

Appendix 7

Drainage Impact Assessment



PineBridge



Drainage Impact Assessment Report

for

Redevelopment of The Salvation Army Lai King Home

at

No. 200 – 210 Lai King Hill Road, Kwai Chung,

New Territories (Kwun Chung Town Lot 354)

Architect:

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Job No.: C23036
Issue 1
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1. Background

The Applicant, The Salvation Army intends to develop two(2) 8-storey building block situated at the existing site of No. 200 – 210 Lai King Hill Road, Kwai Chung, New Territories (Kwun Chung Town Lot No. 354). The two(2) building blocks will include Day Activity Centre, Hostel for Severely Mentally Handicapped Persons, Residential Respite Services, Integrated Vocational Rehabilitation Services Centre, Hostel for Moderately Mentally Handicapped Persons, Care & Attention Home for Severely Disable Persons, Extended Care Programme and Ancillary Facilities.

PineBridge Consulting Limited was employed by the Applicant to conduct a Drainage Impact Assessment (DIA) to assess the potential drainage impact arising from the proposed redevelopment.

2. Objectives

This objectives of this DIA are to assess the potential drainage impacts arising from the proposed development and recommend the mitigation measures, if necessary, to alleviate the impacts.

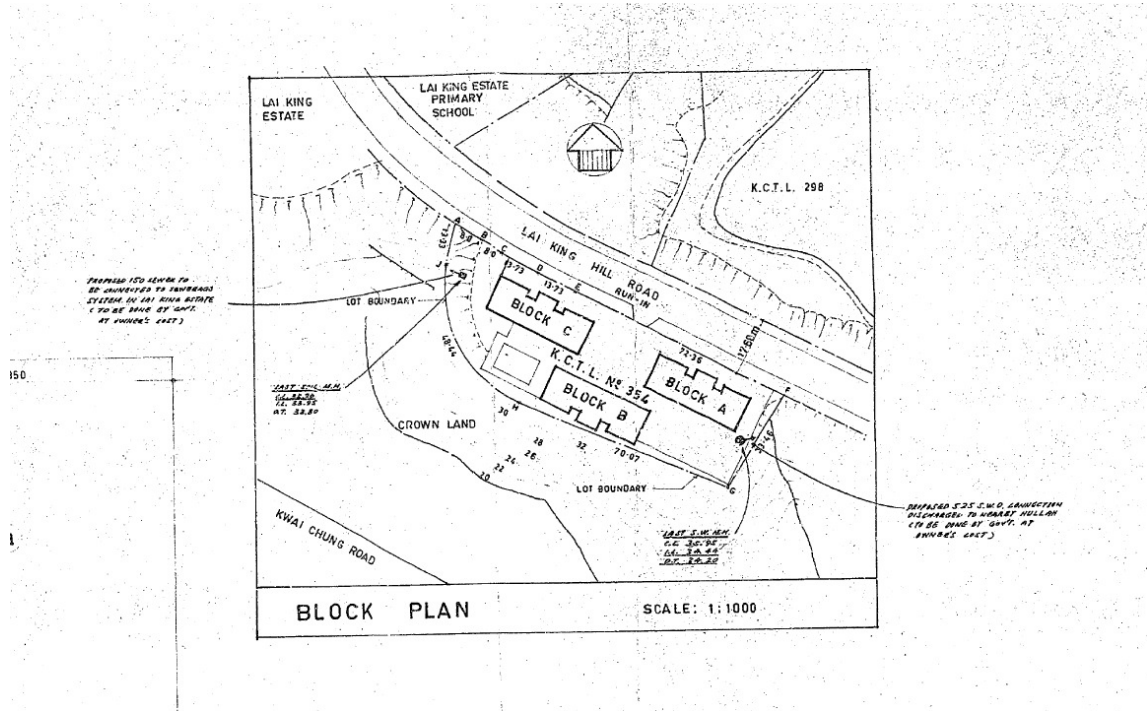
3. Site Information

3.1. Existing Site Information

The site is located at No. 200 – 210 Lai King Hill Road, Kwai Chung, New Territories (Kwun Chung Town Lot No. 354).

Currently, there are three(3) nos. of building erected on site, namely Block A, Block B and Block C. Block A and C are both 5-storey buildings whereas Block B is a 4-storey building. The buildings provides services including Day Activity Centre (DAC), Hostel for Severy Mentally Handicapped Persons (HSMHP), Extended Cre programme (ECP) and Residential Respite Servies (RRS). The buildings will be demolished and two(2) 8-storey building block will be built to provide services in the community and to strengthen comprehensive care and support to the needy persons with disabilities and their carers.

A block plan extracted from approved GBP [Dwg. No. 1182-SD-06] on February 27, 1979 of the existing site is shown as below:



An aerial photo for the existing site is shown on the **Appendix I**.

The existing catchment area is 3,830m² as referred to the approved GBP [Dwg. No. 1182-SD-06] shown on the **Appendix II**.

3.2. Existing Drainage

Approved drainage plans [Dwg. No. 1182-SD-02 & 06] are shown on **Appendix II & III** indicating that there is an existing Ø525 stormwater pipe currently serving for the existing site (catchment area) to collect surface runoff and discharged to the existing Nullah (Done by Government).

Drainage plans (plan no.: 11-NW-1D-4 and 11-NW-6B-2) on **Appendix IV** were obtained from Drainage Services Department (DSD) to gather the background information on drainage infrastructure in the vicinity of the Site.

According to the drainage record plans (plan no.: 11-NW-1D-4 and 11-NW-6B-2), the Site Boundary is currently served by the public drainage facilities near the Kwai Chung Road. The collected surface runoff is collected by an existing U-channel and ultimately discharged to an existing Nullah (Done by Government).

4. Stormwater Drainage Impact Analysis

4.1. Assessment Methodology

As per existing site investigation and DSD's record plan, surface runoff from the proposed development within the Study Boundary is proposed to be connected to DSD's existing stormwater catchpit and finally discharge to the existing Nullah.

This DIA has adopted the Rational Method for runoff estimation:

$$Q_p = 0.278i \sum_{j=1}^m C_j A_j$$

Where,

- Q_p is peak runoff (m³/s);
- i is rainfall intensity (mm/hr);
- A_j is the jth catchment (km²);
- C_j is the runoff coefficient of the jth catchment (dimensionless)

The details of the Rational Method can be referred to the Stormwater Drainage Manual (SDM) (DSD, 2018).

Based on a 1:50 year flood protection standard in the SDM and the estimated time of concentration, the appropriate rainfall intensities (i) were calculated based on linear interpolation of the intermediate table values.

4.2. Design Parameter & Drainage Discharge Estimation

The on-site Catchment for the proposed development within the Existing Site Boundary was identified based on the plans as submitted to Section 16 [Appendix V] and topographic survey record of the site boundary and its nearby areas as shown in Appendix VI.

In addition to catchment of the site, there is no change in size before and after development, while the change in paving condition as a result of the proposed development is summarized in **Table A** below.

Table A: Permeable and Paved Areas of the Site

Catchment	Before Development			After Development		
	Permeable	Concrete-paved	Catchment Area (m ²)	Permeable	Concrete-paved	Catchment Area (m ²)
Site	13.2%*	86.8%*	3,830	20%	80%	3,830

*denote the percentage to be verified by topographic survey.

As summarized above, there shall be an decrease in stormwater runoff associated with the decrease in the concrete-paved area of the proposed development.

In the hydraulic analysis, runoff coefficient of 0.95 and 0.25 was adopted to represent a concrete-paved area and flatted grassland (heavysoil) respectively. The rainfall intensity of 250mm/hr is assumed for the estimation of the runoff after redevelopment.

	Concrete-paved	Flatted Grassland (heavysoil)
% of Site Area	80%	20%
Area (m ²)	3,064	766
Rainfall Coefficient	0.95	0.25
Peak Runoff (l/s)	202.1	13.3
Total Peak Runoff = 215.4 l/s		

4.2. Design Parameter & Drainage Discharge Estimation

(CONT'D)

The rain water run-off rate of the entire site is **215.4 l/s** and be gone through the existing last manhole S.W.M.H. with connection of the existing Ø525 concrete pipe and discharged to the existing Nullah.

The Manning's roughness coefficients of 0.012 (fair condition for Concrete pipe) as stated in Table 13 of Stormwater Drainage Manual were assumed for the capacity calculation as referred in the Stormwater Drainage Manual.

a) Manning equation,

$$V = 84 \times H^{2/3} \times I^{1/2}$$

Where, V = discharge velocity through pipe (m/s)

H = hydraulic meandepth & is ¼ when pipe in full bore full

I = Inclination of pipe

b) Discharge pipe formula,

$$Q^1 = A^1 \times V$$

Where, Q¹ = quantity of discharge through pipe (m³/s)

A¹ = Wetted area of flow though pipe (m²)

c) Assumption made,

Assume full depth of full bore flow

Hydraulic meandepth, H = 0.25D

Wetted area of flow through pipe, A¹ = 0.78D² (D = pipe diameter)

d) Simplified equation

$$\begin{aligned} Q^1 &= A^1 \times V \\ &= 0.78D^2 \times 84 \times (0.25D)^{2/3} \times I^{1/2} \\ &= 25.989 \times D^{2.667} \times I^{1/2} \end{aligned}$$

e) Available Capacity of the Ø525 concrete pipe

$$D = 0.525\text{m}$$

$$I = 1:200 \text{ (i.e. } 5 \times 10^{-3}\text{)}$$

$$Q^1 = 25.989 \times D^{2.667} \times I^{1/2}$$

$$Q^1 = 25.989 \times (0.525)^{2.667} \times (5 \times 10^{-3})^{1/2}$$

$$= 0.3296 \text{ m}^3/\text{s} \text{ (**329.6 l/s**)} > 215.4 \text{ l/s (required)}$$

The capacity of Ø525 concrete pipe with fall 1:200 at full bore is **329.6l/s** which exceeds the required capacity of **215.4 l/s**.

Hence, the existing Ø525 concrete pipe is sufficient to catch up the discharge flow of the Building after redevelopment.

4.3. Drainage Impact Assessment

The catchment of the site is unchanged and the unpaved area is increased after the redevelopment works. The runoff rate is around is **215.4 l/s**.

The existing Ø525 concrete pipeworks from the site to the existing Nullah will be retained and reuse after the redevelopment works.

Hence, there will be no adverse impacts on the drainage arising from the proposed redevelopment. However, it is important to provide appropriate internal drainage facilities to collect all runoff from the site itself and connected to the existing Ø525 concrete pipe.

5. Conclusions

The runoff rate of the existing site is around **215.4 l/s** and will be collected by the existing Ø525 concrete pipe and discharged to the existing Nullah (Done by Government) after redevelopment. The available capacity of the existing Ø525 concrete pipe is **329.4l/s** that is sufficient to cater for the required runoff. Appropriate internal drainage facilities shall be provided to collect runoff from the site the existing Ø525 concrete pipe.

It is concluded that the redevelopment works would not result in any adverse impacts to the public drainage system.

Appendix I - Aerial Photo of the Existing Site

APPENDIX I: Aerial Photo of the Existing Site



Aerial Photo

TFS of Redevelopment of Lai King Home by
The Salvation Army under the Special Scheme on
Privately Owned Sites for Welfare Uses



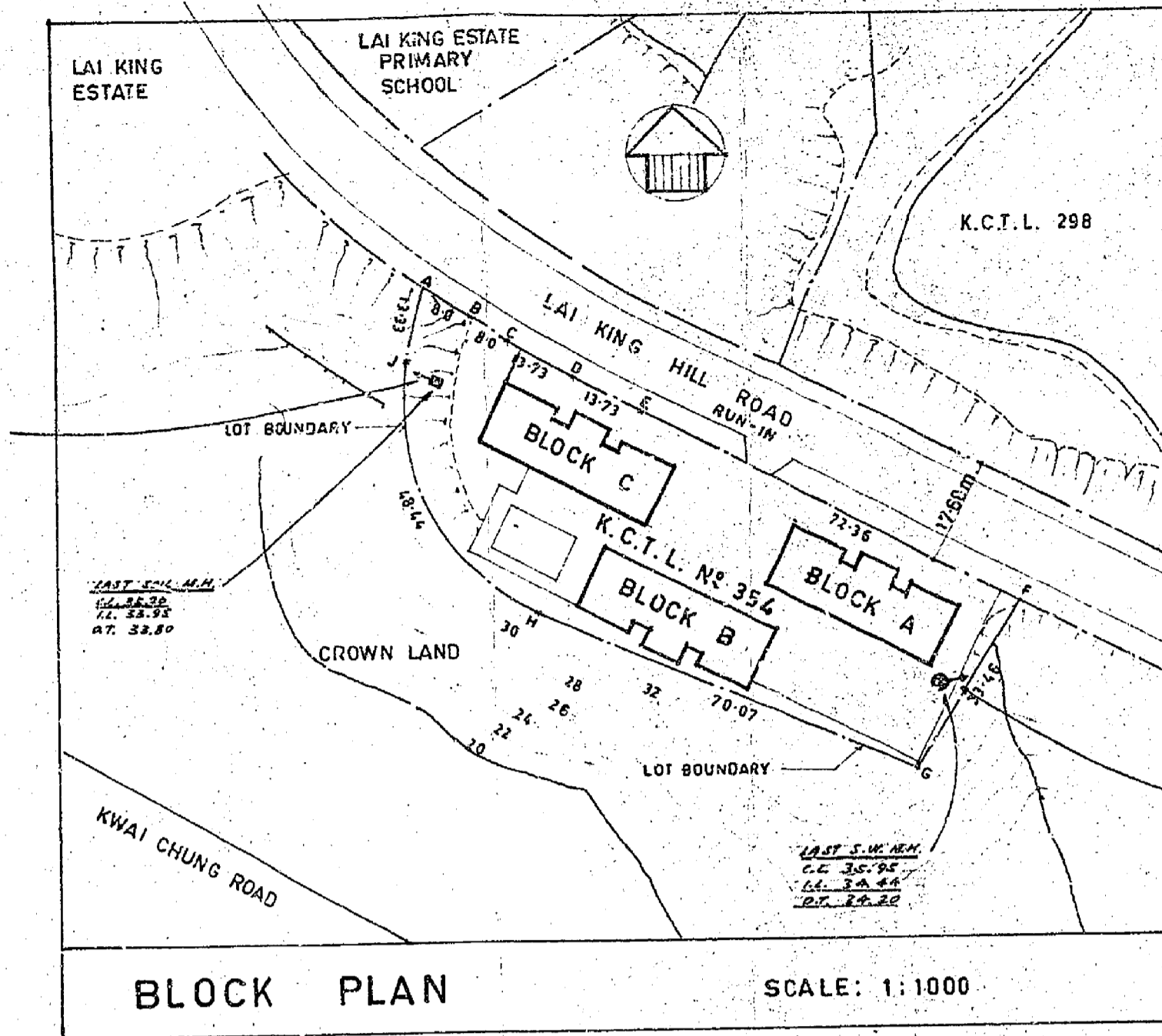
**Appendix II - Approved GBP of the Existing
Site**

FIRE RESISTANCE REQUIREMENT FOR ELEMENT OF CONSTRUCTION										
BLOCK & STOREY	USAGE	CLASS	COMPARTMENT OF BUILD'G		MIN. DIMENSIONS OF ELEMENTS OF CONSTRUCTION					
			AREA sq. metre	VOLUMN cu. metre	R.F.P. REQ'D	R.C. SLAB thickness	R.C. BEAM cover to steel	R.C. COL.	R.C. WALL	
B LEV. 1	MULTI-PURPOSE AREA	3	438.30	1402.56	1	100 mm	15 mm	50 mm	225 mm	100 mm
C LEV. 1	TRAINING	3	417.30	1335.36	1	100 mm	15 mm	50 mm	225 mm	100 mm
A LEV. 2	TRAINING	3	417.30	1335.36	1	100 mm	15 mm	50 mm	225 mm	100 mm
B LEV. 2	OFFICE	3	438.30	1402.56	1	100 mm	15 mm	50 mm	225 mm	100 mm
C LEV. 2	DOMESTIC	3	417.30	1335.36	1	100 mm	15 mm	50 mm	225 mm	100 mm
A LEV. 3	"	3	"	"	1	"	"	"	"	"
B LEV. 3	"	3	438.30	1402.56	1	"	"	"	"	"
C LEV. 3	"	3	417.30	1335.36	1	"	"	"	"	"
A LEV. 4	"	3	"	"	1	"	"	"	"	"
A LEV. 5	"	3	319.40	1022.08	1	"	"	"	"	"

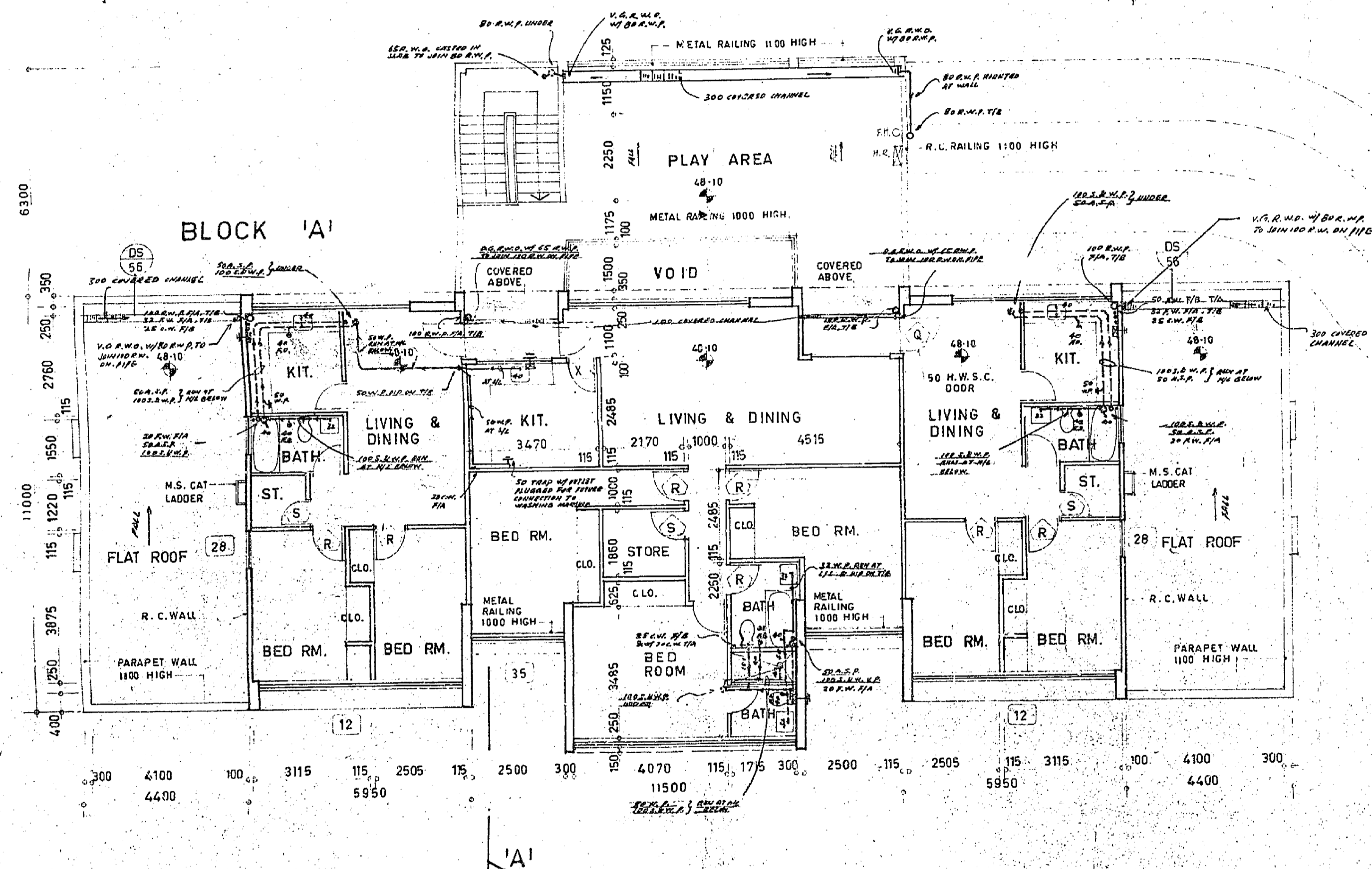
DISCHARGE VALUE OF STAIRCASE				
BLOCK	STOREY ABOVE LEV. 1	DEPTH OF STAIRCASE	DISCHARGE VALUE	ACTUAL N° OF PERSON
A	4	1150	405	132
B	2	1150	335	35
C	2	1150	335	42

REQUIREMENT OF EXIT MAINS :-
 MIN. EXIT ROUTE REQUIRED 1050 mm.
 MIN. EXIT DOOR REQUIRED 850 mm.

SCHEDULE OF SANITARY FITMENT											
BLOCK & STOREY	USAGE	NR OF PERSON		W.C.		BASIN		URINAL		BATH SHOWER	
		MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	REQ.	PROV.	REQ.	PROV.
C LEV. 1	TRAINING	38	38	2	2	2	2	2	2	2	
A LEV. 2	TRAINING	38	38	2	2	2	2	2	2	2	
B LEV. 2	OFFICE	14		2	2	2	2				1
C LEV. 2	DOMESTIC	21		3	6	3	3				3 4
A LEV. 3	DOMESTIC	21		3	6	3	3				3 4
B LEV. 3	DOMESTIC	21		3	6	3	3				3 4
C LEV. 3	DOMESTIC	21		3	6	3	3				3 4
A LEV. 4	DOMESTIC	21		3	6	3	3				3 4
A LEV. 5	STAFF FLAT	4		1	1	1	1				1 1



525mm DIA STORMWATER PIPE DISCHARGE TO NEAREST NULLAH



ROOFED AREA CALCULATION:-
 AREA OF SITE: 3830.00 SQ. METRES
 HEIGHT OF BUILDING: NOT EXCEED 15 METRES
 PERMISSIBLE SITE COVERAGE (CLASS A): 56.67%
 ACTUAL ROOFED AREA PROVIDED:-
 BLOCK 'A' SAME AS BLOCK 'C' = 419.33 S.M.
 BLOCK 'B' = 227.70 S.M.
 (a) 10.35 x 11.00 x 2 = 227.70 S.M.
 (b) 6.50 x 12.00 = 78.00 S.M.
 (c) 2.50 x 9.25 x 2 = 46.25 S.M.
 (d) 12.10 x 8.15 - 5.90 x 1.50 = 89.77 S.M.
 441.72 S.M.
 BLOCK 'C' = 227.70 S.M.
 (a) 10.35 x 11.00 x 2 = 227.70 S.M.
 (b) 6.50 x 12.00 = 78.00 S.M.
 (c) 2.50 x 9.25 x 2 = 46.25 S.M.
 (d) 12.10 x 6.30 - 6.90 x 1.50 = 67.38 S.M.
 419.33 S.M.
 GARBAGE & JANITOR = 17.16 S.M.
 9.80 x 1.75
 ACTUAL SITE COVERAGE PROVIDED:-
 419.33 + 441.72 + 419.33 + 17.16 = 33.878%
 3830.00

SITE AREA (CATCHMENT AREA) = 3,830 SQM INDICATED ON APPROVED GBP

PLOT-RATIO CALCULATION:-
 PERMISSIBLE PLOT-RATIO: 3.30
 GROSS FLOOR AREA PROVIDED:-
 BLOCK 'A' 419.33 x 3 = 1257.99 S.M.
 BLOCK 'B' 441.72 x 2 = 883.44 S.M.
 BLOCK 'C' 419.33 x 3 = 1257.99 S.M.
 GARBAGE & JANITOR 17.16 S.M.
 3965.85 S.M.
 ACTUAL PLOT-RATIO 3965.85 / 3830.00 = 1.0355

STREET SHADOW AREA CALCULATION:-
 PERMISSIBLE STREET SHADOW AREA: FRONTAGE x WIDTH OF ROAD
 115.84 x 17.68 = 2046.256 S.M.
 STREET SHADOW AREA PROJECTED OVER ALONG LAI KING HILL ROAD:-
 8.80 x 0.50 = 4.40 S.M.

Approved
 27 FEB 1979

NOTE: All these plans have been examined only as set forth in Circular Letter No. 64, your attention is drawn to Section 4(1) of the Building Ordinance regarding your duty as Authorized Person and to Section 14(2)(c) regarding possible contravention of any provision of the Buildings Ordinance.

PALMER AND TURNER

ARCHITECTS AND CONSULTING ENGINEERS
 HONG KONG 100A SHING KWAN HOUSE - SHEWAN WAY - 516673

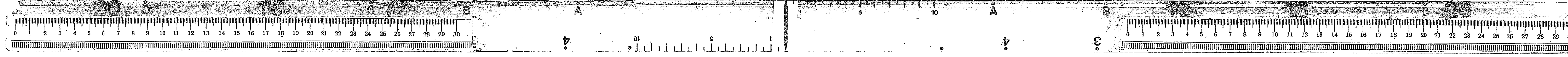
AMENDED
 DATE: 24 JAN 1979

PROJECT: SALVATION ARMY'S HOME FOR HANDICAPPED CHILDREN & YOUNG ADULTS LAI KING HILL ROAD, K.C.T.L. NO. 354

DRAWING (PLUMBING)
 LEVEL 5 & 6 (ROOF) PLAN
 BLOCK PLAN
 CALCULATIONS

SCALE: 1:100 DRAWING NO: 1182
 DATE: 25.6.78 SD-6
 DRAWN: [Signature] CHECKED: [Signature] APPROVED: [Signature]

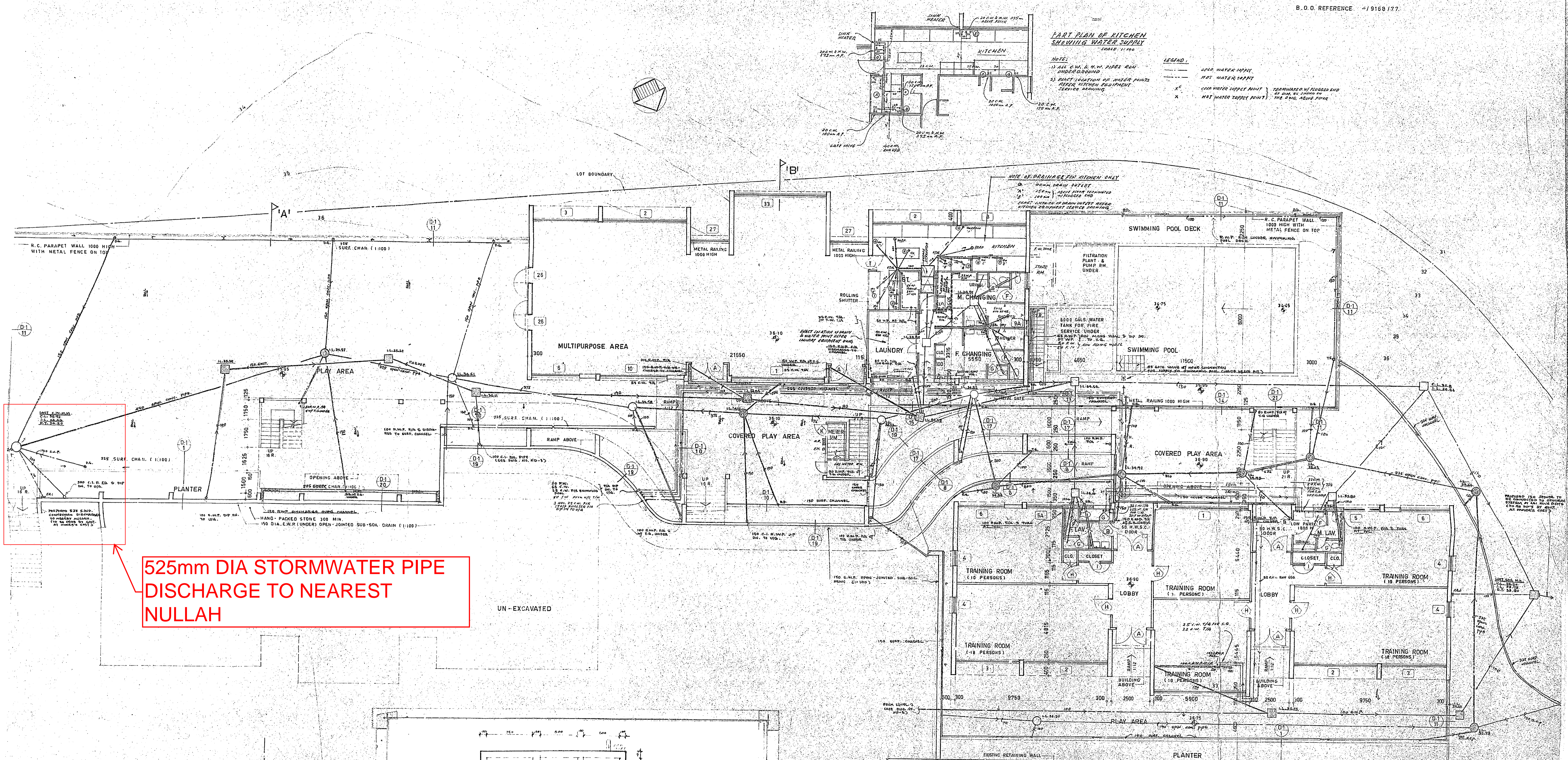
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**Appendix III - Approved Drainage Plan of the
Existing Site**

APPENDIX III - Approved Drainage Plan of the Existing Site

B.O.O. REFERENCE - /9168/77.



PART PLAN OF KITCHEN SHOWING WATER SUPPLY

NOTE:
 1. ALL C.P. & W.M. PIPES RUN UNDERGROUND
 2. POINT LOCATION OF WATER PIPES TO BE SHOWN WITH EQUIPMENT SERVICE RANALING
 3. 20 C.M. 1800 M.A.P.
 4. 20 C.M. 1800 M.A.P.

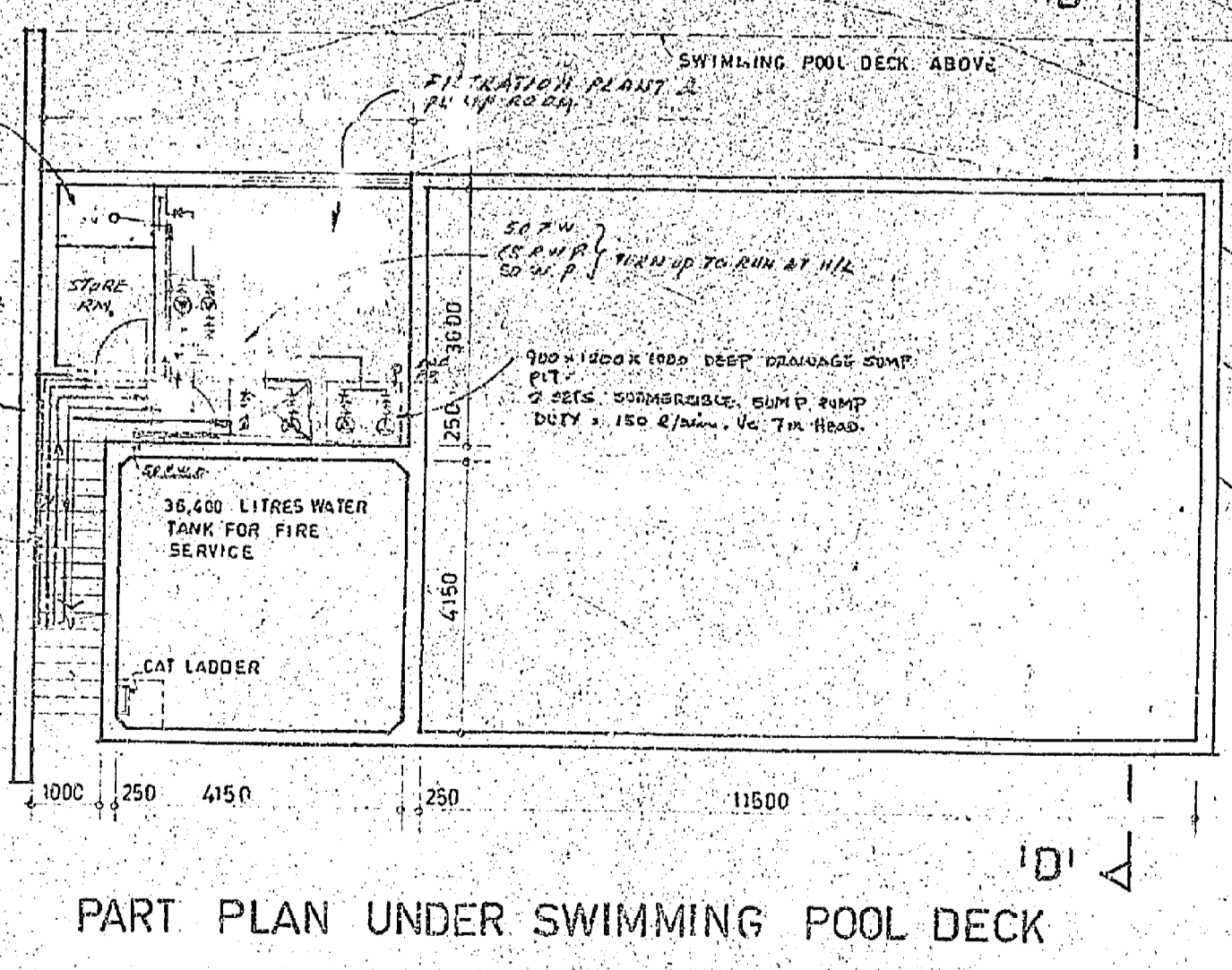
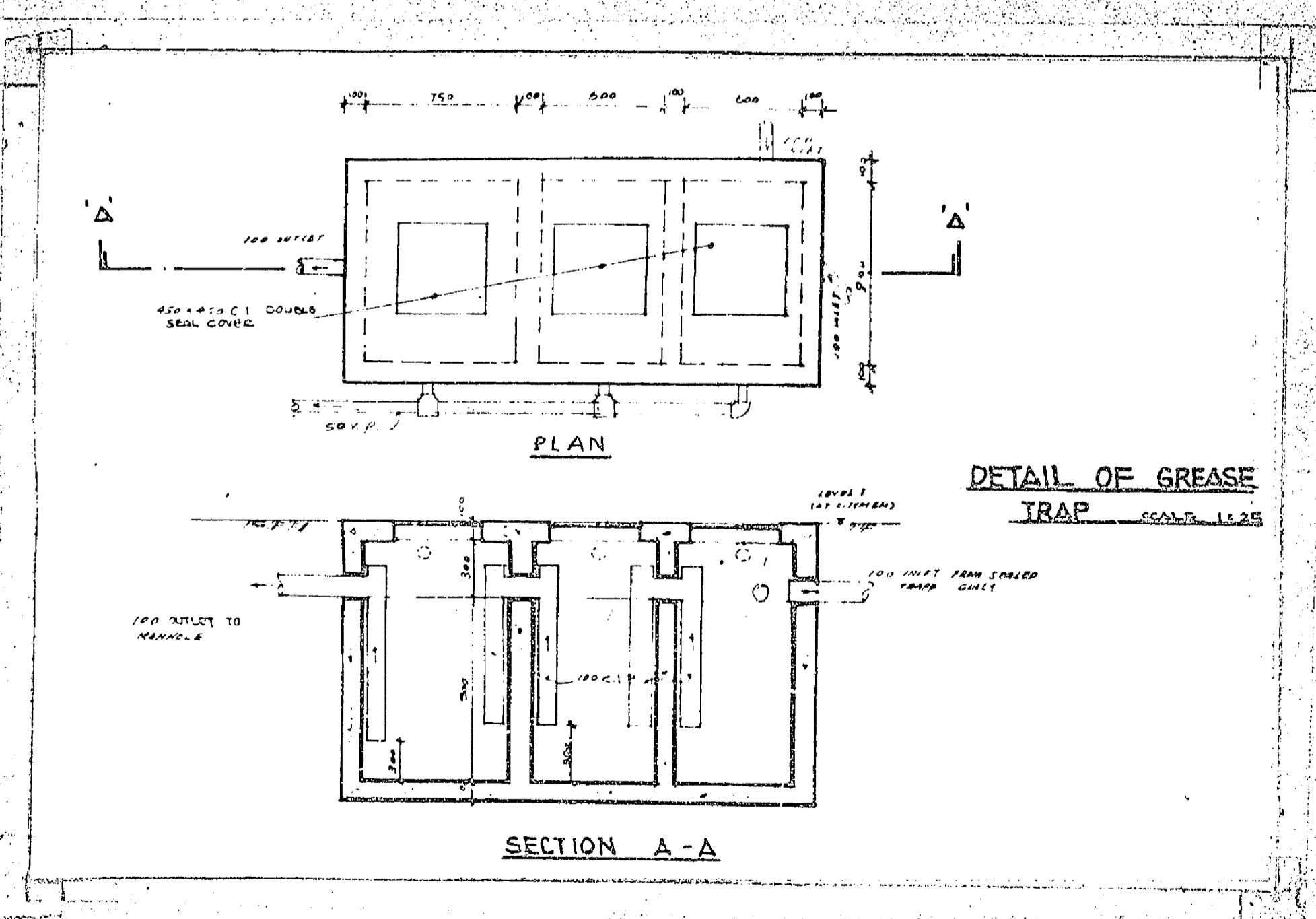
LEGEND:
 - - - - - COLD WATER SUPPLY
 - - - - - HOT WATER SUPPLY
 - - - - - COLD WATER SUPPLY UNIT
 - - - - - HOT WATER SUPPLY UNIT

NOTE OF DRAINAGE FOR KITCHEN ONLY

1. DRAINAGE DRAIN OFFSET
 2. 100 M.M. 1800 M.A.P. TO BE SHOWN
 3. 100 M.M. 1800 M.A.P. TO BE SHOWN
 4. 100 M.M. 1800 M.A.P. TO BE SHOWN

525mm DIA STORMWATER PIPE DISCHARGE TO NEAREST NULLAH

- GENERAL NOTES:-**
- R.C.C. works to be of 1:2:4 mix, except otherwise specified in structural drawings.
 - Concrete block to be built in 1:3 cement mortar.
 - Drainage layout, R.C.C. calculations & details to be submitted later.
 - Staircase to have treads not less than 225 mm, risers not more than 175 mm, clear headroom not less than 2000 mm & handrail on both sides.
 - All lavatories & kitchens to have glazed tile dado 1200 mm high min.
 - Fire service requirements to be complied with.
 - Mechanical room where under ground to be of waterproof construction.
 - No storage of dangerous goods without the Authority of the Director of Fire Service.
 - A fire alarm system to be incorporated in the PH/HR installation throughout the building.
 - Electrical circuits to be protected by miniature circuit breakers in lieu of conventional re-wirable fuses.
 - Pressure valves to be provided where necessary so as to maintain a pressure, not exceeding 100 p.s.i. not less than 50 p.s.i. at any one hydrant point.
 - Wall lin. is recommended that all internal linings for acoustic or thermal insulation, or decorative purposes to be of class 1 or 2 rate of surface flame spread as laid down by B.S. 476:1971, (part 7).
 - Cable duct to be enclosed with conc., a m.s. box will be provided to protect the service wiring running off the duct to individual consumers.
 - 50 mm S.C.H.U. inspection door to cable duct to be provided.
 - Automatic smoke detection system to be provided throughout the building and the system to be linked direct to the New Territories Fire Control.
 - Brick works to be built in 1:3 cement mortar.
 - DOOR MARK
 - WINDOW MARK
 - DETAIL MARK



Approved
 PRO BUILDING AUTHORITY
 27 FEB 1979

PALMER AND TURNER

NOTE: As these plans have been submitted only to the Building Authority for approval under Section 4 (1) of the Building Ordinance, the Building Authority is not responsible for any errors or omissions in the drawings or for any consequences of any provision of the Building Ordinance.

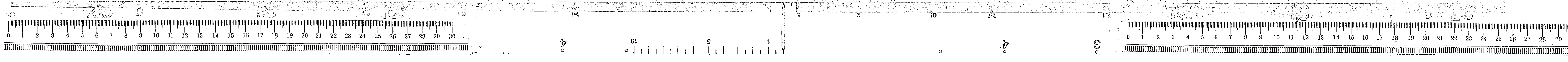
AMENDED
 DATE: 24 JAN 1979

SALVATION ARMY'S HOME FOR HANDICAPPED CHILDREN & YOUNG ADULTS
 LAI KIN HILL ROAD, K.C.T.L.NE 354

PROJECT: SALVATION ARMY'S HOME FOR HANDICAPPED CHILDREN & YOUNG ADULTS
 DRAWING: PLUMBING
 LEVEL 1 PLAN

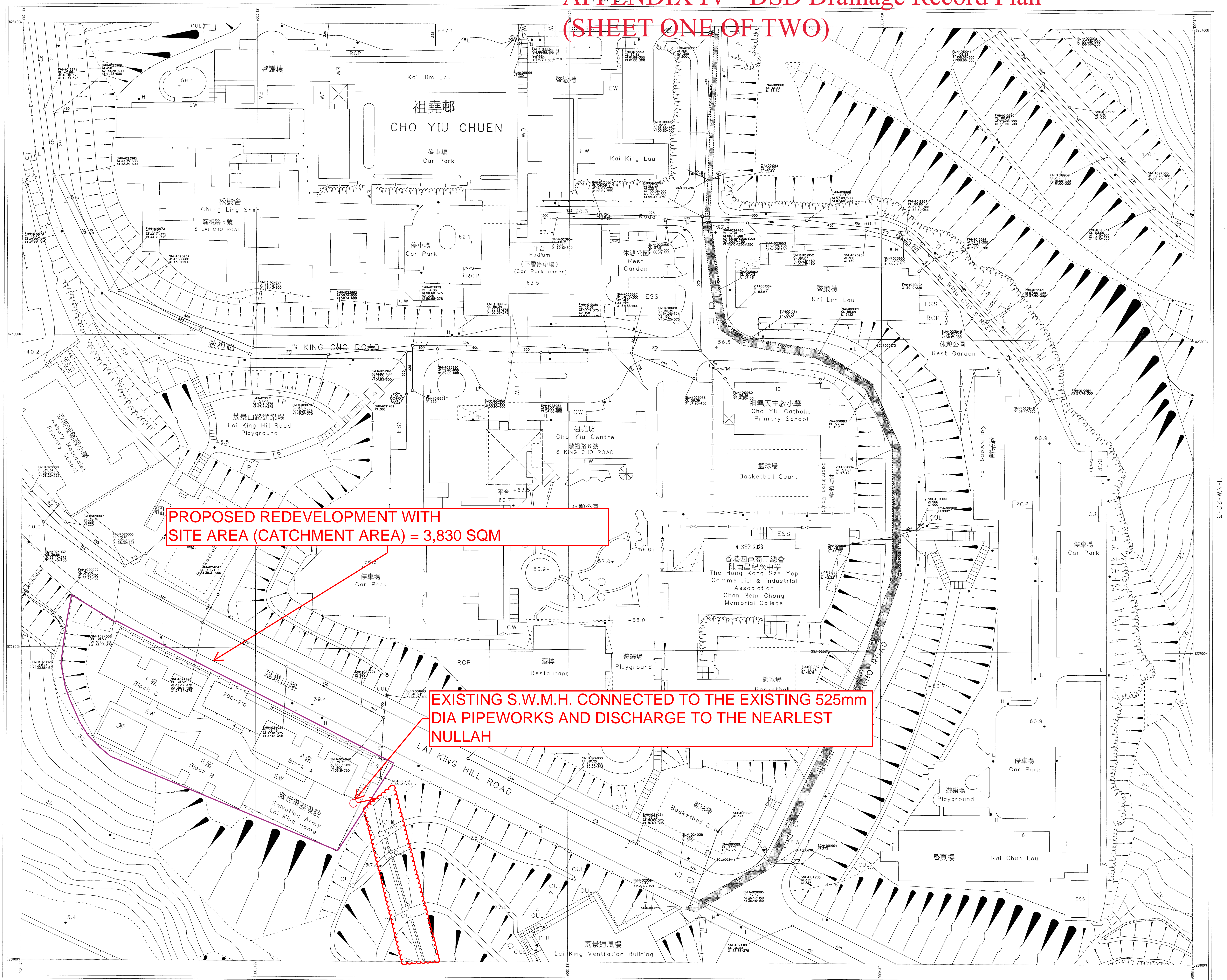
SCALE: 1:100
 NUMBER: 1182
 DATE: 27-2-78
 DRAWN: P. TUN
 DESIGNED: [Signature]
 CHECKED: [Signature]
 APPROVED: [Signature]

RECEIVED BY
 Fig 1 in 20/73
 BUILDING DEPARTMENT
 OFFICE 4-10

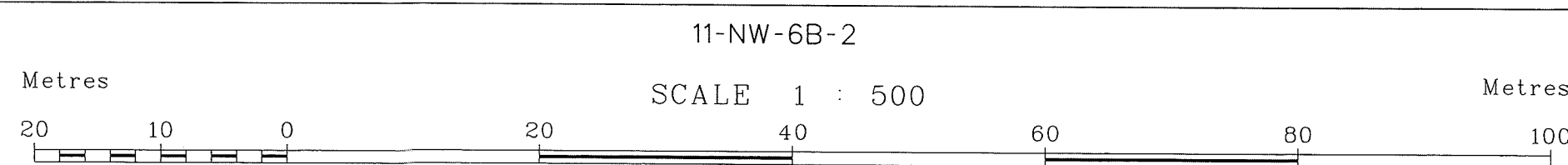


Appendix IV – DSD Drainage Record Plans

APPENDIX IV - DSD Drainage Record Plan (SHEET ONE OF TWO)



Please note that drainage information is now available in the GeoInfo Map services of the Lands Department (<https://www.map.gov.hk/gm/?lg=en>). Please refer to the Quick Reference Guide of the system for the operation.
For legend of drainage record plans, please refer to the following URL: (https://www.dsd.gov.hk/EN/Files/Legend_BW.pdf)



Drainage Record Sheet Number

11-NW-1D-4

Last Updating : 18-05-2022

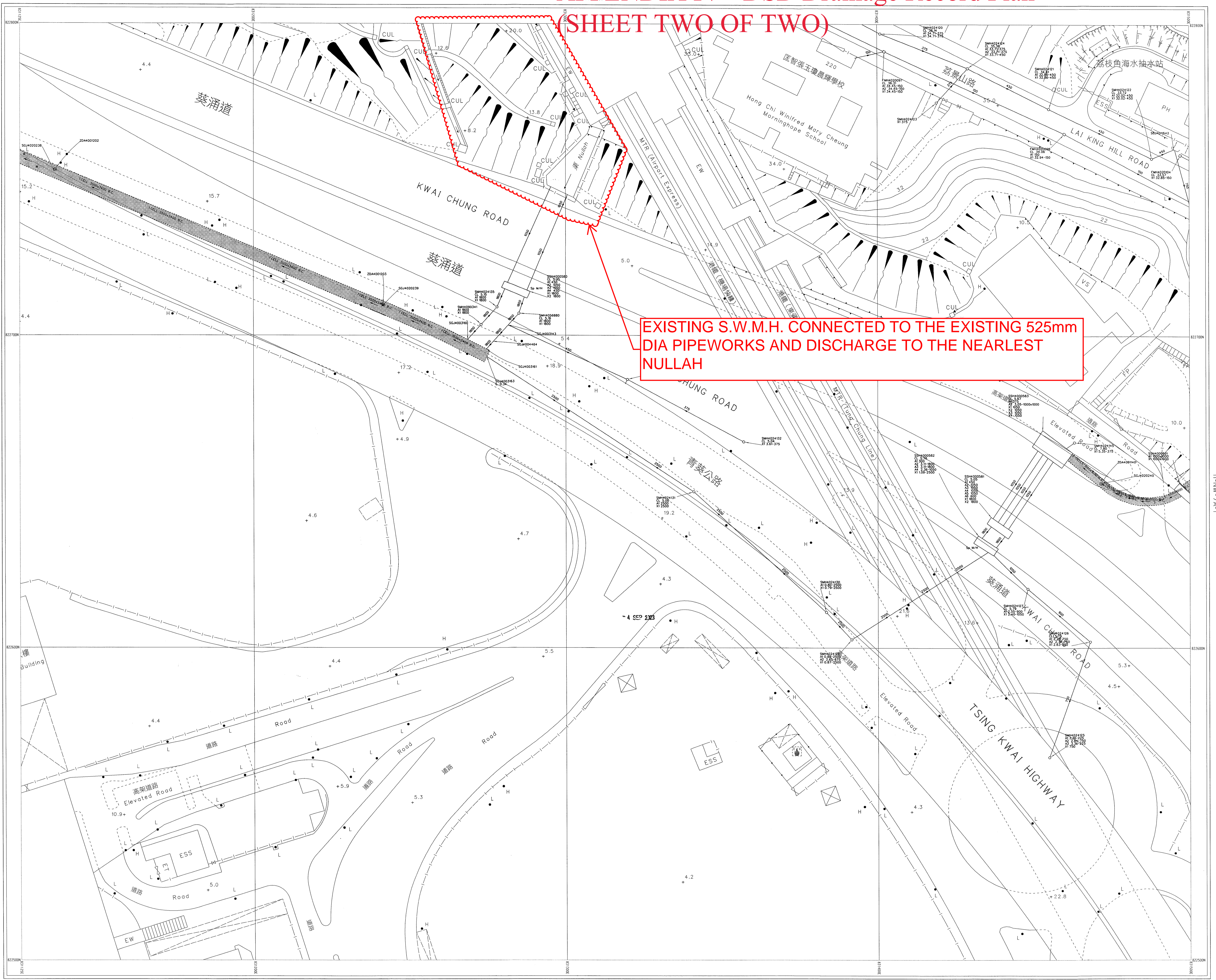
Map data renewed on November 2021

Mainland South Division
Drainage Services Department
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INITIALS: _____
DATE: _____

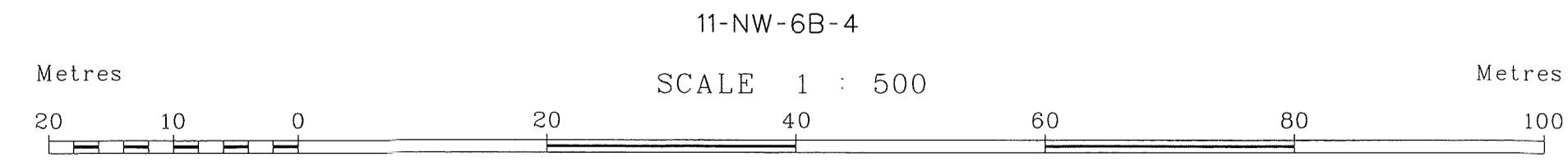
APPENDIX IV - DSD Drainage Record Plan

(SHEET TWO OF TWO)



EXISTING S.W.M.H. CONNECTED TO THE EXISTING 525mm DIA PIPEWORKS AND DISCHARGE TO THE NEAREST NULLAH

Please note that drainage information is now available in the GeoInfo Map services of the Lands Department (<https://www.map.gov.hk/gm/?lg=en>). Please refer to the Quick Reference Guide of the system for the operation.
For legend of drainage record plans, please refer to the following URL: (https://www.dsd.gov.hk/EN/Files/Legend_BW.pdf)



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Drainage Services Department
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Drainage Record Sheet Number
11-NW-6B-2

Last Updating: 12-11-2020

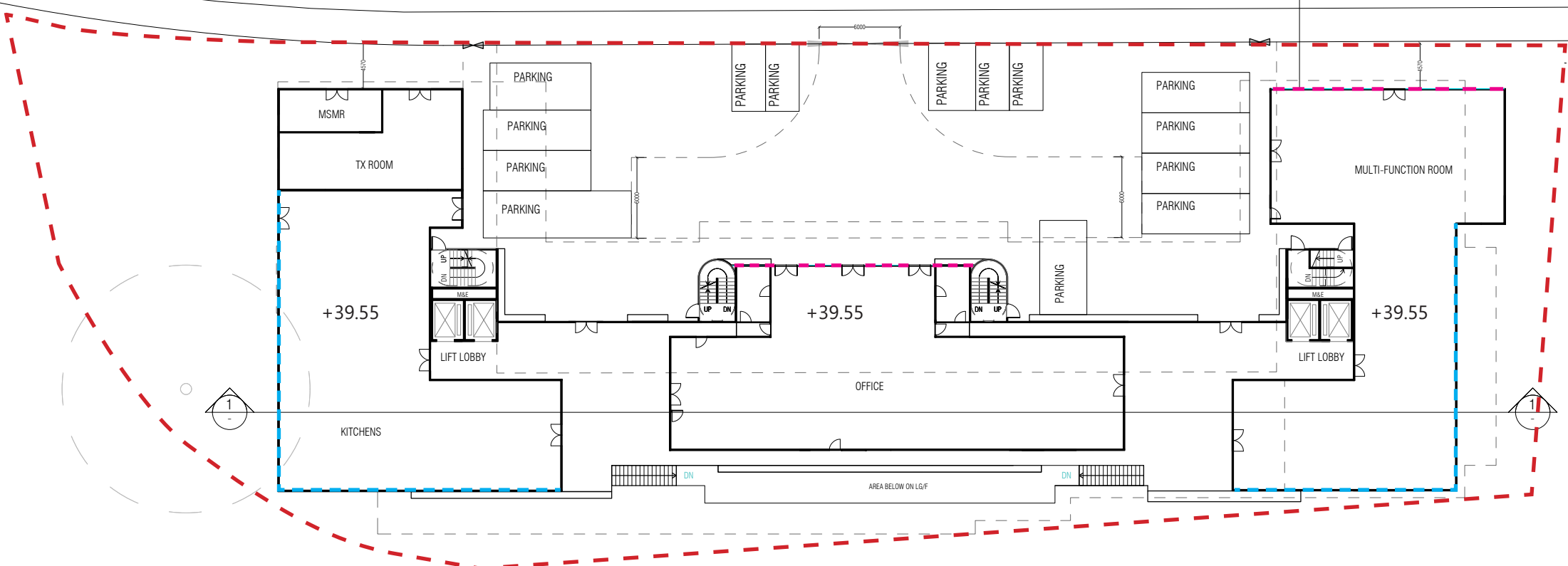
Map data renewed on August 2020

Appendix V – Plan Submitted to Section 16

NON-OPENABLE WINDOW

OPENABLE WINDOW

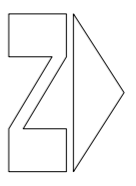
LAI KING HILL ROAD



1 GENERAL LAYOUT PLAN - G/F
Scale 1:400@A4

APPENDIX V- Plan submitted to Section 16

Appendix VI - Topographic Survey Record



AREA=225+141+46+14+56+24
=506m²

- NOTES :
1. All dimensions are in metres.
 2. All spot level positions are indicated by a cross.
 3. All levels are in metres to Principal Datum (PD) unless noted otherwise.
 4. All co-ordinates are refer to Hong Kong (1980) metric grid.
 5. Channels are U shaped except where stated. Widths are given.

ABBREVIATIONS :-

BR	BRIER	FR	FRUIT
CH	CHANNEL	GR	GRASS
CO	CONCRETE	IR	IRON
CP	CHANNEL	MC	MASONRY
CS	CONCRETE	MT	METAL
CT	CONCRETE	NT	NON-TERRITORIES
CU	CURB	OR	ORANGE
CV	CONCRETE	OS	OS
CA	CABLE	PT	POST
CB	CABLE	RA	RAIL
CC	CABLE	RE	REINFORCED
CD	CABLE	RF	RADIUM
CE	CABLE	RI	RIVER
CF	CABLE	RS	RUBBER
CG	CABLE	RT	ROOF
CH	CABLE	SA	SAND
CI	CABLE	SC	STEEL
CJ	CABLE	SD	SHED
CK	CABLE	SE	SEWER
CL	CABLE	SH	SHED
CM	CABLE	SI	SILICON
CN	CABLE	SM	SMOKE
CO	CABLE	SN	SOUND
CP	CABLE	SO	SOIL
CQ	CABLE	SP	SPRING
CR	CABLE	SR	STEEL
CS	CABLE	SS	STEEL
CT	CABLE	ST	STEEL
CU	CABLE	SV	STEEL
CV	CABLE	SW	STEEL
CA	CABLE	SY	STEEL
CB	CABLE	TA	STEEL
CC	CABLE	TC	STEEL
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CD	CABLE	UA	STEEL
CE	CABLE	UB	STEEL
CF	CABLE	UC	STEEL
CG	CABLE	UD	STEEL
CH	CABLE	UE	STEEL
CI	CABLE	UF	STEEL
CJ	CABLE	UG	STEEL
CK	CABLE	UH	STEEL
CL	CABLE	UI	STEEL
CM	CABLE	UJ	STEEL
CN	CABLE	UK	STEEL
CO	CABLE	UL	STEEL
CP	CABLE	UM	STEEL
CQ	CABLE	UN	STEEL
CR	CABLE	UO	STEEL
CS	CABLE	UP	STEEL
CT	CABLE	UQ	STEEL
CU	CABLE	UR	STEEL
CV	CABLE	US	STEEL
CA	CABLE	UT	STEEL
CB	CABLE	UU	STEEL
CC	CABLE	UV	STEEL
CD	CABLE	UW	STEEL
CE	CABLE	UX	STEEL
CF	CABLE	UY	STEEL
CG	CABLE	UZ	STEEL
CH	CABLE	VA	STEEL
CI	CABLE	VB	STEEL
CJ	CABLE	VC	STEEL
CK	CABLE	VD	STEEL
CL	CABLE	VE	STEEL
CM	CABLE	VF	STEEL
CN	CABLE	VG	STEEL
CO	CABLE	VH	STEEL
CP	CABLE	VI	STEEL
CQ	CABLE	VJ	STEEL
CR	CABLE	VK	STEEL
CS	CABLE	VL	STEEL
CT	CABLE	VM	STEEL
CU	CABLE	VN	STEEL
CV	CABLE	VO	STEEL
CA	CABLE	VP	STEEL
CB	CABLE	VQ	STEEL
CC	CABLE	VR	STEEL
CD	CABLE	VS	STEEL
CE	CABLE	VT	STEEL
CF	CABLE	VU	STEEL
CG	CABLE	VV	STEEL
CH	CABLE	VO	STEEL
CI	CABLE	VP	STEEL
CJ	CABLE	VQ	STEEL
CK	CABLE	VR	STEEL
CL	CABLE	VS	STEEL
CM	CABLE	VT	STEEL
CN	CABLE	VU	STEEL
CO	CABLE	VO	STEEL
CP	CABLE	VP	STEEL
CQ	CABLE	VQ	STEEL
CR	CABLE	VR	STEEL
CS	CABLE	VS	STEEL
CT	CABLE	VT	STEEL
CU	CABLE	VU	STEEL
CV	CABLE	VO	STEEL
CA	CABLE	VP	STEEL
CB	CABLE	VQ	STEEL
CC	CABLE	VR	STEEL
CD	CABLE	VS	STEEL
CE	CABLE	VT	STEEL
CF	CABLE	VU	STEEL
CG	CABLE	VO	STEEL
CH	CABLE	VP	STEEL
CI	CABLE	VQ	STEEL
CJ	CABLE	VR	STEEL
CK	CABLE	VS	STEEL
CL	CABLE	VT	STEEL
CM	CABLE	VU	STEEL
CN	CABLE	VO	STEEL
CO	CABLE	VP	STEEL
CP	CABLE	VQ	STEEL
CQ	CABLE	VR	STEEL
CR	CABLE	VS	STEEL
CS	CABLE	VT	STEEL
CT	CABLE	VU	STEEL
CU	CABLE	VO	STEEL
CV	CABLE	VP	STEEL
CA	CABLE	VQ	STEEL
CB	CABLE	VR	STEEL
CC	CABLE	VS	STEEL
CD	CABLE	VT	STEEL
CE	CABLE	VU	STEEL
CF	CABLE	VO	STEEL
CG	CABLE	VP	STEEL
CH	CABLE	VQ	STEEL
CI	CABLE	VR	STEEL
CJ	CABLE	VS	STEEL
CK	CABLE	VT	STEEL
CL	CABLE	VU	STEEL
CM	CABLE	VO	STEEL
CN	CABLE	VP	STEEL
CO	CABLE	VQ	STEEL
CP	CABLE	VR	STEEL
CQ	CABLE	VS	STEEL
CR	CABLE	VT	STEEL
CS	CABLE	VU	STEEL
CT	CABLE	VO	STEEL
CU	CABLE	VP	STEEL
CV	CABLE	VQ	STEEL
CA	CABLE	VR	STEEL
CB	CABLE	VS	STEEL
CC	CABLE	VT	STEEL
CD	CABLE	VU	STEEL
CE	CABLE	VO	STEEL
CF	CABLE	VP	STEEL
CG	CABLE	VQ	STEEL
CH	CABLE	VR	STEEL
CI	CABLE	VS	STEEL
CJ	CABLE	VT	STEEL
CK	CABLE	VU	STEEL
CL	CABLE	VO	STEEL
CM	CABLE	VP	STEEL
CN	CABLE	VQ	STEEL
CO	CABLE	VR	STEEL
CP	CABLE	VS	STEEL
CQ	CABLE	VT	STEEL
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CF	CABLE	VQ	STEEL
CG	CABLE	VR	STEEL
CH	CABLE	VS	STEEL
CI	CABLE	VT	STEEL
CJ	CABLE	VU	STEEL
CK	CABLE	VO	STEEL
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CM	CABLE	VQ	STEEL
CN	CABLE	VR	STEEL
CO	CABLE	VS	STEEL
CP	CABLE	VT	STEEL
CQ	CABLE	VU	STEEL
CR	CABLE	VO	STEEL
CS	CABLE	VP	STEEL
CT	CABLE	VQ	STEEL
CU	CABLE	VR	STEEL
CV	CABLE	VS	STEEL
CA	CABLE	VT	STEEL
CB	CABLE	VU	STEEL
CC	CABLE	VO	STEEL
CD	CABLE	VP	STEEL
CE	CABLE	VQ	STEEL
CF	CABLE	VR	STEEL
CG	CABLE	VS	STEEL
CH	CABLE	VT	STEEL
CI	CABLE	VU	STEEL
CJ	CABLE	VO	STEEL
CK	CABLE	VP	STEEL
CL	CABLE	VQ	STEEL
CM	CABLE	VR	STEEL
CN	CABLE	VS	STEEL
CO	CABLE	VT	STEEL
CP	CABLE	VU	STEEL
CQ	CABLE	VO	STEEL
CR	CABLE	VP	STEEL
CS	CABLE	VQ	STEEL
CT	CABLE	VR	STEEL
CU	CABLE	VS	STEEL
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CE	CABLE	VR	STEEL
CF	CABLE	VS	STEEL
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CJ	CABLE	VP	STEEL
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CJ	CABLE	VQ	STEEL
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CR	CABLE	VR	STEEL
CS	CABLE	VS	STEEL
CT	CABLE	VT	STEEL
CU	CABLE	VU	STEEL
CV	CABLE	VO	STEEL
CA	CABLE	VP	STEEL
CB	CABLE	VQ	STEEL
CC	CABLE	VR	STEEL
CD	CABLE	VS	STEEL
CE	CABLE	VT	STEEL
CF	CABLE	VU	STEEL
CG	CABLE	VO	STEEL
CH	CABLE	VP	STEEL
CI	CABLE	VQ	STEEL
CJ	CABLE	VR	STEEL
CK	CABLE	VS	STEEL
CL	CABLE	VT	STEEL
CM	CABLE	VU	STEEL
CN	CABLE	VO	STEEL
CO	CABLE	VP	STEEL
CP	CABLE	VQ	STEEL
CQ	CABLE	VR	STEEL
CR	CABLE	VS	STEEL
CS	CABLE	VT	STEEL
CT	CABLE	VU	STEEL
CU	CABLE	VO	STEEL
CV	CABLE	VP	STEEL
CA	CABLE	VQ	STEEL
CB	CABLE	VR	STEEL
CC	CABLE	VS	STEEL
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CE	CABLE	VU	STEEL
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CG	CABLE	VP	STEEL
CH	CABLE	VQ	STEEL
CI	CABLE	VR	STEEL
CJ	CABLE	VS	STEEL
CK	CABLE	VT	STEEL
CL	CABLE	VU	STEEL
CM	CABLE	VO	STEEL
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CO	CABLE	VQ	STEEL
CP	CABLE	VR	STEEL
CQ	CABLE	VS	STEEL
CR	CABLE	VT	STEEL
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CT	CABLE	VO	STEEL
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CV	CABLE	VQ	STEEL
CA	CABLE	VR	STEEL
CB	CABLE	VS	STEEL
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CE	CABLE	VO	STEEL
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CI	CABLE	VS	STEEL
CJ	CABLE	VT	STEEL
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CP	CABLE	VS	STEEL
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CD	CABLE	VO	STEEL
CE	CABLE	VP	STEEL
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CG	CABLE	VR	STEEL
CH	CABLE	VS	STEEL
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CJ	CABLE	VU	STEEL
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