ADDENDUM NO. 2

to the

REQUEST FOR PROPOSAL

for

DETAILED DESIGN AND CONSULTING ENGINEERING SERVICES
Cadboro Bay Road and Thompson Avenue Intersection and Underground Works
RFP No. OBMH 21-2020

To All Respondents: June 08, 2020

The following changes, additions, and/or deletions are hereby made a part of the Request for Proposal Documents for the District of Oak Bay DETAILED DESIGN AND CONSULTING ENGINEERING SERVICES -Cadboro Bay Road and Thompson Avenue Intersection and Underground Works RFP NO. OBMH 02-2020 as fully and completely as if the same were fully set forth therein:

Add:

Attached drawings and information as referenced in the Scope of Work -Available information.

Note: Addendum No.1 was issued to correct a spelling error in the title of project on the BCBid website. This resulted in the "Available Information Addendum" being designated number two.

End of Addendum.

Adept Transportation Solutions
PLANNING AND ENGINEERING

Cadboro Bay Road / Thompson Avenue, Oak Bay, BC

Intersection Operation & Safety Assessment

FINAL REPORT

Prepared for:

District of Oak Bay

Date:

June 3, 2014

Prepared by:

Adept Transportation Solutions

Project No. OB-1001

Adept Transportation Solutions
2426 Mill Bay Road, Mill Bay, BC V0R-2P4
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BACKGROUND

Adept Transportation Solutions (Adept) was engaged to conduct an independent review of the intersection Cadboro Bay Road / Thompson Avenue, in the District of Oak Bay, BC.

Our understanding of this assignment is that the subject intersection, in its present configuration, may pose issues for pedestrians, cyclists and drivers. As seen in **Exhibit 1** below, Neil Street to the north, Allenby Street to the south and Nottingham Road to the east, all intersect in close proximity to the main intersection, resulting in wide intersection approaches and a high number of overall conflict points for vehicles, cyclists and pedestrians.

Of particular interest is the location of the existing pedestrian crosswalk. District staff has indicated that there has been some discussion regarding the placement of the crosswalk following two incidents of a pedestrian being struck while in the crosswalk.

EXHIBIT 1 – Study Intersection

EXISTING ROADWAY

In the vicinity of the subject intersection, Cadboro Bay Road consists of a single travel lane in each direction with concrete curb and gutter. There are sidewalks on both sides of the road and the posted speed is 50km/h. There is a dedicated southbound left turn lane at the Cadboro Bay Road intersection approach to Thompson Avenue. The left turn storage length is limited to approximately 10m in length as it is back to back with the 10m northbound left turn storage lane on Cadboro Bay Road onto Neil Street.

Thompson Avenue also consists of one travel lane in each direction with a sidewalk on the northeast side of the road only. On-street parking is permitted on both sides of the road and the posted speed is 40km/h.

Nottingham Road has one travel lane in each direction; however, there are separate right and left turn lanes at the intersection with Thompson Avenue. There are sidewalks on both sides of the street but the north side sidewalk terminates approximately 45m east of Thompson Avenue. The posted speed is 40km/h.

COLLISION HISTORY

Historical collision data was provided by the District for this study. The data set was from February 1997 onward. Over the 17 year period, there have been a total of 7 reported collisions at the intersection. None of the collisions reported a fatality and 5 of the collisions resulted in personal injury. The extent of any property damage or injuries was not contained in the reports.

Typically, collision statists are reviewed over the most recent 5 years. According to the data provided, there have two collisions in the past five years. There was insufficient detail in the reports to identify any trends. Based on the data provided, the intersection collision rate is found to be well below the provincial average.

TRAFFIC VOLUMES

AM and PM Peak Period traffic volume counts were conducted on Wednesday, March 5th, 2014 and included pedestrian and cyclist counts.

The AM Peak Hour occurred between 8:00am – 9:00am and the PM Peak Hour occurred between 3:30pm-4:30pm. These peak periods are typical for intersections in proximity to schools. In this case, the adjacent Willows Elementary School generates peak traffic through the Cadboro Bay Road / Thompson Avenue intersection coinciding with student arrival and dismissal times. The AM and PM Peak Hour traffic volumes and movements are illustrated in **Exhibits 2 and 3** below:

EXHIBIT 2 - AM Peak Hour Traffic Volumes

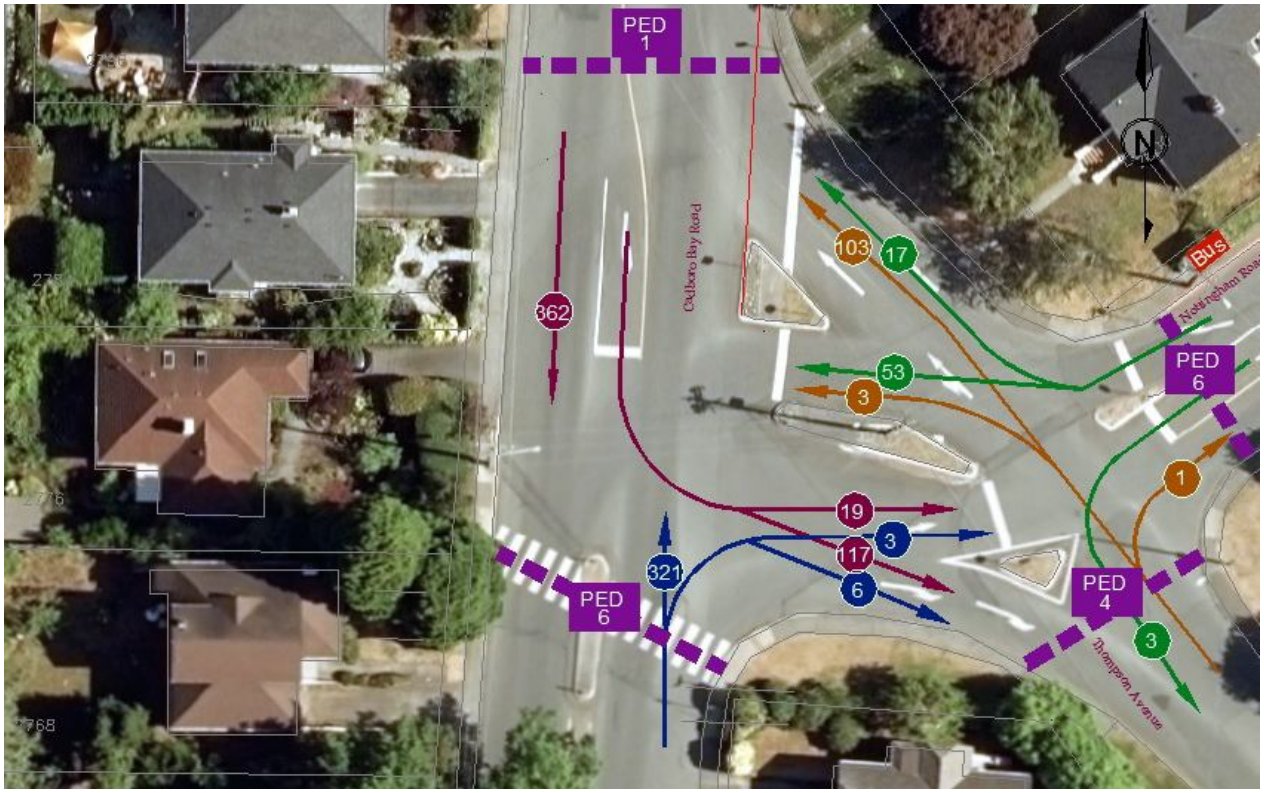
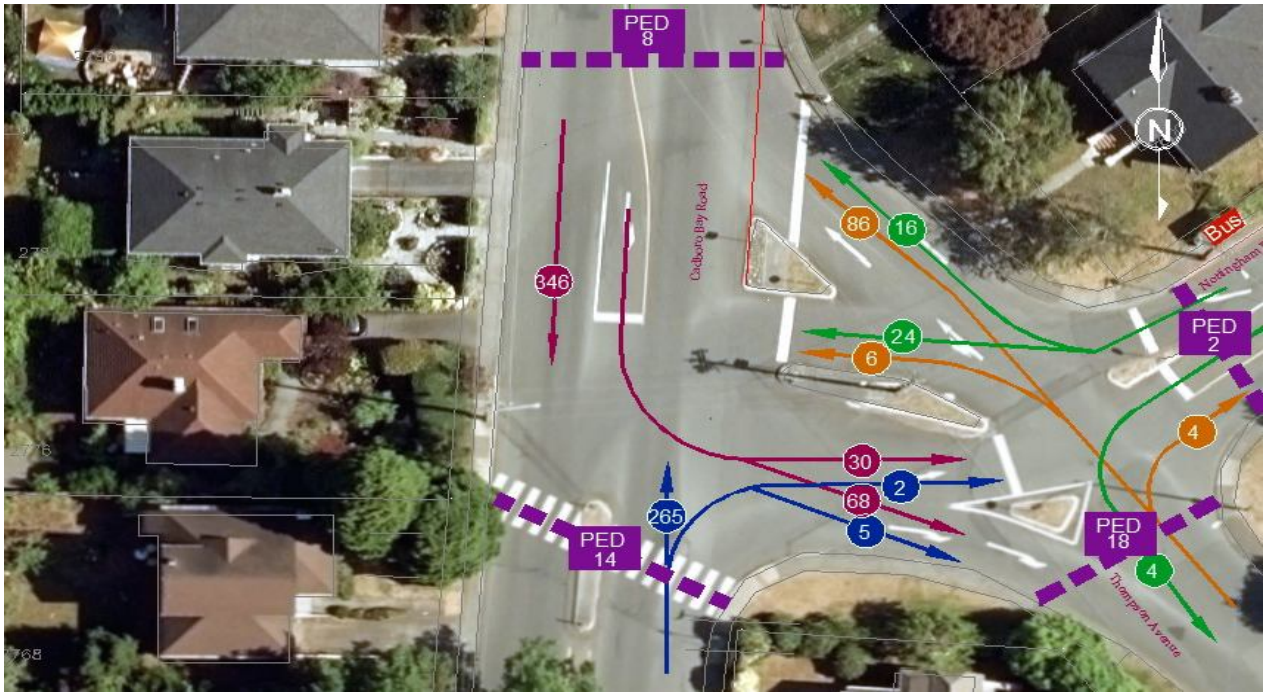


EXHIBIT 3 - PM Peak Hour Traffic Volumes



WALKING

As discussed earlier, there are concrete sidewalks along Cadboro Bay Road, Thompson Avenue and Nottingham Road, in close proximity to the study intersection. The sidewalk on the west side of Thompson Avenue is discontinuous. This is described in more detail in the following section. There is a marked pedestrian crosswalk across the south (Cadboro Bay Road) leg of the intersection only.

The bus stop on Nottingham Road generates pedestrian traffic. During observation periods, the stop was well utilized. Pedestrians boarding and alighting at the stop arrived / departed in various directions and generally all crossed at least one road without a marked crosswalk. In fact, some pedestrians were observed walking within the Thompson Avenue vehicle travel lanes toward Cadboro Bay Road.

TRANSIT

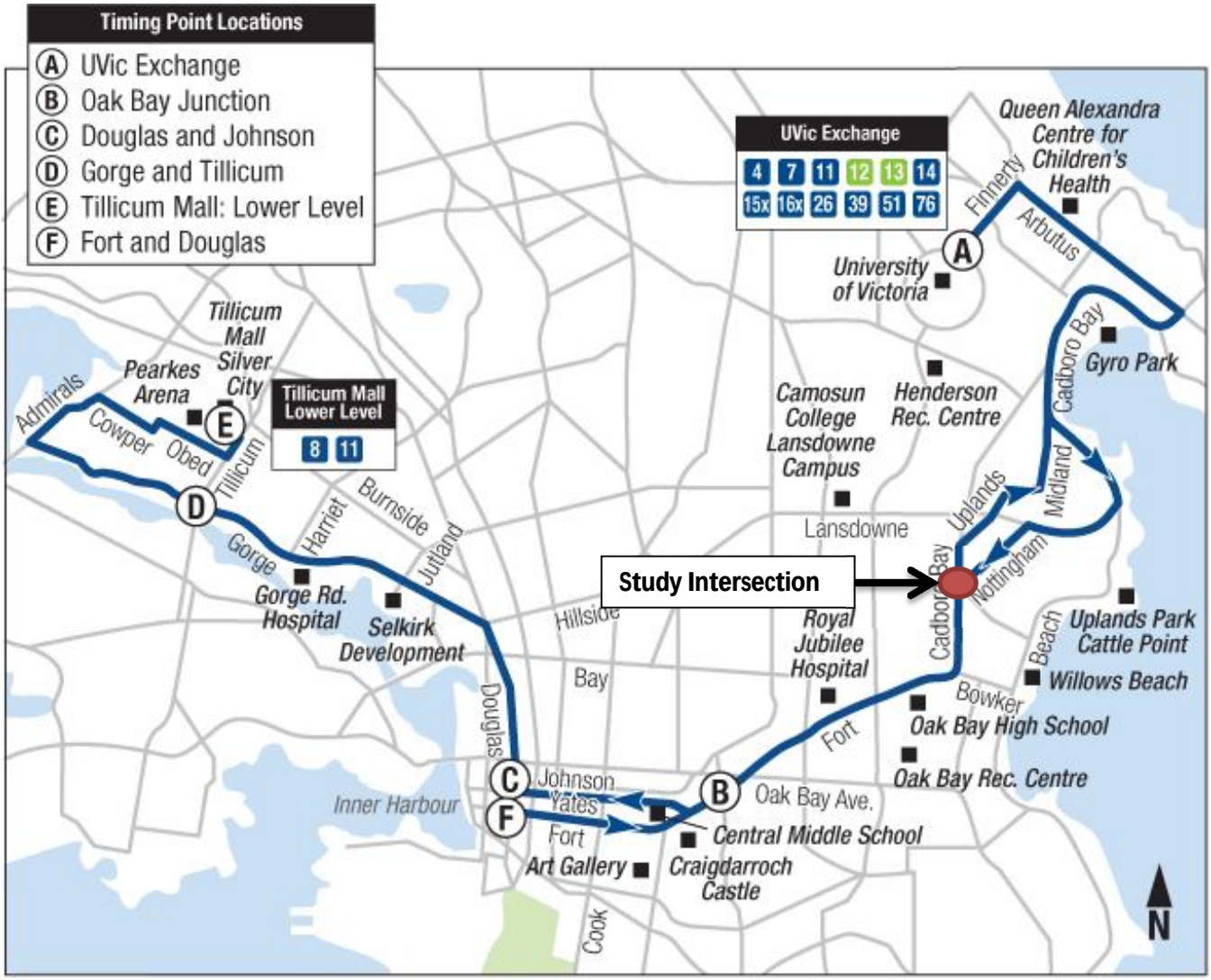
As shown in **Exhibit 4**, the Route 11 — "Tillicum Mall/UVIC" BC Transit bus travels northbound through the Cadboro Bay Road / Thompson Avenue intersection. There is a northbound stop approximately 80m north of the Thompson Avenue intersection

In the southbound direction, the bus routes along Beach Drive to Lansdowne Road and continues to Nottingham Road and then makes a westbound left turn from Thompson Avenue onto Cadboro Bay Road.

There is a westbound bus stop on the north side of Nottingham Road, at the intersection of Thompson Avenue / Nottingham intersection.

There is a southbound stop on Cadboro Bay Road, approximately 125m south of the Thompson Avenue intersection

EXHIBIT 4 – BC Transit Route #11 Map



CYCLING

Cadboro Bay Road is identified in the Capital Regional District's Pedestrian and Cycling Master Plan (PCMP) as a designated Primary Inter Community (PIC) cycling route, providing connectivity to the Camosun College Lansdowne Campus and UVIC for Oak Bay and Victoria residents. The recommended treatment for the corridor is the provision of separated on-street facilities. Within the PCMP, separated on-street facilities are defined as buffered cycling lanes or cycle tracks, as seen below:

Separated On-Street Bicycle Facilities

Cycle Tracks

Cycle tracks are a hybrid bicycle facility combining the experience of a separated path with the on-street infrastructure of a conventional bike lane. Cycle tracks utilize a variety of applications such as parking placement, channelization, mountable curbs, bollards and pavement markings, and grade separation.

Buffered Bicycle Lanes

Buffered bicycle lanes are designed to increase the space between the bicycle lanes and the travel lane or parked cars. They are appropriate on streets with high automobile traffic volumes and speeds, on-street parked cars, and high volumes of truck or oversized vehicle traffic.

As Cadboro Bay Road provides direct access to a number of residential driveways, it would not be practical to install a Cycle Track along the corridor. Additionally, the construction costs associated with Cycle Tracks along Cadboro Bay Road would be significant. Based on these considerations, Buffered Bicycle Lanes would provide a more practical alternative at this time.

OBSERVED INTERSECTION ISSUES

A number of minor issues with the intersection operation in its' current configuration were observed. The notable issues are identified by number on the following **Exhibit 5** and a description of the issues follows.

EXHIBIT 5: Existing Issue Identification

1) Pedestrians cross without a marked crosswalk,
2) Wide lane with dual markings; left lane is utilized by vehicles destined for Neil Street; however, when two vehicles are abreast, turning sight distance is restricted for vehicles in the curb lane. This condition is atypical and would be confusing to drivers that are unfamiliar with the intersection.
3) Short vehicle stacking distance – one transit bus fills the available storage and vehicles were observed blocking the Thompson Avenue thru / right turn lanes.
4) No marked crosswalk near bus stop.
5) No marked crosswalk.
6) Sight distance limited at pedestrian holding area by parked vehicles on Cadboro Bay Road, south of the crosswalk. The skewed crosswalk increases the pedestrian crossing distance and exposure to conflicting vehicles.

7) Drivers were confused by the stop sign for the Nottingham Road through movement and stopped at the free right turn. This could lead to rear end collisions.
8) No marked crosswalk. Observed northbound vehicle travel speeds appeared high through the intersection.
9) The sidewalk on west side of Thompson Avenue terminates near the intersection with Nottingham Road, deterring continuous pedestrian mobility. Pedestrians are likely to cross to the east side at this location to utilize the east side sidewalk to continue south on Thompson Avenue.
10) Wide travel lane encourages higher vehicle speed.

EXISTING CADBORO BAY ROAD CROSSWALK LOCATION

The existing Cadboro Bay Road crosswalk location, south of the intersection with Thompson Avenue was assessed based on roadway geometrics and field observations as well as an analysis of vehicle traffic volumes at the intersection.

The subject intersection(s) need to be upgraded to enhance the pedestrian environment and better serve bicyclists

Although some pedestrians were observed crossing Cadboro Bay Road, north of the Thompson Avenue intersection, the traffic count data confirms that there are higher traffic volumes at that leg of the intersection; hence, a higher potential for pedestrian / vehicle conflicts. Additionally, with the back to back left turn lanes, a crosswalk would only be practical to the north of the Neil Street intersection. This should only be considered if the existing crosswalk were removed, which is not recommended.

PROPOSED INTERSECTION IMPROVEMENT OPTIONS

According to our traffic count data, the dominant side street traffic movement is to/from the Thompson Avenue intersection leg. Given this condition, it is proposed that any intersection design maintain right of way for these movements to minimize overall intersection delay.

For each option, it is recommended that the west side sidewalk on Thompson Avenue be extended to the south for a minimum distance of 50m. This distance is the minimum distance that a driver needs to come to a stop for a 40km/h posted speed.

Option 1 - Minimum Improvement

This lowest cost option is intended as an interim measure to mitigate some of the pedestrian safety concerns that were noted; particularly the limited visibility at the east side of the existing crosswalk. The option calls for a curb extension at the southeast quadrant of the intersection. The curb extension would improve visibility for northbound approaching drivers as well as for pedestrians looking south for approaching vehicles. The crosswalk is to be realigned; reducing the crossing distance by approximately 3.5 metres. Reduced travel lane widths are shown to result in lower vehicle travel speeds.

Another consideration at the intersection would be the marking of dedicated bike lanes. The markings would provide a safe area for cyclists and would also visually narrow the vehicle travel lanes at the Cadboro Bay Road intersection approaches. In this option, 1.8m wide bike lanes are shown, with an accompanying painted buffer

strip 0.4m wide. On the southeast side of the intersection, parallel on-street parking is maintained with a 2.5m stall width.

Ideally, the crosswalk could be fitted with solar powered crosswalk beacons to further alert approaching drivers of pedestrian crossing activity.

Option 2 - Preferred Improvement

Option 2 is an extension of the Option 1 construction. This higher cost option has significant safety benefits. Overall, vehicle conflict points are reduced and the intersection design is much more traditional, eliminating the confusion experienced under the current laning design. Under this design scenario, pedestrians are provided with sufficient marked crosswalks to safely continue their walk trip in any direction.

The design also accommodates existing infrastructure (i.e. Hydro Poles) and three of the existing channelization medians would be removed. The design also allows for the straightening of the south leg crosswalk and maintains the centre refuge area. The pedestrian crossing distance is further reduced by a total of approximately 4metres and the southbound left turn lane on Cadboro Bay Road can be lengthened to 15m, which many jurisdictions consider a minimum length.

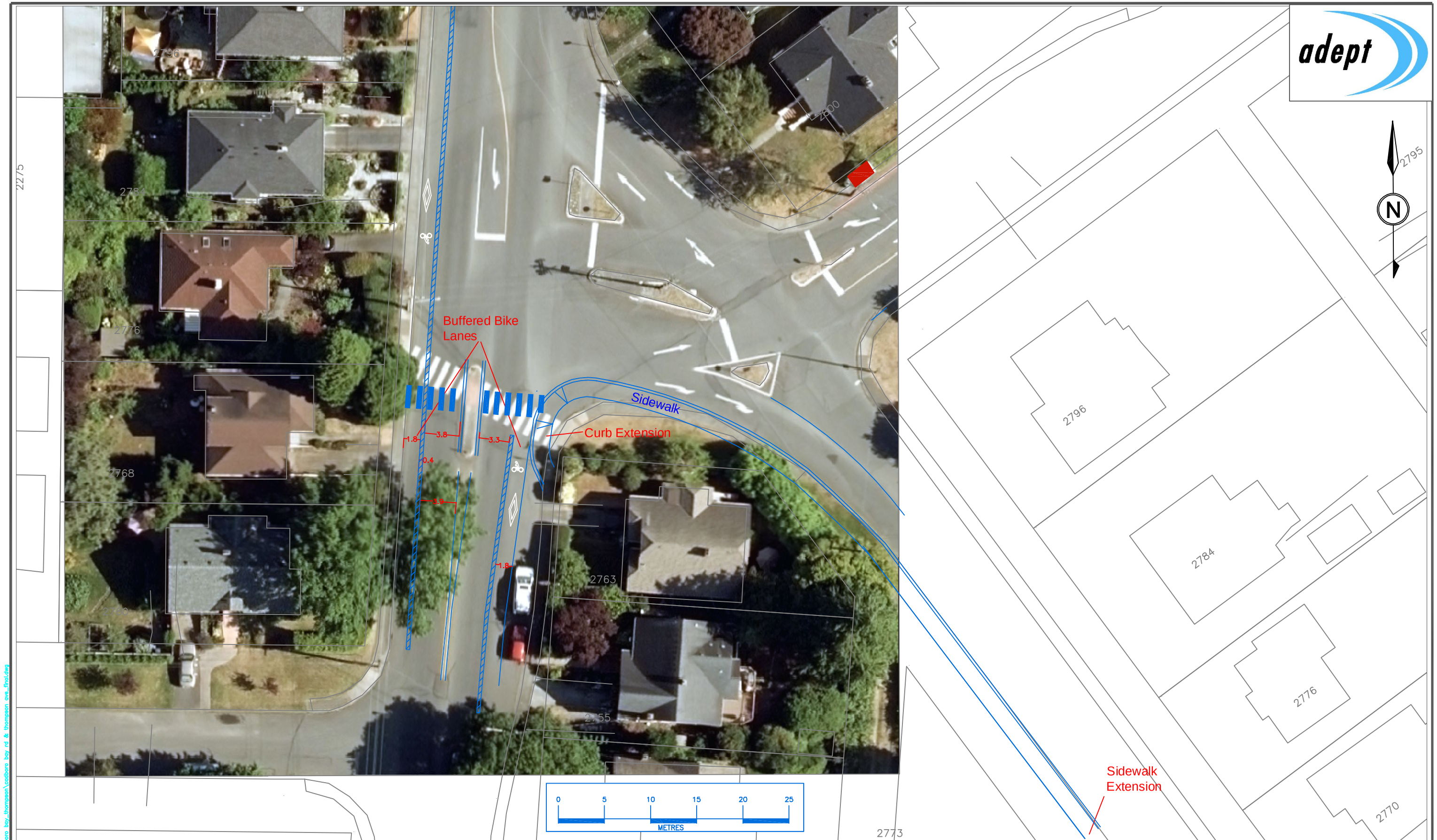
As with Option 1, buffered bike lanes are depicted along Cadboro Bay Road. With this option, cyclist exposure to vehicle conflicts is greatly reduced.

Landscaping and / or stormwater management design such as rain gardens can be implemented in the reclaimed pavement areas.

Option 3 - Roundabout

An option for a single lane roundabout option was explored. Typically, roundabouts are installed where traffic signals would be warranted, or on roads that traffic calming is desired. Based on the existing traffic volumes, signalization or roundabout is not warranted for this intersection. While the existing traffic volumes could be easily handled by a roundabout intersection; given the property constraints, it is not feasible to design an effective laning configuration for the Thompson Avenue / Nottingham Road intersection to maintain existing right of way priority for the Thompson Avenue approach. Further, a BC Transit bus would be required to mount the internal circle apron, which would cause discomfort for passengers. Marked “Buffered” bicycle lanes through the intersection would not be appropriate; therefore, cyclists comfort through the intersection would be compromised.

Based on our study findings, two options to mitigate the observed issues are presented in **Attachments 1 and 2** on the following pages.



Cadbroa Bay Road / Thompson Avenue / Nottingham Road Intersection
Recommended Improvements - Option 1

PRELIMINARY CONCEPT PLAN – NOT FOR CONSTRUCTION

ATTACHMENT 1

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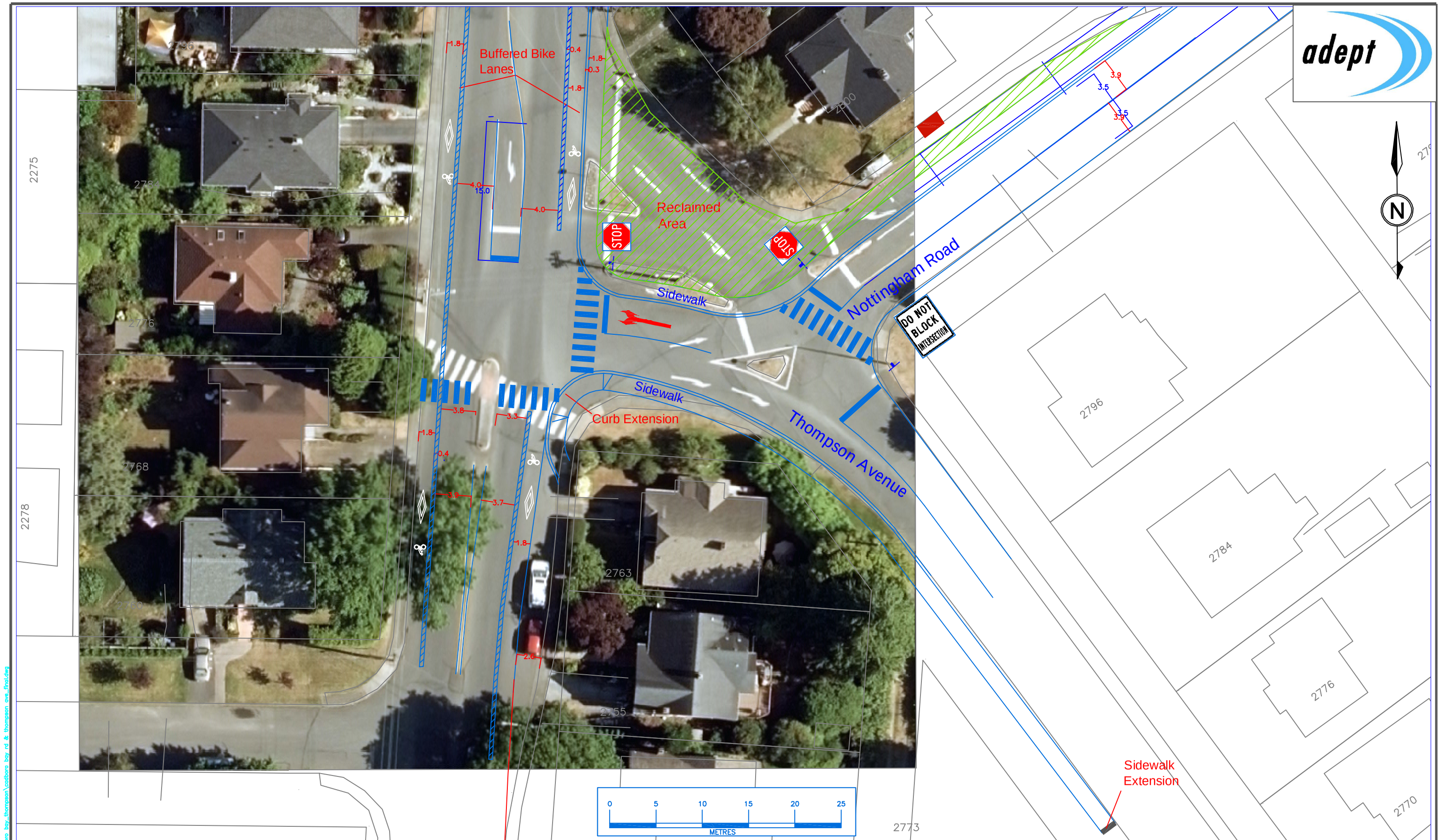


Cadbroa Bay Road / Thompson Avenue / Nottingham Road Intersection
Recommended Improvements - Option 2

PRELIMINARY CONCEPT PLAN – NOT FOR CONSTRUCTION

ATTACHMENT 2

CONSTRUCTION COST ESTIMATES

Preliminary "Class D" construction cost estimates provided below are based on unit costs provided by the District of Oak Bay and experience in similar projects. A Class D estimate provides a rough cost projection used for budget planning purposes in the early stages of concept development of a project. A 30% contingency has been applied to each option estimate to cover engineering design and unforeseen additional construction tasks.

Common - extend sidewalk on Thompson by 50m				
	90 m2 @ 1.8m			
excavation	$6,750.00			
construction	$9,000.00	30%	Contigency	
	$15,750.00	**$20,500.00**		
Option 1				**Total with sidewalk extension**
excavation	$8,250.00			
Curb & Sidewalk	$8,788.00			
road paint	$3,500.00	30%	Contigency	
	$20,538.00	**$27,000.00**		**$47,500.00**
Option 2				
excavation	$37,500.00			
Curb & Sidewalk	$24,500.00			
road paint	$5,000.00			
planted beds	$20,125.00	30%	Contigency	
	$87,125.00	**$115,000.00**		**$135,500.00**
Option 3		30%	Contigency	
Lum Sum	**$200,000.00**	**$260,000.00**		**$280,500.00**

**** If Solar Powered flashing crosswalk beacons are considered, the cost associated with the hardware would be an approximate additional cost of $25,000.***

CONCLUSIONS

Based on the assessment above, a number of minor issues with the intersection operation in its' current configuration were observed. Although the collision statistics provided for this study did not indicate a high frequency or any identifiable crash patterns, observations revealed that there are a number of safety enhancements that should be considered at the intersection.

The immediate concern relates to the Cadboro Bay Road crosswalk. There is limited visibility for pedestrians on the east side of the crosswalk to observe oncoming traffic. Option 1 shows a curb extension on the east side of the crosswalk to improve visibility for pedestrians and approaching drivers.

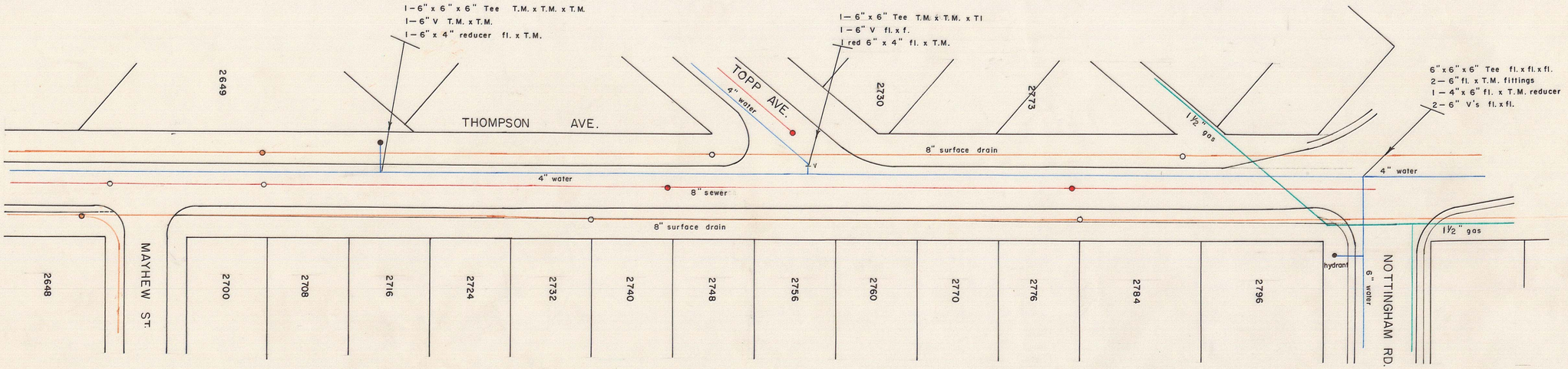
Option 2 shows an extensive reconfiguration of the intersections of Cadboro Bay Road / Thompson Avenue / Nottingham Road. This option provides enhanced pedestrian and cyclist facilities and reduces the number of vehicle conflict points.

Option 3 shows a roundabout intersection; however, a roundabout is typically installed where traffic signals would be warranted, which is not the case at this intersection. Also, due to property constraints, it is not feasible to design an effective laning configuration for the Thompson Avenue / Nottingham Road intersection to maintain existing right of way priority for the Thompson Avenue approach. Other concerns were noted regarding transit and cyclist limitations with this option.

RECOMENDATIONS

Based on the assessment above, it is recommended that the conceptual design option shown in **Attachment 1** be considered as an interim solution. This design would improve pedestrian safety by enhancing their visibility at the east side holding area which is currently compromised by parked vehicles on Cadboro Bay Road. The proposed bicycle lanes and curb extension would also narrow the vehicle travel lane which can reduce travel speeds through the intersection. The curb extension would also shorten the pedestrian crossing distance. Installation of solar powered crosswalk flashers would also increase awareness of pedestrian crossing activity for approaching drivers.

The second option, shown in **Attachment 2**, effectively mitigates all of the observed issues at the intersection(s). This option also provides an opportunity to reclaim some the existing pavement areas and which could be used to enhance the aesthetic appeal in the immediate area and could also provide opportunities for enhanced stormwater management. Based on our assessment, Option 2 is the preferred option.



THE CORPORATION OF THE DISTRICT OF OAK BAY

ENGINEERING DEPARTMENT

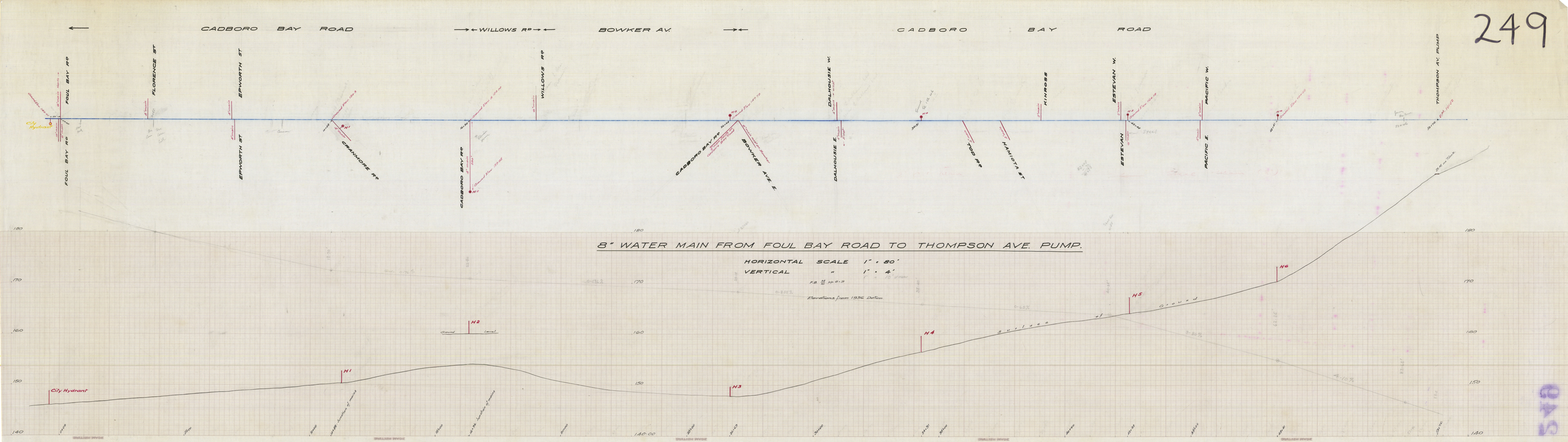
Watermain Replacement

DATE	BY	NO.	DETAILS	APV'D
			REVISIONS	

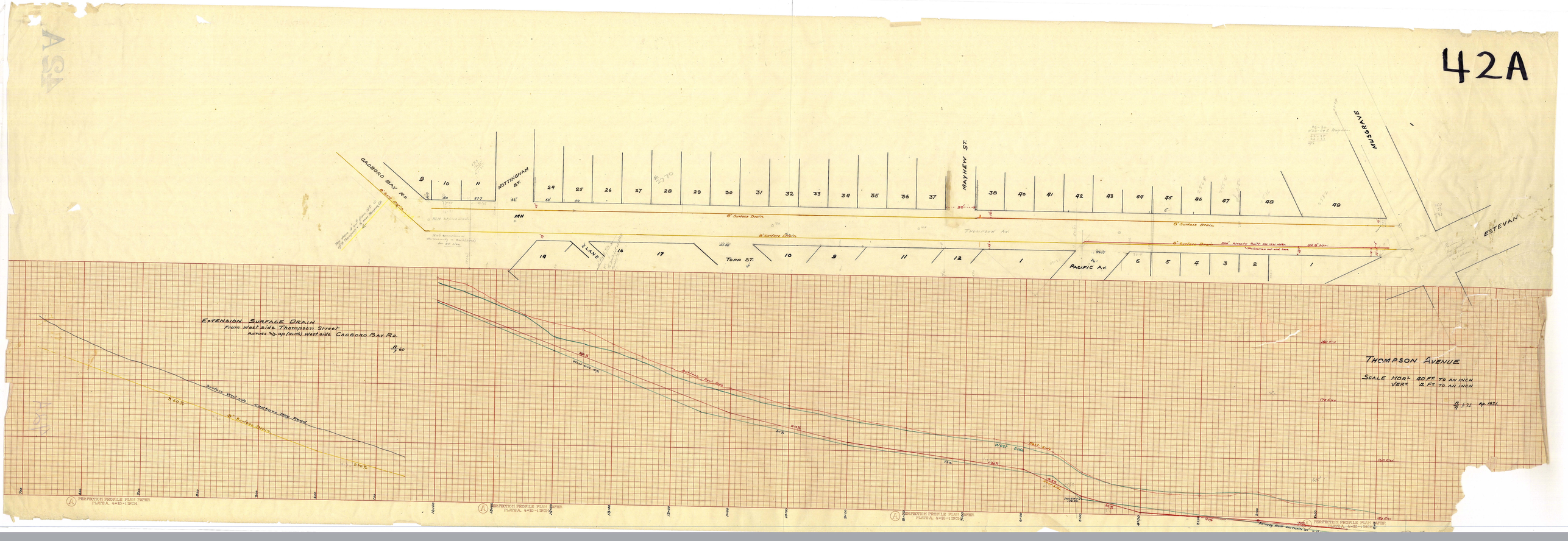
DATE NOV./75	DRAWN R.S.		DWG. NO. 478
	CHECKED R.S.		
SCALES 1" = 40'	DESIGN R.O.H.S.		REF. NO.
	APPROVED		SHEET NO. 2

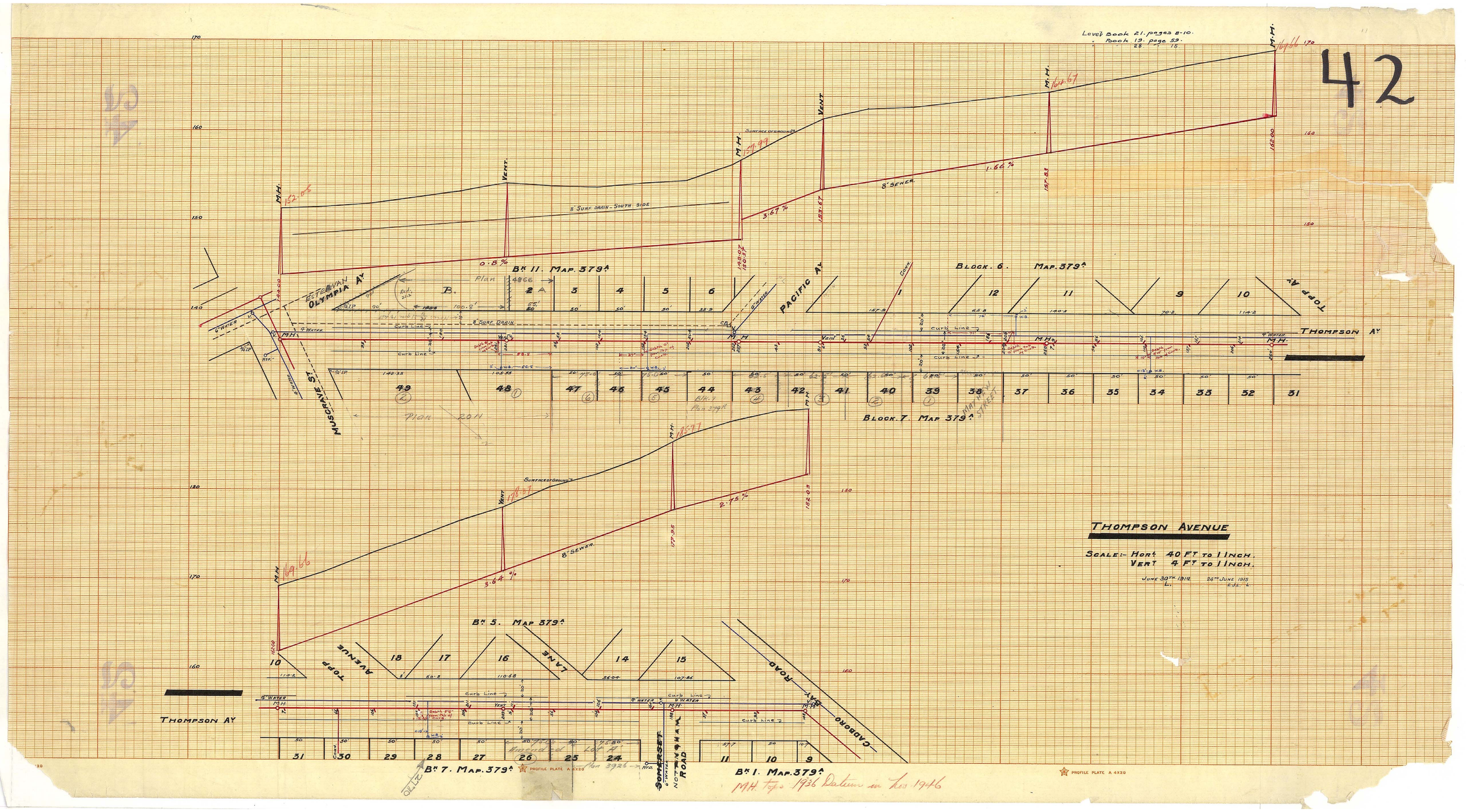
478 2/2

249


CADBORO BAY ROAD
WILLOWS RD
BOWKER AV.
CADBORO BAY ROAD
FOUL BAY RD
FLORENCE ST
EDWARD ST
EDWARD ST
WILLOWS RD
DALHOUSIE W.
HINROSS
ESTEVAN W.
PACIFIC W.
THOMPSON AV. PUMP
City Hydrant
GRANNORE RD
CADBORO BAY RD
CADBORO BAY RD
BOWKER AVE E.
DALHOUSIE E.
HANISTA ST
ESTEVAN
PACIFIC E.
H1
H2
H3
H4
H5
H6
8" WATER MAIN FROM FOUL BAY ROAD TO THOMPSON AVE. PUMP.
HORIZONTAL SCALE 1" = 80'
VERTICAL " 1" = 4'
Elevations from 1936 Datum
City Hydrant
Ground Level
Surface of Ground
180
170
160
150
140

42A


CADBORO BAY RD.
NOTTINGHAM ST.
MAYHEW ST.
MULSOR AVE
ESTEVAN
TOPP ST.
PACIFIC AV.
THOMPSON AV.
LANE
8" Surface Drain
EXTENSION SURFACE DRAIN
FROM WEST SIDE THOMPSON STREET
ACROSS ¼ MILE (NEAR) WEST SIDE CADBORO BAY RD.
THOMPSON AVENUE
SCALE HORZ. 40 FT. TO AN INCH
VERT. 2 FT. TO AN INCH
PERFECTION PROFILE PLAN PAPER
PLATE A. 4=20-1 INCH


42
Level Book 21. pages 8-10.
Book 19. page 59.
M.H.
VENT.
8" SURF. DRAIN - SOUTH SIDE
8" SEWER.
0.8 %
3.67 %
1.66 %
2.45 %
3.64 %
Bk 11. Map. 379A
Block. 6. Map. 379A
Block. 7. Map. 379A
Bk 5. Map. 379A
Bk 7. Map. 379A
Bk 1. Map. 379A
OLYMPIA AY
PACIFIC AY
TOPP AY
MUSCOGEE ST
THOMPSON AY
TOPP AVENUE
LANE
CADDO
SEMINOLE
NOTTOWAY ROAD
Curb Line
4" WATER
6" WATER
8" SURF. DRAIN
Plan 4866
Plan 2011
Plan 3926
Amended Lot 31
MH. Tops 1936 Datum in Bks 1946
THOMPSON AVENUE
SCALE:- HORZ. 40 FT. TO 1 INCH.
VERT. 4 FT. TO 1 INCH.
JUNE 30TH 1914. L.
24TH JUNE 1915 E.H.L.
PROFILE PLATE A 4X20