ENVELOPE

MEMO

CRESTVIEW RISE WASTEWATER ASSESSMENT

TO	Veolia/Watercare	**DATE**	1 October 2024
PROJECT NAME	Crestview Rise, Proposed Plan Change	**ENVELOPE REF**	1915-01
ATTENTION	Sanjeev Morar	**FROM**	Kyle Dirse
EMAIL ADDRESS	Sanjeev.morar@veolia.com		

1.0 INTRODUCTION

Envelope Engineering Ltd has been engaged to provide an infrastructure assessment in support of a Private Plan Change (rezoning) application that will inform a future Resource Consent application for proposed residential development of land located at 28, 30 and 66 Crestview Rise, Papakura, Auckland. This memo pertains to the wastewater infrastructure required to service up to 31 residential lots and a total of up to 90 dwellings

We understand an agreement in principle has been earlier reached between Veolia and Harbour View Heights LP (HVHLP) regarding potable water supply for up to 90 DUE. This memo is also in response to clarifying the nature of the issue and potential options for resolution of wastewater alluded to by Veolia, and more recently by email to Council dated 12 September (attached).

2.0 EXISTING WASTEWATER NETWORK AND POST DEVELOPMENT SCENARIOS

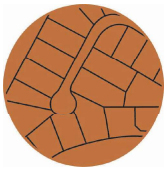
Following discussions with Veolia in February and March 2023, it was advised that the existing wastewater network lacks sufficient capacity for the proposed residential dwellings, requiring further investigation.

A wastewater catchment analysis has been conducted by Envelope Engineering from the newly installed network at Crestview Rise (where HVHLP plan to connect) to the transmission main. Plans and model outputs are attached to this memo and illustrate the current capacity and flows in the catchment's wastewater system for three different scenarios as follows:

- Scenario 1 – Post-Development with updated survey data as of August 2024
- Scenario 2 – Post-Development with updated survey data as of August 2024, assuming 50% blockage of the downstream transmission main
- Scenario 3 – Pre-Development with updated survey data as of August 2024

Due to insufficient as-built information, pipe inverts were surveyed by Envelope, with the exception of WWMH 387377, which is located adjacent to the transmission main. This manhole could not be opened as it is sealed, and Watercare's approval is required to lift/open manhole lids on the transmission main. This approval has been requested but is still awaiting approval; as a result, GIS information has been used.

Our model outputs show that the existing pre-development scenario experiences surcharging during peak wet weather events. The post-development scenario increases flows by a negligible amount and has a minimal impact on the performance of the already overcapacity pipes.



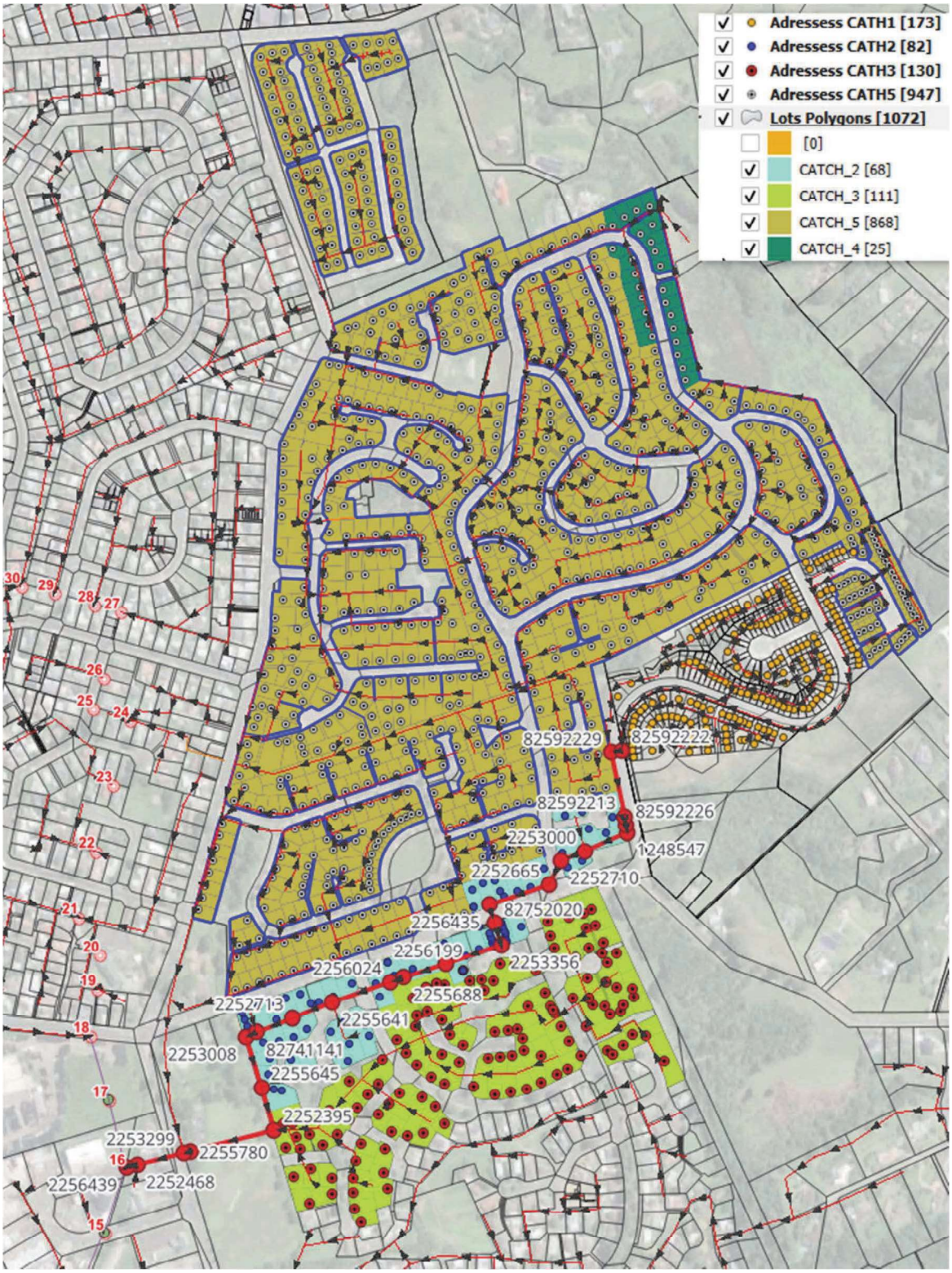
3.0 RECOMMENDATIONS

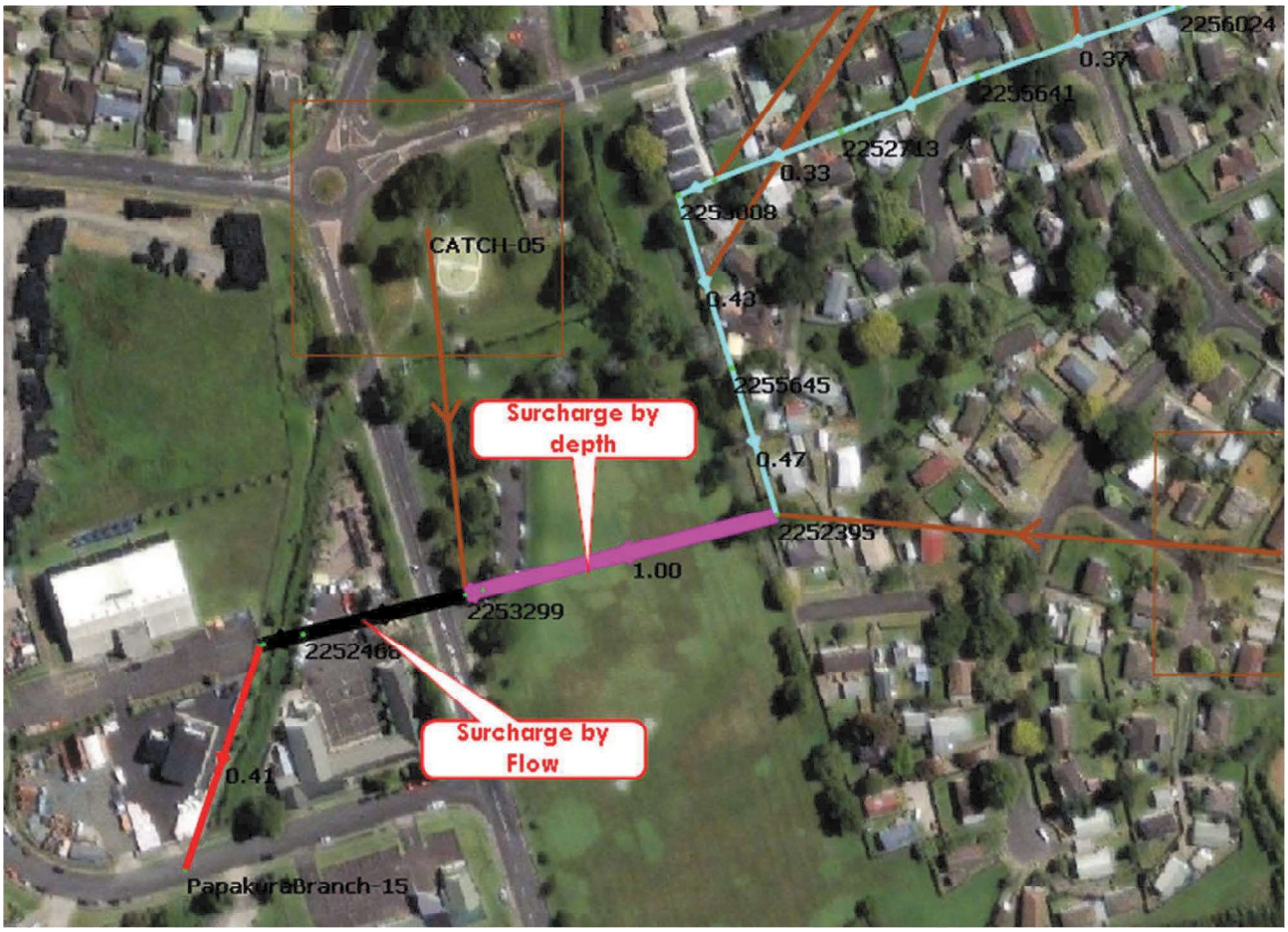
The existing 300mm wastewater main (highlighted in black on the plans below) is undersized in both the pre- and post-development scenarios. We have considered options for flow mitigation, while this would mitigate the effects of the developments, it would not resolve the current surcharging issue, so upgrading the network would benefit both the asset owner (to improve existing performance) and the HVHLP proposal at Crestview Rise. The existing pipe under 159 Dominion Road and pipe bridge, which directly connects to the transmission main, will likely need to be upgraded to a DN450 to address the existing surcharging, or manholes sealed to prevent any potential overflow.

We believe Veolia should contribute to these necessary upgrades, as there would be a benefit to the existing network, providing an improved level of service, and accommodating future growth.

We are requesting a meeting to discuss upgrade options and an agreement regarding responsibility (with Veolia and Watercare as need be), cost apportioning for the works and related manifestation.

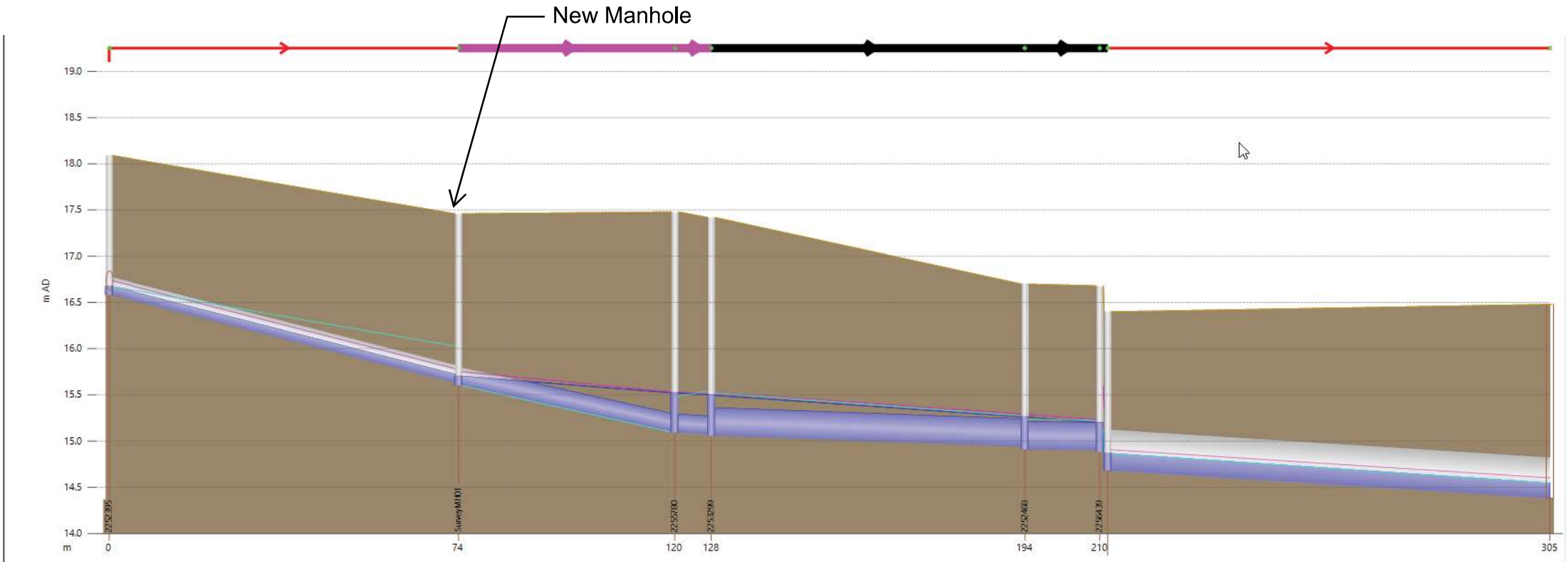
MODEL EXTENT:




2256024
0.37
2255641
2252713
0.33
2255008
CATCH-05
0.43
2255645
Surcharge by depth
0.47
2252395
1.00
2253299
2252406
Surcharge by Flow
0.41
PapakuraBranch-15

2024-222 OTH 28, 30, 66 Crestview Rise, Papakura

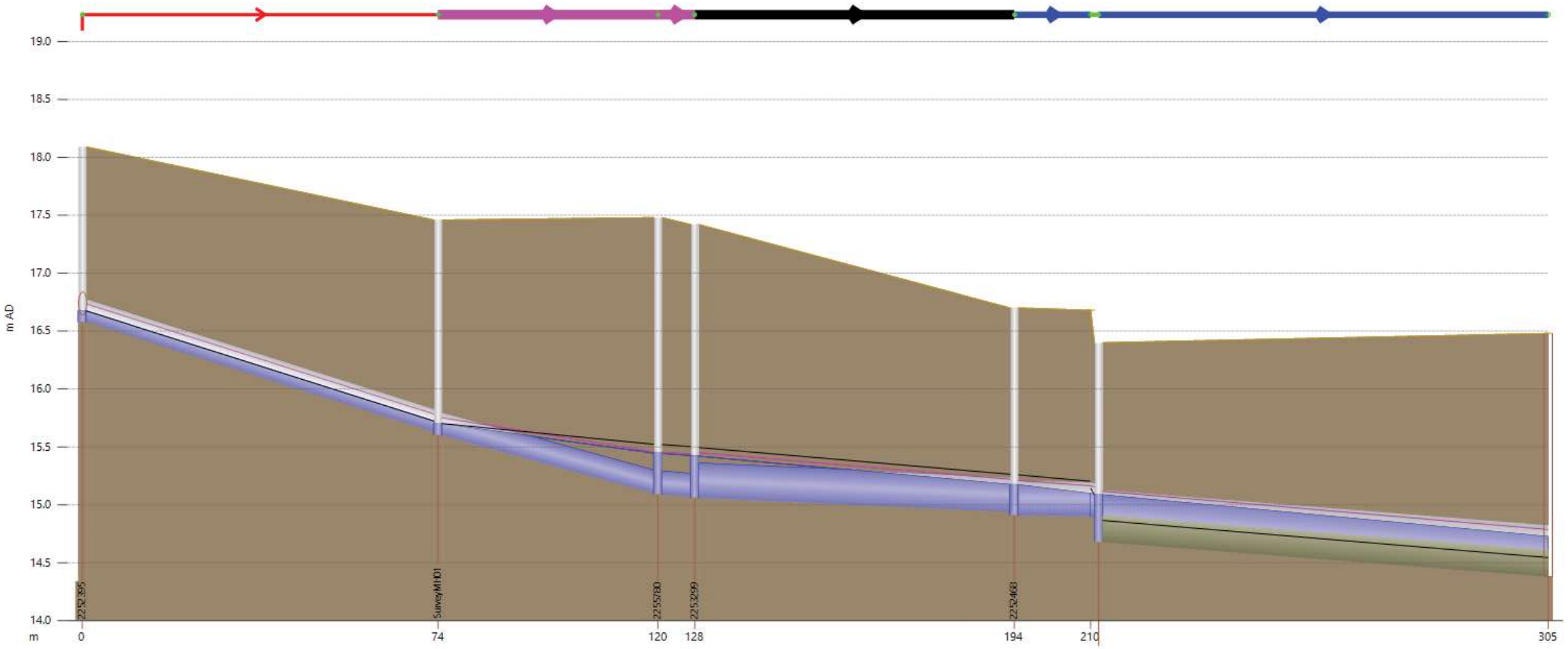
Scenario 01: Just updating with the new survey data (orange values). Comparison previous results (cyan line and text)



Link	2252395.1	SurveyMH01.1	-	2253299.1	2252468.1	PapakuraBranch-16.1
width (mm)	200	200	200	300	300	450
Bot rough M	0.013	0.013	0.013	0.013	0.013	0.013
length (m)	74.0	45.8	7.7	66.5	15.8	93.5
grad (m/m)	0.01281	0.01092	-	0.00181	0.00063	0.00321
pfc (l/s)	37	34	17	41	24	162
us inv (m AD)	16.580	15.600	15.090	15.060	14.910	14.680
ds inv (m AD)	15.630	15.100	15.070	14.940	14.900	14.380
US flow (l/s)	15.77	15.77	15.92	56.53	56.52	56.51
US velocity (m/s)	1.095	1.009	0.477	0.764	0.793	0.921
Max surcharg	0	1	1	2	2	0

Node	2252395	SurveyMH01	2255780	2253299	2252468	-	PapakuraBranch-16	PapakuraBranch-15
ground (m AD)	18.090	17.460	17.480	17.420	16.700	16.680	16.400	16.480
flood dep (m)	-1.426	-1.758	-2.247	-2.207	-1.686	-1.477	-1.995	
flood vol (m3)	-1.997	-1.758	-3.157	-15.606	-2.813	-2.593	-3.696	

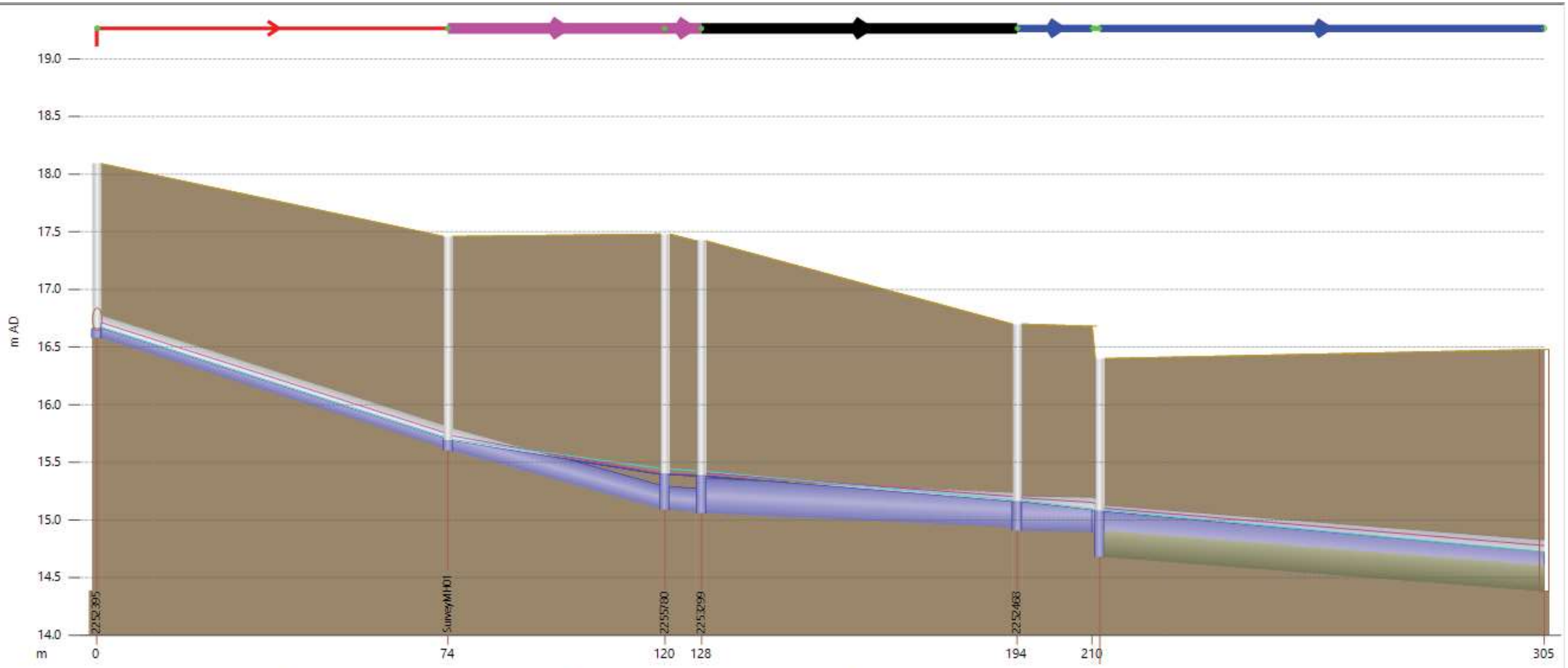
Scenario 02: Scenario 01 (black line) AND adding the following assumptions:
- 50% blockage in the transmission pipe downstream.
- Avoiding `satellite manhole 2256439. Deleting 150mmø pipe.



Link	2252395.1	SurveyMH01.1	-	2253299.1	2252468.1	PapakuraBranch-16.1
width (mm)	200	200	200	300	300	450
Bot rough M	0.013	0.013	0.013	0.013	0.013	0.013
length (m)	74.0	45.8	7.7	66.5	15.8	93.5
grad (m/m)	0.01283	0.01092	-	0.00181	0.00063	0.00321
pfc (l/s)	37	34	17	41	24	58
us inv (m AD)	16.580	15.600	-	15.060	14.910	14.680
ds inv (m AD)	15.630	15.100	-	14.940	14.900	14.380
US flow (l/s)	15.77	15.77	15.87	56.61	56.52	56.49
US velocity (m/s)	1.095	1.027	0.480	0.770	0.867	0.796
Max surcharg	0	1	1	2	1	1

Node	2252395	SurveyMH01	2255780	2253299	2252468	-	PapakuraBranch-16	PapakuraBranch-15
ground (m AD)	18.090	17.460	17.480	17.420	16.700	-	16.400	16.480
flood dep (m)	-1.426	-1.762	-2.323	-2.284	-1.775	-	-1.772	
flood vol (m3)	-1.997	-1.762	-3.268	-15.742	-2.906	-	-3.439	

Scenario 03: EXISTING SCENARIO



Link	2252395.1	SurveyMH01.1	-	2253299.1	2252468.1	PapakuraBranch-16.1
width (mm)	200	200	200	300	300	450
Bot rough M	0.013	0.013	0.013	0.013	0.013	0.013
length (m)	74.0	45.8	7.7	66.5	15.8	93.5
grad (m/m)	0.01283	0.01092	-	0.00181	0.00063	0.00321
pfc (l/s)	37	34	17	41	24	58
us inv (m AD)	16.580	15.600	-	15.060	14.910	14.680
ds inv (m AD)	15.630	15.100	-	14.940	14.900	14.380
US flow (l/s)	11.88	11.88	11.96	52.94	52.84	52.82
US velocity (m/s)	1.004	0.949	0.363	0.728	0.857	0.786
Max surcharg	0	1	1	2	1	1

Node	2252395	SurveyMH01	2255780	2253299	2252468	-	PapakuraBranch-16	PapakuraBranch-15
ground (m AD)	18.090	17.460	17.480	17.420	16.700	-	16.400	16.480
flood dep (m)	-1.439	-1.776	-2.374	-2.326	-1.793	-	-1.787	
flood vol (m3)	-2.010	-1.776	-3.339	-15.807	-2.923	-	-3.456	

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MODEL INFLOWS:

			Critical	Assumed max occupants per unit		WSL WWCOP 5.3.5.1.1	WSL WWCOP 5.3.5.1.1	WSL WWCOP 5.3.5.1.1	Ave Dry Weather Flow	Peak Dry Weather Flow	Peak Wet Weather Flow
		Discharge To COMPKEY Manhole	Number of dwellings	People per dwelling	Total Population	ADWF per person, litres/day	PDWF peaking factor	PWWF Peaking factor	Total ADWF, litres/second	Total PDWF, litres/second	Total PWWF, litres/second
CATCH-00	Proposed by Harbour View Heights LP	82592222	90	3	270	180	3	6.7	0.56	1.69	3.77
CATCH-01	Recently developed	82592222	82	3	246	180	3	6.7	0.51	1.54	3.43
CATCH-02	Existing	Along 1248547 and 2255645	82	3	246	180	3	6.7	0.51	1.54	3.43
CATCH-03	Existing	2252395	114	3	342	180	3	6.7	0.71	2.14	4.77
CATCH-05	PS upstream loaded by 25 dwelling	2253299	947	3	2841	180	3	6.7	5.92	17.76	39.66

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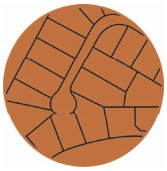
						PDWF		PWWF	
US node ID	DS node ID	Width (mm)	Length (m)	Gradient (m/m)	Full capacity (l/s)	Max. (L/S)	Max. Surcharge State	Max. (L/S)	Max. Surcharge State
82592222	82592229	150	15.5	0.06471	39	3.22	0.24	7.52	0.34
82592229	82592213	150	90.7	0.05636	36	3.21	0.24	7.51	0.34
82592213	82592226	150	11.8	0.08536	45	3.21	0.22	7.51	0.31
82592226	1248547	150	10	0.19465	67	3.21	0.3	7.51	0.44
1248547	2253000	150	63.8	0.0185	21	3.34	0.3	7.82	0.45
2253000	2252710	150	35.5	0.02337	23	3.41	0.32	7.98	0.48
2252710	2252665	150	36.8	0.01522	19	3.49	0.34	8.16	0.51
2252665	2256435	150	87.2	0.01238	17	3.66	0.4	8.58	0.62
2256435	82752020	180	26.4	0.00493	17	3.71	0.33	8.71	0.53
82752020	2253356	150	30	0.007	13	3.77	0.4	8.85	0.63
2253356	2256199	150	80.9	0.01273	17	3.93	0.35	9.24	0.54
2256199	2255688	150	60.2	0.01396	18	4.05	0.35	9.52	0.54
2255688	2256024	150	19.7	0.04292	32	4.09	0.28	9.62	0.4
2256024	2255641	200	84.2	0.04292	68	4.25	0.25	10.02	0.37
2255641	2252713	200	58.5	0.0135	38	4.37	0.25	10.3	0.37
2252713	82741141	200	53.4	0.02135	48	4.47	0.23	10.55	0.33
82741141	2253008	200	16.1	0.01432	39	4.5	0.25	10.63	0.37
2253008	2255645	200	72.2	0.01455	40	4.64	0.28	10.97	0.43
2255645	2252395	200	61.1	0.00851	30	4.64	0.31	10.97	0.47
2252395	2255780	200	119.8	0.01231	36	6.61	0.45	15.85	1
2255780	2253299	200	7.7	0.01231	36	6.63	0.86	15.91	1
2253299	2252468	300	66.5	0.0015	38	24.01	0.57	56.55	2
2252468	2256439	300	15.8	0.00317	54	24	0.45	56.54	2
2256439	PapakuraBranch-16	150	1.7	0.11895	53	24	0.8	56.54	2
PapakuraBranch-16	PapakuraBranch-15	450	93.5	0.00321	162	23.96	0.26	56.51	0.41



NOTES

1. LEVELS ARE IN TERMS OF NEW ZEALAND VERTICAL DATUM 2016
   ORIGIN OF LEVELS
   (EUFC) PRM IX DP 79174
   RL 17.66 m

2. COORDINATES ARE IN TERMS NZ GEODETIC DATUM 2000
   MT EDEN CIRCUIT
   ORIGIN OF COORDINATES
   (C648) RM 6147 SO 58077
   7796O.27 mN 417933.95 mE

3. THIS PLAN HAS BEEN CARRIED OUT TO TOPOGRAPHICAL STANDARDS OF +/-30MM ON HARD STAND AND +/-50MM ON SOFT SURFACES. ALL LEVELS SHOWN ARE CORRECT AT TIME OF SURVEY. CRITICAL DIMENSIONS AND LEVELS SHOULD BE VERIFIED.

4. BOUNDARIES SHOWN ON THIS PLAN HAVE BEEN ADOPTED FROM XML DATA AND HAVE NOT BEEN SURVEYED. A BOUNDARY DEFINITION SURVEY SHOULD BE CARRIED OUT TO ESTABLISH EXACT BOUNDARY POSITIONS ON SITE.

5. ALL EASEMENTS, COVENANTS AND OTHER LEGAL INSTRUMENTS ASSOCIATED WITH THIS SITE MAY NOT BE SHOWN ON THIS PLAN. AN INVESTIGATION OF THE MOST CURRENT LEGAL RECORDS SHOULD BE UNDERTAKEN PRIOR TO DESIGN AND CONSTRUCTION COMMENCING.

6. WASTEWATER LIDS HAVE BEEN MEASURED WITH TOTAL STATION AND LID LEVELS WILL BE WITHIN +/-5MM. ENVELOPE SURVEYING DOES NOT IN ANY WAY GUARANTEE THE ACCURACY OF ANY UNDERGROUND SERVICE SHOWN ON THIS PLAN.

7. THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN.

8. THIS PLAN IS ISSUED FOR A SPECIFIC PROJECT AND MAY NOT BE ALTERED OR USED FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF ENVELOPE SURVEYING.

9. INVERT LEVELS MAY DIFFER FROM RECORDS DUE TO FLOW AND OBSTRUCTIONS IN CHAMBERS. WE WOULD RECOMMEND WATERCARE UNDERTAKE DEPTH MEASURES TO GAIN A GREATER ACCURACY. WE ESTIMATE INVERT LEVELS TO BE WITHIN +/-50MM.

DRAFT PLAN ONLY

LEGEND

- WW — WASTEWATER MAIN
- MANHOLE
- SITE BENCHMARK

REVISIONS:

REV	NOTES	BY	DATE
A	FOR INFORMATION	AP	24.09.24

PROJECT:

HARBOUR VIEW HEIGHTS LP
SETTLEMENT ROAD
PAPAKURA

TITLE:

WASTEWATER LINE ASBUILT
(SHEET 1 OF 2)

ENVELOPE
WWW.ENVELOPE-ENG.CO.NZ

DESIGNED:	AP	DRAWN:	AP
CHECKED:	MF	PLOT DATE:	24-09-2024
SCALE A1:	1:400	SCALE A3:	1:800
STATUS:	FOR INFORMATION		

PROJECT No:	DRAWING No:	REVISION:
1915-01	1915-01-SV	A

NOTES

1. LEVELS ARE IN TERMS OF NEW ZEALAND VERTICAL DATUM 2016
   ORIGIN OF LEVELS
   (EUFC) PRM IX DP 79174
   RL 17.66 m

2. COORDINATES ARE IN TERMS NZ GEODETIC DATUM 2000
   MT EDEN CIRCUIT
   ORIGIN OF COORDINATES
   (C64B) RM 6147 SO 58077
   77960.27 mN 417933.95 mE

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DRAFT PLAN ONLY

LEGEND

WW WASTEWATER MAIN
MANHOLE
SITE BENCHMARK

REVISIONS:

REV	NOTES	BY	DATE
A	FOR INFORMATION	AP	24.09.24

PROJECT:

HARBOUR VIEW HEIGHTS LP
SETTLEMENT ROAD
PAPAKURA

TITLE:

WASTEWATER LINE ASBUILT
(SHEET 2 OF 2)

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DESIGNED: AP
DRAWN: AP
CHECKED: MF
PLOT DATE: 24-09-2024
SCALE A1: 1:400
SCALE A3: 1:800
STATUS: FOR INFORMATION

PROJECT No: 1915-01
DRAWING No: 1915-01-SV
REVISION: A