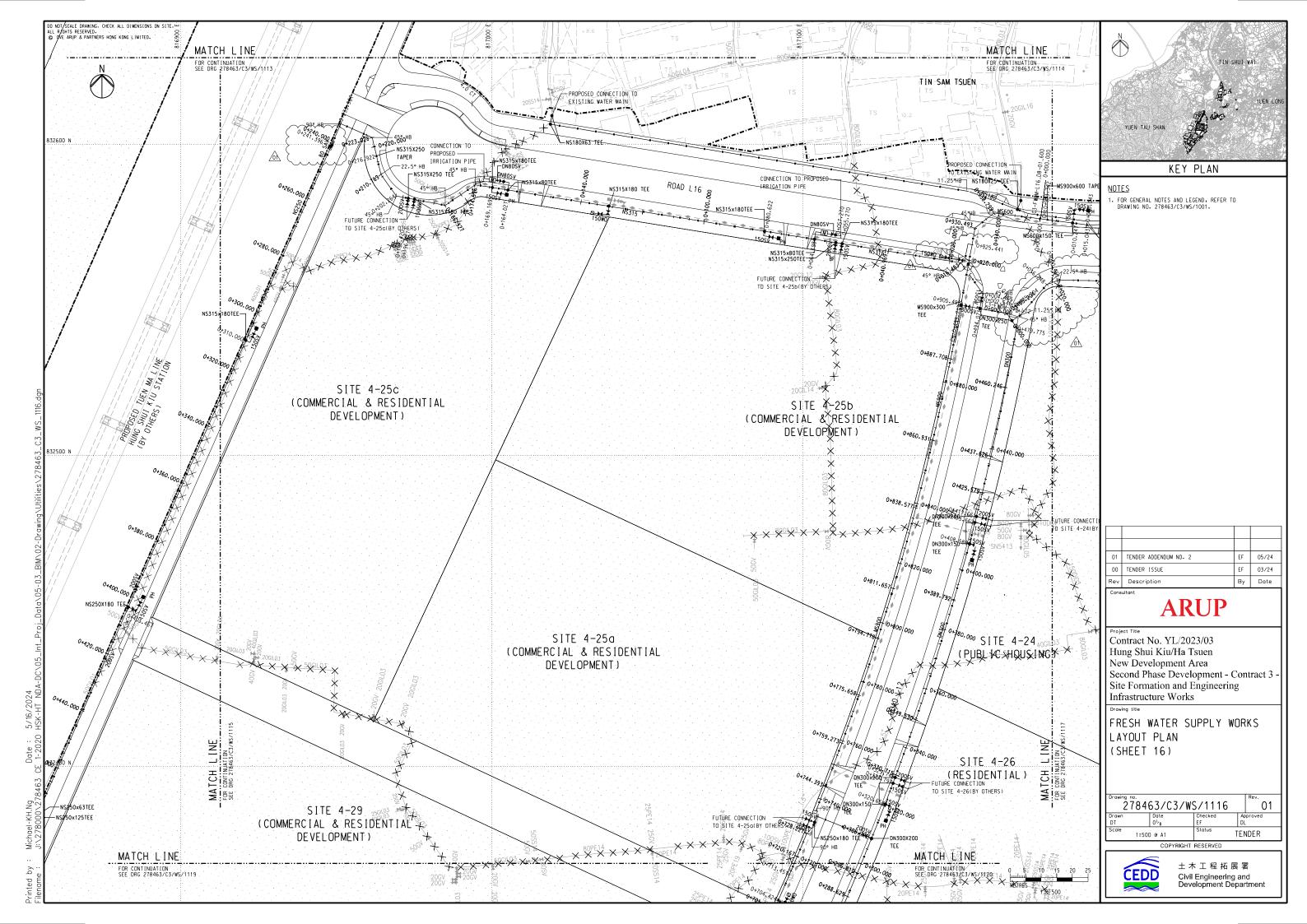
Appendix A - WSD Water Supply Mains Record Plans

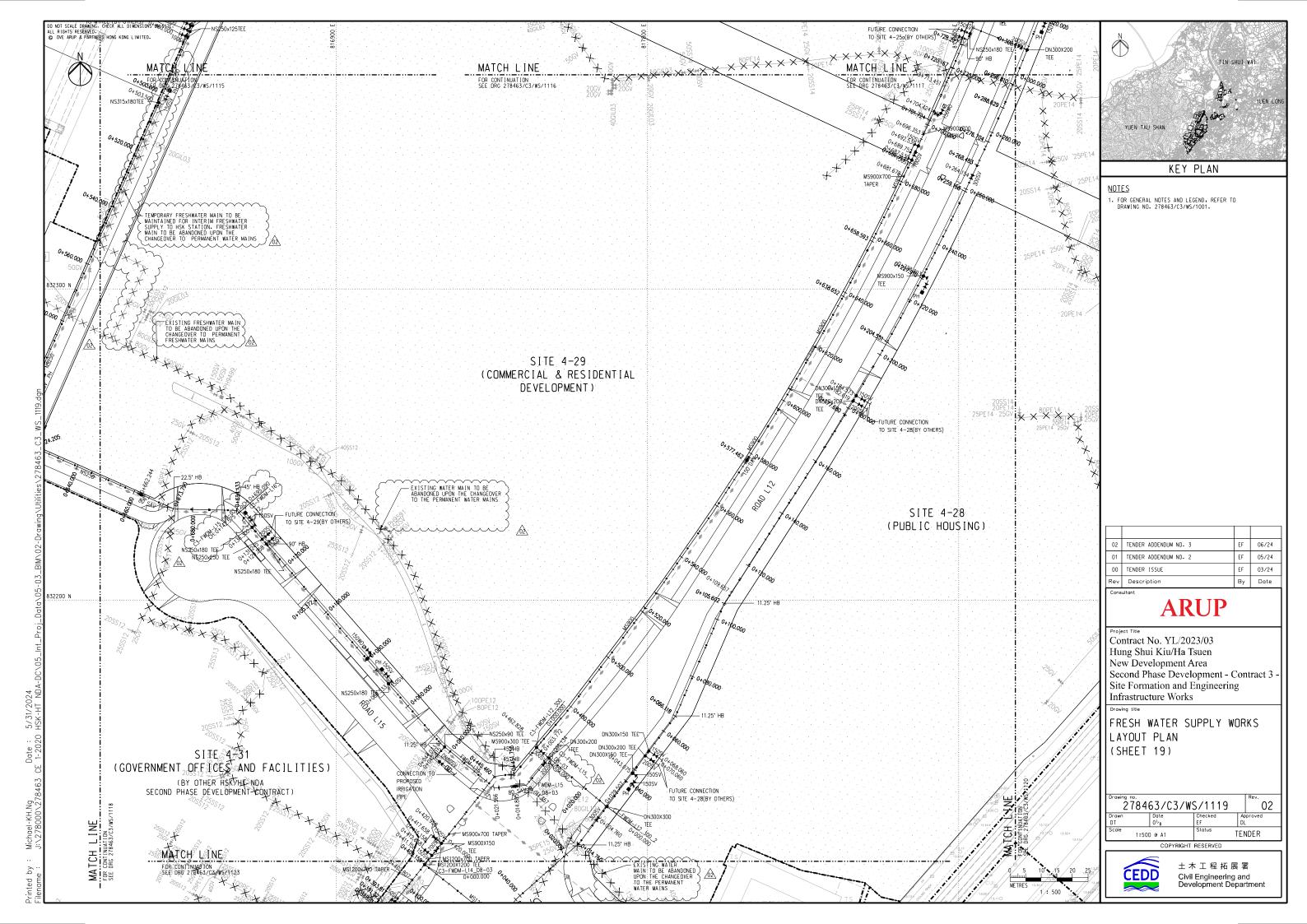


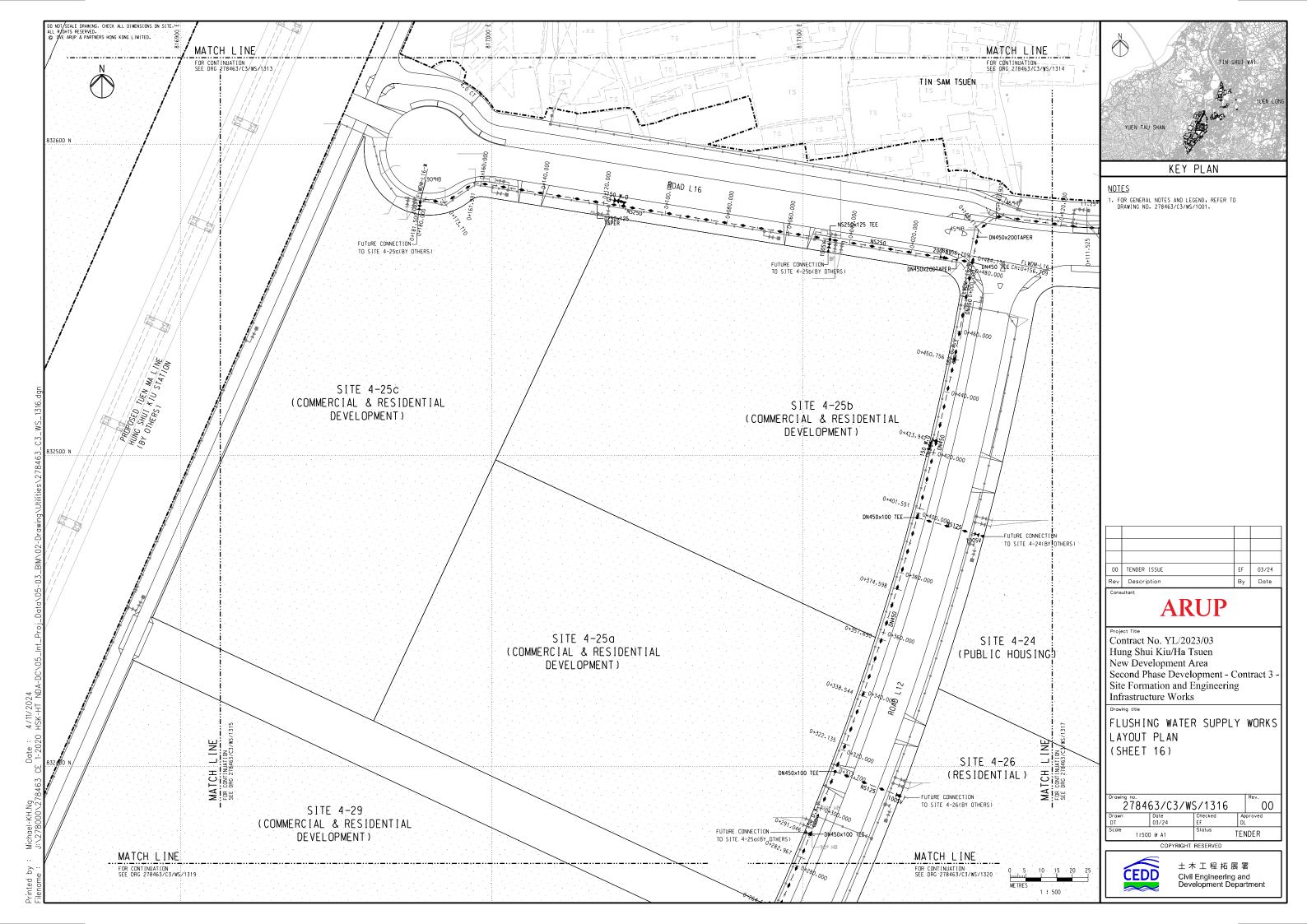


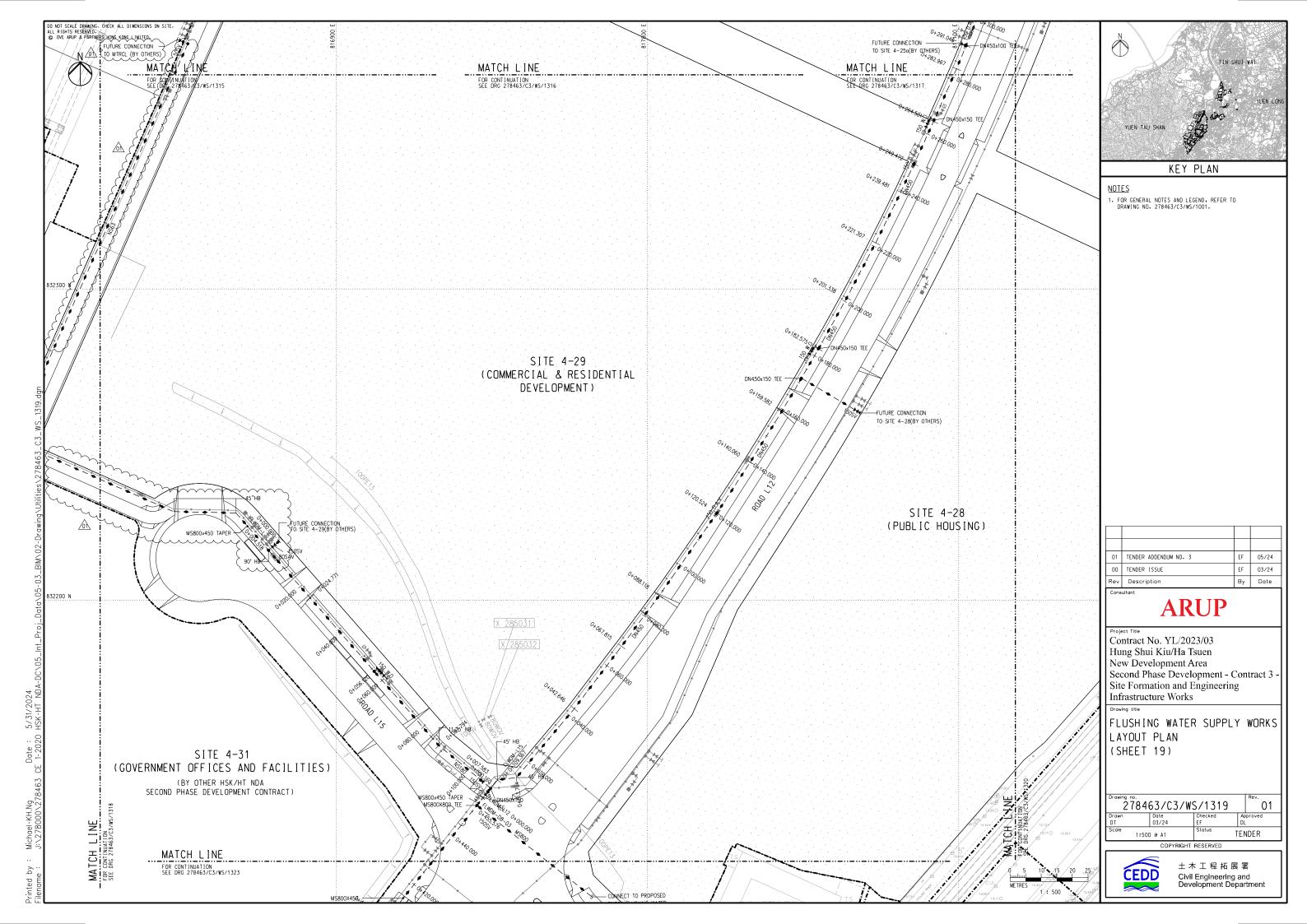


Appendix B - New CEDD Fresh & Flushing Water Supply Mains Layout Plans









Section 16 Planning Application for Proposed Minor Relaxation of Plot Ratio Restriction (20% of Non-domestic Plot Ratio Conversion to Domestic Plot Ratio. Total Plot Ratio Remains Unchanged) for Mixed Use Development at Planning Areas 28A and 28B, Hung Shui Kiu

Appendix C - Fresh Water & Flushing Water Consumption Estimation

Hung Shui Kiu Planning Area 28A & 28B

Fresh Water and Flushing Water Consumption in Estimation		1	
Print Date: 14 May 2025	Units	Area 28A	Area 28B
1) Residential			
No. of units	No.	4300	3902
Factor		2.8	2.8
Population of Area	Head	12040	10926
Refer to WSD D.I. no. 1309 - R1			
Mean daily fresh water demand per person	L / Head / Day	230	230
Mean daily fresh water demand for residential	L / Day	2769200	2512980
	m ³ / day	2769	2513
2) Commercial			
Retail Area	m ²	45702	34348
Refer to CIFSUS Table 8, 3.5 employee per 100m ² (Based on 85%			
efficiency)			
Total of employee for retails	employee	1360	1023
Proposed mean daily fresh water demand	L / Head / Day	230	230
Mean daily fresh water demand for retails	m ³ / day	312.8	235.3
Proposed mean daily flushing water demand	L / Head / Day	50	50
Mean daily flushing water demand for retails	m ³ / day	68	51.2
Office Area	m ²	0	16504
Refer to CIFSUS Table 8, 5.5 employee per 100m ²			
Total of employee for office	employee	0	908
Proposed mean daily fresh water demand	L / Head / Day	30	30
Mean daily fresh water demand for office	m ³ / day	0	27.2
Proposed mean daily flushing water demand	L / Head / Day	50	50
Mean daily flushing water demand for office	m ³ / day	0	45.4
Total mean daily fresh water demand for commercial	m ³ / day	312.8	262.5
Total mean daily flushing water demand for commercial	m ³ / day	68	97
, ,	,		
3) Transport Facilities	2	45000	N 1/A
Transport Facilities Area	m ²	15000	N/A
Refer to CIFSUS Table 8, 3.8 employee per 100m ²			21/2
Total of employee for Transport Facilities	employee	570	N/A
Proposed Mean daily fresh water demand	L / Head / Day	130	130
Mean daily fresh water demand for Transport Facilities	m ³ / day	74.1	N/A
Proposed mean daily Flushing water demand	L / Head / Day	50	50
Mean daily flushing water demand for Transport Facilities	m ³ / day	28.5	N/A
Woarr daily flaoring water definant for Transport Faointies	iii / day	20.0	14/7
4) Proposed fresh water Consumption			
Mean daily fresh water demand for residential	m ³ / day	2769	2513
Mean daily fresh water demand for commercial	m ³ / day	313	263
Mean daily fresh water demand for transport facilities	m ³ / day	74	N/A
Total mean daily fresh water demand	m ³ / day	3156	2776
	, day	100	2770
The peak mean daily fresh water demand			
= 3 x mean daily demand	m ³ / day	9468	8328
	l/s	110	96
5) Proposed flushing water Consumption			
Population of Area	Head	12040	10926
Refer to WSD D.I. no. 1309 - R1			
Mean daily flushing water demand per person for residential	L / Head / Day	70	70
Mean daily flushing water demand for residential	m ³ / day	843	765
Mean daily flushing water demand for commercial	m ³ / day	68	97
Mean daily flushing water demand for transport facilities	m ³ / day	29	N/A
Total mean daily flushing water demand	m ³ / day	940	862
The peak mean daily flushing water demand	2		
= 2 x mean daily demand	m ³ / day	1880	1724
	l/s	22	20

Hung Shui Kiu Planning Area 28A (Phase 4, 5 & 6)

Fresh Water and Flushing Water Consumption in Estimation

Print Date: 14 May 2025 1) Residential	Units	Phase 4	Phase 5	Phase 6
No. of units	No.	1148	1535	1617
Factor	140.	2.8	2.8	2.8
Population of Area 28A	Head	3214	4298	4528
Refer to WSD D.I. no. 1309 - R1				
Mean daily fresh water demand per person	L / Head / Day	230	230	230
Mean daily fresh water demand for residential	L / Day	739220	988540	1041440
	m ³ / day	739.2	989.0	1041.4
P) Commercial Retail Area on 28A	m ²	N/A	2000	43702
Refer to CIFSUS Table 8, 3.5 employee per 100m ² (Based on 85%	""	IN/A	2000	43702
efficiency)		N1/A	20	4000
Total of employee for retails	employee	N/A	60	1300
Proposed mean daily fresh water demand	L / Head / Day	230	230	230
Mean daily fresh water demand for retails	m ³ / day	N/A	13.8	299.0
Proposed mean daily flushing water demand	L / Head / Day	50	50	50
Mean daily flushing water demand for retails	m ³ / day	N/A	3	65
Office Area on 28A	m^2	N/A	0	0
Refer to CIFSUS Table 8, 5.5 employee per 100m ²				
Total of employee for office	employee	N/A	0	C
Proposed mean daily fresh water demand	L / Head / Day	30	30	30
Mean daily fresh water demand for office	m ³ / day	N/A	0	(
		50	50	=-
Proposed mean daily flushing water demand	L / Head / Day	50	50	50
Mean daily flushing water demand for office	m ³ / day	N/A	0	C
Total mean daily fresh water demand for commercial	m ³ / day	N/A	13.8	299.0
Total mean daily flushing water demand for commercial	m ³ / day	N/A	3.0	65.0
3) Transport Facilities				
Transport Facilities Area on 28A	m ²	0	15000	0
Refer to CIFSUS Table 8, 3.8 employee per 100m ²				
Total of employee for Transport Facilities	employee	0	570	C
Proposed Mean daily fresh water demand	L / Head / Day	130	130	130
Mean daily fresh water demand for Transport Facilities	m ³ / day	0.0	74	0.0
Proposed mean daily Flushing water demand	L / Head / Day	50	50	50
Mean daily flushing water demand for Transport Facilities	m³ / day	0	28.5	(
Proposed fresh water Consumption				
Mean daily fresh water demand for residential	m ³ / day	739.2	989.0	1041.4
Mean daily fresh water demand for commercial	m ³ / day	N/A	13.8	299.0
Mean daily fresh water demand for transport facilities	m ³ / day	0.0	74	0.0
Total mean daily fresh water demand	m ³ / day	739	1077	1340
The peak mean daily fresh water demand				
= 3 x mean daily demand	m ³ / day	2217	3231	4020
	l/s	25.7	37.4	46.5
Proposed fresh water lead-in diameter	mm	200	200	250
Water flow velocity	m/s	0.83	1.22	0.96
i) Proposed flushing water Consumption				
Population of Area on 28A	Head	3214	4298	4528
Refer to WSD D.I. no. 1309 - R1	ricad	3214	4230	4020
Mean daily flushing water demand per person for residential	L / Head / Day	70	70	70
Mean daily flushing water demand for residential	m ³ / day	225.0	301.0	317.0
Mean daily flushing water demand for commercial	m ³ / day	N/A	3.0	65.0
Mean daily flushing water demand for transport facilities	m ³ / day	0.0	29	0.0
Total mean daily flushing water demand	m ³ / day	225	333	382
The peak mean daily flushing water demand	,,			002
= 2 x mean daily demand	m ³ / day	450	666	764
-	l/s	5.2	7.7	8.8
Proposed flushing water lead-in diameter	mm	100	100	150
Water flow velocity	m/s	0.74	1.1	0.52

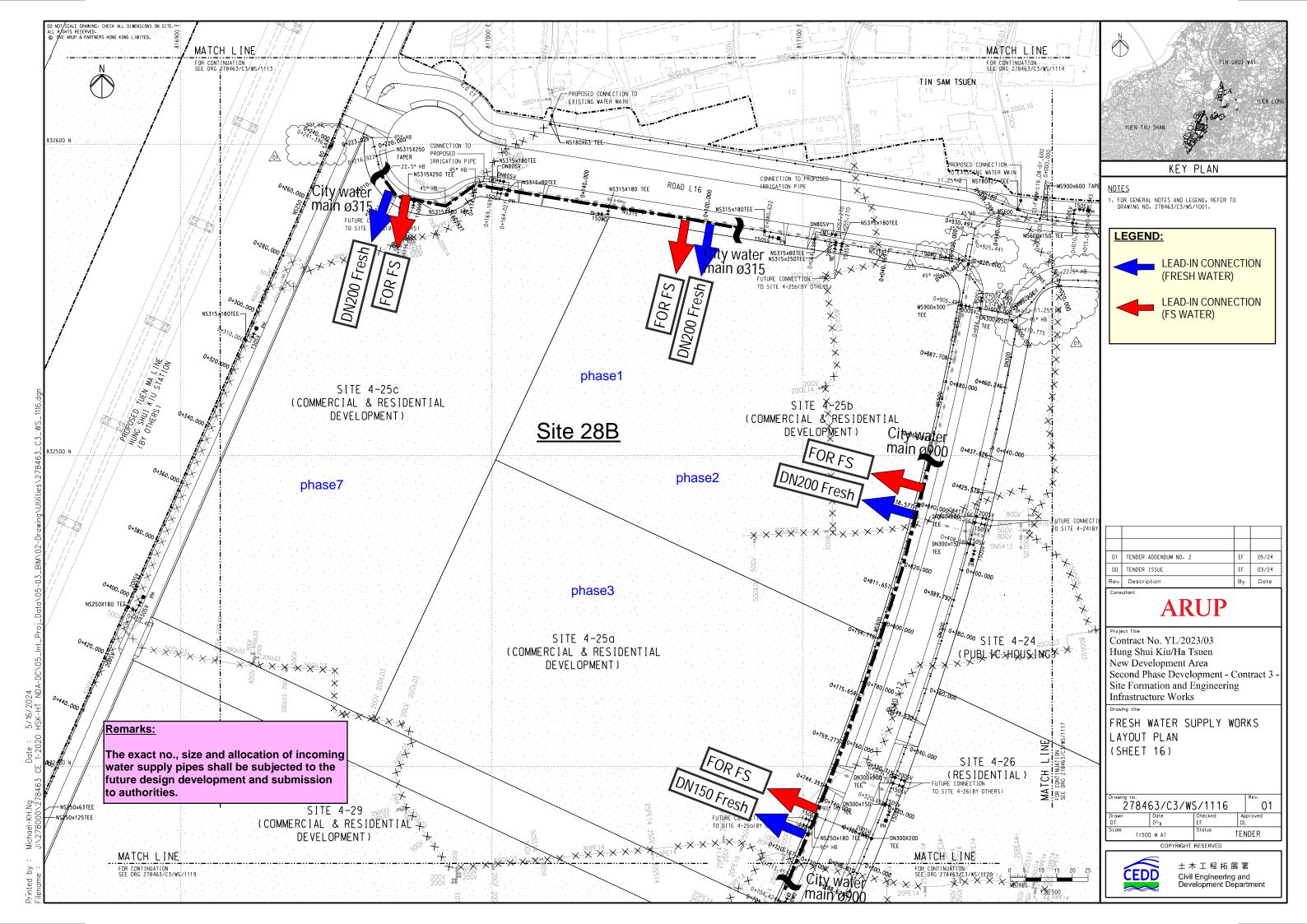
Hung Shui Kiu Planning Area 28B (Phase 1, 2, 3 & 7)

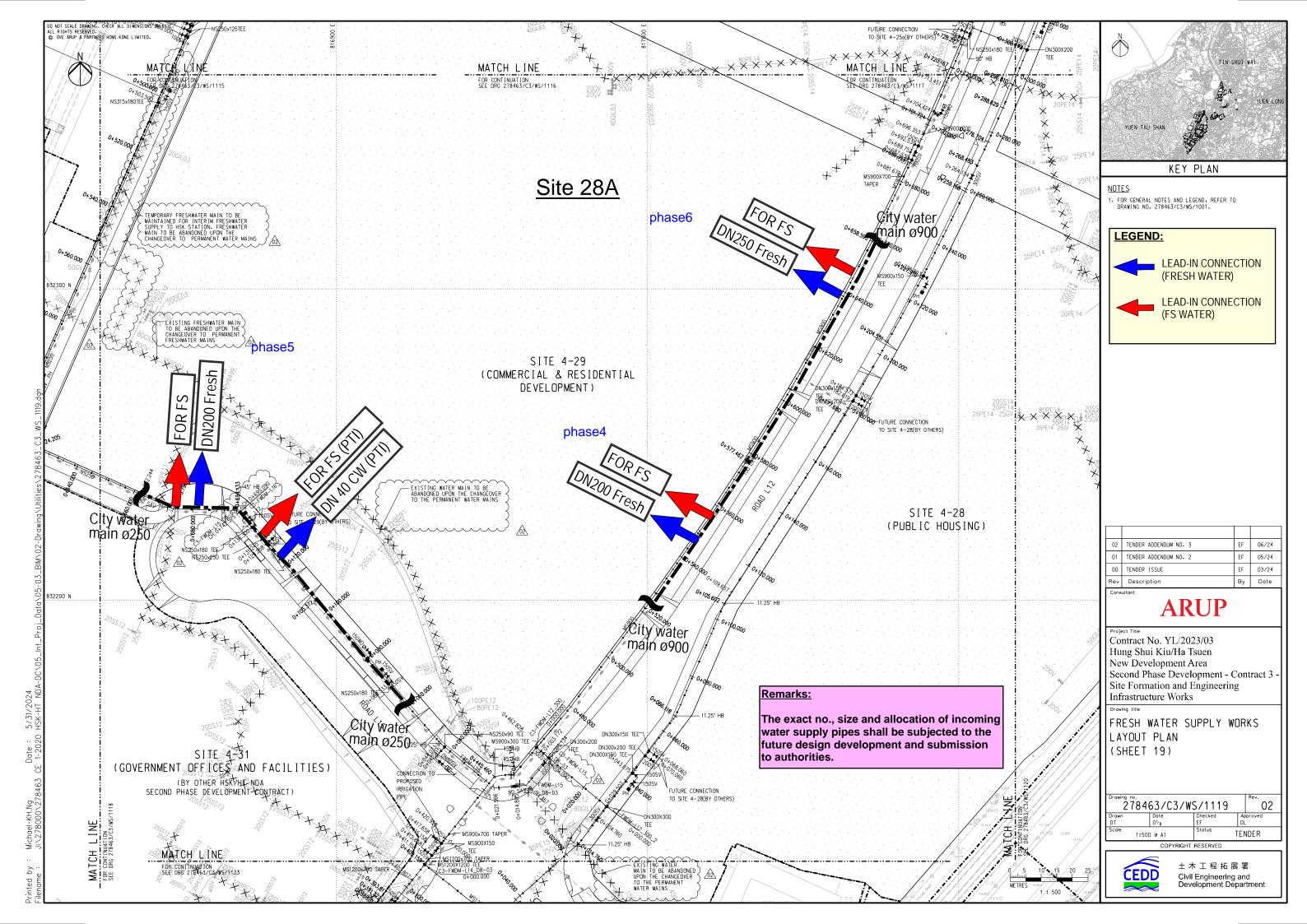
Fresh Water and Flushing Water Consumption in Estimation

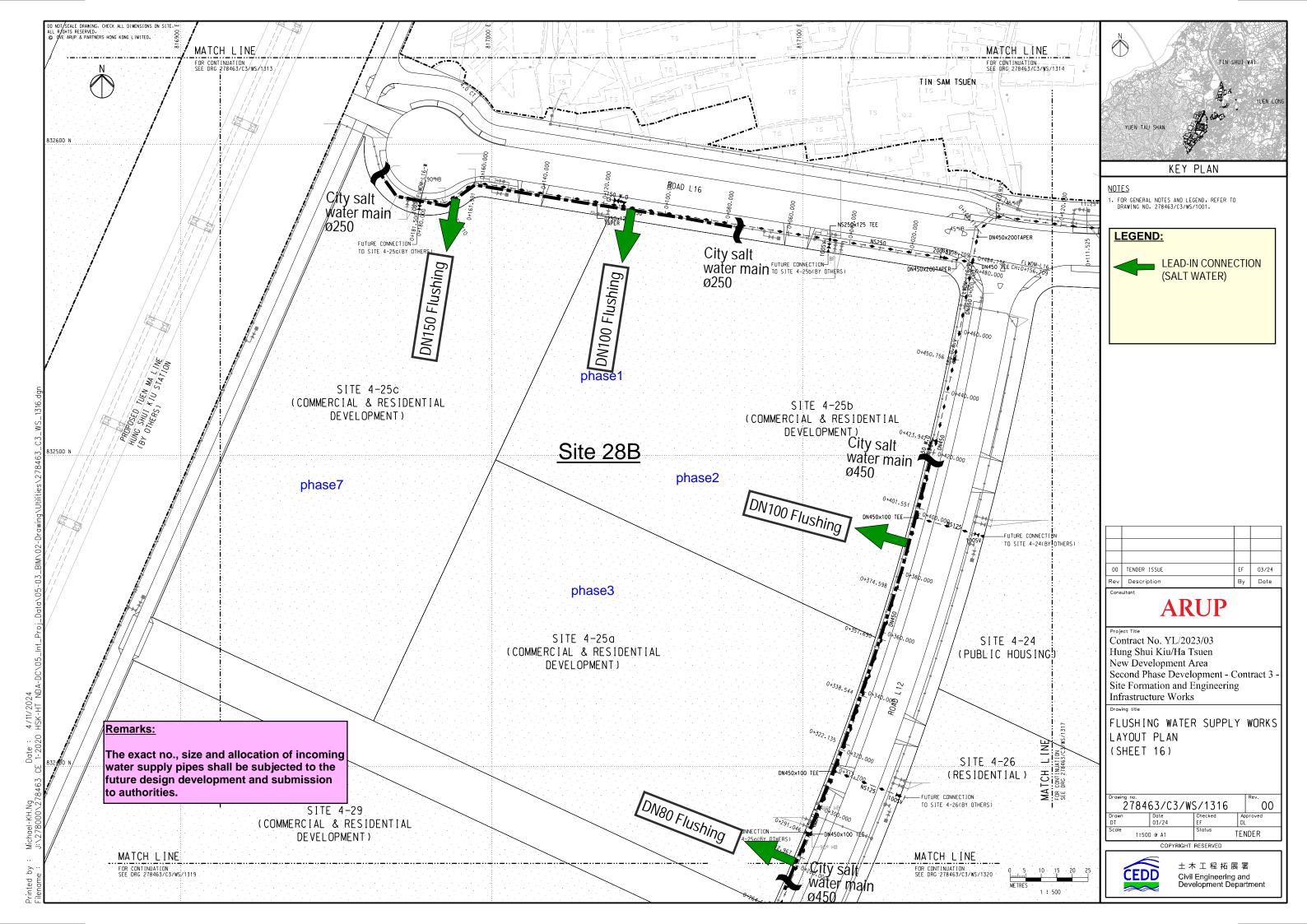
Fresh water and Flushing water Consumption in Estimation	T	1			
Print Date: 14 May 2025	Units	Phase 1	Phase 2	Phase 3	Phase 7
1) Residential					
No. of units	No.	958	958	500	1486
Factor		2.8	2.8	2.8	2.8
Population of Area 28B	Head	2682	2682	1400	4161
Refer to WSD D.I. no. 1309 - R1					
Mean daily fresh water demand per person	L / Head / Day	230	230	230	230
Mean daily fresh water demand for residential	L / Day	616860	616860	322000	957030
	m ³ / day	617	617	322	957
2) Commercial					
	m ²	N1/A	N1/A	4.400	00040
Retail Area on 28B Refer to CIFSUS Table 8, 3.5 employee per 100m ² (Based on 85% efficiency)	l III	N/A	N/A	1400	32948
Total of employee for retails	employee	N/A	N/A	42	981
Proposed mean daily fresh water demand	L / Head / Day	N/A	N/A	230	230
Mean daily fresh water demand for retails	m ³ / day	N/A	N/A	9.7	225.6
Modification water definance for retaile	iii / day	14//	1 4/7 (0.1	220.0
Proposed mean daily flushing water demand	L / Head / Day	N/A	N/A	50	50
Mean daily flushing water demand for retails	m ³ / day	N/A	N/A	2	49
Office Area on 28B	m ²	N/A	N/A	16504	0
	""	IN/A	IN/A	16304	ď
Refer to CIFSUS Table 8, 5.5 employee per 100m ²		NI/A	N1/A	000	0
Total of employee for office	employee	N/A	N/A	908	0
Proposed mean daily fresh water demand	L / Head / Day	N/A	N/A	30	30
Mean daily fresh water demand for office	m ³ / day	N/A	N/A	27.2	0.0
Proposed mean daily flushing water demand	L / Head / Day	N/A	N/A	50	50
Mean daily flushing water demand for office	m ³ / day	N/A	N/A	45.4	0
Total mean daily fresh water demand for commercial	m ³ / day	N/A	N/A	36.9	225.6
Total mean daily flushing water demand for commercial	m ³ / day	N/A	N/A	47.5	49.1
3) Proposed fresh water Consumption					
Mean daily fresh water demand for residential	m ³ / day	616.9	616.9	322.0	957.0
Mean daily fresh water demand for commercial	m ³ / day	N/A	N/A	36.9	225.6
Total mean daily fresh water demand	m ³ / day	617	617	359	1183
The peak mean daily fresh water demand					
= 3 x mean daily demand	m ³ / day	1851	1851	1077	3549
,	l/s	21.4	21.4	12.5	41.1
Proposed fresh water lead-in diameter	mm	200	200	150	200
Water flow velocity	m/s	0.76	0.76	0.74	1.33
4) Proposed flushing water Consumption					
Population of Area 28B	Head	2682	2682	1400	4161
Refer to WSD D.I. no. 1309 - R1					
Mean daily flushing water demand per person for residential	L / Head / Day	70	70	70	70
Mean daily flushing water demand for residential	m ³ / day	187.7	187.7	98.0	291.3
Mean daily flushing water demand for commercial	m ³ / day	N/A	N/A	47.5	49.1
Total mean daily flushing water demand	m ³ / day	188	188	146	340
The peak mean daily flushing water demand	iii / day	100	100	140	340
	m ³ / day	376	376	292	680
= 2 x mean daily demand	// / day	4.4	376 4.4	3.4	7.9
	l/ 3	4.4	4.4	3.4	
Proposed flushing water lead-in diameter	mm	100	100	80	150
Water flow velocity	m/s	0.62	0.62	0.77	0.46

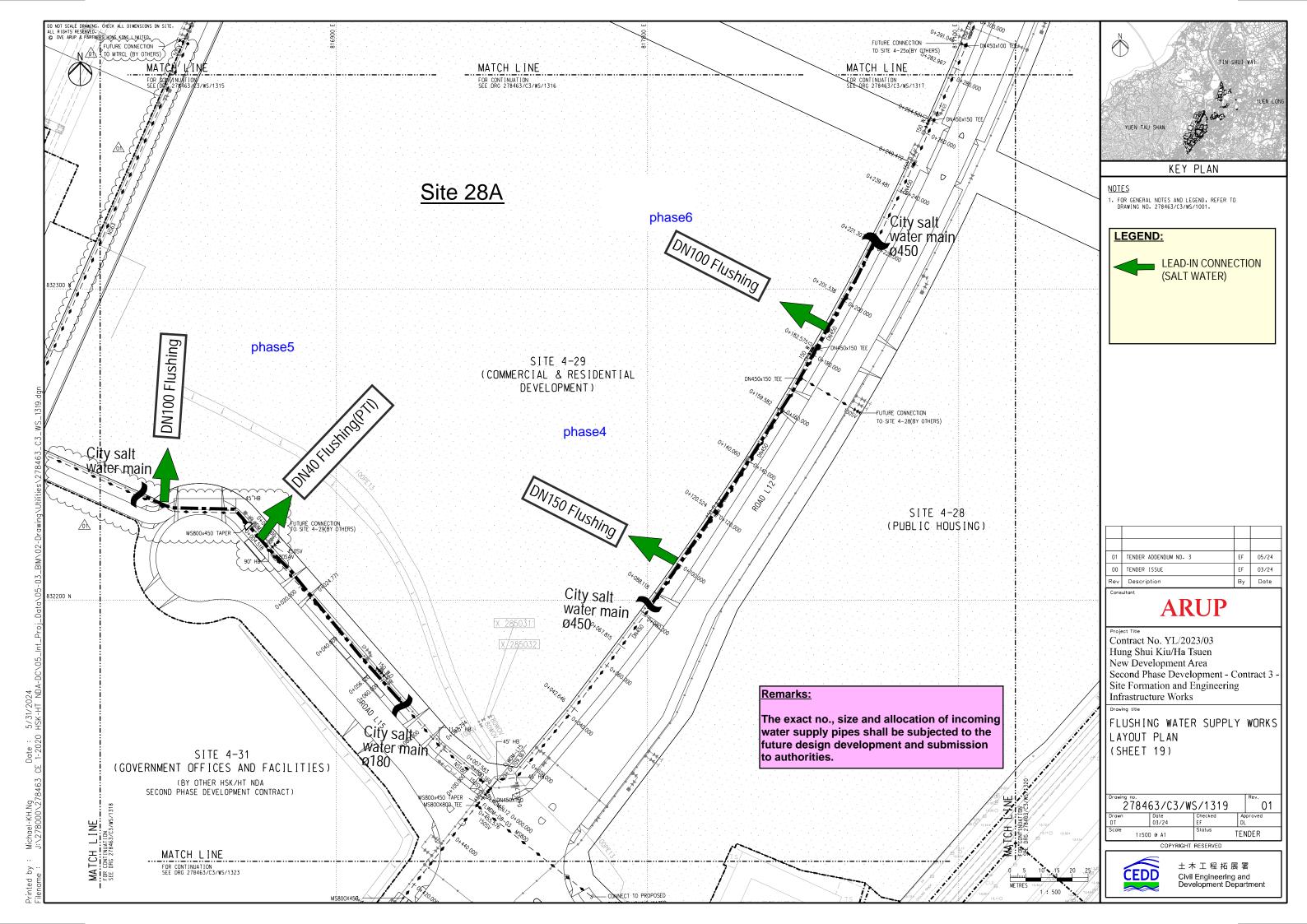
Section 16 Planning Application for Proposed Minor Relaxation of Plot Ratio Restriction (20% of Non-domestic Plot Ratio Conversion to Domestic Plot Ratio. Total Plot Ratio Remains Unchanged) for Mixed Use Development at Planning Areas 28A and 28B, Hung Shui Kiu

Appendix D - Proposed Fresh Water and Flushing Water Supply Lead-in



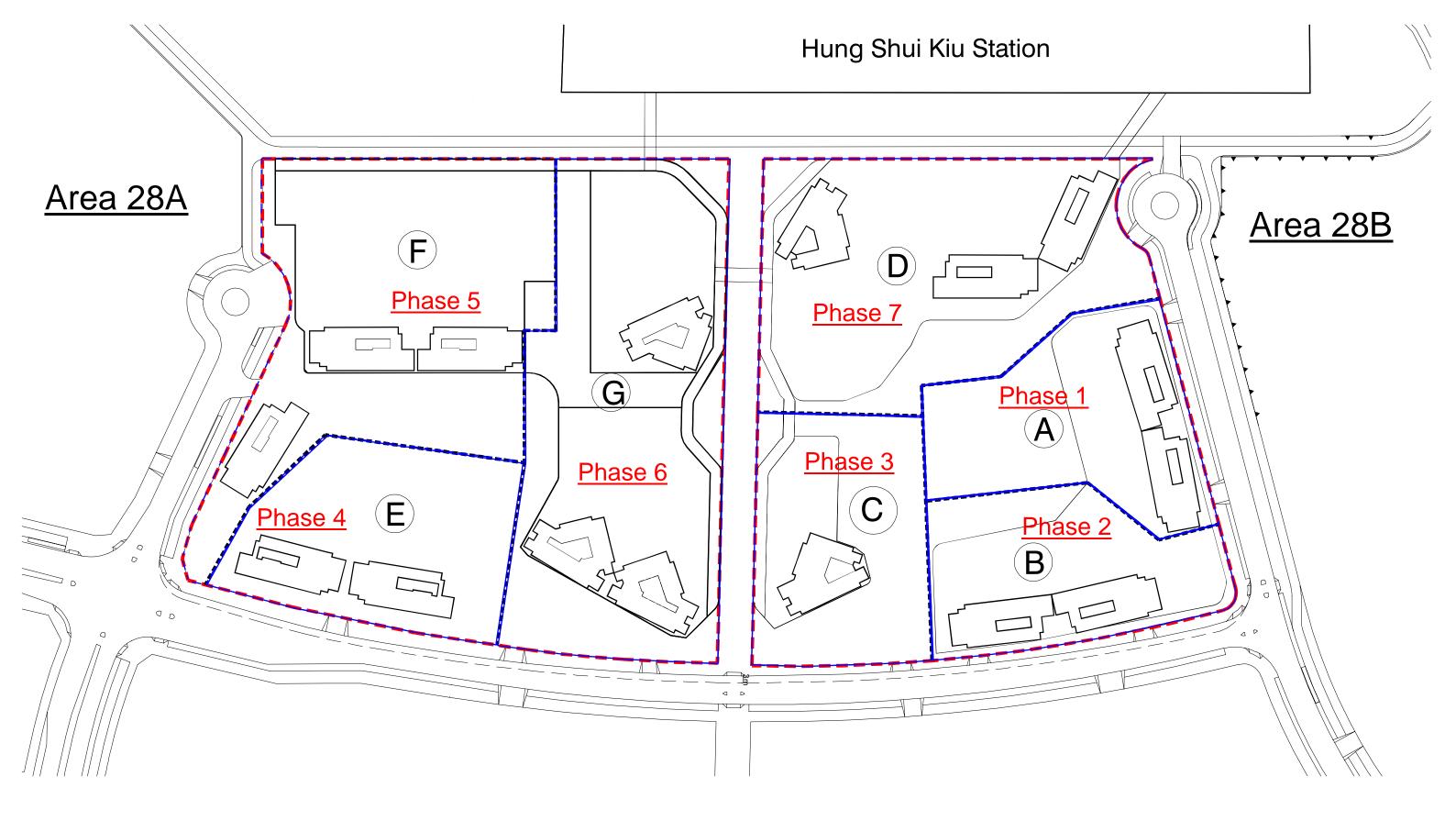






Section 16 Planning Application for Proposed Minor Relaxation of Plot Ratio Restriction (20% of Non-domestic Plot Ratio Conversion to Domestic Plot Ratio. Total Plot Ratio Remains Unchanged) for Mixed Use Development at Planning Areas 28A and 28B, Hung Shui Kiu

Appendix E – Phasing plan for Mixed Use Development at Planning Areas 28A and 28B of Hung Shui Kiu



PHASING PLAN FOR MIXED USE DEVELOPMENT AT PLANNING AREAS 28A AND 28B SCALE: 1:1500 @A3