Jenya Asia Engineering Limited
FLAT A7, 13/F., FORDA INDUSTRIAL BUILDING,
16 WANG CHAU ROAD, YUEN LONG, HK
[redacted]

Appendix A

Response-to-comment

Item	Comment	Response to Comment
(a)	My comment 2(a) given in memo ref. (01BMF8) in NM 10/YL/DD113/317 dated 12 August 2025 is still applicable. The reference materials used for the design calculation is outdated.	DSD's SMD 5th Edition (Jan 2018) and Corrigendum No. 1/2022 are adopted and revised the design calculation.
(b)	Please refer to the Stormwater Drainage Manual Corrigendum No. 1/2022 and take into account the rainfall increase due to climate change for the design calculations.	Mid 21st century is adopted for rainfall increase due to climate change in revised design calculation.
(c)	According to section 6.6.1 of the Stormwater Drainage Manual, the impact of a 50-year event should be assessed in the planning and design of village system to check whether a higher standard than 10 years is justified.	Both 200 and 50 years return period are checked and attached in revised design calculation.
(d)	IDF relationship of HKO headquarters should be adopted for the design calculation.	The calculation sheet is updated.
(e)	The northwestern side of the application site is fronting a hilly terrain with large catchment area, please demonstrate with hydraulic calculations, with catchment plan, that all proposed/ existing drainage facilities are adequate to collect, convey and discharge the surface runoff accrued on the application site and to intercept the overland flow from the adjacent lands.	The surface runoff induced from this proposed site would be solely discharged to the proposed drainage system without intercepting existing drainage system. No adverse impact on the existing drainage system.
(f)	There is calculation for proposed drainage pipe. However, no drainage pipe is found in Plan Nos. CW/DN/113/317/DP/01(a) and CW/DN/113/317/DP/02(a).	The drawings and calculation sheet are updated.
(g)	The size of the proposed site is 1,408.41m^2. However, the catchment area is 1,274.2m^2 only. Please clarify and indicate the proposed catchment in drawing.	The catchment plan is attached.
(h)	Drainage channels after CP7 to CP10 are at location outside the side boundary. The applicant is responsible for the operation and maintain of these channels. The application should take into account of any overland flow intercepted from the adjacent lands for sizing of these channels.	Noted.
(i)	Please replace the channel after CP10 by a drainage pipe.	The drawing is updated.
(j)	Please consider to discharge the intercepted stormwater into the nearby belt-mount instead of discharging into the existing channel.	The drawing is updated.
(k)	Please indicate the size and location of openings on boundary walls for intercepting the existing overland flow passing through the site.	Please be note that there would be no boundary wall for intercepting the existing overland flow.
(l)	The development should neither obstruct overland flow nor adversely affect existing	Noted.

	natural streams, village drains, ditches and the adjacent areas, etc.	
(m)	The applicant shall resolve any conflict/disagreement with relevant lot owner(s) and seek LandsD's permission for laying new drains/channels and/or modifying/upgrading existing ones in other private lots or on Government land outside the application site.	Noted.
(n)	The applicant should submit from HBP1 to this Division for application of technical audit for proposed connection to DSD's drainage facilities.	Noted.
(o)	Please include responses to comments table in the submission.	Noted.

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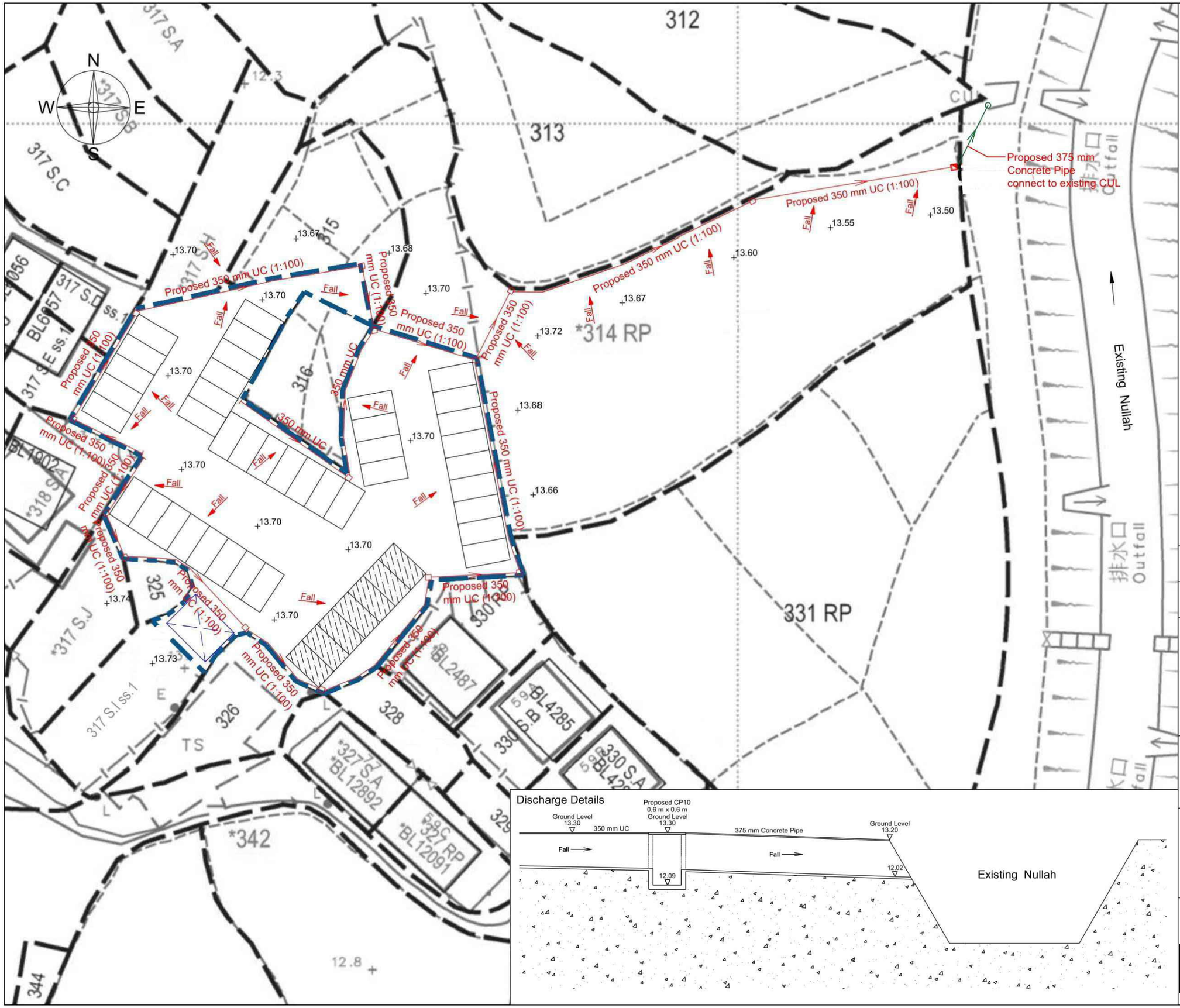
[redacted]

Appendix B

Proposed Drainage Layout Plan



LEGEND :

- Application Site
- Proposed 350 mm UC (1:100) with cast iron grating
- Proposed Catchpit with trap and with concrete cover
- Fall
- Catchpit with sand trap and with concrete cover
- Proposed 375 mm Concrete Pipe
- Existing Nullah
- Existing Catchpit
- +13.70 Existing Spot Level
- Fall Stormwater Fall Direction
- Parking space for Private Car (5m x 2.5m) for each
- Parking space for Light Goods Vehicle (5m x 2.5m) for each
- 1 Storey Container use for office (L6.1m x W4.6m x H2.6m)

Drawn	P.Y.KONG
Checked	H.Y.PANG

Project Title :

Lot Nos. 314 RP (Part), 315 (Part), 317 S.F, 317 S.G (Part), 317 S.H (Part) & 317 S.I RP in D.D. 113, Ma On Kong, Pat Heung,

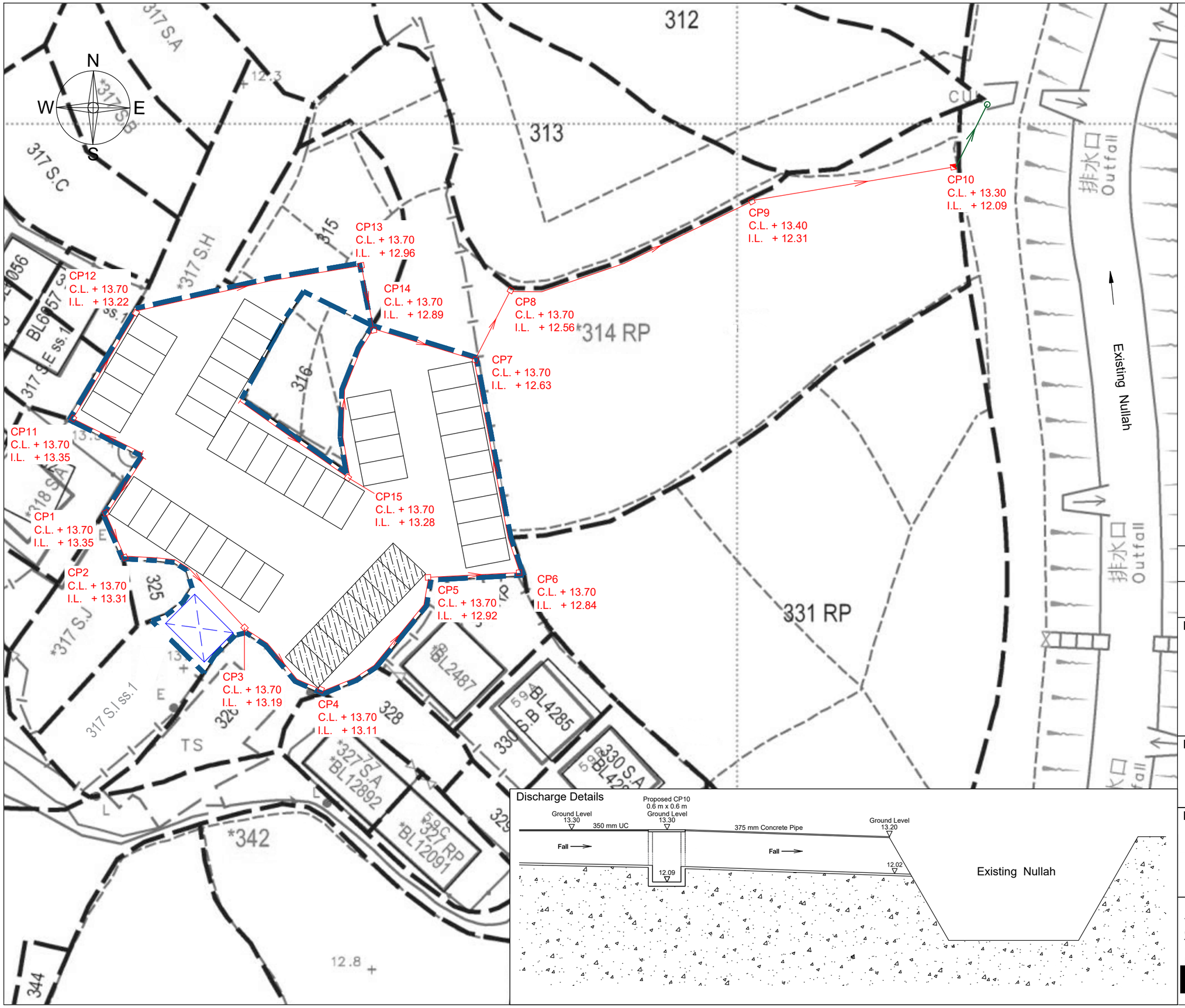
Plan Title :

Proposed Stormwater Drainage Plan

Plan No. :	Scale :
CW/DN/113/317/DP/01(a)	1 : 400
	Date : 08-09-2025

卓 弘 測 量 服 務 公 司
CHUO WANG SURVEY SERVICES COMPANY

[redacted]



LEGEND :

- Application Site
- Proposed 350 mm UC (1:100) with cast iron grating
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- Existing Nullah
- Existing Catchpit
- 13.70 Existing Spot Level
- Fall Stormwater Fall Direction
- Parking space for Private Car (5m x 2.5m) for each
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- 1 Storey Container use for office (L6.1m x W4.6m x H2.6m)

Drawn	P.Y.KONG
Checked	H.Y.PANG

Project Title :

Lot Nos. 314 RP (Part), 315 (Part), 317 S.F, 317 S.G (Part), 317 S.H (Part) & 317 S.I RP in D.D. 113, Ma On Kong, Pat Heung,

Plan Title :

Proposed Stormwater Drainage Plan

Plan No. :

CW/DN/113/317/DP/02(a)

Scale : 1 : 400

Date : 08-09-2025

卓 弘 測 量 服 務 公 司
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1/F, Block A, Wo Tai Building, No.2-24, Wo Tai Street, Luen Wo Hui, Fanling, N.T.
[redacted]

Jenya Asia Engineering Limited
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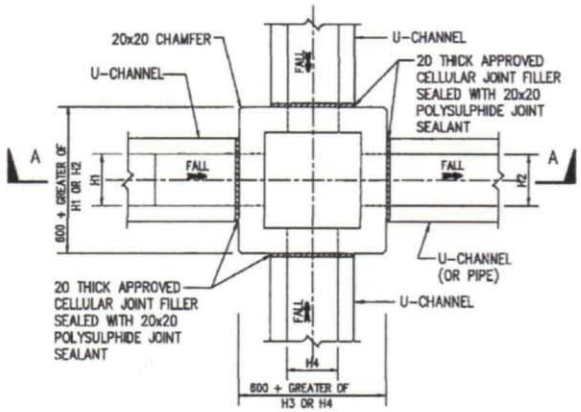
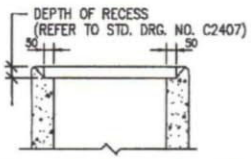
16 WANG CHAU ROAD, YUEN LONG, HK
[redacted]

Appendix C

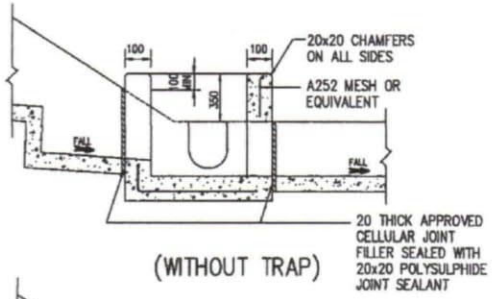
Extracted Standard Drawings for Catchpit and U-Channel Details



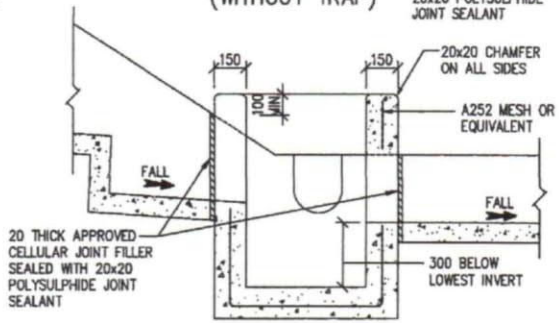
PLAN



ALTERNATIVE TOP SECTION FOR PRECAST CONCRETE COVER



(WITHOUT TRAP)



(WITH TRAP)

STANDARD CATCHPIT DETAILS

(ACCORDING TO CEDD'S DRAWING NO. C2405I & 2406I)

NOTES

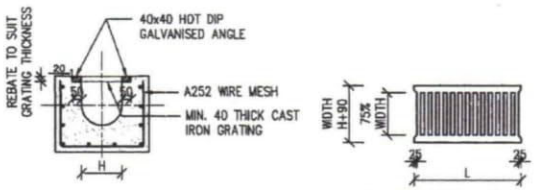
SECTION A – A

(1) ALL DIMENSIONS ARE IN MILLIMETRES.

(2) SIZE – DEPTH : $D \leq 750$
WIDTH : $W \geq 3B$
LENGTH : $L = 4.8D^{0.67} h^{0.5} F^{-0.5} > 4B$

(3) GRADED STONE FILTER SHALL BE CRUSHER RUN GRANITE AGGREGATE.

(4) THE SANDTRAP SHALL BE REGULARLY DESILTED TO AVOID BLOCKAGE.



TYPICAL SECTION

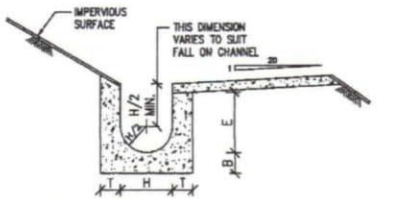
CAST IRON GRATING

(DIMENSIONS ARE FOR GUIDANCE ONLY, CONTRACTOR MAY SUBMIT EQUIVALENT TYPE)

U-CHANNEL WITH CAST IRON GRATING

(UP TO H OF 525)

(ACCORDING TO CEDD'S DRAWING NO. C2412E)



NOMINAL SIZE (H)	T	B	REINFORCEMENT
225–300	80	100	A252 MESH PLACED CENTRALLY AND T=100 WHEN F>650
375–600	100	150	
675–900	100	150	A252 MESH PLACED CENTRALLY

TYPICAL U-CHANNEL DETAILS

(ACCORDING TO CEDD'S DRAWING NO. C2410G)

N.T.S.

NOTES FOR U-CHANNEL

1. THE COVER OF PROPOSED U-CHANNEL SHALL BE FLUSH WITH THE PATH SURFACE AND ANY HOLE IN SUCH COVER SHALL NOT EXCEED 20mm IN ONE DIMENSION.
2. CAST IRON GRATINGS TO BE USED SHALL BE COMPLIANCE WITH BS 437:2008.

Drawn	P.Y.KONG
Checked	H.Y.PANG

Project Title :

Lot Nos. 314 RP (Part), 315 (Part), 317 S.F, 317 S.G (Part), 317 S.H (Part) & 317 S.I RP in D.D. 113, Ma On Kong, Pat Heung,

Plan Title :

Catchpit and U-Channel Details

Plan No. :

CW/DN/113/317/DP/03(a)

Scale :
Not To Scale

Date :
08-09-2025

卓 弘 測 量 服 務 公 司
CHUO WANG SURVEY SERVICES COMPANY
1/F, Block A, Wo Tai Building, No.2-24, Wo Tai Street, Luen Wo Hui, Fanling, N.T.
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[redacted]

Appendix D

Channel and Manhole Schedule

Lot Nos. 314 RP (Part), 315 (Part), 317 S.F, 317 S.G (Part), 317 S.H (Part)
317 S.I RP in D.D 113, Ma On Kong, Pat Heung
U-Channel Design Calculation

臻亞工程有限公司
Jenya Asia Engineering Limited

Design assumptions and parameters

1. The time of entry is taken as 5 minutes.
2. The channel is designed with a rainfall return period of 1 in 50 years. (a = 451.3; b = 2.46; c = 0.337)
3. A uniformly distributed rainfall with an intensity determined by the intensity-duration-frequency relationship is used.
4. Rainfall increase due to Climate Change for Mid 21st Century of 11.1% is adopted.
5. Adopted runoff coefficients: (Paved areas: 0.95; unpaved areas: 0.35)
6. Rational method is adopted for runoff estimation.
7. The Manning's equation is adopted for channel capacity estimation.
8. Adopted Manning's coefficient for concrete channels: 0.018 $s/m^{1/3}$

Design calculation for capacity of U-channel

Channel no.	Incremental paved catchment area, A_{ip} (m^2)	Incremental unpaved catchment area, A_{iu} (m^2)	Cumulative paved catchment area, A_{cp} (m^2)	Cumulative unpaved catchment area, A_{cu} (m^2)	Length of designed channel section (m)	Time of flow, t_f (min)	Time of concentration, t_c (min)	Rainfall intensity, I (mm/hr)	Rainfall intensity with Climate Change , I (mm/hr)	Design runoff, Q_d (m^3/s)	Channel width, W (mm)	Upstream ground level (mPD)	Downstream ground level (mPD)	Upstream channel invert (mPD)	Downstream channel invert (mPD)	Critical channel sectional area, A (m^2)	Wetted perimeter, P (m)	Hydraulic radius, R (m)	Gradient, S_f (1 in)	Flow velocity, V (m/s)	Channel capacity, Q_c (m^3/s)	%	$Q_c > Q_d$?
Start to CP1	70		70		7.0	0.117	5.12	228.078	253.394	0.005	350	13.70	13.70	13.420	13.350	0.085	1.110	0.076	100	1.001	0.085	5.51%	OK
CP1 to CP2	58		128		4.0	0.061	5.06	228.646	254.025	0.009	350	13.70	13.70	13.350	13.310	0.109	1.250	0.087	100	1.095	0.120	7.17%	OK
CP2 to CP3	171		299		12.0	0.176	5.18	227.481	252.732	0.020	350	13.70	13.70	13.310	13.190	0.123	1.330	0.093	100	1.138	0.140	14.20%	OK
CP3 to CP4	38		337		8.0	0.108	5.11	228.169	253.496	0.023	350	13.70	13.70	13.190	13.110	0.165	1.570	0.105	100	1.239	0.205	11.00%	OK
CP4 to CP5	195		532		19.0	0.246	5.25	226.783	251.956	0.035	350	13.70	13.70	13.110	12.920	0.193	1.730	0.112	100	1.289	0.249	14.19%	OK
CP5 to CP6	100		632		8.0	0.097	5.10	228.277	253.616	0.042	350	13.70	13.70	12.920	12.840	0.260	2.110	0.123	100	1.375	0.357	11.84%	OK
CP6 to CP7	205		837		21.0	0.250	5.25	226.744	251.913	0.056	350	13.70	13.70	12.840	12.630	0.288	2.270	0.127	100	1.402	0.404	13.78%	OK
CP7 to CP8			1408		7.0	0.080	5.08	228.449	253.807	0.094	350	13.70	13.70	12.630	12.560	0.361	2.690	0.134	100	1.457	0.527	17.91%	OK
CP8 to CP9			1408		25.0	0.285	5.29	226.393	251.523	0.093	350	13.70	13.40	12.560	12.310	0.368	2.730	0.135	100	1.462	0.538	17.36%	OK
CP9 to CP10			1408		22.0	0.251	5.25	226.731	251.898	0.094	350	13.40	13.30	12.310	12.090	0.368	2.730	0.135	100	1.462	0.538	17.38%	OK
Start to CP11	45		45		7.0	0.117	5.12	228.078	253.394	0.003	350	13.70	13.70	13.420	13.350	0.085	1.110	0.076	100	1.001	0.085	3.54%	OK
CP11 to CP12	110		155		13.0	0.198	5.20	227.259	252.485	0.010	350	13.70	13.70	13.350	13.220	0.109	1.250	0.087	100	1.095	0.120	8.62%	OK
CP12 to CP13	126		281		26.0	0.356	5.36	225.699	250.752	0.019	350	13.70	13.70	13.220	12.960	0.155	1.510	0.103	100	1.217	0.189	9.86%	OK
CP13 to CP14	31		312		7.0	0.086	5.09	228.391	253.742	0.021	350	13.70	13.70	12.960	12.890	0.246	2.030	0.121	100	1.360	0.334	6.25%	OK
CP14 to CP7	47		571		12.0	0.144	5.14	227.797	253.083	0.038	350	13.70	13.70	12.890	12.770	0.270	2.170	0.125	100	1.386	0.375	10.18%	OK
Start to CP15	134		134		14.0	0.233	5.23	226.907	252.094	0.009	350	13.70	13.70	13.420	13.280	0.085	1.110	0.076	100	1.001	0.085	10.50%	OK
CP15 to CP14	78		212		17.0	0.243	5.24	226.812	251.988	0.014	350	13.70	13.70	13.280	13.110	0.134	1.390	0.096	100	1.167	0.156	9.02%	OK

Lot Nos. 314 RP (Part), 315 (Part), 317 S.F, 317 S.G (Part), 317 S.H (Part)
317 S.I RP in D.D 113, Ma On Kong, Pat Heung
U-Channel Design Calculation

臻亞工程有限公司
Jenya Asia Engineering Limited

Design assumptions and parameters

1. The time of entry is taken as 5 minutes.
2. The channel is designed with a rainfall return period of 1 in 200 years. (a = 429.5; b = 2.05; c = 0.295)
3. A uniformly distributed rainfall with an intensity determined by the intensity-duration-frequency relationship is used.
4. Rainfall increase due to Climate Change for Mid 21st Century of 11.1% is adopted.
5. Adopted runoff coefficients: (Paved areas: 0.95; unpaved areas: 0.35)
6. Rational method is adopted for runoff estimation.
7. The Manning's equation is adopted for channel capacity estimation.
8. Adopted Manning's coefficient for concrete channels: 0.018 $s/m^{1/3}$

Design calculation for capacity of U-channel

Channel no.	Incremental paved catchment area, A_{ip} (m^2)	Incremental unpaved catchment area, A_{iu} (m^2)	Cumulative paved catchment area, A_{cp} (m^2)	Cumulative unpaved catchment area, A_{cu} (m^2)	Length of designed channel section (m)	Time of flow, t_f (min)	Time of concentration, t_c (min)	Rainfall intensity, I (mm/hr)	Rainfall intensity with Climate Change , I (mm/hr)	Design runoff, Q_d (m^3/s)	Channel width, W (mm)	Upstream ground level (mPD)	Downstream ground level (mPD)	Upstream channel invert (mPD)	Downstream channel invert (mPD)	Critical channel sectional area, A (m^2)	Wetted perimeter, P (m)	Hydraulic radius, R (m)	Gradient, S_f (1 in)	Flow velocity, V (m/s)	Channel capacity, Q_c (m^3/s)	%	$Q_c > Q_d$?
Start to CP1	70		70		7.0	0.117	5.12	240.241	266.907	0.005	350	13.70	13.70	13.420	13.350	0.085	1.110	0.076	100	1.001	0.085	5.81%	OK
CP1 to CP2	58		128		4.0	0.061	5.06	240.794	267.522	0.009	350	13.70	13.70	13.350	13.310	0.109	1.250	0.087	100	1.095	0.120	7.55%	OK
CP2 to CP3	171		299		12.0	0.176	5.18	239.659	266.261	0.021	350	13.70	13.70	13.310	13.190	0.123	1.330	0.093	100	1.138	0.140	14.96%	OK
CP3 to CP4	38		337		8.0	0.108	5.11	240.329	267.006	0.024	350	13.70	13.70	13.190	13.110	0.165	1.570	0.105	100	1.239	0.205	11.59%	OK
CP4 to CP5	195		532		19.0	0.246	5.25	238.979	265.506	0.037	350	13.70	13.70	13.110	12.920	0.193	1.730	0.112	100	1.289	0.249	14.95%	OK
CP5 to CP6	100		632		8.0	0.097	5.10	240.435	267.123	0.045	350	13.70	13.70	12.920	12.840	0.260	2.110	0.123	100	1.375	0.357	12.47%	OK
CP6 to CP7	205		837		21.0	0.250	5.25	238.941	265.463	0.059	350	13.70	13.70	12.840	12.630	0.288	2.270	0.127	100	1.402	0.404	14.53%	OK
CP7 to CP8			1408		7.0	0.080	5.08	240.603	267.310	0.099	350	13.70	13.70	12.630	12.560	0.361	2.690	0.134	100	1.457	0.527	18.86%	OK
CP8 to CP9			1408		25.0	0.285	5.29	238.599	265.084	0.098	350	13.70	13.40	12.560	12.310	0.368	2.730	0.135	100	1.462	0.538	18.29%	OK
CP9 to CP10			1408		22.0	0.251	5.25	238.928	265.449	0.099	350	13.40	13.30	12.310	12.090	0.368	2.730	0.135	100	1.462	0.538	18.32%	OK
Start to CP11	45		45		7.0	0.117	5.12	240.241	266.907	0.003	350	13.70	13.70	13.420	13.350	0.085	1.110	0.076	100	1.001	0.085	3.73%	OK
CP11 to CP12	110		155		13.0	0.198	5.20	239.442	266.020	0.011	350	13.70	13.70	13.350	13.220	0.109	1.250	0.087	100	1.095	0.120	9.09%	OK
CP12 to CP13	126		281		26.0	0.356	5.36	237.923	264.332	0.020	350	13.70	13.70	13.220	12.960	0.155	1.510	0.103	100	1.217	0.189	10.40%	OK
CP13 to CP14	31		312		7.0	0.086	5.09	240.546	267.246	0.022	350	13.70	13.70	12.960	12.890	0.246	2.030	0.121	100	1.360	0.334	6.58%	OK
CP14 to CP7	47		571		12.0	0.144	5.14	239.967	266.603	0.040	350	13.70	13.70	12.890	12.770	0.270	2.170	0.125	100	1.386	0.375	10.72%	OK
Start to CP15	134		134		14.0	0.233	5.23	239.100	265.640	0.009	350	13.70	13.70	13.420	13.280	0.085	1.110	0.076	100	1.001	0.085	11.06%	OK
CP15 to CP14	78		212		17.0	0.243	5.24	239.007	265.537	0.015	350	13.70	13.70	13.280	13.110	0.134	1.390	0.096	100	1.167	0.156	9.51%	OK

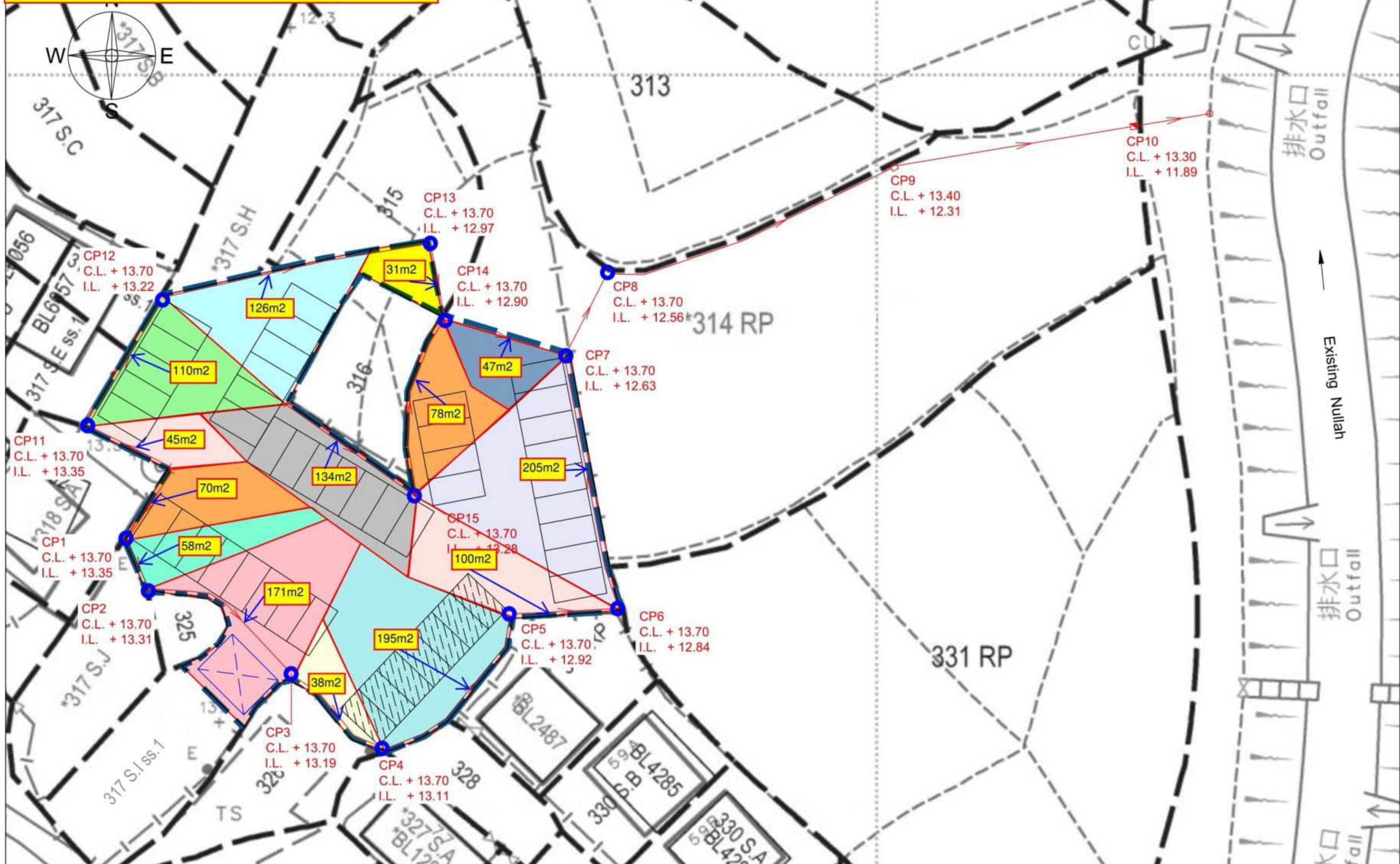
MANHOLE	PIPE			INVERT LEVEL		FINISHED ROAD LEVEL	PIPE BEDDING	PIPE													
MANHOLE NO.	LENGTH	DIAMETER	GRADIENT	INLET	OUTLET			ROUGHNESS Ks (mm)	PERCENTAGE AREA ALLOWANCE FOR SEDIMENT	FLOW AREA, A (m^2)	WETTED PERIMETER, P(m)	HYDRAULIC RADIUS, R(m)	FULL FLOW VELOCITY, V (m/s)	0.75<V<3?	CAPACITY, Qc (m^3/s)	PIPE MATERIAL	INTENSITY (mm/HOUR)	INTENSITY WITH CLIMATE CHANGE (mm/HOUR)	DISCHARGE, Q (m^3/s)	% OF CAPACITY	Qc>Q?
	m	mm	1 IN	mPD	mPD	mPD															
Return Period: 1 IN 50																					
CP10					12.090	13.300															
	12.75	375	150				B	0.60	0.10	0.11	1.18	0.09	1.48	OK	0.16	CONCRETE	226.731	251.898	0.094	57.4%	OK
Bellmount				12.005		13.300															
Return Period: 1 IN 200																					
CP10					12.090	13.300															
	12.75	375	150				B	0.60	0.10	0.11	1.18	0.09	1.48	OK	0.16	CONCRETE	238.928	265.449	0.099	60.5%	OK
Bellmount				12.005		13.300															

Jenya Asia Engineering Limited
FLAT A7, 13/F., FORDA INDUSTRIAL BUILDING,
16 WANG CHAU ROAD, YUEN LONG, HK
[redacted]

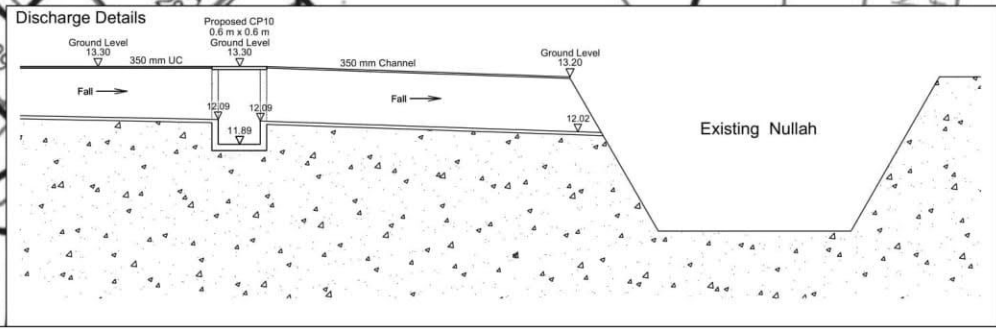
Appendix E

Catchment Plan

Catchment Plan



Total Surface Area = 1408m2



LEGEND :

- Application Site
- Proposed 350 mm UC (1:100) with cast iron grating
- Proposed Catchpit with trap and with concrete cover
- Fall
- Catchpit with sand trap and with concrete cover
- Existing Nullah
- Existing Catchpit
- 13.70 Existing Spot Level
- Stormwater Fall Direction
- Parking space for Private Car (5m x 2.5m) for each
- Parking space for Light Goods Vehicle (5m x 2.5m) for each
- 1 Storey Container use for office (L6.1m x W4.6m x H2.6m)

Drawn	P.Y.KONG
Checked	H.Y.PANG

Project Title :

Lot Nos. 314 RP (Part), 315 (Part), 317 S.F, 317 S.G (Part), 317 S.H (Part) & 317 S.I RP in D.D. 113, Ma On Kong, Pat Heung,

Plan Title :

Proposed Stormwater Drainage Plan

Plan No. : CW/DN/113/317/DP/01(a)

Scale : 1 : 400

Date : 08-09-2025

卓 弘 測 量 服 務 公 司

CHUO WANG SURVEY SERVICES COMPANY

1/F, Block A, Wo Tai Building, No.2-24, Wo Tai Street, Luen Wo Hui, Fanling, N.T.

[redacted]

Jenya Asia Engineering Limited
FLAT A7, 13/F., FORDA INDUSTRIAL BUILDING,
16 WANG CHAU ROAD, YUEN LONG, HK
[redacted]

Appendix F

Section Drawings

LEGEND :

Application Site

Drawn	P.Y.KONG
Checked	H.Y.PANG

Project Title :

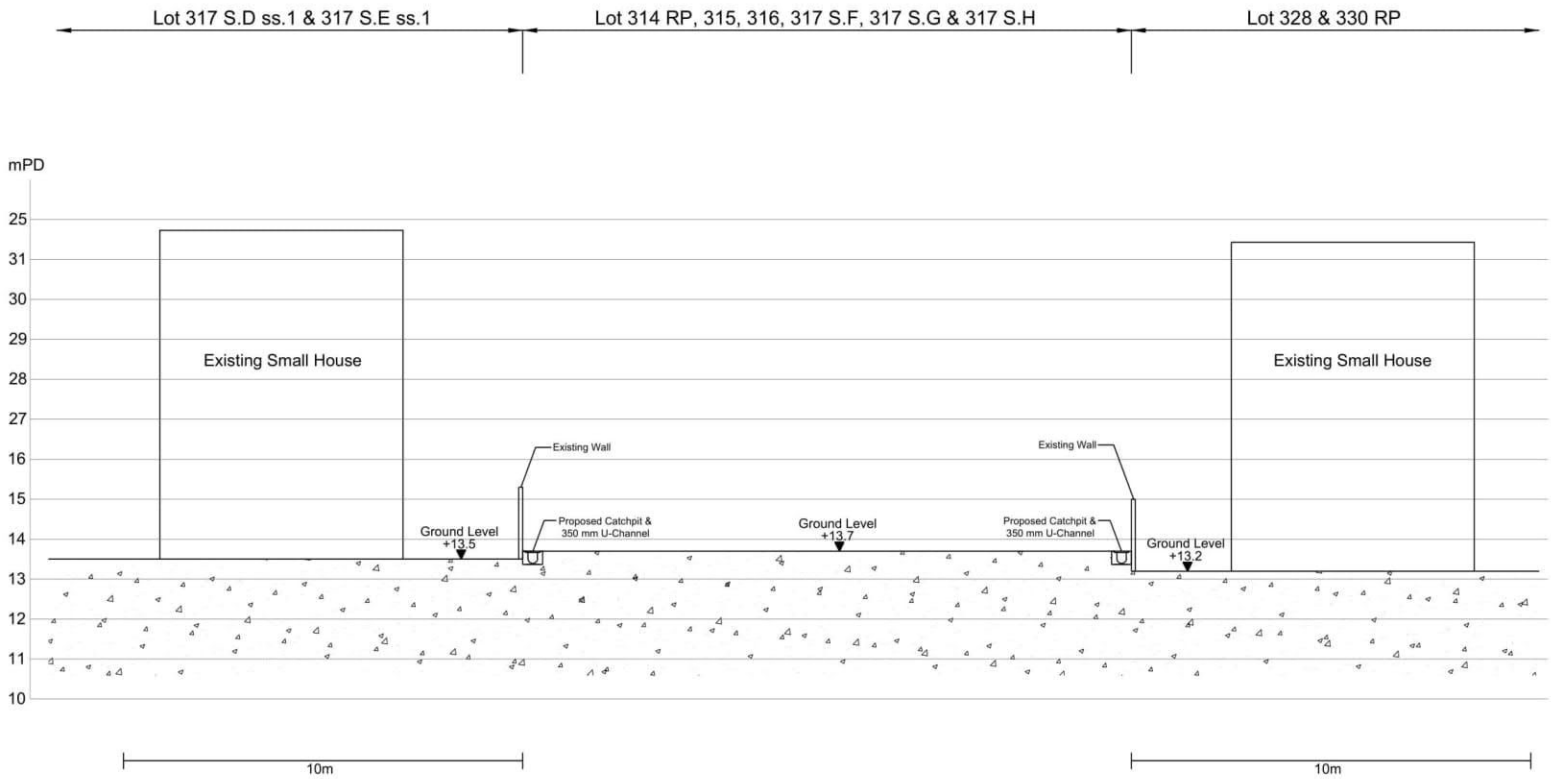
Lot Nos. 314 RP (Part), 315 (Part), 317 S.F, 317 S.G (Part), 317 S.H (Part) & 317 S.I RP in D.D. 113, Ma On Kong, Pat Heung,

Plan Title :

Cross Section

Plan No. : CW/DN/113/317/CS/01	Scale : 1 : 400
	Date : 08-09-2025

卓 弘 測 量 服 務 公 司
CHUO WANG SURVEY SERVICES COMPANY
1/F, Block A, Wo Tai Building, No.2-24, Wo Tai Street, Luen Wo Hui, Fanling, N.T.
[redacted]



Drawn	P.Y.KONG
Checked	H.Y.PANG

Project Title :

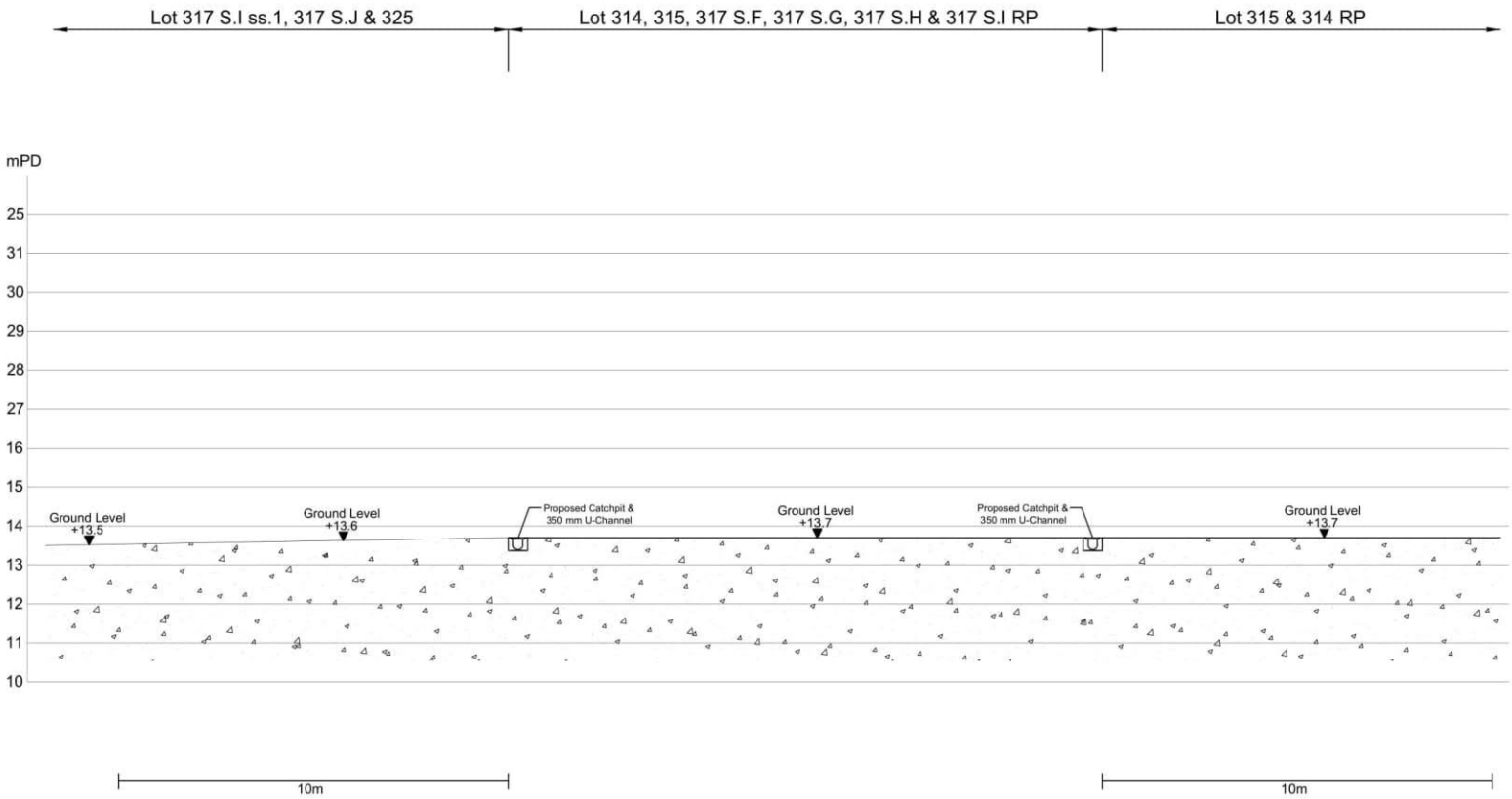
Lot Nos. 314 RP (Part), 315 (Part), 317 S.F, 317 S.G (Part), 317 S.H (Part) & 317 S.I RP in D.D. 113, Ma On Kong, Pat Heung,

Plan Title :

Section A - A

Plan No. : CW/DN/113/317/CS/02	Scale : Not To Scale
	Date : 08-09-2025

卓 弘 測 量 服 務 公 司
CHUO WANG SURVEY SERVICES COMPANY
1/F, Block A, Wo Tai Building, No.2-24, Wo Tai Street, Luen Wo Hui, Fanling, N.T.
[redacted]



Drawn	P.Y.KONG
Checked	H.Y.PANG

Project Title :

Lot Nos. 314 RP (Part), 315 (Part), 317 S.F, 317 S.G (Part), 317 S.H (Part) & 317 S.I RP in D.D. 113, Ma On Kong, Pat Heung,

Plan Title :

Section B - B

Plan No. : CW/DN/113/317/CS/03	Scale : Not To Scale
	Date : 08-09-2025

卓 弘 測 量 服 務 公 司
CHUO WANG SURVEY SERVICES COMPANY
1/F, Block A, Wo Tai Building, No.2-24, Wo Tai Street, Luen Wo Hui, Fanling, N.T.
[redacted]

Jenya Asia Engineering Limited
FLAT A7, 13/F., FORDA INDUSTRIAL BUILDING,
16 WANG CHAU ROAD, YUEN LONG, HK
[redacted]

Appendix G

Reference Clause from Hong Kong Code

routing through drainage channels. The same consideration shall also be applied when ground gradients vary greatly within the catchment.

(b) *Runoff Coefficient.* C is the least precisely known variable in the Rational Method. Proper selection of the runoff coefficient requires judgement and experience on the part of the designer. The value of C depends on the impermeability, slope and retention characteristics of the ground surface. It also depends on the characteristics and conditions of the soil, vegetation cover, the duration and intensity of rainfall, and the antecedent moisture conditions, etc. In Hong Kong, a value of C = 1.0 is commonly used in developed urban areas.

In less developed areas, the following C values may be used but it should be checked that the pertinent catchment area will not be changed to a developed area in the foreseeable future. Particular care should be taken when choosing a C value for unpaved surface as the uncertainties and variability of surface characteristics associated with this type of ground are known to be large. It is important for designer to investigate and ascertain the ground conditions before adopting an appropriate runoff coefficient. Designers may consider it appropriate to adopt a more conservative approach in estimation of C values for smaller catchments where any consequent increase in cost may not be significant. However, for larger catchments, the designers should exercise due care in the selection of appropriate C values in order to ensure that the design would be fully cost-effective.

Surface Characteristics	*Runoff coefficient, C**
Asphalt	0.70 - 0.95
Concrete	0.80 - 0.95
Brick	0.70 - 0.85
Grassland (heavy soil**)	
Flat	0.13 - 0.25
Steep	0.25 - 0.35
Grassland (sandy soil)	
Flat	0.05 - 0.15
Steep	0.15 - 0.20

* For steep natural slopes or areas where a shallow soil surface is underlain by an impervious rock layer, a higher C value of 0.4 - 0.9 may be applicable.

** Heavy soil refers to fine grain soil composed largely of silt and clay

(c) *Rainfall intensity.* i is the average rainfall intensity selected on the basis of the design rainfall duration and return period. The design rainfall duration is taken as the time of concentration, t_c. The Intensity-Duration-Frequency Relationship is given in Section 4.3.2.

(d) *Time of concentration.* t_c is the time for a drop of water to flow from the remotest point in the catchment to its outlet. For an urban drainage system,

$$t_c = t_o + t_f \qquad t_f = \sum_{j=1}^{n} \frac{L_j}{V_j}$$

where t_o = inlet time (time taken for flow from the remotest point to reach the most upstream point of the urban drainage

Table 3a – Storm Constants for Different Return Periods of HKO Headquarters

Return Period T (years)	2	5	10	20	50	100	200	500	1000
a	499.8	480.2	471.9	463.6	451.3	440.8	429.5	414.0	402.1
b	4.26	3.36	3.02	2.76	2.46	2.26	2.05	1.77	1.55
c	0.494	0.429	0.397	0.369	0.337	0.316	0.295	0.269	0.251

Table 3b – Storm Constants for Different Return Periods of Tai Mo Shan Area

Return Period T (years)	2	5	10	20	50	100	200
a	1743.9	2183.2	2251.3	2159.2	1740.1	1307.3	1005.0
b	22.12	27.12	27.46	25.79	19.78	12.85	7.01
c	0.694	0.682	0.661	0.633	0.570	0.501	0.434

Table 3c – Storm Constants for Different Return Periods of West Lantau Area

Return Period T (years)	2	5	10	20	50	100	200
a	2047.9	1994.1	1735.2	1445.6	1107.2	909.1	761.8
b	24.27	24.23	21.82	18.36	13.01	8.98	5.40
c	0.733	0.673	0.619	0.561	0.484	0.428	0.377

Table 3d – Storm Constants for Different Return Periods of North District Area

Return Period T (years)	2	5	10	20	50	100	200
a	1004.5	1112.2	1157.7	1178.6	1167.6	1131.2	1074.8
b	17.24	18.86	19.04	18.49	16.76	14.82	12.47
c	0.644	0.614	0.597	0.582	0.561	0.543	0.523