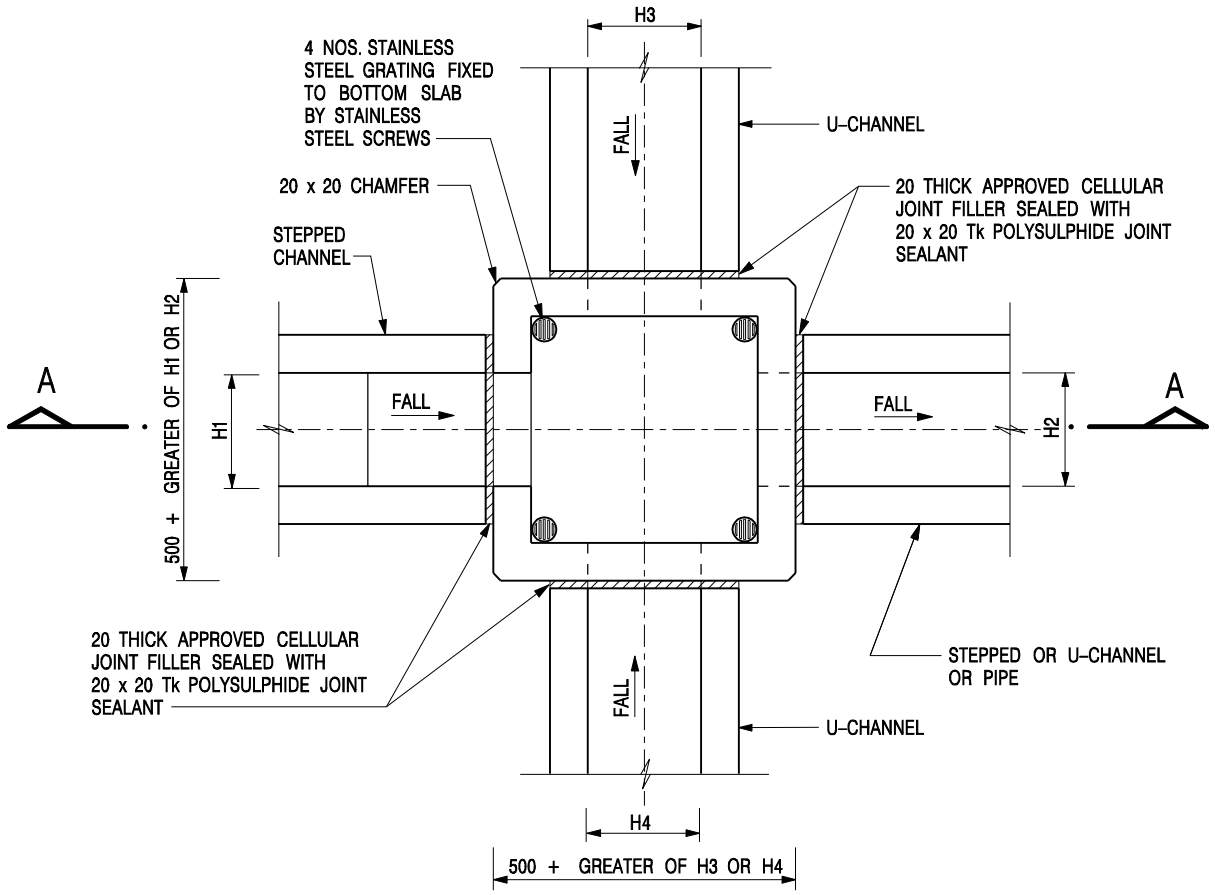
Application No. A/NE-LT/774

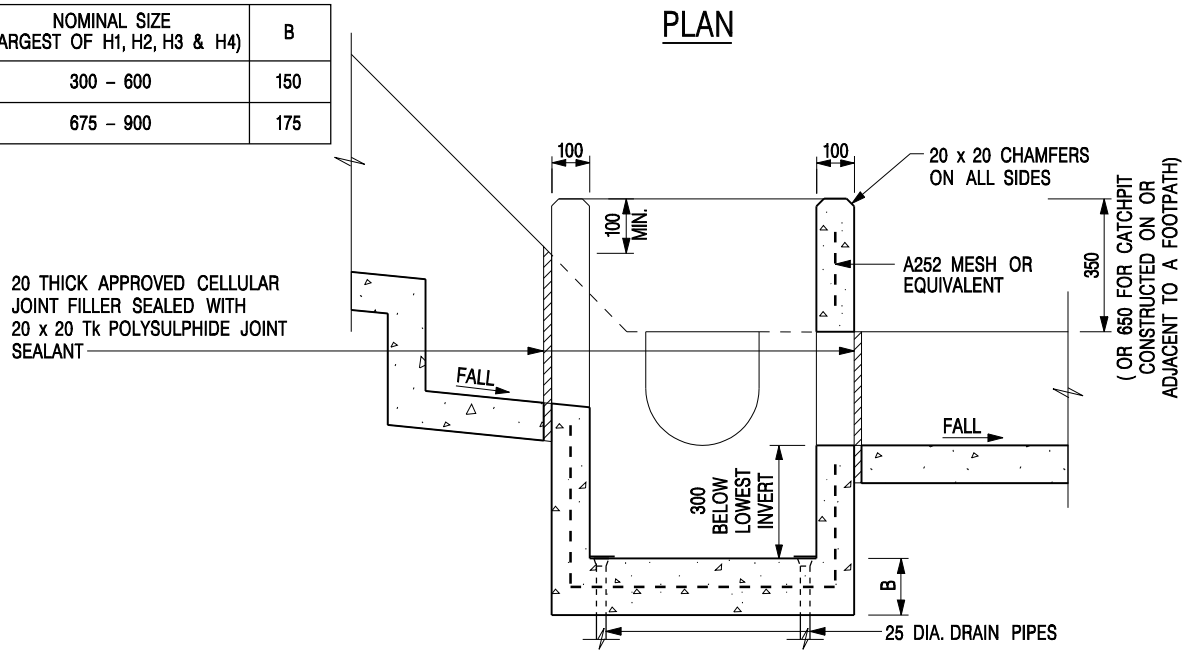
No.	Comments	Responses
1	**From: Chief Engineer/Construction, WSD** **Contact: Ms. Victoria SUEN**	
	The application site is located within the upper indirect Water Gathering Ground (WGG). Based on the provided information, there are risks of contamination to the WGG due to the operation and management of the vehicle park. In order to safeguard the raw water quality in WGG, the Applicants shall provide a risk assessment report to prove and demonstrate to the satisfaction of the Water Supplies Department (WSD) that there is no material increase in pollution effect resulting from the proposed development. In particular, the Applicant shall provide evidences and/or control measures to ensure that the following conditions are met:	A risk assessment has been provided. Details of the risk assessment has been summarized below: In order to eliminate any potential pollution induced from the operation of the proposed vehicle park, drainage system have been proposed to the site, so that surface runoff during rainfall events collected within the application site would be discharged to the drainage channels and subsequently to the stream course. A series of mitigation measures and management practices have been proposed to ensure there is no material increase in pollution effect within WGG during the operation of the proposed development. The only construction activities involved in the proposed development would be the construction of the proposed minor drainage system, which may involve minimal excavation at specific locations. A series of mitigation measures and management practices have been proposed to ensure the possible impacts of the proposed development to the water bodies dur to the installation works is minimized.
a.	No discharge of effluent or foul water into adjoining land, storm water drain, channel, stream or river course is allowed. Such foul water or effluent shall be collected and disposed of outside WGG.	Since the application site is solely used for car parking, no foul water or effluent will be produced. Any waste (expected to be small in amount) will be regularly collected and transferred to the nearest refuse collection point. The collection point is at She Shan Road, which is 20m away from the site.
b.	All solid waste and sludge arising from the operation of the proposed car park shall be disposed of properly outside the gathering grounds.	Noted, all solid waste and sludge (expected to be small in amount) will be regularly collected and transferred to the nearest refuse collection point. The collection point is at She Shan Road, which is 20m away from the site.
c.	The use and storage of pesticides, herbicides, toxicants, chemical solvents, larvicidal oil, rodenticide, tar and petroleum oil are strictly prohibited in WGG.	Noted, no pesticides, herbicides, toxicants, chemical solvents, larvicidal oil, rodenticide, tar and petroleum oil will be allowed/ stored/ sold at the application site. Signage to forbid the use or storage of these chemicals will be displayed on the application site.
d.	No chemicals including fertilizers and detergents shall be used/stored without the prior approval from the Water Authority.	No chemicals including fertilizers and detergents will be allowed/ stored/ sold at the application site. Signage to forbid the use or storage of fertilisers

No.	Comments	Responses
		and detergents will be displayed on the application site.
e.	Oil leakage and spillage are not allowed within WGG at all times. Oil and grease decontamination kit such as absorbent pads shall be made available to decontaminate any possible oil leakage or spillage. Control measures including not allowing oil tanker to park inside the vehicle parking spaces shall be implemented to avoid oil leakage or spillage in the gathering grounds.	No oil will be allowed/ stored/ sold at the application site. Signage to forbid the use or storage of oil will be displayed on the application site. Signage to forbid oil tanker will be displayed on the application site.
f.	The vehicle park and its associated activities shall be located away from any water courses as far as possible. Signage for alerting not to pollute WGG should be displayed.	Kerbs will be installed, and drainage system will be adopted to avoid polluting WGG. Signage for alerting not to pollute WGG will be displayed on the application site.
g.	Fencing shall be erected on the sides facing the nearest stream course to trap all wind-blown litters within the site of development.	Chain-link fence will be installed on the sides facing the nearest stream course to trap all wind-blown litters such as paper, plastic bags, bottles and boxes from the application site. Good management measures such as regular cleaning and sweeping of site surface will be conducted. The site surface cleaning will also be carried out prior to occurrence of rainstorm.
h.	Site surface should be impermeable to oil and grease as far as practicable. Any soil contaminated with fuel leakage shall be immediately removed off site and the voids arising from removal of contaminated soil shall be replaced by suitable material to the satisfaction of the Water Authority.	The site surface has been hard paved and impermeable. No oil will be allowed/ stored/ sold at the application site. Signage to forbid the use or storage of oil will be displayed on the application site. Signage to forbid oil tanker will be displayed on the application site.
i.	Vehicle Park shall be surrounded by kerbs and drains. Drainage traps such as grease traps and petrol interceptors shall be installed at each of the drainage outlets and shall be under proper maintenance. All such drainage traps shall have sufficient capacity to ensure the proper interception and collection of fuel and lubricants in surface run-off for off-site disposal. Proper maintenance and disposal records should be maintained.	Kerbs will be installed, and drainage system will be adopted. Sufficient drainage traps such as grease traps and petrol interceptors will be installed at the drainage outlet. Proper maintenance and disposal will be maintained.
j.	Besides vehicle parking, other activities such as on-site vehicle inspection, maintenance, repairing and washing activities shall not be allowed in the proposed development.	No on-site vehicle inspection, maintenance, repairing and washing activities will be allowed in the application site.
k.	The 'Conditions of Working within Water Gathering Grounds' shall be complied.	Noted.



PLAN

NOMINAL SIZE (LARGEST OF H1, H2, H3 & H4)	B
300 – 600	150
675 – 900	175



SECTION A – A

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO SHEET 2 FOR OTHER NOTES.

REF.	REVISION	SIGNATURE	DATE
–	FORMER DRG. NO. C2406J.	Original Signed	03.2015

CATCHPIT WITH TRAP

(SHEET 1 OF 2)

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

SCALE 1 : 20

DATE JAN 1991

DRAWING NO. C2406 /1

DESIGN OF THE U-CHANNELS (225mm)

Catchment area	=	440	m^2							
	=	0.00044	km^2							
Peak runoff	=	0.278	x	0.95	x	250	mm/hr	x	0.00044	km^2
	=	0.029051	m^3/s							
	=	1743.06	liter/min							

According to Figure 1 - Chart for the rapid design of U-shaped and half-round channels up to 600mm,

Capacities of channels (gradient of 1:100)	=	3900	liter/min	>	1743.06	liter/min	OK

Therefore, 225UC with gradient 1:100 is adequate for application site.

DESIGN OF THE uPVC DOWNPIPE (225mm DIA.)

Peak runoff	=	1743.06	liter/min
	=	29.051	liter/s

a) Checking average velocity and discharge capacity when running full

From Flow chart 1 (B.S.8005: part 1 1987)

Use gradient of pipe, a	=	1 in 100	
With diameter	=	225	mm
Read discharge	=	50	L/s
Read average flow velocity	=	1.3	m/s

b) Checking channel usage and actual flow velocity when running at design flow

From Relative Velocity and Flow in Circular Pipe for any Depth of Flow (B.S. 8005: part 1 1987)

Assume 90% Full								
Read Proportional Discharge	=	1.07						
Read Proportional Velocity	=	1.13						
Actual Discharge	=	1.07	x	50				
	=	53.5						
Actual Velocity	=	1.13	x	1.3				
	=	1.469						

c) Checking if self-cleansing is achieved when flowing at design flow

When the discharge is 0.5, the proportion velocity is 1.0,

Flow velocity	1	<	1.3	<	4

d) The capacity of the drainage pipe

Read average flow velocity	=	1.3	m/s							
Cross-section area of existing pipe	=	0.04	m^2							
Maximum pipe capacity	=	1.3	x	0.04	x	1000	x	60		
	=	3120	L/min	>	1743.06	L/min		OK		

Therefore, 225mm DIA. of pipe with gradient 1:100 is adequate for application site.

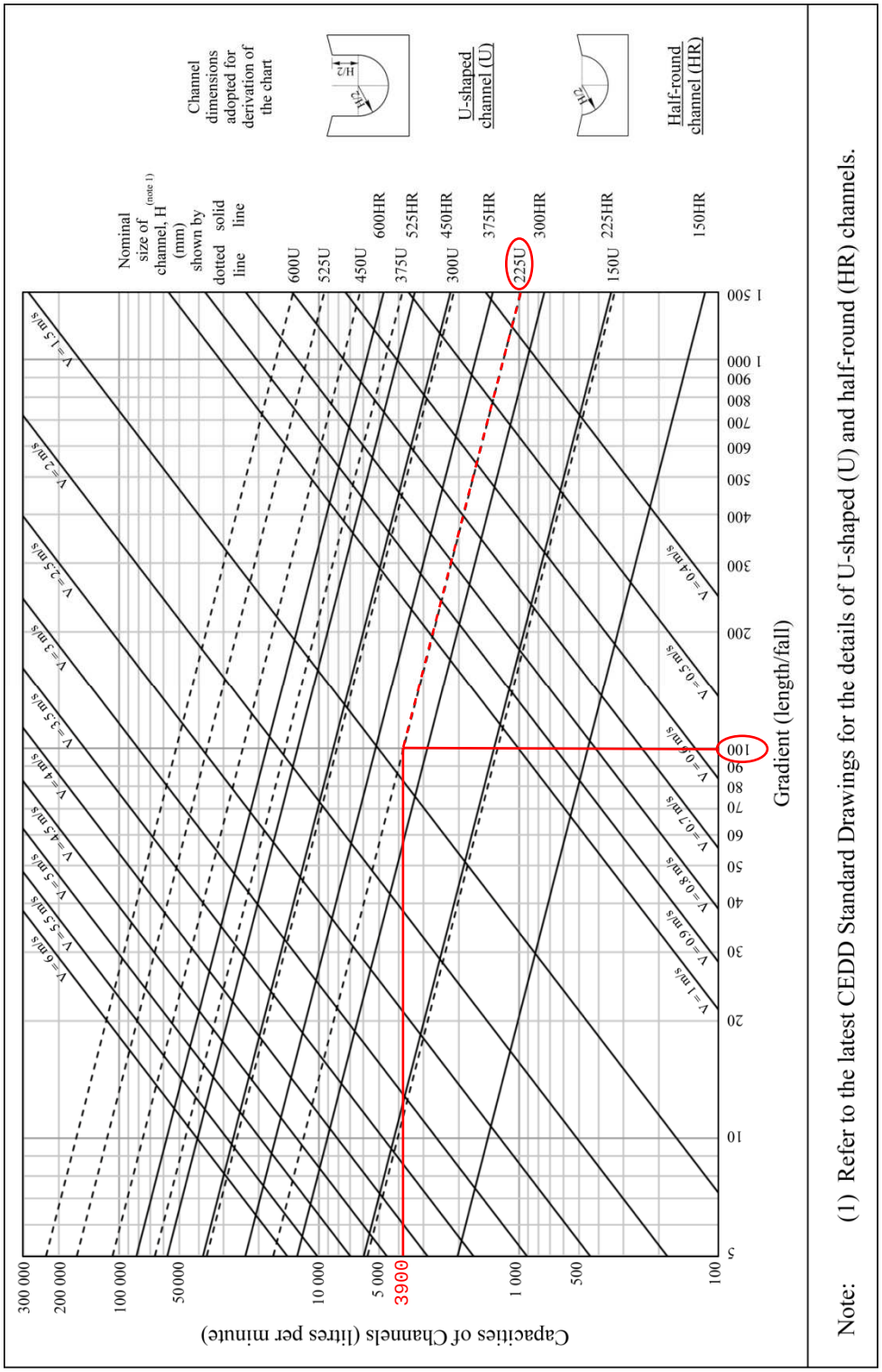
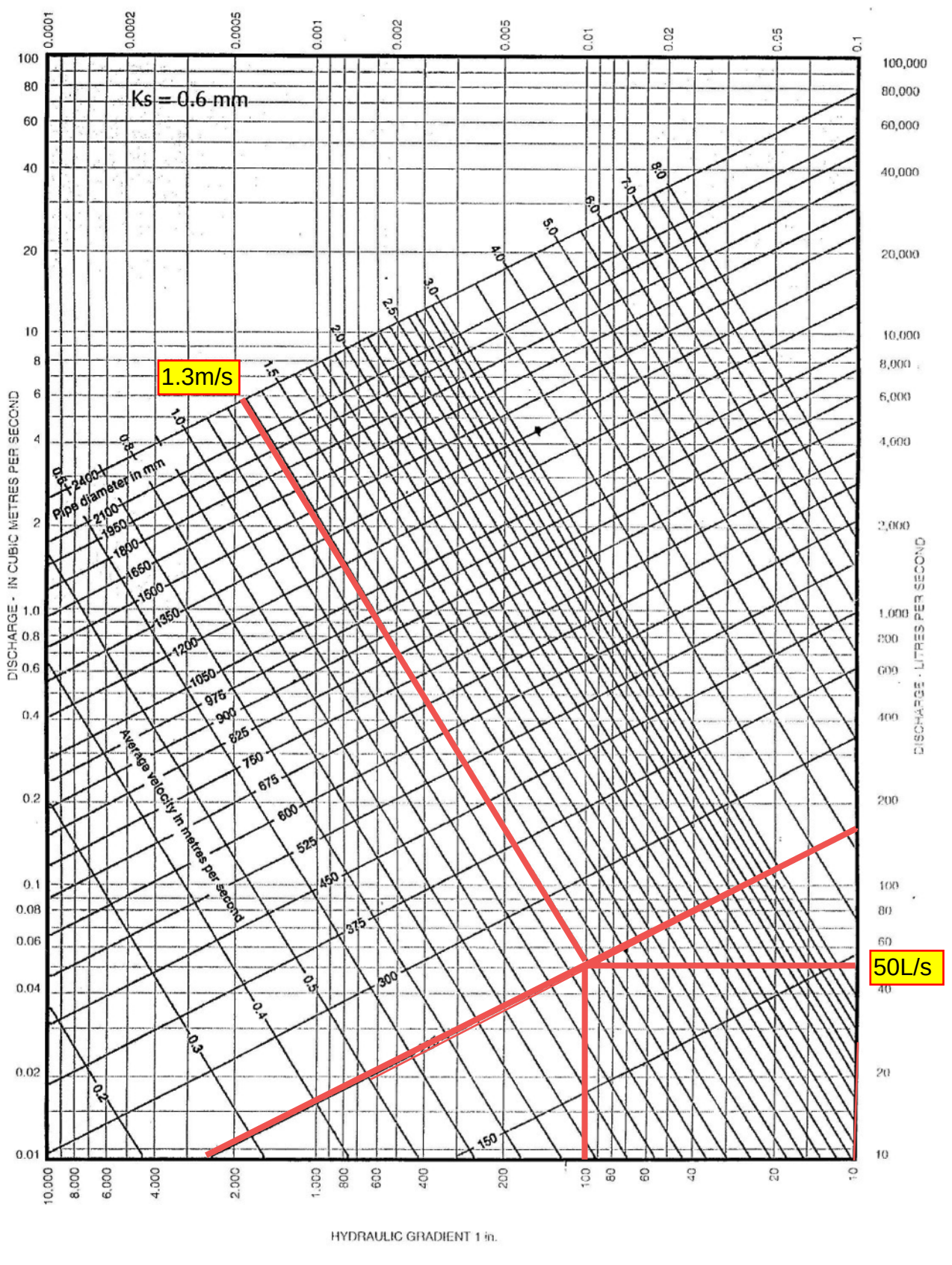
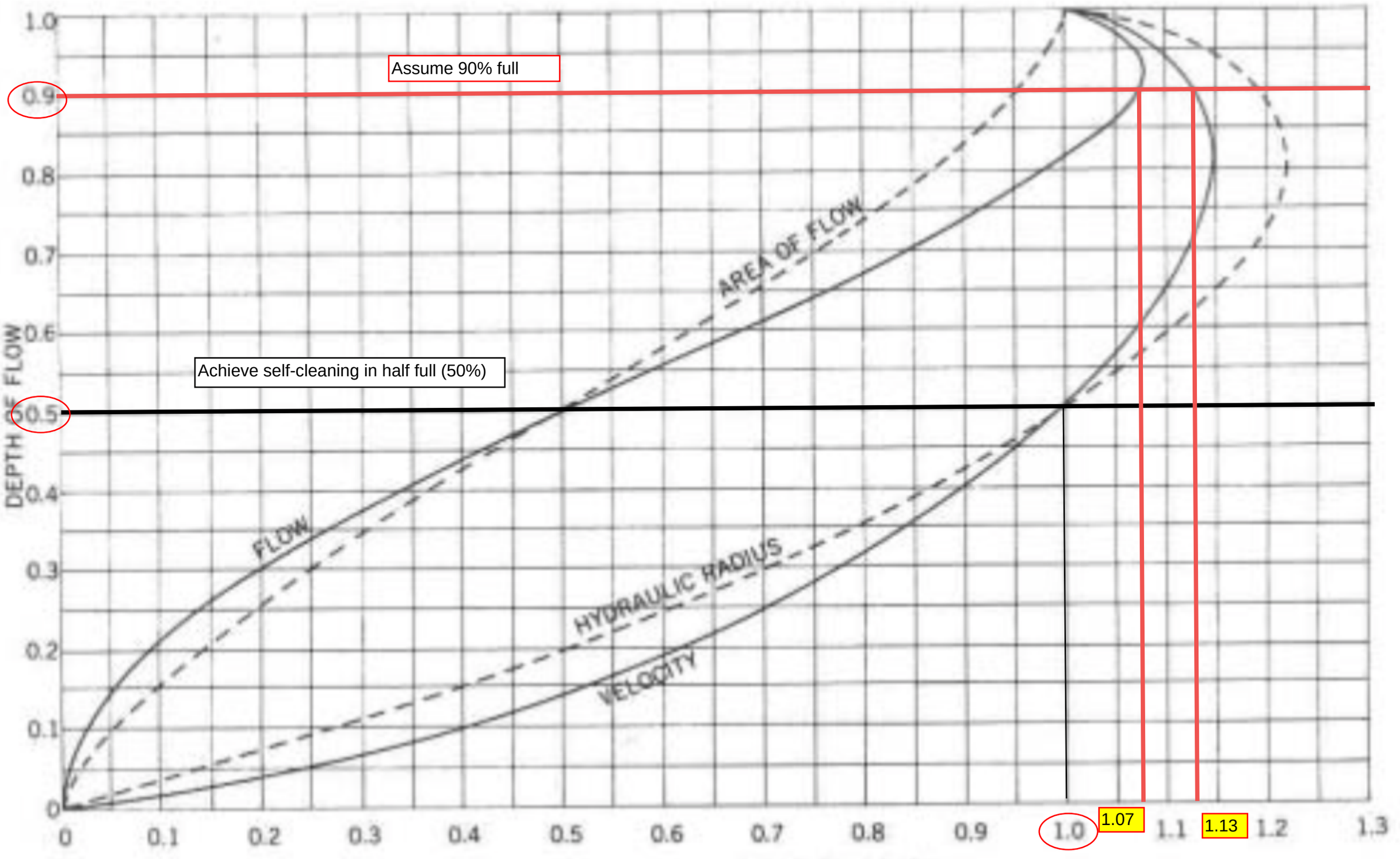
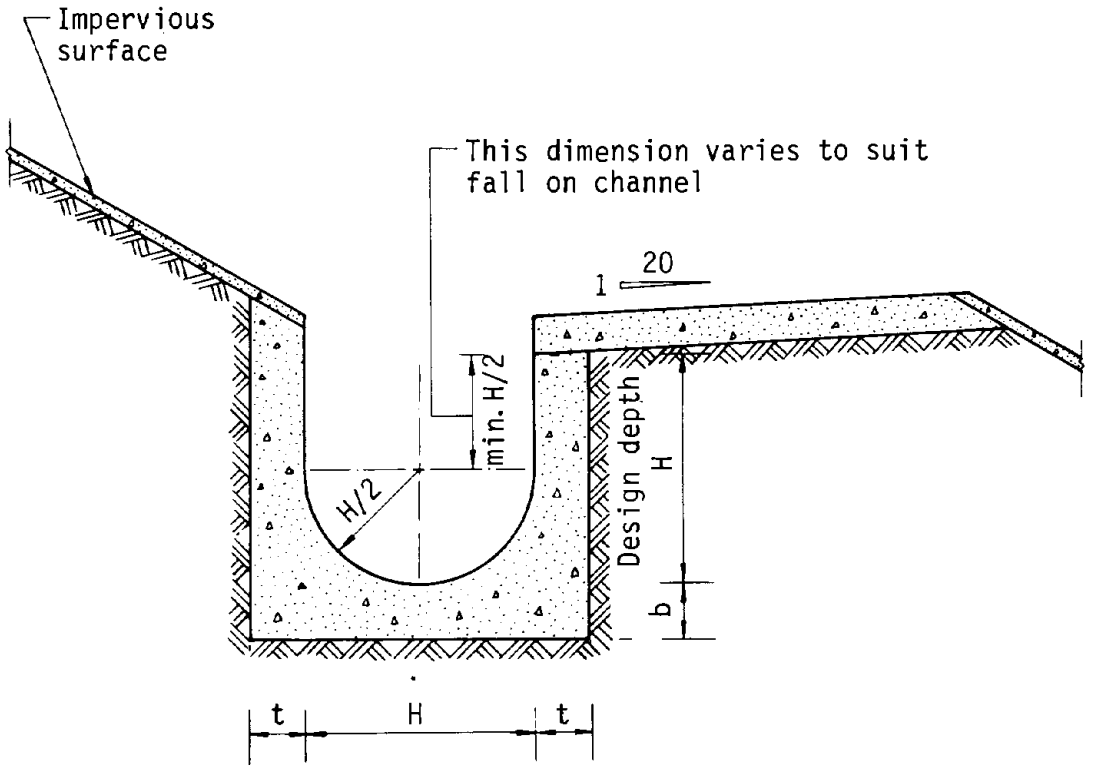


Figure 1 - Chart for the rapid design of U-shaped and half-round channels up to 600 mm


Ks = 0.6 mm
1.3m/s
50L/s
DISCHARGE - IN CUBIC METRES PER SECOND
DISCHARGE - LITRES PER SECOND
HYDRAULIC GRADIENT 1 in
Pipe diameter in mm
Average velocity in metres per second

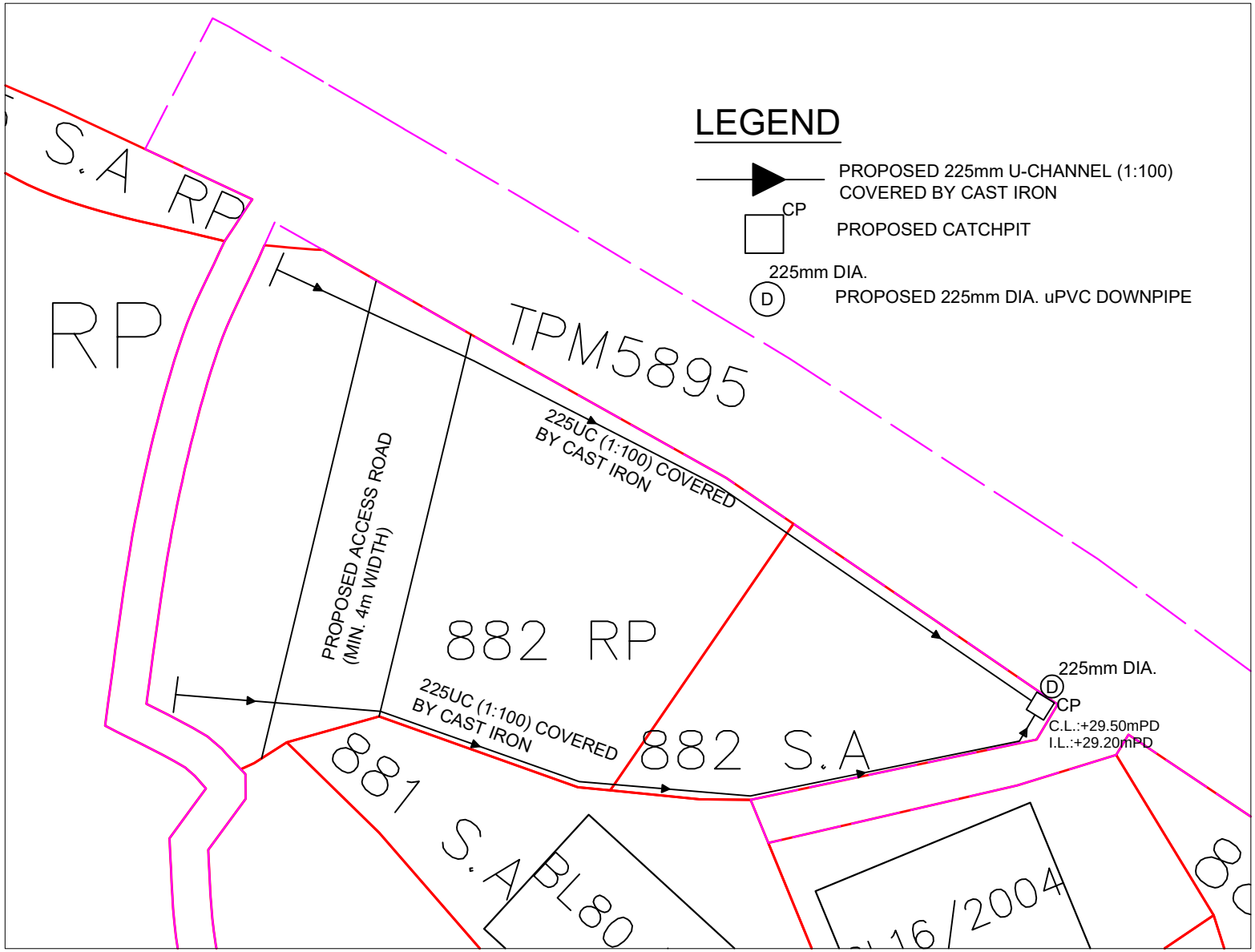

Assume 90% full
Achieve self-cleaning in half full (50%)
AREA OF FLOW
FLOW
HYDRAULIC RADIUS
VELOCITY
DEPTH OF FLOW
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.07
1.1
1.13
1.2
1.3



Dimensions of U - channel		
Nominal size of channel H (mm)	Thickness t (mm)	Thickness b (mm)
225 to 600	150	150
675 to 1200	175	225

Figure 8.11 - Typical U-channel Details

PROPOSED DRAINAGE PLAN



GENERAL NOTES:

1. PROPOSED DRAINAGE SYSTEM INVOLVED EXCAVATION OF WORKS.

2. CATCHPIT WITH DESILTING FACILITY SHALL FOLLOW CEDD STANDARD DRAWING NO. C2406/1.

3. U-CHANNEL SHALL FOLLOW TYPICAL DETAILS OF GEOTECHNICAL MANUAL FOR SLOPE FIGURE 8.11.

4. U-CHANNEL SHALL BE COVERED BY CAST IRON.

5. THE COVERED LEVEL AND INVERTED LEVEL OF THE CONNECTION POINT SHALL BE VERIFIED ON SITE.

Risk Assessment Report for Planning Application No. A/NE-LT/774

1.1 Scope of Work

The aim of this study is to address the comments from Water Supplies Department.

1.2 The Proposed Development

The application site is located at She Shan Village, Tai Po, New Territories. It has a total area of about 440m^2 and is currently vacant and flat. The site has long been hard paved for more than 2 years. While the application site falls within the upper indirect Water Gathering Ground (WGG), there is a stream course along the north of the site.

The development proposal only consists of a temporary village car park with 11 parking spaces (private car only) for a period of 3 years. It is intended to relieve the genuine demand for parking spaces to serve the villagers in the area. No toilet facility, car washing, or repair activities will be allowed. In order to eliminate any pollution, it may possibly arise from the proposed vehicle park, drainage system have been proposed at the site within the site boundary, so that surface runoff during rainfall events collected within the application site would be discharged to the drainage channels and then discharged to the stream course to the northeast of the site.

1.3 Assessment of Impact During Construction Phase

1.3.1 Factors that may affect the Water Gathering Ground (WGG)

The application site is flat and hard paved. The only construction activities involved in the proposed development would be the construction of proposed drainage system and erection of chain-link fence, which may involve minor excavation of not more than 0.5m depth at specific locations. Minor excavation may cause sediments, other suspended solids and contaminants. As such works should be carried out in such a manner as to minimize adverse impacts on the water quality.

1.3.2 Proposed Mitigation Measures and Management Practices

Control of potential water quality impact arising from the minor excavation shall be achieved based on the following principles:

a. Minimization of runoff; and
b. Prevention of the likelihood of the identified pollutants being in contact with rain or runoff; and
c. Measures to abate pollutants in the stormwater runoff.

In order to minimize the likelihood of the potential hazards as identified above, the Applicant has proposed a series of mitigation measures and management practices;

1. Installation works should be programmed to minimize excavation works where practicable during the rainy days;
2. During construction of proposed drainage system and erection of chain-link fence, no earth and other installation materials which may cause contamination to WGG are allowed to be stockpiled or stored on site;
3. All excavated or filled surfaces shall be protected from erosion and siltation to any water courses shall be prevented within WGG;
4. All spoils shall be contained and protected; and effluent containing spoils shall be disposed of after desiltation;
5. Waste and other garbage generated during the installation works would be dumped properly.

With the above mitigation measures, the potential impacts of the proposed development to the water bodies due to the construction works is minimized.

1.4 Assessment of Impact During Operation Phase

1.4.1 Factors that may affect the Water Gathering Ground (WGG)

1. Discharge of effluent, sewage or foul water;
2. Solid waste and sludge;
3. Use and storage of pesticides, herbicides, toxicants, chemical solvents, larvicidal oil, rodenticide, tar and petroleum, oil;
4. Use and storage of chemicals such as fertilizers and detergents;
5. Existence of oil leakage and spillage;
6. Lack of fencing to trap wind-blown litters;
7. Kerbs and drains surrounding vehicle park/ drainage traps at drainage outlet;
8. Lack of oil and grease decontamination kit;
9. On-site vehicle inspection, maintenance, repairing & washing activities/ machinery repairing;
10. Oil tanker parking inside vehicle park;
11. Use of detergents & fertilisers; and
12. Vehicle dust, scraps and oil deposited on site surface.

During operation, potential water quality impact would be the surface runoff during rainfall event which is known as non-point source of pollution. Substances such as vehicle dust, scraps and oil may be deposited on paved site surface. Pollutants contributed by non-point source are often bound or adsorbed onto particles, thus an effective stormwater management system will be the removal of pollution sources prior to rainstorm and the provision of facilities that collect sediment.

1.4.2 Proposed Mitigation Measures and Management Practices

In order to minimize the likelihood of the potential hazards as identified above, the Applicant has proposed a series of mitigation measures and management practices, which are detailed in Appendix 1;

The operation of the car park will only commence once the construction of the proposed drainage system has been completed upon satisfaction of relevant government departments. During operation, collected surface runoff will be discharged into the proposed drainage system within the application site, and then discharged to the stream course at the northeast of the site. Given the proposed development is small scale in nature, the increase in surface runoff generated from the proposed development should not be in significant amount. The Applicant will properly manage and maintain the facilities within the application site.

Good management measures such as regular cleaning and sweeping of site surface is suggested. The site surface cleaning should also be carried out prior to occurrence of rainstorm. U-channels and catchpit provided will be regularly inspected and cleaned out. With the removal of pollutants, the pollution levels from stormwater would be much reduced, and given the stochastic nature of non-point source pollution and the proposed management measures, there will be no significant impact expected.

Therefore, there will be no flooding arising from the proposed development, and no adverse water quality impact on nearby water bodies during operation of the proposed development is anticipated.

1.5 Recommendations

To protect the integrity of the upper indirect WGG, no excavation exceeding 0.5m will be allowed within the site. To minimize the likelihood of the potential hazards during the construction and operational phases, mitigation measures and good management practices have been proposed as detailed in Section 1.3 and Section 1.4 above. The "Conditions of Working within Water Gathering Grounds" shall be complied.

1.6 Conclusion

All potential hazards are anticipated to remain at low risk or to be reduced after the implementation of mitigation measures. The analysis shows the proposed vehicle park would cause no material increase in pollution effect within WGG and low risk of pollution to be arisen from the construction and operational phases.

The applicant shall undertake that the operation and maintenance of the proposed development. This report shows that contamination to be caused to the water course in the WGG by the proposed development is not anticipated.

APPENDIX 1

L	Likelihood	rL	Residual Likelihood
C	Consequence	rC	Residual Consequence
RR	Risk Rating (L x C)		
RL	Risk Level		
ARR	Anticipated Residual Risk (rL x rC)		

Consequence (C) / (rC)	Likelihood (L) / (rL)		
	High (Near certain) - 3	Medium (Frequent) - 2	Low (Seldom) -1
Major - 3	Urgent - 9	High - 6	Medium - 3
Serious - 2	High - 6	Medium - 4	Low - 2
Slight (tolerable) - 1	Medium - 3	Low - 2	Low - 1

Item	Potential Hazard	L	C	RR	RL	Control Measures	rL	rC	ARR	RL
1	Discharge of effluent or foul water into adjoining land, storm water drain, channel, stream or river course	2	2	4	Medium	No activity will produce foul water, sewage or effluent of the application site. No toeilets will be proposed within the site. Therefore, no sewage will be producted at the application site. Notice will be posted at the site to forbid any usage and storage of pesticides, toxicants, flammable solvents, larvicidal oil, rodenticide, tar, petroleum oil and fertilizers.	1	1	1	Low
2	Solid waste and sludge arising from the operation of the proposed car park	1	2	2	Low	Any waste (expected to be small in amount) will be regularly collected and transferred to the nearest refuse collection point. The collection point is at She Shan Road, which is 20m away from the site.	1	1	1	Low

L	Likelihood	rL	Residual Likelihood
C	Consequence	rC	Residual Consequence
RR	Risk Rating (L x C)		
RL	Risk Level		
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Consequence (C) / (rC)	Likelihood (L) / (rL)		
	High (Near certain) - 3	Medium (Frequent) - 2	Low (Seldom) -1
Major - 3	Urgent - 9	High - 6	Medium - 3
Serious - 2	High - 6	Medium - 4	Low - 2
Slight (tolerable) - 1	Medium - 3	Low - 2	Low - 1

3	Leakage of pesticides, herbicides, toxicants, chemical solvents, larvicidal oil, rodenticide, tar and petroleum oil	1	2	2	Low	No usage or storage of pesticides, herbicides, toxicants, chemical solvents, larvicidal oil, rodenticide, tar and petroleum oil will be allowed at the site. Notice will be posted at the site to forbid any usage or storage of pesticides, herbicides, toxicants, chemical solvents, larvicidal oil, rodenticide, tar and petroleum oil.	1	1	1	Low
4	Leakage of chemicals such as fertilizers and detergents	1	2	2	Low	No chemicals such as fertilizers and detergents is allowed to be used at the site. Notice will be posted at the site to prohibit the use of chemicals.	1	1	1	Low
5	Oil leakage and spillage within Water Gathering Ground (WGG)	1	2	2	Low	No oil will be allowed/ stored/ sold at the application site. Signage to forbid the use or storage of oil will be displayed on the application site. Signage to forbid oil tanker will be displayed on the application site.	1	1	1	Low

L	Likelihood	rL	Residual Likelihood
C	Consequence	rC	Residual Consequence
RR	Risk Rating (L x C)		
RL	Risk Level		
ARR	Anticipated Residual Risk (rL x rC)		

Consequence (C) / (rC)	Likelihood (L) / (rL)		
	High (Near certain) - 3	Medium (Frequent) - 2	Low (Seldom) -1
Major - 3	Urgent - 9	High - 6	Medium - 3
Serious - 2	High - 6	Medium - 4	Low - 2
Slight (tolerable) - 1	Medium - 3	Low - 2	Low - 1

6	Wind-blown litters within the stream course	3	2	6	High	Chain-link fence will also be installed on the sides facing the nearest stream course to trap all wind-blown litters such as paper, plastic bags, bottles and boxes from the application site. Any waste (expected to be small in amount) will be regularly collected and transferred to the nearest refuse collection point. The collection point is at She Shan Road, which is 20m away from the site.	2	1	2	Low
7	Lack of Kerbs and drains surrounding vehicle park/ drainage traps at each drainage outlet	2	2	4	Medium	Kerbs will be installed, and drainage system will be adopted. Sufficient drainage traps such as grease traps and petrol interceptors will be installed at the drainage outlet.	1	1	1	Low

L	Likelihood	rL	Residual Likelihood
C	Consequence	rC	Residual Consequence
RR	Risk Rating (L x C)		
RL	Risk Level		
ARR	Anticipated Residual Risk (rL x rC)		

Consequence (C) / (rC)	Likelihood (L) / (rL)		
	High (Near certain) - 3	Medium (Frequent) - 2	Low (Seldom) -1
Major - 3	Urgent - 9	High - 6	Medium - 3
Serious - 2	High - 6	Medium - 4	Low - 2
Slight (tolerable) - 1	Medium - 3	Low - 2	Low - 1

8	Lack of oil and grease decontamination kit	1	2	2	Low	No oil will be allowed/ stored/ sold at the application site. Signage to forbid the use or storage of oil will be displayed on the application site. Signage to forbid oil tanker will be displayed on the application site.	1	1	1	Low
9	On-site vehicle inspection, maintenance, repairing & washing activities/machinery repairing	2	2	4	Medium	No vehicle inspection, maintenance, repairing & washing activities/machinery repairing will be allowed within the site. Notice will be posted at the site to prohibit vehicle inspection, maintenance, repairing & washing activities/machinery repairing.	1	1	1	Low
10	Oil tanker parking inside vehicle park	2	2	4	Medium	No oil tankerwill be allowed to be parked inside the site to avoid oil leakage or spillage. A notice will be posted at the entrance of the site to prohibit oil tanker to enter the site.	1	1	1	Low

L	Likelihood	rL	Residual Likelihood
C	Consequence	rC	Residual Consequence
RR	Risk Rating (L x C)		
RL	Risk Level		
ARR	Anticipated Residual Risk (rL x rC)		

Consequence (C) / (rC)	Likelihood (L) / (rL)		
	High (Near certain) - 3	Medium (Frequent) - 2	Low (Seldom) -1
Major - 3	Urgent - 9	High - 6	Medium - 3
Serious - 2	High - 6	Medium - 4	Low - 2
Slight (tolerable) - 1	Medium - 3	Low - 2	Low - 1

11	Use of detergents and fertilisers	1	2	2	Low	No detergents nor fertilisers will be used at the site. Notices will be posted at the site to prohibit the use of detergents and fertilisers.	1	1	1	Low
12	Vehicle dust scraps and oil deposited on site surface	2	2	4	Medium	Kerbs will be installed, and drainage system will be adopted. No oil will be allowed/ stored/ sold at the application site. Good management measures such as regular cleaning and sweeping of site surface will be conducted. The site surface cleaning will also be carried out prior to occurrence of rainstorm.	1	1	1	Low