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TRAFFIC AND PARKING IMPACTS REPORT
FOR A DEVELOPMENT APPLICATION
FOR THE EXPANSION OF THE PITTWATER HOUSE SCHOOL
AT NO. 70 SOUTH CREEK ROAD, COLLAROY NSW 2097

Property address	70 South Creek Road, Collaroy NSW 2097
Client	Neeson Murcutt Architects Pty Ltd
Prepared by	O. Sannikov, MEngSc (Traffic Engineering), MIEAust, PEng, FAITPM
Date	30/10/2019
Job No.	19051
Report No.	19051 Rep 01

Item	Report
Site location	• Refer to **Figure 1** overleaf.
Existing land use	• The Pittwater House School
Proposed redevelopment	• Redevelopment of the Pittwater House School ◦ New two (2) storey building (student learning resource) ◦ Demolish one (1) part of the M-block building and refurbish ◦ Construction of one (1) new parking areas and a children/student drop-off and pick-up area, plus renovation to one existing car parking area • Students and staff ◦ It is not proposed to increase the numbers of students and staff as part of the proposed redevelopment in the short to medium term. In the next 3-5 years the proposal is aimed only to improve the quality of student and staff accommodation and ancillary facilities. ▪ In the long term, by 2030, student numbers may increase from 854 (currently) to 1091 (by 28%). The additional students numbers will be fully accommodated in the proposed facilities. • Car parking areas ◦ There are 5 car/bus parking areas on site ▪ Main car park and children drop-off/pick-up on the southern side of the site (access off South Creek Road) • Existing – 50 car parking spaces for staff and Early Learning Centre (ELC) ◦ The existing car park is also used for student drop-off and pick-up, with 6 parallel spaces allocated for this purpose. The existing arrangement is far from ideal. The drop-off/pick-up area does not allow for internal queuing of vehicles and queues extending into the street interfere with the operation of the intersection of South Creek Road and Parkes Road. • Proposed – 49 car parking spaces ◦ 31 spaces for staff ◦ 17 spaces for ELC

Item	Report
	◦ one (1) space for people with disabilities for ELC and staff • A new substantially improved separate drop-off and pick-up area is also proposed to the east of the car park, with its own entry/exit driveway. ▪ Staff car park on the northern side (access off Westmoreland Avenue) • Existing – 10 car parking spaces • Proposed – no change ▪ Service zone (access off Westmoreland Avenue) • Existing – No parking spaces (only garbage bins) • Proposed – 4 bus parking spaces and delivery zone ▪ Service car park on the western side (access off Parkes Road) • Existing – 8 car parking spaces • Proposed – no change ▪ Mini-bus parking area on the southern side (access off South Creek Road) • Existing – 4 bus parking spaces • Proposed – 34 additional car parking spaces for staff ◦ Including 12 spaces for small cars ▪ **Overall staff parking**: • Existing – 53 car parking spaces • Proposed – 83 car parking spaces ◦ Including 12 spaces for small cars • 30 additional spaces have been proposed. ▪ **Overall ELC parking:** • Existing – 15 car parking spaces • Proposed – 17 car parking spaces • Two (2) additional spaces have been proposed. ▪ **Shared staff and ELC parking**: • Existing - one (1) space for people with disabilities • Proposed - one (1) space for people with disabilities

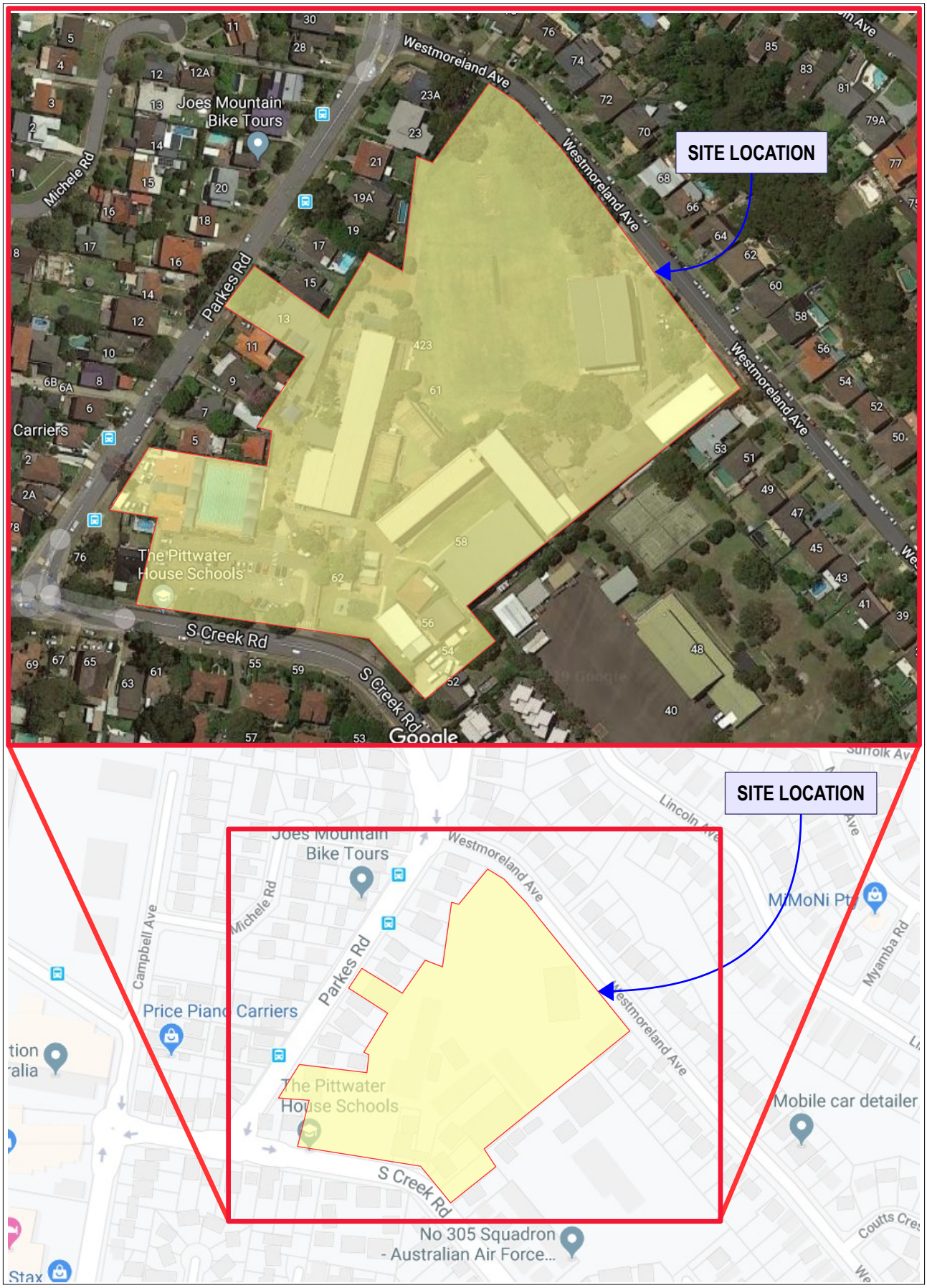


Figure 1. Site location.

Item	Report
	Existing traffic and parking situation
Street characteristics	• Refer to **Figure 2.** • The key roads surrounding the proposed development are described below. ◦ Westmoreland Avenue ▪ Local road ▪ 2 travel lanes and parking opportunities on both sides Parkes Road ▪ Local collector road ▪ 2 travel lanes and parking opportunities on both sides ◦ South Creek Road ▪ Local collector road ▪ 2 travel lanes and parking opportunities on both sides ◦ Campbell Avenue ▪ Local road ▪ 2 travel lanes and parking opportunities on western side ◦ Other streets in the surrounding area are local/local collector roads. Street conditions are typical for a low density residential area, with low to moderate traffic volumes. ▪ General speed limit is 50 km/h on local streets around the site.
	Public Transport
Bus	• There are four (4) bus stops for public buses within walking distance, approximately 100, 150, 200 and 250 metres from the site location. Refer to **Figure 3.** ◦ Bus route 158 ▪ PrePay-Only – Manly to Collaroy Plateau via Cromer • 1 service operates during the morning and afternoon peak. ◦ Bus route 180 ▪ PrePay-Only – City Wynyard to Collaroy Plateau • 8 services operate during the morning peak. • No services operate during the afternoon peak. ▪ PrePay-Only – Collaroy Plateau to City Wynyard • 1 service operates during the morning peak. • 6 services operate during the afternoon peak. ◦ Bus route E80 ▪ PrePay-Only – City Wynyard to Collaroy Plateau (Express Service) • No services operate during the morning peak. • 11 services operate during the afternoon peak. ▪ PrePay-Only – Collaroy Plateau to City Wynyard (Express Service) • 10 services operate during the morning peak. • No services operate during the afternoon peak. ▪ The morning peak was considered to be between 6:30 a.m. and 9:30 a.m. and the afternoon peak was considered to be between 3:30 p.m. and 6:30 p.m. • In addition to the general public bus services, there are numerous school bus services with stops near the school on South Creek Road (routes 600n, 601n, 606n, 626n, 637n, 649n, 663n, 673n, 676n, 690n, 696n, 704n, 774n, 781n, 785n, 789n). • Pittwater House School also offers private bus delivery and pick-up services for students, on the school (southern) side of Westmoreland Avenue near the school entrance.

Figure 2. Street characteristics.

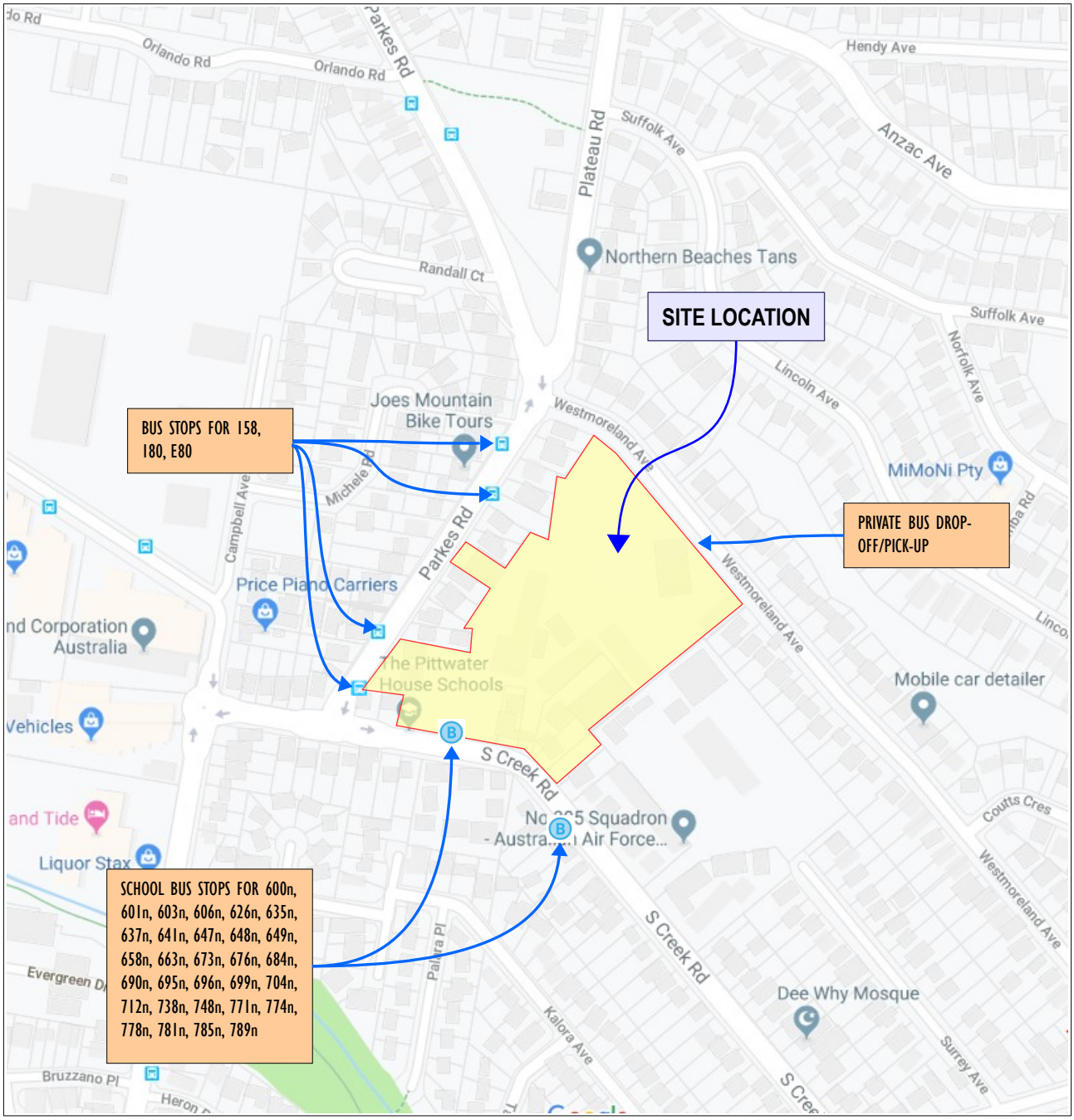


Figure 3. Public transport.

Item	Report
	Surveys and survey results
Parking survey	• A parking demand survey was conducted on Tuesday 11th of June (afternoon) and Wednesday 12 of June 2019 (morning) during the typical periods of children drop-off and pick-up.
	◦ The morning survey was between 6:30 a.m. and 10:30 a.m.
	◦ The afternoon survey was between 2:00 p.m. and 6:00 p.m.
	• Refer to **Figures 4a** and **4b** for survey locations
	◦ Areas in red represent a walking distance of up to 150 metres from the site location
	◦ Areas in blue represent a walking distance within 250 metres from the site location
Survey results	• Refer to **Tables 1a** and **1b** for survey results.
	• Areas CP1 – CP4 (existing school car parks).
	◦ The morning peak occurred between 8:15 a.m. and 8:45 a.m.
	◦ The afternoon peak occurred at 2:45 p.m.
	◦ The survey results indicated that there were at least 16 spaces vacant throughout the day (but generally in the order of 30) in the survey areas during the school times
	◦ It is evident from the survey results at CP2 (main staff and ELC car park, where student drop-offs and pick-ups occur currently), that the car parking demand generated by the school and ELC staff is in the order of 26-30 cars.
	▪ Additional parking demand is generated by parents delivering and collecting students between 8:15 and 9:15 a.m. and 2:45 and 3:45 p.m., to the order of 36 and 45 vehicles respectively.
	• Areas 1a-5b (on-street parking within 150 metres walking distance).
	◦ The morning peak occurred at 8:15 a.m. and 8:45 a.m.
	◦ The afternoon peak occurred at 3:15 p.m.
	◦ The survey results indicated that there were at least 28 spaces vacant throughout the day (to a maximum of 100) in the survey area during the school times
	• Areas 6-8 (on-street parking between 150 to 250 metres walking distance).
	◦ The morning peak occurred at 10:30 a.m.
	◦ The afternoon peak occurred between 3:00 p.m. and 3:30 p.m.
	◦ The survey results indicated that there were at least 26 spaces vacant throughout the day (to a maximum of 50) in the survey area during the school times
	◦ There are ample parking opportunities within walking distance from the site.

Figure 4a. Parking demand survey locations (Pittwater House School car parks).

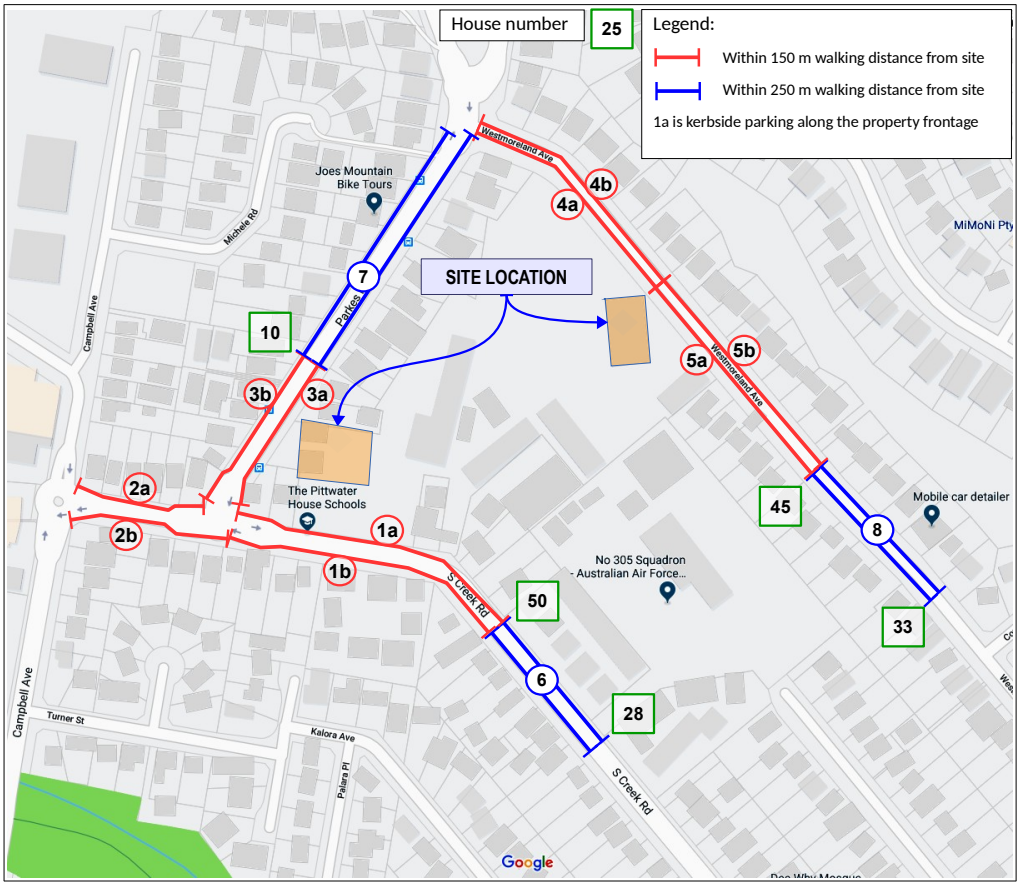


Figure 4b. Parking demand survey locations (on-street parking).

Table 1a. Parking demand survey results.

Wednesday	Number of parked cars																				
12/06/19	Parking Location																	Total			
Time	CP1	CP2	CP3	CP4	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6	7	8	CP1-CP4	1a-5b	6-8	All
6:30	1	6	6	3	14	8	4	4	6	3	17	13	10	13	8	11	22	16	92	41	149
6:45	1	6	6	3	14	8	4	4	6	3	17	13	10	13	8	11	22	16	92	41	149
7:00	1	6	6	3	14	8	4	4	6	3	17	13	10	13	8	11	22	16	92	41	149
7:15	1	6	6	3	14	8	4	4	6	3	17	13	10	13	8	11	22	16	92	41	149
7:30	1	7	6	3	14	8	4	4	6	3	17	13	10	13	8	11	22	17	92	41	150
7:45	1	17	6	5	14	8	5	5	6	5	17	13	10	13	8	11	22	29	96	41	166
8:00	1	17	6	5	14	8	5	5	6	5	17	13	10	13	8	11	22	29	96	41	166
8:15	3	36	8	7	14	8	5	5	6	5	17	13	11	16	8	11	22	54	100	41	195
8:30	3	36	8	7	14	8	5	5	6	5	16	13	11	16	8	11	22	54	99	41	194
8:45	3	36	8	7	14	8	5	5	6	5	17	13	11	16	8	11	22	54	100	41	195
9:00	2	33	8	6	13	8	5	5	4	5	17	12	11	14	8	11	22	49	94	41	184
9:15	4	33	8	7	13	8	6	5	4	5	17	12	11	14	8	11	22	52	95	41	188
9:30	4	25	8	7	12	7	6	5	1	3	17	12	11	14	8	10	22	44	88	40	172
10:00	3	26	8	7	12	7	4	6	2	3	16	11	12	14	8	10	22	44	87	40	171
10:30	2	30	8	7	12	8	4	6	3	4	16	11	12	14	10	10	22	47	90	42	179
No of spaces	**4**	**50**	**8**	**10**	**16**	**13**	**6**	**7**	**9**	**8**	**18**	**18**	**16**	**19**	**12**	**35**	**21**	**72**	**130**	**68**	**270**

Wednesday	Number of vacant parking spaces																				
12/06/19	Parking Location																	Total			
Time	CP1	CP2	CP3	CP4	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6	7	8	CP1-CP4	1a-5b	6-8	All
6:30	3	44	2	7	2	5	2	3	3	5	1	5	6	6	4	24	-1	56	38	27	121
6:45	3	44	2	7	2	5	2	3	3	5	1	5	6	6	4	24	-1	56	38	27	121
7:00	3	44	2	7	2	5	2	3	3	5	1	5	6	6	4	24	-1	56	38	27	121
7:15	3	44	2	7	2	5	2	3	3	5	1	5	6	6	4	24	-1	56	38	27	121
7:30	3	43	2	7	2	5	2	3	3	5	1	5	6	6	4	24	-1	55	38	27	120
7:45	3	33	2	5	2	5	1	2	3	3	1	5	6	6	4	24	-1	43	34	27	104
8:00	3	33	2	5	2	5	1	2	3	3	1	5	6	6	4	24	-1	43	34	27	104
8:15	1	14	0	3	2	5	1	2	3	3	1	5	5	3	4	24	-1	18	30	27	75
8:30	1	14	0	3	2	5	1	2	3	3	2	5	5	3	4	24	-1	18	31	27	76
8:45	1	14	0	3	2	5	1	2	3	3	1	5	5	3	4	24	-1	18	30	27	75
9:00	2	17	0	4	3	5	1	2	5	3	1	6	5	5	4	24	-1	23	36	27	86
9:15	0	17	0	3	3	5	0	2	5	3	1	6	5	5	4	24	-1	20	35	27	82
9:30	0	25	0	3	4	6	0	2	8	5	1	6	5	5	4	25	-1	28	42	28	98
10:00	1	24	0	3	4	6	2	1	7	5	2	7	4	5	4	25	-1	28	43	28	99
10:30	2	20	0	3	4	5	2	1	6	4	2	7	4	5	2	25	-1	25	40	26	91

Note: negative numbers indicate illegally parked cars

Table 1b. Parking demand survey results (continued).

Tuesday	Number of parked cars																			
11/06/19	Parking Location																Total			
Time	CP1	CP2	CP3	CP4	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6	7	8	CP1-CP4	1a-5b	6-8	All
14:00	2	27	5	6	14	5	5	6	6	4	13	9	13	13	7	10	6	40	88	23	151
14:15	2	28	5	6	14	5	5	6	6	4	15	9	13	13	7	12	6	41	90	25	156
14:30	2	28	5	6	14	5	5	5	5	4	15	9	13	13	7	12	6	41	88	25	154
14:45	2	43	5	6	14	5	5	5	5	4	15	12	13	13	10	12	6	56	91	28	175
15:00	1	43	5	6	13	5	5	5	7	6	14	12	10	12	10	13	6	55	89	29	173
15:15	1	43	5	6	13	5	5	5	7	6	17	16	16	12	10	13	6	55	102	29	186
15:30	1	33	3	6	7	4	4	5	7	6	17	16	16	12	10	13	6	43	94	29	166
15:45	1	33	3	4	7	4	3	5	7	4	6	7	16	12	10	8	6	41	71	24	136
16:00	1	22	3	4	6	4	2	5	6	3	6	7	3	6	7	8	6	30	48	21	99
16:15	4	18	3	3	6	4	4	5	6	4	3	5	3	6	7	8	7	28	46	22	96
16:30	4	15	3	3	5	4	4	5	3	4	1	3	3	5	7	7	7	25	37	21	83
16:45	3	17	3	3	5	4	4	5	3	4	1	4	3	6	7	7	7	26	39	21	86
17:00	4	17	3	1	4	2	2	5	2	2	0	4	3	6	6	6	7	25	30	19	74
17:15	4	8	3	1	4	5	5	6	2	2	0	4	4	6	6	5	7	16	38	18	72
17:30	5	8	3	1	4	5	5	6	1	3	0	4	4	6	6	5	7	17	38	18	73
17:45	5	5	3	0	4	5	4	6	2	3	0	4	4	4	7	6	7	13	36	20	69
18:00	5	4	3	5	4	5	4	6	2	3	0	4	3	6	7	6	6	17	37	19	73
No of spaces	**4**	**50**	**8**	**10**	**16**	**13**	**6**	**7**	**9**	**8**	**18**	**18**	**16**	**19**	**12**	**35**	**21**	**72**	**130**	**68**	**270**

Tuesday	Number of vacant parking spaces																			
11/06/19	Parking Location																Total			
Time	CP1	CP2	CP3	CP4	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6	7	8	CP1-CP4	1a-5b	6-8	All
14:00	2	23	3	4	2	8	1	1	3	4	5	9	3	6	5	25	15	32	42	45	119
14:15	2	22	3	4	2	8	1	1	3	4	3	9	3	6	5	23	15	31	40	43	114
14:30	2	22	3	4	2	8	1	2	4	4	3	9	3	6	5	23	15	31	42	43	116
14:45	2	7	3	4	2	8	1	2	4	4	3	6	3	6	2	23	15	16	39	40	95
15:00	3	7	3	4	3	8	1	2	2	2	4	6	6	7	2	22	15	17	41	39	97
15:15	3	7	3	4	3	8	1	2	2	2	1	2	0	7	2	22	15	17	28	39	84
15:30	3	17	5	4	9	9	2	2	2	2	1	2	0	7	2	22	15	29	36	39	104
15:45	3	17	5	6	9	9	3	2	2	4	12	11	0	7	2	27	15	31	59	44	134
16:00	3	28	5	6	10	9	4	2	3	5	12	11	13	13	5	27	15	42	82	47	171
16:15	0	32	5	7	10	9	2	2	3	4	15	13	13	13	5	27	14	44	84	46	174
16:30	0	35	5	7	11	9	2	2	6	4	17	15	13	14	5	28	14	47	93	47	187
16:45	1	33	5	7	11	9	2	2	6	4	17	14	13	13	5	28	14	46	91	47	184
17:00	0	33	5	9	12	11	4	2	7	6	18	14	13	13	6	29	14	47	100	49	196
17:15	0	42	5	9	12	8	1	1	7	6	18	14	12	13	6	30	14	56	92	50	198
17:30	-1	42	5	9	12	8	1	1	8	5	18	14	12	13	6	30	14	55	92	50	197
17:45	-1	45	5	10	12	8	2	1	7	5	18	14	12	15	5	29	14	59	94	48	201
18:00	-1	46	5	5	12	8	2	1	7	5	18	14	13	13	5	29	15	55	93	49	197

Note: negative numbers indicate illegally parked cars

Item	Report	
	Traffic counts	
Intersection traffic volume counts	Location / type of control	Campbell Avenue / South Creek Road (roundabout)
		South Creek Road / Parkes Road (roundabout)
		Parkes Road / Westmoreland Avenue (T-intersection with "Stop" sign control and with a roundabout controlled intersection of Parkes Road/Plateau Road immediately to the north)
		South Creek Road / Pittwater House School entry driveway
		South Creek Road / Pittwater House School exit driveway
	Date / Day of the week	Friday 14th of June 2019 (AM and PM).
	Time period (AM)	06:00 to 10:45; the morning peak hour occurred at 07:30– 08:30
	Time period (PM)	13:30 to 18:30; the afternoon peak hour occurred at 15:00 – 16:00
	• Refer to **Figures 5a** and 5**b.**	

Intersection operation

- Observations at the two roundabouts listed above indicated good operation with low to moderate delays during peak hours, except for short 15-30 minute periods of school drop-offs and pick-ups (particularly in the afternoon) when queuing from the school car park entry at times extended to Parkes Road around the corner and created queuing both from the northern approach as well as from the west to Campbell Avenue.
- The double intersection of Parkes Road / Westmoreland Avenue/Plateau Road operated smoothly without queuing during both peak periods.
- AIMSUN v 8.2.3 was used to model the intersection performance at South Creek Road/Parkes Road. Results of the of the AIMSUN modelling determined that:
  - Operates at a good Level of Service (LoS A) for both the morning and afternoon peak hours generally.
    - periodical queues on the northern approach due to high demand for the right-hand turn from Parker Road to the west
    - periodical queues on western and eastern approaches to the South Creek Road entry to existing school parking area
  - Refer to the RMS (RTA) definitions for LoS below:

Level of service criteria for intersections			
Level of Service	**Average Delay per Vehicle (secs/veh)**	**Traffic Signals, Roundabout**	**Give Way & Stop Signs**
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays; Roundabouts require other control mode	At capacity, requires other control mode

Source: RTA (2002) Guide to Traffic Generating Developments

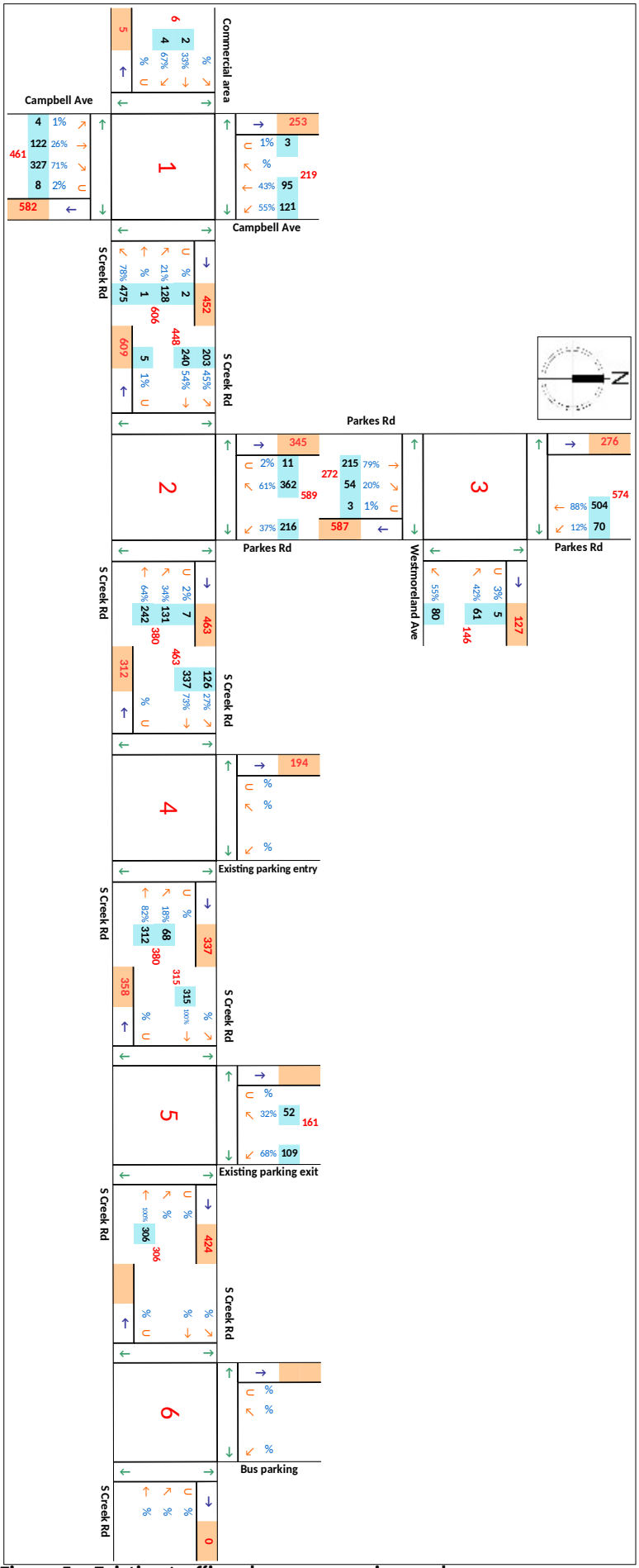


Figure 5a. Existing traffic volumes – morning peak.

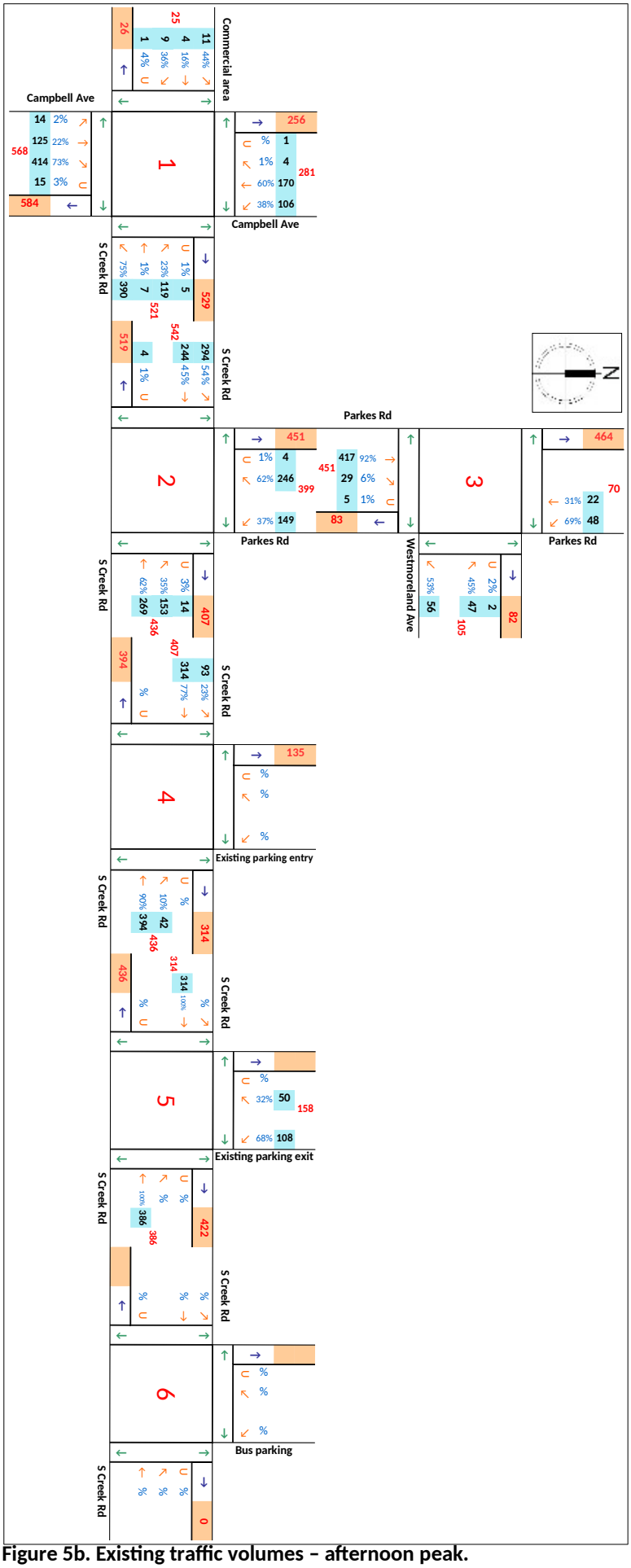


Figure 5b. Existing traffic volumes – afternoon peak.

Item	Report

Planning control document	• Northern Beaches Council
	  ◦ Warringah Development Control Plan (DCP) 2011
	  ▪ Part C – Sitting Factors
	• Guide to the State Environmental Planning Policy (SEPP Educational Establishments and Child Care Facilities 2017)

Requirement	Compliance
Part C – Sitting factors	
Section C2 – Traffic, Access and Safety	
Objectives	
To minimise:	
a) traffic hazards;	
b) vehicles queuing on public roads	
c) the number of vehicle crossings in a street;	
d) traffic, pedestrian and cyclist conflict;	
e) interference with public transport facilities; and	
f) the loss of "on street" kerbside parking.	
Vehicular Access	
1. Applicants shall demonstrate that the location of vehicular and pedestrian access meets the objectives.	The existing parking facilities have the following traffic issues (localised to the short periods of children drop-off and pick-up): • Children pick-up and drop-off delays and queuing extending to the street • Queuing and delays on South Creek Road and its intersections with Parkes Road and Campbell Avenue Due to these issues, the development proposal includes a rearrangement of the existing long-term staff car parking and student drop-off/pick-up facilities. This proposal will ensure that: • No major delays and queuing on South Creek Road will occur as this design will ensure children pick-up and drop-off internally, • Children pick-up and drop-off will be done in a more efficient manner and • There will be less congestion on South Creek Road.
2. Vehicle access is to be obtained from minor streets and lanes where available and practical.	Complies
3. There will be no direct vehicle access to properties in the B7 zone from Mona Vale Road or Forest Way.	Not applicable
4. Vehicle crossing approvals on public roads are to be in accordance with Council's Vehicle Crossing Policy (Special Crossings) LAP-PL413 and Vehicle Access to Roadside Development LAP-PL 315.	Capable of compliance at the Construction Certificate stage
5. Vehicle crossing construction and design is to be in accordance with Council's Minor works specification.	Capable of compliance at the Construction Certificate stage

Item	Report	
	Requirement	**Compliance**
	On-site loading and unloading	
	6. Facilities for the loading and unloading of service, delivery and emergency vehicles are to be: appropriate to the size and nature of the development; screened from public view; and designed so that vehicles may enter and leave in a forward direction.	Complies Refer to the **Appendix** for design checks and vehicle turning diagrams
	Section C3 – Parking Facilities	
	1. The following design principles shall be met:	
	• Garage doors and carports are to be integrated into the house design and to not dominate the façade. Parking is to be located within buildings or on site.;	Not applicable
	• Lane ways are to be used to provide rear access to car parking areas where possible;	Not applicable
	• Car parking is to be provided partly or fully underground for apartment buildings and other large scale developments;	Not applicable
	• Parking is to be located so that views of the street from front windows are not obscured; and	Complies
	• Where garages and carports face the street, ensure that the garage or carport opening does not exceed 6 metres or 50% of the building width, whichever is the lesser.	Not applicable
	2. Off street parking is to be provided within the property demonstrating that the following matters have been taken into account:	
	• the land use;	Complies
	• the hours of operation;	Complies
	• the availability of public transport;	Complies
	• the availability of alternative car parking; and	Refer to the previous section **'Survey and Survey results'** for on-street car parking opportunities. Complies
	• the need for parking facilities for courier vehicles, delivery / service vehicles and bicycles.	Complies
	3. Car parking, other than for individual dwellings, shall:	
	• Avoid the use of mechanical car stacking spaces;	Complies
	• Not be readily apparent from public spaces;	Complies
	• Provide safe and convenient pedestrian and traffic movement;	Complies
	• Include adequate provision for manoeuvring and convenient access to individual spaces;	Complies

Item	Report	
	Requirement	**Compliance**
	• Enable vehicles to enter and leave the site in a forward direction;	Complies
	• Incorporate unobstructed access to visitor parking spaces;	Complies
	• Be landscaped to shade parked vehicles, screen them from public view, assist in micro-climate management and create attractive and pleasant places;	To be addressed by others
	• Provide on site detention of storm water, where appropriate; and	To be addressed by others
	• Minimum car parking dimensions are to be in accordance with AS/NZS 2890.1.	Complies with AS/NZS 2890.1:2004
	4. Car parking is to be provided in accordance with Appendix 1 which details the rate of car parking for various land uses. Where the car parking rate is not specified in Appendix 1 or the WLEP, car parking must be adequate for the development having regard to the objectives and requirements of this clause. The rates specified in the Roads and Traffic Authority's Guide to Traffic Generating Development should be used as a guide where relevant.	As per below.

Appendix 1 Car Parking Requirements

Health and community services	
Use	**Requirement**
Educational establishment	1 space per staff member in attendance, plus as relevant, adequate pickup/setdown area on site, plus · adequate provision of bicycle racks, plus · adequate provision for student parking, plus provision of bus standing and turning area

Car parking required for staff	**Car parking proposed for staff**
The current car parking supply includes 53 spaces for staff members (excluding ELC). There are 138 staff at the school, however they are not on site all at the same time. Also, a some staff walk, use public transport or are dropped-off/picked-up and thus do not require parking. Some staff prefer to park on street. As evidenced by the results of the parking accumulation surveys, the main staff car park is underutilised. This is due to some spaces assigned to ELC (only fully utilised during peak times of children drop-off and pick-up) and also because there is need to provide sufficient room for student drop-off and pick-up activities which currently occur within the car park. For the assessment purposes, the current situation represents the base line and the additional required parking needs to cater for the additional staff only. There will be 5 additional staff members. • 5 x 1 = **5 car parking spaces**	30 additional car parking spaces for staff have been proposed. This addition complies and exceeds the DCP requirements. It will also provide 25 additional car parking spaces for the existing staff, thus providing a significant improvement compared with the current situation. Potentially, up to 25 staff cars will be removed from on-street parking.

Item	Report	
	Requirement	**Compliance**
	Existing car parking for the ELC	**Car parking proposed for the ELC**
	The current car parking provision provides adequate spaces for visitors and staff. Currently, there are **15 car parking spaces** allocated to the Early Learning Centre (ELC).	Two (2) additional car parking spaces for the ELC has been proposed. This is not necessary with regard to the DCP and RMS requirements, however this addition provides for more comfortable conditions and for potential increase in the number of children (not planned at this stage). A **separate drop-off/pick-up area** is now proposed to replace the existing arrangements where drop-offs and pick-ups occur within the staff and ELC car park. This is a substantial improvement of the current situation with congestion and safety.
	Student parking	There is no existing nor proposed car parking provision for the students. Students are discouraged from driving to/from the school.
	5. Adequate provision for staff, customer and courier parking, and parking and turning of vehicles with trailers must be provided if appropriate to the land use.	Refer to vehicle manoeuvring diagrams attached in the **'Appendix'**. Complies
	6. For bulky goods premises adequate on-site parking spaces for service/delivery vehicles at a convenient location, separated from customer parking must be provided.	Not applicable
	7. Where appropriate, car parking which meets the needs of people with physical disabilities must be provided in accordance with the relevant Australian Standard.	Complies with AS/NZS 2890.6:2009
	8. For Forest Way Village car parking at ground level is to be provided for individual units.	Not applicable
	Section C3(A) – Bicycle Parking and End of Trip Facilities	
	1. Bicycle parking facilities must be provided for new buildings and for alterations or additions to existing buildings. In the case of alterations or additions to existing buildings bicycle parking facilities are required for the additional floor area only.	The existing staff bicycle facilities are sufficient. Students are discouraged from cycling to school due to the absence of adequate bicycle paths to/from the school.
	2. Bicycle parking shall be designed and constructed in accordance with Australian Standard AS 2890.3 – Bicycle Parking Facilities.	Staff can utilise storage for bicycle parking
	3. Bicycle parking facilities shall be designed to be an integral part of the development and where visible from public places or streets, will complement the visual quality of the public domain.	Not applicable
	4. Bicycle parking shall be provided in accordance with the generation rates in the following table and is determined by adding Column 1 and Column 2 requirements and rounding up.	As per below.

MINIMUM BICYCLE PARKING REQUIREMENTS	
Land Use	Column 2 High–Low Security Level**
School	1 per 5 students over Year 4 – Protected from weather

Item	Report	
	Requirement	**Compliance**
	Bicycle spaces required	**Bicycle spaces proposed**
	The Pittwater House School development has adequate bicycle provision.	No additional bicycle spaces are proposed as the existing provision is underutilised. Students are discouraged from cycling to school due to the absence of adequate bicycle paths to/from the school.
	5. End of trip facilities must be provided for new buildings and for alterations or additions to existing buildings. In the case of alterations for additions to existing buildings end of trip facilities are required for the additional floor area only. End of trip facilities are not required or schools, wholly residential buildings or residential components of mixed use buildings.	End of trip facilities are not required for schools. Not applicable.
	6. End of trip facilities shall be provided in accordance with the following:	Not applicable.
	Guide to the SEPP Educational Establishments and Child Care Facilities 2017	
	Complying development	
	Development undertaken as complying development must not contravene any existing conditions of the most recent development consent that applies to any part of the school. This includes conditions that relate to hours of operation, noise, car parking requirements, vehicular movements, traffic generation, loading, waste management requirements, landscape areas or requirements, and staff or student numbers.	Not applicable.
	Development permitted with consent	
	Traffic issues associated with school development	
	For complying developments that will result in an additional 50 or more students at schools, the application must be accompanied by a certificate issued by the Roads and Maritime Services (RMS) certifying that any impacts on the surrounding road network as a result of the development are acceptable or will be acceptable if specified requirements are met. Schedule 1 of the EP&A Regulation 2000 has been amended to insert this requirement. the Roads and Maritime Services (RMS) first to assess whether the traffic impacts of the proposed development on the surrounding road network are acceptable or will be acceptable if specified requirements are met. This is to ensure that the traffic impacts arising from certain complying school development are assessed by the RMS prior to the lodgement of an application for a CDC, and any required measures to address traffic congestion and road safety are identified.	The normal procedure is for Council to seek TfNSW (formerly RMS) comments after the DA submission.
	The SEPP provisions also require that a proponent consult with the RMS on school development undertaken without development consent that will result in additional 50 or more students and located adjacent to a classified road. The proponent is required to take into account any matters raised by the RMS prior to determining whether to undertake the development.	Not applicable

Item	Report	
	Requirement	**Compliance**
	Development applications (including SSD applications) lodged for a new school or an enlargement of an existing school that will result in an additional 50 or more students and is on a site that has direct vehicular or pedestrian access to any road will be referred to the RMS by the consent authority for provision of technical input as part of the assessment process.	The proposed development falls into this category. The normal procedure is for Council to seek TfNSW (formerly RMS) comments after the DA submission.

Matters for assessment from Pre-DA consultation with Council

- Comment/requirement
  - Staff parking area – approximately 700mm to the eastern boundary at the southern portion of -the site - It is recommended that a minimum 900mm setback be provided along this boundary to provide an opportunity for some landscape screening for the neighbouring dwelling.
- Assessment/response
  - The proposed car parking area is limited in width due to the existing building alongthe western boundary of the proposed car park. The proposed car parking design already features minimal dimensions for complaince with AS/NZS 2890.1:2004 and further reduction is not possible without a loss of 17 car parking spaces. It is the opinion of the author of this report that benefits of provision of additional 17 staff car parking spaces outweigh a minor non-compliance with regard to landscape screening.
- Comment/requirement
  - All pick up and drop offs to be accommodated within the school with no overflow/impact onto local roads.
- Assessment/response
  - The new drop-off and pick-up area will present a very significant improvement compared with the existing situation. The existing conflict between parked staff cars and drop-off/pick-up activities and queuing spill-out to South Creek Road will be eliminated.
- Comment/requirement
  - All staff parking is to be accommodated within the site.
- Assessment/response
  - The proposed additional parking exceeds that required by DCP by 25 spaces.
- Comment/requirement
  - Provision of indented bus bays with adequate length are strongly recommended on Westmoreland Ave and ensure adequate area to pass on street.
- Assessment/response
  - At present, in the order of 6 buses in the morning and 4 buses in the afternoon peak drop-off/pick-up hours, for about 40 minutes in each peak (not all at the same time). About 50% of these buses are medium size (21-23 seaters). Traffic volumes on Westmoreland Ave are in the order of 330 veh/h and 130 veh/h in the morning and in the afternoon peak hours respectively. This level of traffic is sufficiently low to enable opposing vehicles to pass without delays or queuing. Vehicles on the school side, when overtaking standing buses, travel with their far side wheels on the centre line, still leaving enough room for the opposing flow.

- In this context, considering the situation occurs only for less than an hour in the morning and in the afternoon on school days only, a significant cost of street widening is difficult to justify. The school will consider improved arrangements for buses for the future stages of redevelopment.

- Comment/requirement
  - Provision of safe pedestrian crossing opportunities as the existing pedestrian crossing may be affected by vehicle movement in and out of the two proposed driveways.
- Assessment/response
  - A kerb extension island at the existing pedestrian zebra crossing only mildly affects movements into the existing car park, which slightly overlap with the exiting movements (refer to a drawing (Sheet 02) included in the Appendix. This is considered to be acceptable given that the car park is purely for staff members with all movements in in the morning and out in the afternoon. However, if required, the zebra crossing can be relocated by 2.0 m to the west (refer to Sheet 03).
- Comment/requirement
  - Separated vehicular entry and exit for the pick-up and drop off parking loop area. As part of this proposal, the existing school bus zone on the northern side of South Creek Road near the existing staff/ELC/drop-off car park / future staff/ELC only car park, is proposed to be relocated to the east of the zebra crossing (refer to Sheets 05, 06 and 07 in the Appendix).
- Assessment/response
  - The site constraints do not allow for this, however the proposed design complies with AS/NZS 2890.1:2004, has been checked using B99 vehicles for manoeuvring requirements and considered adequate.
- Comment/requirement
  - Provision of a Traffic and Parking Management Plan addressing the management of the schools activities, prepared in consultation with the community.
- Assessment/response
  - This requirement is outside of the normal requirements for the Development Application submission. The Plan can be developed if required as a response to Development Approval conditions.

Item	Report
	Traffic impacts
Traffic generation	• **Base traffic generation rates** ◦ Based on TEF surveys completed near the site • **Traffic generated by the proposed development** ◦ Children ▪ There will be an increase in student numbers by approximately 28% (854 to 1091 students). A rounded up increase by 30% was adopted for the modelling purposes. • In order to accommodate the future students, the proposal includes additional spaces for the ELC visitors and a separate pick-up and drop-off area. ◦ Staff ▪ There will be 5 additional staff members in the school. • Staff members generally arrive before and leave after the peak children arrival and departure times.
Impacts of the proposed access	• The operation of the new proposed drop-off/pick-up area and the nearest intersection of South Creek Road / Parkes Road was modelled using Aimsun micro-simulation software.. • **Model description** ◦ **Geometry and movements** ▪ The current design for children pick-up and drop-off within the staff/ELC car park has the following issues: • Children pick-ups and drop-off delays and queuing extending to the street • Queuing and delays on South Creek Road and on Parkes Road during the peak periods of drop-offs and pick-ups ▪ The proposed arrangement addresses the above issues by separating the children drop-off and pick-up area from the car park. • The proposed arrangement is based on that implemented at Cranbrook School, which operates very successfully. ◦ Similarly to the Cranbrook School's arrangement, the proposed design features a long internal queuing aisle with a turning area at the end. ◦ Parents are given designated times to drop off and to pick up their children. ◦ Cars picking up children are directed to designated bays in batches of six (by the number of parking bays). A traffic warden is present at the front of the vehicular queue. Each driver is required to display student's surname in large font on the back of the vehicle sun visor (visible to the traffic warden). The traffic warden thus can direct respective students to the specific parking bays where their vehicles will stop to pick up. This arrangement is very efficient. ◦ Staff parking and children pick-up and drop-off ares are separated. ▪ Access driveway options • A number of access and internal arrangement options have been modelled and assessed. Two options were chosen as the final proposed arrangement (Options labelled 3A and 4A). • Option 3A – left in / left out / right in • Option 4A – left in / left out only ▪ Vehicular speeds • Adopted from measured speeds of vehicles at the Cranbrook School's drop-off zone ▪ Dwell times for drop-off and pick-up • Morning peak - from measured dwell times at the Pittwater School drop-off / pick-up area

Item	Report
	• Afternoon peak - from measured dwell times at the Cranbrook School drop-off area (expected to be more similar to the Cranbrook School due to changed procedure)
	• **Modelled time periods** ◦ As per the existing commuter peak hours are: ▪ Morning peak hour: 7:30 to 8:30 ▪ Afternoon peak hour: 15:00 to 16:00
	• **Trip generation and distribution** ◦ Additional trips were estimated as Trip distribution was completed by adding 30% of additional traffic onto the road network. Please refer to the **'Traffic Counts'** section in this report. ▪ Refer to **Figures 6a** and **6b.**
	• **Modelling results** ◦ The AIMSUN modelling results are as follows: ▪ Traffic movements into and out of the drop-off/pick-up area will be fully accommodated on site, with may be an occasional vehicle or two in a moving queue on the kerbside lane (which will have no stopping restrictions and thus through traffic flows will not be affected). ▪ Both traffic management options [left in / left out] and [left in / left out /right in] work. ▪ In 2030, with the assumed general traffic growth, for Option 4A (left in / left out only), additional school vehicles making a U-turn may add to delays and queuing on the northern approach to the Parkes Road roundabout. This is, however, subject to a reassessment using more accurate data closer to 2030 and possible need to upgrade the roundabout regardless of the school development. ▪ Videos of micro-simulation runs can be downloaded for viewing using the following web links • https://www.dropbox.com/s/by41izxh8o78l4h/19051%20Aimsun%20model%203A%202030%201h%20AM%20Peak%205x%20speed%20y2030.mp4?dl=0 • https://www.dropbox.com/s/g68jjojldzug5ks/19051%20Aimsun%20model%203A%202030%201h%20PM%20Peak%205x%20speed%20y2030.mp4?dl=0 • https://www.dropbox.com/s/ejleym2sq2y15an/19051%20Aimsun%20model%204A%202030%201h%20AM%20Peak%205x%20speed%20y2030.mp4?dl=0 • https://www.dropbox.com/s/ppjubffoqu2xjdw/19051%20Aimsun%20model%204A%202030%201h%20PM%20Peak%205x%20speed%20y2030.mp4?dl=0
Conclusion	• The results of the modelling necessitate the following conclusions and recommendations: ▪ There will be no major delays and queuing on South Creek Road as this design will control children pick-up and drop-off internally, ▪ As there will be no congestion on South Creek Road, the Parkes Rd roundabout is likely to experience less delays and queuing, at least in the short term.

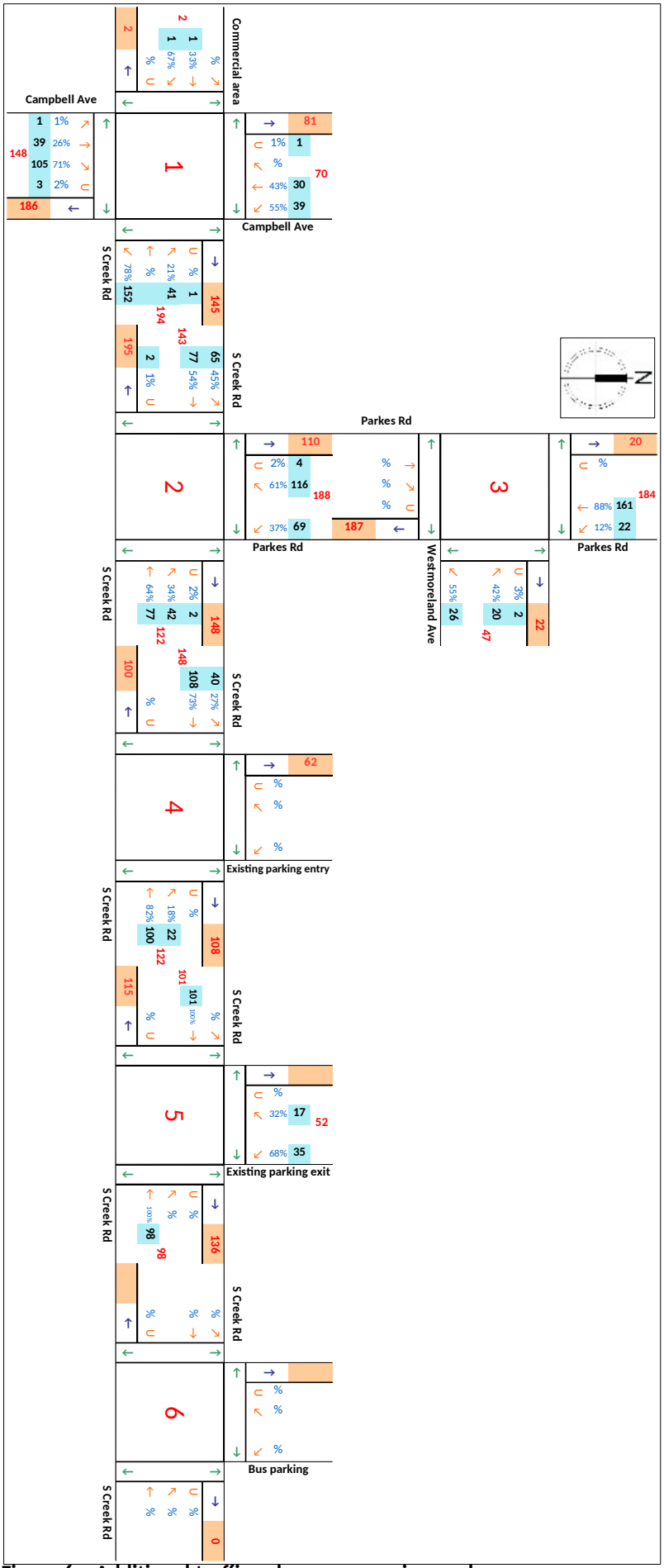


Figure 6a. Additional traffic volumes – morning peak.

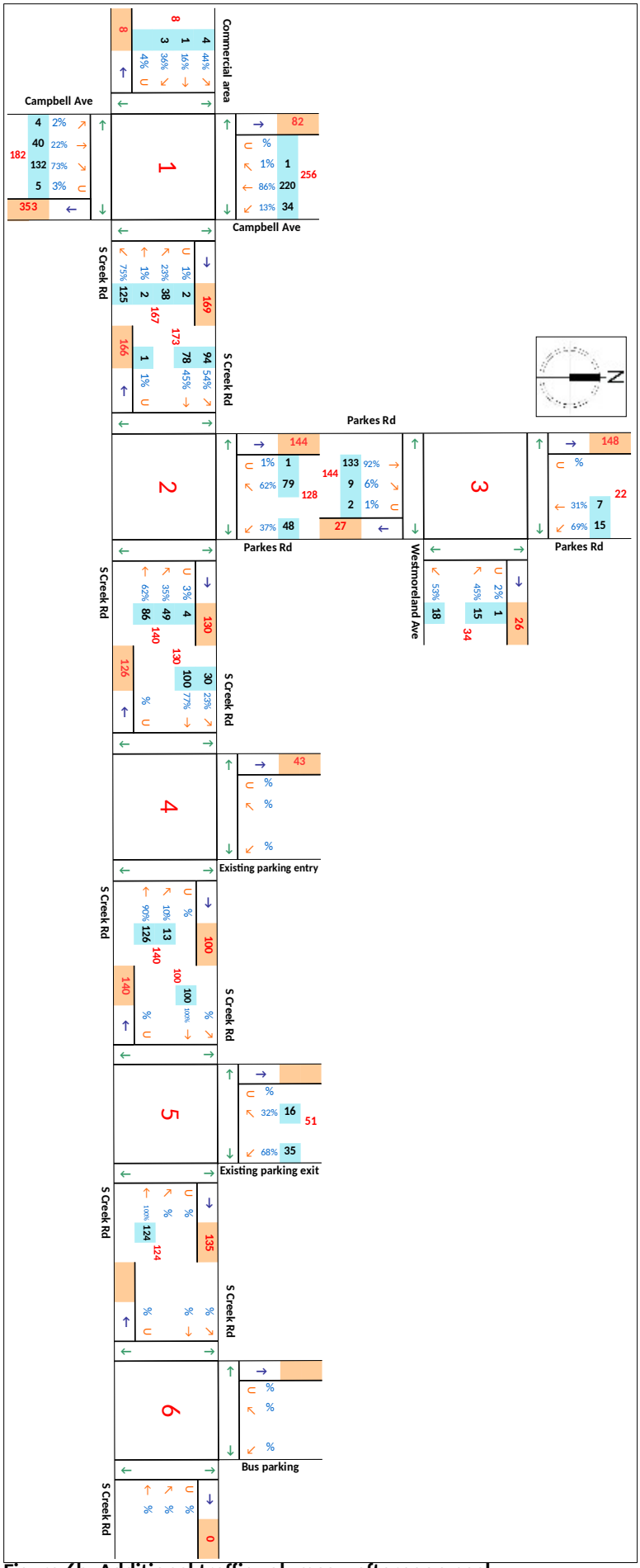
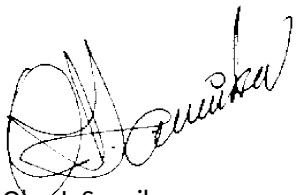


Figure 6b. Additional traffic volumes – afternoon peak.

Conclusions	• Proposed parking provision ◦ Complies with and exceeds the Council's Development Control Plan requirements
	• Traffic impacts ◦ The drop-off/pick-up activities will be fully contained within the school site and will cease to affect the operation of the nearest roundabout ◦ The additional traffic from the proposed development will have no detrimental impacts on the street network operation.
	• Design of access, car parking and servicing facilities ◦ Sufficiently complies with the relevant Standards
	• The proposed development is supportable on traffic and parking grounds.



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MEngSc (Traffic Engineering)
MIEAust, PEng
FAITPM

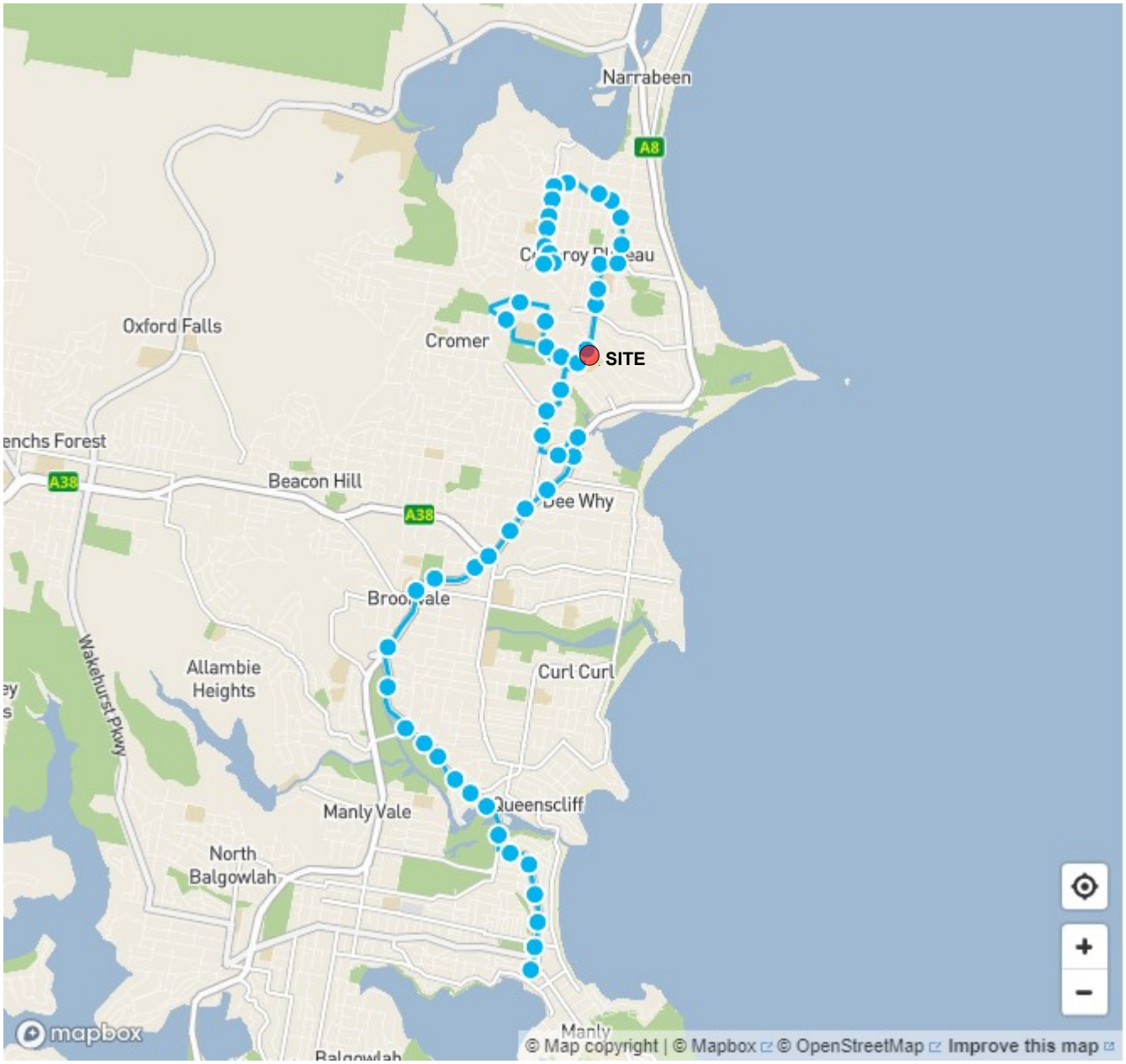
References:

Warringah Development Control Plan (WDCP) 2011
Guide to the SEPP (Educational Establishments and Child Care Facilities) 2017
RMS Guide to Traffic Generating Developments (2002)
AS/NZS 2890.1:2004: Parking Facilities – Off-street car parking
AS 2890.3:2015: Parking Facilities – Bicycle parking
AS/NZS 2890.6:2009: Parking Facilities – Off-street parking for people with disabilities

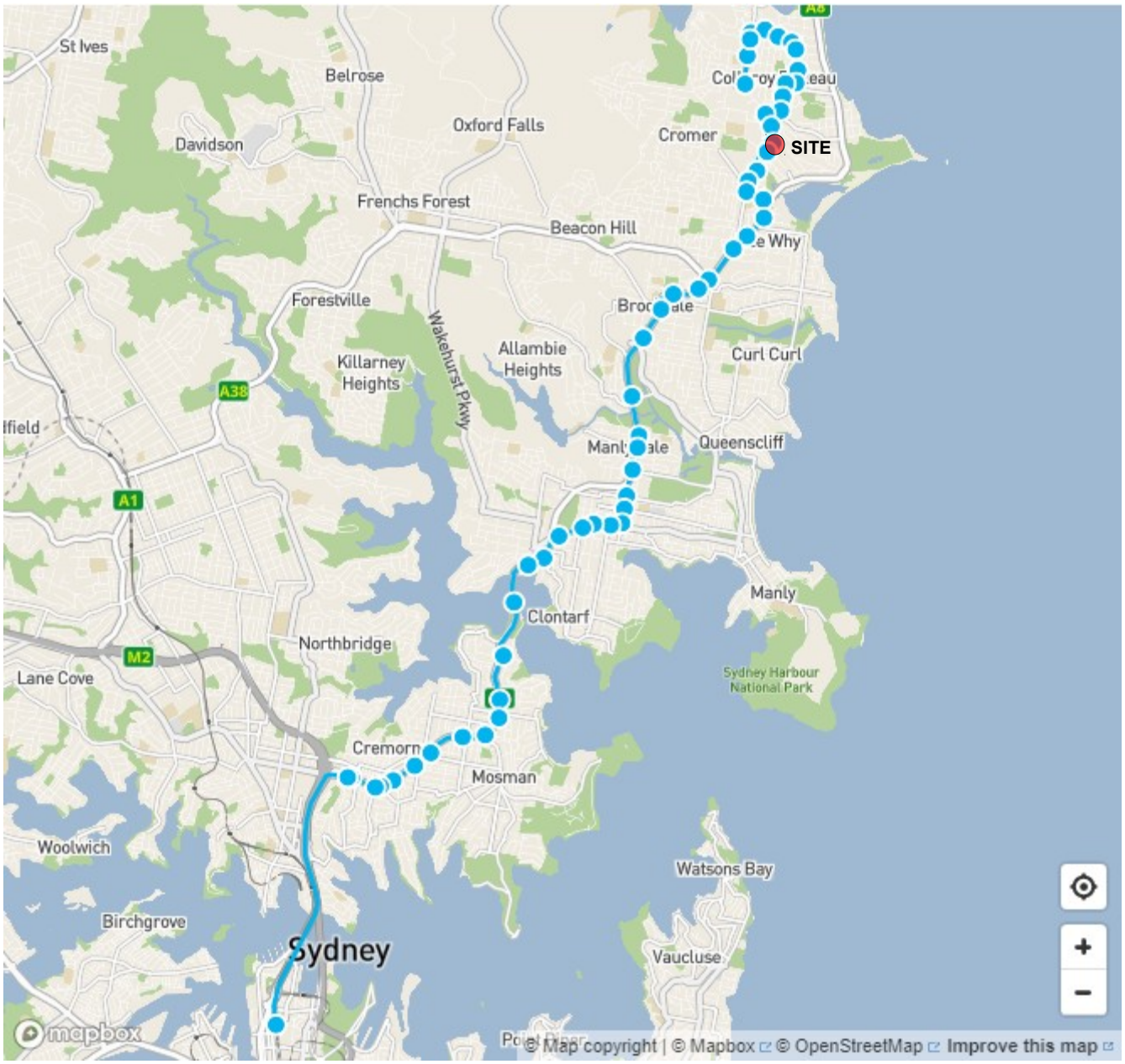
Appendix

Bus routes (public)
Results of AIMSUN modelling
Car park, bus parking and loading area design checks and vehicle turning diagrams

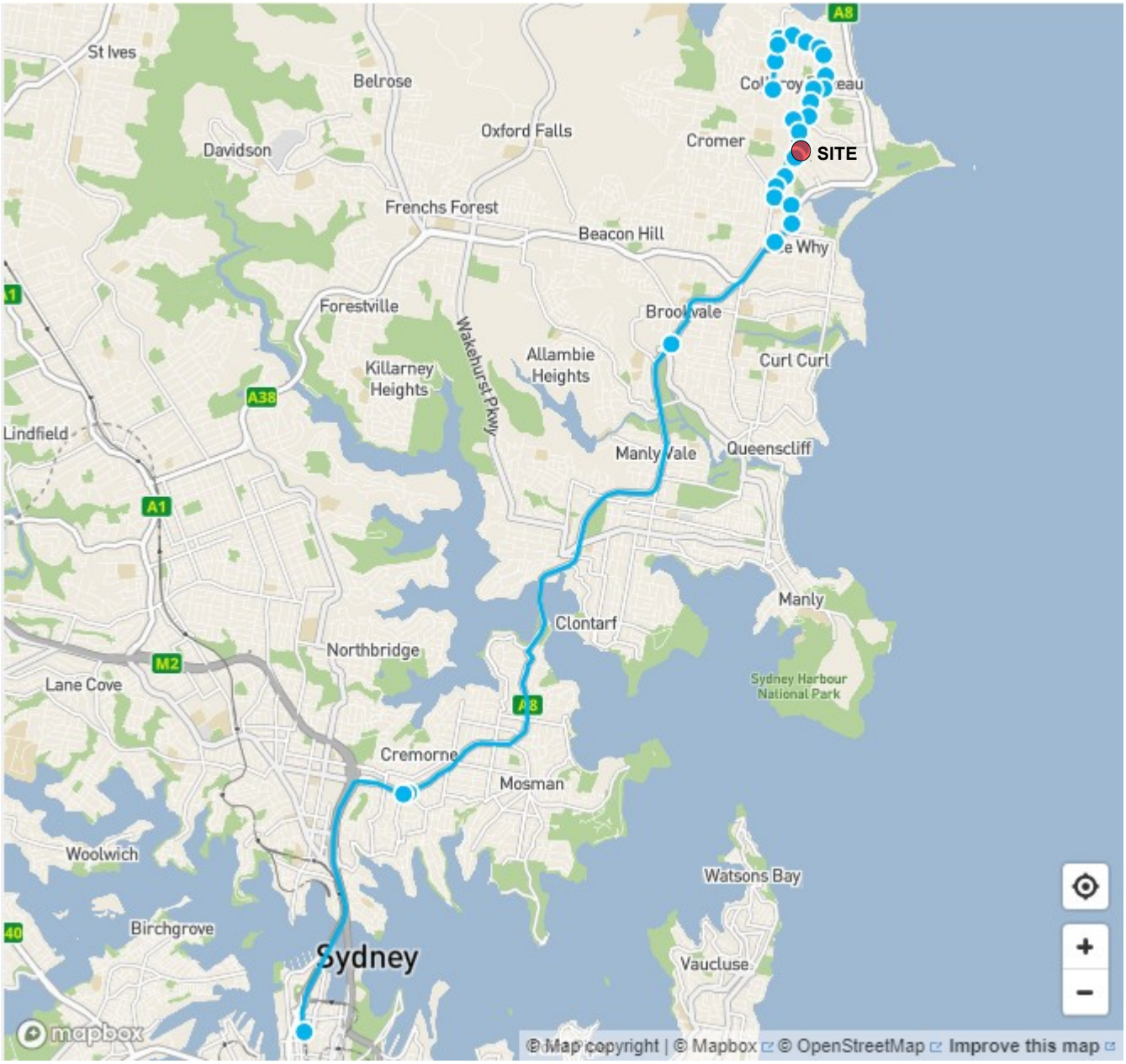
Bus Route 158



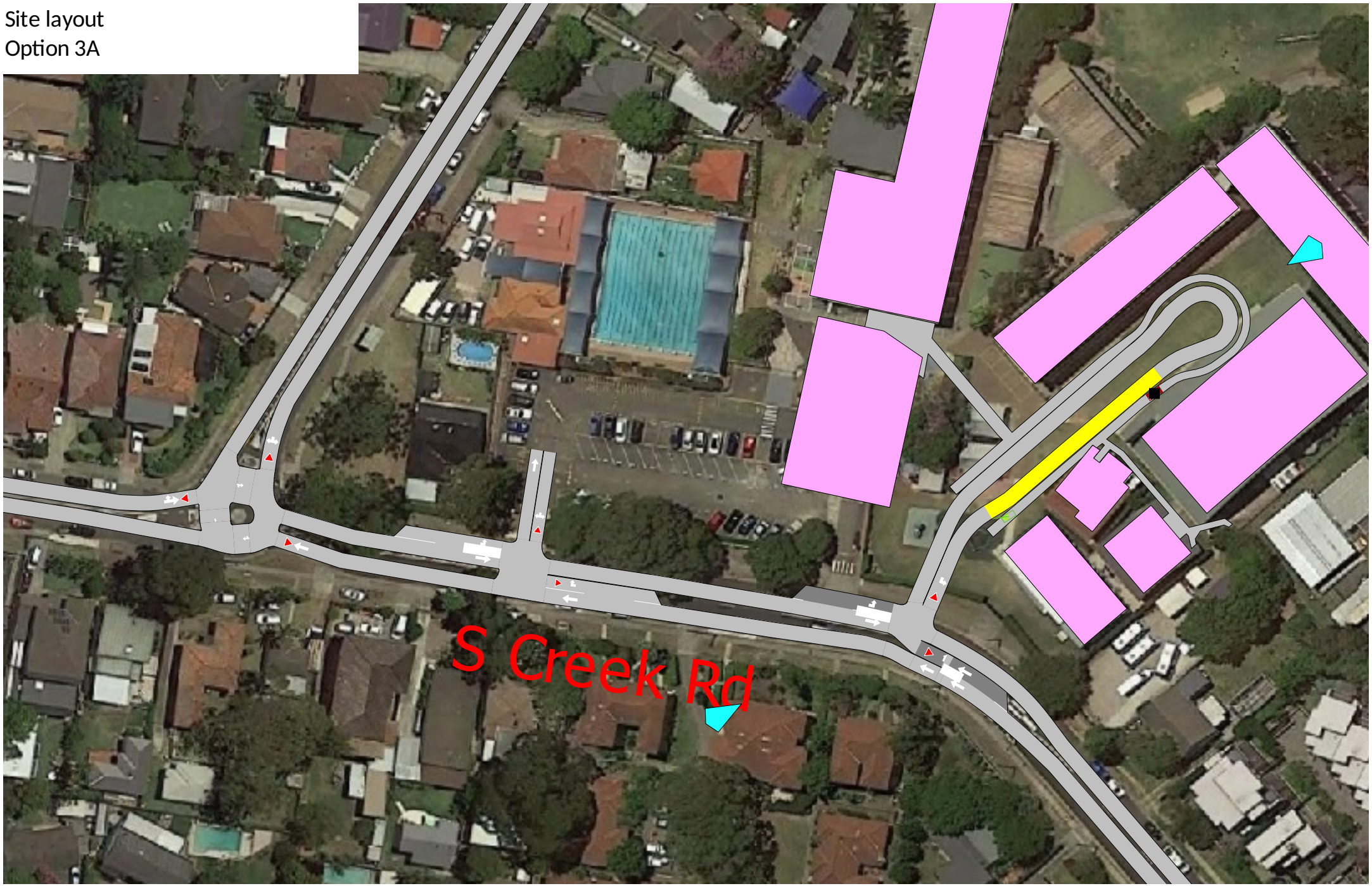
Bus Route 180

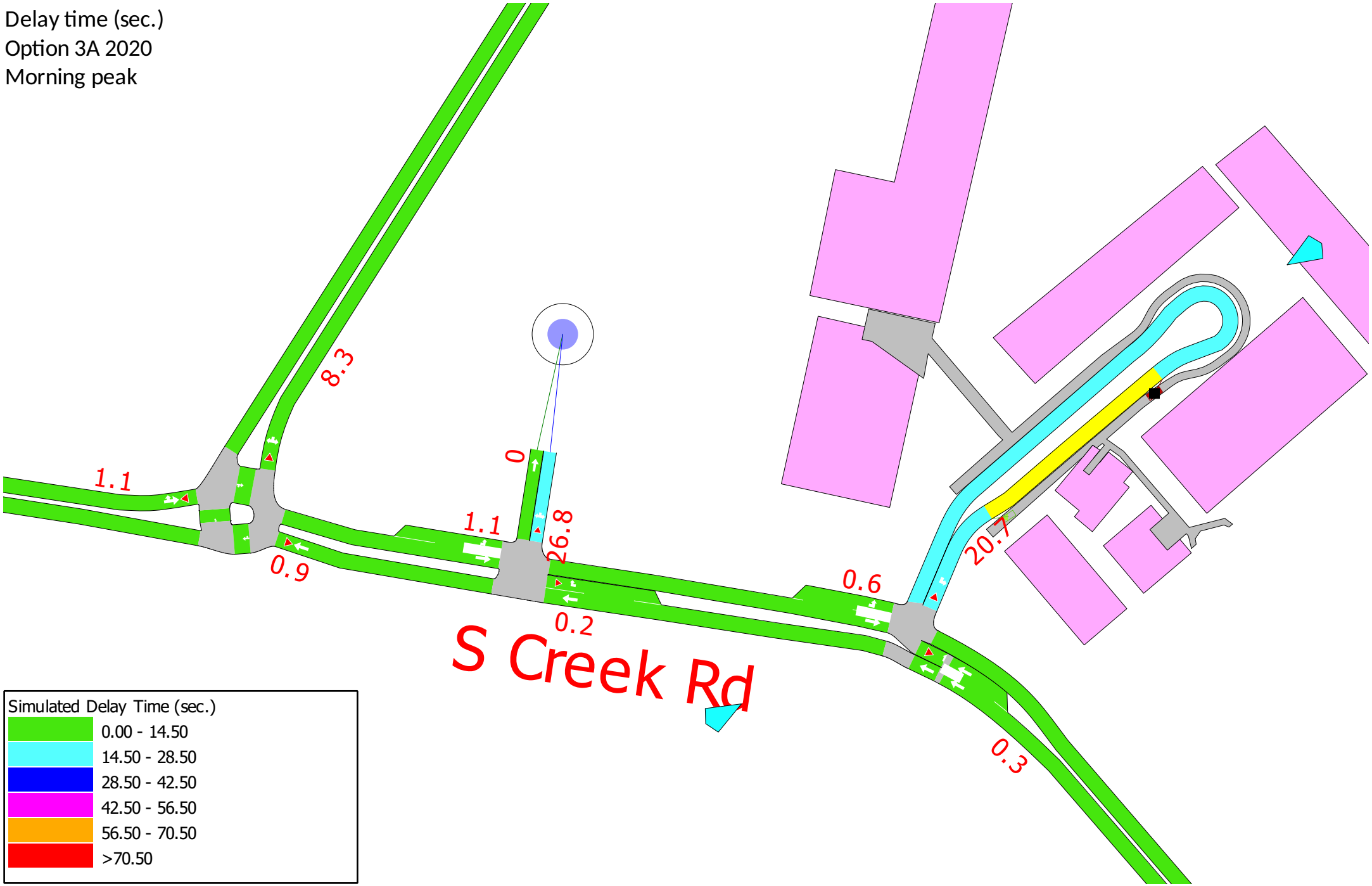


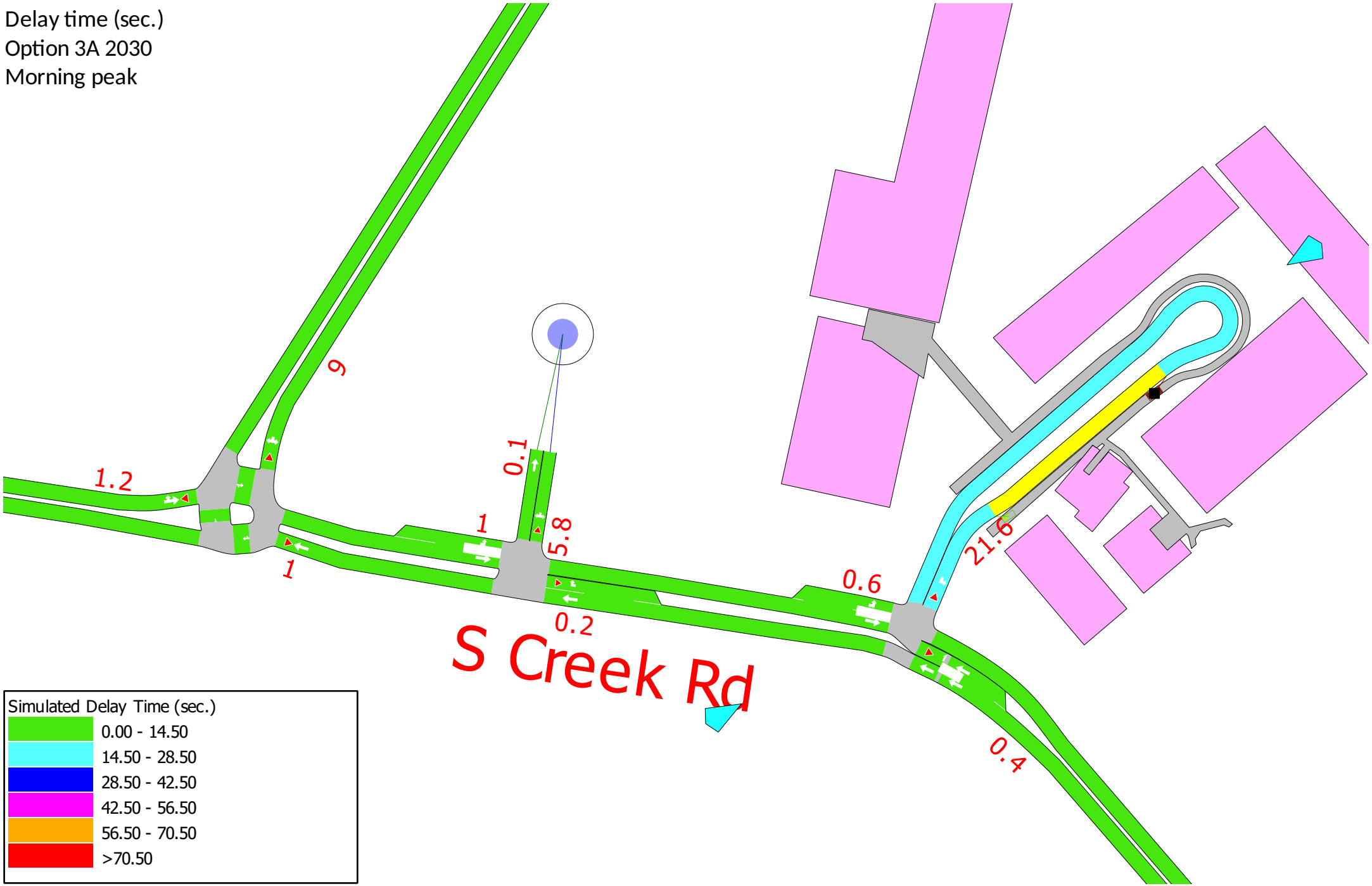
Bus Route E80

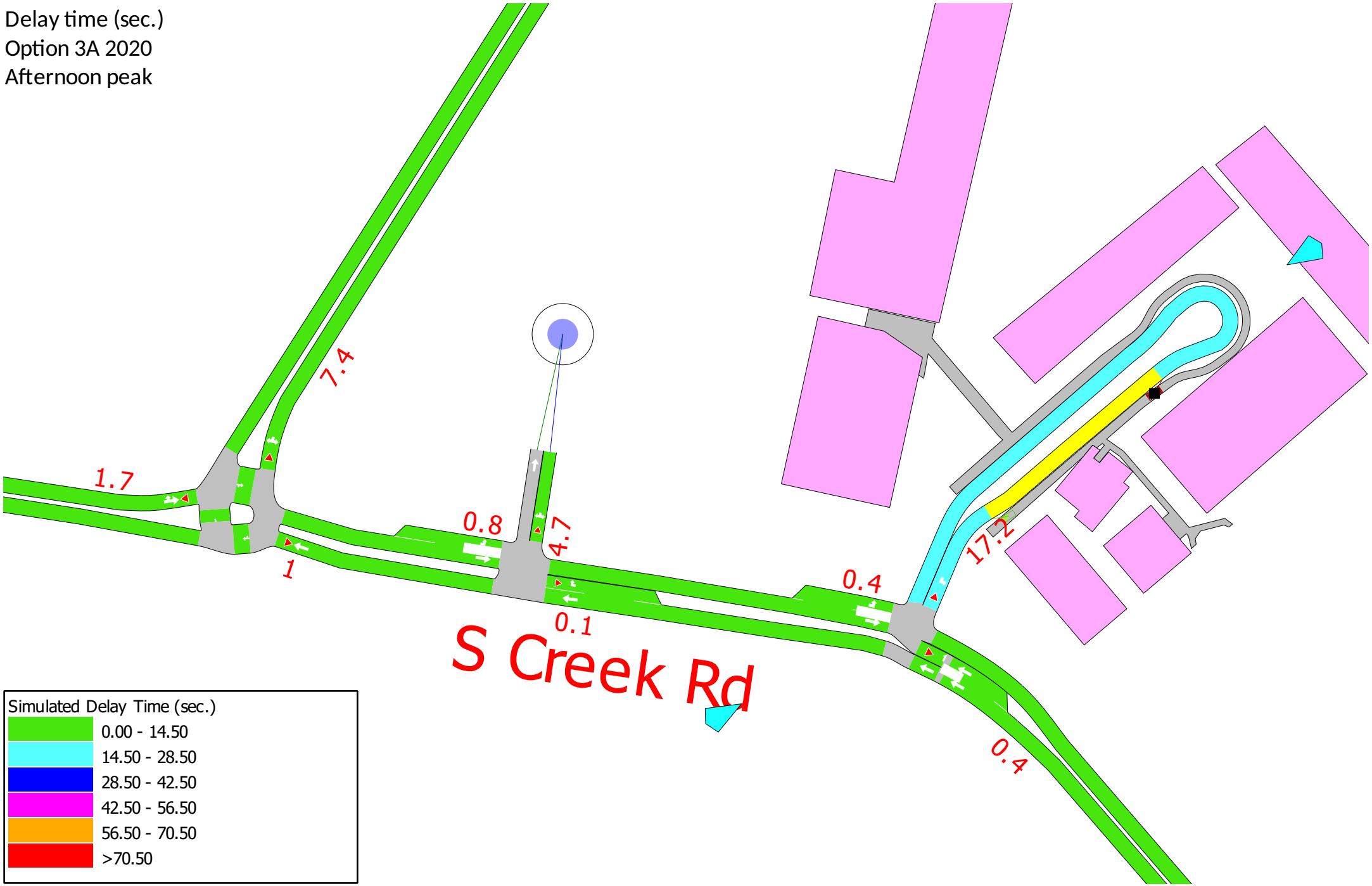


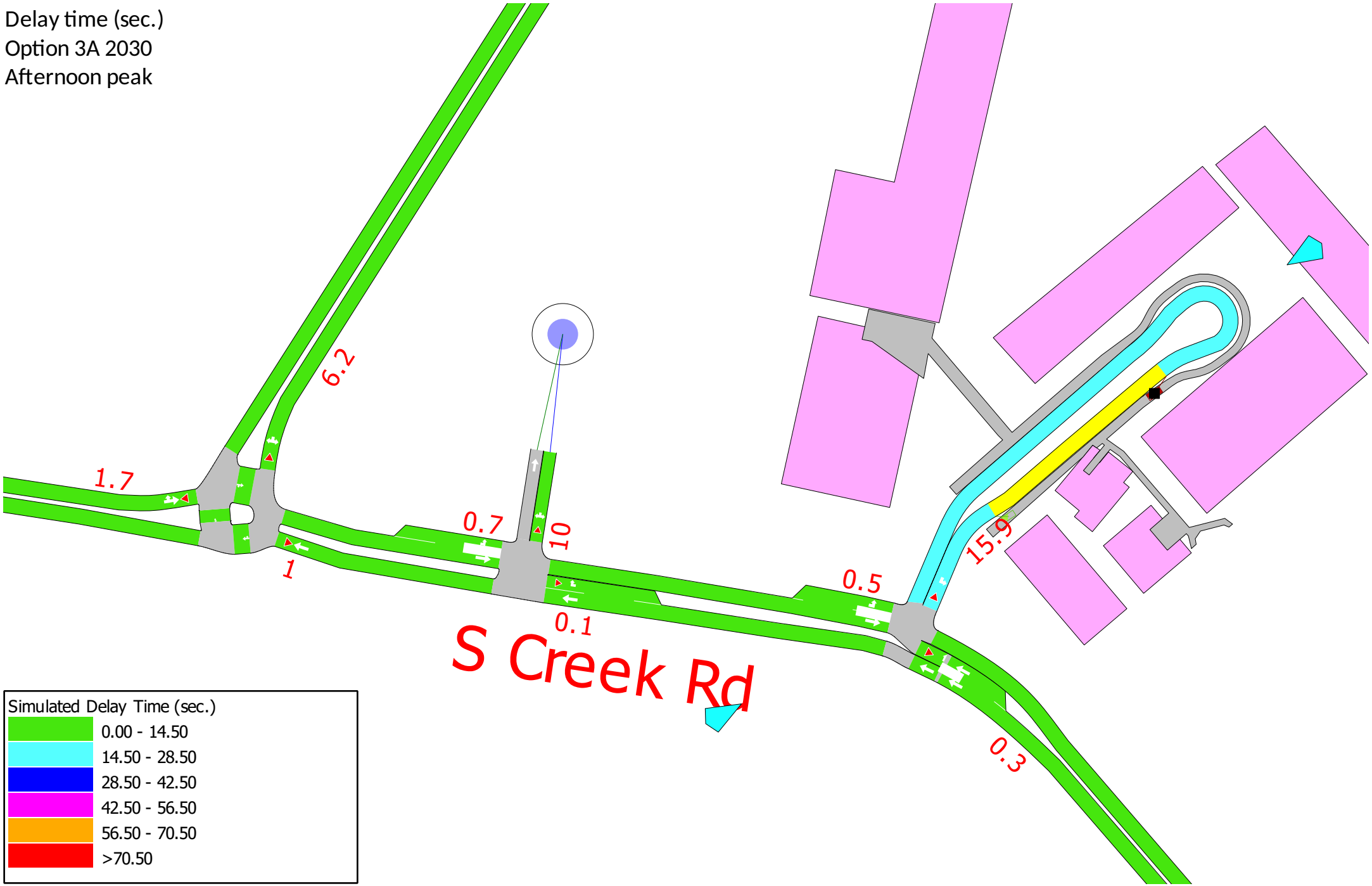
Site layout
Option 3A

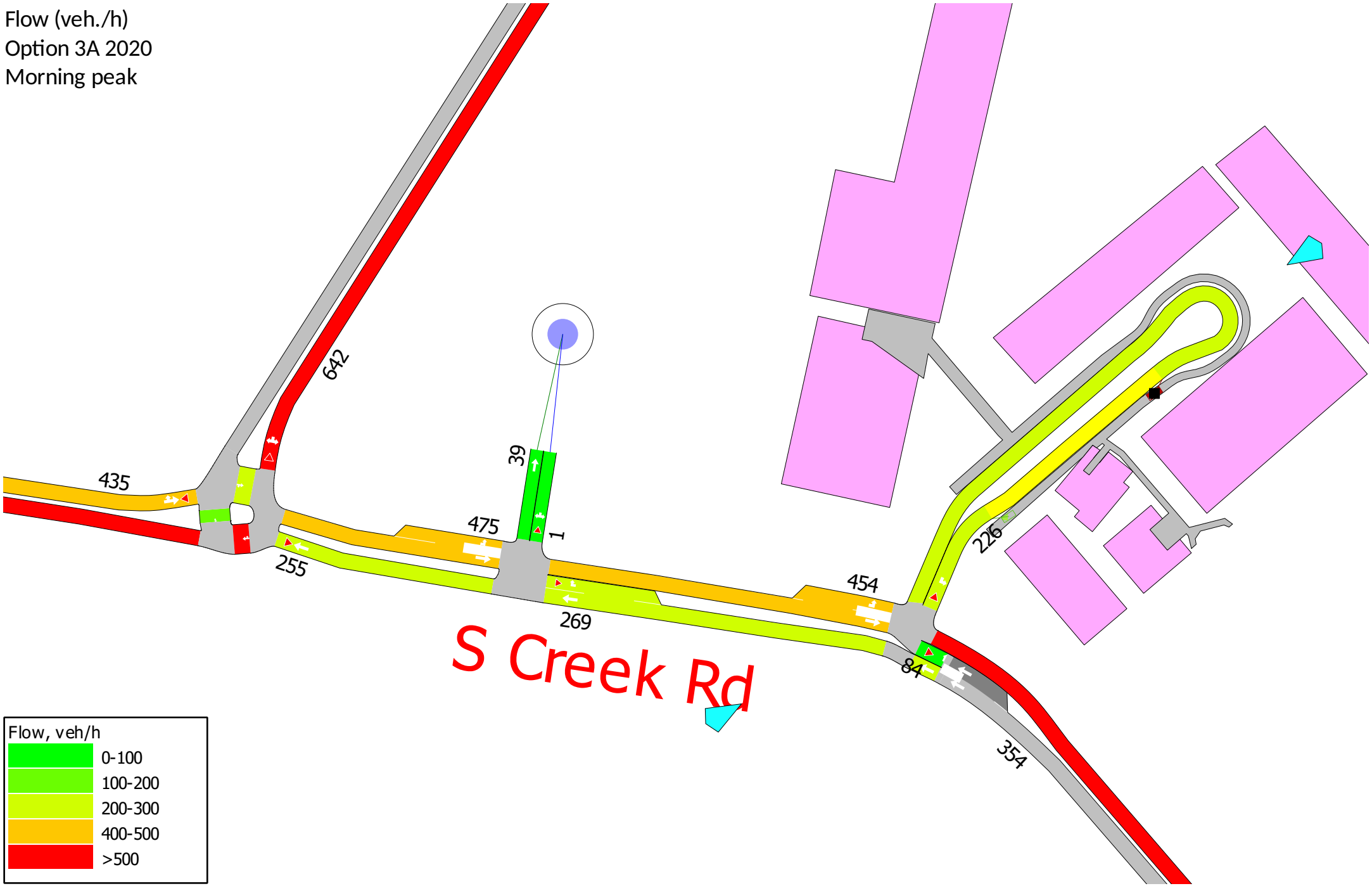


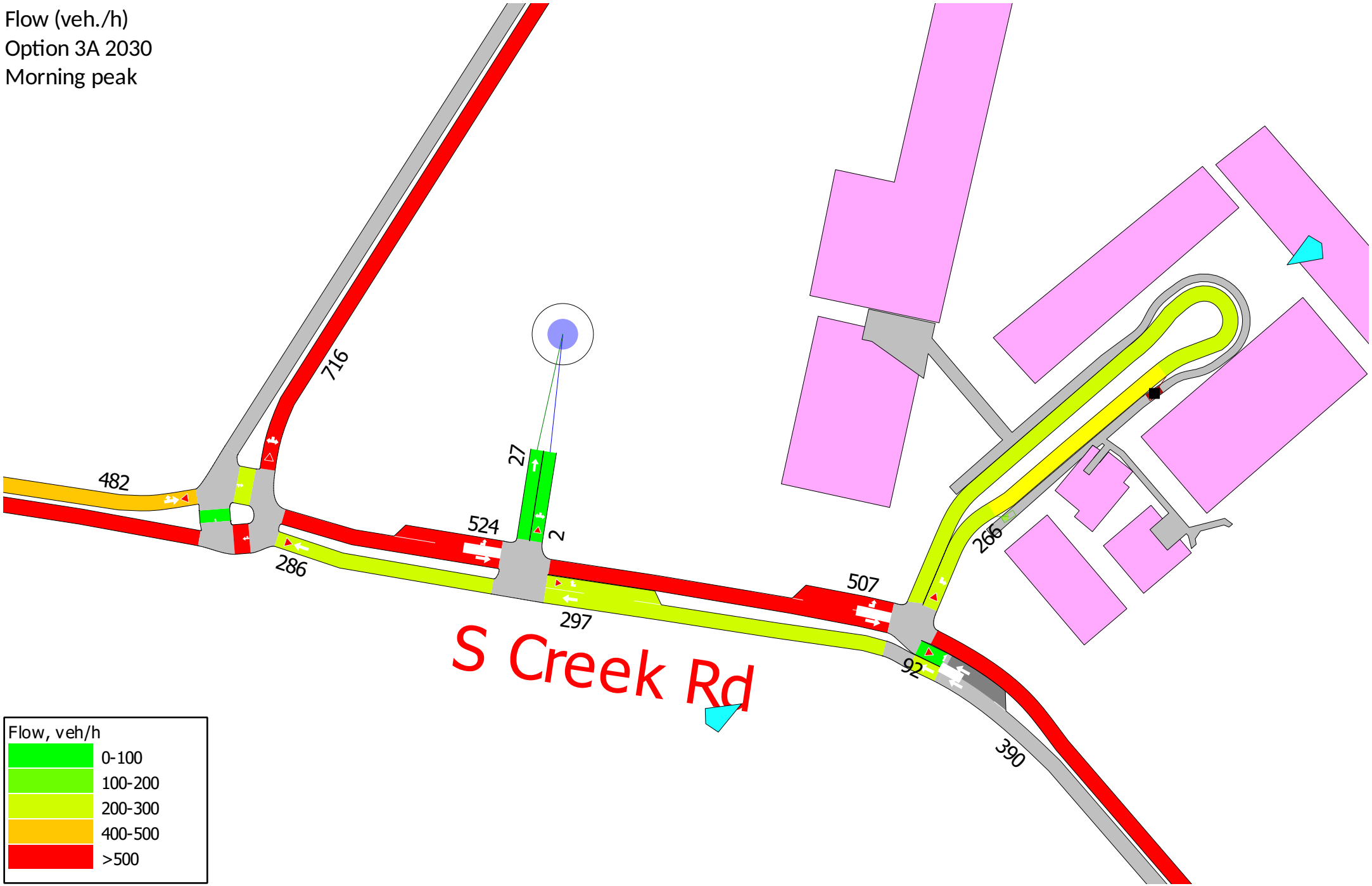

Delay time (sec.)
Option 3A 2020
Morning peak
1.1
8.3
0
1.1
26.8
0.9
0.2
0.6
20.7
0.3
S Creek Rd
Simulated Delay Time (sec.)
0.00 - 14.50
14.50 - 28.50
28.50 - 42.50
42.50 - 56.50
56.50 - 70.50
>70.50

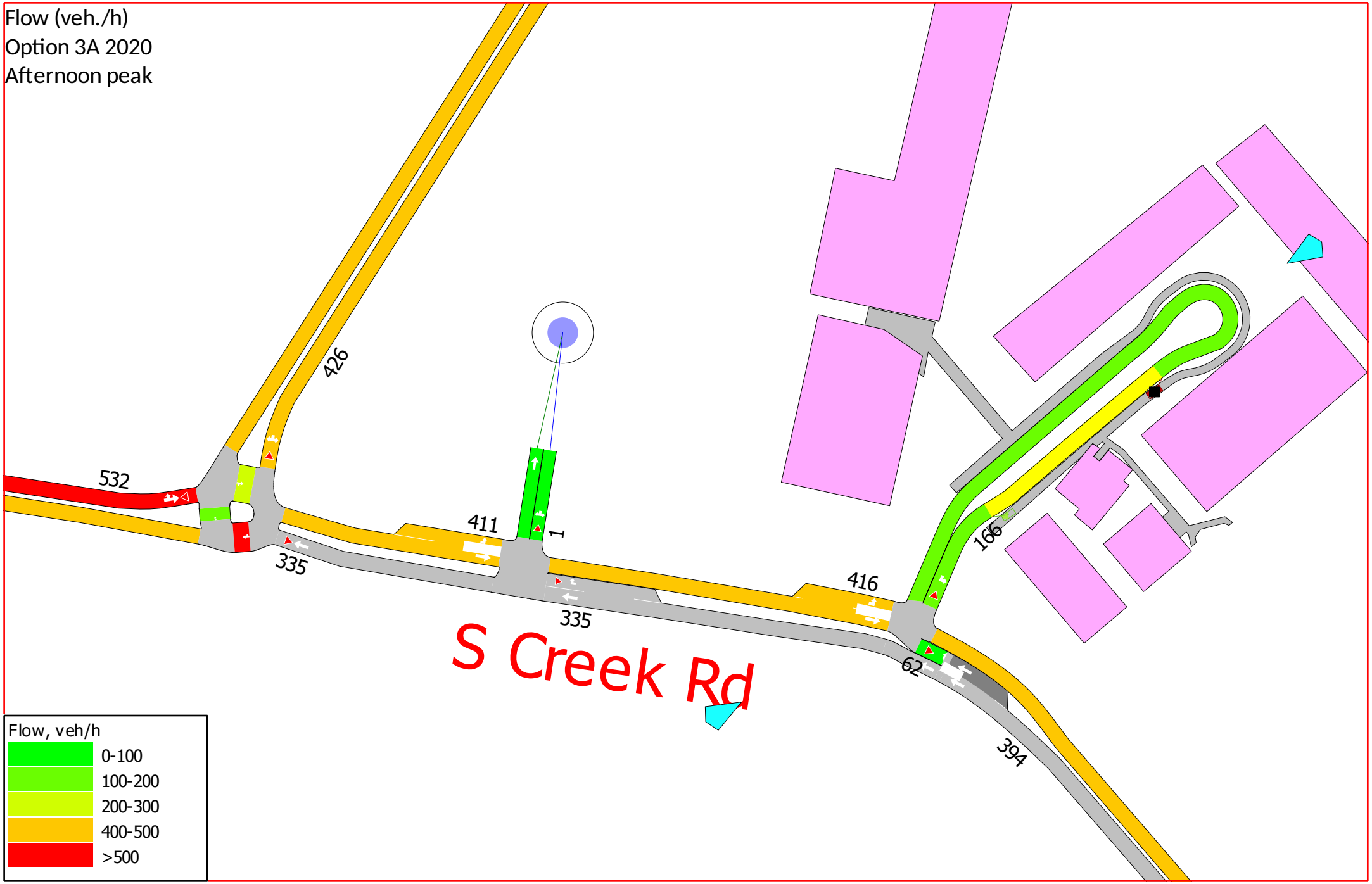

Delay time (sec.)
Option 3A 2030
Morning peak
1.2
9
0.1
1
5.8
1
0.2
0.6
21.6
0.4
S Creek Rd
Simulated Delay Time (sec.)
0.00 - 14.50
14.50 - 28.50
28.50 - 42.50
42.50 - 56.50
56.50 - 70.50
>70.50

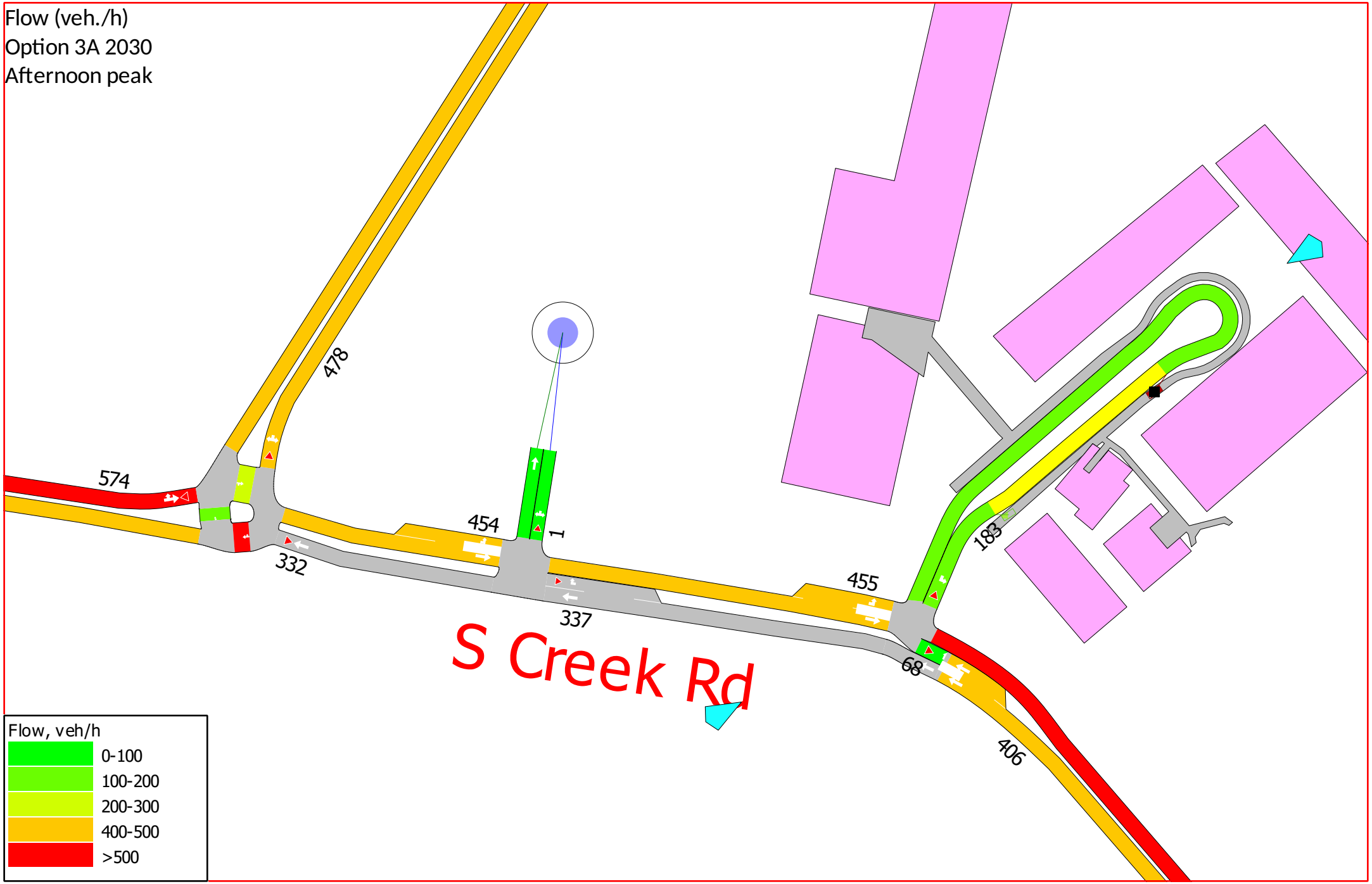

Delay time (sec.)
Option 3A 2020
Afternoon peak
1.7
7.4
0.8
4.7
1
0.1
0.4
17.2
0.4
S Creek Rd
Simulated Delay Time (sec.)
0.00 - 14.50
14.50 - 28.50
28.50 - 42.50
42.50 - 56.50
56.50 - 70.50
>70.50


Delay time (sec.)
Option 3A 2030
Afternoon peak
1.7
6.2
1
0.7
10
0.1
0.5
15.9
0.3
S Creek Rd
Simulated Delay Time (sec.)
0.00 - 14.50
14.50 - 28.50
28.50 - 42.50
42.50 - 56.50
56.50 - 70.50
>70.50


Flow (veh./h)
Option 3A 2020
Morning peak
642
435
39
475
1
255
269
454
226
84
354
S Creek Rd
Flow, veh/h
0-100
100-200
200-300
400-500
>500


Flow (veh./h)
Option 3A 2030
Morning peak
716
482
27
524
2
286
297
507
266
92
390
S Creek Rd
Flow, veh/h
0-100
100-200
200-300
400-500
>500


Flow (veh./h)
Option 3A 2020
Afternoon peak
532
426
411
1
335
335
416
166
62
394
S Creek Rd
Flow, veh/h
0-100
100-200
200-300
400-500
>500


Flow (veh./h)
Option 3A 2030
Afternoon peak
574
478
454
1
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337
455
183
68
406
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Flow, veh/h
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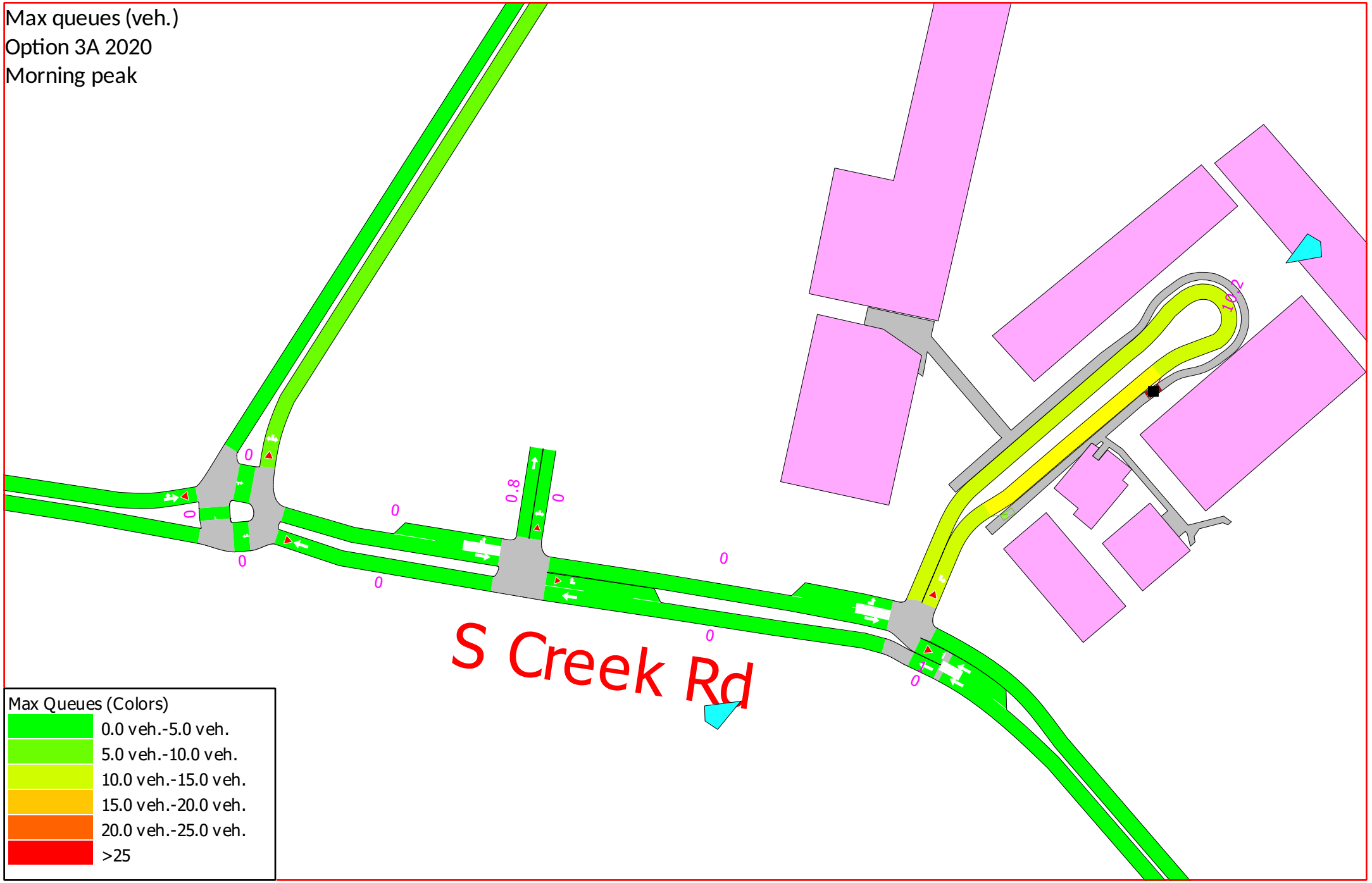
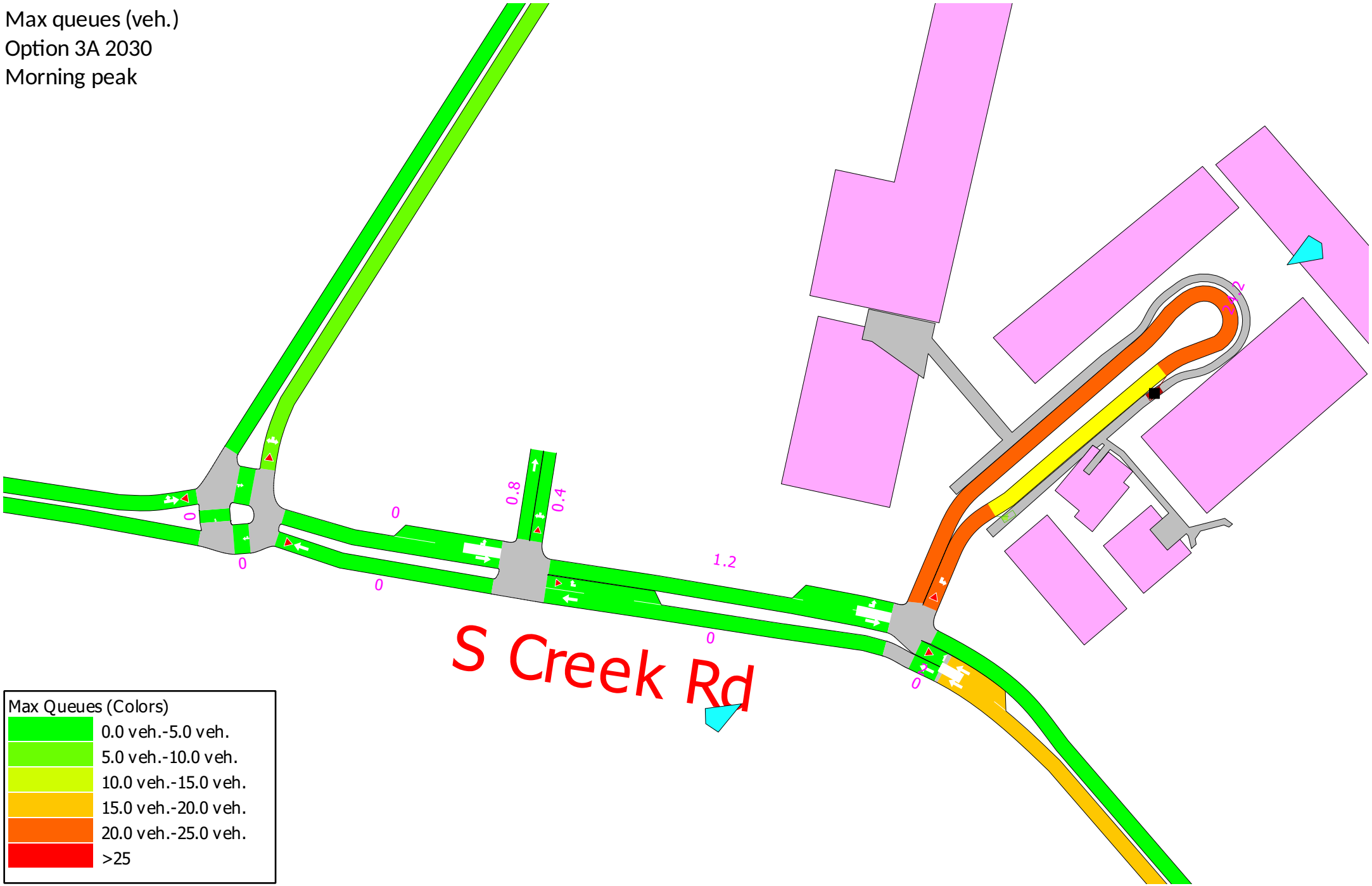
100-200
200-300
400-500
>500


Max queues (veh.)
Option 3A 2020
Morning peak
S Creek Rd
0
0
0
0.8
0
0
0
0
10.2
Max Queues (Colors)
0.0 veh.-5.0 veh.
5.0 veh.-10.0 veh.
10.0 veh.-15.0 veh.
15.0 veh.-20.0 veh.
20.0 veh.-25.0 veh.
>25


Max queues (veh.)
Option 3A 2030
Morning peak
0
0
0
0.8
0.4
0
1.2
0
0
2.2
S Creek Rd
Max Queues (Colors)
0.0 veh.-5.0 veh.
5.0 veh.-10.0 veh.
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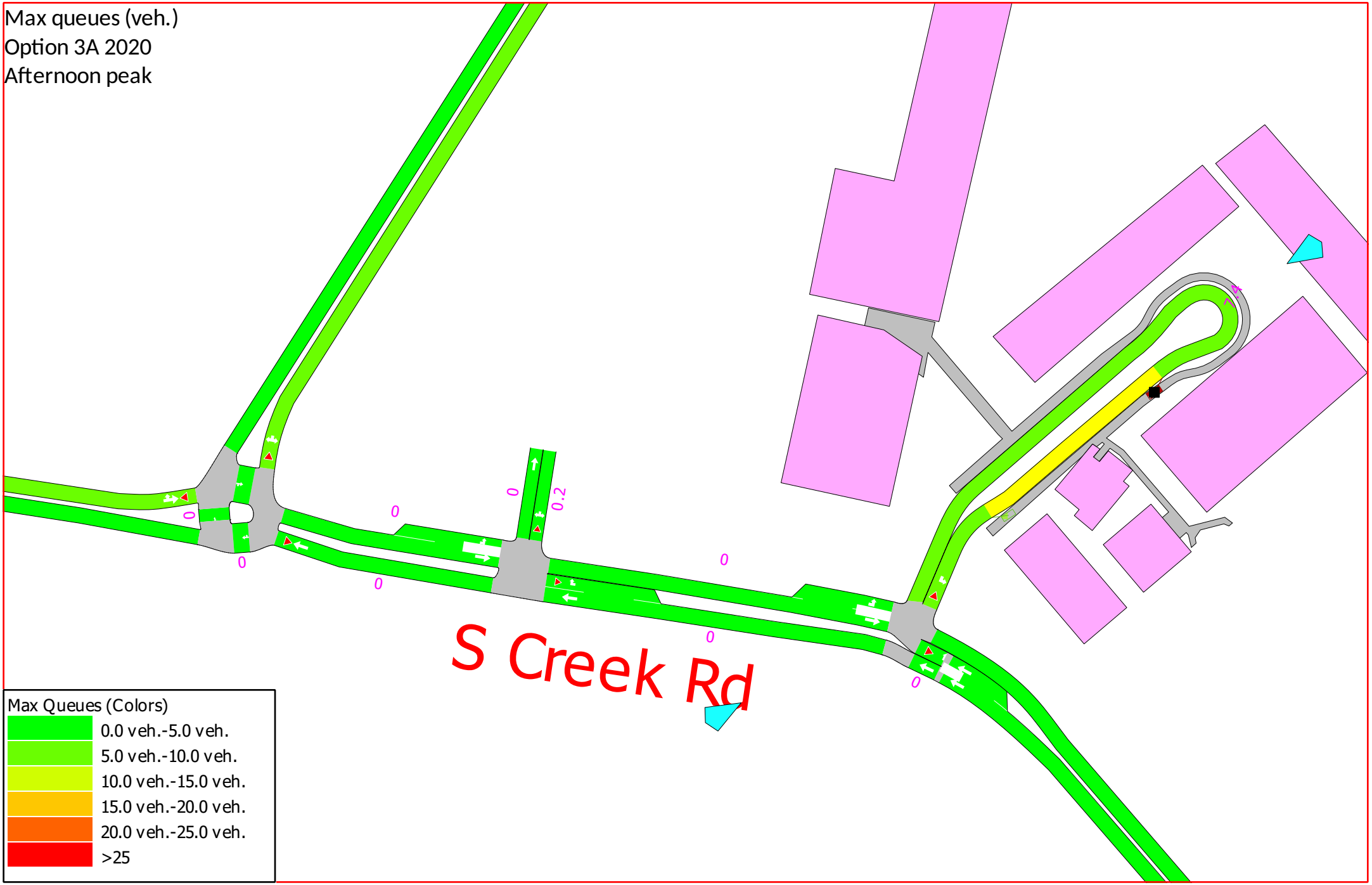
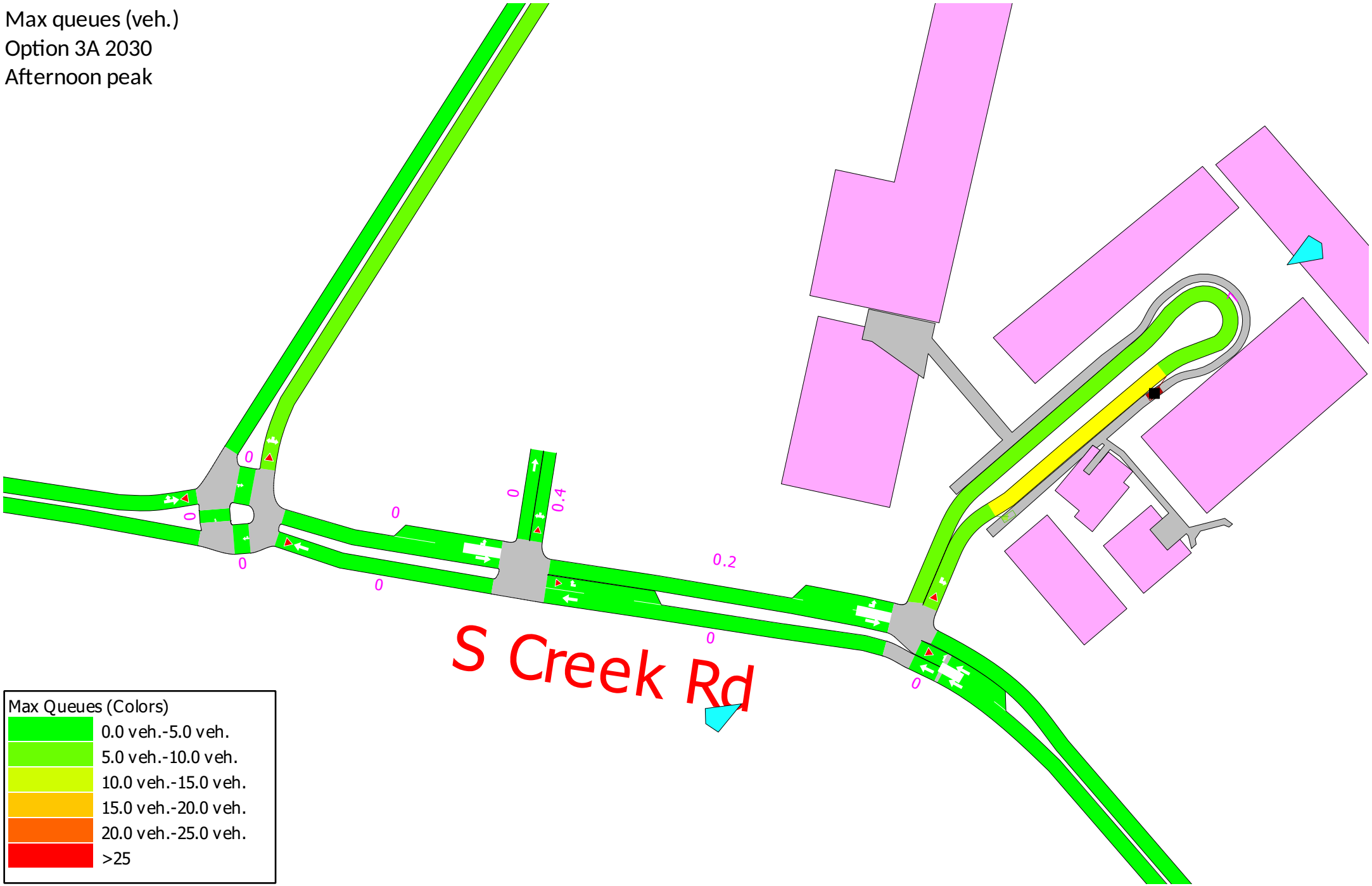
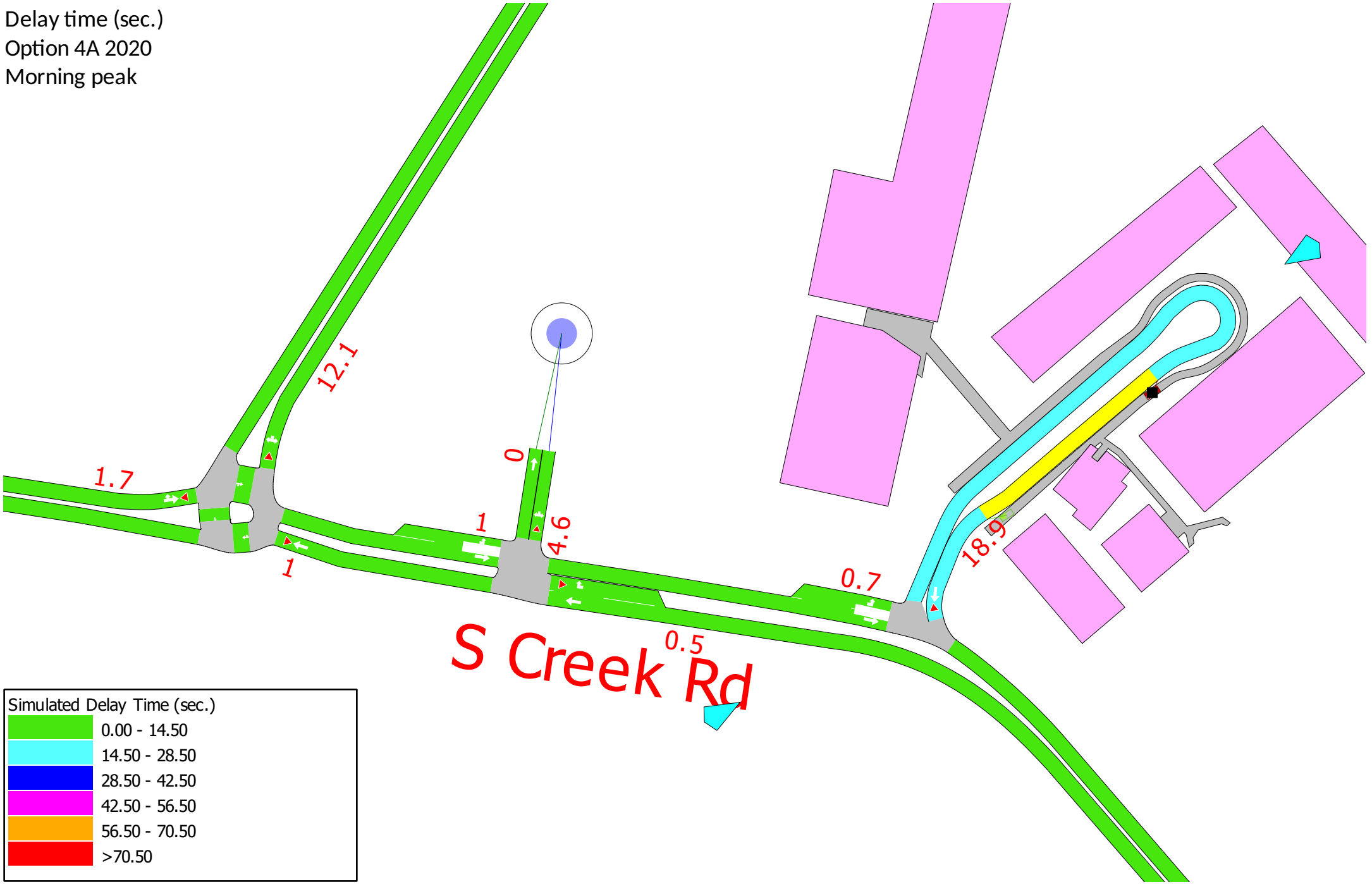
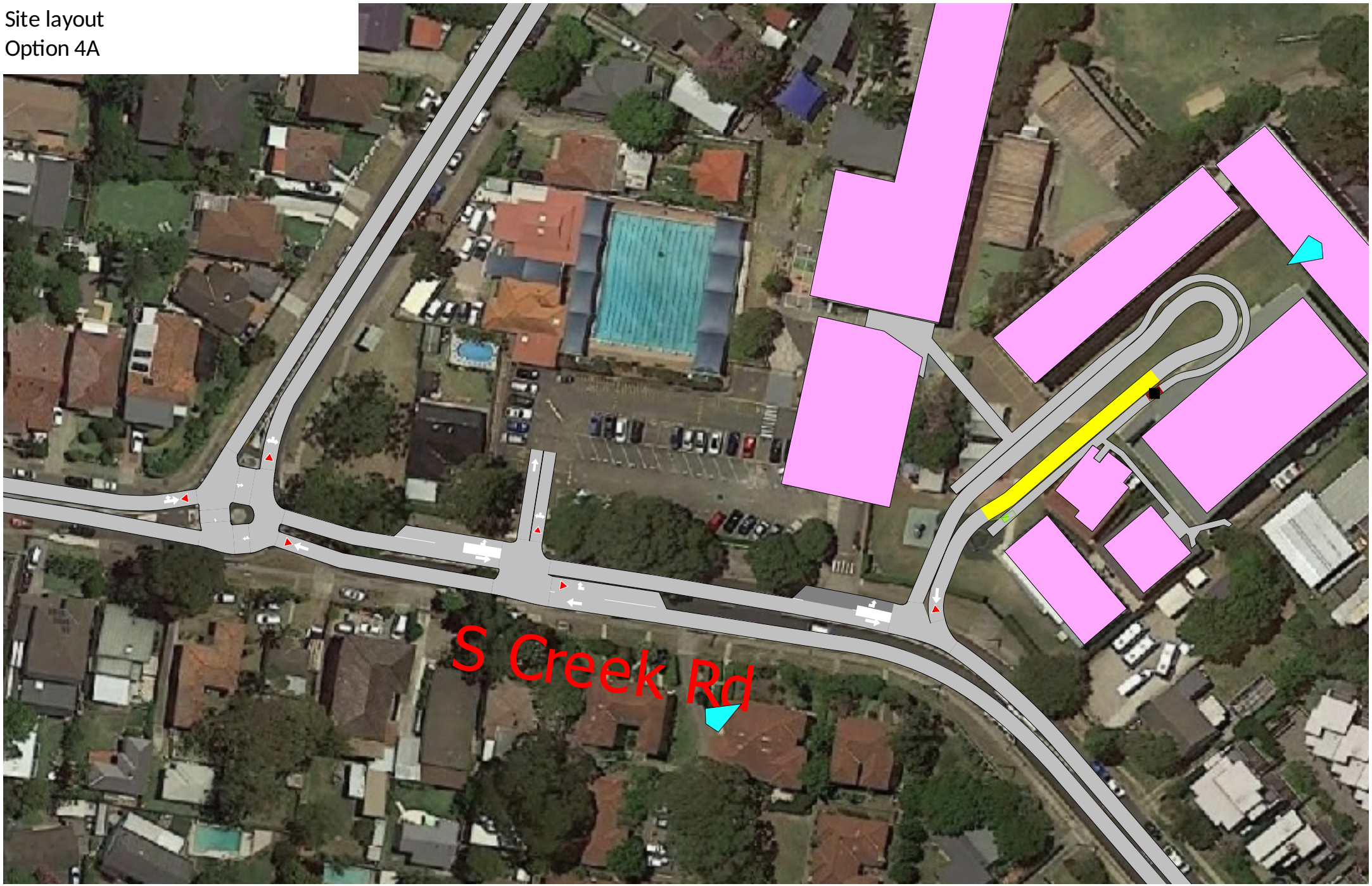
15.0 veh.-20.0 veh.
20.0 veh.-25.0 veh.
>25

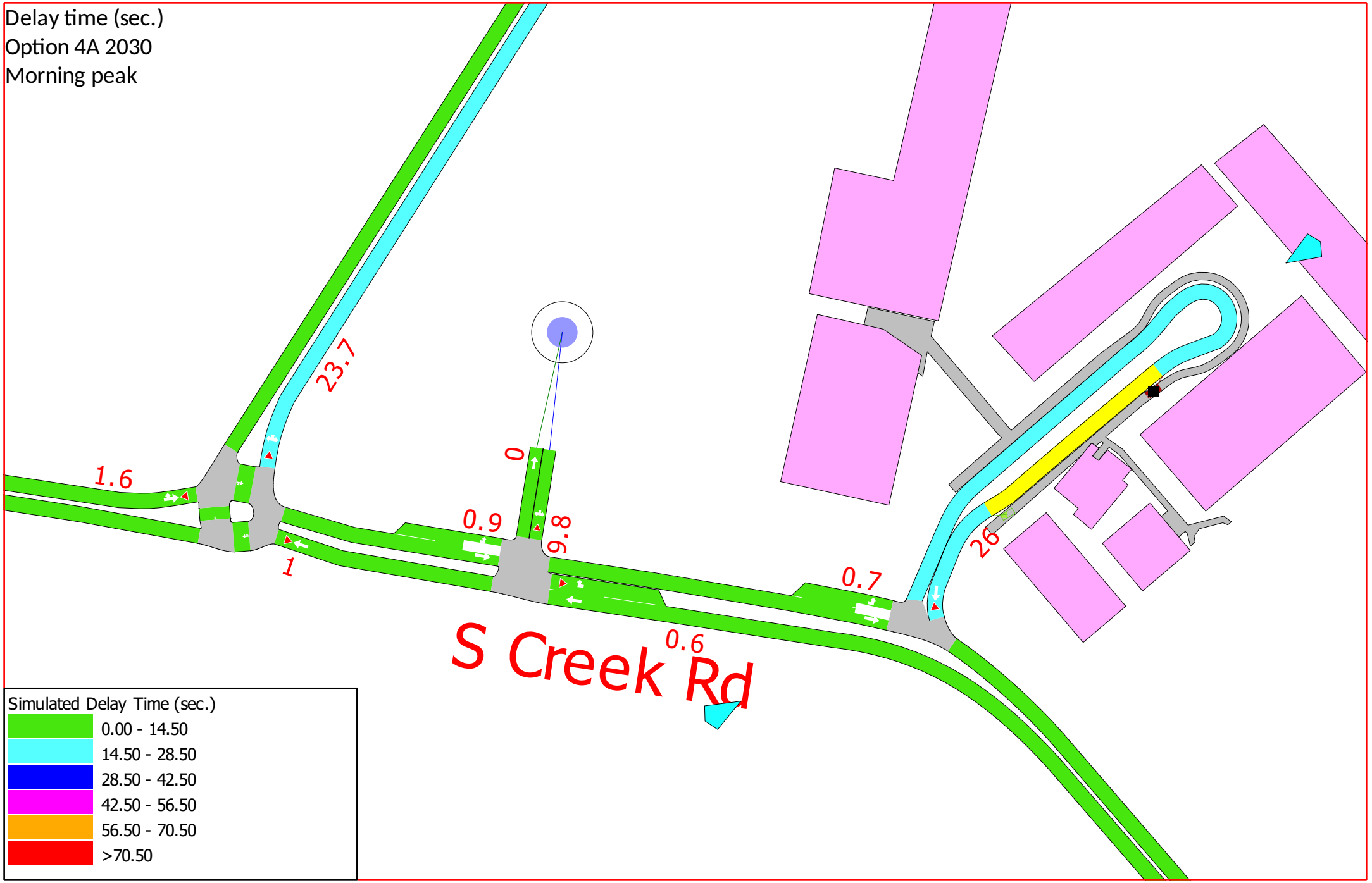

Max queues (veh.)
Option 3A 2020
Afternoon peak
S Creek Rd
0
0
0
0
0
0.2
0
0
0
0
Max Queues (Colors)
0.0 veh.-5.0 veh.
5.0 veh.-10.0 veh.
10.0 veh.-15.0 veh.
15.0 veh.-20.0 veh.
20.0 veh.-25.0 veh.
>25

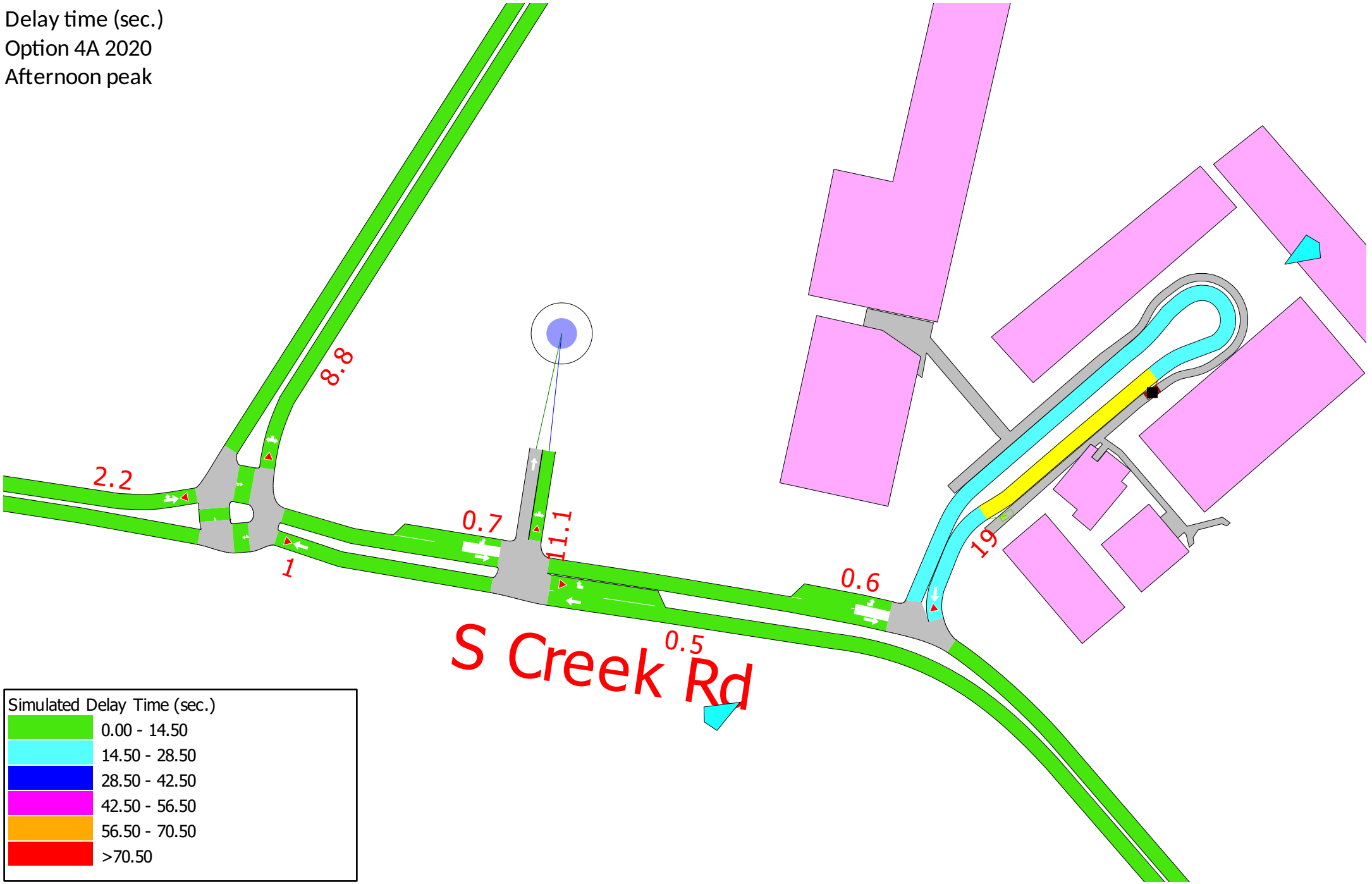

Max queues (veh.)
Option 3A 2030
Afternoon peak
0
0
0
0
0
0.4
0
0.2
0
0
S Creek Rd
Max Queues (Colors)
0.0 veh.-5.0 veh.
5.0 veh.-10.0 veh.
10.0 veh.-15.0 veh.
15.0 veh.-20.0 veh.
20.0 veh.-25.0 veh.
>25

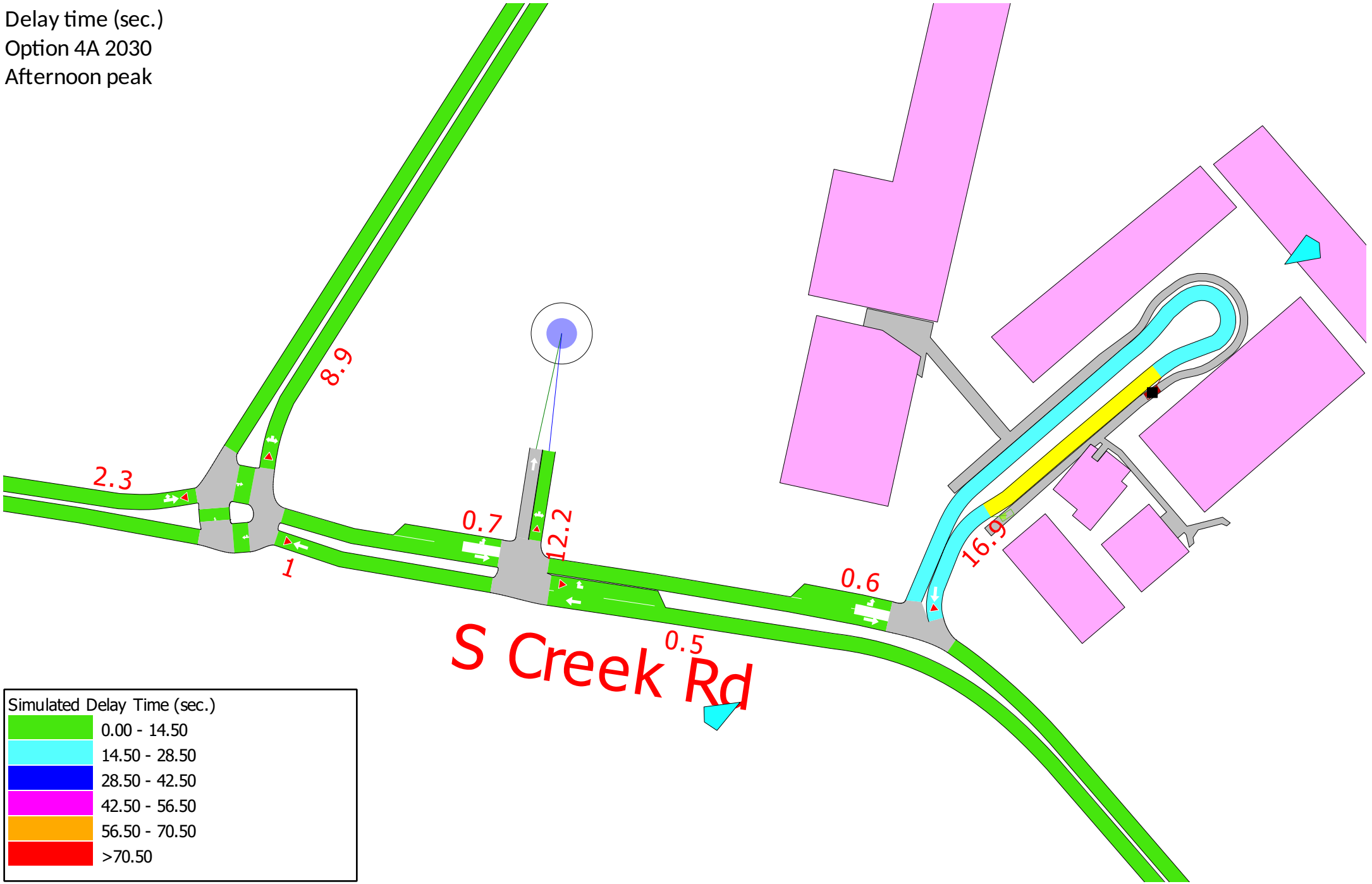

Delay time (sec.)
Option 4A 2020
Morning peak
1.7
12.1
0
1
4.6
1
0.7
18.9
0.5
S Creek Rd
Simulated Delay Time (sec.)
0.00 - 14.50
14.50 - 28.50
28.50 - 42.50
42.50 - 56.50
56.50 - 70.50
>70.50

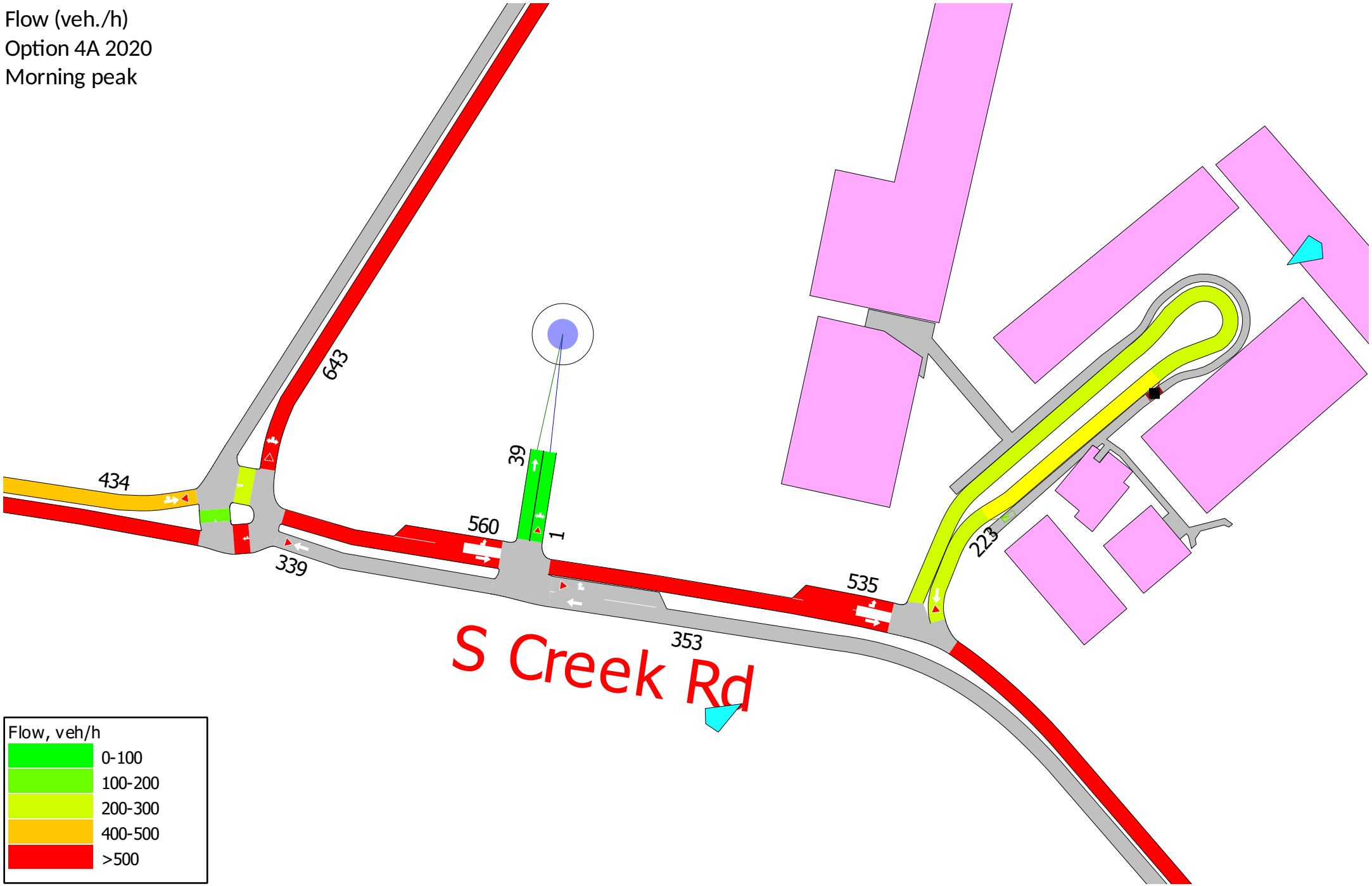
Site layout
Option 4A

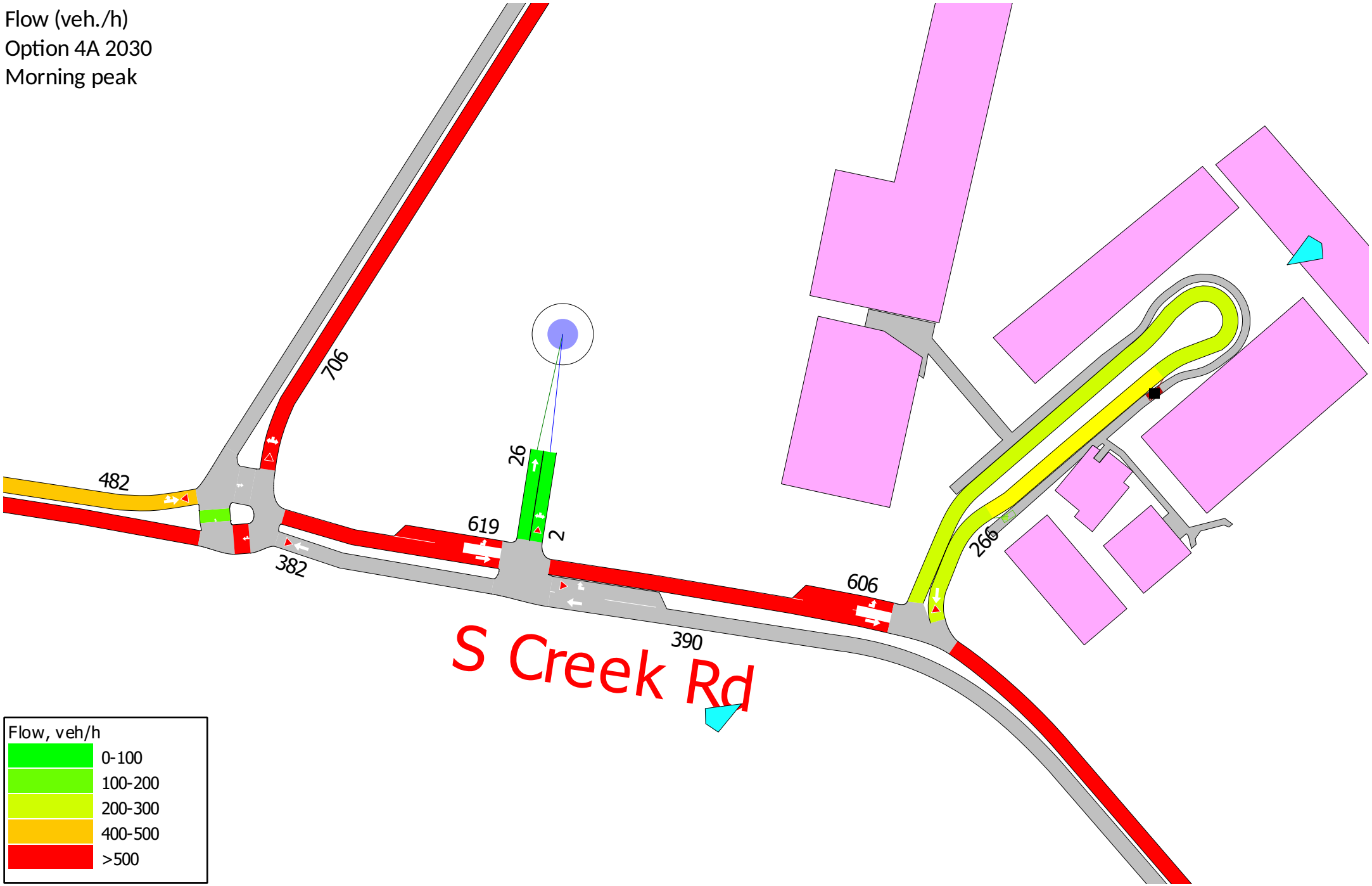


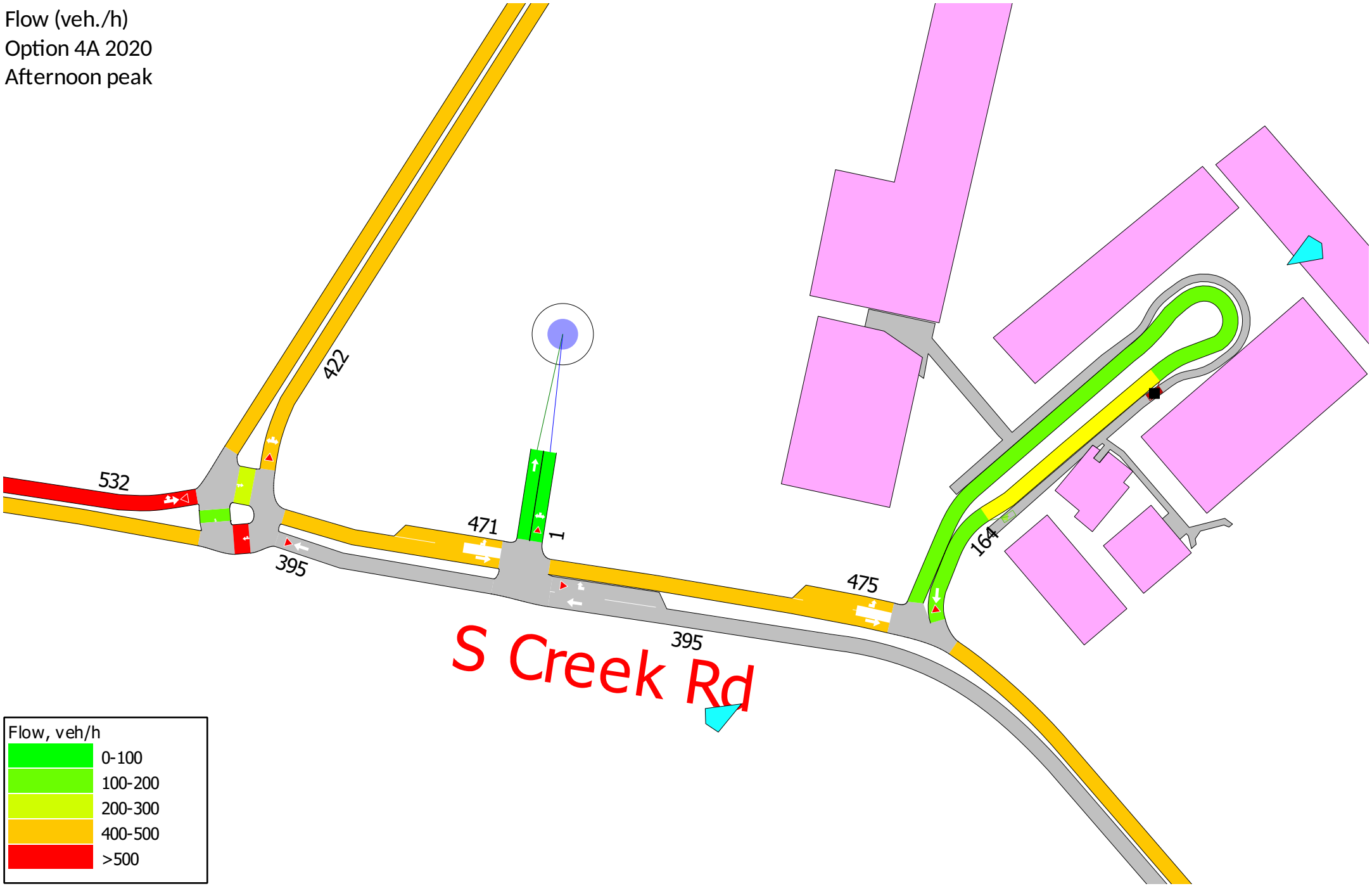

Delay time (sec.)
Option 4A 2030
Morning peak
1.6
23.7
0
0.9
9.8
1
0.7
26
0.6
S Creek Rd
Simulated Delay Time (sec.)
0.00 - 14.50
14.50 - 28.50
28.50 - 42.50
42.50 - 56.50
56.50 - 70.50
>70.50

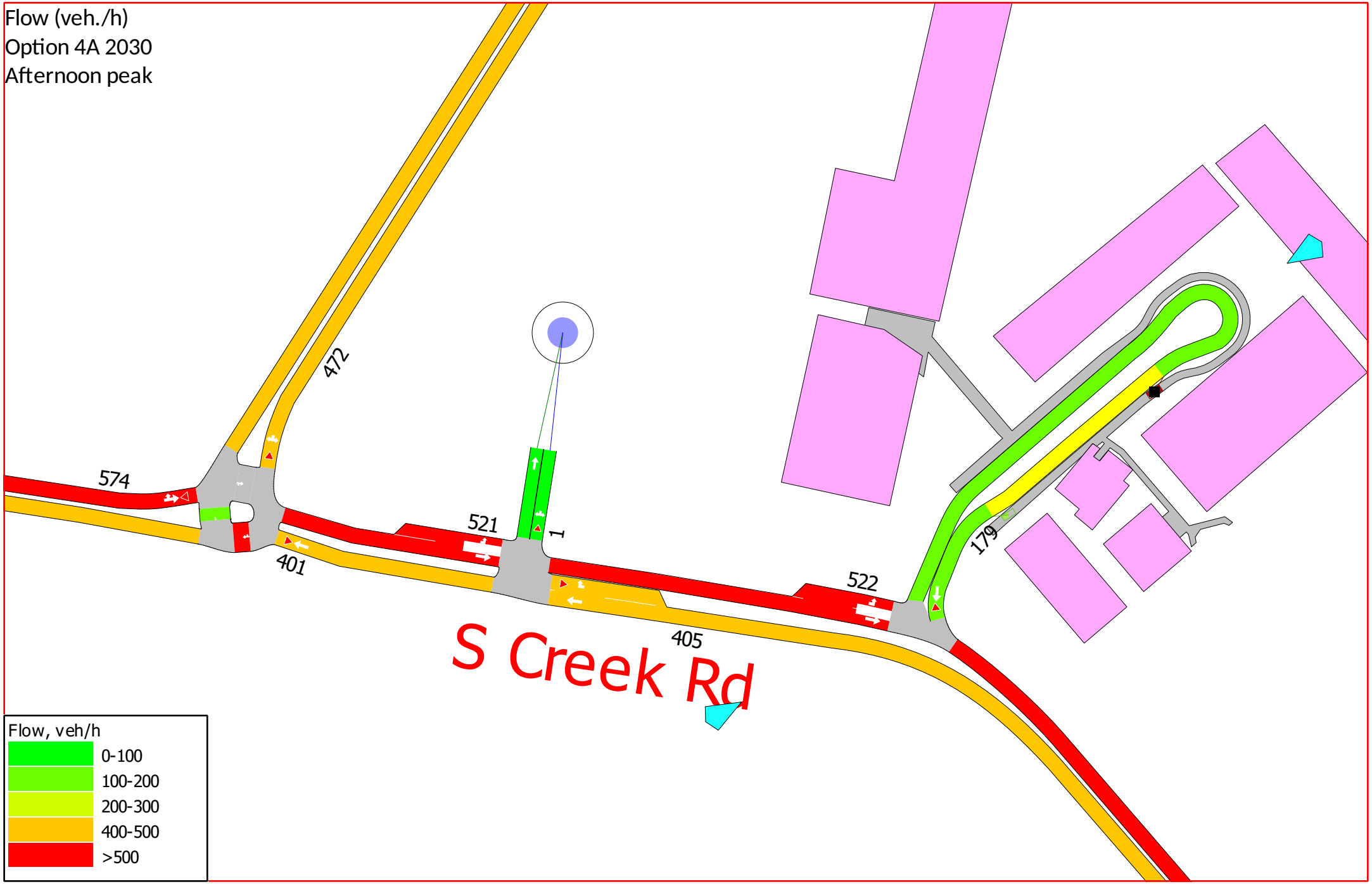

Delay time (sec.)
Option 4A 2020
Afternoon peak
8.8
2.2
0.7
11.1
1
0.6
19
0.5
S Creek Rd
Simulated Delay Time (sec.)
0.00 - 14.50
14.50 - 28.50
28.50 - 42.50
42.50 - 56.50
56.50 - 70.50
>70.50

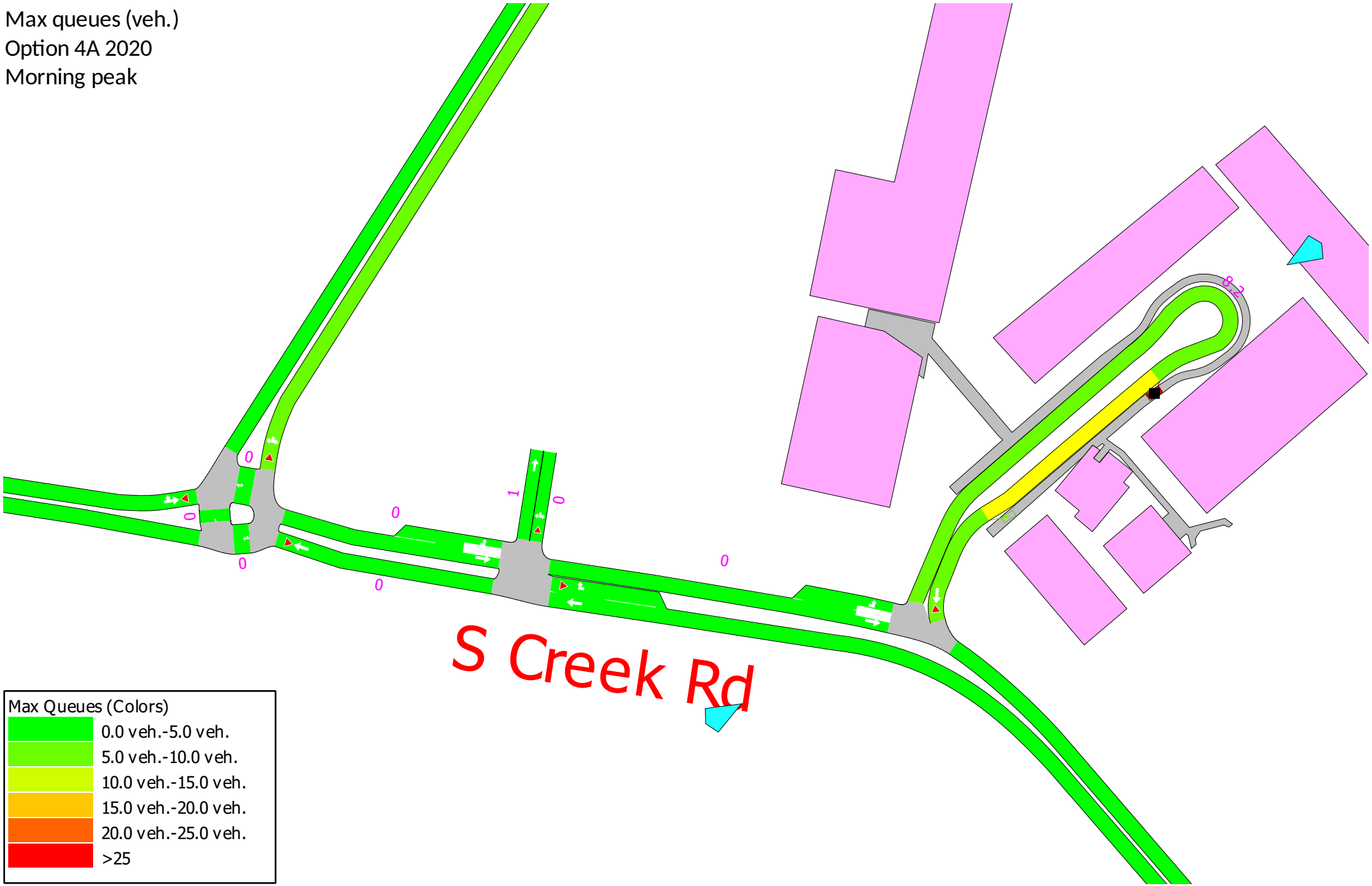

Delay time (sec.)
Option 4A 2030
Afternoon peak
2.3
8.9
1
0.7
12.2
0.6
16.9
0.5
S Creek Rd
Simulated Delay Time (sec.)
0.00 - 14.50
14.50 - 28.50
28.50 - 42.50
42.50 - 56.50
56.50 - 70.50
>70.50

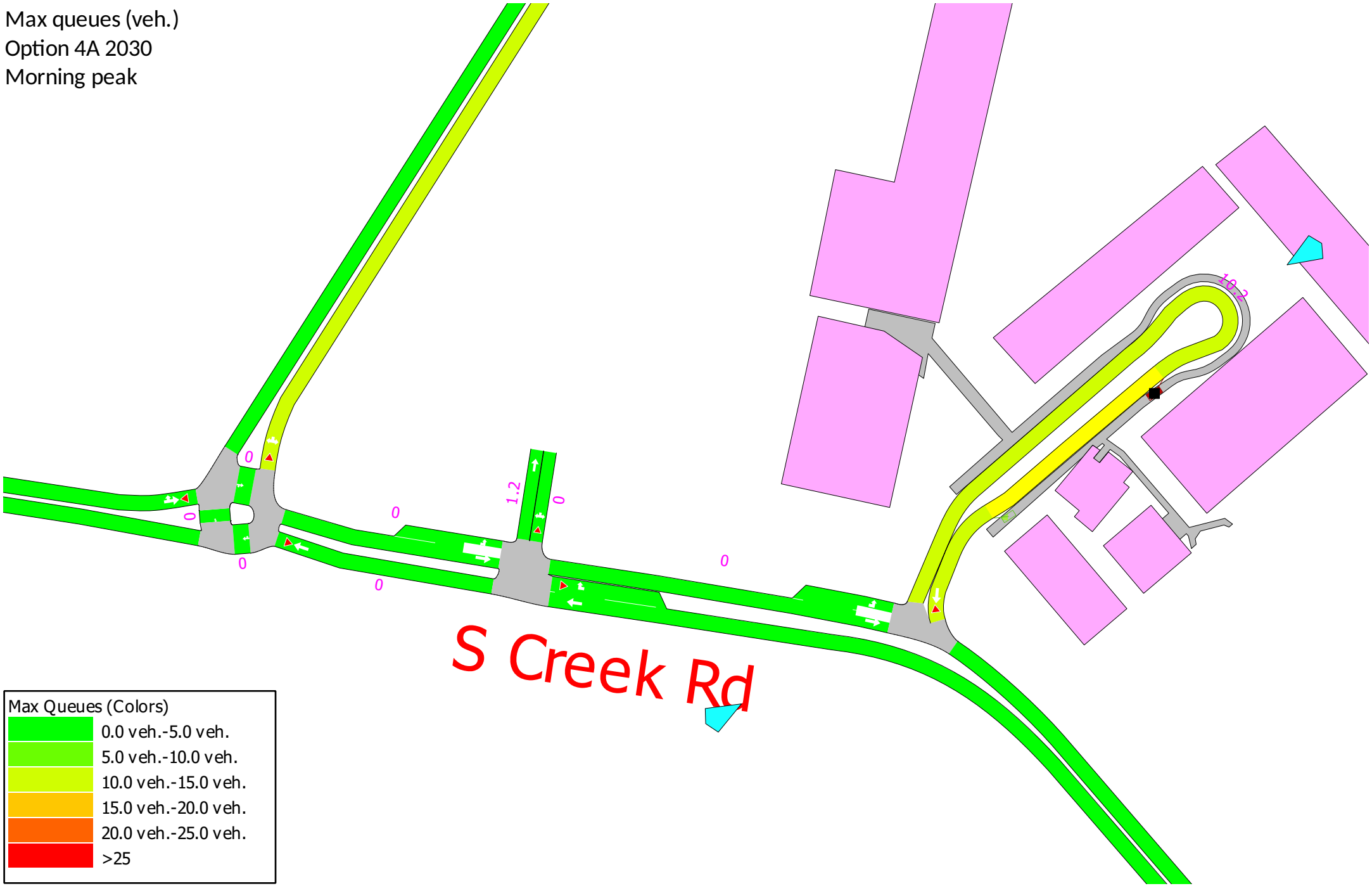

Flow (veh./h)
Option 4A 2020
Morning peak
643
434
39
560
1
339
535
223
353
S Creek Rd
Flow, veh/h
0-100
100-200
200-300
400-500
>500

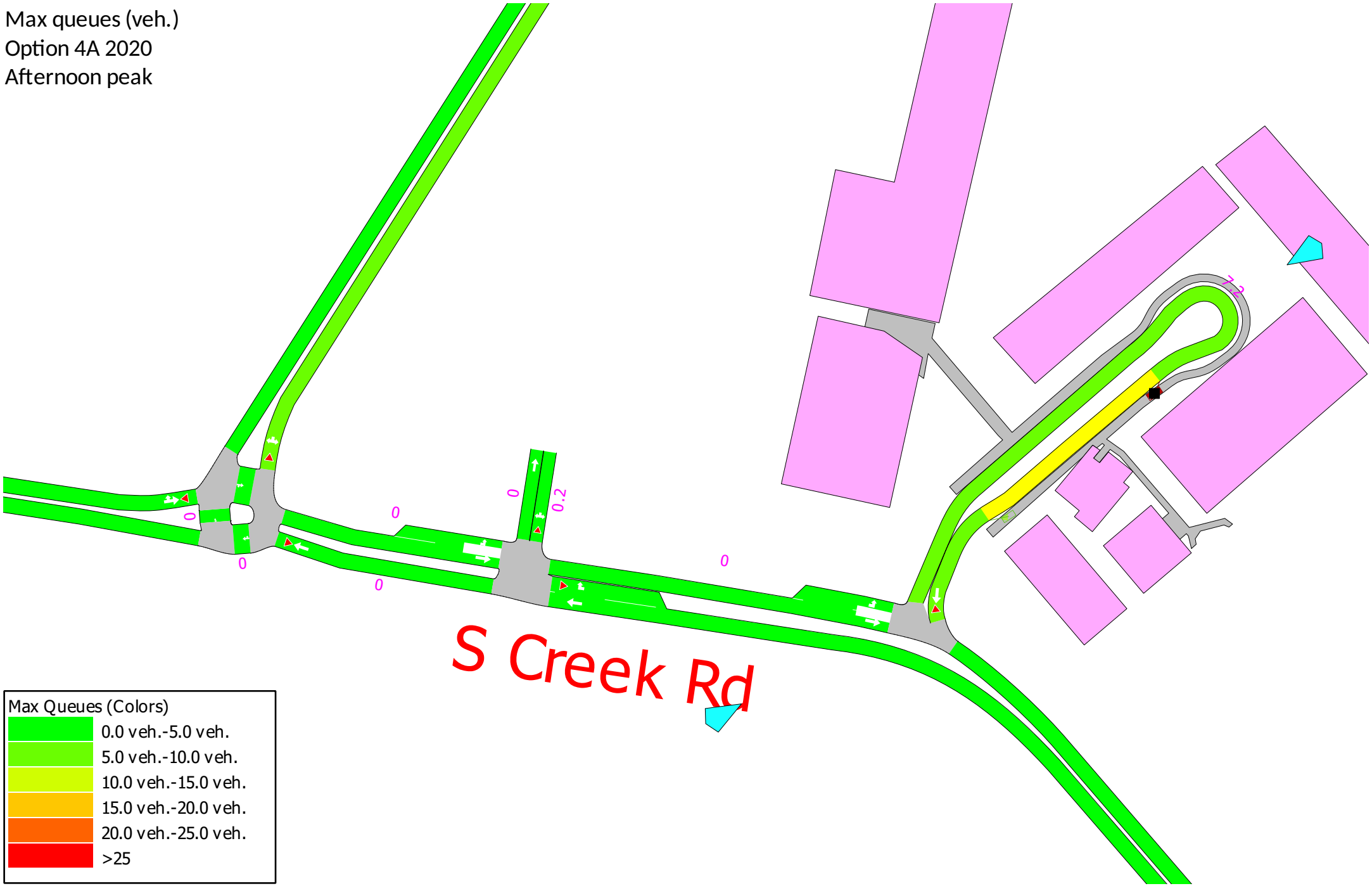

Flow (veh./h)
Option 4A 2030
Morning peak
706
482
26
619
2
382
606
266
390
S Creek Rd
Flow, veh/h
0-100
100-200
200-300
400-500
>500

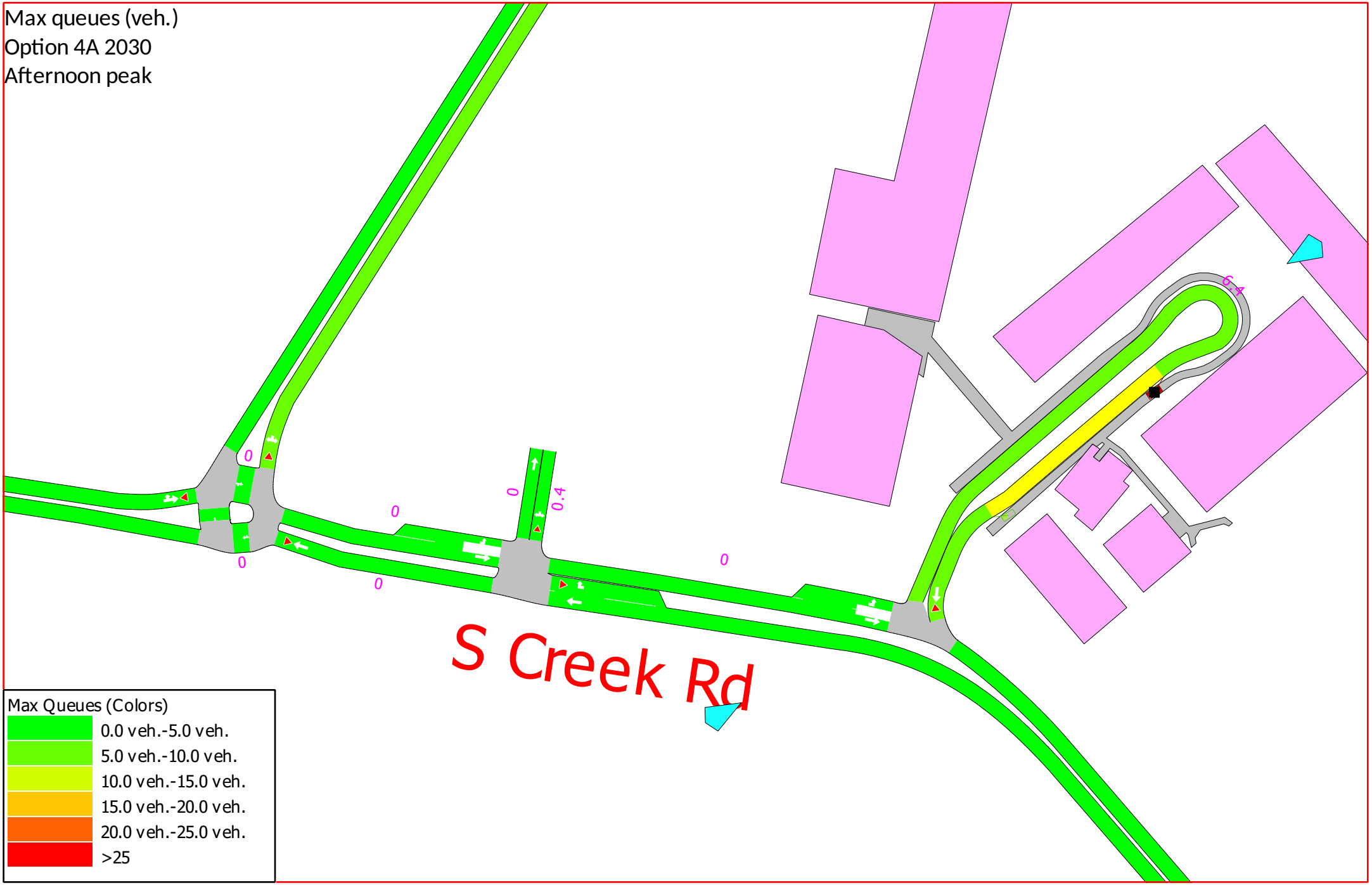

Flow (veh./h)
Option 4A 2020
Afternoon peak
532
422
471
1
395
395
475
164
S Creek Rd
Flow, veh/h
0-100
100-200
200-300
400-500
>500

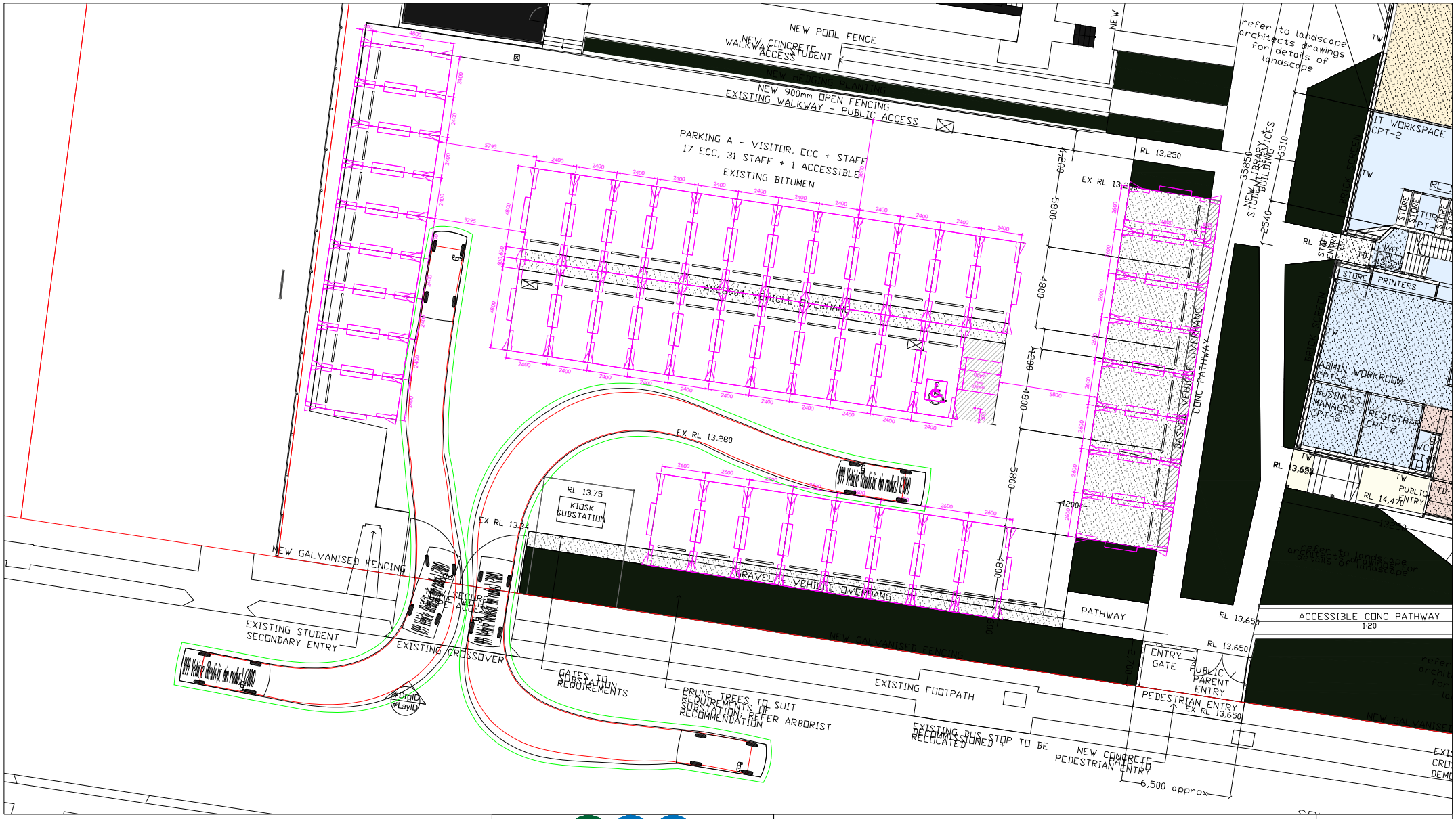

Flow (veh./h)
Option 4A 2030
Afternoon peak
472
574
521
1
401
405
522
179
S Creek Rd
Flow, veh/h
0-100
100-200
200-300
400-500
>500


Max queues (veh.)
Option 4A 2020
Morning peak
0
0
0
0
1
0
0
0
2
S Creek Rd
Max Queues (Colors)
0.0 veh.-5.0 veh.
5.0 veh.-10.0 veh.
10.0 veh.-15.0 veh.
15.0 veh.-20.0 veh.
20.0 veh.-25.0 veh.
>25

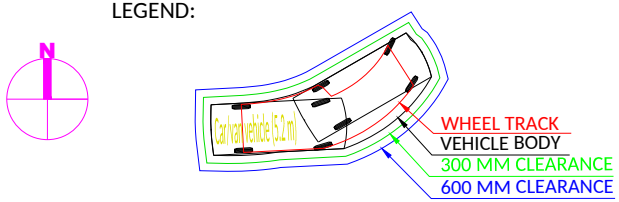

Max queues (veh.)
Option 4A 2030
Morning peak
0
0
0
1.2
0
0
0
10.2
S Creek Rd
Max Queues (Colors)
0.0 veh.-5.0 veh.
5.0 veh.-10.0 veh.
10.0 veh.-15.0 veh.
15.0 veh.-20.0 veh.
20.0 veh.-25.0 veh.
>25


Max queues (veh.)
Option 4A 2020
Afternoon peak
0
0
0
0
0
0.2
0.2
S Creek Rd
Max Queues (Colors)
0.0 veh.-5.0 veh.
5.0 veh.-10.0 veh.
10.0 veh.-15.0 veh.
15.0 veh.-20.0 veh.
20.0 veh.-25.0 veh.
>25


Max queues (veh.)
Option 4A 2030
Afternoon peak
0
0
0
0
0
0.4
0.4
S Creek Rd
Max Queues (Colors)
0.0 veh.-5.0 veh.
5.0 veh.-10.0 veh.
10.0 veh.-15.0 veh.
15.0 veh.-20.0 veh.
20.0 veh.-25.0 veh.
>25



LEGEND:



TEF CONSULTING

Dwg No 19051/01	Rev. A	30/10/2019

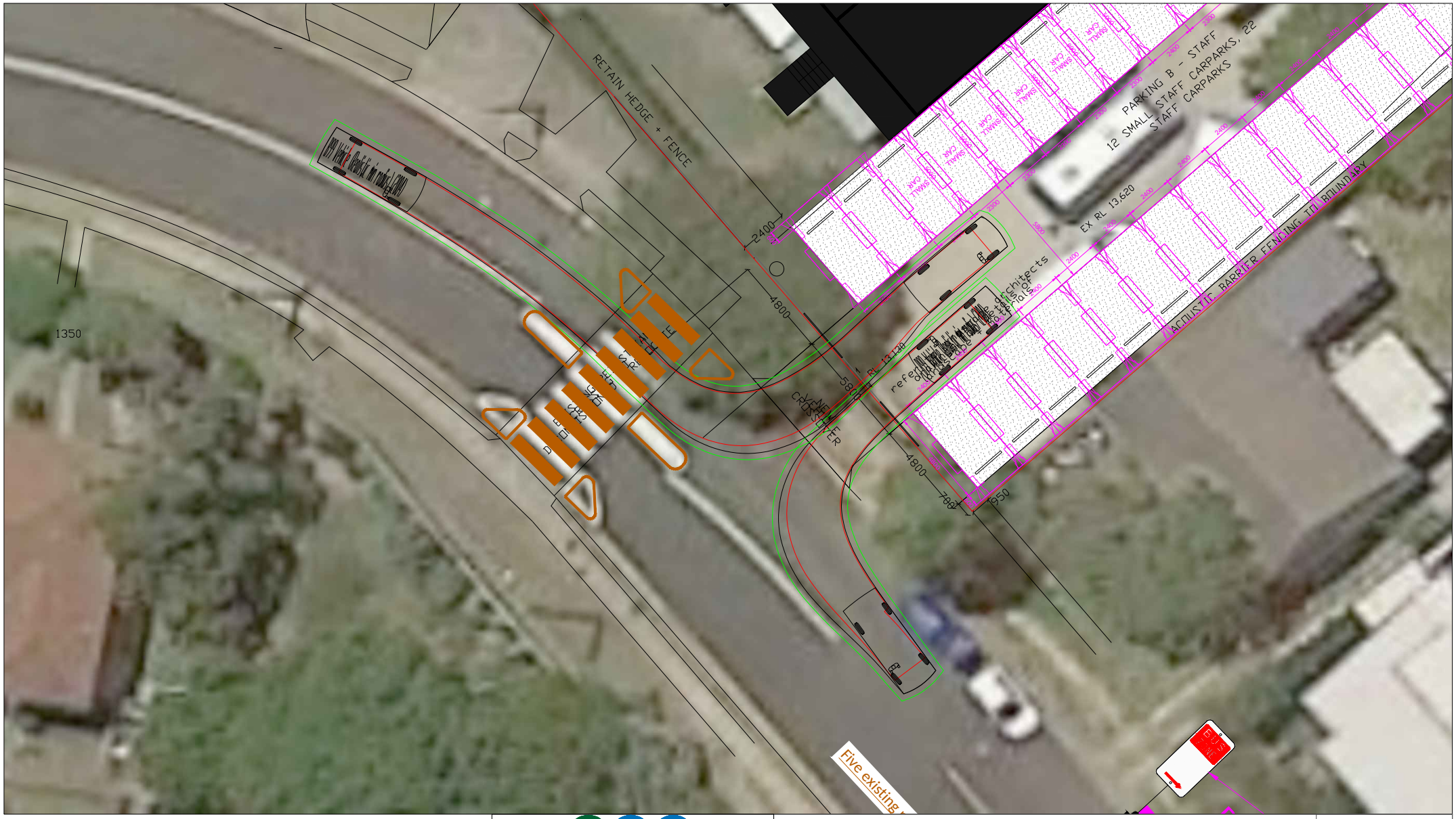
Client:
Neeson Murcutt

Pittwater House School

SCALE 1:300@A4

Proposed car park layout
Design checks as per AS/NZS 2890.1:2004, AS 2890.2-2002 and AS/NZS 2890.6:2009

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



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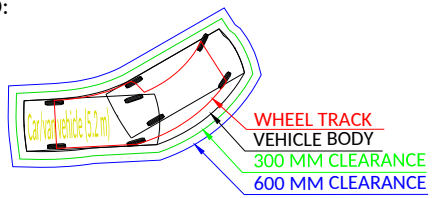


CONSULTING

Dwg No 19051/02	Rev. A	30/10/2019

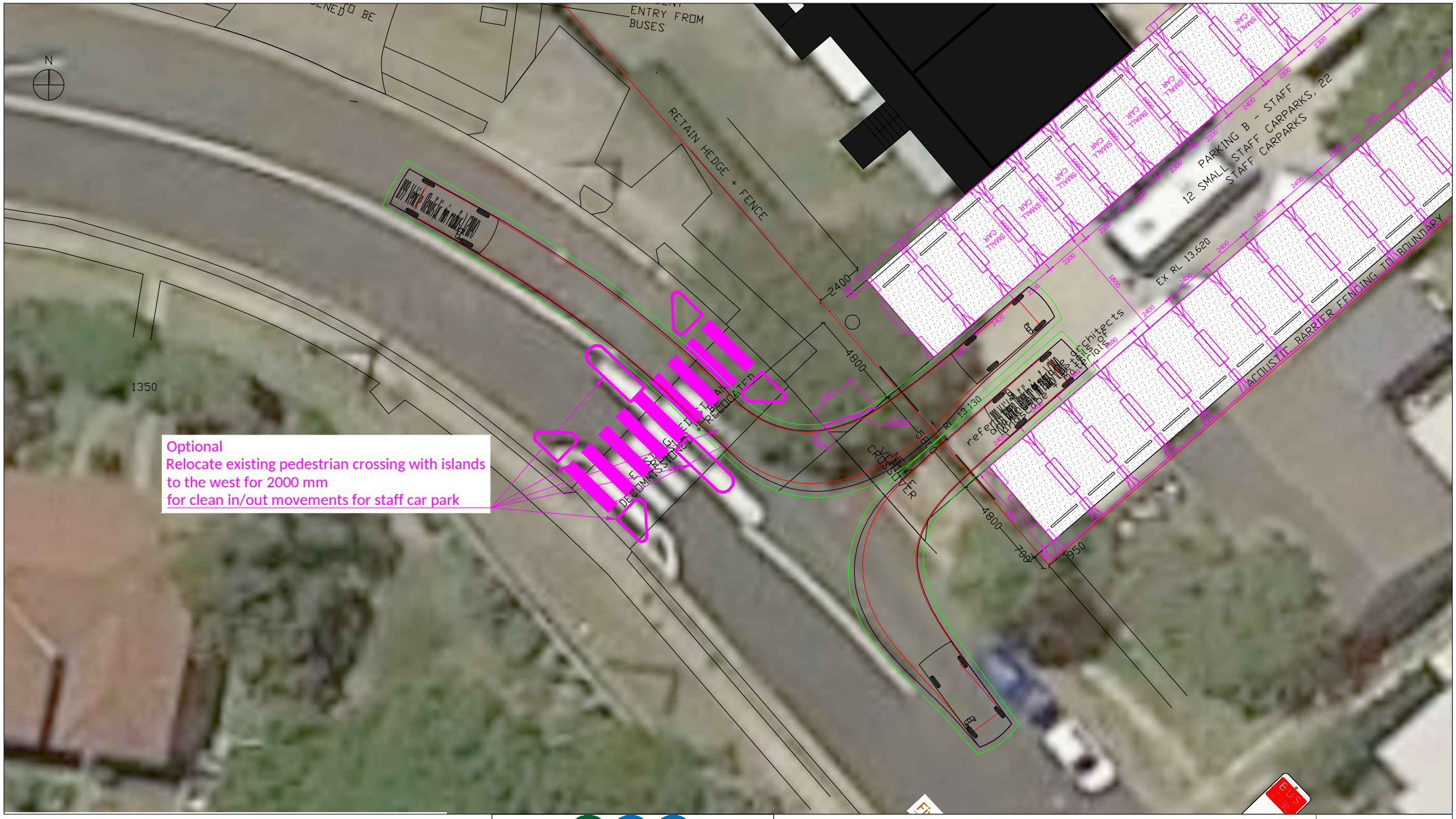
Client:
Neeson Murcutt

Pittwater House School

SCALE 1:250@A4

Proposed car park layout
Design checks as per AS/NZS 2890.1:2004, AS 2890.2-2002 and AS/NZS 2890.6:2009

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



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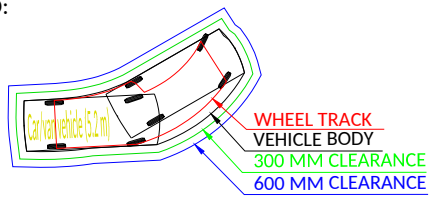

CONSULTING

Dwg No 19051/03	Rev. A	30/10/2019

Client:
Neeson Murcutt

Pittwater House School

SCALE 1:250@A4

Proposed car park layout
Design checks as per AS/NZS 2890.1:2004, AS 2890.2-2002 and AS/NZS 2890.6:2009

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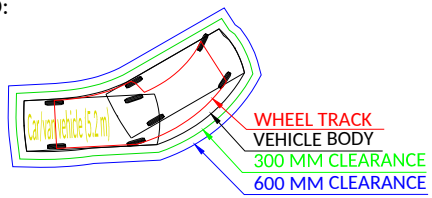
LEGEND:



TEF CONSULTING

Dwg No 19051/04	Rev. A	30/10/2019

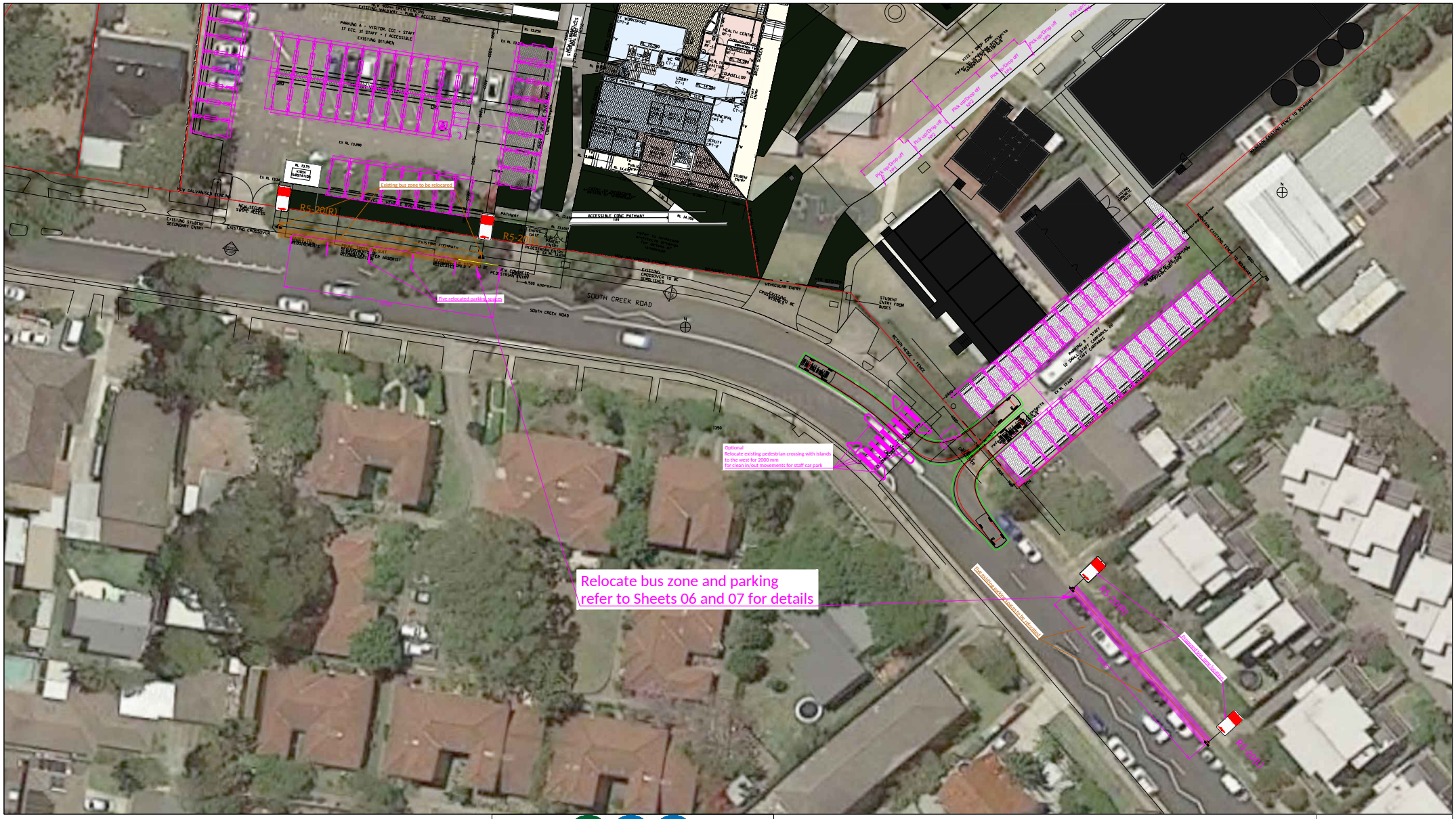
Client:
Neeson Murcutt

Pittwater House School

SCALE 1:400@A4

Proposed drop-off / pick-up area

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



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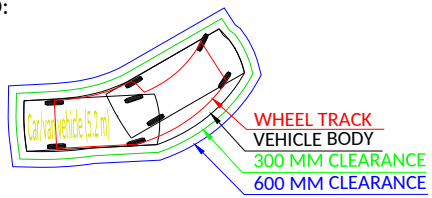


TEF CONSULTING

Dwg No 19051/05	Rev. A	30/10/2019

Client:
Neeson Murcutt

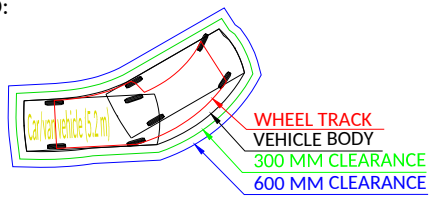
Pittwater House School

SCALE 1:750@A4

Proposed relocation of the bus zone

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au

LEGEND:



TEF CONSULTING

Dwg No 19051/06	Rev. A	30/10/2019

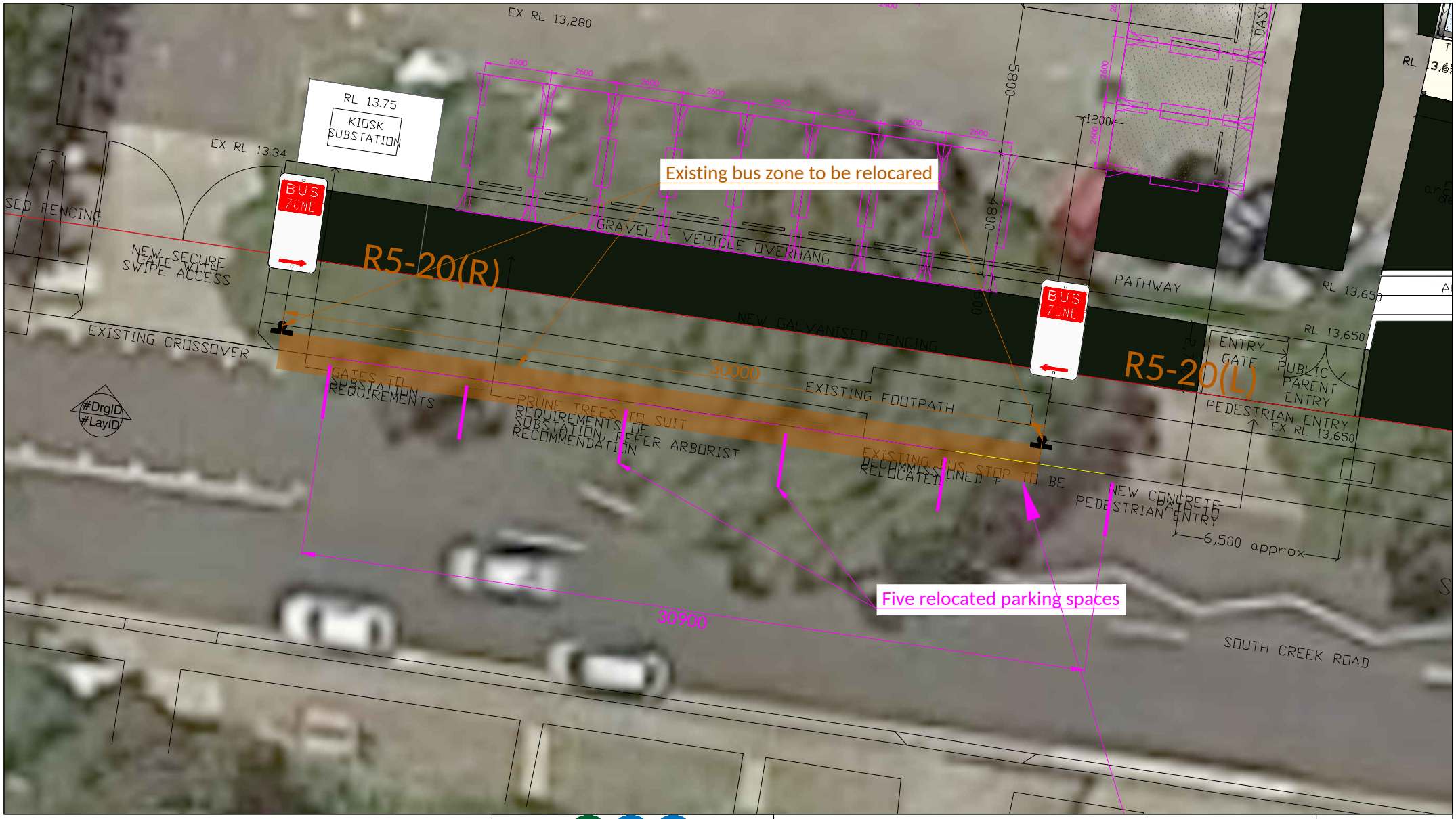
Client:
Neeson Murcutt

Pittwater House School

SCALE 1:300@A4

Proposed new bus zone

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



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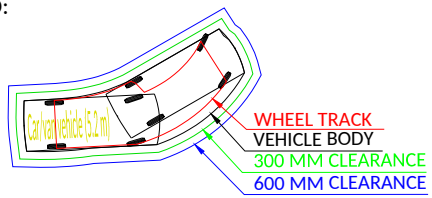


TEF CONSULTING

Dwg No 19051/07	Rev. A	30/10/2019

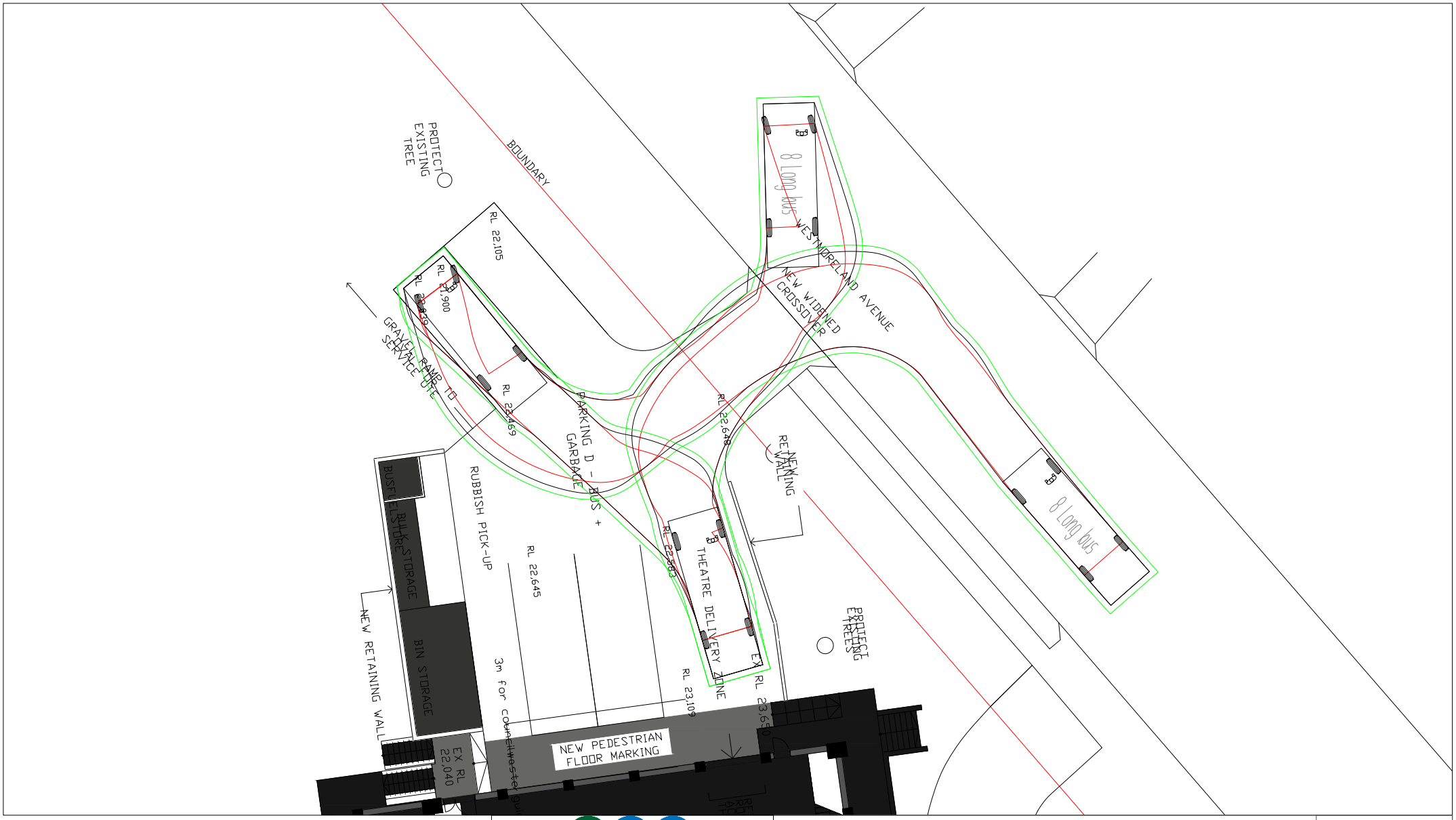
Client:
Neeson Murcutt

Pittwater House School

SCALE 1:200@A4

Proposed car parking to compensate for the loss at the proposed new bus zone location

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



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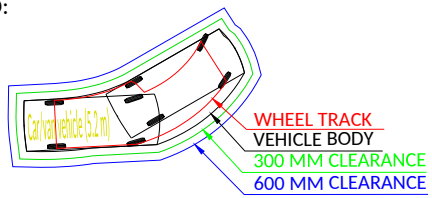


TEF CONSULTING

Dwg No 19051/08 | Rev. A | 28/10/2019

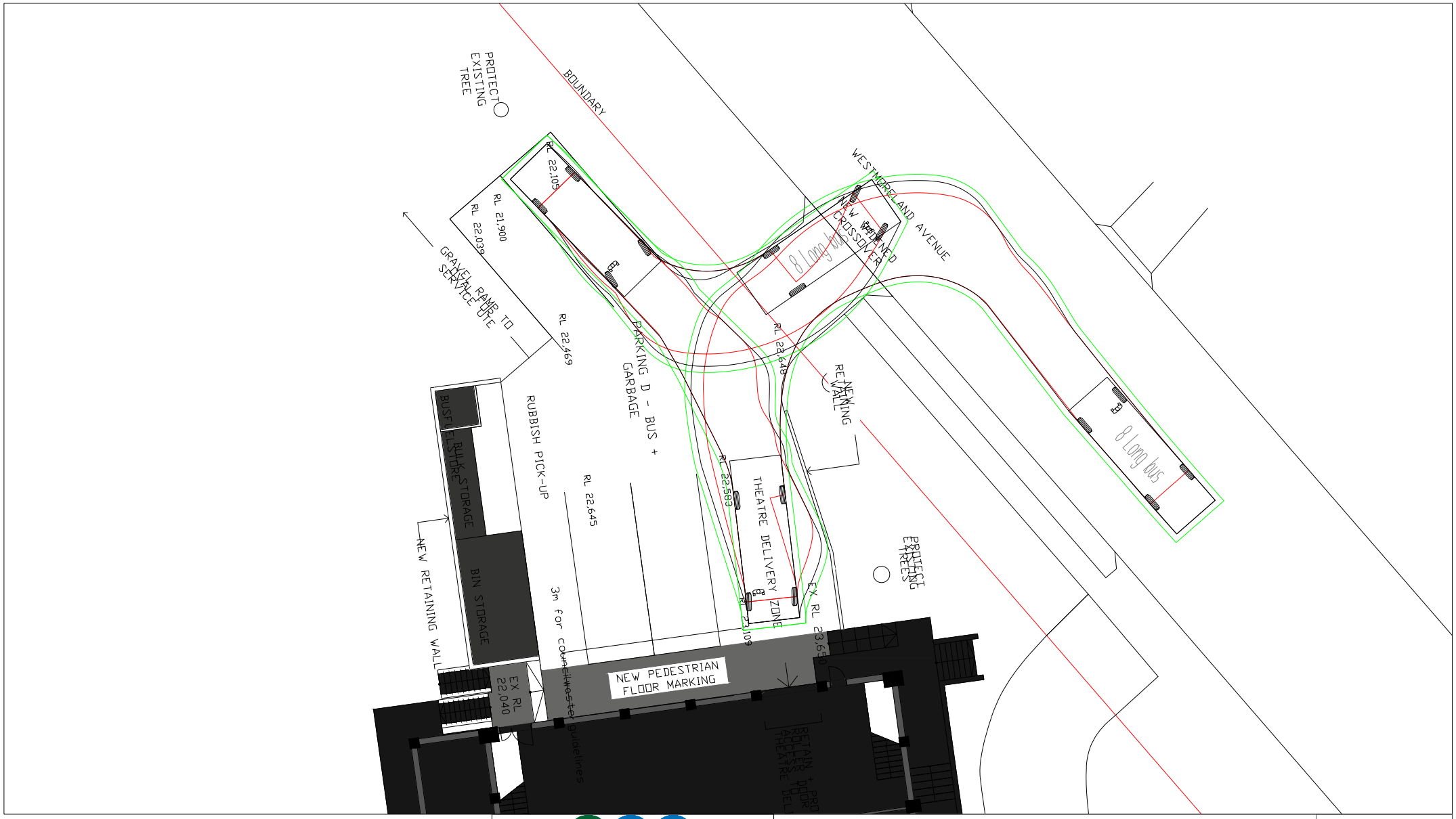
Client:
Neeson Murcutt

Pittwater House School

SCALE 1:250@A4

Proposed car park layout
Bus terminal

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



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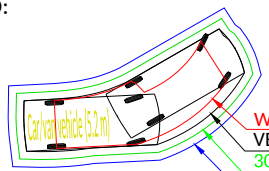


TEF CONSULTING

Dwg No 19051/09 | Rev. A | 28/10/2019

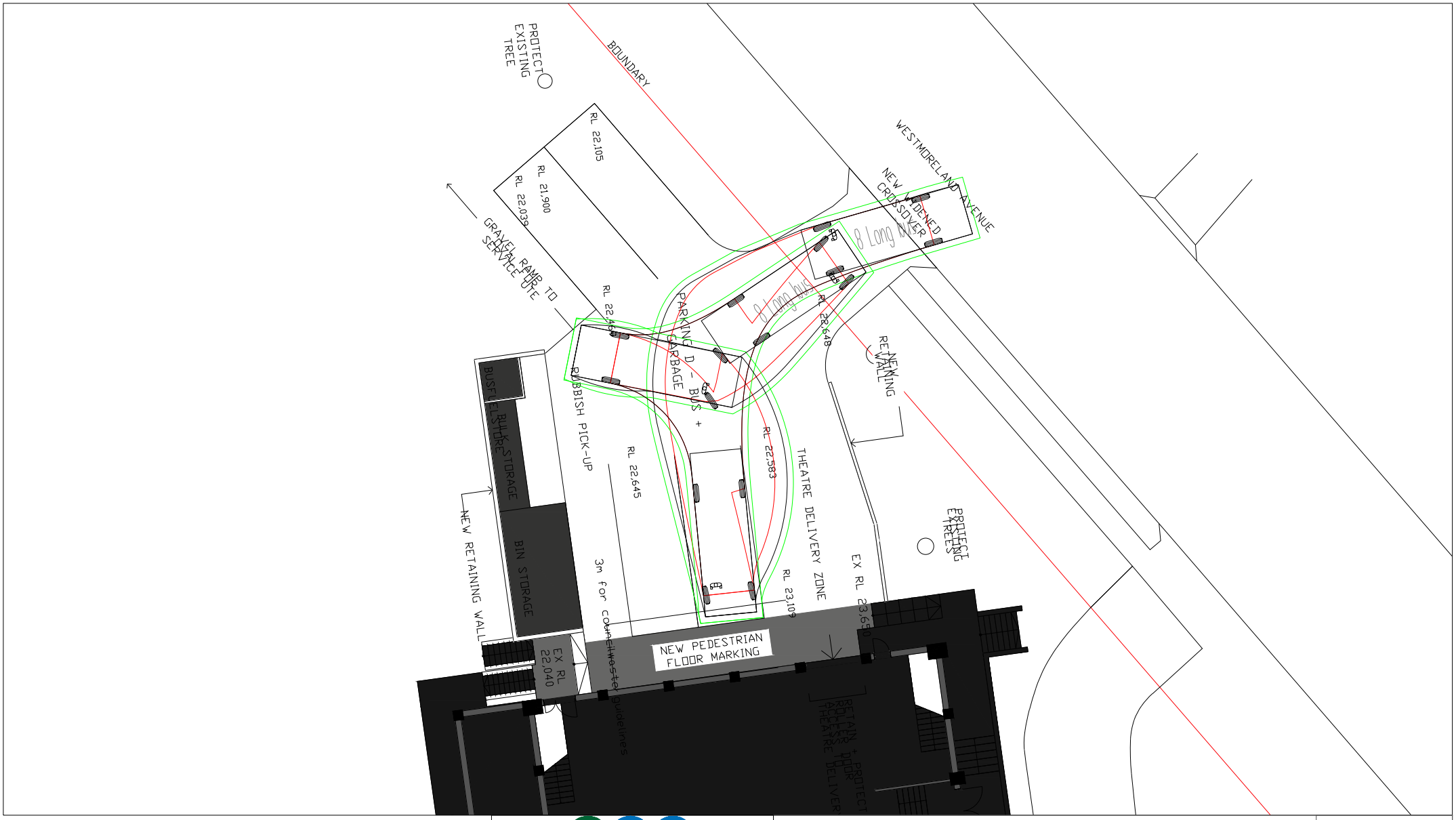
Client:
Neeson Murcutt

Pittwater House School

SCALE 1:250@A4

Proposed car park layout
Bus terminal

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



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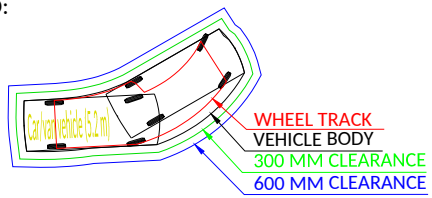


CONSULTING

Dwg No 19051/10 | Rev. A | 28/10/2019

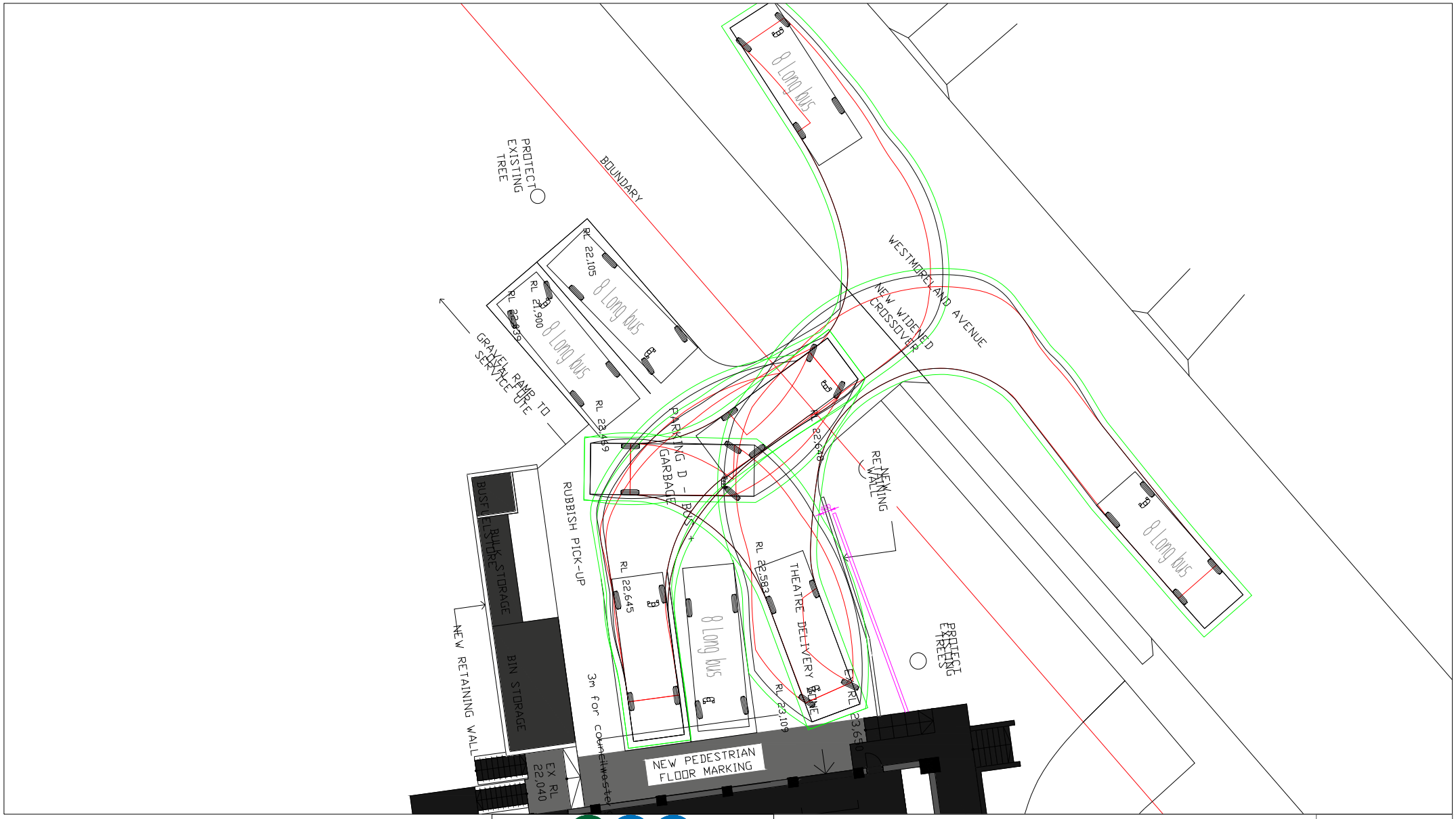
Client:
Neeson Murcutt

Pittwater House School

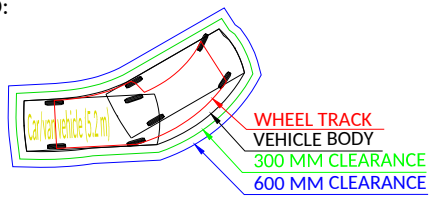
SCALE 1:250@A4

Proposed car park layout
Bus terminal

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



LEGEND:



TEF CONSULTING

Dwg No 19051/11	Rev. A	28/10/2019

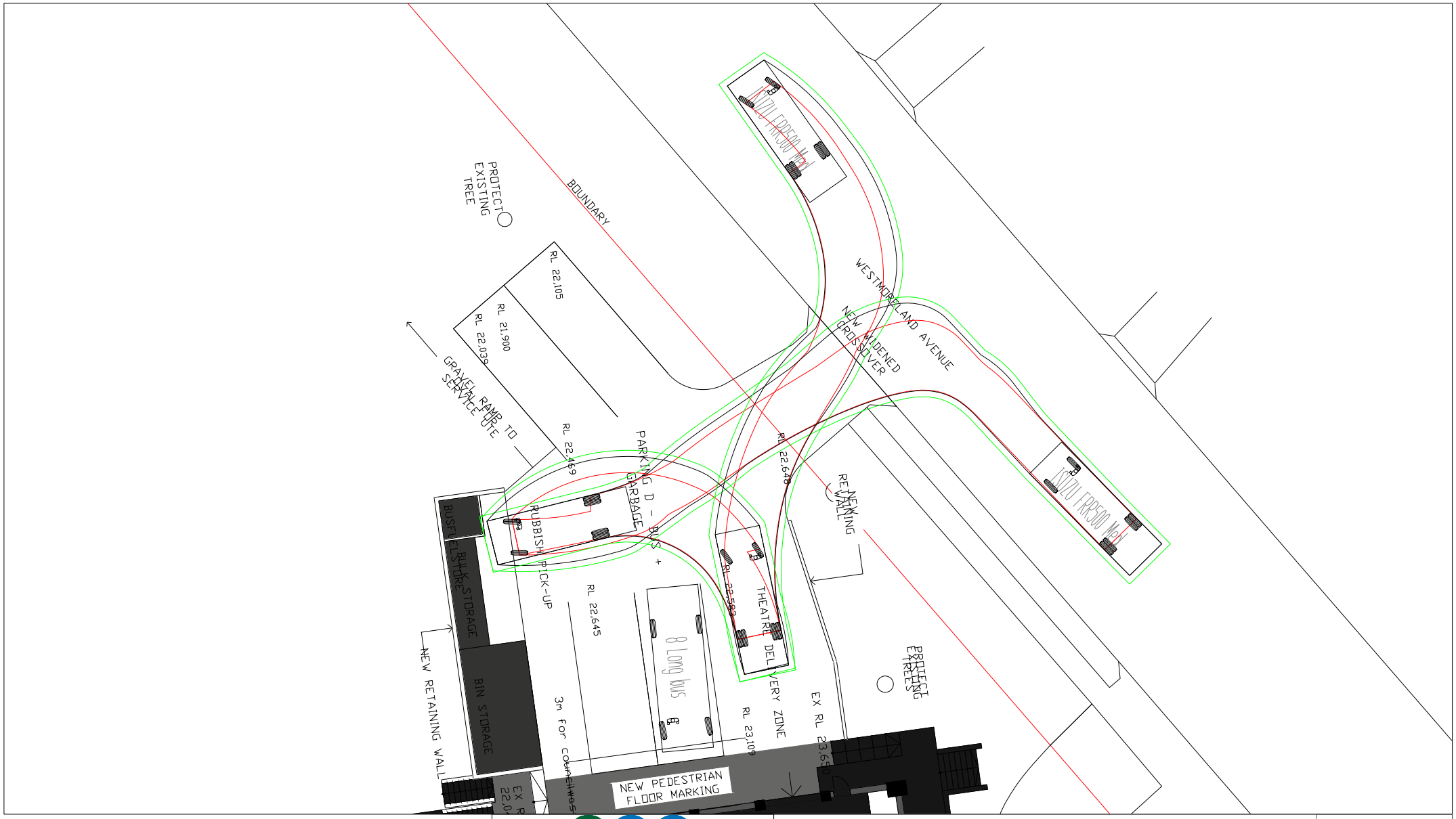
Client:
Neeson Murcutt

Pittwater House School

SCALE 1:250@A4

Proposed car park layout
Bus terminal

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



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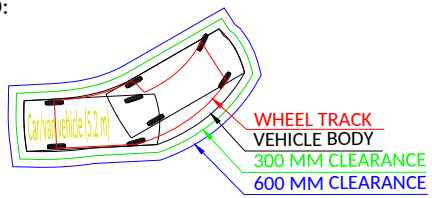


TEF CONSULTING

Dwg No 19051/12	Rev. A	28/10/2019

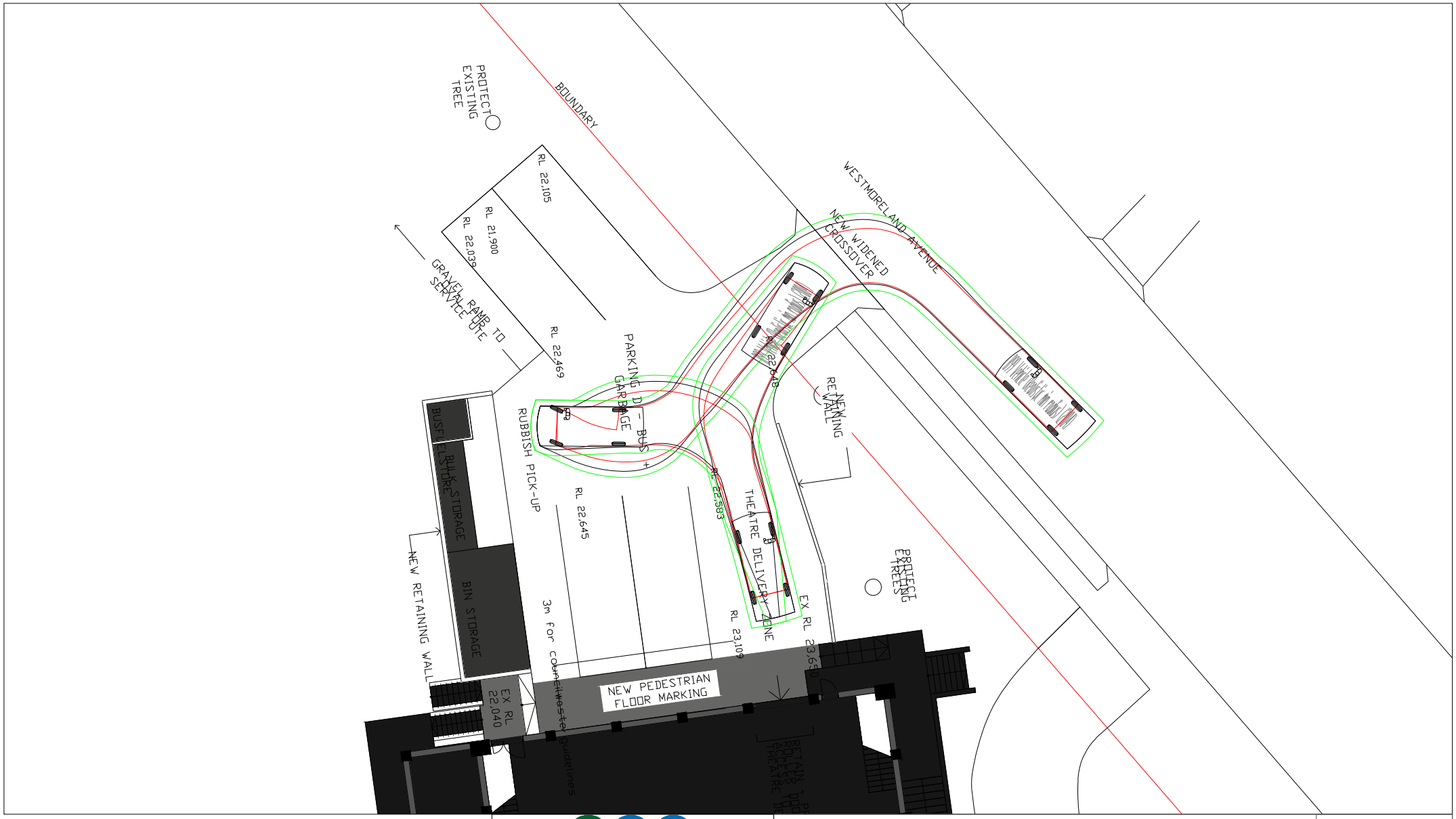
Client:
Neeson Murcutt

Pittwater House School

SCALE 1:250@A4

Proposed car park layout
Bus terminal

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au



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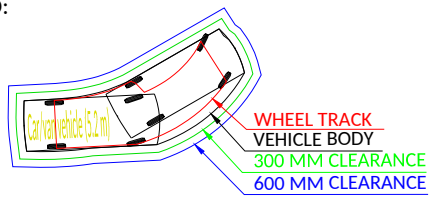

CONSULTING

Dwg No 19051/13 | Rev. A | 28/10/2019

Client:
Neeson Murcutt

Pittwater House School

SCALE 1:250@A4

Proposed car park layout
Bus terminal

PO Box 215 Bondi NSW 2026 | ph:+61 (0)2 9332 2024 | fax: +61 (0)2 9332 2022 | mob: +61 (0)414 978 067 | email: o.s@tefconsult.com.au | www.tefconsult.com.au