## ANNEX 3A

Sewerage Drainage Calculation based on 270 units sent to DSD on 23 September 2022 and DSD's email reply on no-principle objection on 22 November 2022

From:	Joey Ng <joeyng@meinhardt.com.hk></joeyng@meinhardt.com.hk>
Sent:	Friday, 23 September 2022 2:56 pm
То:	khlai@dsd.gov.hk
Cc:	tkhyip@bd.gov.hk; '(MME) Project Email'
Subject:	105 Robinson Road - Reply for DSD's Comment
Attachments:	Reply of Comment to DSD (20220923).pdf; Sewerage Drainage Calculation.pdf;
	Storm Water Drainage Calculation.pdf; Drainage Discharge Proposal.pdf

Dear Mr. Lai,

Further to your comment on our drainage submission drawings dated 9 Sept 2022, our responses are tableted as attached "Reply of Comment to DSD (20220923)" for your consideration.

Should you have any queries, please contact our Ms. Joey Ng at 2859 5421.

Regards, Joey Ng Senior Engineer



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Proiect:	Proposed Development at 105 Robinson Road, Mid-Levels West, Hong Kong, I.L. 942	Date: 23-9-2022
Ref.:		
Reply of	Comment to DSD	1
ltem	Comment	Reply
(a)	The diameter of the drain (i.e. 150mm) connecting to existing government manhole SMH7068622 as shown on drawing no. ME2248-D1-01 is inconsistent with those show in other drawings as well as our drainage records (i.e. 225mm).	Noted. The diameter of drain will be revised from 150mm to 225mm.
(b)	The AP shall submit to us for consideration design calculations to demonstrate that the proposed drainage and sewerage connection as well as the existing public drainage and sewrage systems at immediate downstream of the connections will have sufficient capacity to cope with the discharge from the redevelopment. If necessary, the AP shall upgrade the existing public drainage and sewerage systems at immediate downstream of the connectiond at his own cost and up to our satisfaction.	Please refer to the attached drainage calculations.
(c)	The connection pipes should have a size of at least 200 mm diameter (internal diameter) for sewer and 225 mm diameter (internal diameter) for stormwater drain. In this regard, the AP shall amend the size of the proposed 150 mm diameter sewer between the proposed sewage terminal manhole FMH-1 and government manhole FMH7005731 to at least 200 mm in diameter.	Please refer to the attached drawing "Drainage Discharge Proposal" for the revised sewer size of 200mm from the proposed sewage terminal manhole FTMH-01 to government manhole FMH7005730.
(d)	Invert levels including inlet invert levels and outlet invert levels of the existing government manholes SMH7068622 and FMH7005731 for the proposed drainage and sewerage connection are missing. This information should be clearly shown on site plan, layout plans and the manhole schedules.	Please refer to the attached drawing "Drainage Discharge Proposal" for the invert levels added. For those invert levels of the existing government manholes not shown in DSD record plan, the invert levels are indicated with reference to our utility survey report.
(e)	As revealed from drawings nos. ME2248-D0-01 and ME2248-D1-01, it appears that only a portion of the connection pipes from the proposed terminal manholes STMH-1 and FMH-1 will be replaced. In this regard, the AP's attention is drawn to that the entire pipe from the terminal manhole to the downstream government manhole should be replaced as required for the redevelopment in order to avoid intermediate connection of new and old pipe which will be susceptible to leakage at the connection point.	Please refer to the attached drawing "Drainage Discharge Proposal" that the connection pipes from our proposed terminal manholes to the government manholes will be newly constructed.
(f)	The proposed adoption of cast iron pipe for drainage and sewerage connection as shown on "Pipe Material Schedule" on drawing no. ME2248-D0-01 is not acceptable. The AP shall note that precast concrete pipes should generally be used for stormwater connection while polyethylene pipes should generally be used for sewer connection. The proposed sewers / stormwater drains running on slope should be made of ductile iron and to be exposed.	Please refer to the attached drawing "Drainage Discharge Proposal" for the revised pipe materials. Precast concrete pipe will be adopted for stormwater connection while polyethylene pipe will be adopted for foul water connection. Ductile iron pipe will be used for the exposed drains laid on slope.
(g)	Based on our records, the area between the proposed terminal manhole FMH-1 and government manhole FMH7005731 is a slope. In this regard, the proposed sewer connection should be an exposed ductile iron pipe. The AP shall clarify and clearly indicate this requirement in the drawings as appropriate. In addition, a leakage collection system should be provided and shown on the drawings for the sewer laying on slope according to Section 10.6 of DSD Stormwater Drainage Manual.	Please refer to the attached drawing "Drainage Discharge Proposal" that an exposed D.I. pipe will be adopted with leakage collection system provided.
(h)	The AO shall note that the slope mentioned in item (g) above is a feature no. 11SW A-C61 which is unber HyD's purview according to Land Department'S Slope Maintenance Responsibility Information System. In this regard, the AP shall seek comment and consent from HyD on the proposed sewerage works.	Noted and will seek comment from HyD on the proposed drainage works.
(i)	The ownership and maintenance responsibility of the drains, sewers and manholes should be clearly demarcated on the drawings for aviodance of doubt.	The drains, sewers and manholes outside our lot boundary shall be owned and maintained by DSD.
(j)	Should there be any abandoned pipes as a result of the porposed redevelopment, they shall be removed or filled up at the developer's cost and to the satisfaction of this Department. For detailed requirements on the handling of abandoned pipes, please refer to DSD Technical Circular No. 2/2008 - Handling of Abandoned Pipes should be indicated on drawings for future reference.	Noted.

	Proposed Development at 105 Robinson Road, Mid-Levels West, Hong	
Project:	Kong, I.L. 942	Date: 23-9-2022
Ret.:		
Reply of	Comment to DSD	Pontu
item		
(k)	The AP is required to ensure that no construction debris, silt and sediments, untreated site runoff or cementitious materials will be will be discharged to or deposited inside the pubmic stormwater drains (SWD) or sewers within or in the vicinity of the development site. The AP shall monitoor the internal conditions of the existing public SWD/sewers within or in the vicinity of the development site by CCTV surveys (or other alternatives to be agreed by DSD), prior to commencement and upon completion of the construction works to our satisfaction. The AP shall propose the detailed arrangement including the timing, methodology and extent of the public SWD/sewer to be surveyed by CCTV (or by other alternatives) for DSD' agreement. Nevertheless, such CCTV surveys (or other agreed alternatives) serve no intention to relieve the AP's liabilities on any damage to other SWD/sewers that are not included in the survey. Any pipe blockage r damage arising from the construction works shall be made good at the cost of the developer and to our satisfaction. In case the CCTV survey is abandoned for any section of SWD/sewers, the AP shall notify DSD by the following working day and arrange joint site inspection with DSD proir to the formal submission of CCTV report for considering of SWD/sewers, the DSD proir to the form al submission of CCTV report for considering the follow-up action required from the AP. Inaddition, the AP shall also seek DSD's agreement before application of the discharge licence for approval by EPD. During the process, DSD might request the AP to arrange joint-site inspection to facilitate determination of the suitable discharge point(s).	Noted.
(1)	The AP shall obtain consent from DLO proir to commencement of such works. Excavation permits should also be obtained from DLO or HyD for any excavation works required. Except those parts agreed to be taken over by DSD, the lot owner should be responsible for the future maintenance and possible relocation of such works as and when required by the Government.	Noted.
(m)	The AP shall exercise extreme care when working in the vicinity of the existing public drainage/sewerage facilities in order not to disturb, interfere with or cause damage to them. Should any undue settlement ot damage of the existing public drainage/sewerage installation be detected, the works should be stopped immediately and the developer shall report the matter to the Buildings Authority and this Department as soon as possible. In the event of any blockage / damage caused to the existing public drainage / sewerage installation by the above works, the developer shall clear the blockage and make good the damage at his own cost and to our satisfaction.	Noted.
(n)	All proposed drainage connection works should be carried out by the developer in accordance with DSD Standard Drawings at the developer's cost. The AP is reminded to submit the HBP1 application works. All drainage/sewerage works to be handed over to this Department shall conform to the requirements stipulated in Stormwater Drainage Manual, Sewerage Manual, DSD Standard Drawings, DSD Technical Circulars, Practice Notes and Guidelines, etc.	Noted.
(0)	In general, this Department will only take over those public drainage/sewerage facilities constructed on government land (except Right of Way) with proper access and located at downstream of the terminal manholes.	Noted.
(q)	The AP is required to liaise with relevant utility indertakers to obtain the latest records, plans and alignments of their utilities in order to ensure the feasibility of the proposed drainage works. The AP is also required to excavate inspection pits and conduct utility detection to verify the alignments of utilities shown in such utility records if considered necessary.	Noted.

	Proposed Development at 105 Robinson Road, Mid-Levels West, Hong	
Project:	Kong, I.L. 942	Date: 23-9-2022
Ref.:		
Reply of (	Comment to DSD	
ltem	Comment	Reply
(q)	Under the Waer Pollution Control Ordinance (Cap 358), discharge of wastewater into stormwater drains is not permitted. The AP shall ensure that the proposed sewerage works shall convey all wastewater, including but not limited to those wastes generated by the domestic use of toilets, water closets, baths, showers, sinks, basins and other sanitary and kitchen fitments, through the sewage terminal manhole(s) to the public sewers. Besides, to ensure the sustainability of the public sewerage network, the AP shall ensure that the surface runoff within the development site will be collected and discharged via a stormwater drainage system and not be drained to the public sewerage network.	Noted.
(r)	It is the developer's responsibility to identify/locate the existing government sewers and stormwater drains to which drainage connections from his site are to be proposed. The AP should verify the existence of any drains/sewers/utilities and also their exact locations, levels and alignments on site in order to ascertain the positions and levels of the proposed manholes and the associated connection works. The AP should also verify that the existing government drains/sewers, to which connections are proposed, are in normal working conditions and capable for taking the discharge from the site. Besides, for any excavation works over or in close vicinity to existing government drains/sewers, the AP should notify DSD in writing at least 14 working days before backfilling the excavation works and arrange joint site inspection with DSD prior to covering up. The AP is also reminded that any person willfully, except with the permission in writing of the Authority, or negligently damages, alters, disconnects or otherwise interferes with any public sewer or drain or any connection therewith, shall be guilty of an offence under Section 6 of Public Health and Municipal Services Ordinance (Cap 132).	Noted.

# **Sewage Layout Plan**





Catchments of Existing Sewerage Network

 $\rightarrow$ 

Existing Upstream Sewerage Pipes

Existing Downstream Sewerage Pipes to be checked on Flow Capacity

### Flowrate Estimation

1. 105 Robinson Road (Proposed Development )					
Nos of Unit :	270				
<sup>(1)</sup> Domestic Household Size :	2.6				
Nos of Residents :	702				
Estimated GFA per Flat :	47.4	$m^2$			
	Domestic I	Flows			
Time	Domulation	(2) <b>11</b>	<sup>(3)</sup> Unit Flow Factors (UFF)		Flow Rate
Type	ropulation	Housing Type	(m3/day)	(l/sec)	(l/sec)
Residents	702	R1	0.19	0.0022	1.544
	Commercial Flows an	d Student Flows			
Tyme	Population	<sup>(4)</sup> Employee Type	<sup>(4)</sup> Unit Flow Factors (UFF)		Flow Rate
Type	ropulation		(m3/day)	(1/sec)	(l/sec)
Property Management	8	J12	0.08	0.0009	0.0074
Maintenance Works	2	J11	0.28	0.0032	0.0065
Environmental Hygiene Service	2	J11	0.28	0.0032	0.0065
Car Park Management	3	Commercial Employee	0.08	0.0009	0.0028
Security	2	Commercial Employee	0.08	0.0009	0.0019
<b>Residential Recreational Facilities</b>	8	J12	0.08	0.0009	0.0074
	Industrial I	Flows			-
Tyme	Population	<sup>(5)</sup> Employee Type	<sup>(5)</sup> Unit Flow Factors (UFF)		Flow Rate
Type	ropulation		(m3/day)	(l/sec)	(l/sec)
-	-	-	-	-	-
Total Flow Rate, Q	1.576				
Area of Swimming Pool	0	$m^2$			
Assumed Average Water Height	0	m			
Assumed Turnover Rate	0	Hrs			
Additional Flow Rate from Swimming Pool	0	l/sec			
Design Flow Rate	1.576	l/sec			

3. Imperial Court		
Nos of Unit :	196	
<sup>(1)</sup> Domestic Household Size :	2.6	
Nos of Residents :	510	
Estimated GFA per Flat :	121.51	$m^2$

Domestic Flows								
Turne	Dopulation	(2)	<sup>(3)</sup> Unit Flow Fac	ctors (UFF)	Flow Rate			
Type	Type Topulation Housing Type		(m3/day)	(l/sec)	(1/sec)			
Residents	510	R2	0.27 0.00313		1.594			
Commercial Flows and Student Flows								
Туре	Dopulation	<sup>(4)</sup> Employee Type	<sup>(4)</sup> Unit Flow Fac	ctors (UFF)	Flow Rate			
rype	ropulation	Employee Type	(m3/day)	(1/sec)	(l/sec)			
Property Management	10	J12	0.08	0.000926	0.00926			
Maintenance Works	3	J11	0.28	0.00324	0.00972			
Environmental Hygiene Service	3	J11	0.28	0.00324	0.00972			
Car Park Management	3	Commercial Employee	0.08	0.000926	0.00278			
Security	3	Commercial Employee	0.08	0.000926	0.00278			
Clubhouse	8	J12	0.08	0.000926	0.00741			
	Industrial F	lows						
Туре	Dopulation	<sup>(5)</sup> Employee Tupe	<sup>(5)</sup> Unit Flow Factors (UFF)		Flow Rate			
r ype	roputation	Employee Type	(m3/day)	(l/sec)	(l/sec)			
-	-	-	-	-	-			
Total Flow Rate, Q	1.635							
Area of Swimming Pool	0	$m^2$						
Assumed Average Water Height	0	m						
Assumed Turnover Rate	0	Hrs						
Additional Flow Rate from Swimming Pool	0	l/sec						
Design Flow Rate	1.635	l/sec						

4.Woodland Gardens					
Nos of Unit :	54				
<sup>(1)</sup> Domestic Household Size :	2.6				
Nos of Residents :	141				
Estimated GFA per Flat :	41.48	$m^2$			
	Domestic	Flows			
Trees	Domulation	(2)	<sup>(3)</sup> Unit Flow Fa	ctors (UFF)	Flow Rate
1 ype	Population	Housing Type	(m3/day)	(1/sec)	(l/sec)
Residents	141	R1	0.19	0.00220	0.310
	Commercial Flows a	nd Student Flows			
Truce	Demoletien	<sup>(4)</sup> Employee Type	<sup>(4)</sup> Unit Flow Factors (UFF)		Flow Rate
I ype	Population		(m3/day)	(1/sec)	(l/sec)
Property Management	10	J12	0.08	0.00093	0.00926
Maintenance Works	3	J11	0.28	0.00324	0.00972
Environmental Hygiene Service	3	J11	0.28	0.00324	0.00972
Car Park Management	3	Commercial Employee	0.08	0.00093	0.00278
Security	3	Commercial Employee	0.08	0.00093	0.00278
Clubhouse	0	J12	0.08	0.00093	0
	Industrial	Flows			
Turno	Dopulation	<sup>(5)</sup> Employee Type	<sup>(5)</sup> Unit Flow Factors (UFF)		Flow Rate
Type	ropulation		(m3/day)	(1/sec)	(l/sec)
-	-	-	-	-	-
Total Flow Rate, Q	0.344	2			
	U	m			
Assumed Average Water Height	U	m			
Assumed Turnover Rate	U	Hrs			
Additional Flow Rate from Swimming Pool	0	l/sec			
Design Flow Rate	0.344	l/sec			

5.109C Robinson Road			
Nos of Unit :	4		
<sup>(1)</sup> Domestic Household Size :	2.6		
Nos of Residents :	11		
Estimated GFA per Flat :	264.2	$m^2$	

Domestic Flows								
Tumo	Dopulation	(2)	<sup>(3)</sup> Unit Flow Fac	Flow Rate				
Type	Topulation Housing Type		(m3/day)	(l/sec)	(l/sec)			
Residents	11	R3	0.37 0.00428		0.047			
	Commercial Flows and	d Student Flows	-					
Туре	Dopulation	<sup>(4)</sup> Employee Type	<sup>(4)</sup> Unit Flow Fac	ctors (UFF)	Flow Rate			
Type	ropulation	Employee Type	(m3/day)	(l/sec)	(l/sec)			
Property Management	10	J12	0.08	0.000926	0.00926			
Maintenance Works	4	J11	0.28	0.003241	0.01296			
Environmental Hygiene Service	4	J11	0.28	0.003241	0.01296			
Car Park Management	3	Commercial Employee	0.08	0.000926	0.00278			
Security	4	Commercial Employee	0.08	0.000926	0.00370			
Clubhouse	0	J12	0.08	0.00092593	0			
	Industrial F	lows						
Туре	Population	<sup>(5)</sup> Employee Type	<sup>(5)</sup> Unit Flow Factors (UFF)		Flow Rate			
r ype	ropulation	Employee Type	(m3/day)	(l/sec)	(l/sec)			
-	-	-	-	-	-			
Total Flow Rate, Q	0.089							
Area of Swimming Pool	0	$m^2$						
Assumed Average Water Height	0	m						
Assumed Turnover Rate	0	Hrs						
Additional Flow Rate from Swimming Pool	0	l/sec						
Design Flow Rate	0.089	l/sec						

6.Beauty Court				
Nos of Unit :	76			
<sup>(1)</sup> Domestic Household Size :	2.6			
Nos of Residents :	198			
Estimated GFA per Flat :	155.4	$m^2$		

Domestic Flows								
Тура	Population	<sup>(2)</sup> Lausing Type	<sup>(3)</sup> Unit Flow Factors (UFF)		Flow Rate			
I ypc	ropulation	Housing Type	(m3/day)	(l/sec)	(l/sec)			
Residents	198	R2	0.27 0.00313		0.619			
Commercial Flows and Student Flows								
Туре	Dopulation	<sup>(4)</sup> Employee Type	<sup>(4)</sup> Unit Flow Factors (UFF)		Flow Rate			
i ype	roputation	Employee Type	(m3/day)	(l/sec)	(l/sec)			
Property Management	4	J12	0.08	0.000926	0.0037			
Maintenance Works	1	J11	0.28	0.00324	0.0032			
Environmental Hygiene Service	1	J11	0.28	0.00324	0.0032			
Car Park Management	3	Commercial Employee	0.08	0.00093	0.0028			
Security	1	Commercial Employee	0.08	0.00093	0.0009			
Clubhouse	3	J12	0.08	0.00093	0.0028			
	Industrial I	Flows						
Туре	Dopulation	<sup>(5)</sup> Employee Type	<sup>(5)</sup> Unit Flow Factors (UFF)		Flow Rate			
I Spe	roputation	Employee Type	(m3/day)	(l/sec)	(l/sec)			
-	-	-	-	-	-			
Total Flow Rate, Q	0.635							
Area of Swimming Pool	66.496	$m^2$						
Assumed Average Water Height	1.5	m						
Assumed Turnover Rate	4	Hrs	(For Indoor Swimn	ning Pool)				
Additional Flow Rate from Swimming Pool	0.006926667	l/sec						
Design Flow Rate	0.642	l/sec						

7.115 Robinson Road		
Nos of Unit :	5	
<sup>(1)</sup> Domestic Household Size :	2.6	
Nos of Residents :	13	
Estimated GFA per Flat :	107.2	$m^2$

	Domestic F	lows			
Tumo	Dopulation	(2)	<sup>(3)</sup> Unit Flow Fac	ctors (UFF)	Flow Rate
i ype	ropulation	Housing Type	(m3/day)	(l/sec)	(l/sec)
Residents	13	R2	0.27 0.003125		0.041
	Commercial Flows and	d Student Flows			
Туре	Population	<sup>(4)</sup> Employee Type	<sup>(4)</sup> Unit Flow Fac	Flow Rate	
rype	ropulation	Employee Type	(m3/day)	(l/sec)	(l/sec)
Property Management	4	J12	0.08	0.00092593	0.003703704
Maintenance Works	1	J11	0.28	0.00324074	0.003240741
Environmental Hygiene Service	1	J11	0.28	0.00324074	0.003240741
Car Park Management	0	Commercial Employee	0.08	0.00092593	0
Security	1	Commercial Employee	0.08	0.00092593	0.000925926
Clubhouse	0	J12	0.08	0.00092593	0
	Industrial F	lows			
Туре	Population	<sup>(5)</sup> Employee Type	<sup>(5)</sup> Unit Flow Fac	Flow Rate	
rype	ropulation	Employee Type	(m3/day)	(l/sec)	(l/sec)
-	-	-	-	-	-
Total Flow Rate, Q	0.052				
Area of Swimming Pool	0	$m^2$			
Assumed Average Water Height	0	m			
Assumed Turnover Rate	0	Hrs			
Additional Flow Rate from Swimming Pool	0	l/sec			
Design Flow Rate	0.052	l/sec			

Pipe No.	Upstream	Downstream	Pipe Dia.	Pipe Length	Upstream Invert level	Downstream Invert level	g	k <sub>s</sub>	8	v	V	Area	Q	Estimated Capacity
	Iviannoie	Mannole	mm	m	mPD	mPD	m/s <sup>2</sup>	m		m <sup>2</sup> /s	m/s	m <sup>2</sup>	m <sup>3</sup> /s	1/s
Newly constructed pipe	Site Terminal Manhole	FMH7005730	200	7.31	114	106.69	9.81	0.0006	1.000	1.14E-06	12.2	0.031	0.384	384.249
FWD7007291	FMH7005730	FMH7005537	150	31.9	106.69	105.65	9.81	0.0006	0.033	1.14E-06	1.8	0.018	0.032	32.209
FWD7007295	FMH7005537	FMH7005734	150	4.2	105.65	105.41	9.81	0.0006	0.057	1.14E-06	2.4	0.018	0.043	42.725
FWD7007293	FMH7005734	FMH7005733	150	25.3	105.41	104.34	9.81	0.0006	0.042	1.14E-06	2.1	0.018	0.037	36.720
FWD7007292	FMH7005733	FMH7005538	150	14.4	104.34	103.66	9.81	0.0006	0.047	1.14E-06	2.2	0.018	0.039	38.816

#### Capacity Utilization AFTER development

D' N			Flow Rate from Catchmer	nts (litre/sec)			Total	(1)Peaking	<sup>(2)</sup> Catchment Inflow	Total Flow Rate	Estimated Capacity	Utilization	1
Pipe No.	105 Robinson Road	Imperial Court	Woodland Gardens	109C Robinson Road	Beauty Court	115 Robinson Road	Population	Factor, P	Factor, $P_{\rm CIF}$	(litre/sec)	(litre/sec)	(%)	
Newly constructed pipe	1.576	-	-	-	-	-	702	8		12.609	384,249	3.28	]ок
FWD7007291	1.576	1.635	0.344	0.089	0.642	0.052	1575	6		26.033	32.209	80.82	OK
FWD7007295	1.576	1.635	0.344	0.089	0.642	0.052	1575	6	1	26.033	42,725	60.93	]ок
FWD7007293	1.576	1.635	0.344	0.089	0.642	0.052	1575	6		26.033	36.720	70.89	]OK
FWD7007292	1.576	1.635	0 344	0.089	0.642	0.052	1575	6		26.033	38 816	67.07	lok

(1) Refer to Table T5 of GESF

(2) Refer to Table T4 of GESF



From:	khlai@dsd.gov.hk
Sent:	Tuesday, 22 November 2022 11:45 am
То:	Joey Ng
Cc:	'(MME) Project Email'; tkhyip@bd.gov.hk
Subject:	Re: 105 Robinson Road - Reply for DSD's Comment
Attachments:	Drainage Connections Sectional Detail (20221122).pdf

Dear Ms. NG,

Having regard to your responses to our comments and revised drawings, we have in-principle no further comment on your submission at the moment from drainage perspective.

2. Nonetheless, please be reminded to incorporate all updates in the drawing through exchange of our emails into finalized drawings for BD's approval.

Best Regards,

Johnny Lai Engineer/W5 Hong Kong and Islands Division Drainage Services Department Tel : 3101 2360



From: "Joey Ng" <joeyng@meinhardt.com.hk> To: <khlai@dsd.gov.hk> Cc: "'\(MME\) Project Email'" <me2248@meinhardt.com.hk>, <tkhyip@bd.gov.hk> Date: 22/11/2022 11:41 Subject: [Internet]RE: [A/V UNSCANNABLE]Re: 105 Robinson Road - Reply for DSD's Comment Serial No.:

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Dear Mr. Lai,

Attached please find the updated section with the description revised for your perusal.

Regards, Joey Ng Senior Engineer

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From: khlai@dsd.gov.hk [mailto:khlai@dsd.gov.hk]
Sent: Tuesday, 22 November 2022 9:50 am
To: Joey Ng
Cc: '(MME) Project Email'; tkhyip@bd.gov.hk
Subject: [A/V UNSCANNABLE]Re: 105 Robinson Road - Reply for DSD's Comment

Dear Ms. Ng,

For clarity, please add "Drainage Facilities" before "To be owned and maintained by the development of IL 942" in the section for drainage connection works. Also, please add "Sewerage Facilities" before "To be owned and maintained by the development of IL 942" in the section for sewerage connection works.

Best Regards,

Johnny Lai Engineer/W5 Hong Kong and Islands Division Drainage Services Department Tel : 3101 2360



From: "Joey Ng" <joeyng@meinhardt.com.hk> To: <khlai@dsd.gov.hk> Cc: "'\(MME\) Project Email'" <me2248@meinhardt.com.hk>, <tkhyip@bd.gov.hk> Date: 09/11/2022 20:08 Subject: [Internet]RE: [Internet]105 Robinson Road - Reply for DSD's Comment Serial No.:

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Dear Mr. Lai,

Attached please find our reply to your further comments for your kindly consideration. Should you have any queries, please contact our Ms. Joey Ng at 2859 5421.

Regards, Joey Ng Senior Engineer

your FIRSTCHOICE Innovative • High-quality • Value-added Solutions Meinhardt (M&E) Ltd. From: khlai@dsd.gov.hk [mailto:khlai@dsd.gov.hk] Sent: Monday, 3 October 2022 10:27 am To: Joey Ng **Cc:** '(MME) Project Email'; tkhyip@bd.gov.hk **Subject:** Re: [Internet]105 Robinson Road - Reply for DSD's Comment

Dear Ms. Ng,

Please find below our further comments:

(a) The proposed 200 dia. DI pipe laying on slope at downstream of STMH-01 should be a stormwater pipe, but not a sewer as stated on the drawing.

(b) Details of leakage collection system for both the stormwater drain and sewer on slope should be provided on the drawings.

(c) Manholes should be added at both immediate upstream and downstream end of the proposed vertical downpipe (i.e. "Proposed New 200 SWP at H/L to U/G" and "Proposed New 225 RWP at H/L to U/G") to facilitate future maintenance.

(d) Based on our records, there is an existing sewage manhole FMH7005731 associated with downstream and upstream sewer in the existing sewerage connection. Please clarify whether these sewerage facilities will be kept in use. If not, details of abandonment works should be indicated on the drawings.

(e) A cross section showing the drainage and sewerage connections up to public drains / sewers along Robinson Road should be provided on the drawings for clarity.

(f) Since the vertical downpipe mentioned in item (c) above as well as the upstream drainage / sewerage facilities are solely serving the subject redevelopment, these drainage/sewerage facilities should be owned and maintained by the subject lot owners.

Best Regards,

Johnny Lai Engineer/W5 Hong Kong and Islands Division Drainage Services Department Tel : 3101 2360



 From:
 "Joey Ng" <joeyng@meinhardt.com.hk</td>

 To:
 <khlai@dsd.gov.hk</td>

 Cc:
 <tkhyip@bd.gov.hk</td>

 Date:
 23/09/2022 15:00

 Subject:
 [Internet]105 Robinson Road - Reply for DSD's Comment

 Serial No.:
 Serial No.:

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Dear Mr. Lai,

Further to your comment on our drainage submission drawings dated 9 Sept 2022, our responses are tableted as attached "Reply of Comment to DSD (20220923)" for your consideration.

Should you have any queries, please contact our Ms. Joey Ng at 2859 5421.

Regards, Joey Ng Senior Engineer



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-LEAKAGE COLLECTION SYSTEM

# ANNEX 3B

Sewerage Review

for Planning Application A/H11/107

# Sewage Layout Plan





Catchments of Existing Sewerage Network



Existing Upstream Sewerage Pipes



Existing Downstream Sewerage Pipes to be checked on Flow Capacity

1. 105 Robinson Road (Proposed						
Development )						
Nos of Unit :	217					
<sup>(1)</sup> Domestic Household Size :	2.6					
Nos of Residents :	565					
Estimated GFA per Flat :	47.4	m <sup>2</sup>				
		Domestic Flows				
			<sup>(3)</sup> Unit Flo	w Factors	Flow Rate	
Туре	Population	<sup>(2)</sup> Housing Type	(UI	FF)		
			(m3/day)	(l/sec)	(1/800)	
Residents	565	<b>R</b> 1	0.19	0.0022	1.242	
	Commerci	al Flows and Student Flo	WS			
			<sup>(4)</sup> Unit Flo	w Factors	Flow Rate	
Туре	Population	<sup>(4)</sup> Employee Type	(UI	FF)		
			(m3/day)	(l/sec)	(1.500)	
Property Management	8	J12	0.08	0.0009	0.0074	
Maintenance Works	2	J11	0.28	0.0032	0.0065	
Environmental Hygiene Service	2	J11	0.28	0.0032	0.0065	
Car Park Management	3	Commercial Employee	0.08	0.0009	0.0028	
Security	2	Commercial Employee	0.08	0.0009	0.0019	
Residential Recreational Facilities	8	J12	0.08	0.0009	0.0074	
	-	Industrial Flows				
			<sup>(5)</sup> Unit Flo	w Factors	Flow Rate	
Туре	Population	<sup>(5)</sup> Employee Type	(UI	FF)	(l/sec)	
			(m3/day)	(l/sec)	(1300)	
-	-	-	-	-	-	
Total Flow Rate, Q	1.275					
Area of Swimming Pool	0	m <sup>2</sup>				
Assumed Average Water Height	0	m				
Assumed Turnover Rate	0	Hrs				
Additional Flow Rate from	0	l/sec				
Swimming Pool	Ū					
Design Flow Rate	1.275	l/sec				

3. Imperial Court						
Nos of Unit :	196					
(1)Domestic Household Size :	2.6					
Nos of Residents :	510					
Estimated GFA per Flat :	121.51	m2				
		Domestic Flows				
			<sup>(3)</sup> Unit Flo	w Factors	Flow Pate	
Туре	Population	<sup>(2)</sup> Housing Type	(UI	FF)		
			(m3/day)	(l/sec)	(1/300)	
Residents	510	R2	0.27	0.00313	1.594	
	Commerci	al Flows and Student Flo	WS			
			<sup>(4)</sup> Unit Flo	w Factors	Flow Rate	
Туре	Population	<sup>(4)</sup> Employee Type	(UI	FF)		
			(m3/day)	(l/sec)	(1300)	
Property Management	10	J12	0.08	0.000926	0.00926	
Maintenance Works	3	J11	0.28	0.00324	0.00972	
Environmental Hygiene Service	3	J11	0.28	0.00324	0.00972	
Car Park Management	3	Commercial Employee	0.08	0.000926	0.00278	
Security	3	Commercial Employee	0.08	0.000926	0.00278	
Clubhouse	8	J12	0.08	0.000926	0.00741	
		Industrial Flows				
			<sup>(5)</sup> Unit Flo	w Factors	Flow Pata	
Туре	Population	<sup>(5)</sup> Employee Type	(UI	FF)		
			(m3/day)	(l/sec)	(l'sec)	
-	-	-	-	-	-	
Total Flow Rate, Q	1.635					
Area of Swimming Pool	0	m <sup>2</sup>				
Assumed Average Water Height	0	m				
Assumed Turnover Rate	0	Hrs				
Additional Flow Rate from	0	1/sec				
Swimming Pool	U	1.500				
Design Flow Rate	1.635	l/sec				

4.Woodland Gardens						
Nos of Unit :	54					
(1)Domestic Household Size :	2.6					
Nos of Residents :	141					
Estimated GFA per Flat :	41.48	m2				
		Domestic Flows				
			<sup>(3)</sup> Unit Flo	w Factors	Flow Rate	
Туре	Population	<sup>(2)</sup> Housing Type	(UI	FF)	(l/sec)	
			(m3/day)	(l/sec)	(1/800)	
Residents	141	R1	0.19	0.00220	0.310	
	Commerci	al Flows and Student Flo	WS			
			<sup>(4)</sup> Unit Flo	w Factors	Flow Data	
Туре	Population	<sup>(4)</sup> Employee Type	(UFF)		(1/sec)	
			(m3/day)	(l/sec)	(2.500)	
Property Management	10	J12	0.08	0.00093	0.00926	
Maintenance Works	3	J11	0.28	0.00324	0.00972	
Environmental Hygiene Service	3	J11	0.28	0.00324	0.00972	
Car Park Management	3	Commercial Employee	0.08	0.00093	0.00278	
Security	3	Commercial Employee	0.08	0.00093	0.00278	
Clubhouse	0	J12	0.08	0.00093	0	
		Industrial Flows		·		
			<sup>(5)</sup> Unit Flo	<sup>(5)</sup> Unit Flow Factors		
Туре	Population	<sup>(5)</sup> Employee Type	(UI	FF)	riow Rate	
			(m3/day)	(l/sec)	(1/sec)	
-	-	-	-	-	-	
Total Flow Rate, Q	0.344					
Area of Swimming Pool	0	m <sup>2</sup>				
Assumed Average Water Height	0	m				
Assumed Turnover Rate	0	Hrs				
Additional Flow Rate from	0	1/sec				
Swimming Pool	U	1/ 500				
Design Flow Rate	0.344	l/sec				

5.109C Robinson Road						
Nos of Unit :	4					
(1)Domestic Household Size :	2.6					
Nos of Residents :	11					
Estimated GFA per Flat :	264.2	m2				
		Domestic Flows				
Type	Population	<sup>(2)</sup> Housing Type	<sup>(3)</sup> Unit Flo	w Factors FF)	Flow Rate	
51	1	8 51	(m3/day) (1/sec)		(l/sec)	
Residents	11	R3	0.37	0.00428	0.047	
	Commerci	al Flows and Student Flo	WS	I		
Туре	Population	<sup>(4)</sup> Employee Type	<sup>(4)</sup> Unit Flow Factors (UFF)		Flow Rate	
			(m3/day)	(l/sec)	(1.500)	
Property Management	10	J12	0.08	0.000926	0.00926	
Maintenance Works	4	J11	0.28	0.003241	0.01296	
Environmental Hygiene Service	4	J11	0.28	0.003241	0.01296	
Car Park Management	3	Commercial Employee	0.08	0.000926	0.00278	
Security	4	Commercial Employee	0.08	0.000926	0.00370	
Clubhouse	0	J12	0.08	0.0009259	0	
		Industrial Flows				
Туре	Population	<sup>(5)</sup> Employee Type	<sup>(5)</sup> Unit Flo (Ul	w Factors FF)	Flow Rate	
			(m3/day)	(l/sec)	(1/300)	
-	-	-	-	-	-	
Total Flow Rate, Q	0.089					
Area of Swimming Pool	0	$m^2$				
Assumed Average Water Height	0	m				
Assumed Turnover Rate	0	Hrs				
Additional Flow Rate from Swimming Pool	0	l/sec				
Design Flow Rate	0.089	l/sec				

6.Beauty Court					
Nos of Unit :	76				
(1)Domestic Household Size :	2.6				
Nos of Residents :	198				
Estimated GFA per Flat :	155.4	m2			
		Domestic Flows			
Туре	Population	<sup>(2)</sup> Housing Type	(3)Unit Flow Factors (UFF) (m3/day) (1/sec)		Flow Rate (l/sec)
Residents	198	R2	0.27	0.00313	0.619
	Commerci	al Flows and Student Flo	ows		
Туре	Population	<sup>(4)</sup> Employee Type	(4)Unit Flow Factors (UFF) (m3/day) (1/sec)		Flow Rate (l/sec)
Property Management	4	J12	0.08	0.000926	0.0037
Maintenance Works	1	J11	0.28	0.00324	0.0032
Environmental Hygiene Service	1	J11	0.28	0.00324	0.0032
Car Park Management	3	Commercial Employee	0.08	0.00093	0.0028
Security	1	Commercial Employee	0.08	0.00093	0.0009
Clubhouse	3	J12	0.08	0.00093	0.0028
	-	Industrial Flows			
Туре	Population	<sup>(5)</sup> Employee Type	<sup>(5)</sup> Unit Flo (Ul	w Factors FF)	Flow Rate (l/sec)
			(m3/day)	(l/sec)	
-	-	-	-	-	-
Total Flow Rate, Q	0.635				
Area of Swimming Pool	66.496	$m^2$			
Assumed Average Water Height	1.5	m			
Assumed Turnover Rate	4	Hrs (For Indoor Swimming Pool)			
Additional Flow Rate from Swimming Pool	0.006926667	l/sec			
Design Flow Rate	0.642	l/sec			

7.115 Robinson Road					
Nos of Unit :	5				
(1)Domestic Household Size :	2.6				
Nos of Residents :	13				
Estimated GFA per Flat :	107.2	m2			
		Domestic Flows			
Type	Population	<sup>(2)</sup> Housing Type	<sup>(3)</sup> Unit Flo	w Factors	Flow Rate
i ypc	ropulation	fibusing Type	(m3/day) (1/sec)		(l/sec)
Residents	13	R2	0.27	0.003125	0.041
	Commerci	al Flows and Student Flo	WS		
Туре	Population	<sup>(4)</sup> Employee Type	<sup>(4)</sup> Unit Flo (U) (m3/day)	FF)	Flow Rate (l/sec)
Property Management	4	J12	0.08	0.0009259	0.003703704
Maintenance Works	1	J11	0.28	0.0032407	0.003240741
Environmental Hygiene Service	1	J11	0.28	0.0032407	0.003240741
Car Park Management	0	Commercial Employee	0.08	0.0009259	0
Security	1	Commercial Employee	0.08	0.0009259	0.000925926
Clubhouse	0	J12	0.08	0.0009259	0
		Industrial Flows			
Туре	Population	<sup>(5)</sup> Employee Type	<sup>(5)</sup> Unit Flow Factors (UFF)		Flow Rate (l/sec)
	_		(III3/day)		
Total Flow Rate O	0.052	_		_	
Area of Swimming Pool	0.032	m <sup>2</sup>			
Assumed Average Water Height	0	m			
Assumed Turnover Rate	0	Hrs			
Additional Flow Rate from Swimming Pool	0	l/sec			
Design Flow Rate	0.052	l/sec			

<sup>(1)</sup> Refer to Population Census 2021, Central and Western District

<sup>(2)</sup> Refer to Table 8 of "Hong Kong Planning Standards and

Guidelines")

<sup>(3)</sup> Refer to Table T1 of "Guidelines for Estimating Sewage Flows

for Sewage Infrastructure Planning (GESF)

<sup>(4)</sup> Refer to Table T2 of GESF

<sup>(5)</sup> Refer to Table T3 of GESF

Pipe No.	Upstream Manhole	Downstream Manhole	Pipe Dia.	Pipe Length	Upstream Invert level	Downstream Invert level
			mm	m	mPD	mPD
Newly constructed pipe	Site Terminal Manhole	FMH7005730	150	7.31	114	106.69
FWD7007291	FMH7005730	FMH7005537	150	31.9	106.69	105.65
FWD7007295	FMH7005537	FMH7005734	150	4.2	105.65	105.41
FWD7007293	FMH7005734	FMH7005733	150	25.3	105.41	104.34
FWD7007292	FMH7005733	FMH7005538	150	14.4	104.34	103.66

g	ks	S	v	V	Area	Q	Estimated Capacity
m/s <sup>2</sup>	m		m²/s	m/s	m²	m³/s	l/s
9.81	0.0006	1.000	1.14E-06	10.2	0.018	0.180	179.572
9.81	0.0006	0.033	1.14E-06	1.8	0.018	0.032	32.209
9.81	0.0006	0.057	1.14E-06	2.4	0.018	0.043	42.725
9.81	0.0006	0.042	1.14E-06	2.1	0.018	0.037	36.720
9.81	0.0006	0.047	1.14E-06	2.2	0.018	0.039	38.816

### Capacity Utilization AFTER development

	Flow Rate from Catchments (litre/sec)							
Pipe No.	105 Robinson Road	Imperial Court	Woodland Gardens	109C Robinson Road	Beauty Court	115 Robinson Road		
Newly constructed pipe	1.275	-	-	-	-	-		
FWD7007291	1.275	1.635	0.344	0.089	0.642	0.052		
FWD7007295	1.275	1.635	0.344	0.089	0.642	0.052		
FWD7007293	1.275	1.635	0.344	0.089	0.642	0.052		
FWD7007292	1.275	1.635	0.344	0.089	0.642	0.052		

Total	(1)Peaking	<sup>(2)</sup> Catchment	Total Flow Rate	Estimated Capacity	Utilization	]
Population	Factor, P	Inflow Factor, P <sub>CIF</sub>	(litre/sec)	(litre/sec)	(%)	
565	8		10.199	179.572	5.68	ОК
1438	6		24.225	32.209	75.21	OK
1438	6	1	24.225	42.725	56.70	OK
1438	6		24.225	36.720	65.97	OK
1438	6		24.225	38.816	62.41	OK

### CONCLUSION

The proposed redevelopment lies within the catchment of the 105 Robinson Road Redevelopment. The estimated sewage generated from the proposed redevelopment is about 110 m3/day (ADWF) and there is no swimming pool within site, which is only 5.68% of the capacity of the FWD7007291. In general, the FWD7007291 is expected to be capable to take the discharge from the 105 Robinson Road Redevelopment.