

Hong Kong & Kowloon Timber Merchants Association

Proposed Temporary Rural Workshop (Timber Yard and Sawmill) in Various Lots in D.D. 86, D.D. 90 and Adjoining Government Land, Lin Ma Hang Road, San Uk Ling, Ma Kam To

Drainage Impact Assessment

Project Profile Report

May 2024

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Introduction 1

1.1 Background

- 1.1.1 This Drainage Impact Assessment (DIA) has been prepared to discharge Town Planning Approval Condition (c) for the Site, in accordance with Town Planning Board (TPB) letter ref. TPB/A/NE-MKT/17 dated 14 May 2021.
- 1.1.2 The Site is to be developed to provide simple workshop facilities for a period of 3 years.
- 1.1.3 This Report assesses the drainage impacts in the vicinity of the Site as a result of the proposed development, with discussion of proposed mitigation measures.
- 1.1.4 This Project Profile Report has been prepared in accordance with the requirements of the DIA process for private sector projects set out under Drainage Services Department's (DSD's) Technical Advice Note No. 1 (Appendix I).
- 1.1.5 A DIA for the Project was previously accepted without comment in May 2022 and the eastern portion of the overall Site has been substantially completed in accordance with that DIA. However, due to changes to the Project Programme and the Site Boundary in the western portion of the Site, the DIA has been updated. It is noted that the essential principles of this updated DIA are the same as the previously accepted DIA.

1.2 Information Available for the Study

- 1.2.1 Reference has been made to Drainage Services Departments DSD's Stormwater Drainage Manual (SDM), 5th Edition, including Corrigendum No. 1/2024, and public drainage information presented on Land's Department's GeoInfo Map website.
- 1.2.2 A local topographic survey has also been carried out for the Project, although the survey coverage is not extensive beyond the Site Boundaries.

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2.1 Project Title

2.1.1 The project title is "Proposed Rural Workshop (Timber Yard and Sawmill) for a period of 3 years in "Agriculture" Zone, Lot 129 (Part) in D.D. 86, Lots 607, 608, 609, 610 S.B RP (Part), 613 (Part), 627 (Part), 632 S.A RP, 633 S.A RP (Part), 635 S.A, 635 S.B, 635 S.C, 635 S.D, 637, 638 (Part) and 642 S.A RP (Part) in D.D. 90 and Adjoining Government Land, Lin Ma Hang Road, San Uk Ling, Ma Kam To". The location of the Site is shown on **Figure 1**.

2.2 Proponent

2.2.1 The proponent of the project is Hong Kong and Kowloon Timber Merchants Association.

2.3 Contact Person

2.3.1 For issues relating to this DIA Study, please contact Ir Colin Moreby of AIM Group Limited at 2572 6533.

2.4 Nature and Description of the Project

- 2.4.1 The proposed development consists of various covered workshop buildings, with access roads and parking/turning areas. There will also be some buffer planting areas. The Master Layout Plan for the proposed development is included in **Appendix A**. The TPB Approval is for a period of 3 years, so all facilities will be generally temporary in nature. As noted above, drainage works at the Site have been substantially completed in accordance with the previous DIA (see As-constructed details in **Appendix B**). It should be noted that some of the As-constructed details in Site C are likely to be modified as part of later expansion works.
- 2.4.2 The overall Application Site is split into two portions, with (adjoining) Sites A and B located to the south of Lin Ma Hang Road and Sites C, D and E to the north of the road. Sites A and B cover a combined area of approximately 9,088m², while Sites C, D and E cover an area of approximately 11,493m².

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2.5 Planning Application and Lease Modification

- 2.5.1 This DIA Project Profile has been prepared to discharge Planning Condition (c) of the TPB Approval Letter.
- 2.5.2 No Lease Modification is required for the proposed Project.

2.6 Location and Zoning

- 2.6.1 The Application Site is located to the south and north of Lin Ma Hang Road, a short distance to the northeast of San Uk Ling.
- 2.6.2 The Site is zoned as "Agriculture".

3 Planning and Implementation Programme

3.1 Planning and Implementation

3.1.1 The proposed redevelopment will be planned and implemented under the supervision of appropriately qualified and experienced professionals. The construction of any works for the proposed redevelopment will be carried out by a suitable Contractor.

3.2 **Project Timetable**

3.2.1 The Redevelopment is expected to be complete by mid-2024.

3.3 Interface with Other Projects

3.3.1 There is no foreseeable direct interaction with other development projects in the area, which should be considered at this time.

4 Existing Drainage

4.1 Existing Drainage Routes and Conditions

4.1.1 The two main Site areas are both partially filled and paved, with the land falling generally from northeast to southwest across the Sites. The existing land in Site E generally falls from northwest to southeast. There were no existing formal drainage systems at the Sites, apart from small

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simple unlined open channels, with runoff mostly passing overland to adjacent areas and nearby Streamcourses to the south and east of the Sites. There is another existing open channel to the north of Sites A & B, which cuts off runoff from areas to the north of the Sites. This channel passes under Lin Ma Hang Road and continues towards the north along the eastern boundary of Site E. The existing local drainage regimes are indicated on **Figure 2**.

- 4.1.2 As mentioned above, Site drainage facilities in Sites A and B have been constructed in accordance with the previous (2022) DIA.
- 4.1.3 To the south of Sites A & B there is an existing natural open channel (streamcourse) running generally from southeast to northwest before discharging to the Shenzhen River close to the Man Kam To Border Crossing. In the vicinity of the Site, the streamcourse is mostly unlined, but fairly straight and with the sides formed by the access road to Muk Wu Village and the supporting wall at the Site Boundary (i.e. the walls are concrete, but the base is soil/silt). It serves an upstream catchment, as shown on **Figure 3**.
- 4.1.4 The existing Site contains some buildings and some areas of paving and hardstanding (compacted broken asphalt). There are also some flat areas of vegetation. Photographs of the existing Site are included in Appendix C (N.B. it should be noted that some parts of the existing Site are currently overgrown and access is limited).
- 4.1.5 There are no flooding blackspots in the vicinity of the Site and informal discussions with local residents and landowners suggest that there is no history of flooding in the area.
- 4.1.6 There are no known Ecologically Important Streams/Rivers in the area.

5.1 Drainage Impact Assessment

<u>General</u>

- 5.1.1 The proposed development at the Site will involve paving of the ground surface and the construction of temporary workshop structures, with most of the Site being roofed over. As such, there will be an increase in paving, with a resultant increase in runoff. These increases have been quantified, with mitigation measures proposed to offset the increases, as discussed below.
- 5.1.2 The Site Areas will be provided with peripheral channels throughout, to collect any runoff from outside the Site (e.g. from Lot No. 630RP) and to prevent runoff from the Site towards adjacent areas. As such, the adjacent areas will not be adversely affected by the proposed development.

Assessment Criteria

- 5.1.3 As the catchment areas are all fairly small, the Rational Method (as set out in Section 7.5.2 of the SDM) has been used for the calculation of runoff.
- 5.1.4 The existing Site contains some buildings and temporary structures, as well as some fully paved (concrete) areas and a runoff coefficient, C, of 0.95 has been adopted for these areas. There are also areas of (compacted broken asphalt) hardstanding for which a runoff coefficient of 0.75 has been adopted. A runoff coefficient of 0.20 has been adopted for the remaining vegetated/farmland areas.
- 5.1.5 The proposed development will introduce additional paving and covered workshop structures (C = 1.00 has been adopted for these). There will also be some flat buffer landscaping (C = 0.20).
- 5.1.6 The overall upstream catchments mostly comprise steep vegetated hillsides with a runoff coefficient of 0.35 assumed. The amount of paving is hard to determine accurately, so an area equivalent to 2.5% of the overall catchment area has been assumed (C = 0.90), except where actual measurement (from maps) is feasible.
- 5.1.7 The 1 in 10-year scenario has been considered, as runoff from the Site will only affect minor local village areas and nearby (largely unused)

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farmland. Furthermore, the approved usage at the Site is only for a period of 3 years, so a higher return period is not considered justified.

- 5.1.8 Allowances for increased rainfall intensity up to mid-21st Century and beyond have not been considered, as the TPB Approval is only for a period of 3 years.
- 5.1.9 The proposed mitigation measures involve the provision of temporary storage and it is therefore necessary to consider runoff hydrographs. Runoff hydrographs have been developed for each Site Area based on the 1 in 10-year design rainfall profile for North District set out in Table 5d of the SDM (the values from Corrigendum No. 1/2024 have been used for the Western Portion (Sites, C, D and E), although not for the Eastern portion, as the facilities have already been constructed in accordance with earlier standards), with assessments of 10-minute, 30-minute and 1-hour storm durations. A 90-minute storm has also been considered for the Western Site (Sites C, D and E) for reference.

5.2 Drainage Impact

5.2.1 The existing and future runoff flows from the overall Sites and overall catchments are presented in **Appendix D**. As the two main portions of the overall Application Site are physically independent, the drainage impacts will be discussed separately.

Eastern Portion (Sites A and B)

- 5.2.2 The discharge from Sites A & B will increase from approximately 0.199m³/s to 0.429m³/s as a result of the proposed development. However, in terms of the overall catchment served by the main streamcourse, the overall runoff from the Site will increase from 0.290m³/s to 0.326m³/s (partly as a result of diversion of the runoff from Sites C and D, as discussed below), an increase of only 0.5% of the overall catchment runoff. Such an increase is well within the accuracy of runoff calculations and is therefore insignificant.
- 5.2.3 Although the overall increased runoff will not significantly change the flow from the overall catchment, there will be more significant increases at the local level. Given the absence of flooding records in the area, it can be reasonably assumed that the existing peak flows can be accommodated within the existing drainage system(s) and it is therefore proposed to provide storage for flows in excess of the existing peak runoff. The storage volumes required are presented in **Appendix E**, including runoff hydrographs for each of the storm durations for each portion of the Site. The required storage volumes for the 30-minute and 1-hour storm

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durations are the same and have been adopted as the minimum storage volumes to be provided, i.e. $147.3m^3$ for Sites A & B. However, as the storage volumes will be provided by multiple standard-sized prefabricated tanks, the actual volumes to be provided will be greater than the minimum volumes required. For Sites A & B, the actual volume will be 3 x $55m^3 = 165m^3$.

- 5.2.4 The south-eastern corner of the Site is close to the existing streamcourse and, to avoid any future conflict, all main building structures in this area will be set back a minimum of 3m from the bank of the stream.
- 5.2.5 The construction works in the eastern portion of the Site, including the Site drainage facilities, have been substantially completed.

Western Portion (Sites C, D and E)

- 5.2.6 Following discussions with Highways Department, the option of discharging from the Site to the road drainage in Lin Ma Hang Hang Road and hence to the main streamcourse to the south of the Site is considered not feasible. It will therefore be necessary to discharge all runoff from the western portion of the Site (Sites C, D and E) to the existing streamcourse to the east of the Site, running partially below the recently constructed access road to Muk Wu Village. The upstream catchment area for this stream is shown on **Figure 4**.
- 5.2.7 As a result of the diversion of flows from Sites C and D towards the east and increased paving at the Site, the theoretical peak discharge from the Site towards the east would increase from 0.078 m³/s to 0.630 m³/s. As for the eastern portion of the Site, it is proposed to provide storage facilities (buried tanks) to temporarily store excess runoff from the Site, to reduce the peak discharge. The existing eastern streamcourse comprises a significant channel (approximately 1m x 1m) and capacity calculations (see Appendix F) indicate that it could accommodate some increased runoff from the Site. However, due to limited physical survey data and to keep the assessment conservative, it is proposed to limit the future runoff from the Site to a nominal 0.25m³/s. This figure has been used for the hydrographs for the Western Site in Appendix E, and the resultant temporary storage volume of approximately 213 m³. It is noted that the required storage volumes for the 60-minute and 90-minute rainfall events are the same, so this has been adopted for this DIA and no further assessment of longer-duration rainfall is required. The storage will be provided as 3 x 75m³ standard tanks.
- 5.2.8 At the Site boundary, the stream comprises a substantial well-defined channel, with the western side formed by concrete blocks supporting the Site boundary and the eastern side formed by the structure of the access

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road (see Appendix C). The crossing beneath Lin Ma Hang Road appears to be quite restricted (see Appendix C) and this supports the concept that the channel can accept additional flows from the Site.

General Issues

- 5.2.9 It is proposed to provide the storage in the form of buried plastic tanks (as indicated in **Appendix G** actual dimensions to be confirmed), with small pumps also provided to gradually empty the tanks over an extended period (say, an hour or two). Inflow to the tanks would be controlled by simple overflow weirs (as illustrated in **Figure 5** and with calculations included in **Appendix H**).
- 5.2.10 Peripheral channels and on-Site underground pipe drainage systems to suit the MLP will be provided to collect all runoff from the Site and all runoff entering the Site from other adjacent catchments (N.B. temporary and permanent hoarding will be constructed so as to not obstruct any overland or stream runoff from adjacent areas). It is proposed that prefabricated units (as shown in **Appendix F)** will be used to simplify construction and maintain standards. The Site Catchment Areas & Drainage Plan for the western Site is included as **Figure 6**, with an indicative layout of the proposed storage shown in **Figure 7**. A Drainage Schedule showing the required and proposed gradients of the peripheral channels and internal pipes is included in **Appendix I**.
- 5.2.11 Sites A & B will discharge directly (via a sand trap) into the main Streamcourse to the south of the Site (as under the existing scenario).
- 5.2.12 Silt/sand traps and Terminal Manholes (if appropriate) will be provided at all discharge points.
- 5.2.13 The Project Proponent will be responsible for the construction, operation and maintenance of all drainage facilities for the Project.

6 Conclusions

- 6.1.1 There will be increases in the volume of runoff from the Site as a result of the Proposed Redevelopment.
- 6.1.2 Runoff from Sites A and B will discharge to an existing streamcourse to the south of the Site. Runoff from Sites C, D and E will discharge to an existing channel to the east of the Site.
- 6.1.3 Peripheral channels, etc. will be provided to collect any flow entering the Site from external areas and to prevent discharge from the Site to adjacent areas. Underground pipes will be provided to collect internal runoff from most Site areas.
- 6.1.4 Temporary storage of runoff will be provided for flows in excess of the acceptable peak flows. The actual storage to be provided will be greater than the minimum volumes calculated.
- 6.1.5 Construction, operation and maintenance of all new drainage facilities will be undertaken by the Project Proponent.
- 6.1.6 There will be no unacceptable increases to the risks of flooding at the Site or in surrounding areas and no unacceptable adverse drainage impacts.

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Master Layout Plan



			B2	935.8												
		4,856.3	B3	546.8	2,941.3	2,898.7	3,713.9		Legend		Site A: Million Lov Development Ltd.					
			B4	459.1	4				Application Site Boundary	Fence Wall	Site B1: Truefaith Enterprises Ltd.					
Site Coverage	Total:		Subtotal	13,92	2.9				Application one boundary		Site B2: Fai Kee Timber Co. Ltd.					
(~sq.m)		6,728.8			7,194.1				Planning Approval Boundary	Site A	Site B3: Tak Kee Timber Company					
Gross Floor	Total:			14,26	2.9				Otwarten famme have	Olto D	Site B4. Wong Chu Kee Timber					
Alea ("sq.m)		0.700.0	6,824.8		7,438.1		ı –		Structure for warehouse,	Site B	Site D: Serawak (K.T.) Company Ltd.					
	Structure for warehouse, parking, loading/ unloading (1 storey, 12m in height)	3,780.8 (excluding office area)	2,69	0.5	2,479.5 (excluding office area)	1,997.2	2,303.7	1	(approx. 12m in height)	Site C	Site E: Ronca Exhibition Ltd.					
	Shed (1 storey, 8m in height)	161.5	-		-	-	169.6		Shed (approx 8m in height)	Site D						
	Ancillary Office (2 storeys, 5m in height)	112			122	-	366									
	Guard House with Store Room (2 storey, 6m in height)		80			-		Office								
Internal Transport	private car parking spaces (2.5m x 5m)	3	5		2	1	1	•	Location of Temporary Portable Toilets	Parking Space for Pr	rivate Cars (5m x 2.5m)					
Facilities	loading/unloading bays for HGV or MGV (3.5 x 11m)		4		1	1	1		Guard House	Loading/Unloading S	pace for HGV/MGV (11m x 3.5m)					
	loading/unloading bays for container vehicle or HGV (3.5 x 16m)	2	-		1	1	1		Reserved 2m Landscape Buffer	Loading/Unloading Sp	pace for Container Vehicles (16m x 3.5m)					
	O CO						Pla	an 1:	Master Layou	t Plan						



As-constructed Drainage



831900 E 844020		Lot 610 S.B RI	+ + + + + + + + + + + + + + + + + + +	+ 844140	+ <u>831900 E</u> 84416
		U			
	Date of Survey	Scale	DRAWING TITLE : As-Built Survey At Lin Ma Hang DD90 Temporar	Legends: 300ø €10,825	Notes : 1. Co-ordinates c Kong Metric Gr 2. All Levels are Principal Datum 3. Elevation of ke to bottom of µ 4. Dimensions are otherwise show
	A0 1:200 "." ne 2023	Sheet 1 of 2	Record Drainage System Road Workshop	As-built Drain Pipe As-built U-Channel As-built Invert Level As-built Catchpit As-built Ground Level	rid (1980) in Metres relative to n (P.D.) prb are referred kerb in Metres unless in



31960 E 43 940 N	843960 N	843980 N	844000 N	844020 N	844040 N	844060 N	20831960 E 4 4 08 2 2
Scale @A0 1:200 Date of Survey: June 2023	DRAWING TITLE : As-Built Survey Record Drainage System At Lin Ma Hang Road DD90 Temporary Rural Workshop					Legends:3000As-built Drain Pipe3000As-built Drain PipeAs-built U-ChannelAs-built U-ChannelAs-built Invert LevelAs-built CatchpitAs-built Ground Level	 Notes : Co-ordinates are relative to Hong Kong Metric Grid (1980) All Levels are in Metres relative to Principal Datum (P.D.) Elevation of kerb are referred to bottom of kerb 4. Dimensions are in Metres unless otherwise shown



Site Photographs



C192 – Proposed Rural Workshop (Timber Yard and Sawmill) for a period of 3 years in Various Lots in D.D. 90 and Adjoining Government Land, Lin Ma Hang Road, San Uk Ling, Ma Kam To

Appendix C – Site Photographs (Dated June 2021, March 2022 and December 2023)

See Plan for Locations. Original Site conditions for Sites A and B have been superseded by the As-constructed details (workshops and drainage facilities) and relevant (original) photographs have therefore been omitted from this DIA.



Plate 1 – Small External Catchment (North of Site C)



Plate 2 – Original ground sloping away from Site C



Plate 3 – Existing/original ground sloping away from Site C



Plate 4 – Existing Site C (December 2023)



Plate 5 – Site D



Plate 6 – Sites D and E



Plate 7 – Site E



Plate 8 – Existing Eastern Streamcourse



Plate 9 – Drainage Crossing Beneath Lin Ma Hang Road (view from the North)



Plate 10 – Catchpit at Southern Side of Lin Ma Hang Road



Runoff Calculations

1 in 10 vear AB

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Overall Catchment Areas and Run-off towards Western (Main) Streamcourse (1 in 10 Year)

Refer:

DSD Stormwater Drainage Manual (SDM) - facilities already constructed.

Notes:

Intensity = a/(t_c+b)^c

The existing Site comprises some small buildings, temporary structures & hard paving (concrete); C = 0.95, some hardstanding (broken asphalt), C = 0.7, and some areas of flat vegetation, C = 0.2

The existing areas of paving, etc. are estimated from survey plans, Google Earth and other Site records The future Site will comprise buildings, flat paving and access roads, etc.; C = 1.0. Also, some landscape buffer zones, C = 0.25

The overall catchment mostly comprises steep naturally vegetated hillsides; C = 0.35

The Site is at Lin Ma Hang Road - North District

The catchments are fairy small, so Rational Method is appropriate.

Runoff from Sites C & D are to be diverted towards the East after the proposed development

1 in 10 year 1157.7 19.04 0.597 Catchment Area Levels (mPD) Fall Overland, L Channel, L Fall, H Overland t Velocity Flow Time Total t Runoff Run-off Intensity (Channel) (Channel) Coefficie (m²) (m³/s) Upstream Downstream (m) (m) (m) m/100m (min) (m/s) (min) (min) (mm/h) Existing (Original) Situation for Streamcourse to the West The Site Sites A & B 9.020 11.4 9.18 2.19 96 2.3 4.7 4.7 175 --Structures/Temporary Structures & Hard Paving (Paved) 902 0.95 0.042 Hardstanding (Paved) 2,951 0.75 0.107 Vegetated Areas (Unpaved) 0.050 5,168 0.20 Tota 0.199 Western Site (Sites C and D - Catchments 1 & 3) 8,209 26 10.35 15.65 162 9.7 6.0 6.0 169 _ . Temporary Structures & Hard Paving (Paved) 1,100 0.95 0.049 Hardstanding (Paved) 1.714 0.75 0.060 Vegetated Areas (Unpaved 5,395 0.20 0.051 Tota 0.160 **Overall Catchment** Overall Catchment Area 385,662 80 25 55 238 652 23.1 5.1 10.9 15.9 139 Paving @ 2.5% of the Area (Paved) 96.416 0.90 3.345 Vegetated Areas (Unpaved) 289,247 0.35 3.902 7.247 Total Sites A, B & C contribution to Overall Catchment Runoff Total Area 17.229 139 Structures/Temporary Structures & Hard Paving (Paved) 2.002 0.95 0.073 Hardstanding (Paved) 4.665 0.75 0.135 Vegetated Areas (Unpaved) 10,563 0.20 0.081 0.290 Tota Future Situation The Site Sites A & B 9.020 5.0 173 Buildings and Paving (Paved) 8.868 1 00 0.428 Buffer Zone (Unpaved) 152 0.20 0.001 0.429 Tota **Overall Catchment** Sites A & B contribution to Overall Catchment Runoff 9.020 139 Total Area Buildings and Paving (Paved) 8.868 0.325 0.95 Vegetated Areas (Unpaved) 152 0.20 0.001 Total 0.326

a, b and c from the DSD Stormwater Manual (Table 3d - North Dist

b а c

1 in 10 year CDE

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Overall Catchment Areas and Run-off (1 in 10 Year)

<u>Refer:</u> DSD Stormwater Drainage Manual (SDM), including SDM Corrigendum No. 1/2024

<u>Notes:</u> The existing (original) Site comprises mostly areas of flat vegetation, with some mild slopes, C = 0.2 The existing areas of paving, etc. are estimated from survey plans and other Site records The future Site will comprise buildings, flat paving and access roads, etc.; C = 1.0. Also, some landscape buffer zones, C = 0.25 The overall upstream catchment mostly comprises steep naturally vegetated hillsides; C = 0.35 The Site is at Lin Ma Hang Road - North District The catchments are fairy small, so Rational Method is appropriate. Runoff from Sites C & D are to be diverted towards the East after the proposed development

Intensity = a/(t_c+b)^c

a, b and c from the DSD Stormwater Manual (Table 3d - North Dist

а b С 1 in 10 year 454.9 3.44 0.412

Catchment	Area	Levels	(mPD)	Fa	Ovenland, L	Channel, L	Fa∎, H	Overland $t_{\rm c}$	Velocity (Channel)	Flow Time (Channel)	Total t _c *	Intensity	Runoff Coefficient	Run-off
	(m ²)	Upstream	Downstream	(m)	(m)	(m)	(m/100m)	(min)	(channel) (m/s)	(min)	(min)	(mm/h)	Coemcient	(m ³ /s)
Existing (Original) Situation for Streamcourse to the East														
Overall Catchment														
Upstream Catchment Structures/Temporary Structures & Hard Paving (Paved) Vegetated Hills (Unpaved) Tota l	17,015 3,748 13,267	75.0	10	65.0	254	-	25.6	7.3	-	-	7.3	171	0.95 0.35	0.170 0.221 0.391
Site E (Catchments 2 and 4, plus 630RP) Temporary Structures & Hard Paving (Paved) Hardstanding (Paved) Vegetated Areas (Unpaved) Total	7,023 0 351 6,672	22	11.4	10.6	160	-	6.6	6.5	-	-	6.5	176	0.95 0.75 0.20	0.000 0.013 <u>0.065</u> 0.078
Total to Eastern Stream														
Overall Discharge to Eastern Stream from Upstream Catchment and the Site Total Area Structures/Temporary Structures & Hard Paving (Paved) Vegetated Areas (Unpaved) Vegetated Hills (Unpaved) Tota l	24,038 3,748 6,672 13,267											171	0.95 0.20 0.35	0.170 0.064 0.221 0.454
Future Situation														
Overall Catchment														
Upstream Catchment Structures/Temporary Structures & Hard Paving (Paved) Vegetated Areas (Unpaved) Tota l	17,015 3,748 13,267	75.0	10	65	254	-	25.6	7.3	-	-	7.3	171	0.95 0.35	0.170 0.221 0.391
The Site (Sites C, D & E plus local external catchments) Buildings and Paving (Paved) Buffer Zone (Unpaved) Upstream Catchments (3 & 4) Lot 630RP Total	15,232 11,389 104 2,649 1,090										6.0	180	1.00 0.20 0.35 0.20	0.571 0.001 0.046 0.011 0.630
Total to Eastern Stream														
Overall Discharge to Eastern Stream from Upstream Catchment and the Site Total Area Site Structures & Hard Paving (Paved) Upstream Temporary Structures (Paved) Vegetated Hills (Unpaved) Tota l	32,247 11,389 3,748 15,916											171	1.00 0.95 0.35	0.543 0.170 0.265 0.978

*Assumed t_c for Future Situation



Hydrograph and Storage Calculations

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Hydrographs and Storage - Sites A & B <u>10-Minute Duration</u>

Hydrographs and Storage Volumes based on full hydrographs using storm profiles from the DSD SDM 5th Edition (Refer to SDM Table 5d - Storm Profile for North District and Figure 6)

Assume Site Areas are equally divided over the time of Concentration, i.e. t_c = 5 minutes, so 20% of the Site over each minute

<u>(m²)</u>	<u>C Value</u>	Average C
9,020		0.987
8,868	1.00	
152	0.20	
	<u>(m²)</u> 9,020 8,868 152	(m ²) <u>C Value</u> 9,020 8,868 1.00 152 0.20

Case 1 - 10-minute duration, 1 in 10-year

Time	Rainfall	Area	Area 1	Area 2	Area 3	Area 4	Area 5	Overall	Original	Excess	Excess
	Intensity	A, $m^2 =$	1804	1804	1804	1804	1804	Runoff	Peak	Discharge	Volume
	-	C =	0.987	0.987	0.987	0.987	0.987	Hydrograph	Discharge		in Time
			Runoff	Runoff	Runoff	Runoff	Runoff		-		Period
(min)	(mm/hr)		(m ³ /s)	(m ³)							
0	0		0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.0
0.5	123		0.061	0.000	0.000	0.000	0.000	0.061	0.200	0.000	0.0
1	133		0.066	0.000	0.000	0.000	0.000	0.066	0.200	0.000	0.0
1.5	133		0.066	0.061	0.000	0.000	0.000	0.127	0.200	0.000	0.0
2	145		0.072	0.066	0.000	0.000	0.000	0.138	0.200	0.000	0.0
2.5	145		0.072	0.066	0.061	0.000	0.000	0.198	0.200	0.000	0.0
3	160		0.079	0.072	0.066	0.000	0.000	0.217	0.200	0.017	0.5
3.5	160		0.079	0.072	0.066	0.061	0.000	0.278	0.200	0.078	2.3
4	177		0.088	0.079	0.072	0.066	0.000	0.304	0.200	0.104	3.1
4.5	177		0.088	0.079	0.072	0.066	0.061	0.365	0.200	0.165	5.0
5	193		0.095	0.088	0.079	0.072	0.066	0.400	0.200	0.200	6.0
5.5	193		0.095	0.088	0.079	0.072	0.066	0.400	0.200	0.200	6.0
6	177		0.088	0.095	0.088	0.079	0.072	0.422	0.200	0.222	6.6
6.5	177		0.088	0.095	0.088	0.079	0.072	0.422	0.200	0.222	6.6
7	160		0.079	0.088	0.095	0.088	0.079	0.429	0.200	0.229	6.9
7.5	160		0.079	0.088	0.095	0.088	0.079	0.429	0.200	0.229	6.9
8	145		0.072	0.079	0.088	0.095	0.088	0.422	0.200	0.222	6.6
8.5	145		0.072	0.079	0.088	0.095	0.088	0.422	0.200	0.222	6.6
9	133		0.066	0.072	0.079	0.088	0.095	0.400	0.200	0.200	6.0
9.5	133		0.066	0.072	0.079	0.088	0.095	0.400	0.200	0.200	6.0
10	123		0.061	0.066	0.072	0.079	0.088	0.365	0.200	0.165	5.0
10.5	0		0.000	0.066	0.072	0.079	0.088	0.304	0.200	0.104	3.1
11	0		0.000	0.061	0.066	0.072	0.079	0.278	0.200	0.078	2.3
11.5	0		0.000	0.000	0.066	0.072	0.079	0.217	0.200	0.017	0.5
12	0		0.000	0.000	0.061	0.066	0.072	0.198	0.200	0.000	0.0
12.5	0		0.000	0.000	0.000	0.066	0.072	0.138	0.200	0.000	0.0
13	0		0.000	0.000	0.000	0.061	0.066	0.127	0.200	0.000	0.0
13.5	0		0.000	0.000	0.000	0.000	0.066	0.066	0.200	0.000	0.0
14	0		0.000	0.000	0.000	0.000	0.061	0.061	0.200	0.000	0.0
14.5	0		0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.0
15	0		0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.0

Total Excess Volume for Storage =

86.1 m³

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Hydrographs and Storage - Sites A & B <u>30-Minute Duration</u>

Hydrographs and Storage Volumes based on full hydrographs using storm profiles from the DSD SDM 5th Edition (Refer to SDM Table 5d - Storm Profile for North District and Figure 6)

Assume Site Areas are equally divided over the time of Concentration, i.e. t_c = 5 minutes, so 20% of the Site over each minute

<u>Average C</u>		
0.987		

Case 2 - 30-minute duration, 1 in 10-year

Time	Rainfall	Area	Area 1	Area 2	Area 3	Area 4	Area 5	Overall	Original	Excess	Excess
	Intensity	m ² =	1804	1804	1804	1804	1804	Runoff	Peak	Discharge	Volume
		C =	0.987	0.987	0.987	0.987	0.987	Hydrograph	Discharge		in Time
			Runoff	Runoff	Runoff	Runoff	Runoff	. 3	. 3	. 3	Period
(min)	(mm/hr)		(m°/s)	(m°/s)	(m°/s)	(m°/s)	(m°/s)	(m°/s)	(m°/s)	(m°/s)	(m [×])
0	0		0.000	0.000	0.000	0.000	0.000	0.000	0 200	0.000	0.0
05	72		0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.0
0.5	75		0.030	0.000	0.000	0.000	0.000	0.037	0.200	0.000	0.0
1.5	75		0.037	0.036	0.000	0.000	0.000	0.073	0.200	0.000	0.0
2	78		0.039	0.037	0.000	0.000	0.000	0.076	0.200	0.000	0.0
2.5	78		0.039	0.037	0.036	0.000	0.000	0.111	0.200	0.000	0.0
3	82		0.041	0.039	0.037	0.000	0.000	0.116	0.200	0.000	0.0
3.5	82		0.041	0.039	0.037	0.036	0.000	0.152	0.200	0.000	0.0
4	86		0.043	0.041	0.039	0.037	0.000	0.159	0.200	0.000	0.0
4.5	86		0.043	0.041	0.039	0.037	0.036	0.194	0.200	0.000	0.0
5	90		0.045	0.043	0.041	0.039	0.037	0.203	0.200	0.003	0.1
5.5	90		0.045	0.043	0.041	0.039	0.037	0.203	0.200	0.003	0.1
6	95		0.047	0.045	0.043	0.041	0.039	0.213	0.200	0.013	0.4
6.5	95		0.047	0.045	0.043	0.041	0.039	0.213	0.200	0.013	0.4
75	101		0.050	0.047	0.045	0.043	0.041	0.225	0.200	0.025	0.7
7.5	107		0.050	0.047	0.043	0.045	0.041	0.225	0.200	0.023	0.7
8.5	107		0.053	0.050	0.047	0.045	0.043	0.237	0.200	0.037	1.1
9	115		0.057	0.053	0.050	0.047	0.045	0.251	0.200	0.051	1.5
9.5	115		0.057	0.053	0.050	0.047	0.045	0.251	0.200	0.051	1.5
10	123		0.061	0.057	0.053	0.050	0.047	0.268	0.200	0.068	2.0
10.5	123		0.061	0.057	0.053	0.050	0.047	0.268	0.200	0.068	2.0
11	133		0.066	0.061	0.057	0.053	0.050	0.286	0.200	0.086	2.6
11.5	133		0.066	0.061	0.057	0.053	0.050	0.286	0.200	0.086	2.6
12	145		0.072	0.066	0.061	0.057	0.053	0.308	0.200	0.108	3.2
12.5	145		0.072	0.066	0.061	0.057	0.053	0.308	0.200	0.108	3.2
13	160		0.079	0.072	0.066	0.061	0.057	0.334	0.200	0.134	4.0
13.5	160		0.079	0.072	0.066	0.061	0.057	0.334	0.200	0.134	4.0
14	177		0.088	0.079	0.072	0.066	0.061	0.365	0.200	0.165	5.0
14.5	177		0.088	0.079	0.072	0.066	0.061	0.365	0.200	0.165	5.0
15 15 5	193		0.095	0.088	0.079	0.072	0.000	0.400	0.200	0.200	0.0
10.0	177		0.095	0.000	0.079	0.072	0.000	0.400	0.200	0.200	0.0
16.5	177		0.088	0.095	0.088	0.079	0.072	0.422	0.200	0.222	6.6
17	160		0.079	0.088	0.095	0.088	0.079	0.429	0.200	0.229	6.9
17.5	160		0.079	0.088	0.095	0.088	0.079	0.429	0.200	0.229	6.9
18	145		0.072	0.079	0.088	0.095	0.088	0.422	0.200	0.222	6.6
18.5	145		0.072	0.079	0.088	0.095	0.088	0.422	0.200	0.222	6.6
19	133		0.066	0.072	0.079	0.088	0.095	0.400	0.200	0.200	6.0
19.5	133		0.066	0.072	0.079	0.088	0.095	0.400	0.200	0.200	6.0
20	123		0.061	0.066	0.072	0.079	0.088	0.365	0.200	0.165	5.0
20.5	123		0.061	0.066	0.072	0.079	0.088	0.365	0.200	0.165	5.0
21	115		0.057	0.061	0.066	0.072	0.079	0.334	0.200	0.134	4.0
21.5	115		0.057	0.061	0.066	0.072	0.079	0.334	0.200	0.134	4.0
22 5	107		0.053	0.057	0.061	0.066	0.072	0.308	0.200	0.108	3.2
22.0	101		0.050	0.057	0.001	0.000	0.066	0.300	0.200	0.100	2.6
23.5	101		0.050	0.053	0.057	0.061	0.066	0.286	0.200	0.086	2.6
24	95		0.047	0.050	0.053	0.057	0.061	0.268	0.200	0.068	2.0
24.5	95		0.047	0.050	0.053	0.057	0.061	0.268	0.200	0.068	2.0
25	90		0.045	0.047	0.050	0.053	0.057	0.251	0.200	0.051	1.5
25.5	90		0.045	0.047	0.050	0.053	0.057	0.251	0.200	0.051	1.5
26	86		0.043	0.045	0.047	0.050	0.053	0.237	0.200	0.037	1.1
26.5	86		0.043	0.045	0.047	0.050	0.053	0.237	0.200	0.037	1.1
27	82		0.041	0.043	0.045	0.047	0.050	0.225	0.200	0.025	0.7
27.5	82		0.041	0.043	0.045	0.047	0.050	0.225	0.200	0.025	0.7
28	78		0.039	0.041	0.043	0.045	0.047	0.213	0.200	0.013	0.4
28.5	78		0.039	0.041	0.043	0.045	0.047	0.213	0.200	0.013	0.4
29	75		0.037	0.039	0.041	0.043	0.045	0.203	0.200	0.003	0.1
30	72		0.036	0.035	0.039	0.041	0.043	0.194	0.200	0.000	0.1
30.5	, 2		0.000	0.037	0.039	0.041	0.043	0.159	0.200	0.000	0.0
31	0		0.000	0.036	0.037	0.039	0.041	0.152	0.200	0.000	0.0
31.5	0		0.000	0.000	0.037	0.039	0.041	0.116	0.200	0.000	0.0
32	0		0.000	0.000	0.036	0.037	0.039	0.111	0.200	0.000	0.0
32.5	0		0.000	0.000	0.000	0.037	0.039	0.076	0.200	0.000	0.0
33	0		0.000	0.000	0.000	0.036	0.037	0.073	0.200	0.000	0.0
33.5	0		0.000	0.000	0.000	0.000	0.037	0.037	0.200	0.000	0.0
34	0		0.000	0.000	0.000	0.000	0.036	0.036	0.200	0.000	0.0
34.5	0		0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.0
35	0		0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.0

Total Excess Volume for Storage =

147.3 m³

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Hydrographs and Storage - Sites A & B <u>60-Winute Duration</u>

Hydrographs and Storage Volumes based on full hydrographs using storm profiles from the DSD SDM 5th Edition (Refer to SDM Table 5d - Storm Profile for North District and Figure 6)

Assume Site Areas are equally divided over the time of Concentration, i.e. $t_c = 5$ minutes, so 20% of the Site over each minute

	<u>(m²)</u>	C Value	Average C
Site Area	9,020		0.987
Paved	8,868	1.00	
Unpaved	152	0.20	
Case 3 - 60-mi	nute duration,	1 in 10-year	

Time	Rainfall Intensity	Area m ² =	Area 1 1804	Area 2 1804	Area 3 1804	Area 4 1804	Area 5 1804	Overall Runoff	Original Peak	Excess Discharge	Excess Volume
(min)	(mm/hr)	C =	Runoff (m ³ /s)	0.987 Runoff (m ³ /s)	0.987 Runoff (m ³ /s)	Runoff (m ³ /s)	Runoff (m ³ /s)	(m ³ /s)	(m ³ /s)	(m ³ /s)	Period (m ³)
0	0		0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.0
0.5	47 48 48		0.023 0.024 0.024	0.000	0.000	0.000	0.000	0.023 0.024 0.047	0.200	0.000	0.0
2	49		0.024 0.024	0.024	0.000 0.023	0.000	0.000	0.048	0.200	0.000	0.0
3 3.5	50 50		0.025	0.024 0.024	0.024 0.024	0.000	0.000 0.000	0.073	0.200	0.000	0.0 0.0
4 4.5	51 51		0.025	0.025	0.024 0.024	0.024 0.024	0.000 0.023	0.098	0.200	0.000	0.0 0.0
5 5.5	52 52		0.026	0.025	0.025	0.024	0.024	0.124	0.200	0.000	0.0
6.5	54 54		0.027	0.026	0.025	0.025	0.024	0.127	0.200	0.000	0.0
7.5	55 57		0.027	0.027	0.026	0.025	0.025	0.130	0.200	0.000	0.0
8.5 9	57 59		0.028	0.027	0.027	0.026	0.025	0.133	0.200	0.000	0.0
9.5 10	59 60		0.029 0.030	0.028	0.027 0.028	0.027 0.027	0.026 0.027	0.137 0.141	0.200	0.000	0.0 0.0
10.5	60 62		0.030	0.029	0.028	0.027	0.027	0.141	0.200	0.000	0.0
11.5 12 12.5	64 64		0.031	0.030	0.029	0.028	0.027	0.145	0.200	0.000	0.0
13	67 67		0.033	0.032	0.031	0.030	0.029	0.154	0.200	0.000	0.0
14 14.5	69 69		0.034 0.034	0.033	0.032	0.031 0.031	0.030	0.159 0.159	0.200	0.000	0.0
15 15.5	72 72		0.036	0.034 0.034	0.033 0.033	0.032 0.032	0.031 0.031	0.165 0.165	0.200	0.000	0.0 0.0
16 16.5	75 75 70		0.037	0.036	0.034	0.033	0.032	0.172	0.200	0.000	0.0
17.5	78		0.039	0.037	0.036	0.034	0.033	0.179 0.179 0.186	0.200	0.000	0.0
18.5 19	82		0.041 0.043	0.039	0.037	0.036	0.034	0.186	0.200	0.000	0.0
19.5 20	86 90		0.043 0.045	0.041 0.043	0.039 0.041	0.037 0.039	0.036 0.037	0.194 0.203	0.200	0.000	0.0 0.1
20.5 21	90 95		0.045	0.043	0.041	0.039 0.041	0.037 0.039	0.203	0.200	0.003	0.1
21.5 22	95 101		0.047	0.045	0.043	0.041	0.039	0.213	0.200	0.013	0.4
22.5 23 23.5	107		0.053	0.047	0.045	0.045	0.041	0.225	0.200	0.025	0.7 1.1 1.1
24 24.5	115 115		0.057	0.053	0.050	0.047	0.045	0.251	0.200	0.051	1.5
25 25.5	123 123		0.061 0.061	0.057 0.057	0.053 0.053	0.050	0.047 0.047	0.268	0.200	0.068	2.0 2.0
26 26.5	133 133		0.066	0.061	0.057	0.053	0.050	0.286	0.200	0.086	2.6 2.6
27 27.5 28	145 145 160		0.072	0.066	0.061 0.061 0.066	0.057 0.057 0.061	0.053 0.053 0.057	0.308 0.308 0.334	0.200	0.108 0.108 0.134	3.2 3.2 4.0
28.5 29	160		0.079	0.072	0.066	0.061	0.057	0.334	0.200	0.134	4.0
29.5 30	177 193		0.088 0.095	0.079	0.072	0.066	0.061	0.365	0.200	0.165	5.0 6.0
30.5 31	193 177		0.095 0.088	0.088 0.095	0.079 0.088	0.072 0.079	0.066 0.072	0.400	0.200	0.200	6.0 6.6
31.5 32	177		0.088	0.095	0.088	0.079	0.072	0.422	0.200	0.222	6.6 6.9
32.5 33	145		0.079	0.079	0.095	0.088	0.079	0.429	0.200	0.229	6.6
34 34.5	133		0.066	0.072	0.079	0.088	0.095	0.400	0.200	0.200	6.0 6.0
35 35.5	123 123		0.061 0.061	0.066	0.072 0.072	0.079 0.079	0.088 0.088	0.365	0.200	0.165 0.165	5.0 5.0
36 36.5	115		0.057	0.061	0.066	0.072	0.079	0.334	0.200	0.134	4.0
37 37.5 38	107		0.053	0.057	0.061	0.066	0.072	0.308	0.200	0.108	3.2 3.2 2.6
38.5 39	101		0.050	0.053	0.057	0.061	0.066	0.286	0.200	0.086	2.6
39.5 40	95 90		0.047 0.045	0.050 0.047	0.053	0.057	0.061 0.057	0.268	0.200	0.068	2.0 1.5
40.5 41	90 86		0.045	0.047	0.050	0.053	0.057	0.251 0.237	0.200	0.051 0.037	1.5
41.5 42	86 82 82		0.043	0.045	0.047	0.050	0.053	0.237	0.200	0.037	1.1 0.7
43	78		0.039	0.041	0.043	0.045	0.047	0.213	0.200	0.013	0.4
44 44.5	75 75		0.037 0.037	0.039 0.039	0.041 0.041	0.043 0.043	0.045 0.045	0.203	0.200	0.003	0.1 0.1
45 45.5	72		0.036	0.037	0.039	0.041	0.043	0.194	0.200	0.000	0.0
46.5	69 67		0.034 0.033	0.036	0.037	0.039	0.041	0.186	0.200	0.000	0.0
47.5 48	67 64		0.033 0.032	0.034 0.033	0.036	0.037	0.039	0.179	0.200	0.000	0.0 0.0
48.5 49	64 62		0.032 0.031	0.033 0.032	0.034 0.033	0.036 0.034	0.037 0.036	0.172 0.165	0.200	0.000	0.0 0.0
49.5 50	62 60		0.031	0.032	0.033	0.034	0.036	0.165	0.200	0.000	0.0
50.5 51	59 59		0.030	0.031	0.032	0.033	0.034	0.159 0.154 0.154	0.200	0.000	0.0
52 52.5	57 57		0.028	0.029	0.030	0.031	0.032	0.149	0.200	0.000	0.0
53 53.5	55 55		0.027 0.027	0.028	0.029 0.029	0.030 0.030	0.031 0.031	0.145 0.145	0.200	0.000	0.0 0.0
54 54.5	54 54		0.027 0.027	0.027	0.028 0.028	0.029 0.029	0.030 0.030	0.141 0.141	0.200	0.000	0.0 0.0
55 55.5	52 52		0.026	0.027	0.027	0.028	0.029	0.137	0.200	0.000	0.0
56 56.5 57	51 51		0.025	0.026	0.027	0.027 0.027 0.027	0.028	0.133 0.133 0.130	0.200	0.000	0.0
57.5 58	50 50 49		0.025	0.025	0.026	0.027	0.027	0.130	0.200	0.000	0.0
58.5 59	49 48		0.024	0.025	0.025	0.026	0.027	0.127	0.200	0.000	0.0
59.5 60	48 47		0.024 0.023	0.024 0.024	0.025 0.024	0.025 0.025	0.026 0.025	0.124 0.121	0.200	0.000 0.000	0.0 0.0
60.5 61	0		0.000	0.024	0.024	0.025	0.025	0.098	0.200	0.000	0.0
61.5 62	0		0.000	0.000	0.024	0.024	0.025	0.073	0.200	0.000	0.0
63 63 5	0		0.000	0.000	0.000	0.024	0.024	0.048	0.200	0.000	0.0
64 64.5	0		0.000	0.000	0.000	0.000	0.023	0.023	0.200	0.000	0.0
65	0		0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.000	0.0

Total Excess Volume for Storage = 147.3 m³







C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Hydrographs and Storage - Sites C, D and E <u>10-Minute Duration</u>

Hydrographs and Storage Volumes based on full hydrographs using (1 in 10-year) storm profiles from the DSD SDM Corrigendum 1/2024 (Refer to SDM Corrigendum 1/2024, Table 5d - Storm Profile for North District and Figure 6)

Assume Site Areas are equally divided over the time of Concentration, i.e. t_c = 6 minutes, so 1/6 of the Site over each minute

	<u>(m²)</u>	<u>C Value</u>	Average C
Site Area	15,232		0.810
Paved	11,389	1.00	
Buffer Zone	104	0.20	
Local Catchments	2.649	0.35	

Case 1 - 10-minute duration, 1 in 10-year

Time	Rainfall	Area	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Overall	Proposed	Excess	Excess
	Intensity	m ² =	2538.7	2538.7	2538.7	2538.7	2538.7	2538.7	Runoff	Peak	Discharge	Volume
		C =	0.810	0.810	0.810	0.810	0.810	0.810	Hydrograph	Discharge		in Time
			Runoff	Runoff	Runoff	Runoff	Runoff	Runoff				Period
(min)	(mm/hr)		(m ³ /s)	(m ³)								
0	0		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.0
0.5	100		0.057	0.000	0.000	0.000	0.000	0.000	0.057	0.250	0.000	0.0
1	108		0.062	0.000	0.000	0.000	0.000	0.000	0.062	0.250	0.000	0.0
1.5	108		0.062	0.057	0.000	0.000	0.000	0.000	0.119	0.250	0.000	0.0
2	119		0.068	0.062	0.000	0.000	0.000	0.000	0.130	0.250	0.000	0.0
2.5	119		0.068	0.062	0.057	0.000	0.000	0.000	0.187	0.250	0.000	0.0
3	133		0.076	0.068	0.062	0.000	0.000	0.000	0.206	0.250	0.000	0.0
3.5	133		0.076	0.068	0.062	0.057	0.000	0.000	0.263	0.250	0.013	0.4
4	156		0.089	0.076	0.068	0.062	0.000	0.000	0.295	0.250	0.045	1.3
4.5	156		0.089	0.076	0.068	0.062	0.057	0.000	0.352	0.250	0.102	3.1
5	194		0.111	0.089	0.076	0.068	0.062	0.000	0.406	0.250	0.156	4.7
5.5	194		0.111	0.089	0.076	0.068	0.062	0.057	0.463	0.250	0.213	6.4
6	246		0.141	0.111	0.089	0.076	0.068	0.062	0.546	0.250	0.296	8.9
6.5	246		0.141	0.111	0.089	0.076	0.068	0.062	0.546	0.250	0.296	8.9
7	194		0.111	0.141	0.111	0.089	0.076	0.068	0.596	0.250	0.346	10.4
7.5	194		0.111	0.141	0.111	0.089	0.076	0.068	0.596	0.250	0.346	10.4
8	156		0.089	0.111	0.141	0.111	0.089	0.076	0.617	0.250	0.367	11.0
8.5	156		0.089	0.111	0.141	0.111	0.089	0.076	0.617	0.250	0.367	11.0
9	133		0.076	0.089	0.111	0.141	0.111	0.089	0.617	0.250	0.367	11.0
9.5	133		0.076	0.089	0.111	0.141	0.111	0.089	0.617	0.250	0.367	11.0
10	119		0.068	0.076	0.089	0.111	0.141	0.111	0.596	0.250	0.346	10.4
10.5	119		0.068	0.076	0.089	0.111	0.141	0.111	0.596	0.250	0.346	10.4
11	108		0.062	0.068	0.076	0.089	0.111	0.141	0.546	0.250	0.296	8.9
11.5	108		0.062	0.068	0.076	0.089	0.111	0.141	0.546	0.250	0.296	8.9
12	100		0.057	0.062	0.068	0.076	0.089	0.111	0.463	0.250	0.213	6.4
12.5	0		0.000	0.062	0.068	0.076	0.089	0.111	0.406	0.250	0.156	4./
10	0		0.000	0.057	0.062	0.068	0.076	0.089	0.352	0.250	0.102	3.1
13.5	0		0.000	0.000	0.062	0.068	0.076	0.089	0.295	0.250	0.045	1.3
14	0		0.000	0.000	0.057	0.062	0.068	0.076	0.263	0.250	0.013	0.4
14.0	0		0.000	0.000	0.000	0.062	0.000	0.070	0.200	0.250	0.000	0.0
15	0		0.000	0.000	0.000	0.057	0.062	0.068	0.119	0.250	0.000	0.0
10.0	0		0.000	0.000	0.000	0.000	0.062	0.068	0.062	0.250	0.000	0.0
16.5	0		0.000	0.000	0.000	0.000	0.057	0.062	0.057	0.250	0.000	0.0
10.5	0		0.000	0.000	0.000	0.000	0.000	0.062	0.000	0.250	0.000	0.0
17.5	0		0.000	0.000	0.000	0.000	0.000	0.057	0.000	0.250	0.000	0.0
17.5	0		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.0
18	0		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.0

Total Excess Volume for Storage = 152.8 m³

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Hydrographs and Storage - Sites C, D and E <u>30-Minute Duration</u>

Hydrographs and Storage Volumes based on full hydrographs using (1 in 10-year) storm profiles from the DSD SDM Corrigendum 1/2024 (Refer to SDM Corrigendum 1/2024, Table 5d - Storm Profile for North District and Figure 6)

Assume Site Areas are equally divided over the time of Concentration, i.e. t_c = 6 minutes, so 1/6 of the Site over each minute

	<u>(m²)</u>	<u>C Value</u>	Average C
Site Area	15,232		0.810
Paved	11,389	1.00	
Unpaved	104	0.20	
Local Catchments	2.649	0.35	

Case 2 - 30-minute duration, 1 in 10-year

Time	Rainfa	Area	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Overa	Original	Excess	Excess
	Intensity	m ² =	2538.7	2538.7	2538.7	2538.7	2538.7	2538.7	Runoff	Peak	Discharge	Volume
		C =	0.810	0.810	0.810	0.810	0.810	0.810	Hydrograph	Discharge	_	in Time
			Runoff	Runoff	Runoff	Runoff	Runoff	Runoff				Period
(min)	(mm/hr)		(m³/s)	(m³/s)	(m³/s)	(m³)						
0	0		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.000	0.0
05	68		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.0
0.0	70		0.040	0.000	0.000	0.000	0.000	0.000	0.040	0.250	0.000	0.0
1.5	70		0.040	0.039	0.000	0.000	0.000	0.000	0.079	0.250	0.000	0.0
2	72		0.041	0.040	0.000	0.000	0.000	0.000	0.081	0.250	0.000	0.0
2.5	72		0.041	0.040	0.039	0.000	0.000	0.000	0.120	0.250	0.000	0.0
3	74		0.042	0.041	0.040	0.000	0.000	0.000	0.123	0.250	0.000	0.0
3.5	74		0.042	0.041	0.040	0.039	0.000	0.000	0.162	0.250	0.000	0.0
4	77		0.044	0.042	0.041	0.040	0.000	0.000	0.167	0.250	0.000	0.0
4.5	//		0.044	0.042	0.041	0.040	0.039	0.000	0.206	0.250	0.000	0.0
55	80		0.046	0.044	0.042	0.041	0.040	0.039	0.213	0.250	0.000	0.0
6	84		0.048	0.046	0.044	0.042	0.041	0.040	0.261	0.250	0.011	0.3
6.5	84		0.048	0.046	0.044	0.042	0.041	0.040	0.261	0.250	0.011	0.3
7	89		0.051	0.048	0.046	0.044	0.042	0.041	0.272	0.250	0.022	0.7
7.5	89		0.051	0.048	0.046	0.044	0.042	0.041	0.272	0.250	0.022	0.7
8	94		0.054	0.051	0.048	0.046	0.044	0.042	0.285	0.250	0.035	1.0
8.5	94		0.054	0.051	0.048	0.046	0.044	0.042	0.285	0.250	0.035	1.0
9	100		0.057	0.054	0.051	0.048	0.046	0.044	0.300	0.250	0.050	1.5
9.5	100		0.057	0.054	0.054	0.048	0.048	0.044	0.300	0.250	0.050	2.0
10.5	108		0.062	0.057	0.054	0.051	0.048	0.046	0.317	0.250	0.067	2.0
11	119		0.068	0.062	0.057	0.054	0.051	0.048	0.340	0.250	0.090	2.7
11.5	119		0.068	0.062	0.057	0.054	0.051	0.048	0.340	0.250	0.090	2.7
12	133		0.076	0.068	0.062	0.057	0.054	0.051	0.368	0.250	0.118	3.5
12.5	133		0.076	0.068	0.062	0.057	0.054	0.051	0.368	0.250	0.118	3.5
13	156		0.089	0.076	0.068	0.062	0.057	0.054	0.406	0.250	0.156	4.7
13.5	156		0.089	0.076	0.068	0.062	0.057	0.054	0.406	0.250	0.156	4.7
14	194		0.111	0.089	0.076	0.008	0.062	0.057	0.403	0.250	0.213	6.4
15	246		0.141	0.000	0.089	0.000	0.068	0.062	0.400	0.250	0.216	8.9
15.5	246		0.141	0.111	0.089	0.076	0.068	0.062	0.546	0.250	0.296	8.9
16	194		0.111	0.141	0.111	0.089	0.076	0.068	0.596	0.250	0.346	10.4
16.5	194		0.111	0.141	0.111	0.089	0.076	0.068	0.596	0.250	0.346	10.4
17	156		0.089	0.111	0.141	0.111	0.089	0.076	0.617	0.250	0.367	11.0
17.5	156		0.089	0.111	0.141	0.111	0.089	0.076	0.617	0.250	0.367	11.0
18	133		0.076	0.089	0.111	0.141	0.111	0.089	0.617	0.250	0.367	11.0
10.5	133		0.078	0.089	0.111	0.141	0.111	0.089	0.617	0.250	0.367	10.4
19.5	119		0.068	0.076	0.089	0.111	0.141	0.111	0.596	0.250	0.346	10.4
20	108		0.062	0.068	0.076	0.089	0.111	0.141	0.546	0.250	0.296	8.9
20.5	108		0.062	0.068	0.076	0.089	0.111	0.141	0.546	0.250	0.296	8.9
21	100		0.057	0.062	0.068	0.076	0.089	0.111	0.463	0.250	0.213	6.4
21.5	100		0.057	0.062	0.068	0.076	0.089	0.111	0.463	0.250	0.213	6.4
22	94		0.054	0.057	0.062	0.068	0.076	0.089	0.406	0.250	0.156	4.7
22.5	94		0.054	0.057	0.062	0.068	0.076	0.089	0.406	0.250	0.156	4.7
23.5	89		0.051	0.054	0.057	0.062	0.068	0.076	0.368	0.250	0 118	3.5
24	84		0.048	0.051	0.054	0.057	0.062	0.068	0.340	0.250	0.090	2.7
24.5	84		0.048	0.051	0.054	0.057	0.062	0.068	0.340	0.250	0.090	2.7
25	80		0.046	0.048	0.051	0.054	0.057	0.062	0.317	0.250	0.067	2.0
25.5	80		0.046	0.048	0.051	0.054	0.057	0.062	0.317	0.250	0.067	2.0
26	77		0.044	0.046	0.048	0.051	0.054	0.057	0.300	0.250	0.050	1.5
26.5	74		0.044	0.046	0.048	0.051	0.054	0.057	0.300	0.250	0.050	1.5
27 5	74		0.042	0.044	0.046	0.048	0.051	0.054	0.285	0.250	0.035	1.0
28	72		0.041	0.042	0.044	0.046	0.048	0.051	0.272	0.250	0.022	0.7
28.5	72		0.041	0.042	0.044	0.046	0.048	0.051	0.272	0.250	0.022	0.7
29	70		0.040	0.041	0.042	0.044	0.046	0.048	0.261	0.250	0.011	0.3
29.5	70		0.040	0.041	0.042	0.044	0.046	0.048	0.261	0.250	0.011	0.3
30	68		0.039	0.040	0.041	0.042	0.044	0.046	0.252	0.250	0.002	0.1
30.5	0		0.000	0.040	0.041	0.042	0.044	0.046	0.213	0.250	0.000	0.0
31	0		0.000	0.039	0.040	0.041	0.042	0.044	0.206	0.250	0.000	0.0
31.5 32	0		0.000	0.000	0.040	0.041	0.042	0.044	0.107	0.250	0.000	0.0
32.5	0		0.000	0.000	0.000	0.040	0.041	0.042	0.123	0.250	0.000	0.0
33	0		0.000	0.000	0.000	0.039	0.040	0.041	0.120	0.250	0.000	0.0
33.5	0		0.000	0.000	0.000	0.000	0.040	0.041	0.081	0.250	0.000	0.0
34	0		0.000	0.000	0.000	0.000	0.039	0.040	0.079	0.250	0.000	0.0
34.5	0		0.000	0.000	0.000	0.000	0.000	0.040	0.040	0.250	0.000	0.0
35	0		0.000	0.000	0.000	0.000	0.000	0.039	0.039	0.250	0.000	0.0
35.5	0		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.0

Total Excess Volume for Storage = 212.5 m³

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Hydrographs and Storage - Sites C, D and E <u>60-Minute Duration</u>

Hydrographs and Storage Volumes based on full hydrographs using (1 in 10-year) storm profiles from the DSD SDM Corrigendum 1/2024 (Refer to SDM Corrigendum 1/2024, Table 5d - Storm Profile for North District and Figure 6)

Assume Site Areas are equally divided over the time of Concentration, i.e. t_c = 6 minutes, so 1/6 of the Site over each minute

	<u>(m²)</u>	C Value	Average C
Site Area	15,232		0.810
Paved	11,389	1.00	
Unpaved	104	0.20	
Local Catchm	2,649	0.35	
Case 3 - 60-min	ute duration.	1 in 10-vear	

Intern C* And And<	Time	Rainfa	Area	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Overall	Original	Excess	Excess
D C Note of the set		Intensity	m ² =	2538.7	2538.7	2538.7	2538.7	2538.7	2538.7	Runoff	Peak	Discharge	Volume
mm			C =	0.810 Runoff	0.810 Runoff	0.810 Rupoff	0.810 Rupoff	0.810 Runoff	0.810 Runoff	Hydrograph	Discharge		in Time Period
	(min)	(mm/hr)		(m ³ /s)	(m ³)								
	0	0		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.0
	1	51		0.029	0.000	0.000	0.000	0.000	0.000	0.029	0.250	0.000	0.0
	1.5	51		0.029	0.029	0.000	0.000	0.000	0.000	0.058	0.250	0.000	0.0
	2 2 5	52		0.030	0.029	0.000	0.000	0.000	0.000	0.059	0.250	0.000	0.0
	3	53		0.030	0.020	0.029	0.000	0.000	0.000	0.089	0.250	0.000	0.0
	3.5	53		0.030	0.030	0.029	0.029	0.000	0.000	0.118	0.250	0.000	0.0
	4	53		0.030	0.030	0.030	0.029	0.000	0.000	0.119	0.250	0.000	0.0
	4.5	54		0.031	0.030	0.030	0.023	0.029	0.000	0.150	0.250	0.000	0.0
	5.5	54		0.031	0.030	0.030	0.030	0.029	0.029	0.179	0.250	0.000	0.0
	6	55		0.031	0.031	0.030	0.030	0.030	0.029	0.182	0.250	0.000	0.0
	0.0	56		0.031	0.031	0.030	0.030	0.030	0.029	0.162	0.250	0.000	0.0
	7.5	56		0.032	0.031	0.031	0.030	0.030	0.030	0.185	0.250	0.000	0.0
	8	57		0.033	0.032	0.031	0.031	0.030	0.030	0.187	0.250	0.000	0.0
	8.5 9	58		0.033	0.032	0.031	0.031	0.030	0.030	0.187	0.250	0.000	0.0
	9.5	58		0.033	0.033	0.032	0.031	0.031	0.030	0.190	0.250	0.000	0.0
	10	60		0.034	0.033	0.033	0.032	0.031	0.031	0.194	0.250	0.000	0.0
	10.5	60		0.034	0.033	0.033	0.032	0.031	0.031	0.194	0.250	0.000	0.0
	11.5	61		0.035	0.034	0.033	0.033	0.032	0.031	0.198	0.250	0.000	0.0
	12	62		0.035	0.035	0.034	0.033	0.033	0.032	0.202	0.250	0.000	0.0
11.5. 64 0.037 0.038 0.	12.5	64		0.035	0.035	0.034	0.033	0.033	0.032	0.202	0.250	0.000	0.0
Hei Dot DotS D	13.5	64		0.037	0.035	0.035	0.034	0.033	0.033	0.207	0.250	0.000	0.0
	14	66		0.038	0.037	0.035	0.035	0.034	0.033	0.212	0.250	0.000	0.0
15.5 0.00 0.0000 0.000 0.000	14.0	00 68		0.038	0.037	0.035	0.035	0.034	0.033	0.212	0.250	0.000	0.0
Her TO D.S.C. D.S.C. <thd.s.c.< th=""> <thd.s.c.< th=""> <thd.s.c.< th=""></thd.s.c.<></thd.s.c.<></thd.s.c.<>	15.5	68		0.039	0.038	0.037	0.035	0.035	0.034	0.218	0.250	0.000	0.0
"17 72 0.01 0.08 0.03 0.	16	70		0.040	0.039	0.038	0.037	0.035	0.035	0.224	0.250	0.000	0.0
17.7 72 0.041 0.049 0.049 0.035 0.041 0.044 0.0	17	72	1	0.041	0.040	0.039	0.038	0.037	0.035	0.230	0.250	0.000	0.0
n n 0.44 0.44 0.44 0.45 0.35 <th0.35< th=""> 0.35 0.35<!--</td--><td>17.5</td><td>72</td><td>1</td><td>0.041</td><td>0.040</td><td>0.039</td><td>0.038</td><td>0.037</td><td>0.035</td><td>0.230</td><td>0.250</td><td>0.000</td><td>0.0</td></th0.35<>	17.5	72	1	0.041	0.040	0.039	0.038	0.037	0.035	0.230	0.250	0.000	0.0
10 77 0.042 0.042 0.041	18 18 5	74 74	1	0.042 n n42	0.041	0.040	0.039	0.038	0.037	0.237	0.250	0.000	0.0
119.1 7 0.044 0.042 0.042 0.044 0.058 0.044 0.058 0.044 0.058 0.044 0.058 0.044 0.058 0.044 0.044 0.046 0.044 <th0.044< th=""> <th0.044< th=""> 0.044</th0.044<></th0.044<>	19	77	1	0.044	0.042	0.041	0.040	0.039	0.038	0.244	0.250	0.000	0.0
n.n. b.o.de b.o.de <td>19.5</td> <td>77</td> <td>1</td> <td>0.044</td> <td>0.042</td> <td>0.041</td> <td>0.040</td> <td>0.039</td> <td>0.038</td> <td>0.244</td> <td>0.250</td> <td>0.000</td> <td>0.0</td>	19.5	77	1	0.044	0.042	0.041	0.040	0.039	0.038	0.244	0.250	0.000	0.0
21 64 0.048 0.048 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.049 0.044	20	80 80	1	0.046	0.044	0.042	0.041	0.040	0.039	0.252	0.250	0.002	0.1
21.2 84 0.048 0.048 0.046 0.046 0.046 0.046 0.047 0.038 0.038 0.038 23.3 84 0.058 0.058 0.048 0.044	21	84	1	0.048	0.046	0.044	0.042	0.041	0.040	0.261	0.250	0.011	0.3
4.4 0.0011 0.001 0.001 <th0< td=""><td>21.5</td><td>84</td><td>1</td><td>0.048</td><td>0.046</td><td>0.044</td><td>0.042</td><td>0.041</td><td>0.040</td><td>0.261</td><td>0.250</td><td>0.011</td><td>0.3</td></th0<>	21.5	84	1	0.048	0.046	0.044	0.042	0.041	0.040	0.261	0.250	0.011	0.3
32 94 0.054 0.054 0.054 0.054 0.054 0.054 0.055 0.055 1 23.1 0.044 0.054 0.054 0.054 0.055 0.056 0.055 0.056	22	89 89		0.051	0.048	0.046	0.044	0.042	0.041	0.272	0.250	0.022	0.7
12.2.1 14 0.054 0.044 0.044 0.044 0.044 0.044 0.044 0.045 0.035 1 2.4.5 1109 0.052 0.054 0.054 0.044 0.044 0.044 0.044 0.045 0.067 0.054 0.046 0.045 0.045 0.046 0.045 0.045 0.046 0.045 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046	23	94		0.054	0.051	0.048	0.046	0.044	0.042	0.285	0.250	0.035	1.0
ab 100 0.007 0.024 0.048 0.048 0.044 0.04	23.5	94		0.054	0.051	0.048	0.046	0.044	0.042	0.285	0.250	0.035	1.0
35 100 0.002 0.007 0.004 0.004 0.017 0.208 0.007 2 25. 110 0.005 0.007 0.005 0.001 0.004 0.011 0.208 0.007 2 27 133 0.077 0.066 0.067 0.054 0.055 0.054 0.055 0.054 0.055 0.054 0.055 0.055 0.055 0.055 0.057 0.054 0.057 0.056 0.055 0.057 0.056 0.057 0.056 0.057 0.056 0.057 0.057 0.056 0.057 0.057 0.057 0.057 0.057 0.057 0.057 <th0.057< th=""> <th0.057< th=""> <th0.057< td="" th<=""><td>24 24 5</td><td>100</td><td></td><td>0.057</td><td>0.054</td><td>0.051</td><td>0.048</td><td>0.046</td><td>0.044</td><td>0.300</td><td>0.250</td><td>0.050</td><td>1.5</td></th0.057<></th0.057<></th0.057<>	24 24 5	100		0.057	0.054	0.051	0.048	0.046	0.044	0.300	0.250	0.050	1.5
25.5 106 0.062 0.051 0.064 0.054 0.054 0.054 0.056 0.067 2 28 1119 0.066 0.057 0.054 0.054 0.054 0.255 0.056 0.118 2 27.5 133 0.076 0.066 0.067 0.054 0.054 0.254 0.258 0.258 0.118 2 28 154 0.036 0.077 0.064 0.057 0.054 0.255 0.258	25	108		0.062	0.057	0.054	0.051	0.048	0.046	0.317	0.250	0.067	2.0
100 0.082 0.057 0.058 0.058 0.380 0.380 0.258 0.008 27 133 0.076 0.068 0.057 0.054 0.058 0.038 0.258 0.118 5 27 133 0.076 0.068 0.057 0.054 0.058 0.038 0.238 0.238 0.238 0.118 5 285 154 0.068 0.076 0.068 0.062 0.057 0.048 0.238	25.5	108		0.062	0.057	0.054	0.051	0.048	0.046	0.317	0.250	0.067	2.0
j 1 0.076 0.082 0.057 0.054 0.038 0.2380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 0.1380 0.2380 <t< td=""><td>26</td><td>119</td><td></td><td>0.068</td><td>0.062</td><td>0.057</td><td>0.054</td><td>0.051</td><td>0.048</td><td>0.340</td><td>0.250</td><td>0.090</td><td>2.7</td></t<>	26	119		0.068	0.062	0.057	0.054	0.051	0.048	0.340	0.250	0.090	2.7
27.5 13.8 0.076 0.062 0.077 0.064 0.088 0.248 0	27	133		0.076	0.068	0.062	0.057	0.054	0.051	0.368	0.250	0.118	3.5
abs come	27.5	133		0.076	0.068	0.062	0.057	0.054	0.051	0.368	0.250	0.118	3.5
28 194 0.111 0.088 0.075 0.088 0.002 0.043 0.228 0.218 6 30 246 0.111 0.018 0.075 0.088 0.007 0.048 0.228 0.218 6 31 194 0.111 0.141 0.111 0.048 0.076 0.068 0.059 0.228 0.238 0.244 1 1 1 1 0.141 0.141 0.041 0.048 0.076 0.068 0.049 0.238 0.044 1 1 0.048 0.047 0.238 0.047 1 1 1 0.048 0.047 0.238 0.047 1 1 1 0.048 0.047 0.238 0.047 1 1 1 0.041 0.111 0.141 0.111 0.044 0.041 0.041 0.041 0.041 0.041 0.041 0.041 0.041 0.041 0.041 0.041 0.041 0.041 0.041 0.041 <t< td=""><td>28.5</td><td>156</td><td></td><td>0.089</td><td>0.076</td><td>0.068</td><td>0.062</td><td>0.057</td><td>0.054</td><td>0.406</td><td>0.250</td><td>0.156</td><td>4.7</td></t<>	28.5	156		0.089	0.076	0.068	0.062	0.057	0.054	0.406	0.250	0.156	4.7
280 144 0.111 0.089 0.076 0.082 0.027 0.481 0.251 0.251 0.251 0.251 0.251 0.251 0.251 0.251 0.251 0.251 0.251 0.251 0.251 0.251 0.255 0.2	29	194		0.111	0.089	0.076	0.068	0.062	0.057	0.463	0.250	0.213	6.4
35 246 0.141 0.011 0.028 0.028 0.0421 0.0431	29.5	194		0.111	0.089	0.076	0.068	0.062	0.057	0.463	0.250	0.213	6.4
31 96 0.111 0.144 0.111 0.089 0.089 0.089 0.236 0.346 11 33 156 0.089 0.111 0.144 0.111 0.089 0.077 0.086 0.037 0.087 0.038 0.0111 0.141 0.111 0.144 0.111 0.444 0.255 0.347 1 34 110 0.068 0.076 0.088 0.111 0.141 0.111 0.444 0.255 0.235 0.235 0.235 0.235 0.235 0.236 0.236 0.236 0.236 0.236 0.116 0.33 0.355 0.355 0.357 0.365 0.357 0.365 0.357 </td <td>30.5</td> <td>240</td> <td></td> <td>0.141</td> <td>0.111</td> <td>0.089</td> <td>0.076</td> <td>0.068</td> <td>0.062</td> <td>0.546</td> <td>0.250</td> <td>0.296</td> <td>8.9</td>	30.5	240		0.141	0.111	0.089	0.076	0.068	0.062	0.546	0.250	0.296	8.9
31 16 0.11 0.41 0.11 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.037 0.036 0.037 11 33 133 0.076 0.088 0.111 0.141 0.111 0.046 0.047 0.236 0.337 11 33 133 0.076 0.088 0.111 0.141 0.111 0.644 0.250 0.347 134 110 0.082 0.088 0.0111 0.141 0.644 0.250 0.226 126 355 108 0.082 0.088 0.0111 0.141 0.648 0.250 0.156 4 37.5 94 0.054 0.057 0.062 0.068 0.076 0.068 0.046 0.041 0.156 44 0.044 0.044 0.045 0.057 0.062	31	194		0.111	0.141	0.111	0.089	0.076	0.068	0.596	0.250	0.346	10.4
125 156 0.088 0.111 0.141 0.011 0.089 0.017 0.230 0.337 11 33 133 0.076 0.088 0.111 0.141 0.111 0.089 0.011 0.048 0.337 11 34 119 0.068 0.077 0.089 0.111 0.141 0.446 0.280 0.337 11 34 119 0.062 0.068 0.077 0.089 0.111 0.141 0.546 0.228 0.286 0.77 0.089 0.111 0.141 0.546 0.228 0.286 0.77 0.089 0.111 0.443 0.220 0.286 0.273 0.46 0.245 0.227 0.062 0.089 0.111 0.443 0.220 0.213 6 0.237 0.237 0.44 0.245 0.237 0.200 0.248 0.230 0.118 3 3.5 3.6 0.037 0.030 0.230 0.118 3 3.5 3.6	31.5	194		0.111	0.141	0.111	0.089	0.076	0.068	0.596	0.250	0.346	10.4
33 133 0.078 0.088 0.111 0.141 0.111 0.080 0.417 0.220 0.337 11 34 119 0.668 0.076 0.088 0.111 0.141 0.548 0.220 0.346 117 34 119 0.668 0.076 0.089 0.111 0.141 0.546 0.220 0.246 0.266 35 108 0.662 0.668 0.076 0.089 0.111 0.441 0.546 0.220 0.213 0.266 36 100 0.677 0.662 0.668 0.076 0.689 0.111 0.443 0.220 0.213 0.66 37 38 60 0.057 0.062 0.066 0.076 0.388 0.220 0.118 0.33 38.5 68 0.051 0.057 0.662 0.668 0.440 0.280 0.118 0.33 39 84 0.044 0.044 0.044 0.057	32.5	156		0.089	0.111	0.141	0.111	0.089	0.076	0.617	0.250	0.367	11.0
33.5 133 0.076 0.089 0.111 0.141 0.	33	133		0.076	0.089	0.111	0.141	0.111	0.089	0.617	0.250	0.367	11.0
dat 119 0.088 0.076 0.089 0.111 0.141 0.546 0.220 0.346 11 35 108 0.062 0.068 0.076 0.089 0.111 0.141 0.546 0.220 0.228 6 35 100 0.057 0.068 0.076 0.089 0.111 0.441 0.546 0.230 0.211 6 0.230 0.211 6 0.230 0.211 6 0.230 0.211 6 0.230 0.211 6 0.33 0.346 0.057 0.062 0.068 0.076 0.388 0.230 0.118 3 3 34 6 0.051 0.054 0.057 0.062 0.317 0.240 0.088 0.310 0.230 0.118 3 3 34 6 0.054 0.057 0.062 0.317 0.240 0.041 0.041 0.044 0.044 0.054 0.057 0.052 0.317 0.230 0.020 0.037	33.5	133		0.076	0.089	0.111	0.141	0.111	0.089	0.617	0.250	0.367	11.0
5 108 0.082 0.088 0.077 0.089 0.111 0.141 0.440 0.240 0.226 0.266 35.5 100 0.087 0.082 0.068 0.077 0.089 0.111 0.443 0.240 0.213 0.213 0.213 0.213 0.213 0.224 0.213	34.5	119		0.068	0.076	0.089	0.111	0.141	0.111	0.596	0.250	0.346	10.4
35.5 100 0.062 0.068 0.076 0.089 0.111 0.446 0.256 0.236 35 100 0.0354 0.0677 0.068 0.076 0.069 0.406 0.236 0.236 0.236 0.116 0.436 0.236 0.116 0.436 0.236 0.116 0.436 0.236 0.116 0.436 0.236 0.116 0.436 0.025 0.068 0.076 0.068 0.076 0.088 0.236 0.116 0.33 36.6 0.051 0.054 0.057 0.062 0.068 0.076 0.368 0.236 0.016 0.026 0.016 0.026 0.016 0.026 0.016 0.026 0.016 0.027 0.030	35	108		0.062	0.068	0.076	0.089	0.111	0.141	0.546	0.250	0.296	8.9
35. 100 1057 0.068 0.076 0.068 0.111 0.243 0.230 0.121 37.5 94 0.054 0.057 0.062 0.068 0.076 0.069 0.400 0.230 0.118 33 38 88 0.051 0.054 0.067 0.062 0.068 0.076 0.068 0.230 0.230 0.118 33 39 84 0.054 0.057 0.062 0.068 0.036 0.230 0.036 0.230 0.230 0.230 0.036 0.036 0.036 0.037 0.300 0.230 0.036 0.037 0.300 0.230 0.035 0.036 0.037 0.300 0.230 0.035 0.036 0.037 0.300 0.230 0.035 0.037 0.300 0.230 0.035 0.037 0.300 0.230 0.035 0.037 0.300 0.230 0.035 0.037 0.300 0.230 0.030 0.331 0.33 0.331	35.5	108		0.062	0.068	0.076	0.089	0.111	0.141	0.546	0.250	0.296	8.9
37 94 0.054 0.057 0.062 0.068 0.076 0.069 0.460 0.226 0.116 4 37.5 94 0.054 0.057 0.062 0.068 0.076 0.086 0.076 0.086 0.250 0.118 3 38.5 84 0.046 0.057 0.062 0.068 0.076 0.386 0.250 0.018 0.350 0.018 0.386 0.350 0.118 3 40 84 0.046 0.046 0.057 0.062 0.317 0.250 0.0607 2 41.5 77 0.044 0.046 0.051 0.057 0.052 0.317 0.250 0.050 1 1 1 1 1 0.250 0.050 1 1 1 1 1 0.250 0.057 0.052 0.027 0.250 0.022 0.02 0.02 1 0.44 0.044 0.044 0.046 0.046 0.041 0.042 <td>36.5</td> <td>100</td> <td></td> <td>0.057</td> <td>0.062</td> <td>0.068</td> <td>0.076</td> <td>0.089</td> <td>0.111</td> <td>0.463</td> <td>0.250</td> <td>0.213</td> <td>6.4</td>	36.5	100		0.057	0.062	0.068	0.076	0.089	0.111	0.463	0.250	0.213	6.4
37.5 94 0.045 0.047 0.046 0.248 0.268 0.340 0.259 0.068 0.340 0.250 0.068 0.340 0.250 0.068 0.348 0.251 0.068 0.347 0.262 0.317 0.250 0.0687 0.351 0.351 0.300 0.255 0.068 0.348 0.351 0.301 0.255 0.303 0.255 0.303 0.255 0.303 1.24 1.4 77 0.044 0.044 0.044 0.046 0.046 0.045 0.272 0.250 0.032 0.221 0.230 0.022 0.24 0.244 0.246 0.248 0.2250 0.021 0.24 0.242 0.244 0.242 <td>37</td> <td>94</td> <td></td> <td>0.054</td> <td>0.057</td> <td>0.062</td> <td>0.068</td> <td>0.076</td> <td>0.089</td> <td>0.406</td> <td>0.250</td> <td>0.156</td> <td>4.7</td>	37	94		0.054	0.057	0.062	0.068	0.076	0.089	0.406	0.250	0.156	4.7
38.5 89 0.051 0.064 0.057 0.062 0.068 0.348 0.230 0.118 3 39.5 84 0.046 0.051 0.054 0.057 0.062 0.340 0.250 0.089 2 40.5 80 0.044 0.046 0.051 0.054 0.057 0.062 0.317 0.250 0.089 2 41 77 0.044 0.046 0.051 0.054 0.057 0.300 0.255 0.305 0.255 0.305 0.255 0.305 0.255 0.305 0.255 0.305 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.022 0.264 0.46 0.466 0.465 0.267 0.250 0.022 0.265 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255 0.255	37.5	94 89		0.054	0.057	0.062	0.068	0.076	0.089	0.406	0.250	0.156	4./
39 84 0.048 0.051 0.062 0.062 0.062 0.040 0.250 0.099 2 40 80 0.044 0.044 0.051 0.057 0.062 0.317 0.250 0.067 2.250 0.067 2.250 0.067 2.251 0.067 2.251 0.067 2.251 0.067 2.251 0.067 2.255 0.067 2.255 0.035 0.137 0.254 0.054 0.054 0.252 0.250 0.035 1 4.2 74 0.042 0.044 0.046 0.046 0.054 0.252 0.250 0.035 1 4.3 72 0.041 0.042 0.044 0.046 0.046 0.046 0.221 0.250 0.022 0.022 0.024 0.441 0.042 0.044 0.046 0.048 0.221 0.250 0.022 0.024 0.244 0.250 0.022 0.024 0.244 0.250 0.022 0.024 0.244 <td< td=""><td>38.5</td><td>89</td><td></td><td>0.051</td><td>0.054</td><td>0.057</td><td>0.062</td><td>0.068</td><td>0.076</td><td>0.368</td><td>0.250</td><td>0.118</td><td>3.5</td></td<>	38.5	89		0.051	0.054	0.057	0.062	0.068	0.076	0.368	0.250	0.118	3.5
33.5 88 0.448 0.049 0.042 0.042 0.042 0.042 0.440 0.440 0.049 0.049 40.5 80 0.044 0.046 0.051 0.054 0.057 0.350 0.056 0.370 0.250 0.056 1 41.5 77 0.044 0.046 0.046 0.051 0.054 0.057 0.300 0.250 0.055 1 42 74 0.042 0.044 0.046 0.048 0.051 0.054 0.285 0.250 0.033 1 43 72 0.041 0.042 0.044 0.048 0.051 0.027 0.250 0.021 0.021 44 77 0.040 0.044	39	84		0.048	0.051	0.054	0.057	0.062	0.068	0.340	0.250	0.090	2.7
40.5 80 0.048 0.054 0.057 0.067 0.067 0.067 0.377 0.250 0.095 1 41.5 77 0.044 0.046 0.046 0.055 0.054 0.057 0.300 0.250 0.050 1 42 74 0.044 0.046 0.046 0.048 0.051 0.054 0.285 0.250 0.035 1 43 72 0.041 0.044 0.046 0.048 0.051 0.252 0.250 0.022 0.222 0.250 0.022 0.241 0.244 0.444 0.046 0.046 0.268 0.221 0.250 0.002 0.041 0.044 0.044 0.044 0.044 0.044 0.044 0.256 0.250 0.002 0.002 0.002 0.002 0.044 0.044 0.044 0.044 0.044 0.044 0.044 0.044 0.244 0.250 0.000 0.002 0.002 0.035 0.032 0.035 <	39.5 40	84 80		0.048	0.051	0.054	0.057	0.062	0.068	0.340	0.250	0.090	2.7
41 77 0.044 0.046 0.051 0.054 0.057 0.300 0.250 0.050 1 41.5 77 0.044 0.046 0.048 0.051 0.054 0.285 0.256 0.335 1 42.5 74 0.044 0.046 0.046 0.048 0.051 0.024 0.285 0.255 0.035 1 43.5 72 0.044 0.046 0.046 0.046 0.046 0.046 0.041 0.042 0.044 0.046 0.046 0.046 0.041 0.042 0.044 0.046 0.048 0.221 0.250 0.011 C 45 68 0.039 0.040 0.041 0.042 0.044 0.044 0.242 0.242 0.242 0.242 0.242 0.242 0.242 0.242 0.242 0.242 0.242 0.242 0.242 0.242 0.242 0.255 0.000 C 45 68 0.038	40.5	80		0.046	0.048	0.051	0.054	0.057	0.062	0.317	0.250	0.067	2.0
-1.1 0.100 0.0000 0.000 0.000 <th< td=""><td>41</td><td>77</td><td>1</td><td>0.044</td><td>0.046</td><td>0.048</td><td>0.051</td><td>0.054</td><td>0.057</td><td>0.300</td><td>0.250</td><td>0.050</td><td>1.5</td></th<>	41	77	1	0.044	0.046	0.048	0.051	0.054	0.057	0.300	0.250	0.050	1.5
42.5 74 0.042 0.044 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.046 0.042 0.022 0.022 0.023 4.3.5 72 0.041 0.042 0.044 0.046 0.046 0.046 0.242 0.243 0.022 0.022 0.044 4.4.5 70 0.040 0.044 0.042 0.044 0.046 0.046 0.242 0.243 0.022 0.011 0.042 4.6.5 66 0.033 0.040 0.041 0.042 0.044 0.046 0.242 0.235 0.000 0.041 4.6.5 66 0.033 0.040 0.041 0.042 0.237 0.250 0.000 0.041 4.6.5 66 0.033 0.039 0.040 0.041 0.042 0.237 0.250 0.000 0.041 0.042 0.237 0.250 0.0000 0.0000 0.041	41.5	74	1	0.044	0.046	0.048	0.051	0.054	0.057	0.300	0.250	0.050	1.5
43 72 0.041 0.042 0.044 0.046 0.048 0.051 0.272 0.250 0.022 0.022 44 70 0.040 0.044 0.044 0.046 0.048 0.281 0.222 0.250 0.022 0.250 0.011 0.022 44.5 68 0.033 0.040 0.041 0.042 0.044 0.046 0.248 0.221 0.250 0.011 0.042 45 68 0.033 0.040 0.041 0.042 0.044 0.242 0.244 0.250 0.000 0.000 46 66 0.033 0.039 0.040 0.041 0.042 0.237 0.250 0.000 0.041 47 64 0.037 0.038 0.039 0.040 0.041 0.042 0.237 0.250 0.000 0.041 48 62 0.035 0.037 0.038 0.039 0.040 0.244 0.250 0.0000 0.021 <	42.5	74		0.042	0.044	0.046	0.048	0.051	0.054	0.285	0.250	0.035	1.0
0.011 0.022 0.023 0.025 0.036 0.036 0.046 0.0412 0.0470 0.0472 0.0470 0.0472 0.0471 0.0472 0.0471 0.0472 0.0471 0.0476 0.0471 0.0472 0.044 0.046 0.0471 0.0472 0.044 0.046 0.0252 0.250 0.0001 C 45.5 68 0.039 0.040 0.041 0.042 0.044 0.242 0.244 0.250 0.000 C 45.6 68 0.039 0.040 0.041 0.042 0.244 0.244 0.250 0.000 C 47.5 64 0.037 0.038 0.040 0.041 0.042 0.237 0.250 0.000 C 446 62 0.033 0.039 0.040 0.041 0.042 0.237 0.250 0.000 C 50 60 0.035 0.037 0.038 0.040 0.241 0.250 0.000	43	72	1	0.041	0.042	0.044	0.046	0.048	0.051	0.272	0.250	0.022	0.7
44.5 70 0.040 0.041 0.042 0.046 0.046 0.241 0.241 0.250 0.011 0 45.5 68 0.039 0.440 0.041 0.042 0.044 0.044 0.242 0.250 0.002 0 46.6 68 0.038 0.040 0.041 0.042 0.044 0.242 0.244 0.250 0.000 0 46.5 68 0.038 0.039 0.040 0.041 0.042 0.244 0.250 0.000 0 47.5 64 0.037 0.038 0.039 0.040 0.041 0.232 0.250 0.000 0 47.5 64 0.037 0.038 0.039 0.040 0.241 0.250 0.000 0 0.041 0.224 0.250 0.000 0 0.44 0.255 0.000 0 0 0.44 0.255 0.000 0 0 0.44 0.255 0.000 0 0<	43.0	70		0.040	0.042	0.044	0.044	0.046	0.048	0.261	0.250	0.011	0.3
usp usp<	44.5	70	1	0.040	0.041	0.042	0.044	0.046	0.048	0.261	0.250	0.011	0.3
46 66 0.038 0.039 0.040 0.041 0.042 0.042 0.244 0.250 0.000 0 47 64 0.037 0.038 0.039 0.040 0.041 0.042 0.237 0.250 0.000 0 47.5 64 0.037 0.038 0.039 0.040 0.041 0.042 0.237 0.250 0.000 0 48.6 62 0.033 0.038 0.039 0.040 0.041 0.232 0.250 0.000 0 49.6 61 0.033 0.033 0.038 0.039 0.040 0.241 0.224 0.250 0.000 0 49.6 61 0.033 0.035 0.037 0.038 0.039 0.241 0.254 0.250 0.000 0 50.5 60 0.034 0.035 0.037 0.038 0.037 0.237 0.250 0.000 0 51.5 58 0.033 <th< td=""><td>45 5</td><td>68 68</td><td>1</td><td>0.039</td><td>0.040</td><td>0.041</td><td>0.042</td><td>0.044</td><td>0.046</td><td>0.252</td><td>0.250</td><td>0.002</td><td>0.1</td></th<>	45 5	68 68	1	0.039	0.040	0.041	0.042	0.044	0.046	0.252	0.250	0.002	0.1
46.5 66 0.038 0.039 0.040 0.041 0.042 0.042 0.244 0.246 0.250 0.000 0 47.5 64 0.037 0.038 0.039 0.040 0.041 0.042 0.237 0.250 0.000 0 48 62 0.037 0.038 0.039 0.040 0.041 0.232 0.250 0.000 0 49 61 0.033 0.033 0.038 0.038 0.040 0.041 0.232 0.250 0.000 0 40 61 0.033 0.033 0.033 0.038 0.040 0.241 0.230 0.236 0.000 0 50.5 60 0.033 0.035 0.037 0.038 0.037 0.038 0.037 0.038 0.212 0.250 0.000 0 51.5 7 0.033 0.034 0.035 0.035 0.037 0.207 0.250 0.0000 0 0 <	46	66		0.038	0.039	0.040	0.041	0.042	0.044	0.244	0.250	0.000	0.0
- -	46.5	66	1	0.038	0.039	0.040	0.041	0.042	0.044	0.244	0.250	0.000	0.0
44 62 0.035 0.037 0.038 0.038 0.046 0.044 0.230 0.230 0.030 0.030 45.5 62 0.035 0.037 0.038 0.038 0.044 0.230 0.231	47 47 5	64 64	1	0.037	0.038	0.039	0.040	0.041	0.042	0.237	0.250	0.000	0.0
+s.b. UZ U.339 U.347 0.038 0.039 0.040 0.240 0.230 0.250 0.000 0 440 61 0.035 0.037 0.038 0.039 0.040 0.224 0.256 0.000 0 45.0 61 0.035 0.035 0.037 0.038 0.039 0.044 0.224 0.256 0.000 0 56 66 0.033 0.035 0.035 0.037 0.038 0.039 0.244 0.256 0.000 0 57.5 58 60 0.033 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.026 0.035 0.026 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.035 0.036 0.035 0.036 0.035 0.036	48	62	1	0.035	0.037	0.038	0.039	0.040	0.041	0.230	0.250	0.000	0.0
de 5 o 0.035 0.035 0.035 0.036 0.046 0.224 0.235 0.000 50 60 0.034 0.035 0.035 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.036 0.037 0.038 0.038 0.248 0.250 0.000 C 51 58 0.033 0.034 0.035 0.037 0.038 0.212 0.250 0.000 C 52 57 0.033 0.034 0.035 0.035 0.037 0.208 0.222 0.250 0.000 C 53 58 0.033 0.034 0.035 0.035 0.037 0.207 0.256 0.000 C C 0.000 C C 0.000 C C C 0.000 C C 0.000 C C C 0.000 C C C 0.000 C C C C C C C<	48.5 40	62 61	1	0.035	0.037	0.038	0.039	0.040	0.041	0.230	0.250	0.000	0.0
b) 60 0.034 0.035 0.037 0.038 0.039 0.218 0.230 0.000 0 51.5 60 0.034 0.035 0.037 0.038 0.039 0.218 0.250 0.000 0 51.5 58 0.033 0.034 0.035 0.037 0.038 0.212 2.250 0.000 0 52.5 57 0.033 0.034 0.035 0.035 0.037 0.207 2.250 0.000 0 52.5 57 0.033 0.033 0.034 0.035 0.035 0.037 0.207 2.250 0.000 0 53.5 54 0.032 0.033 0.033 0.033 0.033 0.034 0.038 0.035 0.037 0.207 2.250 0.000 0 0 0.035 0.037 0.203 0.203 0.030 0.031 0.031 0.031 0.033 0.033 0.030 0.031 0.031 0.031 0.03	49.5	61		0.035	0.035	0.037	0.038	0.039	0.040	0.224	0.250	0.000	0.0
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	50	60	1	0.034	0.035	0.035	0.037	0.038	0.039	0.218	0.250	0.000	0.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	50.5 51	60 58		0.034	0.035	0.035	0.037	0.038	0.039	0.218 0.212	0.250	0.000	0.0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	51.5	58	1	0.033	0.034	0.035	0.035	0.037	0.038	0.212	0.250	0.000	0.0
data data <thdata< th=""> data data <thd< td=""><td>52</td><td>57</td><td>1</td><td>0.033</td><td>0.033</td><td>0.034</td><td>0.035</td><td>0.035</td><td>0.037</td><td>0.207</td><td>0.250</td><td>0.000</td><td>0.0</td></thd<></thdata<>	52	57	1	0.033	0.033	0.034	0.035	0.035	0.037	0.207	0.250	0.000	0.0
55.5 56 0.032 0.033 0.033 0.033 0.034 0.035 0.035 0.036 0.035 0.036 0.035 0.036 0.035 0.033 0.033 0.034 0.034 0.144 0.250 0.000 0 55 54 0.031 0.031 0.032 0.033 0.033 0.144 0.250 0.000 0	53.	57 56		0.033	0.033	0.034	0.035	0.035	0.037	0.207	0.250	0.000	0.0
-s -s<	53.5	56	1	0.032	0.033	0.033	0.034	0.035	0.035	0.202	0.250	0.000	0.0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	54	55	1	0.031	0.032	0.033	0.033	0.034	0.035	0.198	0.250	0.000	0.0
55.5 54 0.031 0.032 0.033 0.033 0.033 0.043 0.033 0.040 0.250 0.000 0.000 56.5 53 0.030 0.031 0.032 0.033 0.033 0.194 0.250 0.000 0.000 57.5 53 0.030 0.031 0.031 0.032 0.033 0.190 0.250 0.000 0.000 57.5 53 0.030 0.031 0.031 0.032 0.033 0.187 0.250 0.000 0.000 58 52 0.030 0.030 0.031 0.031 0.032 0.187 0.250 0.000 0.000 58 52 0.030 0.030 0.031 0.031 0.031 0.185 0.250 0.000 0.000 59 51 0.022 0.030 0.030 0.031 0.031 0.181 0.231 0.182 0.250 0.000 0.000 0.031 0.031 0.182 0.250	04.5 55	54		0.031	0.032	0.033	0.033	0.034	0.035	0.198	0.250	0.000	0.0
bs 53 0.030 0.031 0.031 0.032 0.033 0.033 0.100 0.250 0.000 0 56.5 53 0.030 0.031 0.032 0.032 0.033 0.100 0.250 0.000 0 57.5 53 0.030 0.031 0.032 0.033 0.110 0.250 0.000 0 57.5 52 0.033 0.030 0.031 0.032 0.033 0.187 0.250 0.000 0 58.5 52 0.030 0.030 0.031 0.031 0.031 0.031 0.185 0.250 0.000 0 59 51 0.029 0.030 0.030 0.031 0.031 0.185 2.550 0.000 0 0.030 0.031 0.031 0.185 0.250 0.000 0 0.031 0.031 0.185 0.51 0.000 0.029 0.330 0.031 0.031 0.185 0.51 0.000 0.000 <td>55.5</td> <td>54</td> <td>1</td> <td>0.031</td> <td>0.031</td> <td>0.032</td> <td>0.033</td> <td>0.033</td> <td>0.034</td> <td>0.194</td> <td>0.250</td> <td>0.000</td> <td>0.0</td>	55.5	54	1	0.031	0.031	0.032	0.033	0.033	0.034	0.194	0.250	0.000	0.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	56	53	1	0.030	0.031	0.031	0.032	0.033	0.033	0.190	0.250	0.000	0.0
57.5 53 0.030 0.031 0.032 0.032 0.032 0.187 0.250 0.000 58 52 0.030 0.030 0.031 0.032 0.187 0.250 0.000 0.030 58.5 52 0.030 0.030 0.031 0.031 0.032 0.185 0.250 0.000 0.030 59.5 51 0.022 0.030 0.030 0.031 0.031 0.185 0.250 0.000 0.000 0.031 0.031 0.185 0.250 0.000 0.030 0.031 0.031 0.185 0.250 0.000 0.000 0.031 0.031 0.185 0.250 0.000 0.000 0.031 0.031 0.182 0.250 0.000 0.000 0.031 0.181 0.250 0.000 0.000 0.031 0.031 0.182 0.250 0.000 0.000 0.031 0.181 0.250 0.000 0.000 0.031 0.181 0.250 0.000 0.000<	57 ST	53 53	1	0.030	0.031	0.031	0.032	0.033	0.033	0.190	0.250	0.000	0.0
58 52 0.030 0.030 0.031 0.031 0.032 0.165 2.56 0.000 0 58.5 52 0.030 0.030 0.031 0.031 0.032 0.165 2.250 0.000 0 59.5 51 0.022 0.030 0.030 0.031 0.031 0.031 0.162 2.250 0.000 0 60.5 0.022 0.030 0.030 0.031 0.031 0.131 0.142 2.250 0.000 0 60.5 0.022 0.029 0.030 0.030 0.031 0.031 0.179 2.250 0.000 0 61.5 0.000 0.029 0.030 0.030 0.031 0.161 0.260 0.000 0 0.031 0.031 0.161 0.260 0.000 0 0.031 0.148 0.250 0.000 0.000 0.029 0.030 0.031 0.341 0.350 0.030 0.369 0.350 0.030	57.5	53		0.030	0.030	0.031	0.031	0.032	0.033	0.187	0.250	0.000	0.0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	58 58 5	52	1	0.030	0.030	0.030	0.031	0.031	0.032	0.185	0.250	0.000	0.0
59.5 51 0.029 0.030 0.031 0.031 0.031 0.132 0.230 0.000 0 66 50 0.029 0.030 0.030 0.031 0.031 0.172 0.230 0.000 0 66.5 0 0.000 0.029 0.030 0.030 0.031 0.173 0.250 0.000 0 61 0 0.000 0.029 0.030 0.030 0.030 0.142 0.250 0.000 0 0 0.031 0.150 0.250 0.000 0 0.031 0.131 0.173 0.251 0.000 0 0 0.031 0.142 0.250 0.030 0.148 0.250 0.000 0 0 0.000 0.033 0.143 0.251 0.000 0.000 0.033 0.142 0.250 0.030 0.148 0.250 0.033 0.143 0.253 0.116 0.255 0.000 0.000 0.005 0.000 0.000 0.00	00.0 59	51	1	0.030	0.030	0.030	0.030	0.031	0.032	0.165	0.250	0.000	0.0
ev bu 0.1229 0.1229 0.1324 0.1330 0.030 0.031 0.179 0.256 0.000 0.000 60.5 0 0.000 0.029 0.030 0.030 0.031 0.179 0.256 0.000 0.000 61 0 0.000 0.029 0.0329 0.030 0.030 0.031 0.160 0.256 0.000 0.000 0.031 0.160 0.256 0.000 0.000 0.029 0.030 0.030 0.148 0.256 0.000 0.000 0.029 0.030 0.030 0.148 0.256 0.000 0.000 0.029 0.035 0.030 0.18 0.256 0.000 0.000 0.029 0.035 0.036 <t< td=""><td>59.5</td><td>51</td><td></td><td>0.029</td><td>0.030</td><td>0.030</td><td>0.030</td><td>0.031</td><td>0.031</td><td>0.182</td><td>0.250</td><td>0.000</td><td>0.0</td></t<>	59.5	51		0.029	0.030	0.030	0.030	0.031	0.031	0.182	0.250	0.000	0.0
61 0.000 0.023 0.020 0.030 0.030 0.146 0.245 0.000 61.5 0 0.000 0.029 0.030 0.030 0.146 0.245 0.000 62.5 0 0.000 0.029 0.030 0.030 0.146 0.250 0.000 62.5 0 0.000 0.029 0.030 0.030 0.186 0.250 0.000 0.000 62.5 0 0.000 0.000 0.029 0.030 0.030 0.087 0.250 0.000 0.000 0.028 0.030 0.087 0.250 0.000 0.000 0.000 0.000 0.087 0.250 0.000	60 80 6	50	1	0.029	0.029	0.030	0.030	0.030	0.031	0.179	0.250	0.000	0.0
61.5 0 0.000 0.029 0.030 0.030 0.19 2.250 0.000 0.000 62.5 0 0.000 0.000 0.029 0.030 0.030 0.048 2.250 0.000 0.000 63.5 0 0.000 0.000 0.000 0.029 0.032 0.030 0.048 2.250 0.000 0.000 63.5 0 0.000 0.000 0.000 0.029 0.032 0.033 0.047 2.550 0.000 0.000 64.5 0 0.000 0.000 0.000 0.029 0.028 0.032 0.088 2.550 0.000 0.000 64.5 0 0.000 0.000 0.000 0.000 0.000 0.029 0.258 0.255 0.000 0.000 65.5 0 0.000 0.000 0.000 0.000 0.000 0.250 0.255 0.000 0.000 65.5 0 0.000 0.000 <th< td=""><td>61</td><td>0</td><td>1</td><td>0.000</td><td>0.029</td><td>0.029</td><td>0.030</td><td>0.030</td><td>0.030</td><td>0.148</td><td>0.250</td><td>0.000</td><td>0.0</td></th<>	61	0	1	0.000	0.029	0.029	0.030	0.030	0.030	0.148	0.250	0.000	0.0
cc U U.UUU U.UUU U.UUU U.UUU U.UUU 0.029 0.030 0.030 0.118 0.250 0.000 0.000 62.5 0 0.000 0.000 0.000 0.029 0.030 0.030 0.089 0.250 0.000 0.000 63.5 0 0.000 0.000 0.000 0.029 0.030 0.087 0.250 0.000 0.000 64.6 0 0.000 0.000 0.000 0.000 0.0029 0.252 0.250 0.000 0.000 64.4 0 0.000 0.000 0.000 0.000 0.0029 0.225 0.250 0.000 0.000 64.5 0 0.000 0.000 0.000 0.000 0.000 0.029 0.229 0.229 0.250 0.000 65.5 0 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	61.5	0		0.000	0.000	0.029	0.030	0.030	0.030	0.119	0.250	0.000	0.0
63 0 0.000 0.000 0.000 0.022 0.022 0.023 0.024 0.026 0.000<	62 62 5	0	1	0.000	0.000	0.029	0.029	0.030	0.030	0.118 0.089	0.250	0.000	0.0
65.5 0 0.000 0.000 0.000 0.000 0.029 0.039 0.250 0.000 0.000 64 0 0.000 0.000 0.000 0.029 0.028 0.250 0.000 0.000 0.000 0.000 0.029 0.058 0.250 0.000 0.000 0.000 0.029 0.058 0.250 0.000	63	0	1	0.000	0.000	0.000	0.029	0.029	0.030	0.087	0.250	0.000	0.0
or 0.000 0.000 0.000 0.029 0.029 0.029 0.028 0.255 0.000 0.000 64.5 0 0.000	63.5	0		0.000	0.000	0.000	0.000	0.029	0.030	0.059	0.250	0.000	0.0
65 0 0.000 0.000 0.000 0.000 0.000 0.029 0.229 0.250 0.000 0.000 65.5 0 0.000	64.5	0	1	0.000	0.000	0.000	0.000	0.029	0.029	0.029	0.250	0.000	0.0
Bate 0 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.00	65	0		0.000	0.000	0.000	0.000	0.000	0.029	0.029	0.250	0.000	0.0
000 UT UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU	65.5 66	0		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.0

Total Excess Volume for Storage = 212.6 m³

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Hydrographs and Storage - Sites C, D and E 99-Minute Duration

 Display
 Operation

 Display Volume 1 asset on Mityporgupts wing (1 in 10 year) down profile for 000 Congression 12024.
 Profile for 000 Congression 12024.

 Maximum Congression 12024.
 Table 50-150m Portle for Mon Datation on Figure (1).
 Solution 100 Congression 12024.

 Assume Datation 1000 Congression 12024.
 Table 50-150m Portle for Mon Datation on Figure (1).
 Solution 100 Congression 12024.

 Congression 1000 Congression 10000 Congressinter 1000 Congression 10000 Congression 1000 Congres

Time	Rainfa Intensity	Area m ² =	Area 1 2536.7	Area 2 2538,7	Area 3 2538.7	Area 4 2538.7	Area 5 2538.7	Area 6 2538.7	Overal Runoff	Original Peak	Excess Discharge	Excess
(min)	(mmħr)	C -	0.810 Runoff (m ³ /s)	0.810 Runoff (m ³ /s)	0.810 Runoff (m²/s)	0.810 Runoff (៣ ³ /s)	0.810 Runoff (m ³ /s)	0.810 Runoff (m ³ /s)	Hydrograph (m ³ /s)	Discharge (m ³ /s)	(m ³ /s)	in Time Period (m ²)
0 0.5	0 42		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.0 0.0
1 1.5 2	43 43 43		0.025 0.025 0.025	0.000 0.024 0.025	0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.000	0.025 0.049 0.049	0.250 0.250 0.250	0.000	0.0 0.0 0.0
2.5 3 3.5	43 44 44		0.025 0.025 0.025	0.025 0.025 0.025	0.024 0.025 0.025	0.000	0.000	0.000	0.073 0.074 0.098	0.250 0.250 0.250	0.000	0.0
4 4,5	44 44		0,025	0.025	0.025	0.025	0.000	0.000	0.099	0.250	0.000	0.0
5.5 6	44 45		0.025 0.025 0.026	0.025 0.025 0.025	0.025 0.025 0.025	0.025 0.025 0.025	0.025 0.025 0.025	0.000 0.024 0.025	0.125 0.149 0.150	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
6.5 7 7.5	45 45 45		0,026 0,025 0,025	0.025 0.026 0.026	0.025	0.025 0.025 0.025	0.025	0.025	0.150 0.151 0.151	0.250 0.250 0.250	0.000	0.0 0.0
8 8.5	46 46		0.026	0.026	0.026	0.025	0.025	0.025	0.153	0.250	0.000	0.0 0.0
9.5 10	40 46 47		0.026	0.026	0.026	0.026 0.026	0.025 0.025 0.026	0.025 0.025 0.025	0.154 0.154 0.156	0.250	0.000	0.0
10.5 11 11.5	47 48 48		0,027 0,027 0,027	0.028 0.027 0.027	0.026 0.026 0.026	0.028 0.028 0.025	0.028 0.026 0.026	0.025 0.026 0.026	0.158 0.158 0.158	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
12 12.5	48 48 49		0.027 0.027 0.028	0.027	0.027 0.027	0.026	0.026	0.026	0.160 0.160 0.162	0.250	0.000	0.0
13.5 14	49 50		0.028	0.027	0.027	0.027	0.026	0.026	0.162	0.250	0.000	0.0
14.0 15 15.5	50 50		0.029 0.029	0.029	0.028	0.027 0.027 0.027	0.027 0.027 0.027	0.026 0.027 0.027	0.165 0.167 0.167	0.250 0.250 0.250	0.000	0.0
16 16,5 17	51 51 52		0.029 0.029 0.030	0.029 0.029 0.029	0.029 0.029 0.029	0.028 0.028 0.029	0.027 0.027 0.028	0.027 0.027 0.027	0.169 0.169 0.171	0.250 0.250 0.250	0.000	0.0 0.0 0.0
17.5 18	52 53		0.030	0.029	0.029	0.029	0.028	0.027	0.171 0.174	0.250	0.000	0.0
19 19.5	53 53		0,030	0.030	0.030	0.029	0.029	0.029	0.177	0.250	0.000	0.0
20.5 21	54 55		0.031 0.031	0.030 0.031	0.030	0.030	0.029 0.030	0.029	0.179 0.182	0.250	0.000	0.0
21.5 22 22.5	55 56 58		0.031 0.032 0.032	0.031 0.031 0.031	0.030 0.031 0.031	0.030 0.030 0.030	0.030 0.030 0.030	0.029 0.030 0.030	0.182 0.185 0.185	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
23 23.5 24	57 57 58		0.033 0.033	0.032 0.032 0.033	0.031 0.031 0.032	0.031 0.031 0.031	0.030	0.030	0.187 0.187 0.190	0.250 0.250 0.250	0.000	0.0
24.5 25	58		0,033	0.033	0.032	0.031	0.031	0.030	0.190	0.250	0.000	0.0
25.5 26 25.5	60 61 61		0.035	0.033 0.034 0.034	0.033	0.033	0.031 0.032 0.032	0.031	0.198 0.198	0.250	0.000	0.0 0.0 0.0
27 27.5 28	62 62 64		0.035 0.035 0.037	0.035 0.035 0.035	0.034 0.034 0.035	0.033 0.033 0.034	0.033 0.033 0.033	0.032 0.032 0.033	0.202 0.202 0.207	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
28,5 29 29 5	84 66 ps		0.037	0.035 0.037 0.037	0.035 0.035 0.035	0.034 0.035 0.035	0.033 0.034 0.034	0.033	0.207 0.212 0.212	0.250	0.000	0.0
30 30.5	68 68		0.039	0.038	0.037	0.035	0.035	0.034	0,218	0.250	0.000	0.0
31 31.5 32	70 70 72		0.040 0.041	0.039 0.039 0.040	0.038	0.037 0.037 0.038	0.035 0.035 0.037	0.035	0.224 0.224 0.230	0.250 0.250 0.250	0.000	0.0 0.0
32.5 33 33.5	72 74 74		0.041 0.042 0.042	0.040 0.041 0.041	0.039 0.040 0.040	0.038 0.039 0.039	0.037 0.038 0.038	0.035 0.037 0.037	0.230 0.237 0.237	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
34 34,5 35	77 77 80		0.044 0.044 0.046	0.042 0.042 0.044	0.041 0.041 0.042	0.040 0.040 0.041	0.039 0.039 0.040	0.038 0.038 0.039	0,244 0,244 0,252	0.250 0.250 0.250	0.000 0.000 0.002	0.0 0.0 0.1
35.5 36	80 84		0.046	0.044	0.042	0.041	0.040	0.039	0.252 0.261	0.250	0.002	0.1
37 37.5	89 89		0.051	0.048	0.046	0.044	0.042	0.041	0.272	0.250	0.022	0.7
38.5 39	94 100		0.054 0.057	0.051 0.054	0.048	0.046 0.046	0.044 0.046	0.042 0.042	0.285 0.300	0.250	0.035	1.0
39.5 40 40,5	100 108 108		0.057 0.062 0.062	0.054 0.057 0.057	0.051 0.054 0.054	0.048 0.051 0.051	0.046 0.049 0.048	0.044 0.046 0.046	0.300 0.317 0.317	0.250 0.250 0.250	0.050 0.067 0.067	1.5 2.0 2.0
41 41.5 42	119 119 133		0.068 0.068 0.076	0.062 0.062 0.068	0.057 0.057 0.062	0.054 0.054 0.057	0.051 0.051 0.054	0.048 0.048 0.051	0.340 0.340 0.368	0.250 0.250 0.250	0.090 0.090 0.118	2.7 2.7 3.5
42.5 43 43.5	133 156		0.076 0.089	0.068	0.062	0.057 0.052 0.052	0.054 0.057 0.057	0.051 0.054 0.054	0.368	0.250	0.118 0.156 0.158	3.5 4.7 4.7
44 44.5	194		0.111	0.089	0.076	0.088	0.062	0.057	0.463	0.250	0.213	6.4 6.4
45 45.5 46	246 194		0.141 0.111	0.111 0.141	0.069	0.076 0.089	0.068	0.062	0.546 0.596	0.250	0.296 0.296 0.346	0.9 8.9 10.4
46.5 47 47.5	194 156 156		0,111 0,089 0,089	0.141 0.111 0.111	0.111 0.141 0.141	0.089 0.111 0.111	0.076 0.089 0.089	0.068 0.076 0.076	0,596 0,617 0,617	0.250 0.250 0.250	0.346 0.367 0.367	10,4 11.0 11.0
48 48.5 49	133 133 119		0,076 0,076 0,058	0.089 0.089 0.075	0.111 0.111 0.089	0.141 0.141 0.111	0.111 0.111 0.141	0.089 0.089 0.111	0.617 0.617 0.595	0.250 0.250 0.250	0.387 0.387 0.346	11,0 11,0 10,4
49.5 50	119 108		0,068 0,062 0,062	0.076	0.089 0.076 0.076	0.111 0.089 0.089	0,141 0,111	0.111 0.141	0.596 0.546	0.250	0.346 0.296	10.4 8.9
51 51.5	100		0.057	0.062	0.068	0.076	0.089	0.111	0.463 0.463	0.250	0.213	6,4 6,4
52 52.5 53	94 94 89		0.054 0.054 0.051	0.057 0.057 0.054	0.062 0.062 0.057	0.058 0.058 0.052	0.076 0.076 0.069	0.069 0.069 0.076	0.405 0.405 0.368	0.250 0.250 0.250	0.156 0.156 0.118	4.7 4.7 3.5
53.5 54 54.5	89 84 84		0,051 0,048 0,048	0.054 0.051 0.051	0.057 0.054 0.054	0.052 0.057 0.057	0.069 0.062 0.062	0.076 0.068 0.068	0.368 0.340 0.340	0.250 0.250 0.250	0.118 0.090 0.090	3.5 2.7 2.7
55 55.5 56	80 80 77		0,046 0,046 0,044	0.048 0.048 0.046	0.051 0.051 0.048	0.054 0.054 0.051	0.057 0.057 0.054	0.062 0.062 0.057	0.317 0.317 0.300	0.250 0.250 0.250	0.067 0.067 0.050	2.0 2.0 1.5
56.5 57	77		0,044	0.046	0.048	0.051	0.054	0.057	0.300	0.250	0.050	1.5
58 58.5	72		0,041 0,041	0.044	0.044	0.046	0.048	0.051	0.272 0.272	0.250	0.033	0.7
59.5 60	70 70 88		0,040	0.041 0.041 0.040	0.042 0.041	0.044 0.042	0.046 0.046 0.044	0.048 0.048 0.046	0.261 0.251 0.252	0.250 0.250 0.250	0.011 0.011 0.002	0.3 0.3 0.1
60.5 61 61,5	68 66 66		0.039 0.038 0.038	0.040 0.039 0.039	0.041 0.040 0.040	0.042 0.041 0.041	0.044 0.042 0.042	0.046 0.044 0.044	0.252 0.244 0.244	0.250 0.250 0.250	0.002 0.000 0.000	0.1 0.0 0.0
62 62.5	64 54 62		0.037 0.037 0.035	0.038	0.039 0.039 0.038	0.040	0.041 0.041 0.040	0.042	0.237 0.237 0.230	0.250	0.000	0.0 0.0
63.5 64	62 61		0.035	0.037	0.038	0.039	0.040	0.041	0.230	0.250	0.000	0.0
65 65	60 60		0.034	0.035 0.035 0.035	0.035	0.037 0.037	0.039 0.038 0.038	0.039	0.218 0.218	0.250	0.000	0.0 0.0
68 66.5 67	58 58 57		0.033 0.033 0.033	0.034 0.034 0.033	0.035 0.035 0.034	0.035 0.035 0.035	0.037 0.037 0.035	0.038 0.038 0.037	0,212 0,212 0,207	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
67.5 68 68,5	57 56 56		0.033 0.032 0.037	0.033 0.033 0.033	0.034 0.033 0.033	0.035 0.034 0.034	0.035 0.035 0.035	0.037 0.035 0.035	0,207 0,202 0,207	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
69 69.5	55 55 55		0.031	0.032	0.033	0.033	0.034	0.035	0,198 0,198 0,198	0.250	0.000	0.0
70.5	54		0.031	0.031	0.032	0.033	0.033	0.034	0,194	0.250	0.000	0.0
71.5 72 72.5	53 53 53		0.030 0.030 0.030	0.031 0.030 0.030	0.031 0.031 0.031	0.032 0.031 0.031	0.033 0.032 0.032	0.033 0.033 0.033	0.190 0.187 0.187	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
73 73,5 74	52 52 51		0.030 0.030 0.029	0.030 0.030 0.030	0.030 0.030 0.030	0.031 0.031 0.030	0.031 0.031 0.031	0.032 0.032 0.031	0.185 0.185 0.182	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
74.5 75	51 50		0.029 0.029 0.029	0.030 0.029 0.020	0.030	0.030	0.031 0.030 0.030	0.031	0.182 0.179 0.179	0.250	0.000	0.0
76 76,5	50		0.029	0.029	0.029	0.030	0.030	0.030	0.177	0.250	0.000	0.0
77.5 78	49 49		0.028	0.029 0.029 0.028	0.029	0.029	0.030 0.030 0.029	0.030	0.174 0.174 0.171	0.250	0.000	0.0 0.0
78.5 79 79.5	48 48 48		0.027 0.027 0.027	0.028 0.027 0.027	0.029 0.028 0.028	0.029 0.029 0.029	0.029 0.029 0.029	0.030 0.029 0.029	0.171 0.169 0.169	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
80 80.5 81	47 47 48		0.027 0.027 0.028	0.027 0.027 0.027	0.027 0.027 0.027	0.028 0.028 0.027	0.029 0.029 0.028	0.029 0.029 0.029	0.167 0.167 0.165	0.250 0.250 0.250	0.000	0.0 0.0 0.0
81.5 82 #2	46 46 46		0.026	0.027	0.027	0.027	0.028	0.029	0.165	0.250	0.000	0.0
63 83.5	~0 45 45		0.026	0.026	0.026	0.027	0.027	0.027	0.160	0.250	0.000	0.0
84.5 85	45 45 44		0.026 0.026 0.025	0.026 0.026 0.026	0.026 0.026 0.026	0.026 0.026 0.026	0.027 0.027 0.026	0.027 0.027 0.027	0.158 0.158 0.156	0.250 0.250 0.250	0.000	0.0 0.0 0.0
85,5 86 86,5	44 44 44		0.025 0.025 0.025	0.026 0.025 0.025	0.026 0.026 0.026	0.026 0.026 0.026	0.028 0.028 0.026	0.027 0.026 0.026	0.156 0.154 0.154	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
87 87.5 88	44 44 43		0.025 0.025 0.025	0.025 0.025 0.025	0.025 0.025 0.025	0.026 0.026 0.025	0.028 0.028 0.025	0.026 0.026 0.026	0,153 0,153 0,151	0.250 0.250 0.250	0.000	0.0 0.0 0.0
88.5 89 89 5	43 43 43		0.025 0.025 0.025	0.025 0.025 0.025	0.025	0.025	0.026 0.025 0.025	0.026	0.151 0.150 0.150	0.250	0.000	0.0
90 90,5	42		0.024	0.025	0.025	0.025	0.025	0.025	0.149	0.250	0.000	0.0
91 91,5 92	0		0.000 0.000 0.000	0.024 0.000 0.000	0.025 0.025 0.024	0.025 0.025 0.025	0.025 0.025 0.025	0.025 0.025 0.025	0.123 0.099 0.098	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
92.5 93 93.5	0		0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.025 0.024 0.000	0.025 0.025 0.025	0.025 0.025 0.025	0,074 0,073 0,049	0.250 0.250 0.250	0.000 0.000 0.000	0.0 0.0 0.0
94 94,5 95	0		0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.024 0.000 0.000	0.025 0.025 0.024	0,049 0,025 0,024	0.250 0.250 0.250	0.000	0.0 0.0 0.0
95.5 96 96	0		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.0
5,0¥	Ű		0,000	0,000	0,000	0,000	0.000	0,000	0,000	0,200	0,000	0,0











Stream Hydraulics

C192 Hong Kong & Kowloon Timber Merchants Association Timber Yard at Lin Ma Hang Road Existing East Channel Capacity Check

Assume:

- 1. Stream channel is rectangular
- 2. Dimensions from Initial Site Inspection (22/12/2023). Check worst location
- 3. Channel is existing concrete sides, with silt/soil base. Assume concrete lined channel, bad condition (n = 0.018)
- 4. Check capacity without freeboard





Prefabricated Drainage Units

Water tank information

Typical details of temporary storage tanks. Actual sizes to suit Site conditions and transportation limitations.





C192 Hong Kong & Kowloon Timber Merchants Association Timber Yard and Sawmill at Lin Ma Hang Road Prefabricated Drainage Units

It is proposed to generally use prefabricated units for the drainage facilities at the new Timber Yard and Sawmill. This will facilitate construction and help to ensure the quality of the final facilities. Typical images are shown below (subject to confirmation during construction).

Drainage Channels





Catchpits (Indicative only)





Overflow Weir Calculations

C192 Hong Kong & Kowloon Timber Merchants Association Timber Yard at Lin Ma Hang Road **Orifice/Sluice Discharges Check Discharges**

- Assume orifice/sluice gate discharge for low flows
 Weir overflow for excess flows
 Discharge through Orifice/Sluice will increase as water level rises.



CROSS-SECTION THROUGH DISCHARGE/OVERFLOW CHAMBER

Sites	<u>s A/B</u>	Sites C/D/E
Flows		
Existing/Proposed Discharge =	0.167 m ³ /s	0.250 m ³ /s
Future Flow =	0.432 m ³ /s	0.591 m ³ /s
Discharge Through Orifice/Sluice		
Orifice Height, H _o =	0.110 m	0.160 m
Orifice Width =	1.0 m	1.0 m
Orifice/Sluice Discharge, $Q_o = C_d \times A \times ($	2gH) ^{0.5}	
Assume C _d =	0.6	0.6
Area, A =	0.11 m ²	0.160 m ²
Discharge, Q_o = (N.B. Maximum discharges before water	0.097 m ³ /s (< Existing Peak Discharge) level rises above the top of the orifice/sluice and c	0.170 m ³ /s (< Proposed Peak Discharge) ver the weir)
Weir Length, B =	3.0 m	4.0 m
Peak Excess Flow =	0.335 m ³ /s (to pass over weir)	0.421 m ³ /s (to pass over weir)
Overflow to Weir		
Weir Discharge, Q _w = C _w x B x H ^{1.5}		
$H_w = (Q_w/(C_w \times B))^{0.67}$		
Assume C _w =	1.5	1.5
Head over Wier, H _w =	0.175 m	0.169 m
Peak Qo =	0.156 m³/s (<= Existing Peak Discharge)	0.244 m³/s (<= Proposed Peak Discharge)

Note: These are conservative assessments, as the water levels are based on the assumption that all excess flows pass over the weir.



Drainage Schedule

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road <u>Capacities of Peripheral Channels</u>

Standard 400W x 300D channel units are to be used throughout Use Manning's Equation

		400	
VV =	400 mm		
D =	300 mm	300	
A*=	0.108 m ²	↓	
P =	1.000 m	* Accurace 10% loss for silteria	
R = A/P =	0.108 m	Assumes 10% loss for sinatio	,,,,
n =	0.012 (neat ceme	ent surfaces, fair - SDM Table 13)	

(R^{2/3})/n = 18.759

$$V = S^{0.5} R^{2/3}/n$$
 Q = VA

Grad	ient	V	Q		
1 in	S	(m/s)	(m ³ /s)		
10	0.1000	5.93	0.641		
20	0.0500	4.19	0.453		
30	0.0333	3.42	0.370		
40	0.0250	2.97	0.320		
50	0.0200	2.65	0.287		
60	0.0167	2.42	0.262		
70	0.0143	2.24	0.242		
80	0.0125	2.10	0.227		
85	0.0118	2.03	0.220		
90	0.0111	1.98	0.214		
95	0.0105	1.92	0.208		
100	0.0100	1.88	0.203		
110	0.0091	1.79	0.193		
120	0.0083	1.71	0.185		
130	0.0077	1.65	0.178		
140	0.0071	1.59	0.171		
150	0.0067	1.53	0.165		
160	0.0063	1.48	0.160		
170	0.0059	1.44	0.155		
180	0.0056	1.40	0.151		
190	0.0053	1.36	0.147		
200	0.0050	1.33	0.143		
210	0.0048	1.29	0.140		
220	0.0045	1.26	0.137		
230	0.0043	1.24	0.134		
240	0.0042	1.21	0.131		
250	0.0040	1.19	0.128		
260	0.0038	1.16	0.126		
270	0.0037	1.14	0.123		
280	0.0036	1.12	0.121		
290	0.0034	1.10	0.119		
300	0.0033	1.08	0.117		
310	0.0032	1.07	0.115		
320	0.0031	1.05	0.113		
330	0.0030	1.03	0.112		
340	0.0029	1.02	0.110		
350	0.0029	1.00	0.108		
360	0.0028	0.99	0.107		
370	0.0027	0.98	0.105		
380	0.0026	0.96	0.104		
390	0.0026	0.95	0.103		
400	0.0025	0.94	0.101		

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Drainage Schedule - Western Site

Refer to Site Catchment Plan (Figure 6), Overall Runoff Calculations and Standard Channel Capacity Calculations

Channel	Contributing	Catchment	Runoff	Rainfall	Runoff	Minimum	Section	Upst	ream	Down	stream	Gradient	Remarks
Section	Catchment(s)	Area	Coefficient	Intensity [#]		Gradient	Length	Ground	Invert	Ground	Invert	Proposed	
		(Cumulative)				Required*	8	Level	Level	Level	Level		
		(m ²)		(mm/h)	(m ³ /s)	(1 in)	(m)	(mPD)	(mPD)	(mPD)	(mPD)	(1 in)	
<u>Site C</u>													
	[
Northern/Eas	<u>tern Boundary</u>								ļ				
P10-P09	C3 x 60%	1,085.4	0.35	180	0.019	350	44	14.0	13.7	12.5	12.2	29	Runoff from External Slopes
P09-P08	C3	1,809.0	0.35	180	0.032	350	26	12.5	12.2	11.8	11.5	37	Runoff from External Slopes
P08-P07	C3+C4	2,649.0	0.35	180	0.046	350	31	11.8	11.5	11.1	10.8	44	Runoff from External Slopes
P07-P06	C3+C4	2,649.0	0.35	180	0.046	350	22	11.1	10.8	10.8	10.5	73	Runoff from External Slopes
P06-P05	C3+C4	2,649.0	0.35	180	0.046	350	20	10.8	10.5	10.6	10.3	99	Runoff from External Slopes
P05-P04	C3+C4	2,649.0	0.35	180	0.046	350	33	10.6	10.3	10.2	9.9	82	Runoff from External Slopes
P04-P03	C3+C4	2,649.0	0.35	180	0.046	350	18	10.2	9.9	10.0	9.7	90	Runoff from External Slopes
P03-P02	C3+C4	2,649.0	0.35	180	0.046	350	20	10.0	9.7	9.7	9.4	67	Runoff from External Slopes
P02-P01	C3+C4	2,649.0	0.35	180	0.046	350	2	9.7	9.4	9	8.7	3	Drop section not using standard channels Outlet to Eastern Stream
Western/Sou	<u>thern Boundary</u>												
P10-P11	Minor local runoff	0.0	1.00	180	0.000	350	20	14.0	13.7	13.4	13.1	33	
P11-P12	Minor local runoff	0.0	1.00	180	0.000	350	9	13.4	13.1	13.1	12.8	30	
P12-P13	Minor local runoff	0.0	1.00	180	0.000	350	3	13.1	12.8	12.9	12.6	15	
P13-P14	Minor local runoff	0.0	1.00	180	0.000	350	18	12.9	12.6	12.5	12.2	45	
P14-P15	Minor local runoff	0.0	1.00	180	0.000	350		12.5	12.2	12.2	11.9	27	
P15-P16	Minor local runoff	0.0	1.00	180	0.000	350	12	12.2	11.9	11.8	11.5	30	
P16-P17	Minor local runoff	0.0	1.00	180	0.000	350	5	11.8	11.5	11.6	11.3	25	
P17-P18	C1A x 25%	384.7	1.00	180	0.019	350	10	11.6	11.3	11.3	11.0	33	
P18-P19	C1A x 50%	769.3	1.00	180	0.038	350	15	11.3	11.0	10.8	10.5	30	
P19-P20	C1A x 75%	1,154.0	1.00	180	0.058	350	12	10.8	10.5	10.4	10.1	30	
P20-P21	C1A	1,538.6	1.00	180	0.077	350	13	10.4	10.1	10.0	9.7	33	
P21-P22	C1A	1,538.6	1.00	180	0.077	350	24	10.0	9.7	9.9	9.6	240	
P22-P23	C1A + C1B x 25%	1,721.8	1.00	180	0.086	350	20	9.9	9.6	9.8	9.5	200	
P23-P24	C1A + C1B x 50%	1,904.9	1.00	180	0.095	350	21	9.8	9.5	9.7	9.4	210	
P24-P25	C1A + C1B x 75%	2,088.1	1.00	180	0.104	350	17	9.7	9.4	9.6	9.3	170	
								ļ					
Southern Bou	<u>ndary</u>												
									ļ				
P25-P26	C1A + C1B	2,271.3	1.00	180	0.114	310	30	9.6	9.3	9.42	9.12	167	
P26-P27	C1A + C1B	2,271.3	1.00	180	0.114	310	7	9.4	9.1	9.37	9.07	233	
P27-P28	Minor local runoff	0.0	1.00	180	0.000	350	40	9.37	9.07	9.25	9.0	333	
P28-P29	C2C*50%	150.1	1.00	180	0.008	350	15	9.25	9.0	9.20	8.90	300	
P29-P30	C2C	300.2	1.00	180	0.015	350	31	9.2	8.90	9.1	8.8	310	
			[[
P27-P30	C1A + C1B	2,271.3	1.00	180	0.114	350	19	9.37	9.07	9.1	8.8	70	
P30-P01	C1A + C1B + C2C	2,571.5	1.00	180	0.129	280	16	9.1	8.8	9	8.7	160	Outlet to Eastern Stream
Internal Pipel	ine												
Unstroom	C1C + C2A	6 110 7	1.00	100	0.205	150	<i>c</i> 0	17		11 -	1	120	Soo constato ninglino calculations
Downstroam		0,118.7	1.00	180	0.306	150	08	11 5		11.5	1	130	See separate pipeline calculations
Downstream	LIL + LZA + LZB	8,920.8	1.00	180	0.446	120	34	11.5		11.2		113	see separate pipeline calculations

[#] Note: Ranfall Intensity taken from overall runoff calculations for the Site

*Note: Minimum required gradient taken as 1:350, to provide full-flow velocity of 1m/s (Q = 0.108m³/s)

C192 - Hong Kong & Kowloon Timber Merchants Association Yard at Lin Ma Hang Road Proposed Drainage Capacity Upstream End of Pipeline - Twin 400mm Pipelines

Colebrook-white Equation in SI units, simplified for solution for D

(From "Tables for the Hydraulic Design of Pipes, Sewers & Channels" HR Wallingford)



Assume uPVC pipes, normal condition

D	0.400	m 400 mm
S (1 in)	150	0.007 Assumed Gradient
Ks	0.06	mm 0.00006 m
Term 1	2.24987E-05	
Term 2	1.65073E-05	
Term 3	28.90013306	
Term 4	28,89962337	
Diff	0	Should be zero for solution
	· ·	
Capacity O	0 230	m ³ /s
Capacity, Q	0.233	11 /3
With 10% flow area a	llowanco for so	adimentation assume 10% reduction in canacity:
		cumentation, assume to % reduction in capacity.
0	0.045	$m^3/a/nina$
Capacity, Q _{silt} =	0.215	m /s/ pipe

Capacity, Q _{silt} -	0.215 11/3/ pipe
A =	0.13 m ²
v = Q/A =	1.90 m/s
Overall Capacity =	0.430 m ³ /s (twin pipes)

Appendix J

Figures











SCHEMATIC DIAGRAMME OF DISCHARGE/OVERFLOW ARRANGEMENT



CROSS-SECTION THROUGH DISCHARGE/OVERFLOW CHAMBER



Proposed Rural Workshop (Timber Yard and Sawmill) at Various Lots	Site Catchments & Drainage Plan (Western Site)
in D.D.86, D.D. 90 and Adjoining Government Land,	Figure 6
Lin Ma Hang Road, San Uk Ling, Ma Kam To	



Lin Ma Hang Road, San Uk Ling, Ma Kam To

Figure 7