Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.03	5.36	0.0	0.5	A	16	23
2	0.00	0.00	0.0	~1	A	0	0
3	0.00	0.00	0.0	~1	A	0	0
4	0.00	0.00	0.0	~1	A	0	0

Main Results for each time segment

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	13	3	0	690	0.019	13	0	0.0	0.0	5.318	A
2	0	0	13	746	0.000	0	0	0.0	0.0	0.000	A
3	0	0	10	747	0.000	0	2	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	10	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	15	4	0	690	0.022	15	0	0.0	0.0	5.337	A
2	0	0	15	745	0.000	0	0	0.0	0.0	0.000	A
3	0	0	13	747	0.000	0	3	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	13	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	19	5	0	690	0.027	19	0	0.0	0.0	5.384	A
2	0	0	19	743	0.000	0	0	0.0	0.0	0.000	A
3	0	0	15	745	0.000	0	3	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	15	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	19	5	0	690	0.027	19	0	0.0	0.0	5.364	A
2	0	0	19	743	0.000	0	0	0.0	0.0	0.000	A
3	0	0	15	745	0.000	0	3	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	15	0.0	0.0	0.000	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	15	4	0	690	0.022	15	0	0.0	0.0	5.340	A
2	0	0	15	745	0.000	0	0	0.0	0.0	0.000	A
3	0	0	13	747	0.000	0	3	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	13	0.0	0.0	0.000	A

09:30 - 09:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	13	3	0	690	0.019	13	0	0.0	0.0	5.320	A
2	0	0	13	745	0.000	0	0	0.0	0.0	0.000	A
3	0	0	11	747	0.000	0	2	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	11	0.0	0.0	0.000	A

Queue Variation Results for each time segment

08:15 - 08:30

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.02	0.00	0.00	0.02	0.02			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:30 - 08:45

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.02	0.02	0.25	0.45	0.45			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:45 - 09:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.03	0.00	0.00	0.03	0.03			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:00 - 09:15

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.03	0.00	0.00	0.03	0.03			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:15 - 09:30

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.02	0.00	0.00	0.02	0.02			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:30 - 09:45

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.02	0.00	0.00	0.02	0.02			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2025 No Construction, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	4.85	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D11	2025 No Construction	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1	100.000
2		ONE HOUR	✓	0	100.000
3		ONE HOUR	✓	1	100.000
4		ONE HOUR	✓	5	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	0	1	0
	2	0	0	0	0
	3	1	0	0	0
	4	5	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.00	0.00	0.0	~1	A	0	0
2	0.00	0.00	0.0	~1	A	0	0
3	0.00	0.00	0.0	~1	A	0	0
4	0.01	4.85	0.0	0.5	A	8	12

Main Results for each time segment

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	7	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
4	7	2	0	752	0.009	7	0	0.0	0.0	4.831	A

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	8	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
4	8	2	0	752	0.011	8	0	0.0	0.0	4.840	A

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	10	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
4	10	2	0	752	0.013	10	0	0.0	0.0	4.852	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	10	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
4	10	2	0	752	0.013	10	0	0.0	0.0	4.852	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	8	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
4	8	2	0	752	0.011	8	0	0.0	0.0	4.842	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	7	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
4	7	2	0	752	0.009	7	0	0.0	0.0	4.833	A

Queue Variation Results for each time segment

16:00 - 16:15

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:15 - 16:30

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.01	0.01	0.25	0.45	0.48			N/A	N/A

16:30 - 16:45

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:45 - 17:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:00 - 17:15

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:15 - 17:30

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2025 With Construction , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	5.86	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	783	Arm 1

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D12	2025 With Construction	AM	ONE HOUR	08:15	09:45	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	62	100.000
2		ONE HOUR	✓	0	100.000
3		ONE HOUR	✓	3	100.000
4		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	0	45	14
	2	0	0	0	0
	3	3	0	0	0
	4	0	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	13	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.10	5.86	0.1	0.5	A	57	85
2	0.00	0.00	0.0	~1	A	0	0
3	0.00	0.00	0.0	~1	A	0	0
4	0.00	0.00	0.0	~1	A	0	0

Main Results for each time segment

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	47	12	0	683	0.068	46	0	0.0	0.1	5.652	A
2	0	0	46	731	0.000	0	0	0.0	0.0	0.000	A
3	0	0	10	747	0.000	0	36	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	10	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	56	14	0	683	0.082	56	0	0.1	0.1	5.735	A
2	0	0	56	726	0.000	0	0	0.0	0.0	0.000	A
3	0	0	13	747	0.000	0	43	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	13	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	68	17	0	683	0.100	68	0	0.1	0.1	5.855	A
2	0	0	68	721	0.000	0	0	0.0	0.0	0.000	A
3	0	0	15	745	0.000	0	53	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	15	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	68	17	0	683	0.100	68	0	0.1	0.1	5.855	A
2	0	0	68	721	0.000	0	0	0.0	0.0	0.000	A
3	0	0	15	745	0.000	0	53	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	15	0.0	0.0	0.000	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	56	14	0	683	0.082	56	0	0.1	0.1	5.740	A
2	0	0	56	728	0.000	0	0	0.0	0.0	0.000	A
3	0	0	13	747	0.000	0	43	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	13	0.0	0.0	0.000	A

09:30 - 09:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	47	12	0	683	0.068	47	0	0.1	0.1	5.660	A
2	0	0	47	730	0.000	0	0	0.0	0.0	0.000	A
3	0	0	11	747	0.000	0	36	0.0	0.0	0.000	A
4	0	0	0	752	0.000	0	11	0.0	0.0	0.000	A

Queue Variation Results for each time segment

08:15 - 08:30

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.07	0.00	0.00	0.07	0.07			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:30 - 08:45

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.09	0.03	0.25	0.47	0.50			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:45 - 09:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.11	0.03	0.25	0.45	0.49			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:00 - 09:15

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.11	0.03	0.25	0.45	0.48			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:15 - 09:30

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.09	0.00	0.00	0.09	0.09			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:30 - 09:45

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.07	0.00	0.00	0.07	0.07			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.00	0.00	0.00	0.00	0.00			N/A	N/A
4	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2025 With Construction, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	5.77	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D13	2025 With Construction	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1	100.000
2		ONE HOUR	✓	0	100.000
3		ONE HOUR	✓	34	100.000
4		ONE HOUR	✓	9	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	0	1	0
	2	0	0	0	0
	3	34	0	0	0
	4	9	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	17	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.00	0.00	0.0	~1	A	0	0
2	0.00	0.00	0.0	~1	A	0	0
3	0.06	5.95	0.1	0.5	A	31	47
4	0.01	4.97	0.0	0.5	A	8	12

Main Results for each time segment

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	32	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	25	6	0	643	0.040	25	0	0.0	0.0	5.832	A
4	7	2	25	739	0.009	7	0	0.0	0.0	4.513	A

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	39	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	31	8	0	643	0.048	31	0	0.0	0.0	5.882	A
4	8	2	31	737	0.011	8	0	0.0	0.0	4.939	A

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	47	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	37	9	0	643	0.058	37	0	0.0	0.1	5.948	A
4	10	2	37	734	0.014	10	0	0.0	0.0	4.974	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	47	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	37	9	0	643	0.058	37	0	0.1	0.1	5.948	A
4	10	2	37	734	0.014	10	0	0.0	0.0	4.974	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	39	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	31	8	0	643	0.048	31	0	0.1	0.1	5.685	A
4	8	2	31	727	0.011	8	0	0.0	0.0	4.939	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	0	0	0	752	0.000	0	32	0.0	0.0	0.000	A
2	0	0	0	752	0.000	0	0	0.0	0.0	0.000	A
3	26	6	0	643	0.040	26	0	0.1	0.0	5.837	A
4	7	2	26	739	0.009	7	0	0.0	0.0	4.916	A

Queue Variation Results for each time segment

16:00 - 16:15

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.04	0.00	0.00	0.04	0.04			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:15 - 16:30

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.05	0.03	0.25	0.45	0.48			N/A	N/A
4	0.01	0.01	0.25	0.45	0.48			N/A	N/A

16:30 - 16:45

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.06	0.03	0.26	0.47	0.49			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:45 - 17:00

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.06	0.00	0.00	0.06	0.06			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:00 - 17:15

Arm	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.05	0.00	0.00	0.05	0.05			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:15 - 17:30

Arm	Mean (Veh)	Q85 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1	0.00	0.00	0.00	0.00	0.00			N/A	N/A
2	0.00	0.00	0.00	0.00	0.00			N/A	N/A
3	0.04	0.00	0.00	0.04	0.04			N/A	N/A
4	0.01	0.00	0.00	0.01	0.01			N/A	N/A

Appendix F. JUNCTION 9 PICADY Detailed Output - Junction 3 (Site Entrance)

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Junction 3.j9
Path: \\FSERVER4-DUB\Tobin\Projects\11069 - Centrica - Profile Park Power Plant\05-Design\01-Calculations\Traffic
Report generation date: 07/05/2021 16:50:01

Summary of junction performance

	AM									PM								
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Netwo Residu Capac
2019 Baseflows																		
Stream B-AC	D1	0.0	~1	0.00	0.00	A	0.00	F	900 %	D2	0.0	~1	0.00	0.00	A	0.00	F	900 %
Stream C-AB		0.0	~1	0.00	0.00	A			[]		0.0	~1	0.00	0.00	A			[]
2023 No Construction																		
Stream B-AC	D3	0.0	~1	0.00	0.00	A	0.00	F	900 %	D4	0.0	~1	0.00	0.00	A	0.00	F	900 %
Stream C-AB		0.0	~1	0.00	0.00	A			[]		0.0	~1	0.00	0.00	A			[]
2023 With Construction																		
Stream B-AC	D5	0.0	0.5	5.78	0.01	A	0.64	A	900 %	D6	0.1	0.5	7.36	0.07	A	5.81	A	900 %
Stream C-AB		0.0	~1	0.00	0.00	A			[]		0.0	~1	0.00	0.00	A			[]
2025 No Construction																		
Stream B-AC	D7	0.0	~1	0.00	0.00	A	0.00	F	900 %	D8	0.0	~1	0.00	0.00	A	0.00	F	900 %
Stream C-AB		0.0	~1	0.00	0.00	A			[]		0.0	~1	0.00	0.00	A			[]
2025 With Construction																		
Stream B-AC	D9	0.0	0.5	11.45	0.02	B	1.63	A	900 %	D10	0.1	0.5	6.97	0.06	A	5.31	A	900 %
Stream C-AB		0.0	~1	0.00	0.00	A			[]		0.0	~1	0.00	0.00	A			[]

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	07/05/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	TOBIN\Mara Rooney
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75	✓		✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2019 Baseflows	AM	ONE HOUR	08:15	09:45	15	✓
D2	2019 Baseflows	PM	ONE HOUR	16:00	17:30	15	✓
D3	2023 No Construction	AM	ONE HOUR	08:15	09:45	15	✓
D4	2023 No Construction	PM	ONE HOUR	16:00	17:30	15	✓
D5	2023 With Construction	AM	ONE HOUR	08:15	09:45	15	✓
D6	2023 With Construction	PM	ONE HOUR	16:00	17:30	15	✓
D7	2025 No Construction	AM	ONE HOUR	08:15	09:45	15	✓
D8	2025 No Construction	PM	ONE HOUR	16:00	17:30	15	✓
D9	2025 With Construction	AM	ONE HOUR	08:15	09:45	15	✓
D10	2025 With Construction	PM	ONE HOUR	16:00	17:30	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2019 Baseflows , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.00	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	900	

Arms

Arms

Arm	Name	Description	Arm type
A	Profile Park (NE)		Major
B	Site Entrance		Minor
C	Profile Park (SW)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	8.13			65.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	5.00	100	53

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	644	0.106	0.255	0.159	0.354
B-C	755	0.110	0.277	-	-
C-B	612	0.215	0.215	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2019 Baseflows	AM	ONE HOUR	08:15	09:45	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	2	100.000
B		ONE HOUR	✓	0	100.000
C		ONE HOUR	✓	2	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	2	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	50
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.00	0.00	0.0	-1	A	0	0
C-AB	0.00	0.00	0.0	-1	A	0	0
C-A						0	0
A-B						0	0
A-C						0	0

Main Results for each time segment

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

09:15 - 09:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

09:30 - 09:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

Queue Variation Results for each time segment

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:00 - 09:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:15 - 09:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:30 - 09:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2019 Baseflows , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.00	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2019 Baseflows	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1	100.000
B		ONE HOUR	✓	0	100.000
C		ONE HOUR	✓	1	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	1	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.00	0.00	0.0	~1	A	0	0
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						0	0
A-B						0	0
A-C						0	0

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

16:15 - 16:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

Queue Variation Results for each time segment

16:00 - 16:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:15 - 16:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2023 No Construction, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.00	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	500	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2023 No Construction	AM	ONE HOUR	08:15	09:45	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	3	100.000
B		ONE HOUR	✓	0	100.000
C		ONE HOUR	✓	3	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	3	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	51
	B	0	0	0
	C	0	0	3

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.00	0.00	0.0	~1	A	0	0
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						0	0
A-B						0	0
A-C						0	0

Main Results for each time segment

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

09:15 - 09:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

09:30 - 09:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

Queue Variation Results for each time segment

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:00 - 09:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:15 - 09:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:30 - 09:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2023 No Construction, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.00	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2023 No Construction	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1	100.000
B		ONE HOUR	✓	0	100.000
C		ONE HOUR	✓	1	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	1	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.00	0.00	0.0	~1	A	0	0
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						0	0
A-B						0	0
A-C						0	0

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

16:15 - 16:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

Queue Variation Results for each time segment

16:00 - 16:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:15 - 16:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2023 With Construction, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.84	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2023 With Construction	AM	ONE HOUR	08:15	09:45	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	49	100.000
B		ONE HOUR	✓	7	100.000
C		ONE HOUR	✓	3	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	47	2
	B	7	0	0
	C	3	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	15	46
	B	1	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.01	5.78	0.0	0.5	A	6	10
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						0	0
A-B						43	65
A-C						2	3

Main Results for each time segment

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5	1	833	0.006	5	0.0	0.0	5.736	A
C-AB	0	0	602	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	35	9			35				
A-C	2	0.38			2				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6	2	832	0.010	5	0.0	0.0	5.754	A
C-AB	0	0	601	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	42	11			42				
A-C	2	0.45			2				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5	2	831	0.012	5	0.0	0.0	5.779	A
C-AB	0	0	598	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	52	13			52				
A-C	2	0.55			2				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5	2	831	0.012	5	0.0	0.0	5.779	A
C-AB	0	0	598	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	52	13			52				
A-C	2	0.55			2				

09:15 - 09:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6	2	632	0.010	6	0.0	0.0	5.754	A
C-AB	0	0	601	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	42	11			42				
A-C	2	0.45			2				

09:30 - 09:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	5	1	632	0.008	5	0.0	0.0	5.736	A
C-AB	0	0	602	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	35	9			35				
A-C	2	0.38			2				

Queue Variation Results for each time segment

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.00	0.00	0.01	0.01			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.01	0.25	0.45	0.45			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.00	0.00	0.01	0.01			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:00 - 09:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.00	0.00	0.01	0.01			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:15 - 09:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.00	0.00	0.01	0.01			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:30 - 09:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.00	0.00	0.01	0.01			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2023 With Construction, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		5.81	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	500	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2023 With Construction	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	6	100.000
B		ONE HOUR	✓	34	100.000
C		ONE HOUR	✓	1	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	5	1
	B	34	0	0
	C	1	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	100	0
	B	22	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.07	7.36	0.1	0.5	A	31	47
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						0	0
A-B						5	7
A-C						0.92	1

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	26	6	527	0.049	25	0.0	0.1	7.170	A
C-AB	0	0	610	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	4	1			4				
A-C	0.75	0.19			0.75				

16:15 - 16:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	31	8	527	0.058	31	0.1	0.1	7.251	A
C-AB	0	0	609	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	4	1			4				
A-C	0.90	0.22			0.90				

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	37	9	527	0.071	37	0.1	0.1	7.357	A
C-AB	0	0	609	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	6	1			6				
A-C	1	0.28			1				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	37	9	527	0.071	37	0.1	0.1	7.357	A
C-AB	0	0	609	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	6	1			6				
A-C	1	0.28			1				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	31	8	527	0.058	31	0.1	0.1	7.256	A
C-AB	0	0	609	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	4	1			4				
A-C	0.90	0.22			0.90				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	26	6	527	0.049	26	0.1	0.1	7.179	A
C-AB	0	0	610	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	4	1			4				
A-C	0.75	0.19			0.75				

Queue Variation Results for each time segment

16:00 - 16:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.05	0.00	0.00	0.05	0.05			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:15 - 16:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.08	0.03	0.25	0.45	0.45			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.08	0.03	0.26	0.47	0.49			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.05	0.00	0.00	0.05	0.05			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.05	0.00	0.00	0.05	0.05			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.05	0.00	0.00	0.05	0.05			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2025 No Construction , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.00	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2025 No Construction	AM	ONE HOUR	08:15	09:45	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	3	100.000
B		ONE HOUR	✓	0	100.000
C		ONE HOUR	✓	3	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	3	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	51
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.00	0.00	0.0	~1	A	0	0
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						0	0
A-B						0	0
A-C						0	0

Main Results for each time segment

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

09:15 - 09:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

09:30 - 09:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

Queue Variation Results for each time segment

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:00 - 09:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:15 - 09:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:30 - 09:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2025 No Construction, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.00	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2025 No Construction	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1	100.000
B		ONE HOUR	✓	0	100.000
C		ONE HOUR	✓	1	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	0	1
	B	0	0	0
	C	1	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.00	0.00	0.0	~1	A	0	0
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						0	0
A-B						0	0
A-C						0	0

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	812	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

16:15 - 16:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	812	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	812	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	812	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	0	0	709	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	612	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	0	0			0				
A-C	0	0			0				

Queue Variation Results for each time segment

16:00 - 16:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:15 - 16:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2025 With Construction , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.83	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2025 With Construction	AM	ONE HOUR	08:15	09:45	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	47	100.000
B		ONE HOUR	✓	5	100.000
C		ONE HOUR	✓	3	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	45	2
	B	5	0	0
	C	3	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	11	47
	B	100	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.02	11.49	0.0	0.5	B	5	7
C-AB	0.00	0.00	0.0	-1	A	0	0
C-A						0	0
A-B						41	62
A-C						2	3

Main Results for each time segment

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4	1	320	0.012	4	0.0	0.0	11.351	B
C-AB	0	0	603	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	34	8			34				
A-C	2	0.38			2				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4	1	319	0.014	4	0.0	0.0	11.435	B
C-AB	0	0	601	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	2	0.45			2				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6	1	319	0.017	5	0.0	0.0	11.495	B
C-AB	0	0	599	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	50	12			50				
A-C	2	0.55			2				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	6	1	319	0.017	6	0.0	0.0	11.495	B
C-AB	0	0	599	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	50	12			50				
A-C	2	0.55			2				

09:15 - 09:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4	1	319	0.014	5	0.0	0.0	11.436	B
C-AB	0	0	601	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	40	10			40				
A-C	2	0.45			2				

09:30 - 09:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	4	1	320	0.012	4	0.0	0.0	11.394	B
C-AB	0	0	603	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	34	8			34				
A-C	2	0.38			2				

Queue Variation Results for each time segment

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.00	0.00	0.01	0.01			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.01	0.25	0.45	0.45			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:00 - 09:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:15 - 09:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.00	0.00	0.01	0.01			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

09:30 - 09:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.01	0.00	0.00	0.01	0.01			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2025 With Construction , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		5.31	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	900	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	2025 With Construction	PM	ONE HOUR	16:00	17:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	6	100.000
B		ONE HOUR	✓	30	100.000
C		ONE HOUR	✓	1	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	5	1
	B	30	0	0
	C	1	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	100	0
	B	17	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.06	6.97	0.1	0.5	A	28	41
C-AB	0.00	0.00	0.0	<1	A	0	0
C-A						0	0
A-B						5	7
A-C						0.62	1

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	23	6	550	0.041	22	0.0	0.0	6.827	A
C-AB	0	0	519	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	4	1			4				
A-C	0.75	0.19			0.75				

16:15 - 16:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	27	7	549	0.049	27	0.0	0.1	6.889	A
C-AB	0	0	509	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	4	1			4				
A-C	0.90	0.22			0.90				

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	33	8	549	0.060	33	0.1	0.1	6.973	A
C-AB	0	0	509	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	6	1			6				
A-C	1	0.28			1				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	33	8	549	0.060	33	0.1	0.1	6.973	A
C-AB	0	0	509	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	6	1			6				
A-C	1	0.28			1				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	27	7	549	0.049	27	0.1	0.1	6.593	A
C-AB	0	0	609	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	4	1			4				
A-C	0.90	0.22			0.90				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	23	6	550	0.041	23	0.1	0.0	6.830	A
C-AB	0	0	610	0.000	0	0.0	0.0	0.000	A
C-A	0	0			0				
A-B	4	1			4				
A-C	0.75	0.19			0.75				

Queue Variation Results for each time segment

16:00 - 16:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.04	0.00	0.00	0.04	0.04			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:15 - 16:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.05	0.03	0.25	0.45	0.48			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.06	0.03	0.26	0.47	0.49			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.06	0.00	0.00	0.06	0.06			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

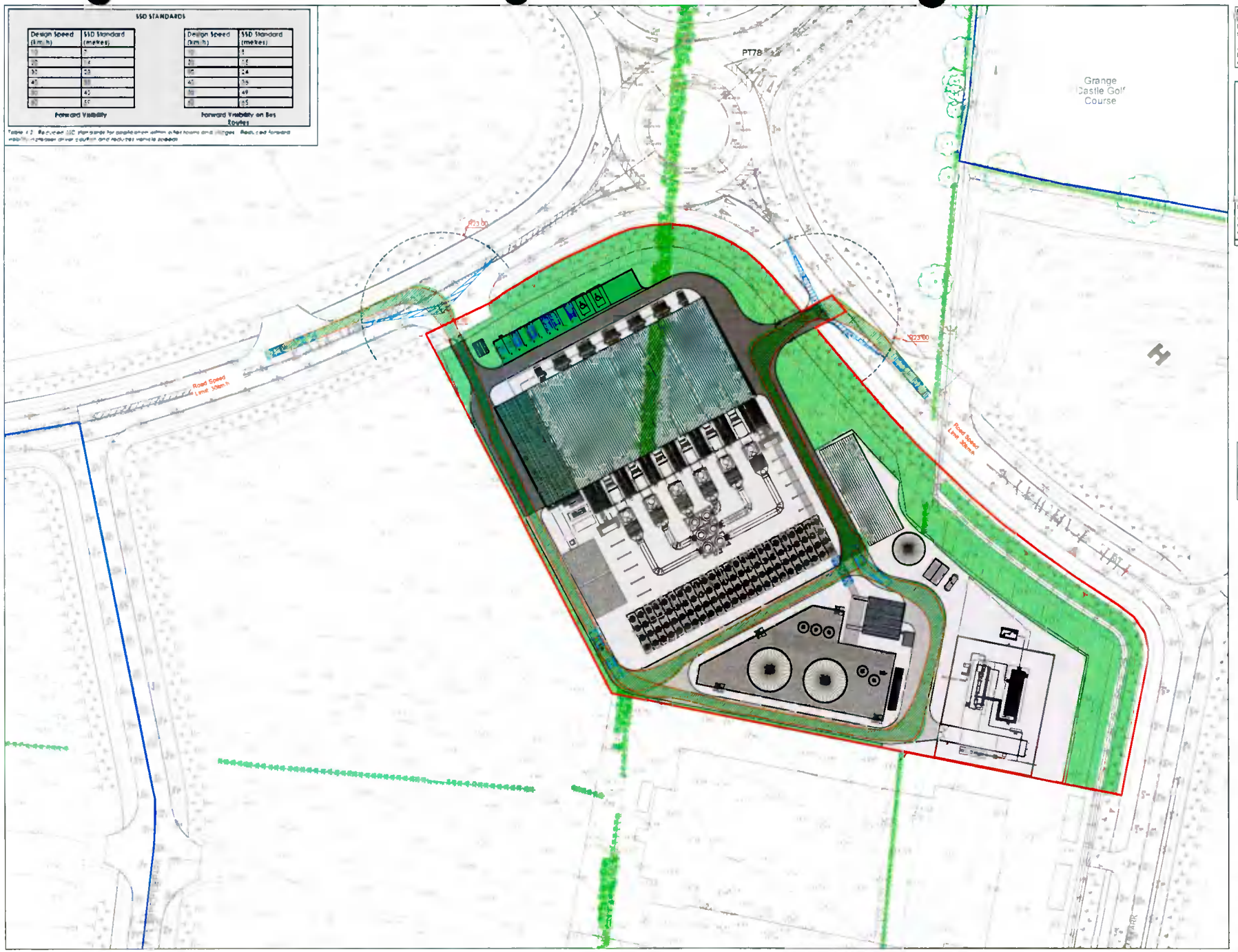
17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.05	0.00	0.00	0.05	0.05			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-AC	0.04	0.00	0.00	0.04	0.04			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

Appendix G. Auto Tracks Drawings



Note

Based on Site Visits and Site Topography it is determined that there are no physical barriers preventing the required sight lines for the proposed site entrances.

A one way traffic system will be implemented on site and the Final Mobility Plan will be agreed with SDCC prior to commencement of the construction phase of the power plant.

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE AS APPROPRIATE TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES ABOVE AND BELOW GROUND BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

CO. DUBLIN

OSI 1 2 500 Sheet No's 3325-B 3325-D 3326-A & 3326-C

Rev	Date	Description	By	Chkd
A	18.06.21	PLANNING ISSUE	MN	MMcC

Client: Greener Ideas

Project: PROFILE PARK POWER PLANT

Title: VISIBILITY SIGHTLINES & AUTOTRACK ASSESSMENT

Scale @ A1	1:500	
Prepared by	Checked	Date
PK	MMcC	June 2021
Project Director	S. Tinnelly	
Drawing Status	Planning	

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Document No. 11069-2005 Revision A

15.2 OUTLINE CONSTRUCTION TRAFFIC MANAGEMENT PLAN

TOBIN
CONSULTING ENGINEERS
BUILT ON KNOWLEDGE

PROFILE PARK POWER PLANT.

DUBLIN 22

Outline Construction Traffic Management Plan
Phase 1

PROPOSED DEVELOPMENT AT PROFILE PARK, CO. DUBLIN

OUTLINE CONSTRUCTION TRAFFIC MANAGEMENT PLAN

Document Control Sheet	
Document Reference	TR02
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Client Address:	The Seapoint Building, Clontarf Dublin 3 Ireland
Project Number	11069

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Revision	Description	Author:	Date	Reviewed By:	Date	Authorised by:	Date
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Table of Contents

1.0 INTRODUCTION

1.1 Introduction

This Outline Construction Traffic Management Plan has been prepared to accompany the planning application for the proposed industrial development in Profile Park, Dublin 22. The proposed development is located on a 1.9ha greenfield site just south of the R134 in the Profile Park Business Campus. The purpose of the document is to outline a plan for the management of construction traffic during the proposed duration of the works for the project.

This document has been compiled for Planning Stage purposes and the final Site-Specific Construction Traffic Management Plan will be produced by the appointed Contractor and PSCS in conjunction with the PSDP for the project. This report outlines the preliminary management plan and what will be expected of the Main Contractor's Management Plan at construction stage.

This document has been prepared with reference to the following guidance documents:

- "Traffic Signs Manual – Chapter 8 – Temporary Traffic Measures and Signs for Roadworks" Department of Transport, August 2019
- Temporary Traffic Management Design Guidance" Department of Transport, August 2019
- Temporary Traffic Management Operations Guidance" Department of Transport, August 2019
    - Part 0 - Introduction and Background
    - Part 1 – Level 1 Roads – Urban and Low Speed Roads
    - Part 2 – Level 2 Roads – Rural Sigle Carriageway Road
    - Part 3 – Level 3 Roads – Dual Carriageways and Motorways
- Guidance for the Control and Management of Traffic at Roadworks (2nd Edition) – Department of Transport, NRA and Local Government Management Services Board, October 2010.

2.0 DESCRIPTION OF THE PROJECT

The proposed development site is located at Profile Park Business Campus in the Kilcarbery area of Dublin 22.

Profile Park comprises a 100 acre (40.5 Ha) fully enclosed, private business park strategically located on the outskirts of Dublin City the Park is easily accessible from the major arterial roads in the City including the M50, M7 and M4, and is served by public transport links also.

Profile Park is noted for the very heart of what is rapidly becoming "Ireland's Data Centre Cluster" with Google, Microsoft, Digital Realty Trust and Telecity all located in the immediate vicinity.

The proposed power plant development located in Profile Park is on an existing site area of 1.9 ha, comprising of a green field site and is illustrated in Figure 2.1

The proposed development is located in the administrative area of South Dublin County Council.

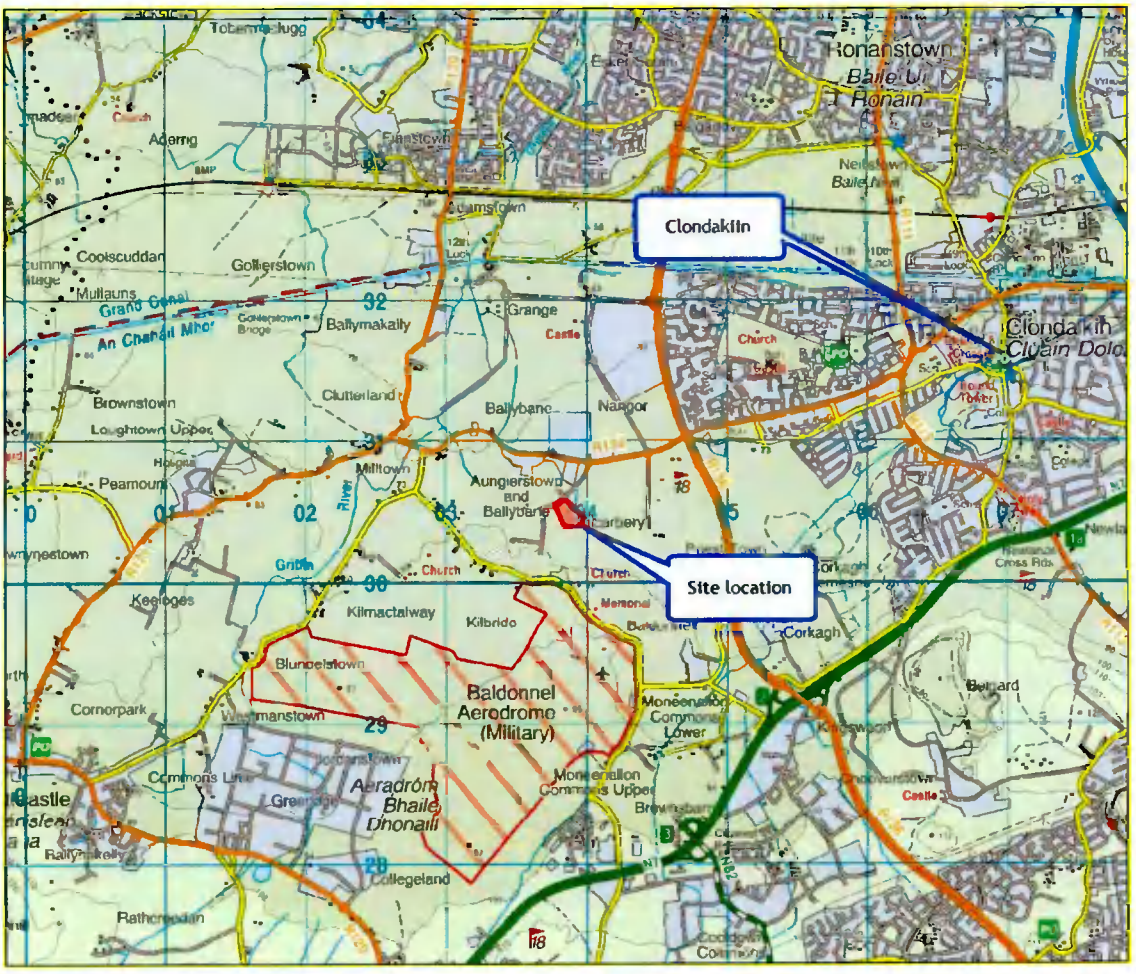

Figure 2-1 - Site Location 0016017 © Ordnance Survey Ireland/Government of Ireland.

2.1 Existing Road Network

The proposed development is to be accessed from the R134 New Nangor Road. The proposed site access is situated within an 60km/h default urban speed zone. The R134 New Nangor Road has a carriageway width of approximately 7.3m in the vicinity of the access to Profile Park Business Park. The R134 also provides a fully segregated two-way cycle facility on the EB side along 2.25m width footpath. Tactile paving crossing points and street lighting are present at the junction along with roadside bus stops.

The Internal Roads of Profile Park are typically up to 9m in width and have full eastbound/westbound segregation via a central reserve or have a central hatched area to segregate traffic flows and facilitate right turning movements. All internal roads have offline pedestrian and cyclist facilities also.

Figure 2-2 - Site Access Points

2.1.1 Proposed Development Access Details

Profile Park has been well developed to cater and entice future growth and expansion. Each of the proposed sites within the park has a pre-constructed access with a bellmouth width of approx. 20m to cater for all vehicle types. Internally Profile Park has an internal roundabout to separate traffic flows to the various sections with an approximate ICD of 45m. All traffic to Profile Park originates from the R134 New Nangor Road to the North.

An existing splitter island and central reserve is present on the arm accessing Profile Park providing lanes for East and West turning traffic. Splitter Islands are present on all arms of the internal roundabout also to separate traffic flows. Autotrack assessment have been carried out as part of the overall design for the scheme which demonstrates that large vehicles will be able to access the site comfortably.

3.0 TRANSPORTATION FACILITIES

3.1 Road Network and Accesses

Profile Park is located of a Regional Road (R134) and is well services by Regional roads such as the R120, R1136 and R113. The park is situated approx 5km away from the N4 and M50 to the North and East respectively and approx. 2.5km from the N7 to the South providing excellent access to some of the country's main Infrastructural links.

3.2 Car Parking

Provision will be made onsite for a construction staff carpark within the Contractor's compound.

3.3 Pedestrian & Cyclists

3.3.1 Pedestrian Footways

An existing continuous pedestrian footway along the North side of the R134 New Nangor Road is present with crossing points at each arm of the R134 / Kilcarbery Park / Profile Park Roundabout provided using the splitter islands as pedestrian refuge points. Within Profile Park, continuous pedestrian footways are provided on both sides of the interal road infrastructure along the full lengths of each developed link. Internal Site Layout will be designed to incorporate safe pedestrian walkways throughout the proposed development.

All existing footways are to be maintained adjacent to the boundary of the site. Drop kerbs and tactile paving are present at the existing site entrance utilising the splitter Island. These facilities shall be maintained throughout the duration of the construction stage.

3.3.2 Cyclists

The R134 New Nangor Road running along the Northern Boundary of Profile Park currently incorporates a segregated cycle lane to cater for cyclists in both directions on the Eastbound side adjacent to the pedestrian footway. As per the footways, within Profile Park, segregated cycleways are provided adjacent to the footways on both sides of the road along each section of the internal road infrastructure.

During the Construction stage of the project advanced warning signs will be required within Profile Park on the approach to the main site access from both directions indicating its use as for Construction traffic. It is not proposed to divert cyclists from their current routes as a result of the construction phase of the development as the cyclists will be able to maintain the current arrangements within Profile Park. The existing main access to the site has fully developed segregated facilities for cyclists and shall be maintained throughout the duration of construction. Signage will need to be erected informing all construction traffic of the likelihood of cyclists crossing the access point throughout.

3.4 Public Transport

There are currently a Dublin bus service operating along the R134 New Nangor Road with multiple stops located to the East and West of the R134 / Kilcarbery Park / Profile Park Roundabout. The route is serviced by the 13, 68 and 68X Dublin Bus Service.

4.0 TRAFFIC MANAGEMENT

4.1 Traffic Management Plan

This section outlines the content of the final Traffic Management Plan (TMP) which shall be prepared prior to construction of the proposed development. It shall be a requirement of the contract that, prior to construction, the appointed contractor shall liaise with the relevant authorities including South Dublin County Council, TII and Emergency Services for the purpose of finalising the TMP, which will encompass all aspects of this outline Traffic

Management Plan. The TMP shall be termed a 'Live Document', such that any changes to construction programme or operations can be incorporated into the TMP.

The contractor will be contractually required to ensure that the elements of this outline TMP shall be incorporated into the final TMP. The principal contractor shall also agree and implement monitoring measures to confirm the effectiveness of the mitigation measures outlined in the TMP. On finalisation of the TMP, the contractor shall adopt the plan and associated monitoring measures. The final TMP shall address the following issues (including all aspects identified in this outline TMP):

- Site Access & Egress;
- Traffic Management Signage;
- Routing of Construction Traffic / Road Closures;
- Timings of Material Deliveries to Site;
- Traffic Management Speed Limits;
- Road Cleaning;
- Road Condition;
- Road Closures;
- Enforcement of Traffic Management Plan
- Details of Working Hours and Days;
- Details of Emergency plan;
- Communication;
- Construction Methodologies; and
- Particular Construction Impacts

These items are explained in detail in the remainder of this section of the report.

4.2 Traffic Management Signage

The principal contractor shall undertake consultation with the relevant authorities for the purpose of identifying and agreeing signage requirements. Such signage shall be installed prior to works commencing on site. Proposed signage may include warning signs to provide warning to road users of the works access / egress locations and the presence of construction traffic. All signage shall be provided in accordance with the Department of Transport's Traffic Signs Manual, -Chapter 8 – Temporary Traffic Measures and Signs for Roadworks – August 2019. In summary, the contractor will be required to ensure that the following elements are implemented:

- Consultation with the relevant authorities for the purpose of identifying and agreeing signage requirements;

- Provision of temporary signage indicating site access route and locations for contractors and associated suppliers; and

Provision of general information signage to inform road users and local communities of the nature and locations of the works, including project contact details.

4.3 Routing of Construction Traffic

As outlined in Section 2.1.1, preferred construction phase access would be from the existing access to site off the internal roundabout within Profile Park. The delivery/haulage vehicles will be routed depending on the destination/origin of the materials being delivered.

The use of local roads will be minimised as much as possible, particularly to avoid / minimise the encountering of narrow road widths, poor visibility and unsuitable bearing capacities. As the site is located on the outskirts of Dublin City and is well serviced by major infrastructural routes, it is envisaged that the majority of delivery vehicles shall be able to access site through the M50 motorway, N4 and N7 National roads and the Regional road network immediately surrounding the site (R134, R120 and R136) which will keep them away from built-up urban centres.

4.4 Programming

In order to reduce impacts on local communities and residents adjacent to the proposed sites, it is proposed that:

- The contractor will be required to liaise with the management of other construction projects and the local authorities to co-ordinate deliveries.

- The contractor will be required to schedule deliveries in such a way that construction activities and deliveries activities do not run concurrently e.g. avoiding pouring of concrete on the same day as material deliveries in order to reduce the possibility of numbers of construction delivery vehicles arriving at the site simultaneously, resulting in build-up of traffic on road network.

- The contractor will be required to schedule deliveries such that traffic volumes on the surrounding road network is kept to a minimum.

- A construction phase programme of works shall be developed by the contractor in liaison with South Dublin County Council specifically taking into account potential road repair works that are included in the local authority's road works schedule. In particular, works should be programmed where possible such that any road works are carried out following the presence of construction traffic for the proposed development.

- HGV deliveries will avoid passing schools at opening and closing times where it is reasonably practicable.

- Normal working hours during the construction period are expected to be Monday to Friday 08.00 to 20.00 hours. During certain stages of the construction phase, it is expected that some work will have to be carried out outside of normal working hours however this will be kept to a minimum..

4.5 Recommended Traffic Management Speed Limits

Adherence to posted / legal speed limits will be emphasised to all staff / suppliers and contractors during induction training. Drivers of construction vehicles / HGVs will be advised that vehicular movements in sensitive locations, such as local community areas, shall be restricted to 50 km/h. Special speed limits of 30 km/h shall be implemented for construction traffic in sensitive areas such as school locations. Such recommended speed limits will only apply to construction traffic and shall not apply to general traffic. It is not proposed to signpost such speed limits in the interest of clarity for local road users.

4.6 Recommended Traffic Management Speed Limits

It shall be a requirement of the works contract that the main contractor will be required to carry out road sweeping operations to remove any project related dirt and material deposited on the road network by construction / delivery vehicles. Road Sweepers will dispose of material following sweeping of road network, to licensed waste facility.

4.7 Vehicle Cleaning

It shall be a requirement of the works contract that the main contractor will be required to provide wheel washing facilities, and any other necessary measures to remove mud and organic material from vehicles exiting the site.

4.8 Road Condition

The extent of the heavy vehicle traffic movements and the nature of the payload may create problems of:

- Fugitive losses from wheels, trailers or tailgates; and
- Localised areas of subgrade and wearing surface failure.

The contractors shall ensure that:

- Loads of materials leaving each site will be evaluated and covered if considered necessary to minimise potential dust impacts during transportation.
- The transportation contractor shall take all reasonable measures while transporting waste or any other materials likely to cause fugitive loses from a vehicle during transportation to and from site, including but not limited to:
    - Covering of all waste or material with suitably secured tarpaulin/ covers to prevent loss; and
    - Utilisation of enclosed units to prevent loss.

- The roads forming part of the haul routes will be monitored visually throughout the construction period and a truck mounted vacuum mechanical sweeper will be assigned to roads along the haul route as required. In addition, the contractor shall, in conjunction with the local authority:

- Throughout the course of the construction of the proposed development, ongoing visual inspections and monitoring of the haul roads will be undertaken to ensure any damage caused by construction traffic is recorded and that the relevant local authority is notified.

Arrangements will be made to repair any such damage to an appropriate standard in a timely manner such that any disruption is minimised. Upon completion of the construction of the proposed development, the surveys carried out at preconstruction phase shall be repeated and a comparison of the pre and post construction surveys carried out. Where such comparative assessments identify a section of road as having been damaged or as having deteriorated as a result of construction traffic, the road will be repaired to the preconstruction standard or better.

4.9 Road Closures

During the course of the works, it is not envisaged that road closures or any temporary traffic control measures will be required.

4.10 Enforcement of Traffic Management Plan

All project staff and material suppliers will be required to adhere to the final TMP. As outlined above, the principal contractor shall agree and implement monitoring measures to confirm the effectiveness of the TMP. Regular inspections / spot checks will also be carried out to ensure that all project staff and material supplies follow the agreed measures adopted in the TMP.

4.11 Details of Working Hours and Days

Normal working hours during the construction period are expected to be Monday to Friday 08.00 to 20.00 hours. During certain stages of the construction phase, it is expected that some work will have to be carried out outside of normal working hours however this will be kept to a minimum.

4.12 Emergency Procedures During Construction

The contractor shall ensure that unobstructed access is provided to all emergency vehicles along all routes and site accesses. The contractor shall provide to the local authorities and emergency services, contact details of the contractor's personnel responsible for construction traffic management. In the case of an emergency the following procedure shall be followed:

- Emergency Services will be contacted immediately by dialling 112;

- Exact details of the emergency / incident will be given by the caller to the emergency line operator to allow them to assess the situation and respond in an adequate manner;
- The emergency will then be reported to the Site Team Supervisors and the Safety Officer;
- All construction traffic shall be notified of the incident (where such occurs off site);
- Where required, appointed site first aiders will attend the emergency immediately; and
- The Safety Officer will ensure that the emergency services are en-route.

4.13 Communication

The contractor shall ensure that close communication with South Dublin County Council and the emergency services shall be maintained throughout the construction phase. Such communications shall include:

- Submissions of proposed traffic management measures for comment and approval;
- Ongoing reporting relating to the condition of the road network and updates to construction programming; and
- Information relating to local and community events that could conflict with proposed traffic management measures and construction traffic in order to implement alternative measures to avoid such conflicts.

The contractor shall also ensure that the local community is informed of proposed traffic management measures in advance of their implementation. Such information shall be disseminated by posting advertisements in local newspapers and delivering leaflets to houses in the affected areas. Such information shall contain contact information for members of the public to obtain additional information and to provide additional knowledge such as local events, sports fixtures etc. which may conflict with proposed traffic management measures.

5.0 CONCLUSION

The Construction Traffic Management Plan (TMP) will form part of the construction contract and will be designed to reduce possible impacts which may occur during the construction of the proposed development. This outline CTMP shall be used by the appointed contractor as a basis for the preparation of a final CTMP and shall detail, at a minimum, the items detailed in this outline CTMP and any subsequent requirements of the local authorities. The employer shall be responsible for ensuring that the contractor manages the construction activities in accordance with this outline TMP and shall ensure that any conditions of planning are incorporated into the final TMP prepared by the appointed works contractor.

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16.1 AERONAUTICAL ASSESSMENT REPORT

Aeronautical Assessment Report

RE SITE AT
Profile Park, Dublin 22
in South County Dublin

Planning Application
for
Greener Ideas Ltd Power Plant

[for Tobin Consulting Engineers]

7th June 2021

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CONTENTS

Executive Summary
May 2021

A. Aviation 'Obstacle Limitation Surfaces' in General

The site at Profile Park lies well clear of all Approach Surfaces, Take-Off Climb Surfaces, and Transitional Surfaces at Casement Aerodrome, which are the more important Obstacle Limitation Surfaces [as defined by the International Civil Aviation Organization (ICAO) and by the European Aviation Safety Agency (EASA)]. The site is also clear of all Surfaces for Weston and Dublin Airports.

B. Casement Aerodrome's 'Inner Horizontal Surface'

The site lies under Casement's Inner Horizontal Surface, but the site is low-lying (at 74.8m OD) so that the highest part of the proposed development (at 106.6m OD) is 25m below Casement's Inner Horizontal Surface and is well clear of it.

C. The Department of Defence 'Inner Zone'

The site is in a location where the 'Inner Zone' (which is not an ICAO surface, but a local military zone) has a building height limit at 106.6m OD, and the highest part of the proposed development does not project above this height limit.

D. Power Plant Emissions

A Study by AWN indicates that emissions from the power plant will not interfere with aviation, and specifically that any adverse oxygen levels, temperatures, or visual effect will be contained well below Casement Aerodrome's Inner Horizontal Surface.

E. Overall

We consider that the proposed power plant at Profile Park, Dublin 22, complies with ICAO guidance, with the Department of Defence's current 'Inner Zone' requirement, and with all aviation and aeronautical requirements affecting the site, [and details of the proposed power plant have been provided to the Department of Defence and Air Corps].

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1. Scope of Report and Location of the Site

1.1 This report assesses the aviation impact of a proposed Power Plant development for Centrica on a site of 1.82 hectares approx. in South County Dublin, located to the west of Grange Castle Golf Club and to the east of the Google Data Centre Campus, at Profile Park, Dublin 22. This power plant is to supply power for new data centres being located in its vicinity.

1.2 **Items of aeronautical significance in relation to the site are:**

(ii) The site lies under the "Inner Horizontal Surface" [as defined by the International Civil Aviation Organization] of Casement Aerodrome, which is at an elevation of 131.6m OD (i.e. at 56.8m above ground level on the site).

(iv) The site also lies within Casement Aerodrome's "Inner Zone" which is a circle of 2km radius centred at the centre point of Casement's main runway: this is not an ICAO surface, but a Department of Defence restriction.

(iii) The site lies at a lateral distance of 1.4km-1.55km approx. from the centreline of Casement's main Runway 10/28, and at a lateral distance of 0.8km-1km approx. from the extended centreline of Casement's subsidiary Runway 04/22;

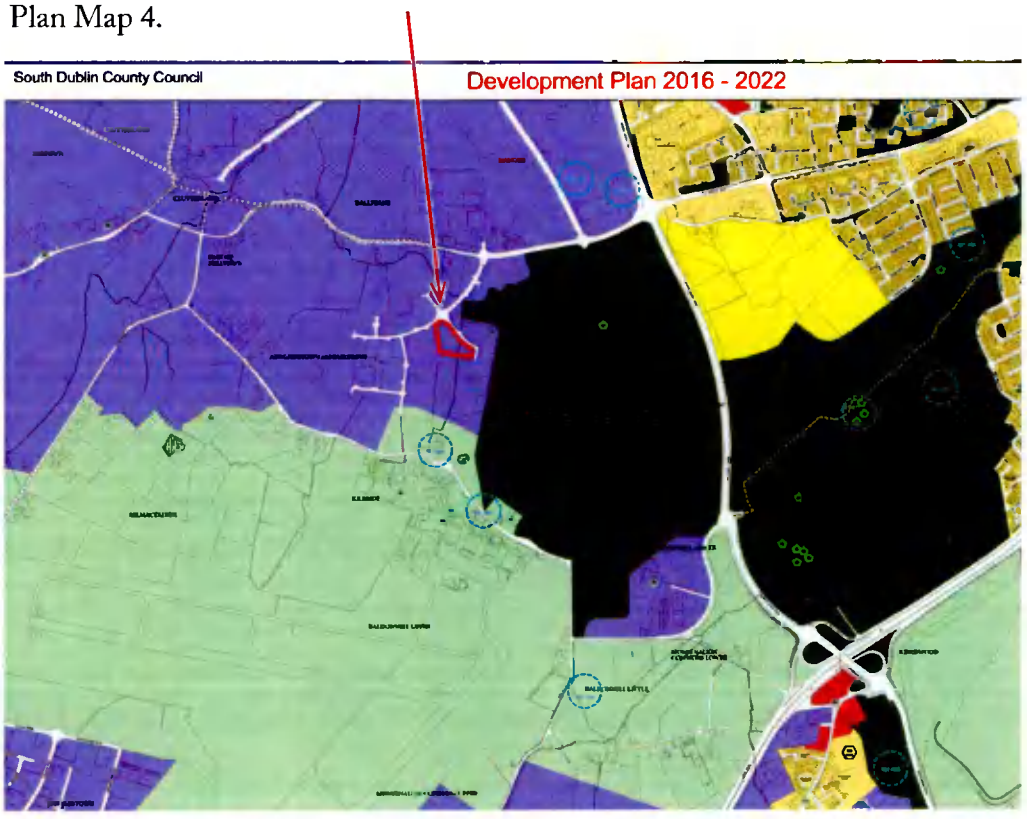
(iv) No part of the site, however, lies under any of Casement Aerodrome's more significant Obstacle Limitation Surfaces: Approach Surface, Take-Off Climb Surface, or Transitional Surface; and no part of the site lies under any of Weston Airport's or Dublin Airport's Obstacle Limitation Surfaces.

(i) The site, with ground level at 74.8m OD, is low-lying in relation to Casement Aerodrome, i.e. at 11.8m below the aerodrome's datum (of 86.6m OD), and at 22.4m below the aerodrome's published 'aerodrome elevation' (319ft /97.2m OD).
[These items (i) to (iv) are illustrated in the section diagram in part #7 on page 13]

1.3 **The Site in Relation to the Current S.D.C.C. Development Plan:**

In the current South Dublin County Council Development Plan 2016-2022, this site directly to the east of Citywest Road is zoned **'Objective EE: To provide for enterprise and employment related uses.'**

The Site is shown, outlined in red, in the extract below from SDCC Development Plan Map 4.



1.5 **Some Recent Aviation Changes to Note (at variance with SDCC Development Plan 2016-2022 data):**

(i) In **December 2017**, the standards relating to eight international and regional airports in Ireland (including **Dublin**, but not Casement) came **under E.A.S.A.** [European Aviation Safety Agency] standards, rather than I.C.A.O. [International Civil Aviation Organization] standards as previously. Weston Airport is temporarily exempted, and remains (with Casement) under ICAO standards.

(ii) In **November 2018, I.C.A.O. issued revised 'Annex 14' Standards** bringing these in line with the new E.A.S.A. Aerodromes Specifications, with several changes to airport design specifications (including narrower Approach Surfaces).

(iii) In **February 2019, Casement's runway designations** were changed: its main runway (formerly 11/29, as in the SDCC Development Plan) was redesignated as **10/28**, and its subsidiary runway (formerly 05/23) was redesignated as **04/22**. This arose from a shift in magnetic variation which affected Casement. In this report we use the new 2019 designations, but they refer to the same runways as are in the SDCC Plan.

2. Aviation Surfaces in Relation to the Site

2.1 The Department of Defence has adopted the I.C.A.O. Obstacle Limitation Surfaces in relation to Casement Aerodrome. Being a military aerodrome, Casement is not bound by these Civil Aviation standards, but the Department of Defence has opted to apply these Standards at Casement (to protect aircraft in flight). These Obstacle Limitation Surfaces – similar to the E.A.S.A. Specifications which now apply at Dublin and other Irish airports – are set out by the International Civil Aviation Organization (based in Montreal) as *International Standards and Recommended Practices* in its *Annex 14 – 'Aerodromes'* document.

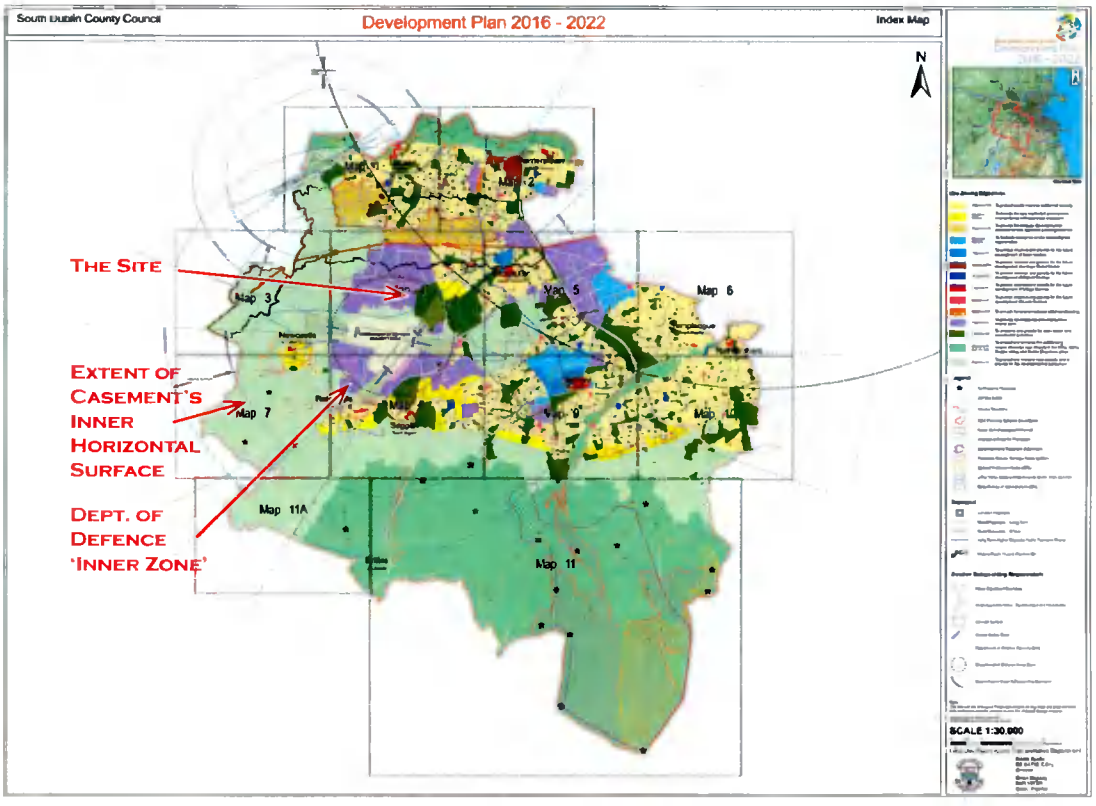
[It may be noted that the revisions to several *Annex 14* dimensions were made by ICAO on 8th November 2018 (affecting Approach Surfaces etc.) do not affect this particular site at Profile Park].

2.2 The Aviation Surfaces of relevance to this Profile Park site are

(i) the Inner Horizontal Surface for Casement Aerodrome; and
(ii) the Department of Defence's "Inner Zone" around Casement Aerodrome.

A diagram on the following page shows these surfaces, (and Casement Aerodrome's other 'obstacle limitation surfaces'), in more detail.

2.3 The South Dublin Development Plan Index Map [2016-2022] includes outlines of both of these surfaces (*as illustrated below*):

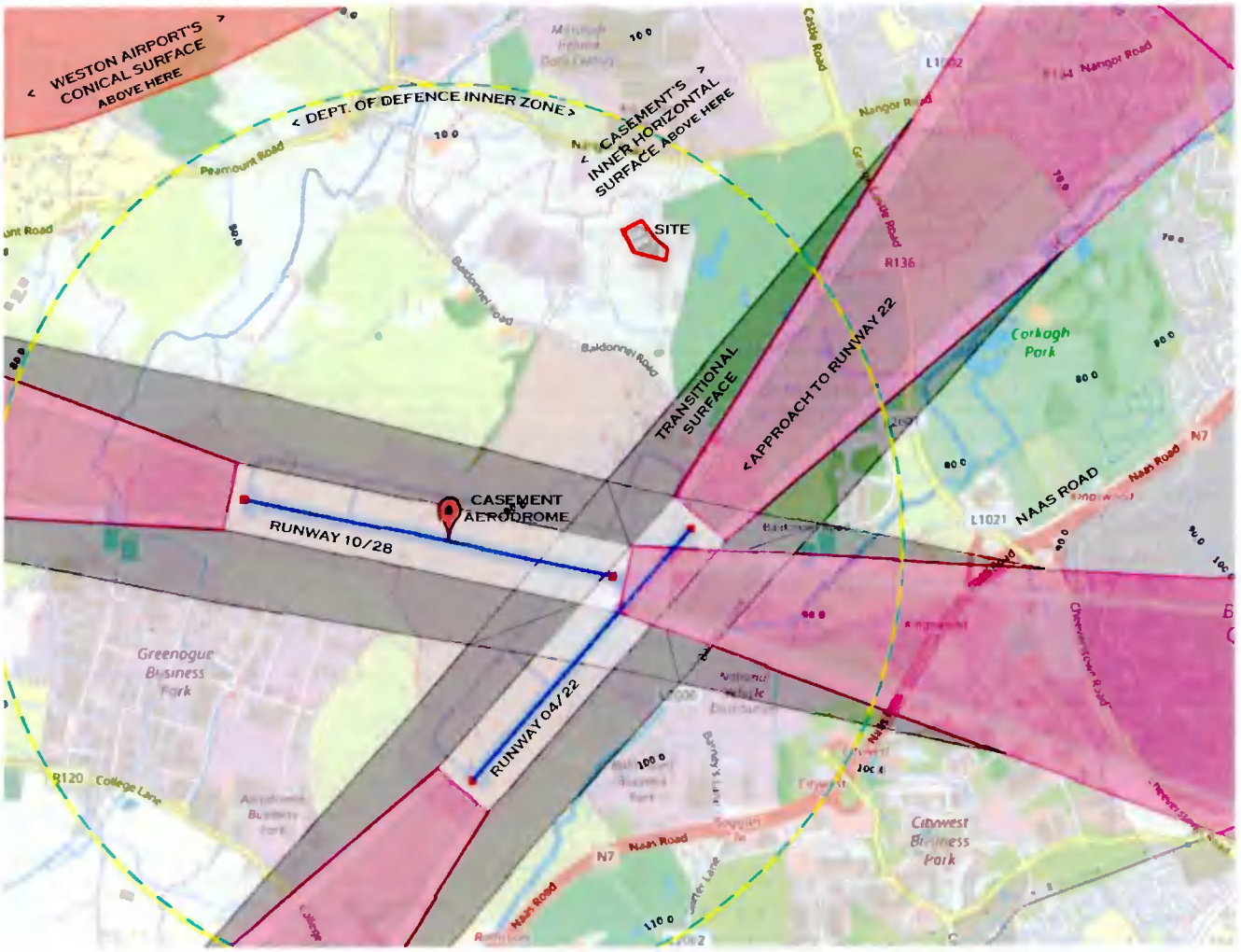


2.4 Aviation Surfaces Diagram

The diagram below (based on Irish Aviation Authority 'Asset' data, onto which the "Inner Zone" is added) shows the various aviation surfaces in the vicinity of the power plant site (which is outlined in red).

The Inner Horizontal Surface (which includes all the area without superimposed colour in the diagram below) is a horizontal plane lying at 131.6m OD, i.e. at 45m above the aerodrome's datum level (a datum chosen at 86.6m OD at Casement).

The Department of Defence's "Inner Zone" (which is not an ICAO surface)is a circle of 2km radius, within which new objects should not be more than than 20m above ground or 20m above the aerodrome's datum (whichever is higher).



3. Relevant S.D.C.C. Development Plan Paragraphs

3.1 Changed Runway Designations

As noted in para. 1.5(iii) above, the runways at Casement Aerodrome have been redesignated in February 2019. This means that where the S.D.C.C. Development Plan refers to Casement runways 11/29 and 05/23, these same runways are now designated (and referred to in this report) as Casement runways 10/28 and 04/22. The Profile Park site that is the subject of this report lies well outside (and is not affected by) any Approach or Take-Off Climb Surfaces mentioned in the Development Plan (which are the more important obstacle limitation surfaces).

[The runways at Weston and Dublin Airports have not been redesignated (and remain the same as described in the current Development Plans. However, since December 2017, Dublin Airport has become subject to E.A.S.A. (European Aviation Safety Agency) standards rather than the I.C.A.O. 'Annex 14' Standards referred to in the S.D.C.C. Development Plan.]

3.3 Relevant SDCC Paragraphs

Of particular relevance to the aeronautical assessment of this Profile Park site are the paragraphs reproduced below from the South Dublin County Council Development Plan 2016-2022, which include —

(i) Paragraphs 7.8.0 'Aerodromes & Airport' on page 135 of the Plan:

7.8.0 Aerodromes & Airport

This section sets out the general restrictions and requirements on development within the County for Dublin Airport, Casement Aerodrome and Weston Aerodrome.

The safeguarding requirements in the vicinity of civil aerodromes are principally set out as 'International Standards and Recommended Practices' within 'Annex 14 to the Convention on International Civil Aviation', which is published by the International Civil Aviation Organisation (ICAO) and the Irish Aviation Authority Guidance Material on Aerodrome Annex 14 Surfaces (2015). These provide dimensions and the basic criteria needed for the preparation of safeguarding maps for all civil aerodromes, with dimensions and criteria varying in relation to the size, shape and usage of different aerodromes.

The main Obstacle Limitation Surfaces for each instrument runway are mapped on the County Development Plan Map Index.

Casement Aerodrome, being a military aerodrome, does not fall under the control of the Irish Aviation Authority but the ICAO Standards and Recommended Practices are applied as policy by the Department of Defence at Casement Aerodrome.

Additionally, the Department of Defence applies two further restricted areas of its own, a circular 'Inner Zone' of 2km radius, and a 'Security Zone' more closely aligned with the flight strips, which are the areas around the runways.

3.3 (ii) Paragraphs 7.8.1 'Casement Aerodrome' on pages 136-137 of the Plan, including Policy Objectives IE8:

7.8.1 CASEMENT AERODROME

Casement Aerodrome is in continuous aviation use and is the only fully equipped military airbase in the State and serves as the main centre of Air Corps operations.

INFRASTRUCTURE AND ENVIRONMENTAL QUALITY (IE) Policy 8 Casement Aerodrome

It is the policy of the Council to safeguard the current and future operational, safety and technical requirements of Casement Aerodrome and to facilitate its ongoing development for military and ancillary uses, such as an aviation museum, within a sustainable development framework.

IE8 Objective 1:

To ensure the safety of military air traffic, present and future, to and from Casement Aerodrome with full regard for the safety of persons on the ground as well as the necessity for causing the least possible inconvenience to local communities.

IE8 Objective 2:

To maintain the airspace around the aerodrome free from obstacles to facilitate aircraft operations to be conducted safely, including restricting development in the environs of the aerodrome.

IE8 Objective 3:

To implement the principles of shielding in assessing proposed development in the vicinity of Aerodromes, having regard to Section 3.23 of the Irish Aviation Authority 'Guidance Material on Aerodrome Annex 14 Surfaces (2015)'.

IE8 Objective 4:

To prohibit and restrict development in the environs of Casement Aerodrome in the following ways:

a) By prohibiting development within the immediately adjacent approach areas to reduce the slight risk to persons on the ground and the increased risk to occupants of an aircraft in the event of the aircraft accidentally touching down outside the aerodrome boundary while taking off or approaching to land, except where development could not reasonably expect to increase the number of people working or congregating in or at the property (this may include development such as the extension of an existing dwelling or a change of building use). In general, no development shall be permitted within the Public Safety Zones.

b) By applying height restrictions to development in the environs of the Aerodrome.

c) By eliminating potential sources of interference with the operation of electronic navigation aids.

d) By obviating possible hazards to aircraft through the generation of smoke, dust or fumes which may reduce visibility.

e) By controlling and assessing the locations of any activities which may be an attraction to birds.

f) By limiting the extent, height and type of external lighting to avoid confusing pilots in the interpretation of aeronautical lights or cause dazzle or glare.

The extent of the restriction necessary in any particular instance depends on its purpose. In some cases, more than one purpose may have to be served in which case a combination of the restrictions to satisfy all the purposes to be served will be necessary.

3.3 (iii) The paragraphs on 'Inner Horizontal Surface' and on the Department of Defence 'Inner Zone' in Section 11.6.6 'Aerodromes' on pages 225 to 231 of the SDCC Plan:

Inner Horizontal Surface

Generally, development will be acceptable in this zone, subject to the development having an OD height below the height restriction of the Inner Horizontal Surface (generally 45 metres above the elevation datum of the Aerodrome). In general, this will be applicable to development above the prevalent building height (based on OD) of the area. The Inner Horizontal Surface of Casement is ~~86.6~~ metres OD and Weston is 91.3 metres OD. Similar to development within the Outer Approach Surface, the applicant should demonstrate that the proposed development is not an obstacle to the Aerodrome airspace.

[correction: 131.6m O.D.]

The applicant shall be required to detail the OD height of the proposed development, in the context of the relevant Aerodrome.

Outer Horizontal Surface

In areas beyond the limits of the Conical Surface, objects and proposed development which extend to a height of 150 metres or more above the OD elevation of the Aerodrome should be regarded as obstacles, unless a special aeronautical study indicates that they do not constitute a hazard to aeroplanes.

Department of Defence Restrictions

a) **Inner Zone**

Within the DoD Inner Zone, in view of the volume of helicopter operations and the level and variety of aircraft training movements and for safety and security reasons, planning applications for structures such as high mast lighting and antennae, in the Inner Zone will be subject to special examination by the DoD to ensure that their construction would not be undesirable for safety, security or operational reasons.

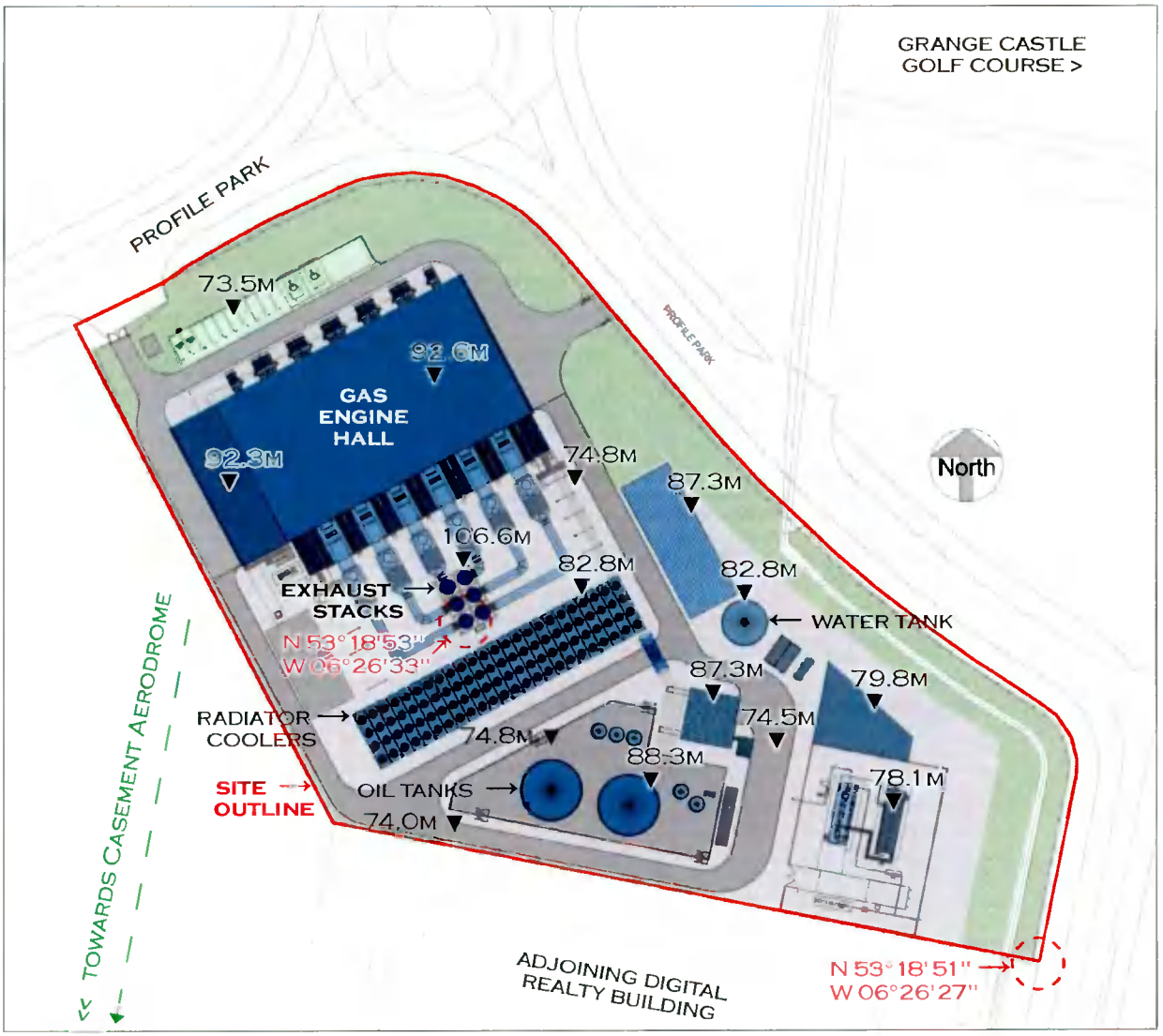
In general, within the DoD Inner Zone (delineated on Development Plan Map), in addition to the Obstacle Limitation Surfaces for the Aerodrome, no buildings or structures exceeding 20 metres in height above ground level should be permitted except where specifically agreed in writing following consultation with the DoD that the proposed development will not affect the safety, efficiency or regularity of operations at the aerodrome.

[We have noted that there is a misprint in the Development Plan in the paragraph reproduced above re the Inner Horizontal Surface of Casement Aerodrome: this Surface is in fact set at **131.6 metres OD** (and not at 86.6m OD as written, which is the aerodrome's datum level, above which the IHS is established at 45m higher).]

3.4 We also point out that much of the information concerning aviation and aerodromes (including data for Casement military aerodrome) has been provided by our own firm to S.D.C.C. (at the time of preparation of the previous Development Plan).

4. Layout, Elevations, & Coordinates of the Proposed Development

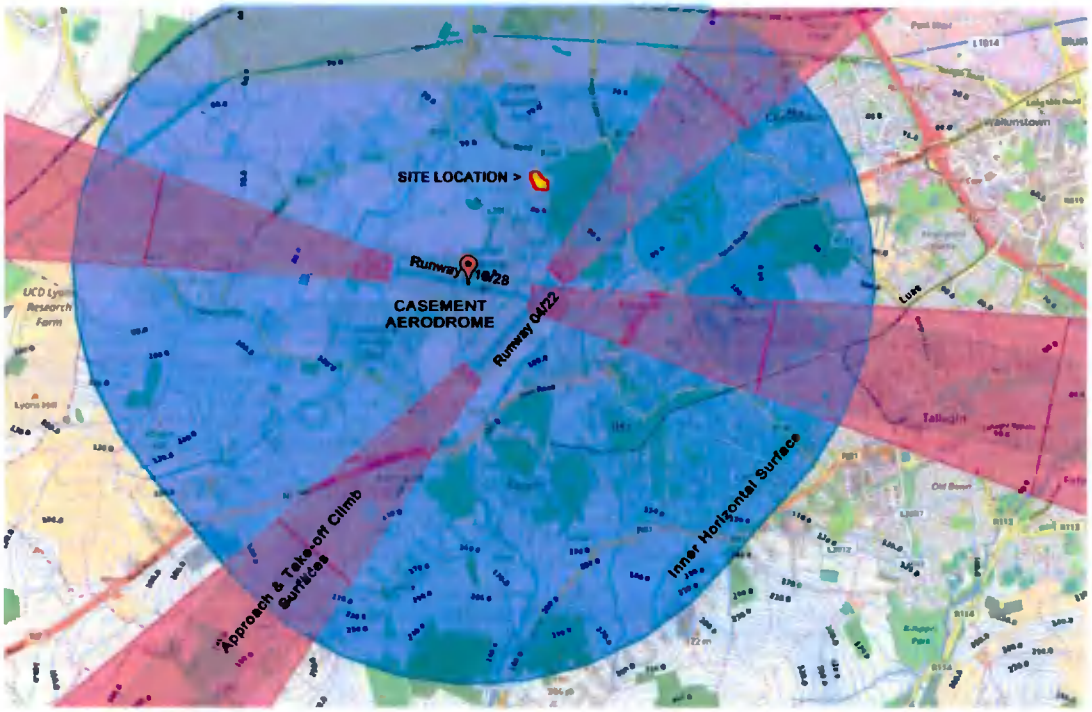
4.1 Below, to approx. scale 1:1,350, is a Site Layout Plan of the proposed Power Plant development at Profile Park, Dublin 22, with elevations OD of its highest elements, and some relevant coordinates.
[The elevations OD of the highest elements (the exhaust stacks) are exact, and the elevations OD given for the lower elements indicate maximum heights of any part of those lower elements.]
In this diagram, darker blue shading indicates higher objects.



ROOF PLAN OF PROPOSED DEVELOPMENT
WITH ELEVATIONS (O.D.) OF HIGHEST PARTS
SCALE 1:1,350 APPROX.

5. The Site in Relation to the Inner Horizontal Surface at Casement

As noted above, the **Inner Horizontal Surface** at Casement Aerodrome is at 131.6 metres OD (being 45m above the Department of Defence's chosen datum of 86.6m, which is the elevation of the aerodrome's lowest runway threshold). On the diagram below [containing Irish Aviation Authority 'Asset' data] this I.H.S. is shown coloured blue, with the site's location inserted in red+yellow. Approach Surfaces (and the narrower Take-Off Climb Surfaces) are included in purple. —



5.1 It can be seen that the site (at 1.4km to 1.55km north of Casement's main runway 10/28, and north-west of Casement's subsidiary runway 04/22) falls within the area of the aerodrome's Inner Horizontal Surface, but is well clear of all Approach and Take-Off-Climb Surfaces.

5.2 Ground level on the site is at 74.8m OD, which is 11.8m lower than Casement's datum level (of 86.6m OD) and at 56.8m below the aerodrome's Inner Horizontal Surface. As the highest part of the proposed development (its 6 exhaust stacks) extends to 106.6m OD – 25m below the 131.6m OD elevation of Casement's Inner Horizontal Surface – it can be seen that no part of the proposed development will project above the aerodrome's Inner Horizontal Surface.

5.3 A Longitudinal Section Diagram & Map – showing the relationship to Casement Aerodrome of the proposed development – are provided on page 13 following.

6. The Development in relation to the Department of Defence "Inner Zone"

6.1 The Department of Defence "Inner Zone"

The "Inner Zone" at Casement Aerodrome *(as described at para. 2.4 and shown in the drawing on page 5)* is not an ICAO surface, but a legacy item which predated the current ICAO Surfaces. At Casement (and at other Irish airports where it is no longer retained) this originated – in an approximation of an Inner Horizontal Surface – as a circle of 4km radius about the aerodrome's reference point. Within this circle – for simplified planning control purposes – building height limits above ground level were applied (rather than building elevation levels above the aerodrome's datum, in accordance with ICAO guidance).

6.2 Evolution of the "Inner Zone" at Casement

Over the past 40 years the characteristics of Casement's "Inner Zone" have changed three times in relation to its radius, three times in relation to the location of the circle's centre, and three times in relation to its height limit, as follows:

(i) Prior to the 1990s Casement's Inner Zone was a circle of **4km** radius centred 100m ***south*** of Casement's runway 11/29, within which a building height limit of **15m** above ground level was applied.
(ii) In 1999, after application at Casement of ICAO Surfaces, the Inner Zone (as illustrated in the *Review of Policy* by Frederick Snow) became reduced to a circle of **2.5km** radius centred *c.*100m ***north**** of Casement's runway 11/29, with a height limit of **15m** above ground level. *[* This shift of Casement's 'Aerodrome Reference Point' from south to north of runway 11/29 may have been done in error.]*
(iii) In 2009 (as described on page 4-4 of Casement's *Review of Policy* by Mott MacDonald) the Inner Zone became reduced to a circle of **2km** radius, centred north of runway 11/29, with a building height limit increased to **20m** above ground level.
These characteristics of this Zone are included in the SDCC Development Plan 2016-22, but its characteristics have more recently been updated by DoD, as follows:
(iv) Recent (2021) Dept. of Defence documentation has the Inner Zone as a circle of **2km** centred at the **mid-point** of runway 10/28, with the building height limit expressed in two ways: either 20m above ground level on the site, or at **106.6m OD**, whichever is the higher *[see extract below]*.

The following is an extract from current Department of Defence 'Inner Zone' policy:

> 8. **2 kilometer Zone**
>
> a. Comprises an area contained within a radius of 2km from Baldonnel Aerodrome Reference Point (ARP) established for security reasons as well as the safety of specific flight profiles in the vicinity of the aerodrome.
>
> b. The maximum height allowed for development within the Inner Zone is 20m above the highest point on the site or a horizontal surface of 106.6m AMSL whichever is higher.

6.3 **The Profile Park Power Plant in relation to Casement's "Inner Zone"**

The proposed Power Plant development is on a particularly low-lying site in relation to Casement Aerodrome. With ground levels on the site at 73m-74.5m OD, it lies at more than 12m below the lowest of Casement Aerodrome's runway thresholds, i.e. below 86.6m (which is also the aerodrome's datum level).

The maximum heights desired by the Department of Defence within this Inner Zone of 2km radius *(as stated in the extract reproduced on the previous page)* are at 20m above ground level for any development located above the 86.6m OD contour, and at 106.6m OD (i.e. 20m above the aerodrome's datum) for any proposed development located below the 86.6m OD contour line, which is the area where the Profile Park Power Plant is located.

The highest elements of the proposed power plant are its six co-located exhaust stacks, of 31.8m height above their finished floor level of 74.8m OD, i.e. these six highest items extend to a maximum of 106.6m OD, which is exactly in compliance with the Department of Defence's stated height/elevation OD limit.

All other parts of the proposed development are substantially lower than this 106.6m OD elevation (and consequently much lower than the Inner Zone limit): e.g. the Gas Engine Hall at 94.8m OD to highest point; the two large Oil Tanks at 89.6m OD to their highest points; and everything else (including all other smaller tanks) no higher than 82.8m OD (i.e. well below the aerodrome's datum).

6.4 As demonstrated above, the proposed Power Plant complies fully with the Department of Defence "Inner Zone" requirements.

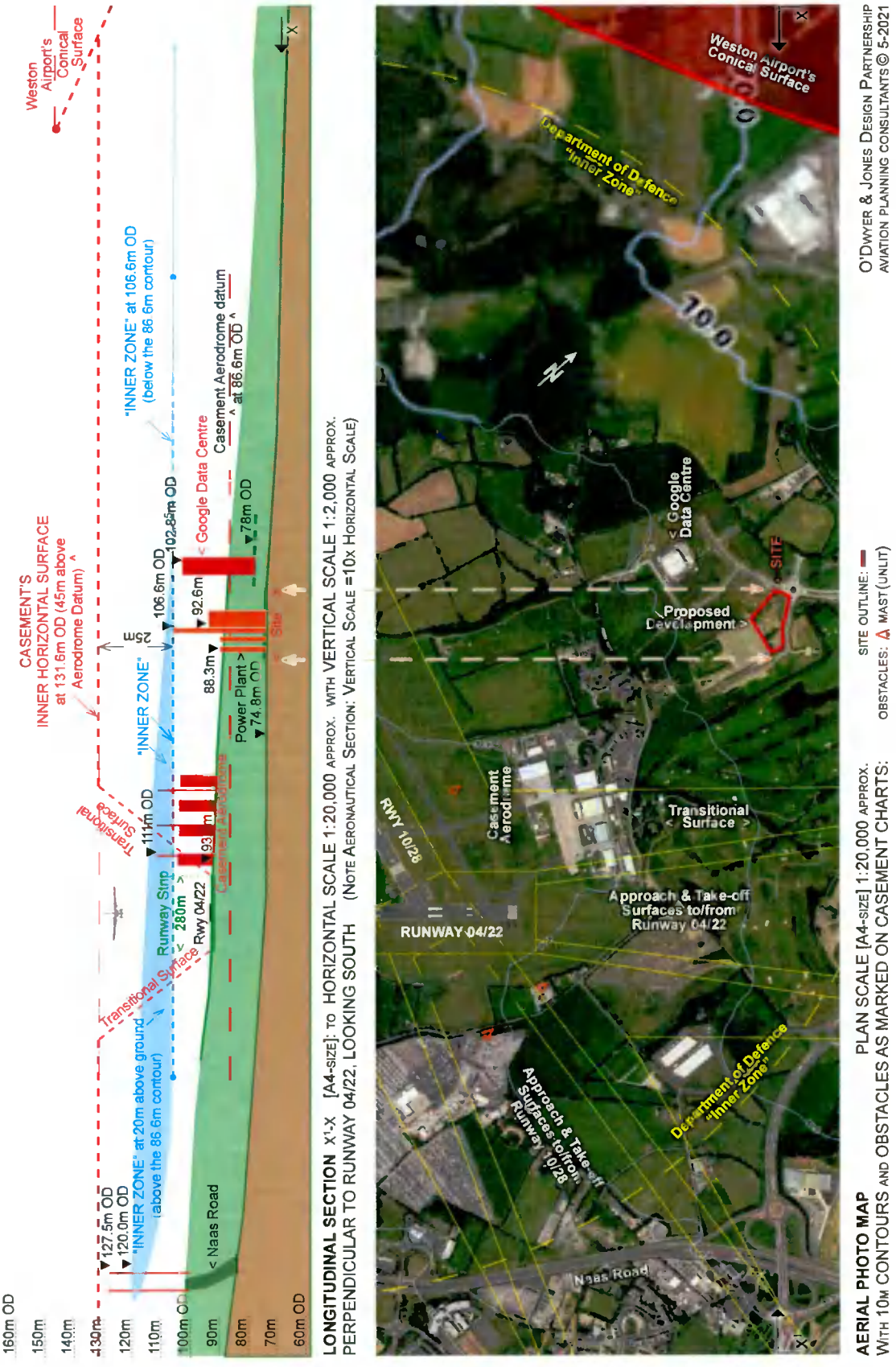
A Longitudinal Section Diagram and Map, showing the Power Plant development in relation to the "Inner Zone" and other aviation Surfaces, appears on the following page >.

6.5 **Some other recent developments within Casement's "Inner Zone"**

The adjacent Google Data Centre development, of 25m height above a ground level of 77.85m OD, extends to 102.85m OD; and the UBC Data Centre, also of 25m stack height, extends to 96.25m OD. Both of these, being below 106.6m OD, comply with "Inner Zone" requirements. By contrast, recent lighting masts of 27.5m height at the Naas Road Citywest interchange, which also lie under this "Inner Zone", do not comply with the "Inner Zone" height limit in their location.

7. Longitudinal Section Diagram & Map

[A4-SIZE:] 1:20,000 HORIZONTAL SCALE
1:2,000 VERTICAL SCALE (SECTION)

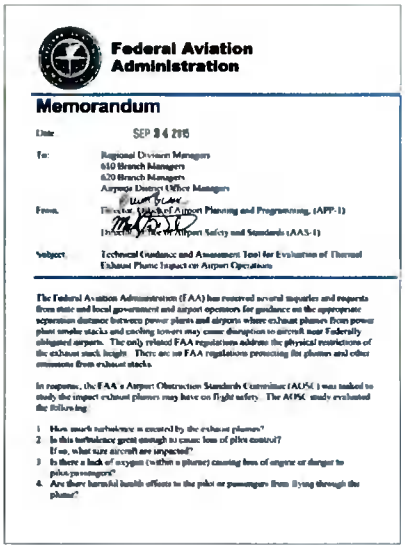


8. Power Plant Emissions vis-à-vis Aviation

8.1 International Policy

Aviation Policy in relation to Power Plant emissions is currently being developed. A Federal Aviation Administration document of 2015 initiated a study of the effect that power plant thermal plumes might have on aviation safety, under the following headings:

1. How much turbulence is created by the exhaust plumes?
2. Is this turbulence great enough to cause loss of pilot control? If so, what size aircraft are impacted?
3. Is there a lack of oxygen (within a plume) causing loss of engine or danger to pilot/ passengers?
4. Are there harmful health effects to the pilot or passengers from flying through the plume?


Federal Aviation Administration

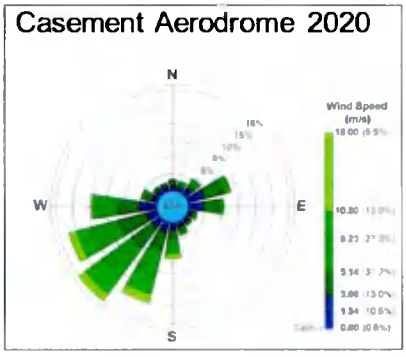
Memorandum

Arising from this, the FAA recommends adoption of a model developed by MITRE Corporation to predict plume size and severity of flight impact from thermal exhaust plume(s).

8.2 Emissions Analysis

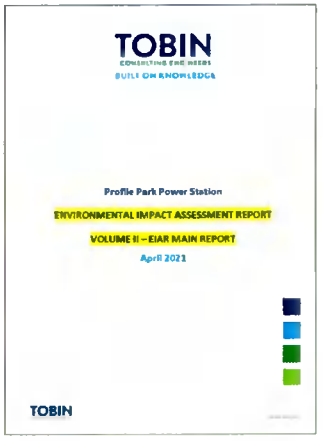
The MITRE "Exhaust-Plume-Analyzer" (recommended by the FAA) has been applied in an analysis of the emissions of the Profile Park Power Plant, by Dr Edward Porter of AWN. This is included in the project's EIAR, of which the relevant pages referring to aviation are included as an Appendix to this report.

In particular this analysis has investigated (i) oxygen content, (ii) emissions temperature, and (iii) vertical velocity of emissions, and whether or not these items might have an effect on helicopter operations (which are more susceptible to these items than fixed-wing aircraft).



This analysis also took into effect all recent Casement Aerodrome wind data [>], and it should be noted that the location of the site and the direction of the prevailing wind mean that emissions will be directed away from Casement Aerodrome (which lies to south-south-west of the power plant site).

8.3 Emissions Analysis Findings



The findings of the AWN Study, using the MITRE Exhaust-Plume Analysis recommended by the FAA, are included in the Environmental Impact Assessment Report [EIAR] for this project. These address possible helicopter risk elements.

These findings are summarised as follows:

" (i) Oxygen Content – within 9 metres of the stack top the oxygen concentration will increase above the 12% risk level for oxygen.

(ii) Temperature – the temperature of the plume will drop to less than 50°C within 11 metres of the stack.

(iii) Vertical Velocity – the critical vertical velocity of 4.3 m/s will not be exceeded within 15 metre from the stack top.

Thus, the maximum extent of the risk zone of the plume for each parameter is shown below based on three full years of meteorological data covering all meteorological conditions including pressure /temperature inversions:

Risk Zone for Oxygen – 9 metres
Risk Zone for Temperature – 11 metres
Risk Zone for Vertical Velocity – 15 metres "

A copy of this AWN analysis (i.e. the pages of the EIAR relating specifically to aviation issues) is included in the Appendix to this aviation report.

8.4 Conclusion with regard to Emissions from the Profile Park Power Plant

As these heights (expressed in metres above the Profile Park power plant exhaust stacks) are significantly lower than Casement Aerodrome's Inner Horizontal Surface elevation (which lies at 131.6m – i.e. at 25m above the tops of the six stacks), the proposed development is not envisioned by AWN to have any adverse effect on aviation (including helicopter operations) at Casement Aerodrome.

[Visual effect is covered on the following page *(in paragraph 9.3)*.]

8.5 Mitigation

In compliance with the views of the Air Corps, as forwarded by the Department of Defence on 2nd June 2021, it is confirmed with the client that, should negative impacts to Air Corps flight operations occur from flue emissions or otherwise, the owners/operators of the plant shall take immediate actions to mitigate such impacts to an acceptable level.

9. Other Aviation Considerations

9.1 Lighting

The Profile Park site is not in a location where Aviation Obstruction Lighting is required, but low-intensity lighting could be provided to the top of the stacks (the highest point) if considered desirable by the Air Corps.

It is also recommended (due to the site's relative proximity to Casement's runways) that any external lighting be of the cut-off type, showing no light above the horizontal.

9.2 Glint and Glare

There are no solar/PV panels proposed as part of this power plant development, so no glint or glare can arise from that source.

With regard to stacks, tanks, pipework, and any metallic surfaces, all such surfaces are to be of non-reflective type (e.g. of matt finish, or plastic-coated, or painted).

9.3 Other Visual Effect

During its operation, the proposed power plant will operate on natural gas. In exceptional circumstances it may operate on its secondary fuel which is low sulphur diesel oil. This would be expected to be for testing purposes only, i.e. less than 18 hours per annum. In both operational profiles, the plant's exhaust stacks will produce minimal visual effects (with no visual effect extending to the Aerodrome's Inner Horizontal Surface).

To illustrate this, a photograph (provided by the plant suppliers) of a comparable power plant in operation is included opposite >>.

9.4 Bird Hazard

When constructed, the power plant site will not contain any landscape features that might attract birds, and all necessary measures to avoid bird hazard are to be implemented during the construction phase.

9.5 Cranes Used During Construction

(i) Notifications & Coordination with Air Corps ATS:

While it is unlikely that any cranes used during construction will reach the aerodrome's Inner Horizontal Surface, it will be necessary [under S.I. 215 of 2005 – *'Irish Aviation Authority (Obstacles to Aircraft in Flight) Order'*] for prior notification of the use of any crane/s to be submitted, at least 30 days in advance, to the Irish Aviation Authority and to Casement Aerodrome.

In particular, the operation of cranes on site will be coordinated with Air Corps Air Traffic Services, who are to be contacted at least 30 days in advance – by email to airspaceandobstacles@defenceforces.ie and/or by telephone to 01-4037681 at Casement Aerodrome.

(ii) 'PANS-OPS*' Considerations:

As well as the Annex 14 Surfaces described above in this report, there are other higher PANS-OPS* Surfaces *[>>]* which are used to establish flying minima [OCA/H**] in the vicinity of an aerodrome, which are published in the Aerodrome's Approach/ Departure Charts.

* = *Procedures for Air Navigation Services – Aircraft Operations.*
** = *Obstacle clearance altitude/height(s).*

While it is beyond the scope and purpose of this report to enter into any detailed PANS-OPS calculations, we do not envisage that the proposed development (with its highest point at 25m below the aerodrome's Inner Horizontal Surface), or any cranes used during its construction, will have any adverse effect on these surfaces.

9.6 Lightning Protection

Lightning protection will be fixed to the stacks. The nature of this protection – i.e. either copper or aluminium strip, or rods – will be confirmed during the detailed design stage of the project. If a strip is used then this will be flush against the exhaust stack structure. If rods are proposed then these will be non-rigid fixtures which would not pose an obstruction risk. Any such rods would be located within the risk zone for oxygen content, temperature, and vertical velocity as outlined in paragraph 8.3 above.

10. SUMMARY

10.1 Obstacle Limitation Surfaces in General

The power plant site at Profile Park lies well clear of all Approach Surfaces, Take-Off Climb Surfaces, and Transitional Surfaces at Casement Aerodrome; and lies outside all Surfaces for Weston Airport and Dublin Airport (the nearest of which is Weston's Conical Surface at around 1.5km to north-west of the site).

10.2 Casement Aerodrome's Inner Horizontal Surface

The site lies under Casement Aerodrome's Inner Horizontal Surface, but the proposed development will be comfortably below it, with its highest point at 25m lower.

10.3 The Department of Defence "Inner Zone"

The site lies within the Department of Defence's "Inner Zone", but the proposed development does not extend above the 106.6m OD elevation which the Department of Defence has set for the portion of this Zone in which this site is located.

10.4 Power Plant Emissions

A Study by AWN (within the EIAR) indicates that emissions from the power plant will not interfere with aviation, and specifically that any adverse oxygen levels, temperatures, or visual effect will be contained well below Casement Aerodrome's Inner Horizontal Surface.

10.5 General

We consider that the proposed power plant development at Profile Park complies with all aviation and aeronautical requirements affecting the location.

Prior to submission we have provided an Advance Copy of this Report to the Irish Aviation Authority, and to the Department of Defence and Air Corps, and have received the views of the Air Corps which will be complied with in full.

7th June 2021
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Aviation Planning Consultants

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APPENDIX A

Power Plant Emissions — Analysis vis-à-vis Aviation

[Extract of aviation-related pages contained within the Environmental Impact Assessment Report for this Power Plant Project]

THERMAL PLUME MODELLING

1.1 Introduction

This appendix provides an assessment of the potential impact of the plumes associated with the operational phase of the Profile Park Power Station on aircraft, and in particular helicopters, in the region.

The issue of plume characteristics and the effect on the operation of helicopters in the region of the site has been assessed below. An assessment has been undertaken to determine the region surrounding the facility where levels of excess temperature, turbulence (vertical velocity) and reduced oxygen could potentially be encountered. Studies undertaken by the MITRE Corporation (MITRE, 2012) and outlined in the user manual for the "Exhaust-Plume-Analyzer" model detail the likely impact of an exhaust plume on aircraft based on a range of parameters / criteria including the thermal buoyancy and temperature of the plume.

The current study is based on detailed site-specific information. The site-specific study, using the Cambridge Environmental Research Consultants (CERC) AMDS-5 model for oxygen, temperature and vertical velocity, allows the actual emission data for the facility to be used as input into the model. In addition, meteorological data for the region, based on three full years of data from Casement Aerodrome (2018-2020) and building data also forms part of the inputs to the model to allow an accurate representation of the impact of the facility in the surrounding environment.

1.2 Methodology

The parameters of the plume which are most relevant to helicopters has been investigated by the Mitre Corporation as part of the development of the "Expanded Model For Determining The Effects Of Vertical Plumes On Aviation Safety" (MITRE, 2012). These parameters have been reviewed below.

1.2.1 Oxygen

The Mitre Corporation report confirms that oxygen levels below 12% are potentially hazardous to helicopters (MITRE, 2012) and thus the oxygen content of the plume with distance from the stack has been investigated.

In relation to the gas generator, the oxygen content of the plume at stack top will typically be 13%.

1.2.2 Temperature

The Mitre Corporation report confirms that temperatures in excess of 50°C are potentially hazardous to helicopters (MITRE, 2012) and thus the temperature of the plume with distance from the stack has been investigated.

In relation to the gas generator, the temperature of the plume at stack top is 592.2K (319°C).

1.2.3 Vertical Velocity

High vertical velocities are also a concern when considering helicopter / plume interactions as they can lead to increased turbulence in the atmosphere. The literature (CASA, 2012) suggests that the critical level for vertical velocities is 4.3 m/s. Thus, modelling has been undertaken to understand the worst-case vertical velocities of the gas generator plume with distance from the stacks.

The change in each of these parameters with distance from the stack has been reviewed below. For each of these parameters, three full years of meteorological conditions has been used in the analysis including periods of atmospheric pressure / temperature inversions. Meteorological data for the years 2018-2020 for Casement Aerodrome have been used in the analysis for all scenarios outlined, with results for the worst case year reported. The ADMS-5 model has the capability to process calm conditions by setting the wind speed to 0.3 m/s and allowing an equal probability for all wind directions. This option has been used in this assessment for both the temperature assessment and the vertical velocity assessment.

The model was also run with a high density receptor grid based on 5m horizontal spacing and 0.5m vertical spacing in the region of the stack top to determine the changes in the parameters above over very short distances. The receptor spacing of 0.5m was selected as the change with vertical distance in oxygen, temperature and vertical velocity from the stack top is rapid and would be difficult to determine with a coarser grid resolution.

1.2.4 Process Emissions

The proposed Profile Park Power Station will have six gas generator stacks at a height of 31.8m (~75m OD). The source information for the modelled emission points has been summarised in Table 1.

Table 1: Summary of Source Information

Scenario	Height Above Ground Level (m)	Exit Diameter (m)	Cross-Sectional Area (m^2)	Temp (K)	Max Volume Flow (Nm^3/hr)	Exit Velocity (m/sec actual)	NO_2	
							Conc. (mg/Nm^3)	Mass Emission (g/s)
Individual stacks	31.8m (75m OD)	1.704	2.28	592.2	133,862	29.54	75.0	2.79

1.3 Results & Discussion

1.3.1 Oxygen / Plume Interaction

The Mitre Corporation report (MITRE, 2012) confirms that depleted oxygen is generally of greatest concern when considering helicopter/plume interactions. The Mitre Corporation report confirms that at an oxygen content below 12% oxygen there is a risk of engine cut-out whilst above this level there is no risk to helicopter engines. Thus, modelling has been undertaken to determine the oxygen percentage of operations both on natural gas and diesel oil.

The following equation is used to model the % of oxygen in the plume with distance from the stack top. For a given emission concentration of any pollutant e (in $\mu g/m^3$), the oxygen content O (%), is related to the plume concentration c (in $\mu g/m^3$) by the following relationship (13% is the plume oxygen percentage at release for gas generators):

$$c / e = (20.95-O) / (20.95-13)$$

Thus, the calculation can be re-arranged to determine the oxygen content (%) of the plume as a function of distance from the stack top. The re-arranged equation is:

$$O (\%) = 20.95- [(c/e) * (7.65)]$$

AERMOD was thus run to calculate the pollutant concentration and identify the distance from the plume centreline where the 12% oxygen level was exceeded. Modelling was undertaken using Casement Aerodrome data for 2018-2020. Shown in

Figures 1 and 2 show the results for the full worst-case year of 2020.

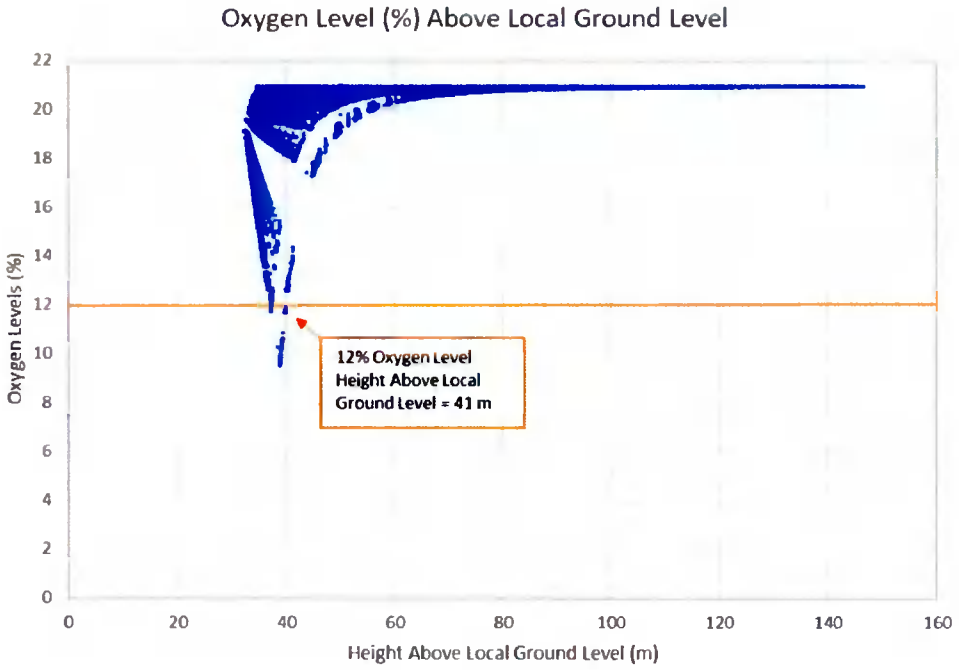

Figure 1: Oxygen Content Of The Plume (%) With Distance Above Ground Level

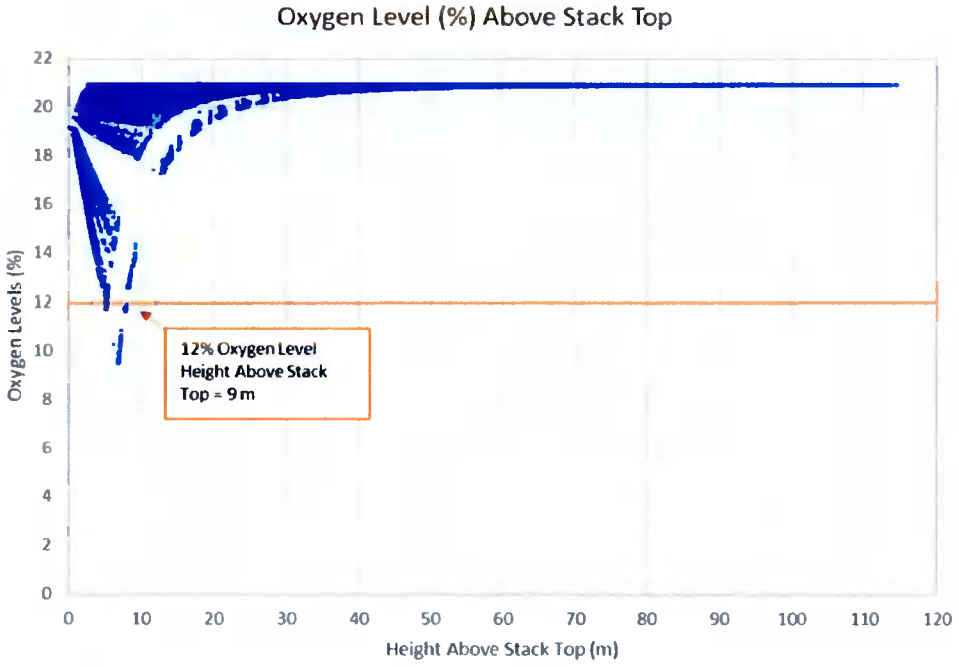

Figure 2: Oxygen Content Of The Plume (%) With Distance From Stack Top

The modelling results confirm that within a distance of 9 m from the stack top (41 m above local ground level) the oxygen content of the stacks plume will be 12% or greater. This analysis is based on every hour of the worst case year 2020 and includes all meteorological conditions including pressure / temperature inversions.

1.3.2 Temperature / Plume Interactions

Temperatures in excess of 50°C are potentially hazardous to helicopters and thus the decrease in the initial temperature of stack plumes (319°C) with distance from the stack has been investigated. Modelling of the temperature of the plume with distance from the stack has been undertaken using the CERC ADMS-5 model for every hour of the year based on Casement Aerodrome 2018-2020 meteorological data. The model has a specific temperature module which can, as part of the model output, give the temperature of the plume centreline with distance from the stack top.

The results are outlined below in Figure 3 and 4 for the worst case year of 2020.

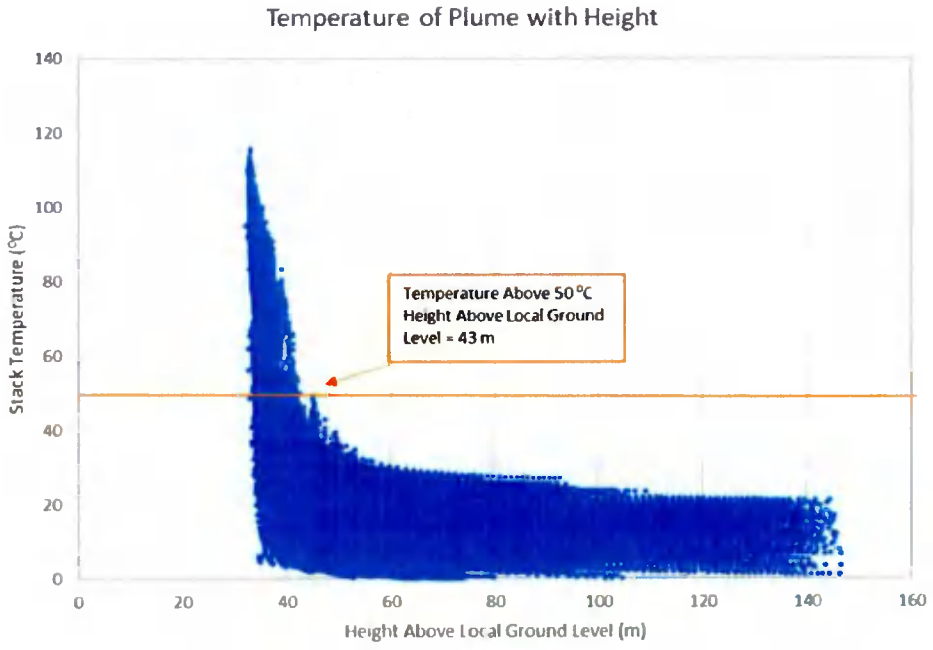

Figure 3: Temperature Of The Plume (°C) With Distance Above Ground Level

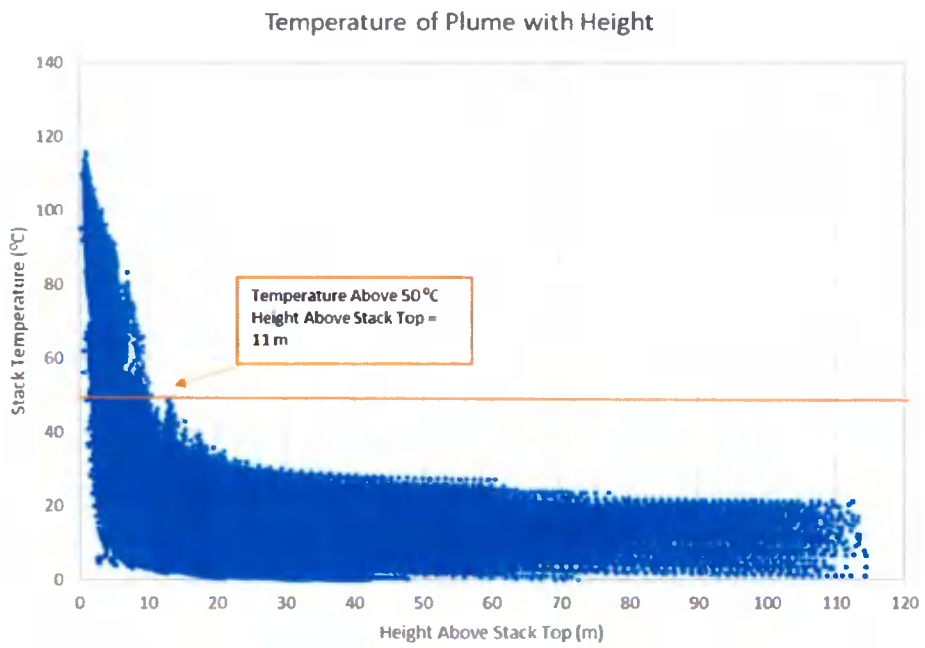

Figure 4: Temperature Of The Plume (°C) With Distance From Stack Top

The results confirm that the plume will be below 50°C within 11 m of the stack top (43 m above ground level) for every hour over the year for the stack including all meteorological conditions including pressure / temperature inversions.

1.3.3 Vertical Velocity / Plume Interactions

High vertical velocities are also relevant when considering helicopter/plume interactions. The Australian CASA (CASA, 2012) consider that the critical level for vertical velocity is 4.3 m/s. Thus, modelling has been undertaken to understand the vertical velocity of the plume with distance from the stack.

Cambridge Environmental Research Consultants (CERC), the developers of the EPA approved AMDS-5 model, were contacted to determine whether vertical velocity could be derived indirectly from the travel time of the plume with distance from the stack. CERC confirmed that the vertical velocity (in m/s) could be derived from an analysis of the plume centreline height (in metres) and the plume travel time (in seconds). The vertical velocity has been calculated for every hour of the year using Casement Aerodrome 2018-2020. The results are outlined below in Figures 5 and 6 for the worst case year of 2020.

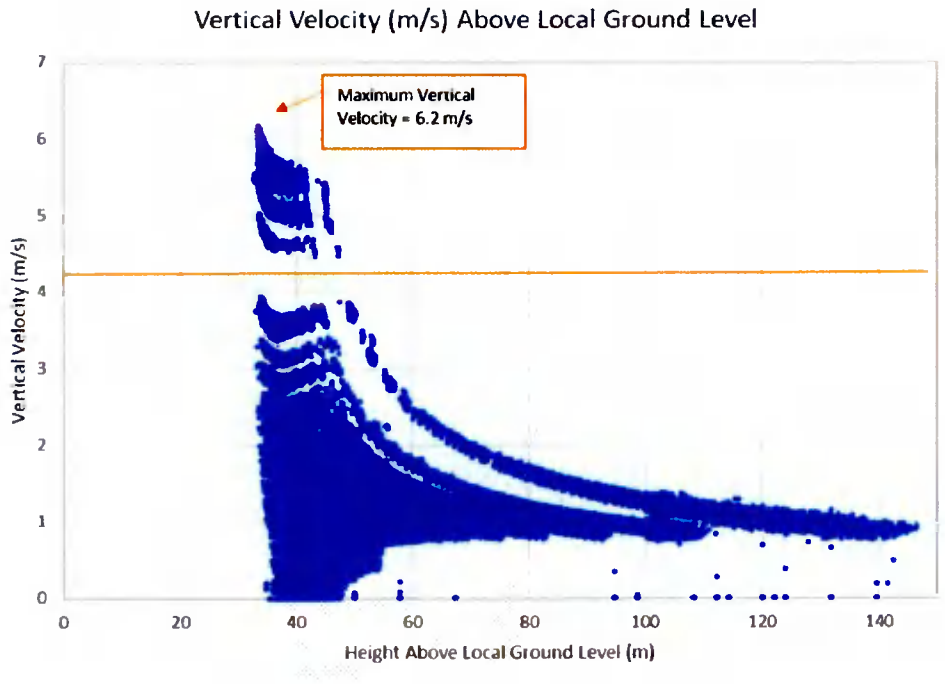

Figure 5: Vertical Velocity Of The Plume (m/s) With Distance Above Ground Level

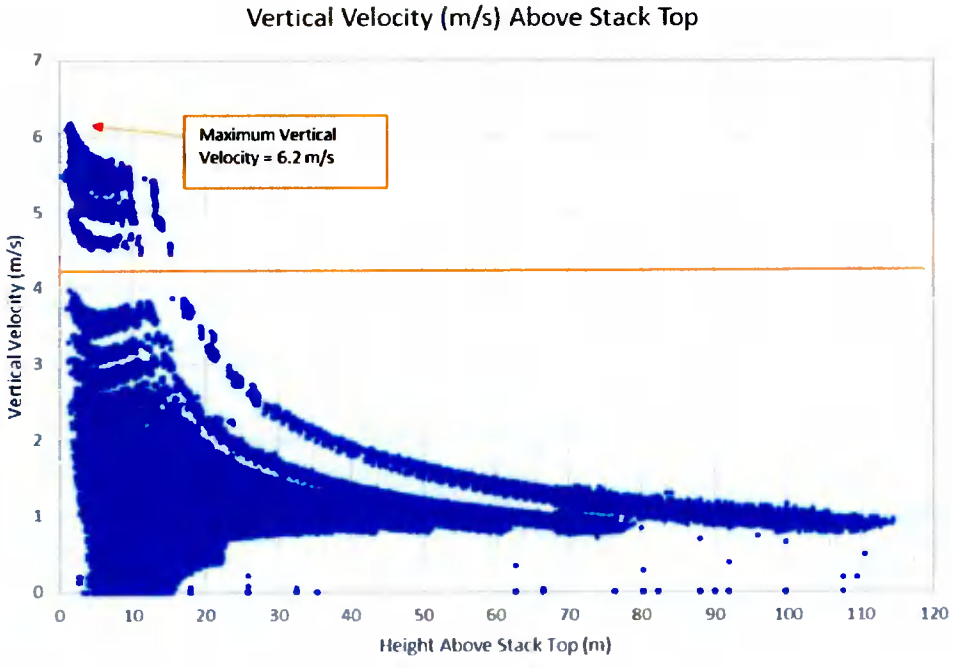

Figure 6: Vertical Velocity Of The Plume (m/s) With Distance From Stack Top

The results confirm that the velocity of the plume will be below 4.3 m/s within 15 m of the stack top (47 m above ground level) of the stack including all meteorological conditions including pressure / temperature inversions.

1.4 Summary

Thus, in summary the results of the analysis are as follows.

- **Oxygen Content** – within 9 metres of the stack top the oxygen concentration will increase above the 12% risk level for oxygen.
- **Temperature** – the temperature of the plume will drop to less than 50°C within 11 metres of the stack.
- **Vertical Velocity** – the critical vertical velocity of 4.3 m/s will not be exceeded within 15 metre from the stack top.

Thus, the maximum extent of the risk zone of the plume for each parameter is shown below based on three full years of meteorological data covering all meteorological conditions including pressure / temperature inversions:

- Risk Zone for Oxygen – 9 metres
- Risk Zone for Temperature – 11 metres
- Risk Zone for Vertical Velocity – 15 metres

APPENDIX B

Sample Correspondence — Engagement with Department of Defence & Air Corps

[Sample emails between 11th March 2021 and 2nd June 2021]

From: Mark McCarthy <mark.mccarthy@tobin.ie>
Sent: Thursday 11 March 2021 20:01
To: Defence Property Management Planning <PropertyManagementPlanning@defence.ie>; Niamh O'Connell <Niamh.OConnell@tobin.ie>
Cc: Gareth O'Flaherty (Defence) <Gareth.OFlaherty@defence.ie>; Sarah Zacharia (Defence) <Sarah.Zacharia@defence.ie>
Subject: RE: 11069 - Centrica - Profile Park Power Plant

Good evening Don,

Many thanks for your email and we are delighted to have the opportunity to engage with the Department on the issues raised in your email.

Our team is very aware of the planning policy in the County Development Plan in respect of Casement Aerodrome and indeed with the Departments requirements for an Aviation Impact Assessment. In this respect, we have engaged suitably qualified and experienced personnel to undertake this assessment. We would be delighted to have the opportunity to share the findings of our assessment with you and your colleagues when complete. We would hope that this would be in the next 4 weeks or so. Can you let me now if you would be open to reviewing and providing feedback in advance of the planning application to SDCC?

I can confirm also that this development will not include solar panels and there will be no surface water features on site.

I look forward to hearing from you.

Kind regards,

Mark McCarthy BA, MURP, MIPI

Senior Project Manager / Planner

TOBIN Consulting Engineers
Telephone: +353 (0)1 8030401

Email: mark.mccarthy@tobin.ie

Website: http://www.tobin.ie

TOBIN
CONSULTING ENGINEERS

2019 Association of Consulting Engineers of Ireland Awards Winner: Design Excellence (Structures)
2018 Engineers Ireland Excellence Awards Winner: Engineering Project of the Year
2018 Engineers Ireland Excellence Awards Winner: Heritage and Conservation
2017 Association of Consulting Engineers of Ireland Awards Winner: Design Excellence (Innovation)
2017 KPMG Property Industry Excellence Awards Winner: Community Benefit Project of the Year

From: Defence Property Management Planning <PropertyManagementPlanning@defence.ie>
Sent: 12 March 2021 15:01
To: Mark McCarthy <mark.mccarthy@tobin.ie>
Cc: Gareth O'Flaherty (Defence) <Gareth.OFlaherty@defence.ie>; Sarah Zacharia (Defence) <Sarah.Zacharia@defence.ie>
Subject: RE: 11069 - Centrica - Profile Park Power Plant

Good afternoon Mark,

Yes, when complete, please forward the Aviation Impact Assessment on potential emissions.

We can review and revert with feedback, if required.

Best regards

Don

Don Watchorn

Property Management Branch

An Roinn Cosanta

Department of Defence

Bóthar an Stáisiúin, An Droichead Nua, Contae Chill Dara, W12 AD93.

Station Road, Newbridge, Co.Kildare, W12 AD93.

T +353 (0)45 492199

E-mail don.watchorn@defence.ie

From: O'Dwyer & Jones - Aviation Planning <admin@aviationplanning.ie>
Sent: 25 May 2021 16:40
To: 'Gareth O'Flaherty (Defence)' <Gareth.OFlaherty@defence.ie>; 'john.hughes@iaa.ie' <john.hughes@iaa.ie>
Cc: 'Mark McCarthy' <mark.mccarthy@tobin.ie>
Subject: Power Plant at Profile Park Dublin 22

O'DWYER & JONES DESIGN PARTNERSHIP
AVIATION PLANNING CONSULTANTS, 28 LEESON PARK, DUBLIN 6, D06E338, IRELAND
TEL: 00-353-1-4981893, EMAIL: ADMIN@AVIATIONPLANNING.IE OR DESIGNPARTNERS@IOL.IE
WEB: WWW.AVIATIONPLANNING.IE

FROM: J. DECLAN O'DWYER B.ARCH MBA RIBA
TO: GARETH O'FLAHERTY, PROPERTY MANAGEMENT BRANCH, DEPARTMENT OF DEFENCE
COPY: JOHN HUGHES, MANAGER AERODROMES SAFETY REGULATION DIVISION. I.A.A.

Hi Gareth,

Attached is an "Advance Copy" of our Aviation Report re an upcoming natural-gas-fired **Power Plant at Profile Park, Dublin 22** (near the Google building, to the north of Casement). It is intended to suit the power needs of data centres in its vicinity, and is due to be submitted to South Dublin for planning permission in the near future.
I would be grateful if you could forward a copy of this report to the Air Corps, for their information and any comment.

For your information, this particular power plant has been the subject of earlier correspondence between Don Watchorn and Mark McCarthy (and Niamh O'Connell) of Tobin Consulting Engineers, most recently an email from Don to Mark of 12th March '21 (15:01), [and if you need dates of other previous correspondence, please let me know].

The plant is on a low-lying site (about 12m below Casement's 86.6m datum) so its highest point (its exhaust stacks) lies 25m below Casement's Inner Horizontal Surface, and also just below Casement's "Inner Zone". We have advised that its highest point should not be higher than 106.6m OD (to suit the Department of Defence's requirements). The site is not under any Approach Surface or Transitional Surface, and there will be no solar/PV panels or bird-attracting landscape elements.

In addition to the usual items (cranes, ICAO surfaces, etc.) this report addresses plant emissions, and includes in its appendix relevant pages extracted from the project's Environmental Impact Assessment Report, which deal with the various aviation considerations (assessed in accordance with FAA guidance): oxygen content, temperature, vertical velocity etc.

If you have any queries, or would like a high-resolution copy of this report, please let me know.

We are also sending an 'advance copy' of this report to John Hughes at the Irish Aviation Authority.

With very best wishes,

Declan

J. Declan O'Dwyer B.Arch MBA RIBA
O'Dwyer & Jones Design Partnership
Aviation Planning Consultants, Dublin

From: Gareth O'Flaherty (Defence) <Gareth.OFlaherty@defence.ie>
Sent: 02 June 2021 15:28
To: O'Dwyer & Jones - Aviation Planning <admin@aviationplanning.ie>
Cc: Sarah Zacharia (Defence) <Sarah.Zacharia@defence.ie>; Don Watchorn (Defence) <Don.Watchorn@defence.ie>
Subject: RE: Power Plant at Profile Park Dublin 22

Hi Declan,

Please see following views from colleagues in the Air Corps:

1. Given the proximity to Casement Aerodrome, operation of cranes should be coordinated with Air Corps Air Traffic Services, no later than 28 days before use, contactable at airspaceandobstacles@defenceforces.ie or 01-4037681
2. Due the proximity to Casement Aerodrome and site location within EIR23 airspace, should negative impacts to Air Corps flight operations occur from flue emissions or otherwise, the owners shall take immediate actions to mitigate such impacts to an acceptable level.
3. Due to the proximity to Casement Aerodrome, the developer should implement adequate bird control measures during the construction phase to mitigate the effects of birds on Air Corps flight operations.

Can you keep the Department updated on this proposal, including notification when an application is lodged, please?

Kind regards,

Gareth.

Gareth O'Flaherty

Higher Executive Officer – Property Management Branch

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An Roinn Cosanta

Department of Defence

Bóthar an Stáisiúin, An Droichead Nua, Contae Chill Dara, W12 AD93.

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——

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gareth.oflaherty@defence.ie

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From: O'Dwyer & Jones - Aviation Planning <admin@aviationplanning.ie>
Sent: 02 June 2021 16:10
To: 'Gareth O'Flaherty (Defence)' <Gareth.OFlaherty@defence.ie>
Subject: RE: Power Plant at Profile Park Dublin 22

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TEL: 00-353-1-4981893, EMAIL: ADMIN@AVIATIONPLANNING.IE OR DESIGNPARTNERS@IOL.IE
WEB: WWW.AVIATIONPLANNING.IE
FROM: J. DECLAN O'DWYER B.ARCH MBA RIBA
TO: GARETH O'FLAHERTY, PROPERTY MANAGEMENT BRANCH, DEPARTMENT OF DEFENCE

Dear Gareth,

Thank you very much for your email, and for getting back to me so quickly.

I will pass on all the Air Corps's views on this proposed power plant to the client, and to Tobin Engineers, and I will stress the importance of complying with each of the three items.

I will also let you know when the project is being submitted for permission to South Dublin (which currently is planned to be done later this month).

Very best wishes, and thanks,

Declan

www.tobin.ie

TOBIN Consulting Engineers

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