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Wellington 6141

TDG Ref: 12834.001
27 February 2015

Issued via email: alistair@urbanp.co.nz

Attention: Alistair Aburn

Dear Alistair

North Kumutoto Precinct Project
Response to WCC Request for Further Information

Council's Request dated 5 February 2015 seeks further information and clarification on a number of urban design, traffic and related matters.

Items 10 through 24 relate to Traffic and Parking, each of which were discussed with Council's transport network manager, Mr Soon Kong, on 10 February. This response has been informed by discussions at that meeting.

This report addresses each item in turn, and is supported by accompanying plans. For ease of reference, the same numbering convention is used.

10 *Please provide full details of the intersections (and approaches) and the pedestrian crossing facilities across Customhouse Quay, north of Whitmore Street. These details should include lane widths, dimensions and turning paths and other relevant details which assist in their operation*.

Appendix A includes a scaled plan with dimensions (refer Drawing number 1.045 prepared by Isthmus).

Appendix A also includes a separate plan illustrating the tracking paths of a standard 8m truck, as defined by the District Plan, turning to and from Customhouse Quay (refer Figure 8 prepared by TDG).

11. *Please clarify whether the new footpath to be provided alongside Site 9 (between the Whitmore Street gates and Waring Taylor Street) will be within legal road or within a private site (please indicate the site boundary of the proposed plan*).

Appendix B includes two plans with dimensions showing the intended footpath arrangements along Customhouse Quay, and also showing the property boundary (refer Drawing Numbers 1.044 and 1.046 prepared by Isthmus).

As confirmed at the 10 February meeting, the proposed arrangements do not intend any changes to the existing kerblines of Customhouse Quay past sites 9 and 10, except where required to form the new Whitmore Street entrance.

12. *Please provide details of the proposed modifications to the traffic lanes along Customhouse Quay (see Figure 3 of the Traffic Report by TDG). This should include the lane width(s), footpath width, truck turning paths and other relevant details which assist in its function.*

Figure 3 of TDG's September 2014 Transportation Assessment Report included duplicate lane markings on Customhouse Quay. The proposal does not intend any changes to the existing traffic lanes and markings, and Figure 3 has been cleaned and a fresh drawing included in Appendix C.

13. *Please provide Traffic Engineering advice on how pedestrian safety (and that of other users) will be maintained through the use of the 'shared space'. Please explain how speed will be controlled, detail any distinguishing features (surface treatment, speedbumps etc).*

The new Kumutoto laneway is proposed with treatments and outcomes consistent with the existing southern portion of the laneway, including raised platforms to define the Whitmore Plaza and the Wool Store Plaza, and banded areas of asphalt and concrete paving.

The same principles of shared spaces that exist in Kumutoto Lane (south) and elsewhere on the waterfront are proposed in this instance.

The concept is well established. There are numerous situations where pedestrians co-exist with vehicles, without the need to demarcate space for different users.

As illustrated by the series of photographs below, there are examples alongside Shed 6, at the Brandon Street access to the TSB Arena carpark, and around Herd Street, including the similar ramp connections to the basement carparks servicing the Chaffers Dock Apartments and the Clyde Quay Wharf Apartments where pedestrians and vehicles currently share the space safely.

Lane alongside Shed 6

Brandon Street shared area

Clyde Quay Wharf shared area

Herd Street shared area

For the most part, and as proposed for North Kumutoto, these areas use variations in paving and/or street furniture, rather than traditional traffic signs and markings, to provide sufficient cues to pedestrians and drivers, while maintaining a predominantly pedestrian environment.

Vehicle speeds will be slow, and with low vehicle volumes, priority can be shared and users can make way for one another, in the manner illustrated by these examples.

14. *Please provide details of the input data, phase timing and output etc, used for the traffic modelling presented. Council Traffic Advisors wish to review this material.*

A summary of the performance of the existing and changed Whitmore Street intersection is included at Tables 5 and 6 of the September 2014 Transportation Assessment Report, for the two-way and one-way lane configurations respectively. Six scenarios are included in each instance, covering the AM, PM and Saturday peaks and the existing (Ex) and future (Fut) configurations.

Appendix D1 includes summaries of the SIDRA data for the two-way lane configuration.

Appendix D2 includes scenarios of the SIDRA data for the one-way lane configuration.

15. *Please provide details of how any parallel movements from the adjoining Centreport Land will interact with the new shared access lane.*

There is no intention to provide two parallel roadways to the rear of Shed 21 and Site 10. Rather, the existing laneway will shift westwards to the positions shown on the application plans, and the existing laneway space within Centreport land will be demarcated from the new Kumutoto Lane with timber beams, and available for pedestrians and cyclists.

The proposed arrangements are shown by the cross-sections included in Appendix E (refer Drawing Number 2.056 prepared by Isthmus).

16. *Please provide details of the altered car park layout for Site 9 (including any subsequent hard/soft landscaping changes).*

Drawing Number 1.046 prepared by Isthmus and included in Appendix B is a scaled plan with dimensions showing the carpark layout, including a stall depth of 4.4m, an overhang of 0.65m and an aisle width of 6.2m.

17. *Please explain what measures will be implemented to ensure that vehicles exiting the parking ramp will not compromise public safety. These could include measures to warn pedestrians along the building edge of exiting vehicles (via an audible and/or visual system), as well as signal controls for users of the one-way ramp for entry and exit*.

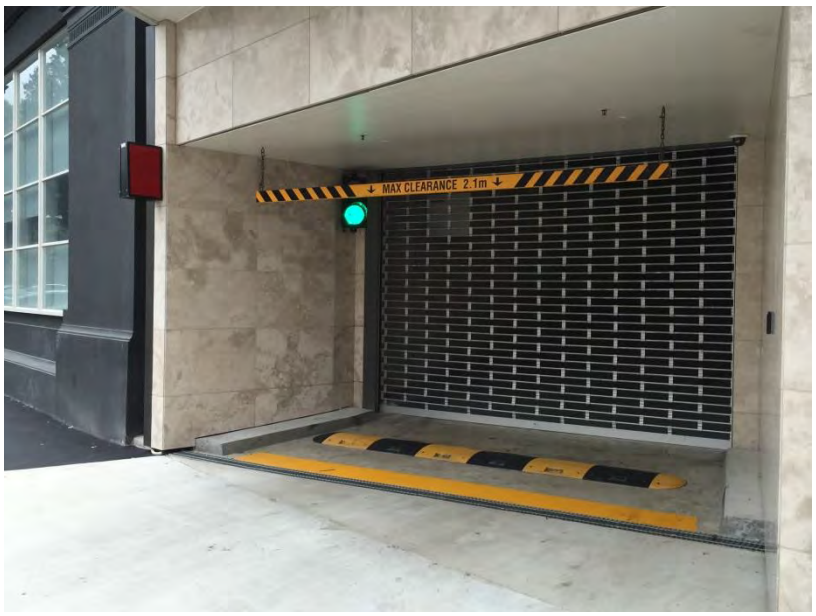
Note: Council's Traffic Advisor has suggested that speed bumps should be installed near the exit of the commercial building to ensure that this is a low-speed environment.

Following the 10 February meeting, a careful review has been undertaken of the carpark ramp, and an updated design developed that presents a safer interface with the Wool Store Plaza.

The developed design incorporates:

- sight triangles in the manner anticipated by the District Plan, presenting required intervisibility between exiting drivers and pedestrians;
- a flat (1:20) grade at the top of the ramp on which vehicles can wait momentarily before exiting the building, should drivers need to yield to pedestrians;
- a roller door that will function as a control point, with an audible sound when it opens and closes that will heighten the awareness of users in the area;
- a judder bar positioned just inside the roller door, that will present a slow control point for vehicles before exiting onto the Plaza space;
- an external electronic 'Car Coming' sign that will alert users of the Plaza when cars exit; and
- traffic signals to control inbound and outbound movements on the single – width ramp. These signals will rest in green for inbound vehicles.

These intended arrangements are very similar to the carpark ramp design at One Market Lane, as illustrated in the photo below, except that in that instance the ramp accesses the floors above.



Appendix F includes the relevant plans (refer SK_06-C and SK_05-D prepared by Athfield Architects).

Also included in Appendix F is a revised layout for the basement carpark (refer SK_02-D prepared by Athfield Architects). This revised layout avoids the previous awkward

arrangement of tandem carparks and presents a total of 62 parking spaces, being four less than the previously – proposed total of 66 spaces.

18. *Please provide tracking paths for larger service vehicles (semi-trailer and a large rigid truck) turning into and out of the intersection with the narrowing of the entry and exit at Customhouse Quay.*

As confirmed at the 10 February meeting, the area of North Kumutoto and its activities and buildings do not attract articulated trucks. Rather a standard 8m truck, as defined by the District Plan, is the appropriate design vehicle.

Such a truck is suitably representative of a standard 7.7m Type 2 Medium Pumper fire appliance and a 8.0m Type 3 Heavy Pumper fire appliance.

The tracking paths for an 8m standard truck turning into and out of the intersection were included earlier in response to Item 10.

19. *Please provide details of how the internal roading network is to be controlled, including interactions with users of Site 9.*

The intended arrangements are described above in response to Item 13.

20. *Please provide details of the width of the proposed public footpath adjoining Site 10.*

Appendix B, as described previously, includes the relevant plan confirming the proposed footpath widths.

21. *Please provide dimensions of the types of vehicles servicing this development (eg rubbish trucks, furniture removal). Please clarify whether all tenancies will have access to the servicing area and how any shared arrangement will be managed. Are there other servicing areas publicly available as an alternative space if the internal loading area is occupied?*

Note: It is likely that any service vehicle parked adjacent to the building will block the access lane and therefore, all servicing must be undertaken on-site.

Following the 10 February meeting, further consideration has been given to the design of the loading bay and the intended loading arrangements. With an available headroom of 3.34m, the internal loading bay will mostly suit cars, vans and small rigid trucks. Larger vehicles will use the inset bays within the laneway and a kerbside zone will be allocated for this purpose.

The arrangements will be very similar to the established loading practices associated with the Meridian Building.

The most frequent visits by larger trucks will be for the collection of waste. In the same manner as the Meridian Building, rubbish removal will be contracted to occur during 'midnight' hours.

Following the same principles as for the carpark ramp, the loading bay itself has been redesigned to add sight triangles in the manner shown by SK_06-C included in Appendix F.

A service corridor extends from the rear of the loading bay to provide direct access to the central lift core and the majority of tenancies. Other tenancies will be accessed from around the perimeter of the building.

22. *Please provide details on how users of the service dock will enter from, and exit onto the shared access lane safely (including tracking curves).*

The manoeuvres of a truck turning to and from the laneway (in both its two-way and one-way form) were illustrated by Figure 7 included in September 2014 Transportation Assessment Report. That diagram has been updated to reflect the new arrangements, and included as Figure 7A in Appendix G.

The arrangements show that driveway design changes will be needed in the event that a one-way lane is constructed.

23. *Please provide details of the proposed gradient(s) into the basement level.*

SK_05-D included earlier at Appendix F shows the updated carpark ramp, which has been designed with the following grades:

- a 1:8 transition from the basement carpark;
- a 1:4 central length;
- a 1:8 transition towards the top of the ramp; and
- a 1:20 flat section at the top in advance of vehicles exiting onto the Wool Store Plaza.

By way of example, the same grades exist on the carpark ramp for One Market Lane, except in that instance the flatter section at the bottom of the ramp on the approach to the footpath is graded at 1:12.

24. *Please provide details of how all required Emergency Service Vehicles will be able to continue using shared space (where required).*

With the laneway proposed to be designed with the same form as the existing southern laneway, as described earlier in response to Item 13, emergency services will be able to use the new northern laneway in the same manner.

Fire appliances will be able to access and egress the area via the new Whitmore Street entrance in the manner shown previously by the vehicle tracking diagrams included in Appendix A.

We trust this response and accompanying plans fully addresses the traffic and parking matters raised in Items 10 through 24.

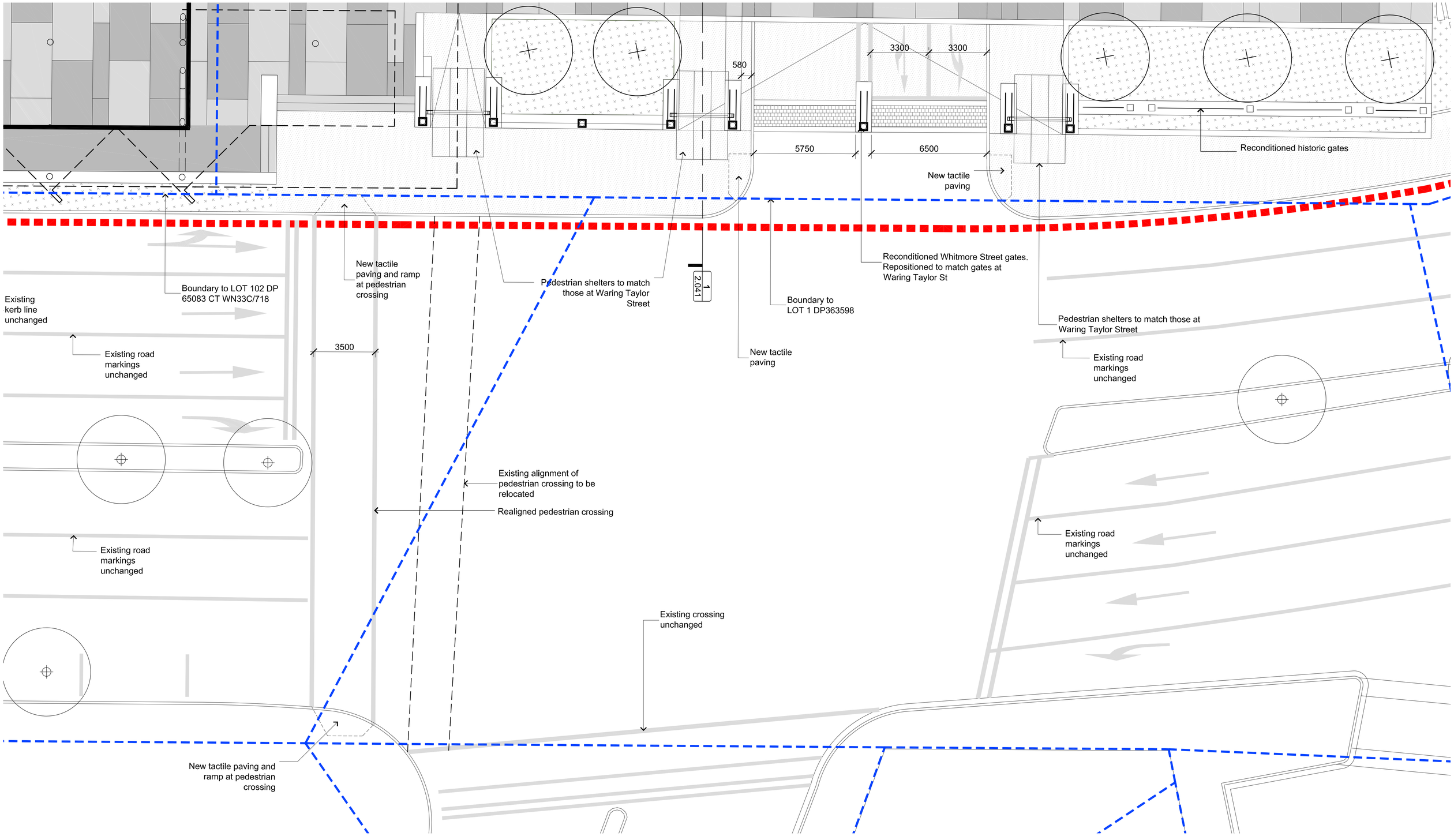
Yours sincerely
Traffic Design Group Ltd

Mark Georgeson
Director

mark.georgeson@tdg.co.nz

Appendix A

Plans Responding to Item 10



No.	Revision	By	Chk	Date
C	Text Updates	JP	DM	26.02.15
B	Text updates	JP	DM	24.02.15
A	For Resource Consent	JP	DM	20.02.15

isthmus
AKL 09 309 9442 | TGA 07 579 0487 | WTN 04 499 9832
www.isthmus.co.nz

Client: Wellington City Council

Scale: 1:100 @A1; 1:200 @A3

Drawing Title: Whitmore Plaza Intersection

Architect

Engineer

Job No.: 3158

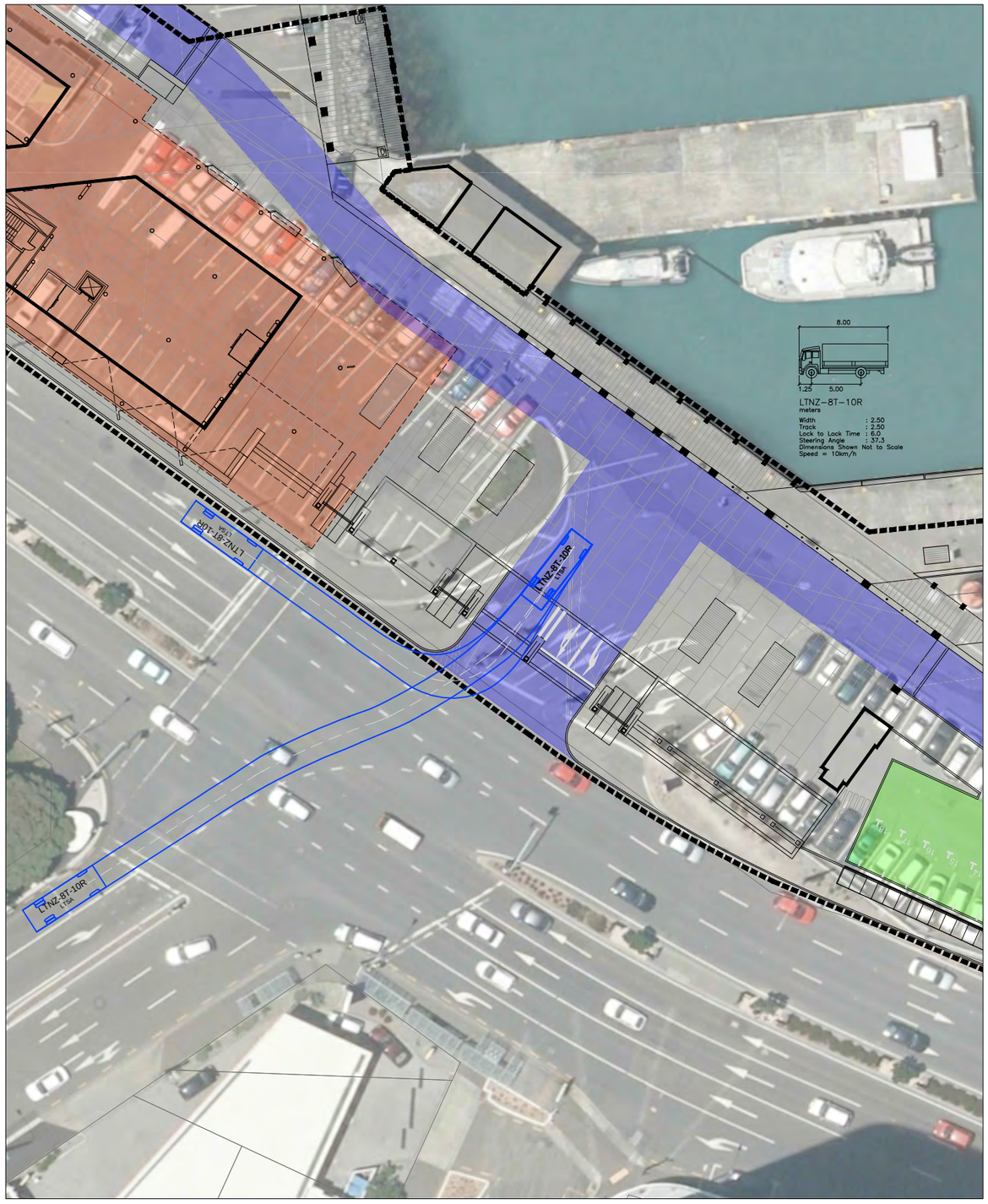
Drawing Number: 1.045

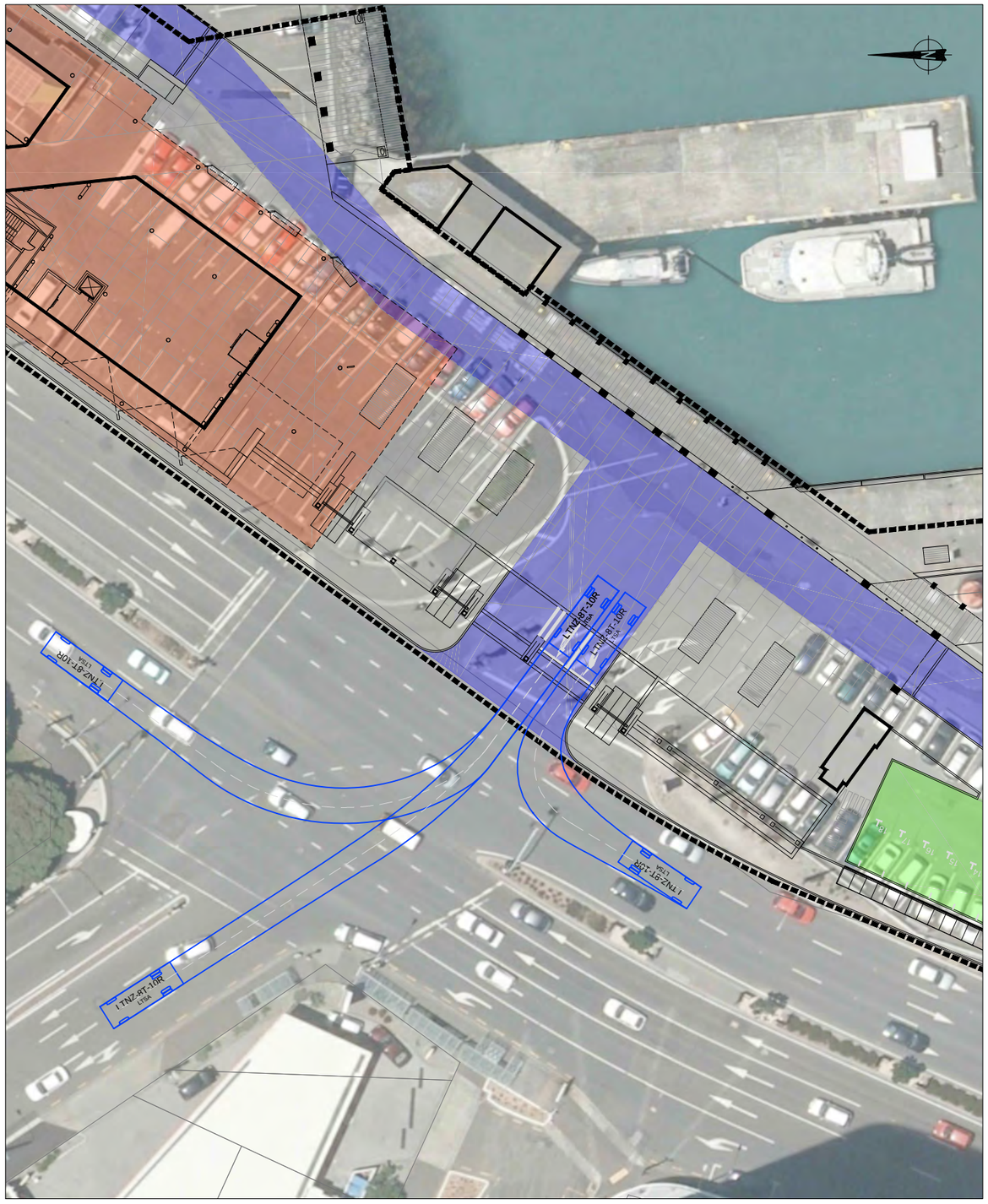
Revision: C

Job Name: North Kumutoto

North

Issued For: Resource Consent





Wednesday, 25 February 2015 0 20mm

REVISION	DATE	DESCRIPTION
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Kumutoto Precinct: Site 10 and Open Space Development

Intersection Tracking for Medium Rigid Truck

DRAWN: Quentin O'S
DATE: 25/02/2015
SCALE: 1:500 @ A3
DWG NO:12834W1A

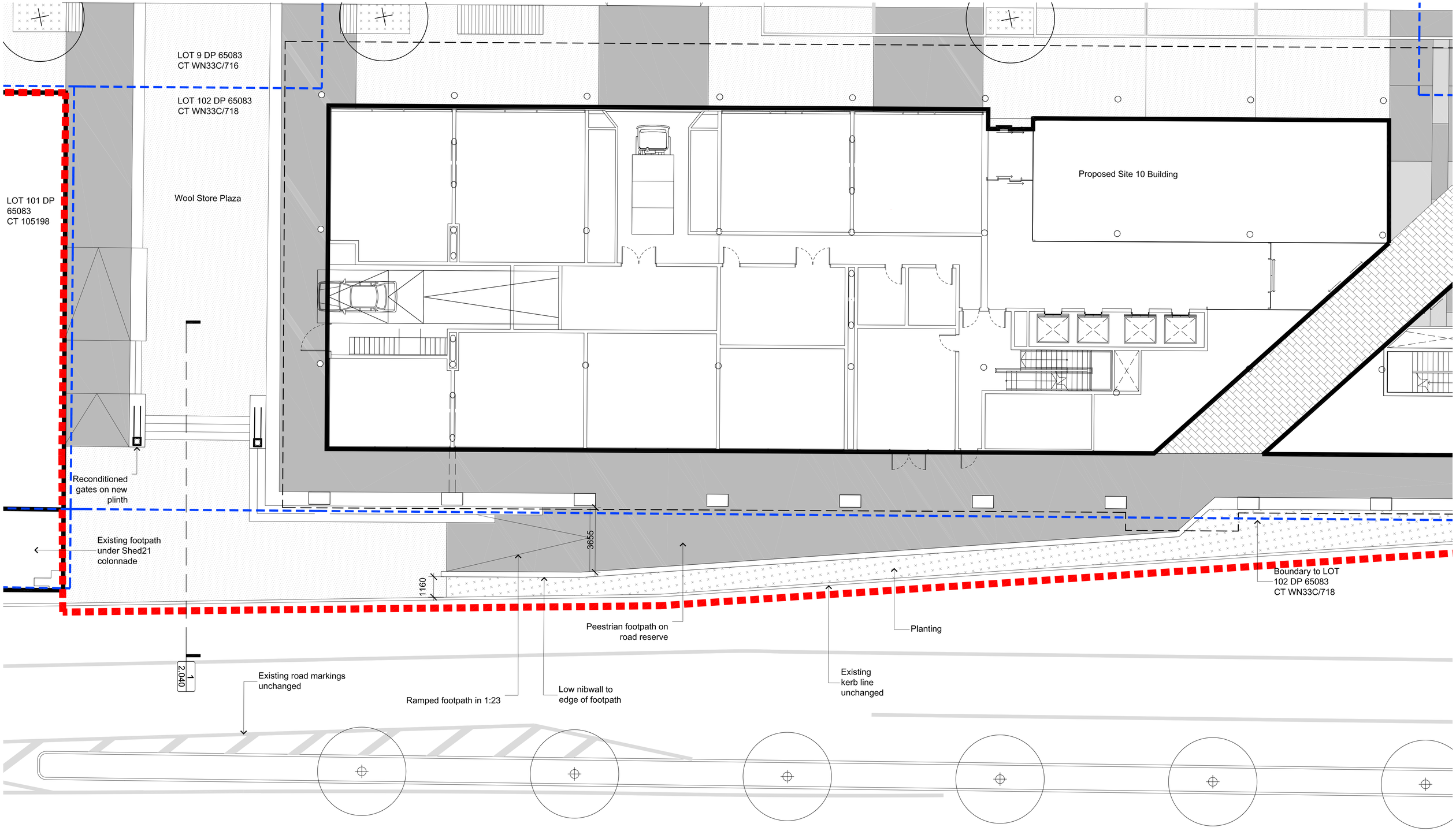
TDG

8

C:\12834.001\12834w1a.dwg

Appendix B

Plans Responding to Item 11



No.	Revision	By	Chk	Date
C	Text Updates	JP	DM	26.02.15
B	Text updates	JP	DM	24.02.15
A	For Resource Consent	JP	DM	20.02.15

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Client
Wellington City Council

Scale
1:100 @A1
1:200 @A3

Drawing Title
Woolstore Plaza

Architect

Engineer

Job No.
3158

Drawing Number
1.044

Revision
C

Job Name
North Kumutoto

North

Issued For
Resource Consent

+2.200

Boundary to LOT
1DP363598

600mmm wide 100mm high
kerb

Wharf edge extension

100mm high kerb

Temporary location of hstoric
toll booth within plaza to be
moved when site 9 is
developed

Vehicle entrance/exit over
footpath

Temporary Carpark

Timber warf beams

Existing Kumutoto
works

2.450

2.042

2.042

4427

6100

4400

6200

4400

1200

2600 TYP

46800

650

2050

1900

3350

Existing kerb
line to be
removed

2.044

New padestrian
footpath on road
reserve

New kerb and
channel

Pedestrian shelter

Reconditioned historic gates

Stepping Stones
in planting

Boundary to LOT 1DP363598

No.	Revision	By	Chk	Date
C	Text Updates	JP	DM	26.02.15
B	Text Updates	JP	DM	24.02.15
A	For Resource Consent	JP	DM	20.02.15

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AKL 09 309 9442 | **TGA** 07 579 0487 | **WTN** 04 499 9832
www.isthmus.co.nz

Client
Wellington City Council

Architect

Engineer

Scale
1:100 @A1
1:200 @A3

Drawing Title
Site 9
Car Park

Job No.
3158

Drawing Number
1.046

Revision
C

Job Name
North Kumutoto

North

Issued For
Resource Consent

Appendix C

Plan Responding to Item 12

Wednesday, 25 February 2015 0 20mm

REVISION	DATE	DESCRIPTION
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Kumutoto Precinct: Site 10 and Open Space Development

Proposed Site Layout

DRAWN: Quentin O'S
DATE: 25/02/2015
SCALE: 1:1000 @ A3
DWG NO:12834W1A

TDG

3

C:\12834.001\12834w1a.dwg

Appendix D1

Data Responding to Item 14
(Two-Way Lane Configuration)

MOVEMENT SUMMARY

Site: 12834 Whitmore St Ex AM

New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	582	2.0	0.886	42.8	LOS D	28.8	205.1	1.00	0.93	34.6
2	T1	1083	2.0	0.664	30.0	LOS C	15.1	107.8	0.94	0.81	40.3
Approach		1665	2.0	0.886	34.5	LOS C	28.8	205.1	0.96	0.85	38.1
East: WWL											
4	L2	14	0.0	0.081	47.6	LOS D	0.5	3.3	0.96	0.67	33.5
5	T1	19	0.0	0.081	42.0	LOS D	0.5	3.4	0.96	0.65	35.4
6	R2	12	0.0	0.088	47.7	LOS D	0.5	3.5	0.96	0.67	33.3
Approach		44	0.0	0.088	45.2	LOS D	0.5	3.5	0.96	0.66	34.2
North: Waterloo Quay											
7	L2	105	2.0	0.889	42.5	LOS D	29.3	208.4	1.00	0.95	36.4
8	T1	1699	2.0	0.889	36.9	LOS D	29.5	209.7	1.00	0.95	37.3
9	R2	66	2.0	0.880	106.0	LOS F	6.1	43.7	1.00	0.92	21.7
Approach		1871	2.0	0.889	39.7	LOS D	29.5	209.7	1.00	0.95	36.3
West: Whitmore St											
10	L2	86	2.0	0.341	27.2	LOS C	7.3	52.2	0.77	0.75	41.3
11	T1	53	2.0	0.341	21.6	LOS C	7.3	52.2	0.77	0.75	42.2
12	R2	312	2.0	0.341	27.3	LOS C	7.3	52.2	0.77	0.77	41.3
Approach		451	2.0	0.341	26.6	LOS C	7.3	52.2	0.77	0.76	41.4
All Vehicles		4031	2.0	0.889	36.1	LOS D	29.5	209.7	0.96	0.88	37.6

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	32.8	LOS D	0.1	0.1	0.88	0.88
P4	West Full Crossing	53	34.4	LOS D	0.1	0.1	0.90	0.90
All Pedestrians		105	33.6	LOS D			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Ex PM

New Site
Signals - Fixed Time Cycle Time = 160 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	525	2.0	0.866	41.0	LOS D	25.8	184.0	1.00	0.92	35.3
2	T1	1211	2.0	0.799	33.3	LOS C	18.1	129.2	0.99	0.88	38.9
Approach		1736	2.0	0.866	35.6	LOS D	25.8	184.0	1.00	0.89	37.7
East: WWL											
4	L2	48	0.0	0.207	46.1	LOS D	1.3	9.0	0.97	0.71	33.9
5	T1	40	0.0	0.207	40.5	LOS D	1.3	9.3	0.97	0.70	35.9
6	R2	40	0.0	0.287	46.6	LOS D	1.8	12.4	0.98	0.73	33.7
Approach		128	0.0	0.287	44.5	LOS D	1.8	12.4	0.97	0.71	34.4
North: Waterloo Quay											
7	L2	42	2.0	0.753	29.7	LOS C	18.8	134.0	0.94	0.83	41.9
8	T1	1512	2.0	0.753	23.8	LOS C	18.9	134.5	0.93	0.81	43.1
9	R2	108	2.0	0.861	95.6	LOS F	9.3	66.1	1.00	0.92	23.2
Approach		1662	2.0	0.861	28.7	LOS C	18.9	134.5	0.93	0.82	40.8
West: Whitmore St											
10	L2	343	2.0	0.632	30.9	LOS C	15.0	106.5	0.90	0.83	39.3
11	T1	42	2.0	0.632	25.3	LOS C	15.0	106.5	0.90	0.83	40.1
12	R2	126	2.0	0.208	27.0	LOS C	4.1	29.4	0.76	0.74	41.3
Approach		512	2.0	0.632	29.5	LOS C	15.0	106.5	0.87	0.81	39.8
All Vehicles		4038	1.9	0.866	32.3	LOS C	25.8	184.0	0.95	0.85	39.1

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	34.3	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	34.8	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		105	34.5	LOS D			0.92	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Ex Sat

New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	506	2.0	0.871	43.4	LOS D	24.7	176.1	1.00	0.92	34.5
2	T1	1576	2.0	0.910	46.3	LOS D	30.2	215.2	1.00	0.99	34.2
Approach		2082	2.0	0.910	45.6	LOS D	30.2	215.2	1.00	0.97	34.2
East: WWL											
4	L2	40	0.0	0.153	48.2	LOS D	0.9	6.2	0.97	0.70	33.0
5	T1	17	0.0	0.122	42.3	LOS D	0.7	5.2	0.97	0.67	35.6
6	R2	11	0.0	0.080	47.7	LOS D	0.5	3.2	0.96	0.67	33.3
Approach		67	0.0	0.153	46.6	LOS D	0.9	6.2	0.97	0.69	33.7
North: Waterloo Quay											
7	L2	52	2.0	0.667	28.2	LOS C	17.9	127.1	0.88	0.78	42.6
8	T1	1448	2.0	0.667	22.4	LOS C	17.9	127.7	0.87	0.77	43.8
9	R2	105	2.0	0.888	103.8	LOS F	9.7	69.1	1.00	0.94	22.0
Approach		1605	2.0	0.888	27.9	LOS C	17.9	127.7	0.88	0.78	41.1
West: Whitmore St											
10	L2	185	2.0	0.336	29.7	LOS C	6.7	47.6	0.81	0.78	39.7
11	T1	11	2.0	0.336	24.2	LOS C	6.7	47.6	0.81	0.78	40.5
12	R2	25	2.0	0.043	27.2	LOS C	0.8	5.5	0.72	0.68	41.1
Approach		221	2.0	0.336	29.2	LOS C	6.7	47.6	0.80	0.76	39.9
All Vehicles		3976	2.0	0.910	37.6	LOS D	30.2	215.2	0.94	0.88	37.0

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	36.0	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	33.3	LOS D	0.1	0.1	0.88	0.88
All Pedestrians		105	34.6	LOS D			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Fut AM

New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	582	2.0	0.886	42.8	LOS D	28.8	205.1	1.00	0.93	34.6
2	T1	1083	2.0	0.664	30.0	LOS C	15.1	107.8	0.94	0.81	40.3
Approach		1665	2.0	0.886	34.5	LOS C	28.8	205.1	0.96	0.85	38.1
East: WWL											
4	L2	14	0.0	0.165	48.2	LOS D	1.0	6.8	0.97	0.70	33.7
5	T1	19	0.0	0.165	42.7	LOS D	1.0	6.8	0.97	0.69	34.3
6	R2	12	0.0	0.165	48.2	LOS D	1.0	6.8	0.97	0.69	34.0
Approach		44	0.0	0.165	45.8	LOS D	1.0	6.8	0.97	0.69	34.1
North: Waterloo Quay											
7	L2	105	2.0	0.889	42.5	LOS D	29.3	208.4	1.00	0.95	36.4
8	T1	1699	2.0	0.889	36.9	LOS D	29.5	209.7	1.00	0.95	37.3
9	R2	66	2.0	0.880	106.0	LOS F	6.1	43.7	1.00	0.92	21.7
Approach		1871	2.0	0.889	39.7	LOS D	29.5	209.7	1.00	0.95	36.3
West: Whitmore St											
10	L2	86	2.0	0.341	27.2	LOS C	7.3	52.2	0.77	0.75	41.3
11	T1	53	2.0	0.341	21.6	LOS C	7.3	52.2	0.77	0.75	42.2
12	R2	312	2.0	0.341	27.3	LOS C	7.3	52.2	0.77	0.77	41.3
Approach		451	2.0	0.341	26.6	LOS C	7.3	52.2	0.77	0.76	41.4
All Vehicles		4031	2.0	0.889	36.1	LOS D	29.5	209.7	0.96	0.88	37.6

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	32.8	LOS D	0.1	0.1	0.88	0.88
P4	West Full Crossing	53	34.4	LOS D	0.1	0.1	0.90	0.90
All Pedestrians		105	33.6	LOS D			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Fut PM

New Site
Signals - Fixed Time Cycle Time = 160 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	525	2.0	0.866	41.0	LOS D	25.8	184.0	1.00	0.92	35.3
2	T1	1211	2.0	0.799	33.3	LOS C	18.1	129.2	0.99	0.88	38.9
Approach		1736	2.0	0.866	35.6	LOS D	25.8	184.0	1.00	0.89	37.7
East: WWL											
4	L2	48	0.0	0.454	47.3	LOS D	2.9	20.3	1.00	0.75	33.7
5	T1	40	0.0	0.454	41.7	LOS D	2.9	20.4	1.00	0.75	34.4
6	R2	40	0.0	0.454	47.3	LOS D	2.9	20.4	1.00	0.75	34.1
Approach		128	0.0	0.454	45.6	LOS D	2.9	20.4	1.00	0.75	34.1
North: Waterloo Quay											
7	L2	42	2.0	0.753	29.7	LOS C	18.8	134.0	0.94	0.83	41.9
8	T1	1512	2.0	0.753	23.8	LOS C	18.9	134.5	0.93	0.81	43.1
9	R2	108	2.0	0.861	95.6	LOS F	9.3	66.1	1.00	0.92	23.2
Approach		1662	2.0	0.861	28.7	LOS C	18.9	134.5	0.93	0.82	40.8
West: Whitmore St											
10	L2	343	2.0	0.632	30.9	LOS C	15.0	106.5	0.90	0.83	39.3
11	T1	42	2.0	0.632	25.3	LOS C	15.0	106.5	0.90	0.83	40.1
12	R2	126	2.0	0.208	27.0	LOS C	4.1	29.4	0.76	0.74	41.3
Approach		512	2.0	0.632	29.5	LOS C	15.0	106.5	0.87	0.81	39.8
All Vehicles		4038	1.9	0.866	32.3	LOS C	25.8	184.0	0.95	0.85	39.1

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	34.3	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	34.8	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		105	34.5	LOS D			0.92	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Fut Sat

New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	506	2.0	0.871	43.4	LOS D	24.7	176.1	1.00	0.92	34.5
2	T1	1576	2.0	0.910	46.3	LOS D	30.2	215.2	1.00	0.99	34.2
Approach		2082	2.0	0.910	45.6	LOS D	30.2	215.2	1.00	0.97	34.2
East: WWL											
4	L2	40	0.0	0.305	49.0	LOS D	1.8	12.6	0.98	0.73	32.7
5	T1	17	0.0	0.203	42.9	LOS D	1.2	8.5	0.97	0.70	34.6
6	R2	11	0.0	0.203	48.5	LOS D	1.2	8.5	0.97	0.70	34.2
Approach		67	0.0	0.305	47.4	LOS D	1.8	12.6	0.98	0.72	33.4
North: Waterloo Quay											
7	L2	52	2.0	0.667	28.2	LOS C	17.9	127.1	0.88	0.78	42.6
8	T1	1448	2.0	0.667	22.4	LOS C	17.9	127.7	0.87	0.77	43.8
9	R2	105	2.0	0.888	103.8	LOS F	9.7	69.1	1.00	0.94	22.0
Approach		1605	2.0	0.888	27.9	LOS C	17.9	127.7	0.88	0.78	41.1
West: Whitmore St											
10	L2	185	2.0	0.336	29.7	LOS C	6.7	47.6	0.81	0.78	39.7
11	T1	11	2.0	0.336	24.2	LOS C	6.7	47.6	0.81	0.78	40.5
12	R2	25	2.0	0.043	27.2	LOS C	0.8	5.5	0.72	0.68	41.1
Approach		221	2.0	0.336	29.2	LOS C	6.7	47.6	0.80	0.76	39.9
All Vehicles		3976	2.0	0.910	37.6	LOS D	30.2	215.2	0.94	0.88	37.0

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	36.0	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	33.3	LOS D	0.1	0.1	0.88	0.88
All Pedestrians		105	34.6	LOS D			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: 12834 Whitmore St Ex AM

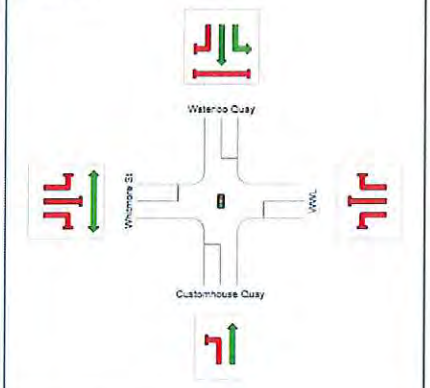
New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

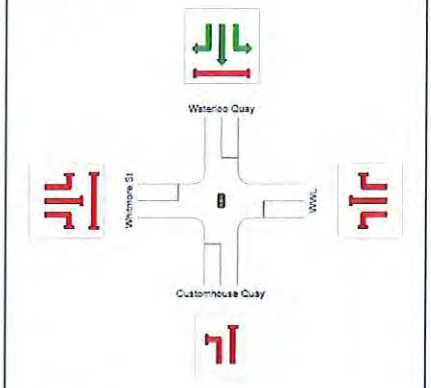
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	40	78	90	123	158
Green Time (sec)	21	7	32	6	27	29	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	13	38	12	33	35	12
Phase Split	16 %	8 %	22 %	7 %	19 %	21 %	7 %

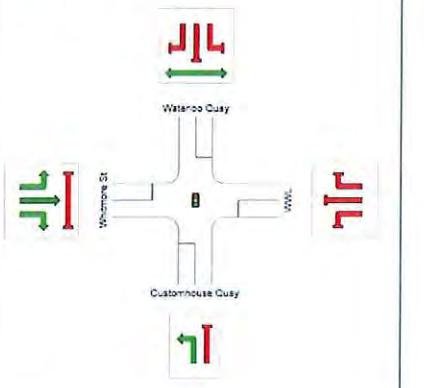
Phase A



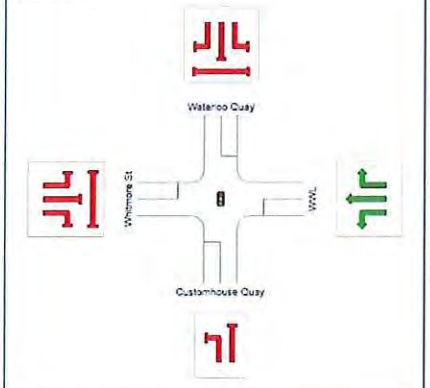
Phase B



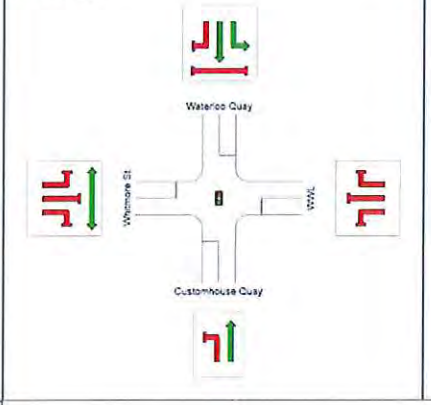
Phase C



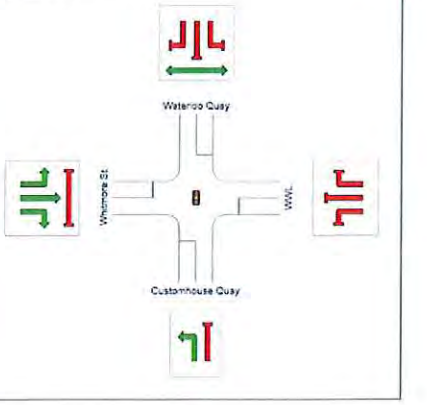
Phase D



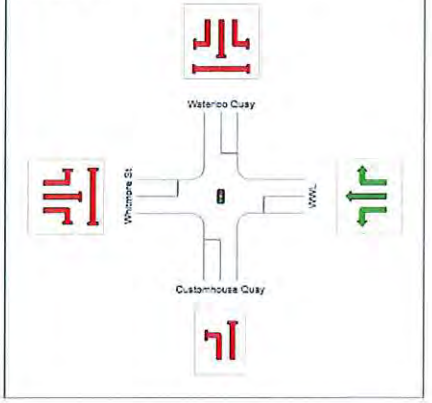
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Ex PM

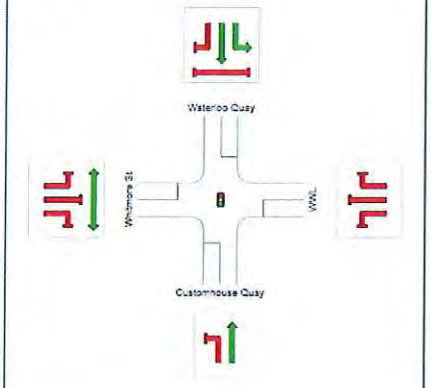
New Site
Signals - Fixed Time Cycle Time = 160 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

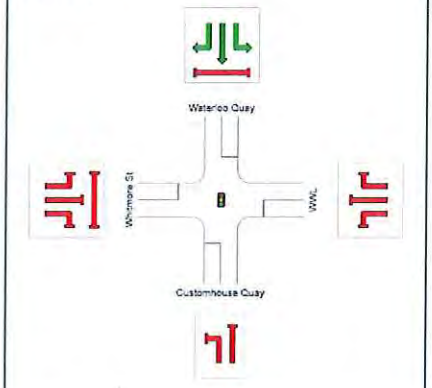
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	44	77	89	116	148
Green Time (sec)	21	11	27	6	21	26	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	17	33	12	27	32	12
Phase Split	17 %	11 %	21 %	8 %	17 %	20 %	8 %

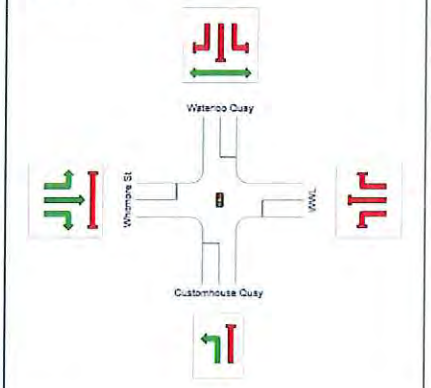
Phase A



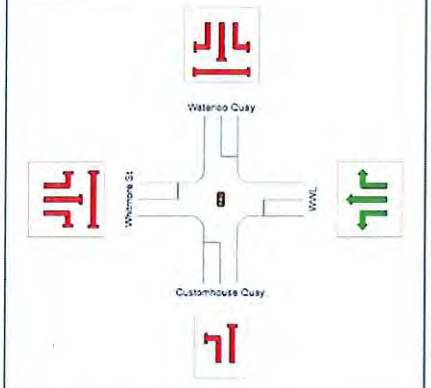
Phase B



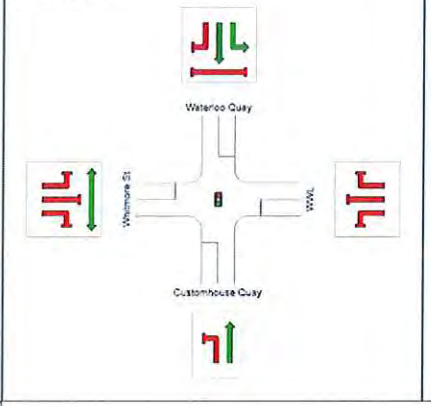
Phase C



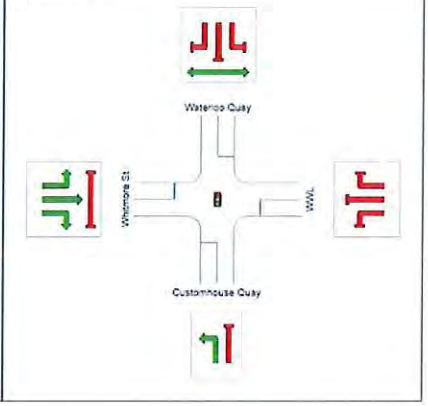
Phase D



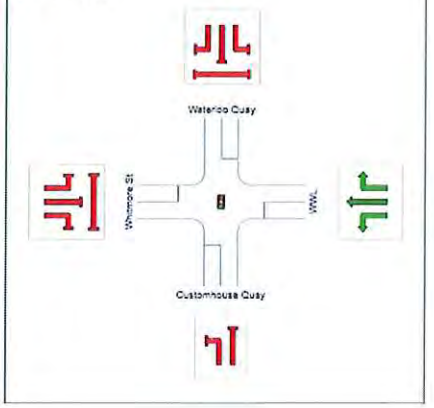
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Ex Sat

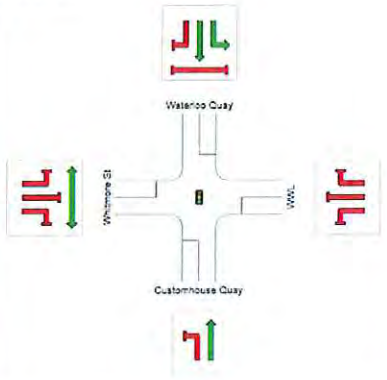
New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

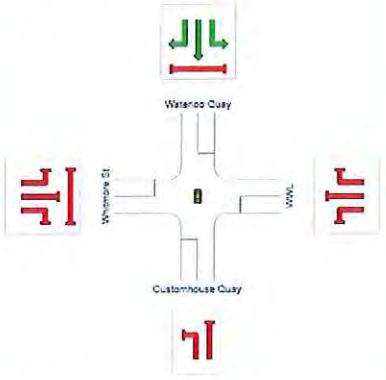
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	44	78	90	126	158
Green Time (sec)	21	11	28	6	30	26	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	17	34	12	36	32	12
Phase Split	16 %	10 %	20 %	7 %	21 %	19 %	7 %

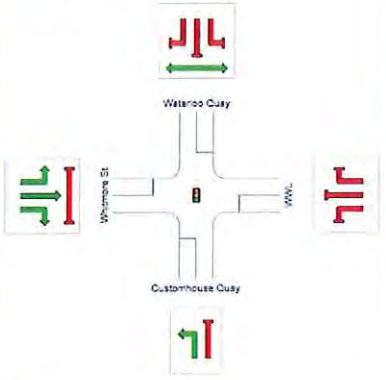
Phase A



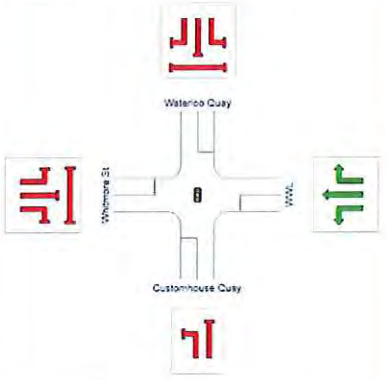
Phase B



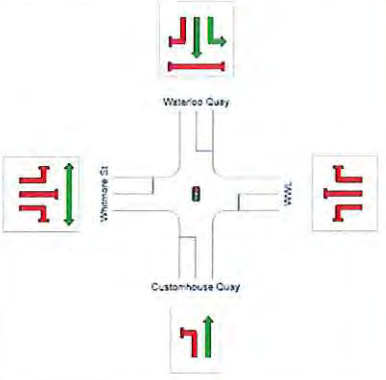
Phase C



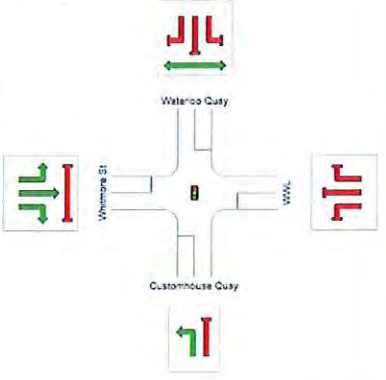
Phase D



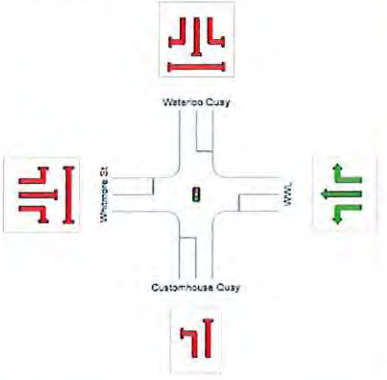
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Fut AM

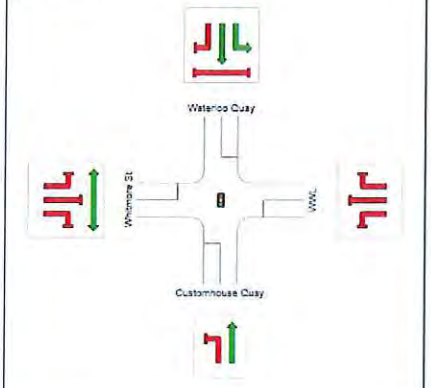
New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

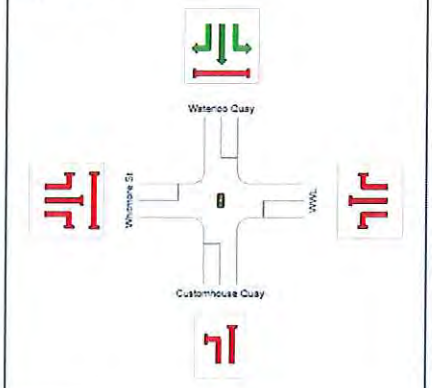
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	40	78	90	123	158
Green Time (sec)	21	7	32	6	27	29	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	13	38	12	33	35	12
Phase Split	16 %	8 %	22 %	7 %	19 %	21 %	7 %

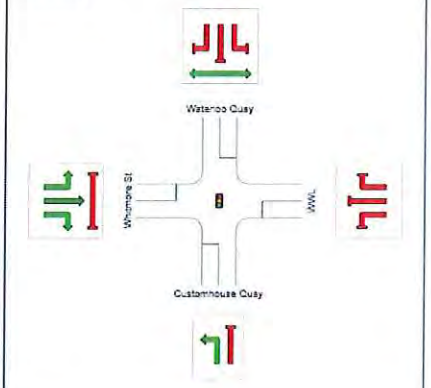
Phase A



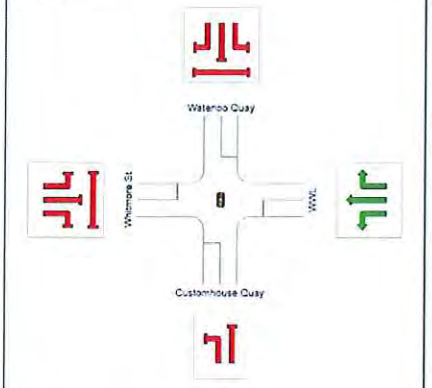
Phase B



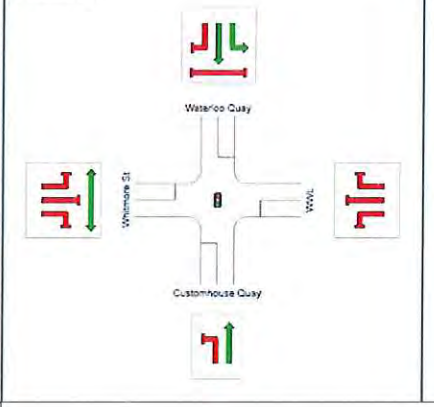
Phase C



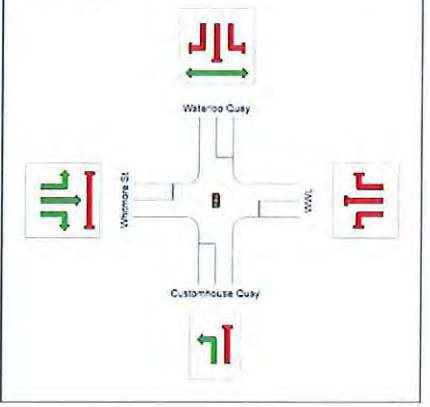
Phase D



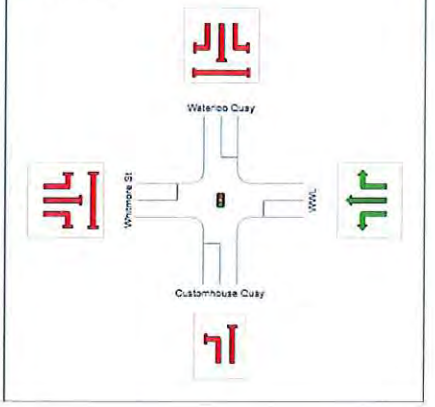
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Fut PM

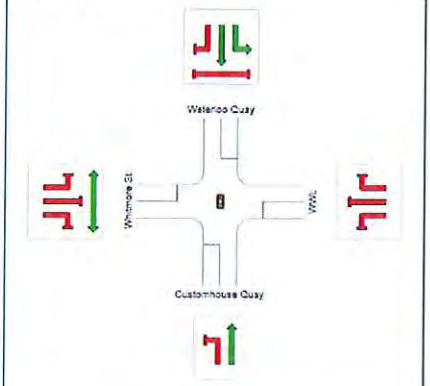
New Site
Signals - Fixed Time Cycle Time = 160 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

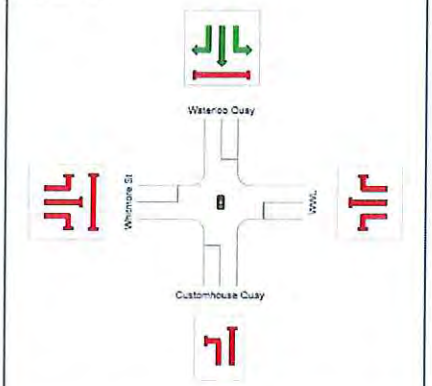
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	44	77	89	116	148
Green Time (sec)	21	11	27	6	21	26	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	17	33	12	27	32	12
Phase Split	17 %	11 %	21 %	8 %	17 %	20 %	8 %

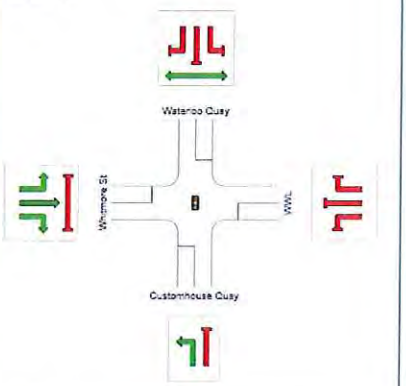
Phase A



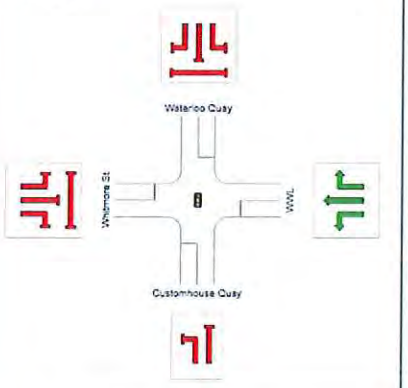
Phase B



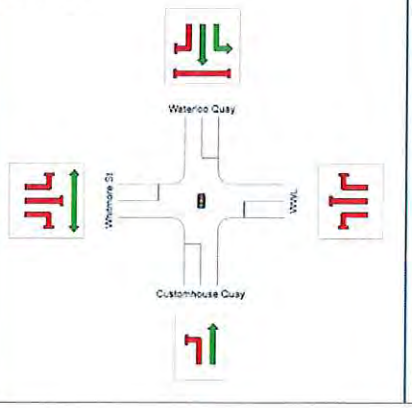
Phase C



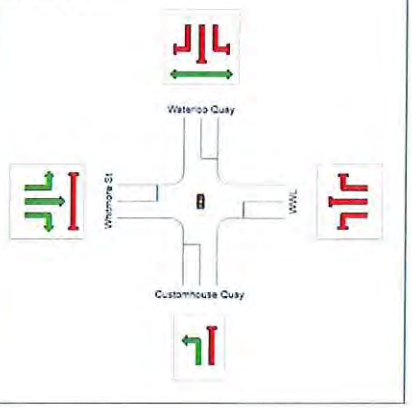
Phase D



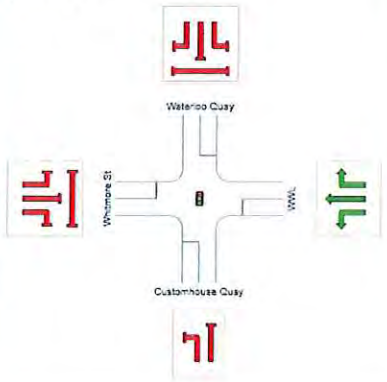
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Fut Sat

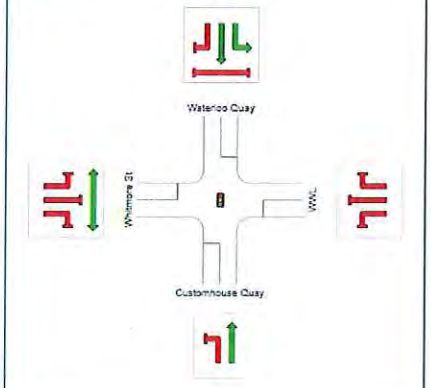
New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

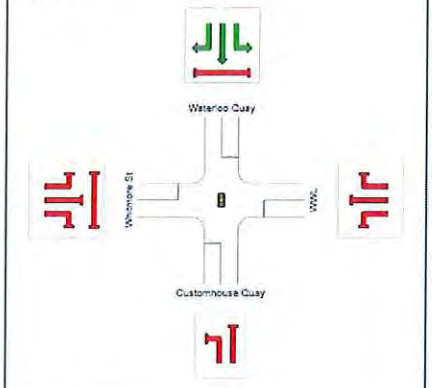
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	44	78	90	126	158
Green Time (sec)	21	11	28	6	30	26	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	17	34	12	36	32	12
Phase Split	16 %	10 %	20 %	7 %	21 %	19 %	7 %

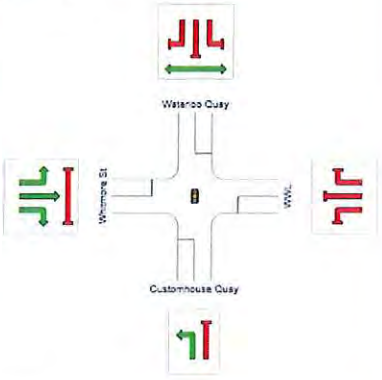
Phase A



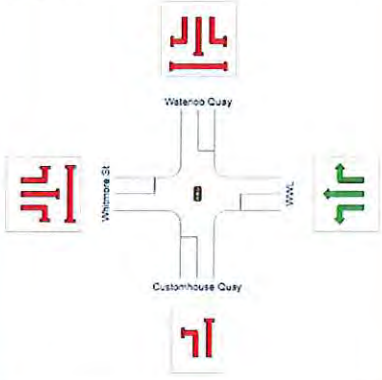
Phase B



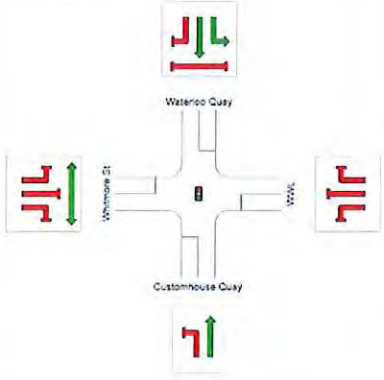
Phase C



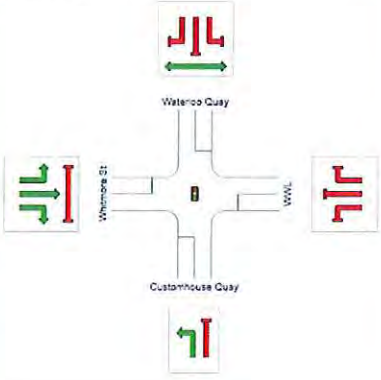
Phase D



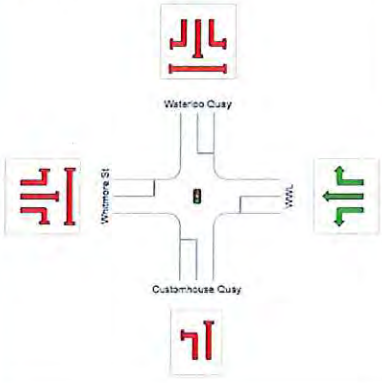
Phase A1



Phase C1



Phase D1



Appendix D2

Data Responding to Item 14
(One-Way Lane Configuration)

MOVEMENT SUMMARY

Site: 12834 Whitmore St Ex AM

New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	582	2.0	0.886	42.8	LOS D	28.8	205.1	1.00	0.93	34.6
2	T1	1083	2.0	0.664	30.0	LOS C	15.1	107.8	0.94	0.81	40.3
Approach		1665	2.0	0.886	34.5	LOS C	28.8	205.1	0.96	0.85	38.1
East: WWL											
4	L2	14	0.0	0.081	47.6	LOS D	0.5	3.3	0.96	0.67	33.5
5	T1	19	0.0	0.081	42.0	LOS D	0.5	3.4	0.96	0.65	35.4
6	R2	12	0.0	0.088	47.7	LOS D	0.5	3.5	0.96	0.67	33.3
Approach		44	0.0	0.088	45.2	LOS D	0.5	3.5	0.96	0.66	34.2
North: Waterloo Quay											
7	L2	105	2.0	0.889	42.5	LOS D	29.3	208.4	1.00	0.95	36.4
8	T1	1699	2.0	0.889	36.9	LOS D	29.5	209.7	1.00	0.95	37.3
9	R2	66	2.0	0.880	106.0	LOS F	6.1	43.7	1.00	0.92	21.7
Approach		1871	2.0	0.889	39.7	LOS D	29.5	209.7	1.00	0.95	36.3
West: Whitmore St											
10	L2	86	2.0	0.341	27.2	LOS C	7.3	52.2	0.77	0.75	41.3
11	T1	53	2.0	0.341	21.6	LOS C	7.3	52.2	0.77	0.75	42.2
12	R2	312	2.0	0.341	27.3	LOS C	7.3	52.2	0.77	0.77	41.3
Approach		451	2.0	0.341	26.6	LOS C	7.3	52.2	0.77	0.76	41.4
All Vehicles		4031	2.0	0.889	36.1	LOS D	29.5	209.7	0.96	0.88	37.6

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	32.8	LOS D	0.1	0.1	0.88	0.88
P4	West Full Crossing	53	34.4	LOS D	0.1	0.1	0.90	0.90
All Pedestrians		105	33.6	LOS D			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Ex PM

New Site
Signals - Fixed Time Cycle Time = 160 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	525	2.0	0.866	41.0	LOS D	25.8	184.0	1.00	0.92	35.3
2	T1	1211	2.0	0.799	33.3	LOS C	18.1	129.2	0.99	0.88	38.9
Approach		1736	2.0	0.866	35.6	LOS D	25.8	184.0	1.00	0.89	37.7
East: WWL											
4	L2	48	0.0	0.207	46.1	LOS D	1.3	9.0	0.97	0.71	33.9
5	T1	40	0.0	0.207	40.5	LOS D	1.3	9.3	0.97	0.70	35.9
6	R2	40	0.0	0.287	46.6	LOS D	1.8	12.4	0.98	0.73	33.7
Approach		128	0.0	0.287	44.5	LOS D	1.8	12.4	0.97	0.71	34.4
North: Waterloo Quay											
7	L2	42	2.0	0.753	29.7	LOS C	18.8	134.0	0.94	0.83	41.9
8	T1	1512	2.0	0.753	23.8	LOS C	18.9	134.5	0.93	0.81	43.1
9	R2	108	2.0	0.861	95.6	LOS F	9.3	66.1	1.00	0.92	23.2
Approach		1662	2.0	0.861	28.7	LOS C	18.9	134.5	0.93	0.82	40.8
West: Whitmore St											
10	L2	343	2.0	0.632	30.9	LOS C	15.0	106.5	0.90	0.83	39.3
11	T1	42	2.0	0.632	25.3	LOS C	15.0	106.5	0.90	0.83	40.1
12	R2	126	2.0	0.208	27.0	LOS C	4.1	29.4	0.76	0.74	41.3
Approach		512	2.0	0.632	29.5	LOS C	15.0	106.5	0.87	0.81	39.8
All Vehicles		4038	1.9	0.866	32.3	LOS C	25.8	184.0	0.95	0.85	39.1

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	34.3	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	34.8	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		105	34.5	LOS D			0.92	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Ex Sat

New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	506	2.0	0.871	43.4	LOS D	24.7	176.1	1.00	0.92	34.5
2	T1	1576	2.0	0.910	46.3	LOS D	30.2	215.2	1.00	0.99	34.2
Approach		2082	2.0	0.910	45.6	LOS D	30.2	215.2	1.00	0.97	34.2
East: WWL											
4	L2	40	0.0	0.153	48.2	LOS D	0.9	6.2	0.97	0.70	33.0
5	T1	17	0.0	0.122	42.3	LOS D	0.7	5.2	0.97	0.67	35.6
6	R2	11	0.0	0.080	47.7	LOS D	0.5	3.2	0.96	0.67	33.3
Approach		67	0.0	0.153	46.6	LOS D	0.9	6.2	0.97	0.69	33.7
North: Waterloo Quay											
7	L2	52	2.0	0.667	28.2	LOS C	17.9	127.1	0.88	0.78	42.6
8	T1	1448	2.0	0.667	22.4	LOS C	17.9	127.7	0.87	0.77	43.8
9	R2	105	2.0	0.888	103.8	LOS F	9.7	69.1	1.00	0.94	22.0
Approach		1605	2.0	0.888	27.9	LOS C	17.9	127.7	0.88	0.78	41.1
West: Whitmore St											
10	L2	185	2.0	0.336	29.7	LOS C	6.7	47.6	0.81	0.78	39.7
11	T1	11	2.0	0.336	24.2	LOS C	6.7	47.6	0.81	0.78	40.5
12	R2	25	2.0	0.043	27.2	LOS C	0.8	5.5	0.72	0.68	41.1
Approach		221	2.0	0.336	29.2	LOS C	6.7	47.6	0.80	0.76	39.9
All Vehicles		3976	2.0	0.910	37.6	LOS D	30.2	215.2	0.94	0.88	37.0

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	36.0	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	33.3	LOS D	0.1	0.1	0.88	0.88
All Pedestrians		105	34.6	LOS D			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Fut AM

New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	582	2.0	0.886	42.8	LOS D	28.8	205.1	1.00	0.93	34.6
2	T1	1083	2.0	0.664	30.0	LOS C	15.1	107.8	0.94	0.81	40.3
Approach		1665	2.0	0.886	34.5	LOS C	28.8	205.1	0.96	0.85	38.1
East: WWL											
4	L2	14	0.0	0.165	48.2	LOS D	1.0	6.8	0.97	0.70	33.7
5	T1	19	0.0	0.165	42.7	LOS D	1.0	6.8	0.97	0.69	34.3
6	R2	12	0.0	0.165	48.2	LOS D	1.0	6.8	0.97	0.69	34.0
Approach		44	0.0	0.165	45.8	LOS D	1.0	6.8	0.97	0.69	34.1
North: Waterloo Quay											
7	L2	105	2.0	0.889	42.5	LOS D	29.3	208.4	1.00	0.95	36.4
8	T1	1699	2.0	0.889	36.9	LOS D	29.5	209.7	1.00	0.95	37.3
9	R2	66	2.0	0.880	106.0	LOS F	6.1	43.7	1.00	0.92	21.7
Approach		1871	2.0	0.889	39.7	LOS D	29.5	209.7	1.00	0.95	36.3
West: Whitmore St											
10	L2	86	2.0	0.341	27.2	LOS C	7.3	52.2	0.77	0.75	41.3
11	T1	53	2.0	0.341	21.6	LOS C	7.3	52.2	0.77	0.75	42.2
12	R2	312	2.0	0.341	27.3	LOS C	7.3	52.2	0.77	0.77	41.3
Approach		451	2.0	0.341	26.6	LOS C	7.3	52.2	0.77	0.76	41.4
All Vehicles		4031	2.0	0.889	36.1	LOS D	29.5	209.7	0.96	0.88	37.6

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	32.8	LOS D	0.1	0.1	0.88	0.88
P4	West Full Crossing	53	34.4	LOS D	0.1	0.1	0.90	0.90
All Pedestrians		105	33.6	LOS D			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Fut PM

New Site
Signals - Fixed Time Cycle Time = 160 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	525	2.0	0.866	41.0	LOS D	25.8	184.0	1.00	0.92	35.3
2	T1	1211	2.0	0.799	33.3	LOS C	18.1	129.2	0.99	0.88	38.9
Approach		1736	2.0	0.866	35.6	LOS D	25.8	184.0	1.00	0.89	37.7
East: WWL											
4	L2	48	0.0	0.454	47.3	LOS D	2.9	20.3	1.00	0.75	33.7
5	T1	40	0.0	0.454	41.7	LOS D	2.9	20.4	1.00	0.75	34.4
6	R2	40	0.0	0.454	47.3	LOS D	2.9	20.4	1.00	0.75	34.1
Approach		128	0.0	0.454	45.6	LOS D	2.9	20.4	1.00	0.75	34.1
North: Waterloo Quay											
7	L2	42	2.0	0.753	29.7	LOS C	18.8	134.0	0.94	0.83	41.9
8	T1	1512	2.0	0.753	23.8	LOS C	18.9	134.5	0.93	0.81	43.1
9	R2	108	2.0	0.861	95.6	LOS F	9.3	66.1	1.00	0.92	23.2
Approach		1662	2.0	0.861	28.7	LOS C	18.9	134.5	0.93	0.82	40.8
West: Whitmore St											
10	L2	343	2.0	0.632	30.9	LOS C	15.0	106.5	0.90	0.83	39.3
11	T1	42	2.0	0.632	25.3	LOS C	15.0	106.5	0.90	0.83	40.1
12	R2	126	2.0	0.208	27.0	LOS C	4.1	29.4	0.76	0.74	41.3
Approach		512	2.0	0.632	29.5	LOS C	15.0	106.5	0.87	0.81	39.8
All Vehicles		4038	1.9	0.866	32.3	LOS C	25.8	184.0	0.95	0.85	39.1

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	34.3	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	34.8	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		105	34.5	LOS D			0.92	0.92

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 12834 Whitmore St Fut Sat

New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Customhouse Quay											
1	L2	506	2.0	0.871	43.4	LOS D	24.7	176.1	1.00	0.92	34.5
2	T1	1576	2.0	0.910	46.3	LOS D	30.2	215.2	1.00	0.99	34.2
Approach		2082	2.0	0.910	45.6	LOS D	30.2	215.2	1.00	0.97	34.2
East: WWL											
4	L2	40	0.0	0.305	49.0	LOS D	1.8	12.6	0.98	0.73	32.7
5	T1	17	0.0	0.203	42.9	LOS D	1.2	8.5	0.97	0.70	34.6
6	R2	11	0.0	0.203	48.5	LOS D	1.2	8.5	0.97	0.70	34.2
Approach		67	0.0	0.305	47.4	LOS D	1.8	12.6	0.98	0.72	33.4
North: Waterloo Quay											
7	L2	52	2.0	0.667	28.2	LOS C	17.9	127.1	0.88	0.78	42.6
8	T1	1448	2.0	0.667	22.4	LOS C	17.9	127.7	0.87	0.77	43.8
9	R2	105	2.0	0.888	103.8	LOS F	9.7	69.1	1.00	0.94	22.0
Approach		1605	2.0	0.888	27.9	LOS C	17.9	127.7	0.88	0.78	41.1
West: Whitmore St											
10	L2	185	2.0	0.336	29.7	LOS C	6.7	47.6	0.81	0.78	39.7
11	T1	11	2.0	0.336	24.2	LOS C	6.7	47.6	0.81	0.78	40.5
12	R2	25	2.0	0.043	27.2	LOS C	0.8	5.5	0.72	0.68	41.1
Approach		221	2.0	0.336	29.2	LOS C	6.7	47.6	0.80	0.76	39.9
All Vehicles		3976	2.0	0.910	37.6	LOS D	30.2	215.2	0.94	0.88	37.0

Level of Service (LOS) Method: Delay (HCM 2000).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	North Full Crossing	53	36.0	LOS D	0.1	0.1	0.92	0.92
P4	West Full Crossing	53	33.3	LOS D	0.1	0.1	0.88	0.88
All Pedestrians		105	34.6	LOS D			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: 12834 Whitmore St Ex AM

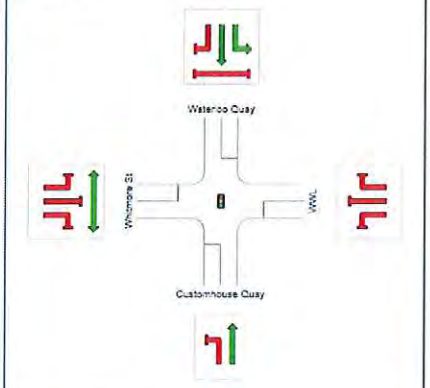
New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

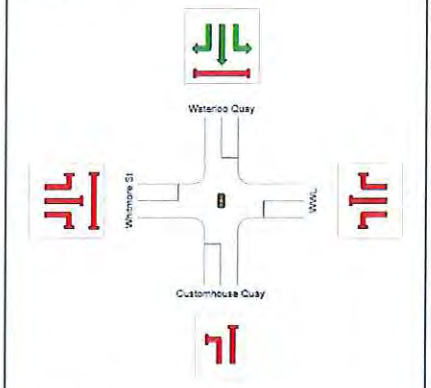
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	40	78	90	123	158
Green Time (sec)	21	7	32	6	27	29	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	13	38	12	33	35	12
Phase Split	16 %	8 %	22 %	7 %	19 %	21 %	7 %

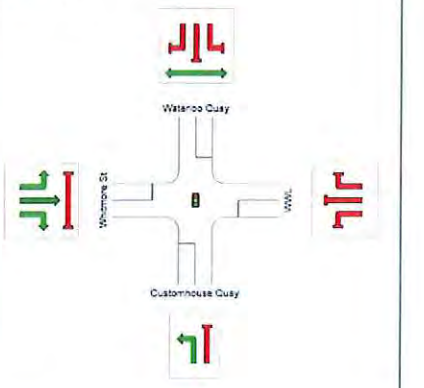
Phase A



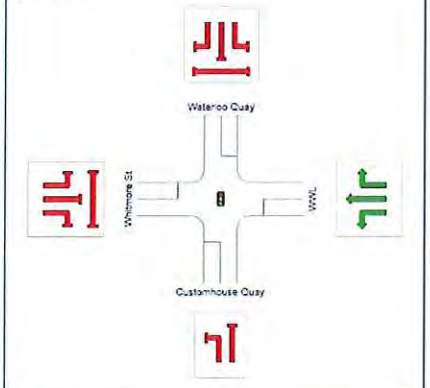
Phase B



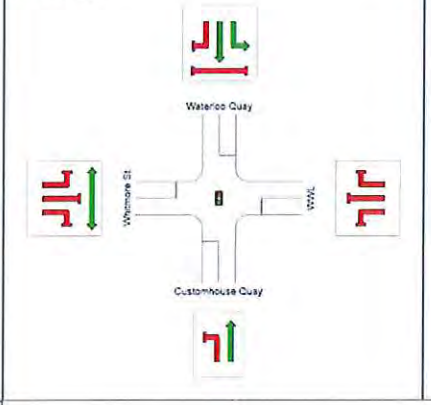
Phase C



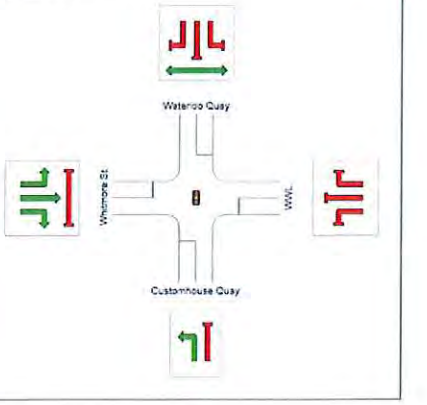
Phase D



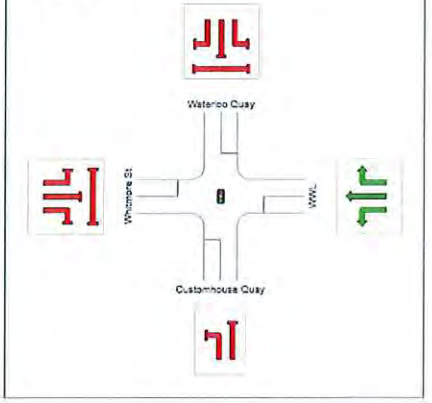
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Ex PM

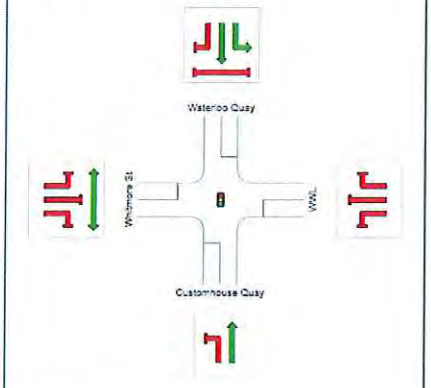
New Site
Signals - Fixed Time Cycle Time = 160 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

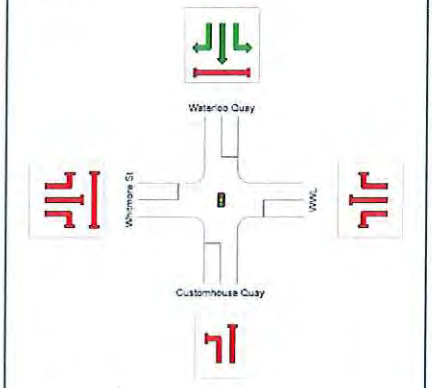
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	44	77	89	116	148
Green Time (sec)	21	11	27	6	21	26	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	17	33	12	27	32	12
Phase Split	17 %	11 %	21 %	8 %	17 %	20 %	8 %

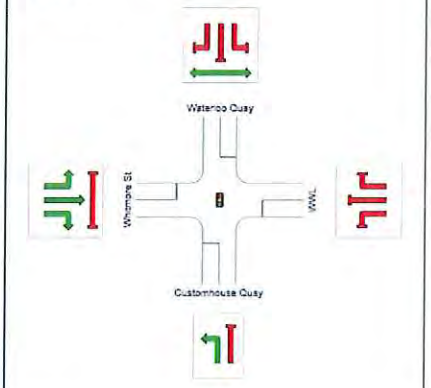
Phase A



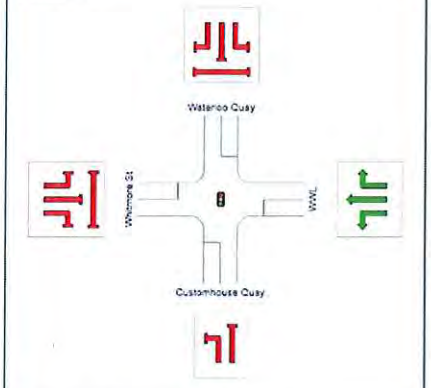
Phase B



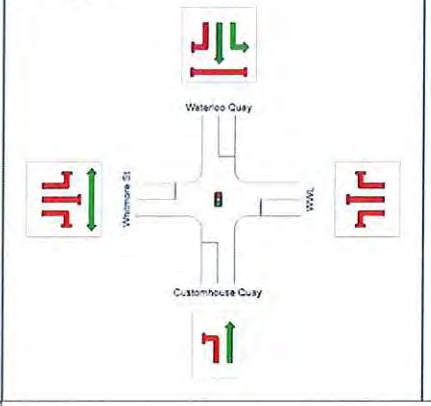
Phase C



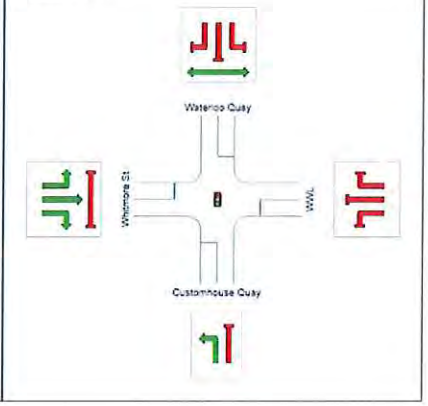
Phase D



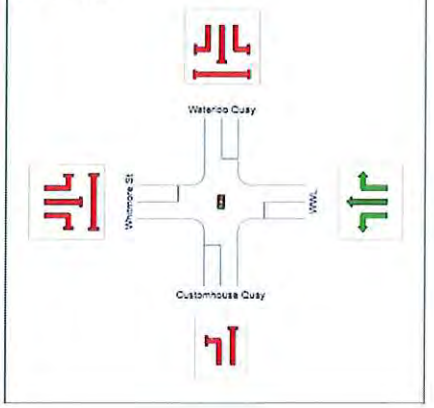
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Ex Sat

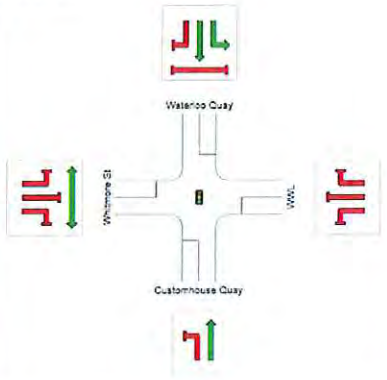
New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

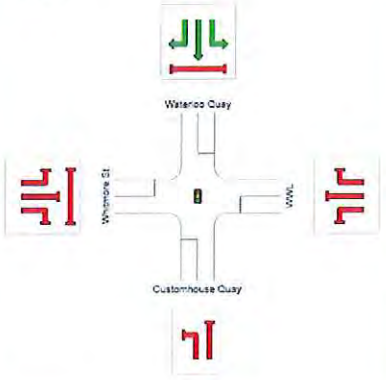
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	44	78	90	126	158
Green Time (sec)	21	11	28	6	30	26	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	17	34	12	36	32	12
Phase Split	16 %	10 %	20 %	7 %	21 %	19 %	7 %

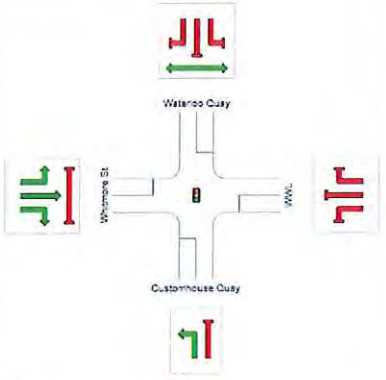
Phase A



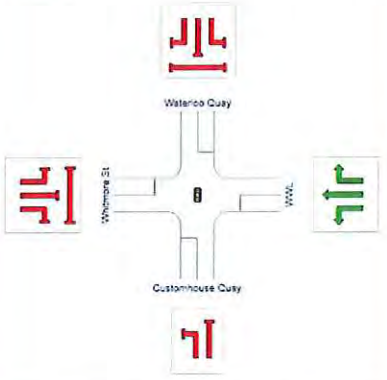
Phase B



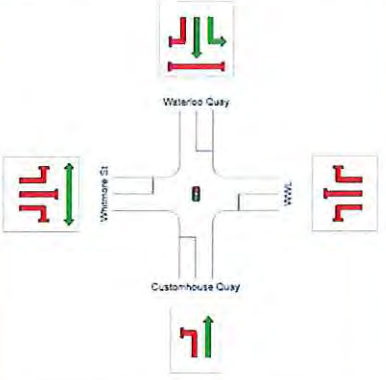
Phase C



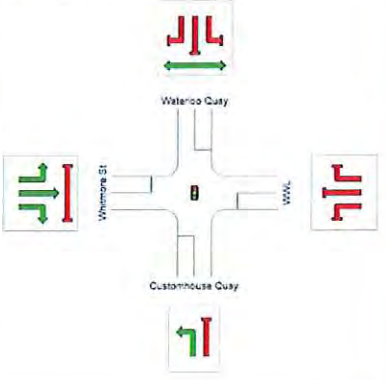
Phase D



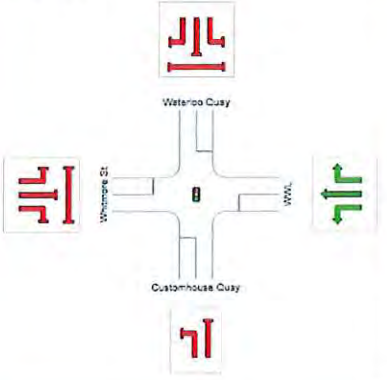
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Fut AM

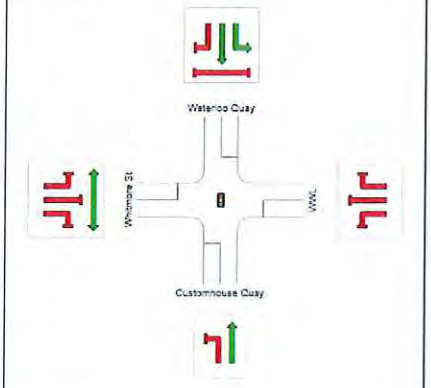
New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

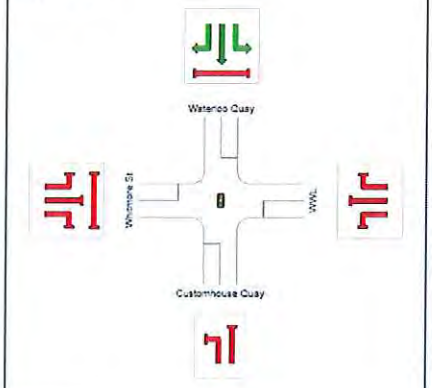
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	40	78	90	123	158
Green Time (sec)	21	7	32	6	27	29	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	13	38	12	33	35	12
Phase Split	16 %	8 %	22 %	7 %	19 %	21 %	7 %

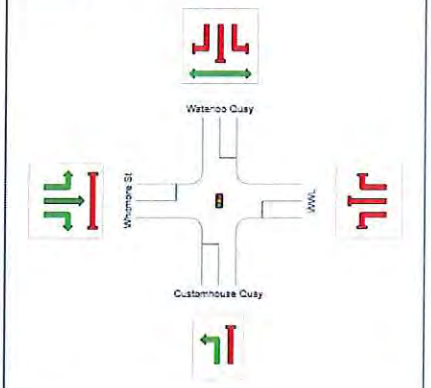
Phase A



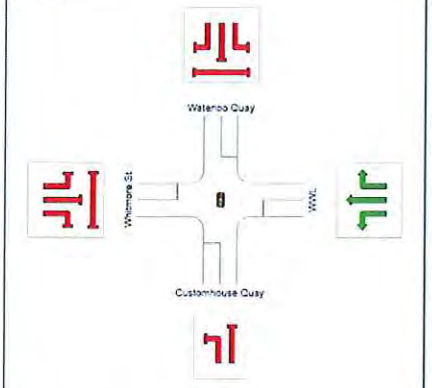
Phase B



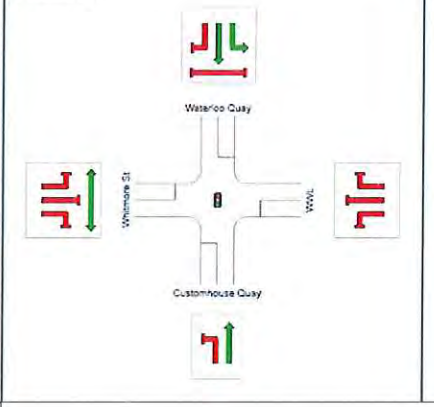
Phase C



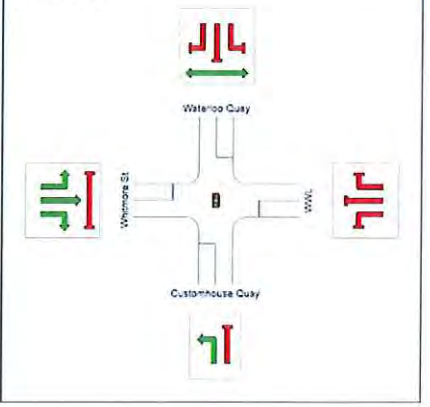
Phase D



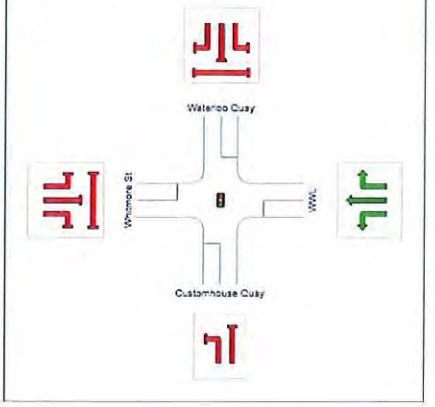
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Fut PM

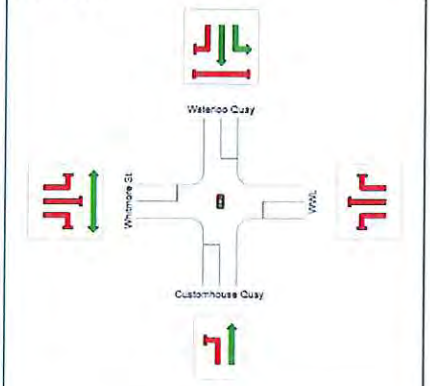
New Site
Signals - Fixed Time Cycle Time = 160 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

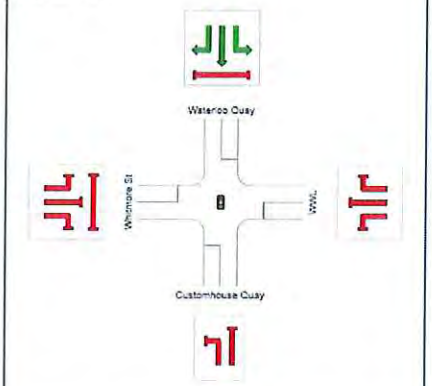
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	44	77	89	116	148
Green Time (sec)	21	11	27	6	21	26	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	17	33	12	27	32	12
Phase Split	17 %	11 %	21 %	8 %	17 %	20 %	8 %

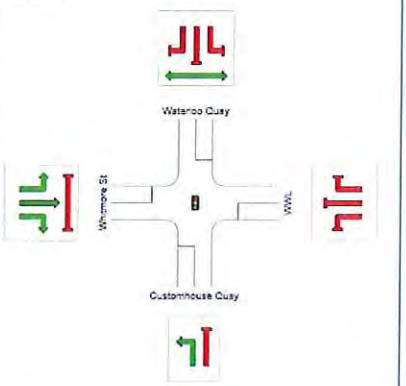
Phase A



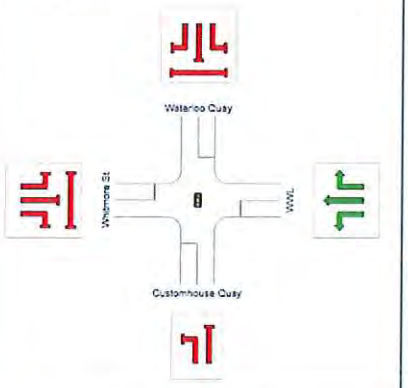
Phase B



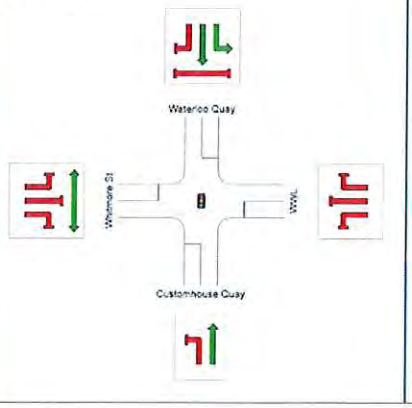
Phase C



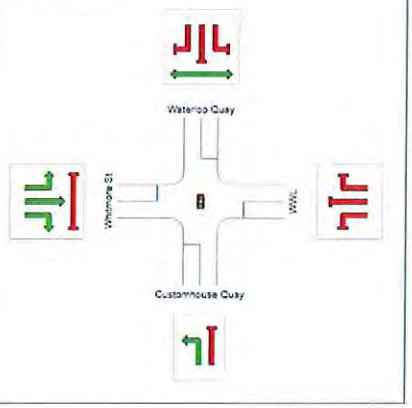
Phase D



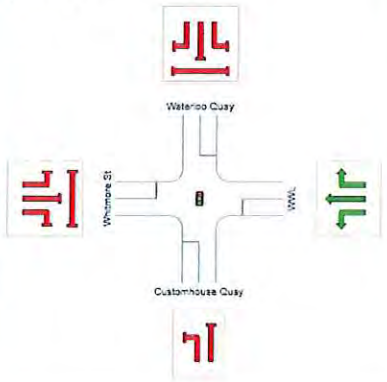
Phase A1



Phase C1



Phase D1



PHASING SUMMARY

Site: 12834 Whitmore St Fut Sat

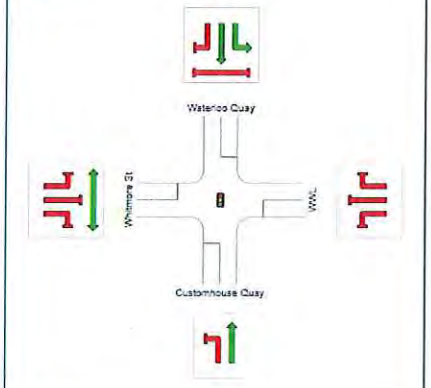
New Site
Signals - Fixed Time Cycle Time = 170 seconds (Practical Cycle Time)

Phase times determined by the program
Sequence: SCATS
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, A1, C1, D1
Output Sequence: A, B, C, D, A1, C1, D1

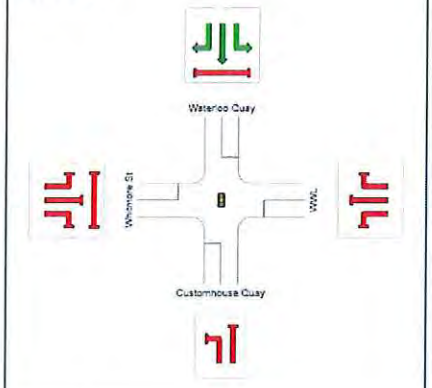
Phase Timing Results

Phase	A	B	C	D	A1	C1	D1
Reference Phase	Yes	No	No	No	No	No	No
Phase Change Time (sec)	0	27	44	78	90	126	158
Green Time (sec)	21	11	28	6	30	26	6
Yellow Time (sec)	4	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2	2
Phase Time (sec)	27	17	34	12	36	32	12
Phase Split	16 %	10 %	20 %	7 %	21 %	19 %	7 %

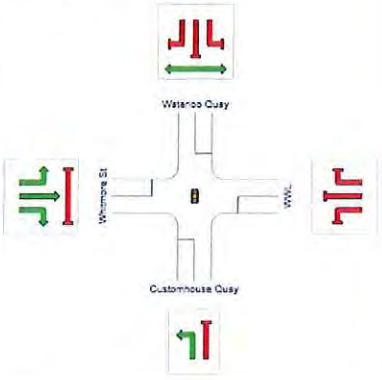
Phase A



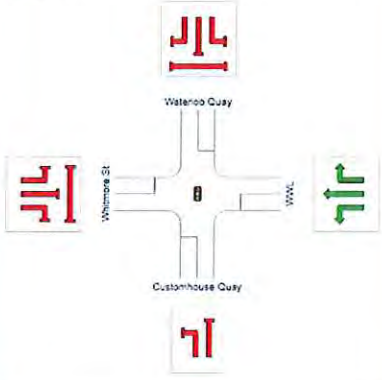
Phase B



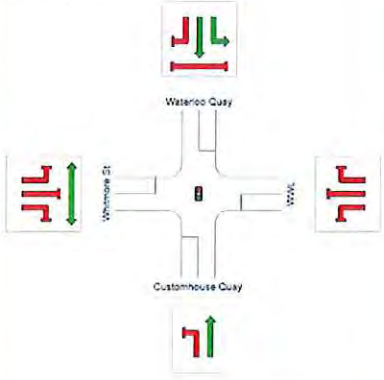
Phase C



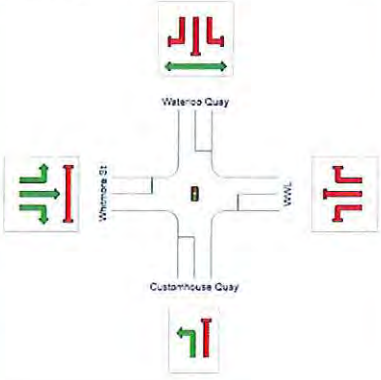
Phase D



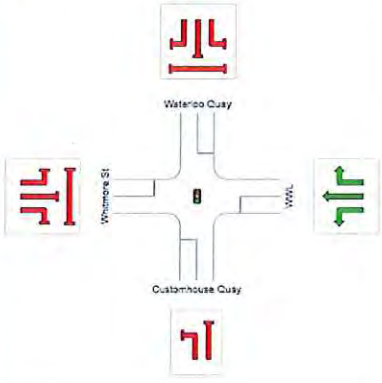
Phase A1



Phase C1

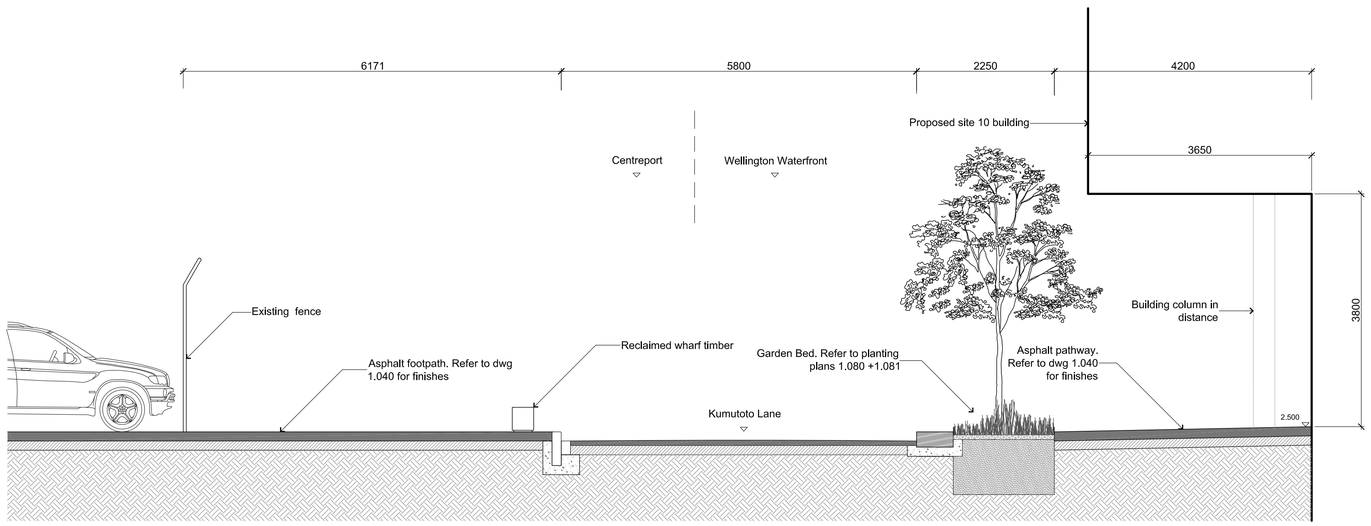


Phase D1

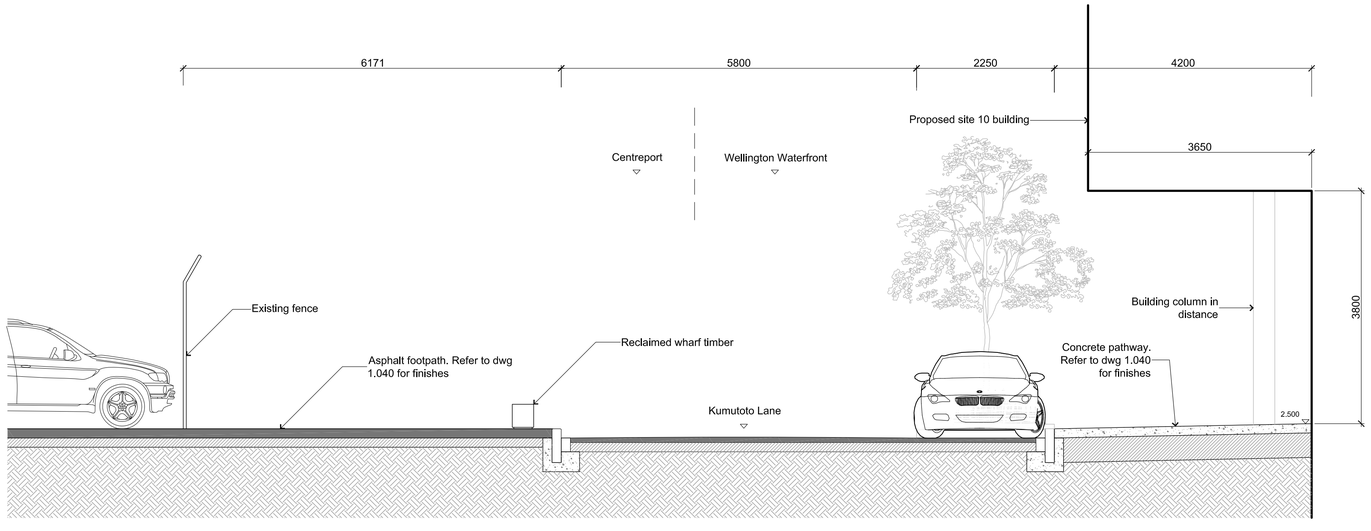


Appendix E

Plan Responding to Item 15



1 **Kumutoto Laneway Section**
Scale: 1:50@ A1 | 1:100@A3



2 **Kumutoto Laneway Section**
Scale: 1:50@ A1 | 1:100@A3

No.	Revision	By	Chk	Date
B	Text updates	JP	DM	24.02.15
A	For Resource Consent	JP	DM	20.02.15

isthmus
AKL 09 309 9442 | **TGA** 07 579 0487 | **WTN** 04 499 9832
www.isthmus.co.nz

Client
Wellington City Council

Architect

Engineer

Job Name
North Kumutoto

Scale
1:25 @A1
1:50 @A3

Job No.
3158

Drawing Number
2.056

Revision
B

North

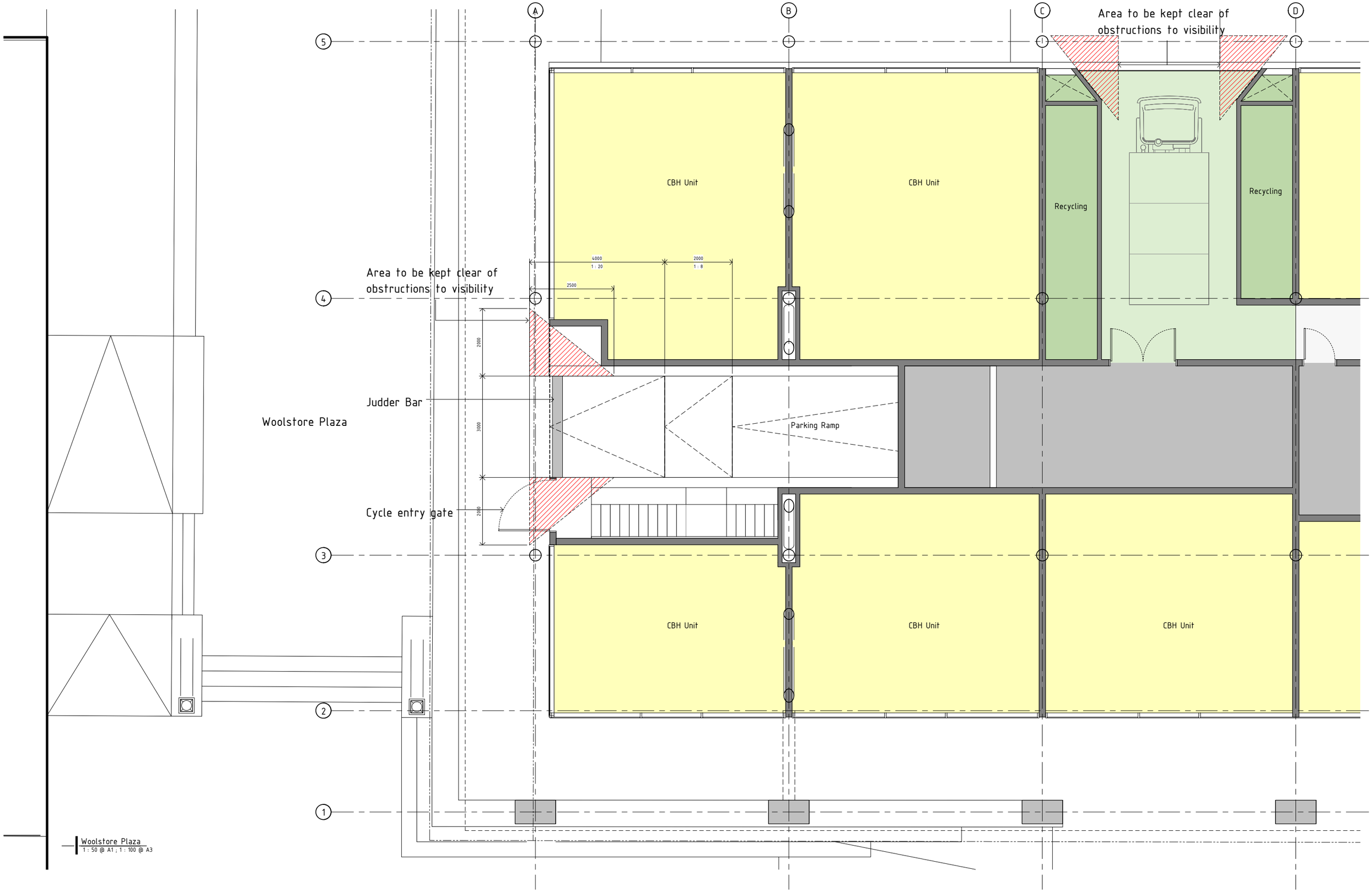
Issued For
Resource Consent

Drawing Title
Kumutoto Lane Sections

DRAFT

Appendix F

Plans Responding to Item 17



Woolstore Plaza
1 : 50 @ A1 ; 1 : 100 @ A3

WILLIS BOND & CO

KEY:

No.	Description	Date
A	For Info	19.02.2015
B	For Info	25.02.2015
C	S92 Response	25.02.2015

65 CAMBRIDGE TERRACE
CHRISTCHURCH 8013
PO BOX 3724
CHRISTCHURCH 8140
NEW ZEALAND
TEL 64 3 377 2007
FAX 64 3 377 2009

105 AMRITSAR STREET
WELLINGTON 6035
PO BOX 3364
WELLINGTON 6140
NEW ZEALAND
TEL 64 4 499 1727
FAX 64 4 499 1960

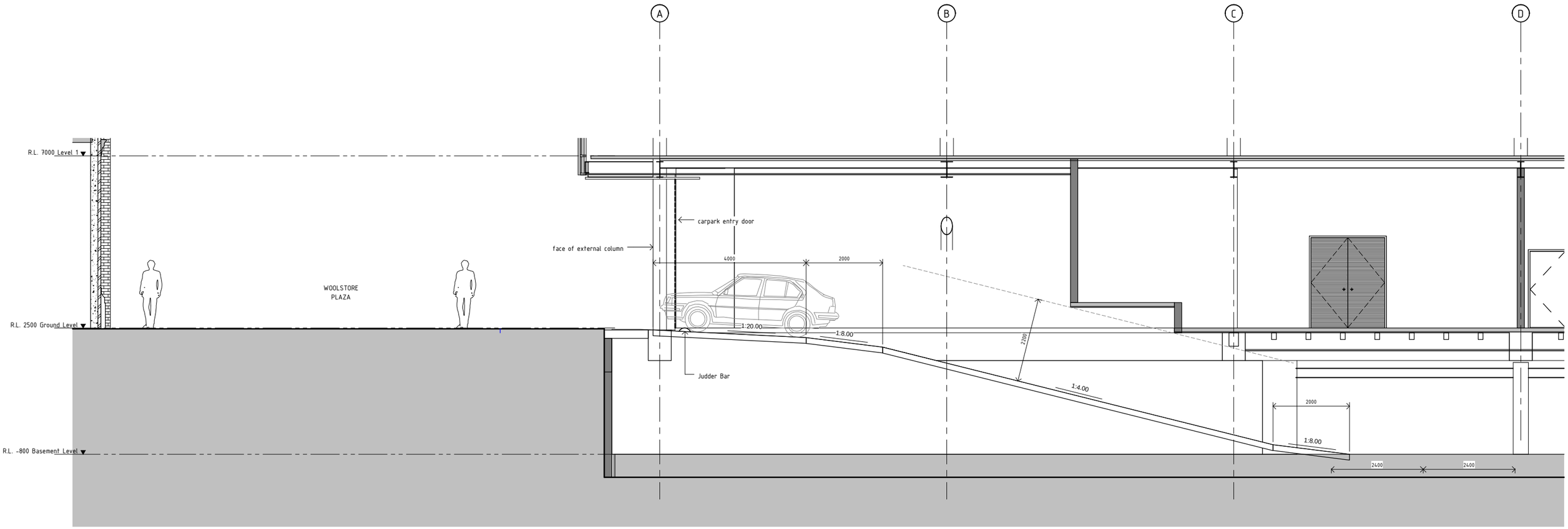
athfield architects limited

Kumutoto - Site 10

Woolstore Plaza
1 : 50 @ A1 ; 1 : 100 @ A3

13-09

SK_06-C



Carpark Ramp
1 : 50 @ A1 ; 1 : 100 @ A3

WILLIS BOND & CO

KEY:

No.	Description	Date
A	For Info	16.02.2015
B	For Info	19.02.2015
C	For Info	25.02.2015
D	S92 Response	25.02.2015

65 CAMBRIDGE TERRACE
CHRISTCHURCH 8013
PO BOX 3724
CHRISTCHURCH 8140
NEW ZEALAND
TEL 64 3 377 2007
FAX 64 3 377 2009

105 AMRITSAR STREET
WELLINGTON 6035
PO BOX 3364
WELLINGTON 6140
NEW ZEALAND
TEL 64 4 499 1727
FAX 64 4 499 1960

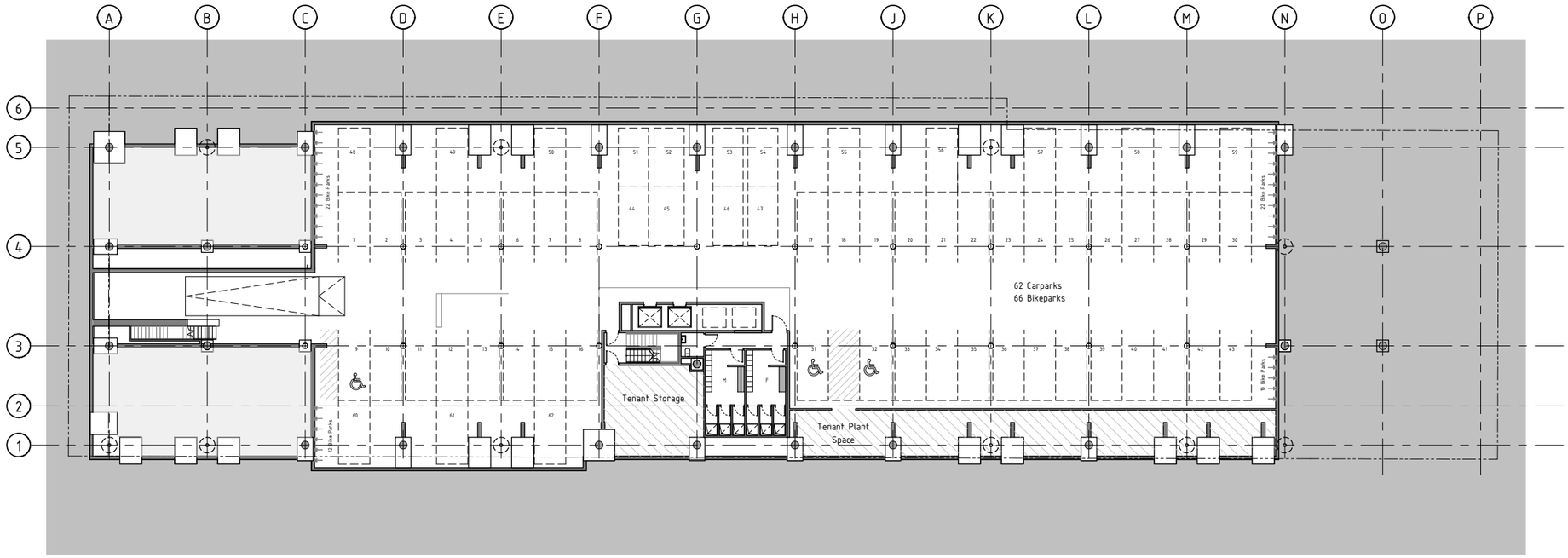
athfield architects limited

Kumutoto - Site 10

Carpark Ramp
1 : 50 @ A1 ; 1 : 100 @ A3

13-09

SK_05-D



Basement Level - S92
1 : 200 @ A1 ; 1 : 400 @ A3

STRUCTURAL ENGINEER:
NAME : Dunning Thornton Consultants Ltd
PH
FAX
PO BOX
EMAIL

SERVICES ENGINEER:
NAME : AECOM
PH
FAX
PO BOX
EMAIL

FIRE ENGINEER:
NAME : Holmes Fire
PH
FAX
PO BOX
EMAIL

KEY:

No.	Description	Date
A	FOR DISCUSSION	26.09.2014
B	Tenant Review	01.12.2014
C	Tenant Review update	09.12.2014
D	S92 Response	25.02.2015

65 CAMBRIDGE TERRACE
CHRISTCHURCH 8013
PO BOX 3724
CHRISTCHURCH 8140
NEW ZEALAND
TEL 64 3 377 2007
FAX 64 3 377 2009

105 AMRITSAR STREET
WELLINGTON 6035
PO BOX 3364
WELLINGTON 6140
NEW ZEALAND
TEL 64 4 499 1727
FAX 64 4 499 1960

athfield architects limited

Kumutoto - Site 10

Basement Plan
1 : 200 @ A1 ; 1 : 400 @ A3 @ A1

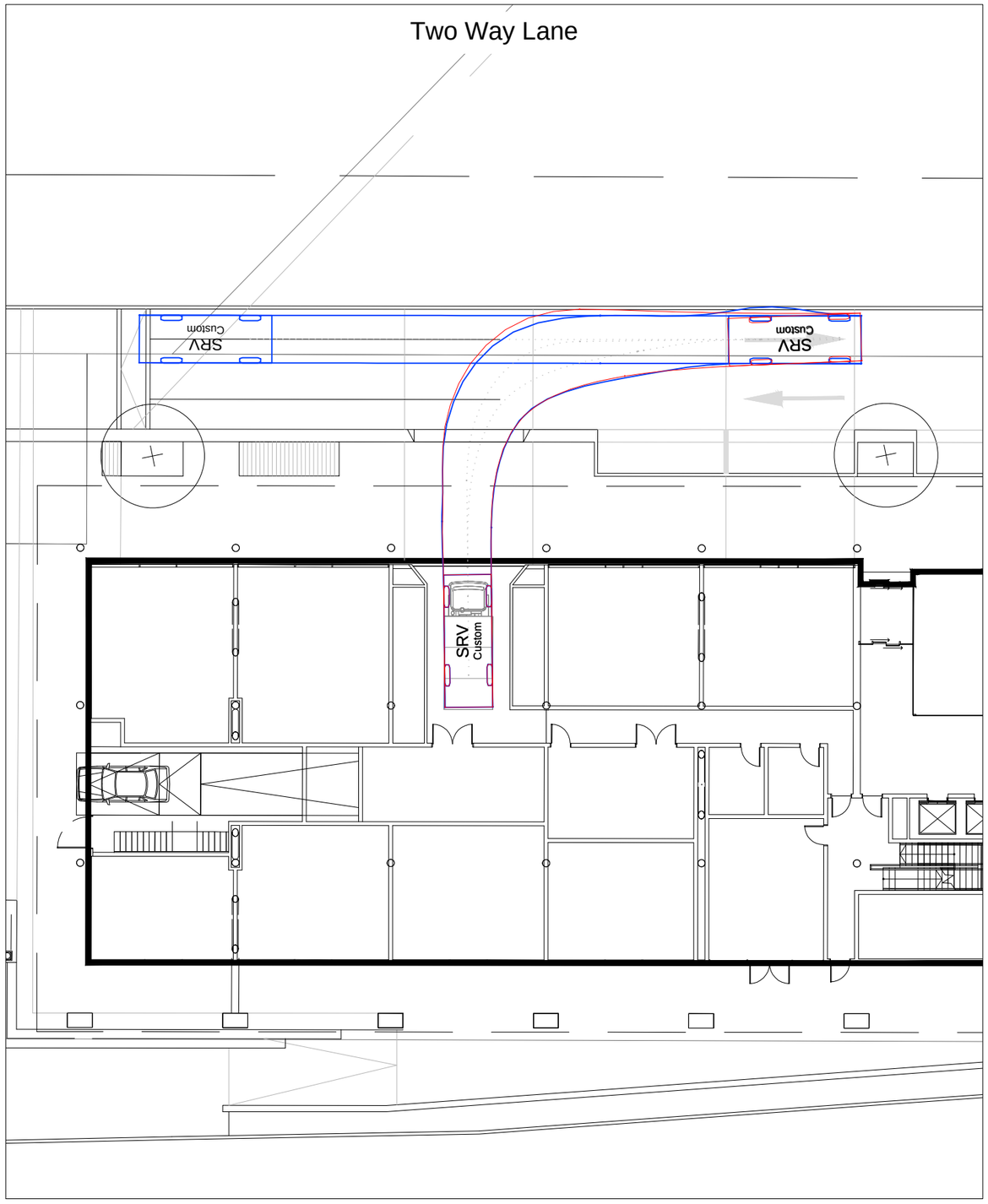
13-09

SK_02-D

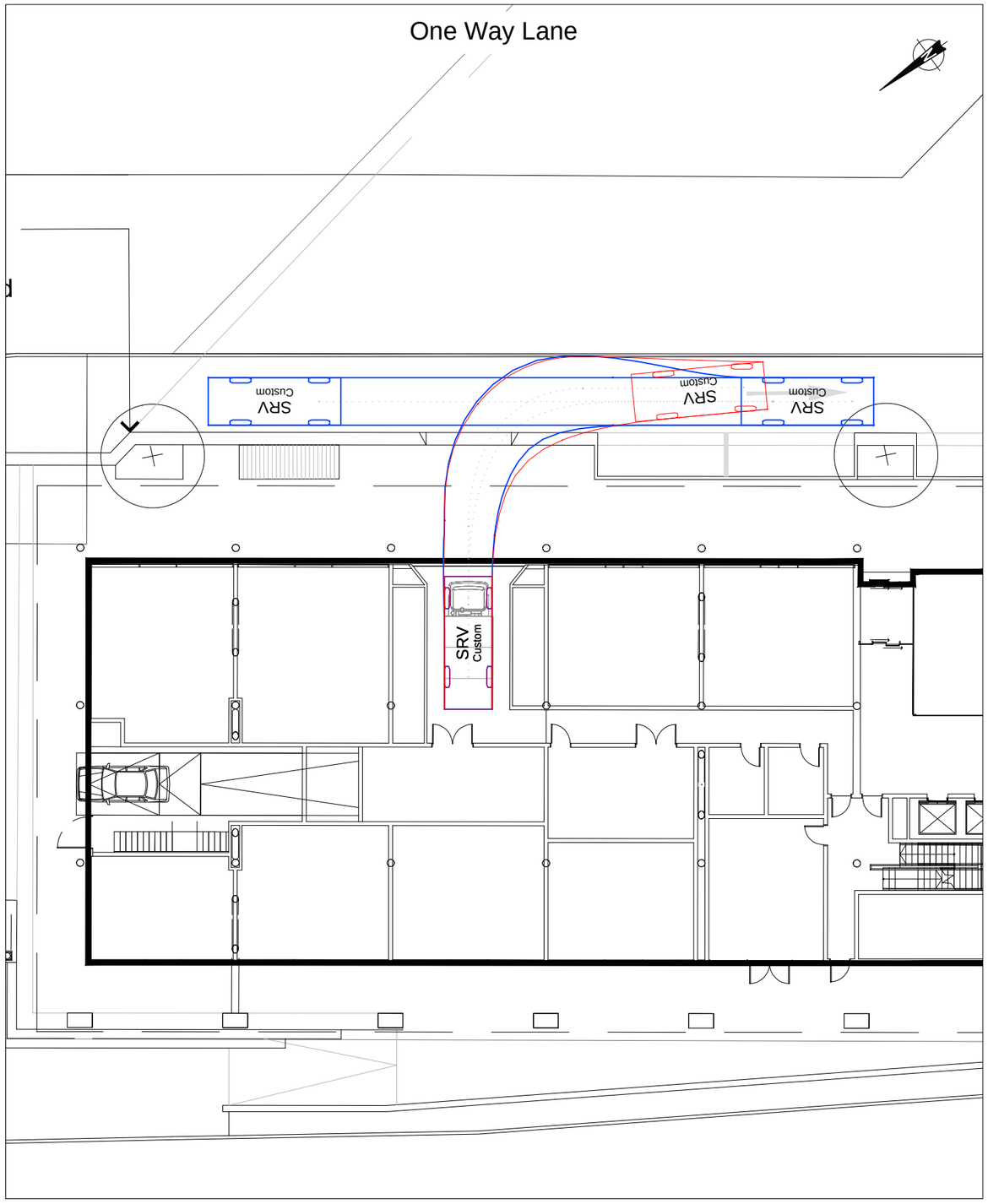
Appendix G

Plan Responding to Item 22

Two Way Lane



One Way Lane



0 20mm

Wednesday, 25 February 2015

REVISION	DATE	DESCRIPTION
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----	----	----
----	----	----
----	----	----
----	----	----
----	----	----

Kumutoto Precinct: Site 10 and Open Space Development

Loading Bay Manoeuvres

DRAWN: Quentin O'S
DATE: 18/02/2015
SCALE: 1:250 @ A3
DWG NO:12834W1A

TDG

7a

C:\12834.001\12834w1a.dwg