

APLIN & MARTIN CONSULTANTS LTD

Principals:
Robert McCurdy, PEng
Ed Fujii, PEng
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Jim Tapp, PEng
Bill Lee, PEng
Andrew Baker, PEng

January 18, 1999

Our File: 97058

Ministry of Environment
Planning & Assessment
Lower Mainland Region
10470-152 Street
Surrey, BC V3R 0R3

Attention: Mr. Miles Stratholt

Dear Sirs:

Re: East Newton Business Park – Neighbourhood Concept Plan (NCP)

We are currently in the early stages of finalizing the East Newton Business Park (NCP) for the City of Surrey. In the course of the review of our draft report, the City of Surrey Planning Department and Engineering Departments have requested that we ask for your comments on the proposed Neighbourhood Concept Plan.

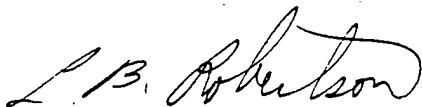
We are enclosing a copy of the Surrey Planning Departments proposed zoning plan, a copy of the proposed storm sewer plan (Figure 10) and a copy of Envirowest Consultants Ltd. report on their field assessment on all the watercourses within the proposed business park for your review and comments.

The business park will consist of light industrial land as shown in pink, a live and work land use south of 66 Avenue and a small commercial lot. The NCP study area will drain via storm sewer collection system to the east end of 68 Avenue within the study area. A biofiltration pond will be eventually designed by an environmental consultant to receive the first flush of the storm events and then flow into the two large ditches along 68 Avenue east of the study area. These two ditches drain eventually into the Serpentine River.

At the next regular scheduled meeting with the City of Surrey on January 27, we and Envirowest Consultants Ltd. will make an oral presentation to you on the Neighbourhood Concept Plan. We would be pleased to answer all of your questions at the above meeting.

Yours truly,

APLIN & MARTIN CONSULTANTS LTD.

A handwritten signature in cursive script, reading "L. B. Robertson".

L. B. Robertson, PEng
Project Engineer

LBR:ct

Enclosure

cc: Ms. Wendy Whelen, City of Surrey
Eric Emery, MBA, PEng, Drainage Planning Manager, City of Surrey
John Sidnell, PEng, NCP Project Coordinator, Reid Crowther & Partners Ltd.

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January 14, 1999

Aplin & Martin Consultants Ltd.
Suite 201, 12448 - 82nd Avenue
Surrey, B.C.
V3W 3E9

Attention: Mr. Len Robertson, P.Eng.
Project Engineer

Dear Mr. Robertson,

**RE: EAST NEWTON BUSINESS PARK - NCP
WATERCOURSE CLASSIFICATIONS**

Envirowest has conducted a field assessment of all watercourses within the proposed business park. The purpose of the assessment was to confirm or, where necessary, revise the current classifications as shown on the City of Surrey Watercourse Classification Map. Our findings are described below.

The current watercourse classification map indicates that the business park area includes streams of classes A(O) and C only. As revised, the map should include streams of classes A(O), B and C. Some mapped watercourses do not exist. Our findings are summarized in Table 1 below.

With development of the business park it is expected that all of the Class C watercourses and some portions of the Class B watercourses will be eliminated. Class C watercourses, by the definition adopted by the City of Surrey and the environmental agencies, have insignificant habitat value and can be displaced without compensation. Class B watercourses, by definition, are not inhabited by salmonids but do provide food/nutrient value to downstream habitats. While the habitat value of Class B watercourses should be preserved, some distinction should be made between Class B habitats that cannot feasibly be re-created (such as ephemeral headwater ravines) and those that can feasibly be re-created. The Class B habitats within the study area are all manmade ditches/swales that were dry when assessed in the fall of 1998. These include the following watercourse sections:

- 66th Avenue, south side, easternmost 60 m;
- 66th Avenue, north side, easternmost 75 m;
- 68th Avenue, south side, easternmost 75 m (to study area boundary);
- south of 68th Avenue, 15250 block;
- 6750 block, 15250 to 15350 blocks; and,
- north of 68th Avenue, 15250 block.

Table 1. Watercourse classifications for the East Newton Business Park.

LOCATION	PHOTO NUMBERS	CURRENT CLASSIFICATION	REVISED CLASSIFICATION
66th Avenue - south side	1 - 2	Class C - all 500 m	Class C - western 440 m Class B - eastern 60 m
66th Avenue - north side	3 - 4	Class C - western 200 m Class A(O) - eastern 300 m	Class C - western 425 m Class B - eastern 75 m
North of 66th Avenue at 15350 block	5	Class A(O)	Does not exist
66th Avenue to 68th Avenue at 15450 block	6	Class A(O)	Class B
68th Avenue - south side	7 - 8	Class A(O)	Class C - western 275 m Class B - middle 75 m Class A(O) - east of study area
68th Avenue - north side	9 - 10	Class A(O)	Class C - western 300 m Class A(O) - eastern 75 m and beyond study area
South of 68th Avenue at 15400 block	11	Class A(O)	Does not exist
South of 68th Avenue at 15250 block	12	Class A(O)	Class B
6750 block between 15250 and 15350 blocks	13	Class A(O)	Class B
North of 68th Avenue at 15300 block	14	Class A(O)	Does not exist
North of 68th Avenue at 15250 block	15	Class A(O)	Class B

The proposed wetland to be constructed at the northeast corner of the study area will accommodate sufficient habitat features to offset the loss of these Class B habitats. The proposed wetland/pond will provide sedimentation and biofiltration functions primarily within about one-half of the area, with food/nutrient production and wildlife habitat within the other half. The lands surrounding the wetland/pond would be landscaped to maximize fish and wildlife values.

Upgrading of the Class A(O) watercourse east of the study area (along the 68th Avenue right-of-way) is anticipated. This will require impact mitigation that may also include compensation habitat.

Attachments A and B show the existing and revised watercourse maps. Pending approval and development of the business park, the watercourse map will require further updating to reflect the ultimate drainage configuration.

Photographs referred to in Table 1 are presented in Attachment C.

Please note that, under the terms of the Memorandum of Agreement regarding the watercourse classification system, revisions to the current watercourse classifications require the endorsement of the Ministry of Environment, Lands and Parks and the Department of Fisheries and Oceans. Please call me should you have questions.

Yours truly,
ECL ENVIROWEST CONSULTANTS LIMITED



Ian W. Whyte
Senior Project Manager

IWW/
attach.

Bear Creek



Study Area
Boundary

Hyland Creek

envirowest
ENVIRONMENTAL CONSULTANTS

Attachment A
Existing Watercourse
Classifications

Bear Creek



Study Area
Boundary

Hyland Creek

envirowest
ENVIRONMENTAL CONSULTANTS

Attachment B
Revised Watercourse
Classifications



Photograph 1. Ditch on south side of 66th Avenue, looking west (Class C).



Photograph 2. Ditch on south side of 66th Avenue near east boundary of study area. Beyond driveway ditch is Class B.



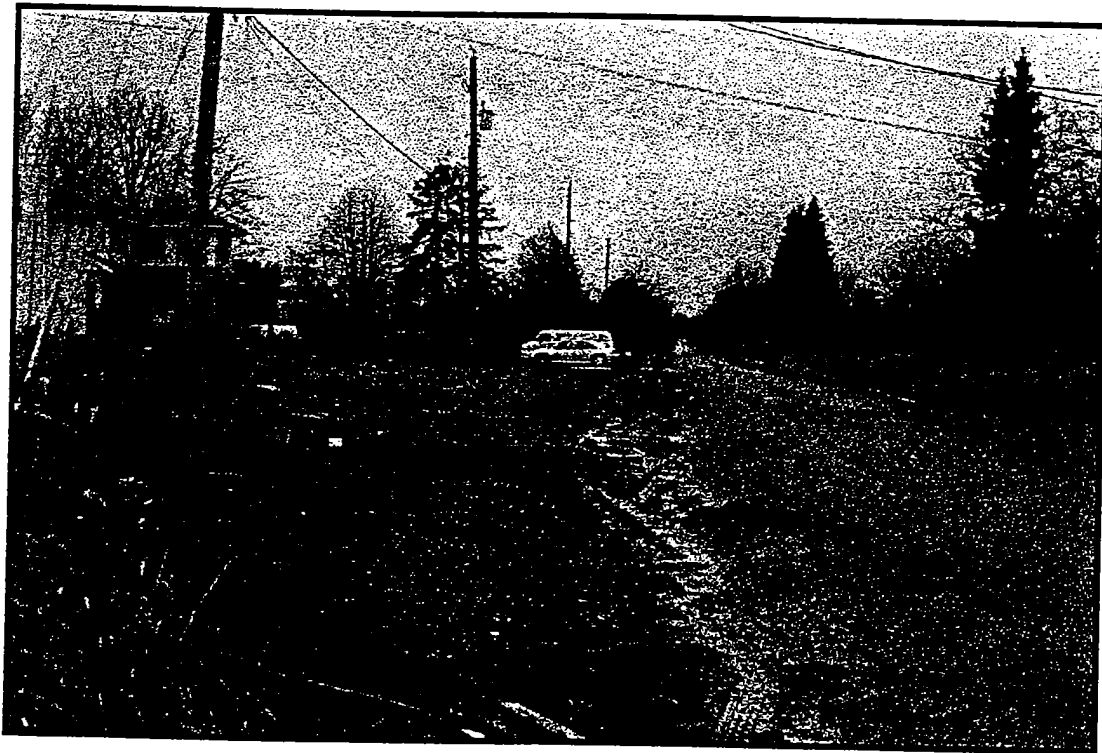
Photograph 3. Ditch on north side of 66th Avenue, looking west (Class C).



Photograph 4. Ditch on north side of 66th Avenue near east boundary of study area. This portion is Class B.



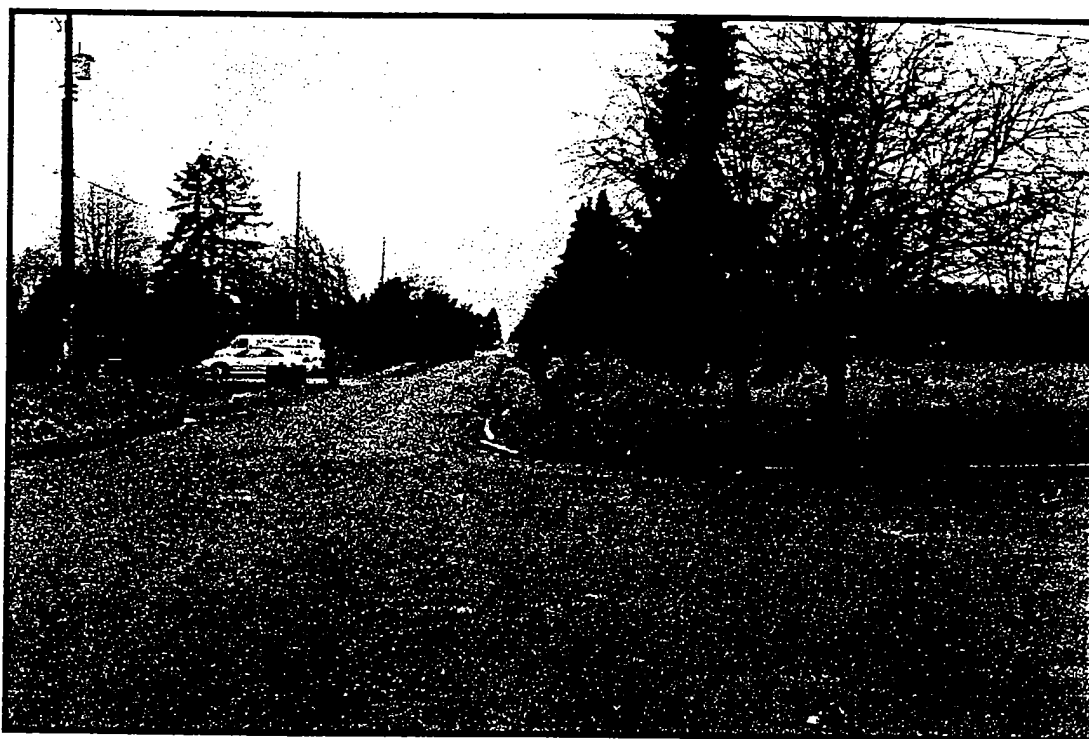
Photograph 7. Ditch on south side of 68th Avenue, looking east. Class B in foreground; Class A(0) in background (beyond eastern boundary of study area).



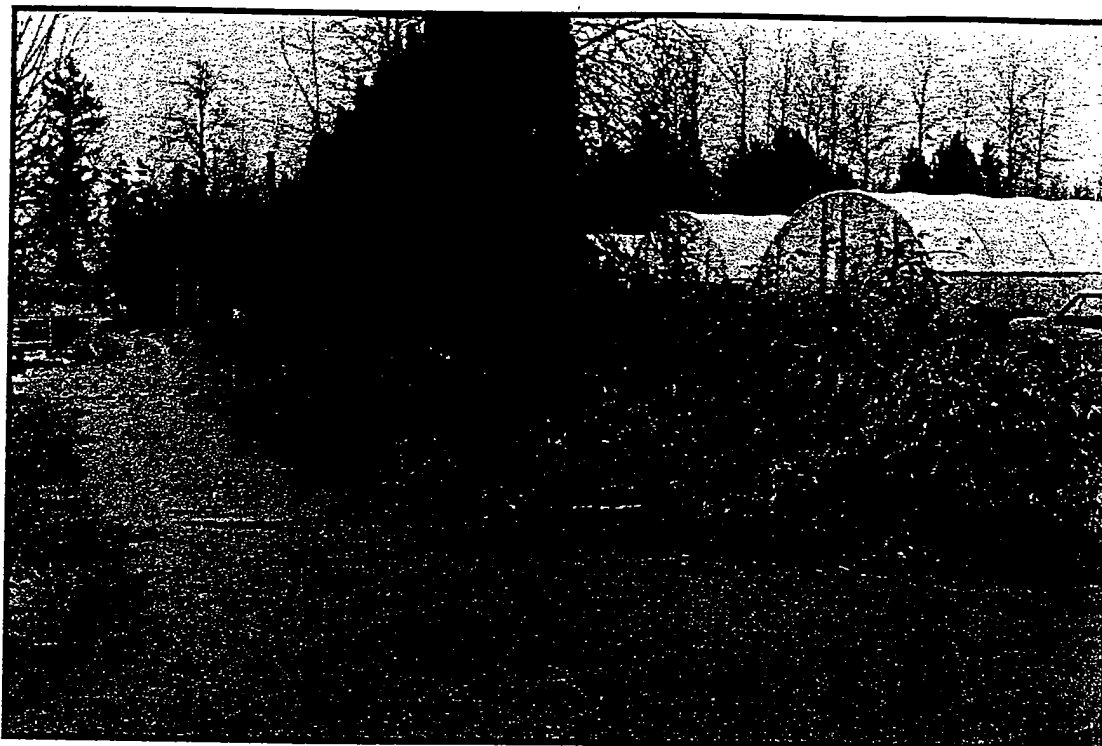
Photograph 8. Looking west along south side of 68th Avenue (Class C).



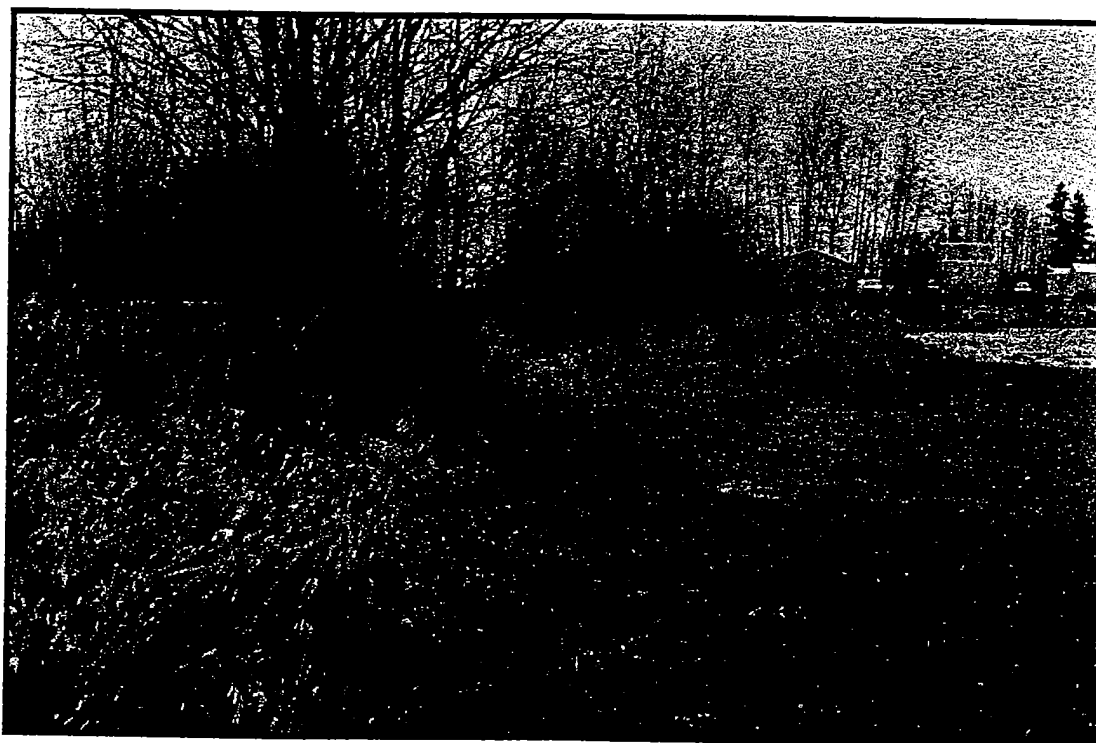
Photograph 9. Looking east along north side of 68th Avenue near eastern boundary of study area (Class A(0)).



Photograph 10. Looking west along north side of 68th Avenue (Class C).



Photograph 11. Property boundary south of 68th Avenue where current map shows a watercourse (that does not exist).



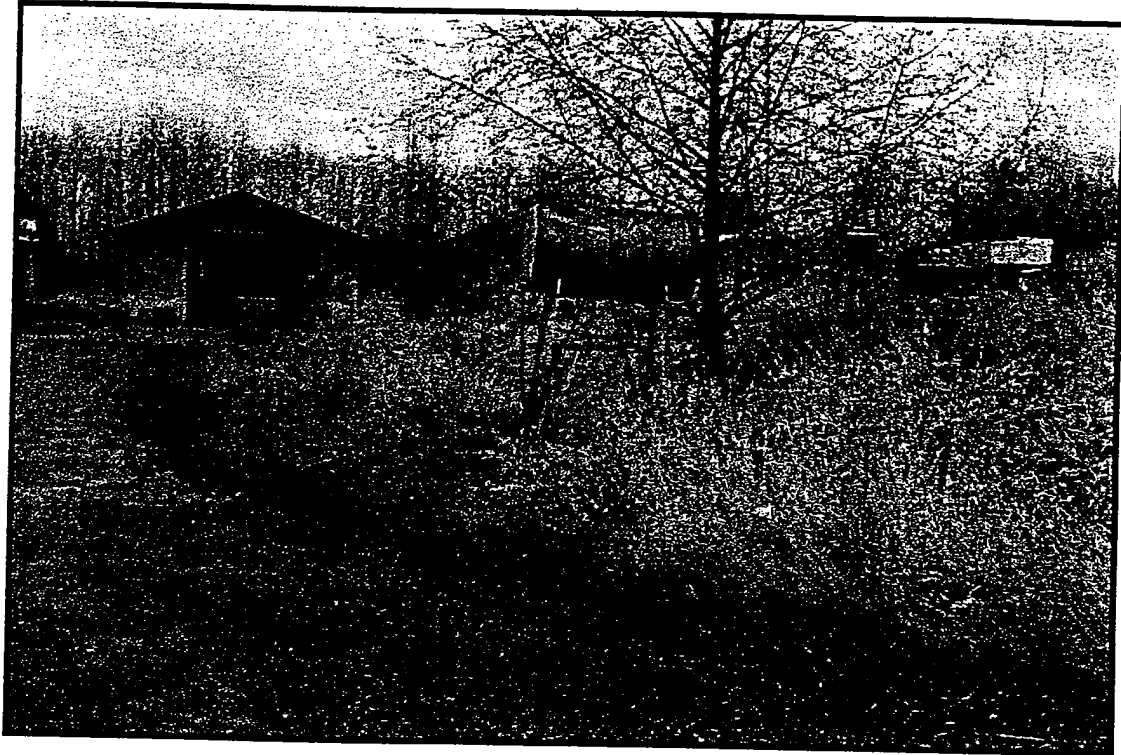
Photograph 12. Minor ditch along property boundary, south of 68th Avenue (Class B). Dry detention basin on right side of photograph.



Photograph 13. Swale oriented eastward at south side of lots on south side of 68th Avenue (Class B).

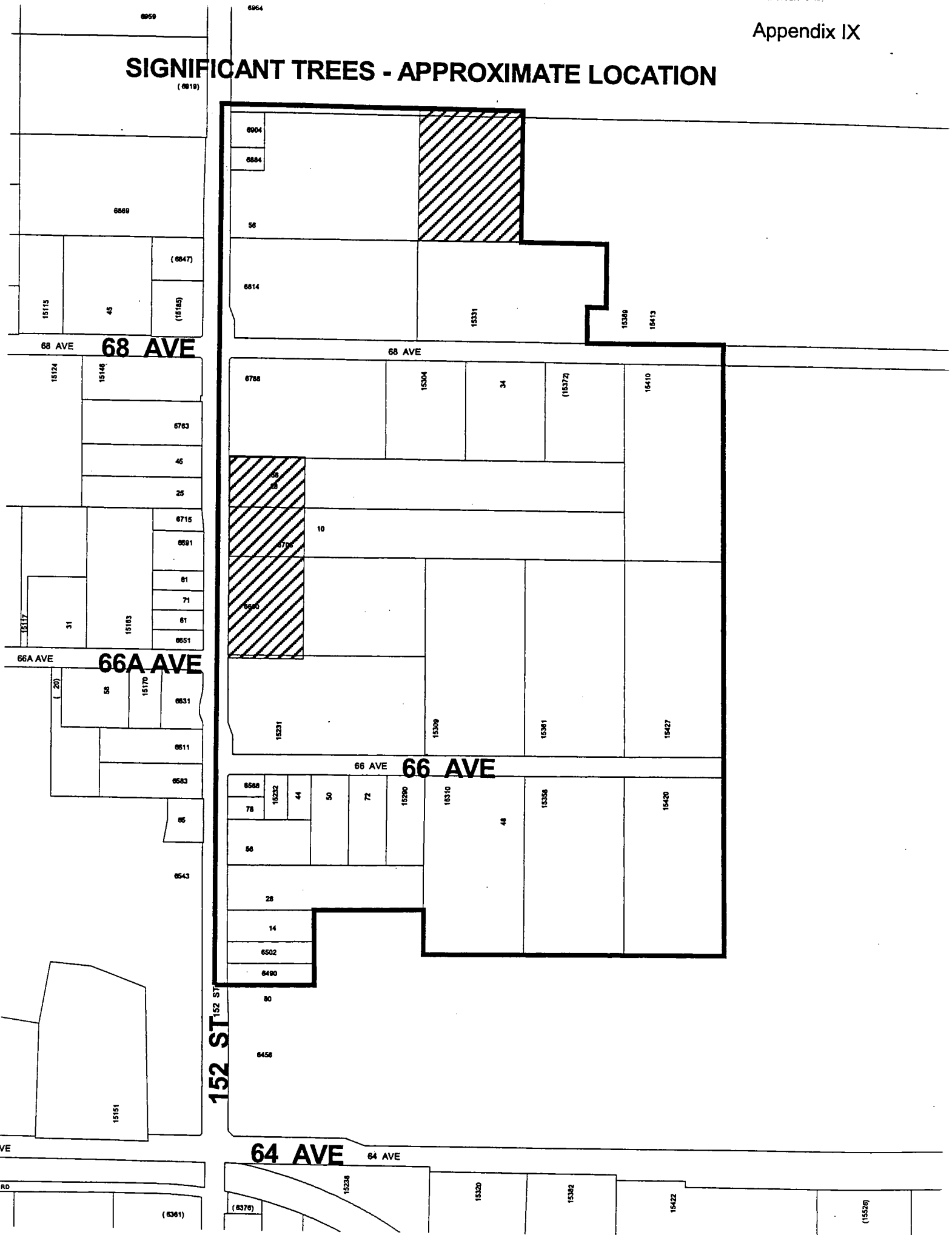


Photograph 14. Looking north from 68th Avenue along property boundary where current map shows a watercourse (that does not exist).



Photograph 15. Looking east at swale through farm (Class B).

SIGNIFICANT TREES - APPROXIMATE LOCATION



APPENDIX X

DESIGN GUIDELINES FOR THE EAST NEWTON BUSINESS PARK

The following design guidelines will apply to developments within the East Newton Business Park Neighbourhood Concept Plan area. These guidelines are intended to complement the Development Permit Guidelines contained in Surrey's Official Community Plan (OCP) and the Provincial Agricultural Land Commission's *Landscape Buffer Specifications, 1993*. Development Permits will be required for all developments to ensure compliance with these, and the above mentioned guidelines.

1. Objectives

- 1.1. To encourage the development of a comprehensively designed Business Park in an open space/campus-like setting.
- 1.2. To achieve a high level of visual identity for the Business Park.
- 1.3. To facilitate the co-ordinated development between buildings, landscaping and site features.
- 1.4. To enhance the interface between Business Park and Live/Work developments.
- 1.5. To enhance the interface between the Business Park and the Agricultural Land Reserve.
- 1.6. To maintain as much of the natural environment as possible.

2. General Guidelines

- 2.1. Compatibility of the building design (scale, massing, material) with the architecture of adjacent buildings is recommended.
- 2.2. To provide visual landmarks, and to promote a sense of enclosure, the principal building of a corner property should be located so as to anchor the corner, and be designed to be visually attractive from both abutting streets.
- 2.3. A consistently maintained wide front yard landscaped setback of not less than 7.5 metres to parking areas and/or to buildings must be established on all sites, regardless of the use or character.
- 2.4. A row of alternating trees along the street to complement the street trees must be planted within the lot to achieve a canopy effect over the sidewalk.
- 2.5. Landscaped screening must be provided for all mechanical, electrical equipment, garbage collection areas, large paved parking areas, blank walls, fences, and loading areas that are visible from the street.
- 2.6. Parking within the front yard setback is discouraged, however, where it is proposed, it must be visually screened from the street by a combination of berming and high quality landscaping.
- 2.7. All planting material must conform to the Official Community Plan guidelines for Landscaping and Fences, Section A.6.

- 2.8. In general, fences along property lines that abut streets will not be permitted. A fence may be permitted provided that the fence is set back the same distance as the principal building and substantial landscaping is provided on the street side of the fence.

3. Streetscape Guidelines for 152 Street

- 3.1. Buildings along 152 Street should be designed to include glazing as a major component.
- 3.2. Loading bays/overhead garage doors will not be permitted to face 152 Street.
- 3.3. No parking or vehicle laneways within the required 152 Street setback will be permitted towards the street.
- 3.4. A consistently maintained 7.5 metre wide high quality landscaped frontage is required.
- 3.5. No free-standing signs will be permitted along the 152 Street frontage.
- 3.6. Fascia signs facing the street may be permitted provided they are integrated and/or co-ordinated with the architecture of the buildings.
- 3.7. Architectural compatibility (scale, massing, finishing materials) between buildings is highly recommended.
- 3.8. The 5 metre-wide buffer along 152 Street must be planted with high quality landscaping material. Planting material must conform to the Official Community Plan guidelines.

4. Streetscape Guidelines for Internal Roads

- 4.1. The use of glass and high quality finishing materials recommended.
- 4.2. A consistently maintained high quality landscape frontage is required.
- 4.3. Signage should be architecturally co-ordinated with the overall design of the building.
- 4.4. Service doors (e.g. an overhead door at a loading dock) and overhead garage doors should not be located towards the street.
- 4.5. Free standing signs should be integrated into the landscaping and be designed in a similar style to the architecture of the buildings. Single pole pylon signs are not permitted.
- 4.6. The maximum height of any free-standing sign is 2.4 metres (8 feet).
- 4.7. On corner sites, the principal building should be located at the corner and designed to be visually attractive from both abutting streets.
- 4.8. Compatibility of the building design with architecture of adjacent buildings must be considered.
- 4.9. For consistency from development to development, the type of lamp, its height, intensity intervals, etc., will be co-ordinated by Engineering through the servicing agreement process.

5. Guidelines for the 15-metre Buffer Between the Business Park and the Agricultural Land Reserve

- 5.1. The buffer will be developed according to the *Schedule A: Buffer Types, A:3 Airborne Particle and Visual Screen* of the Landscaped Buffer Specifications of the B.C. Agricultural Land Commission.

6. Interface between the Business Park and the Live/Work Area

- 6.1. A minimum 5-metre landscaped buffer is required between the Business Park/Commercial area and the Live/Work area.
- 6.2. A combination of a mound and high quality landscaping is required for this 5-metre buffer.
- 6.3. A double row of alternating trees should be planted to achieve a canopy effect over the sidewalk along the south side of 66 Avenue and the east side of 152 A Street (north of 66 Avenue).
- 6.4. Pedestrian-scale lighting is recommended for the sidewalk along the south side of 66 Avenue and the east side of 152A Street (north of 66 Avenue).

7. Guidelines for Gateways, View Corridors, Urban Plaza, Open Space and Tree Preservation

7.1. Gateways

- 7.1.1. Gateway features must be developed in the locations depicted in the Neighbourhood Concept Plan.
- 7.1.2. Gateway features should incorporate unique lighting standards and landscaped medians.
- 7.1.3. These gateways must be developed with high quality soft and hard landscaping.
- 7.1.4. Main entry signs or major business park identification signs should be of high quality, durable material, co-ordinated with the architecture of the Business Park.
- 7.1.5. The entry signs should make provision for identifying the individual businesses located in the Business Park.

7.2. View Corridors

- 7.2.1. No buildings or structures will be permitted within the three view corridors identified on the Plan.
- 7.2.2. The width of these view corridors will be the same width as the right-of-way width of 66 Avenue, 67 Avenue, and 68 Avenue.

7.3. Urban Plaza (privately owned)

- 7.3.1. The small plaza should be developed to provide for outdoor amenity space and the enjoyment of the Business Park users.
- 7.3.2. It should include lighting, seating, and good quality landscaping.
- 7.3.3. This plaza should be integrated to the public street sidewalk system by pedestrian walkways.
- 7.3.4. Crime prevention measures should be used in the design of this plaza.

7.4. Park

- 7.4.1. Picnic tables will be provided adjacent to the road on the higher elevations.
- 7.4.2. Benches will be provided and pedestrian paths will be developed.
- 7.4.3. A small playground will be developed to serve the children living in the live/work area.

7.5. Bio-filtration Facility (Wetland)

- 7.5.1. The edge of the bio-filtration facility at the north east corner of the Business Park will be developed to allow passive recreation opportunities near its edge.

7.6. Tree Preservation

- 7.6.1. The large Sequoia (Giant Red Wood) trees near 152 Street south of 168 Street (see location map in Appendix IX) should be preserved and incorporated into the site design of development proposals.
- 7.6.2. The wood lot located in the north east corner of the Business Park should be considered for retention in connection with the development of the larger property.

APPENDIX XI

PRELIMINARY DESIGN GUIDELINES FOR LIVE/WORK DEVELOPMENTS

Defining the Concept of Live/Work Developments

Specific densities and forms of the live/work developments proposed in East Newton will be determined in conjunction with an ensuing study of this land use to be undertaken for East Newton, Rosemary Heights and East Clayton. This type of housing/work opportunity is not currently available in Surrey and research is required to adapt this innovative product to the conditions in East Newton.

These lands (located south of 66 Avenue) are intended to accommodate a new form of housing/business opportunity not currently available in Surrey. The businesses would provide services to the Business Park.

Proposed General Guidelines

- 1) The development should be comprehensively designed including architecturally controlled building facades, signs and landscaping.
- 2) The site design of the development should take into consideration mature trees, groups of trees, water courses and should be designed to maintain as much of the natural environment as possible.
- 3) The development projects should provide outdoor amenity space and indoor amenity space for the enjoyment of the residents.
- 4) The projects should also provide common space for meetings and shared support work space (i.e. copier, secretarial services).
- 5) Provision should be made for adequate parking to accommodate the residents and visitors/customers.
- 6) Visitor parking should be located so as to minimize disruption to the residents.
- 7) In some cases, (more research required) there may be a physical separation (with a fire wall) between the live and work spaces.
- 8) The entire development should be large enough for the users to share facilities and also to feel some sense of community.
- 9) There should be a mechanism to ensure that prospective purchasers of the units are aware of the types of uses in the development (by a covenant or signs/plagues on the buildings).
- 10) A business license should be required for the unit.
- 11) The work areas must be adequately sized and tied in tenure to the living space; dwelling use would not be permitted in the work space.
- 12) The units would provide functional features to accommodate businesses such as larger doors, suitable electrical, plumbing, ventilation.

- 13) Larger storage space for the units should be provided (either in the units or communal).
- 14) The buildings would resemble residential (e.g. single detached, duplex or attached groups).
- 15) At the time of rezoning, the City would work with the developers in defining the site layout, building designs, floor plans, parking areas, setbacks, etc.

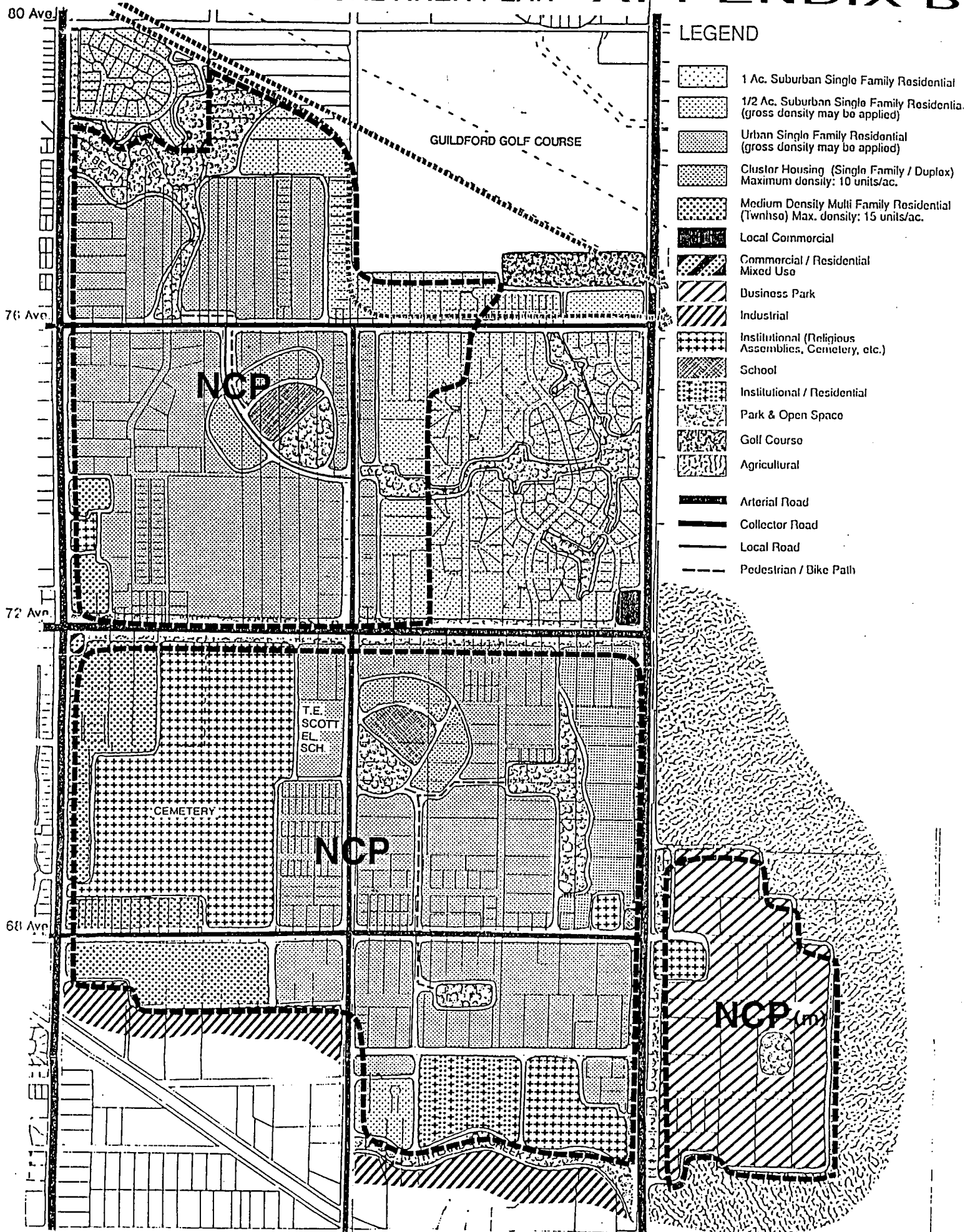
APPENDIX XII

EAST NEWTON BUSINESS PARK AND LIVE/WORK AREA AMENITY CONTRIBUTIONS			
	Per Acre Contribution Business Park <i>Approx. 55 acres</i>	Per Acre Contribution Live/Work Area <i>Approx. 15 acres</i>	Anticipated Revenue
Police Protection	\$201.60 per acre	\$201.60 per acre	\$14,112
Fire Protection	\$870.92 per acre	\$870.92 per acre	\$60,964.40
Park/Pathways Development	\$2,664.30 per acre	\$2664.30 per acre	\$186,500
Library Materials	N/A	\$113.40 per unit @ 8 units per acre	\$13,267.80
Total Contribution (per acre)	\$3,736.82 per acre	\$3,736.82 per acre <i>plus \$113.40 per unit for libraries</i>	
Total Anticipated Revenue			

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EAST NEWTON LOCAL AREA PLAN

APPENDIX B



APPENDIX C

APPENDIX C

AGR

68⁶⁸ AVE

URB

66A AVE

IND

152 ST

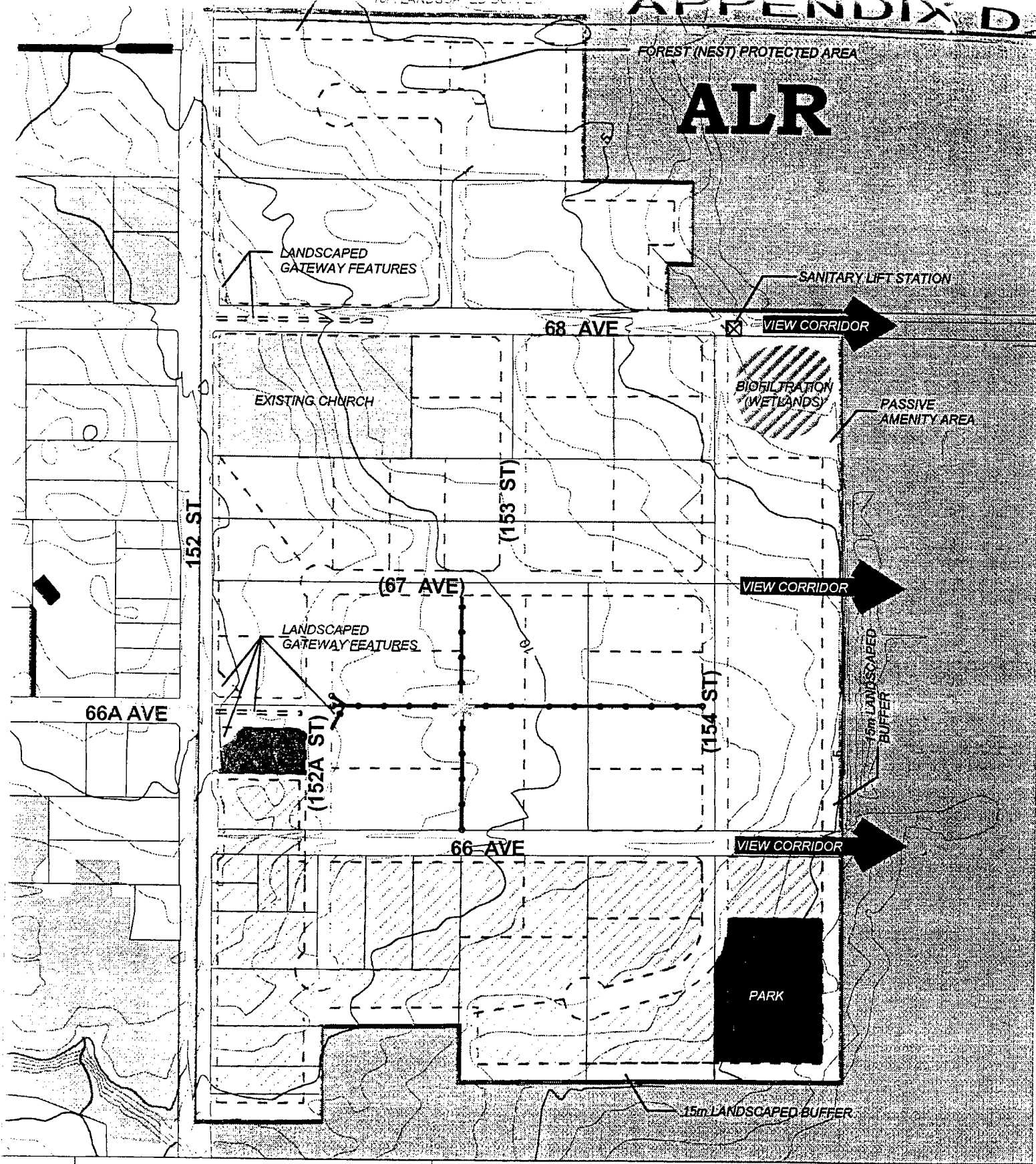
IND

66 AVE

AGR

Existing Small Land Parcels

Proposed Business Park Expansion





**East Newton Business Park
Neighbourhood Concept Plan
Proposed Land Use Concept**

City of Surrey Planning & Development Department

Fig. 1

LEGEND

- East Newton Business Park NCP Boundary
- Buffers / Natural Areas
- Business Park
- Local Commercial
- Existing Church
- Park
- Live & Work (or future business park)
- Agricultural Land Reserve
- Biofiltration (wetland) Facility
- Proposed Roads & Lots
- Contours 1m
- Contours 5m
- Landscaped Pathways (private property)
- Possible Small Urban Plaza (privately owned)

Scale: 30 0 30 60 Meters

Date: March 3, 1999

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN



Prepared by: Aplin & Martin Consultants Ltd.

Date: March 1999

Project No.: 97058

**APLIN &
MARTIN**
CONSULTANTS LTD

Principals:
Robert McCurdy, PEng
Ed Fujii, PEng
Ray Janzen, BCLS
Arnold Badke, PEng
Jim Tapp, PEng
Bill Lee, PEng
Andrew Baker, PEng

March 19, 1999

Our File: 97058

City of Surrey
Engineering Department
14245 - 56 Avenue
Surrey, BC V3X 3A2

Attention: Mike Darbyshire, PEng
Acting Manager, Engineering Planning

Dear Sirs:

Re: Final Report for East Newton Business Park – NCP

We are forwarding five copies of the final report for the East Newton Business Park Neighbourhood Concept Plan.

We thank you for giving us the opportunity to work with you on this exciting project.

Yours truly,

APLIN & MARTIN CONSULTANTS LTD.



L. B. Robertson, PEng
Project Engineer

LBR:lf

Enclosures

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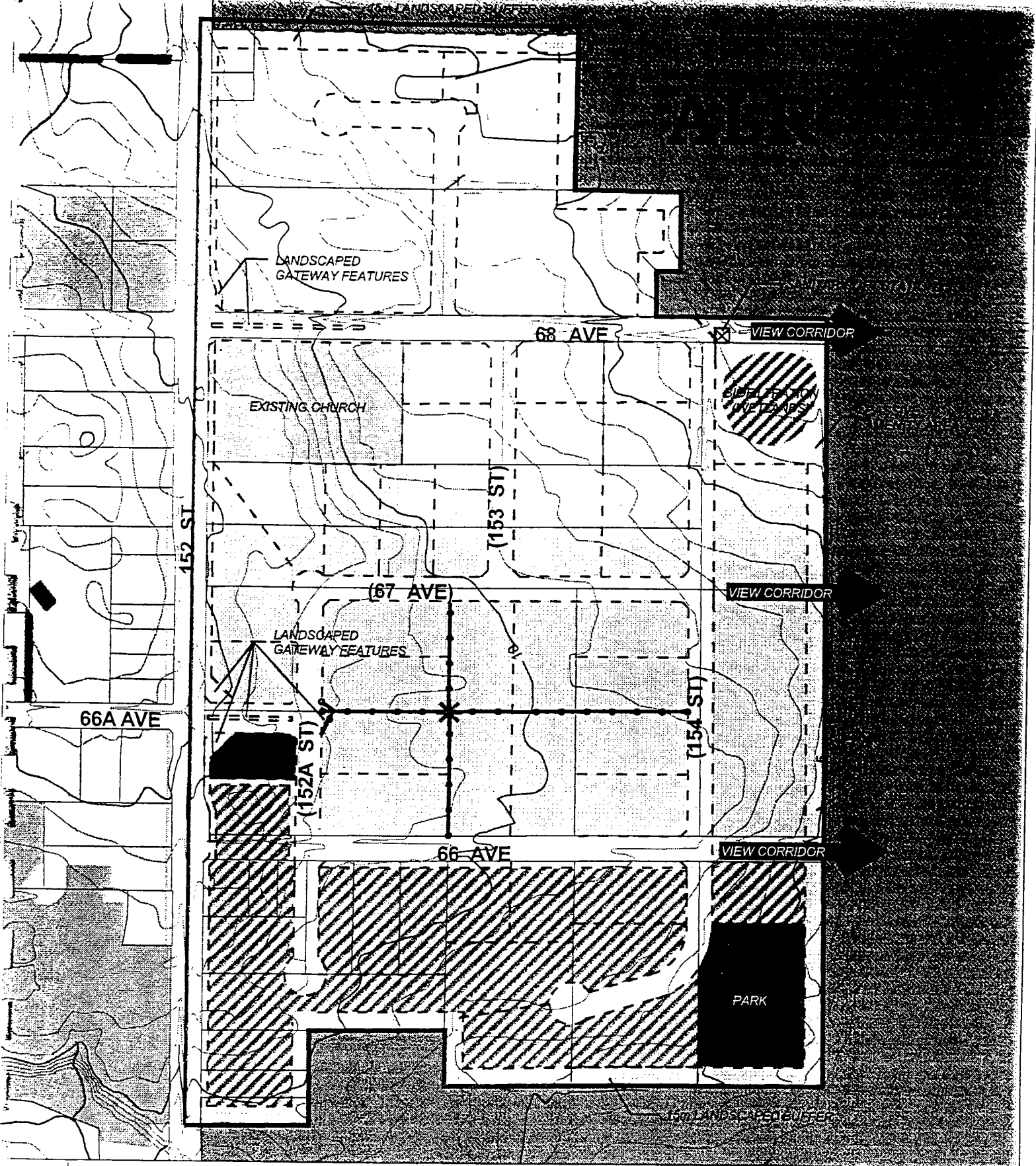
1.0 INTRODUCTION

The City of Surrey commissioned Aplin & Martin Consultants Ltd. to undertake the engineering servicing study to review constraints, and prepare options, examine financial issues and provide recommendations.

Aplin & Martin Consultants Ltd., the City of Surrey Engineering Department and Planning Department attended a series of Citizen" Advisory Committee meetings and Public meetings to listen to concerns and resolve issues. After a series of public meetings and in consultation with the public, the chosen land use plan for the NCP study area was developed and is depicted as Figure 1. This plan was used as the basis for the report.

The East Newton Business Park Neighbourhood Concept Plan (NCP) area is approximately 93 acres of land located immediately east of 152 Street at 68 Avenue. The site is surrounded by the Agricultural Land Reserve on three sides (north, east, south) with 152 Street being the west boundary and separation from the East Newton (South) NCP that is located immediately west of 152 Street.

The southerly portion of the study area has a new land use known as Live/Work. Since Live/Work land use is undefined, and with the Live/Work land use designation having the ability to revert to a business park use, this area was serviced and analysed under similar land use as a light industrial business park.



N
Fig. 1

East Newton Business Park Neighbourhood Concept Plan Proposed Land Use Concept

City of Surrey Planning & Development Department

NOTE: This Plan is a conceptual illustration only. It is not intended to be used for legal purposes.

30 0 30 60 Meters

Date: March 3, 1999

LEGEND

- East Newton Business Park NCP Boundary
- Buffers / Natural Areas
- Business Park
- Local Commercial
- Existing Church
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- Live & Work (or future business park)
- Agricultural Land Reserve
- Biofiltration (wetland) Facility
- Proposed Roads & Lots
- Contours 1m
- Contours 5m
- Landscaped Pathways (private property)
- Possible Small Urban Plaza (privately owned)

2.0 SERVICING PLANS

2.1 TOPOGRAPHY

The site is gently sloping, with the land falling away to the east from a high point of about 15 metres at 152 Street, falling to an elevation of less than two metres at the junction of the flood plain located at the easterly boundary of the site as shown on Figure 2. 25% of the NCP area drains naturally in a south-east direction to the south-east corner of the site and the remaining 75% drains naturally in a north-easterly direction to the north-east corner of the site. Slopes are mainly less than 5%.

This NCP study area is the lowest segment of uplands drainage basin that drains into the lowlands area and surrounding Agricultural Land Reserve. The lowlands drain through the agricultural fields in ditches to the nearby Serpentine River. The topography causes a constraint on the servicing plans as the lowest points of the study area is the north-east and south-east corners. This constraint is reviewed further in the following sections.

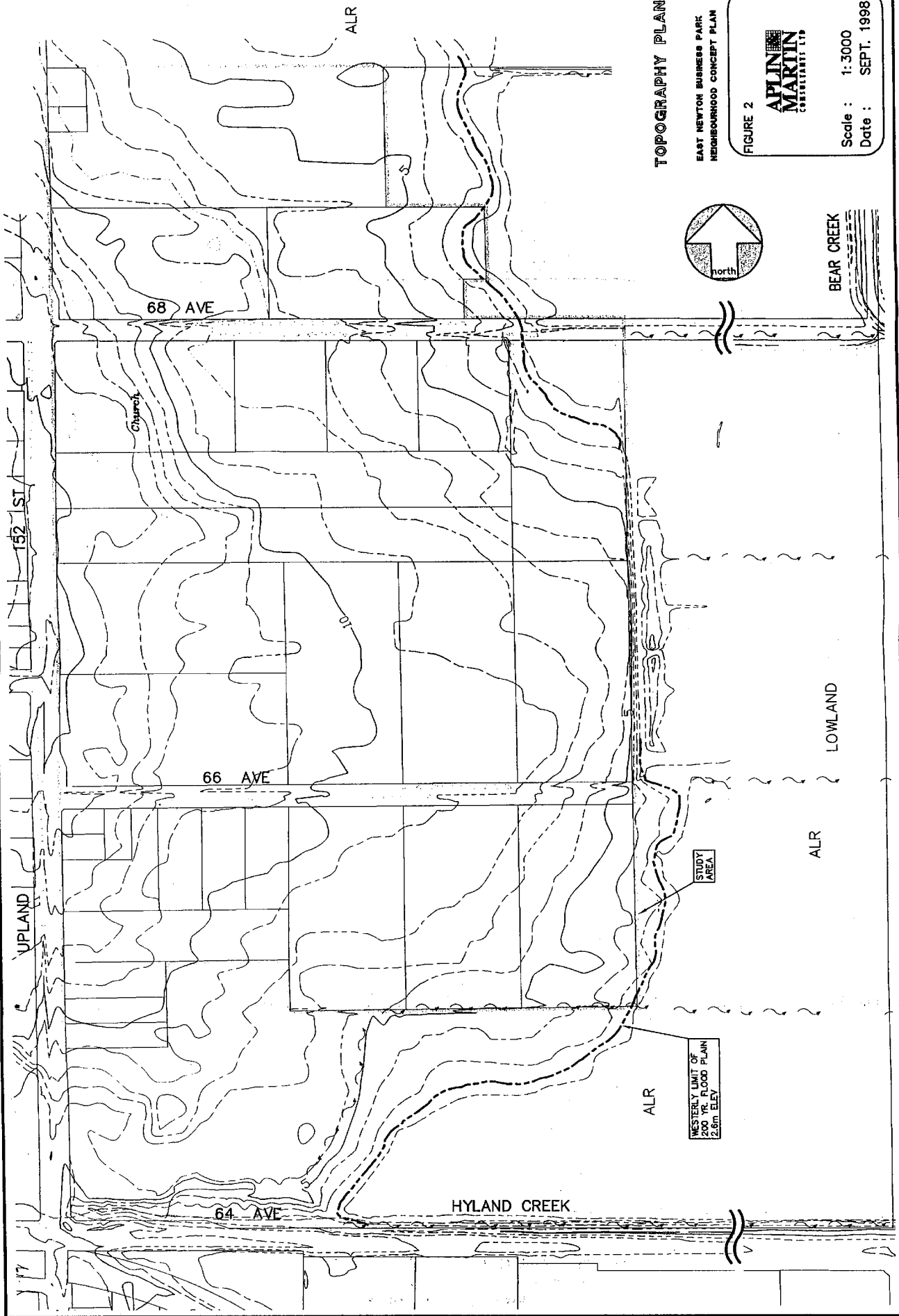
2.2 ROADS AND TRANSIT

2.2.1 Constraints

The NCP study area is located on the east side of 152 Street which is one of the principal north/south arterial roads in Surrey, and just north of 64 Avenue, one of the principal east/west arterial roads in Surrey. This location is, therefore, ideal in terms of road access for the use of the industrial operators.

One of the difficulties with the site is that all access is to be provided via 152 Street, a roadway that is experiencing ever increasing traffic volumes. According to the 1995 traffic volume map, 152 street is carrying about 20,000 vehicles per day (vpd) and about 16,000 vpd on 64 Avenue. These traffic volumes have likely increased due to the recent completion of works on 152 Street south of 64 Avenue and on 64 Avenue on either side of 152 Street. Prior to the completion of these works, the intersection of 152 Street and 64 Avenue was one of the most congested in Surrey. The recent improvements on both 64 Avenue and on 152 Street include the provision of an additional through lane in all four directions.

In summary, the road network is able to sustain the development of the NCP provided that the Floor Area Ratio (FAR) does not exceed 0.50.



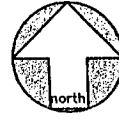
TOPOGRAPHY PLAN

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN

FIGURE 2



Scale : 1:3000
Date : SEPT. 1998



BEAR CREEK

LOWLAND

ALR

ALR

WESTERLY LIMIT OF
200 YR. FLOOD PLAN
2.6m ELEV

HYLAND CREEK

64 AVE

66 AVE

68 AVE

152 ST

UPLAND

Chaparral

It should be noted that the City of Surrey should monitor the level and type of development that occurs in the study area. If the average FAR is less than 0.50 and the number of vehicle trips is lower than predicted, it is possible to allow higher levels of development in subsequent phases.

The constraints are summarised as the following points:

1. The average Floor Area Ratio for the NCP area must not exceed 0.50.
2. A signal must be installed at 66A Avenue and 152 Street (prior to development of Phase Three).
3. The signals on 152 Street must be coordinated.
4. 152 Street must be constructed to ultimate municipal standard (raised median).
5. The speed limit on 152 Street needs to be reduced from 70 km/h to 60 km/h from 70 Avenue south prior to Phase Two.
6. The existing and future background traffic volumes on 152 Street constrain the ability of the study area to be developed at an average FAR greater than 0.50.

2.2.2 Proposed Site Development

The NCP study area is proposed to consist of a mixture of land uses including business park; commercial/retail; live/work; neighbourhood park; and, existing institutional (church) for a total of 93.4 acres including roads, buffers and bio-filtration ponds.

Land Use	Area (ha)	Percent of Total
Business Park	20.07	53.3
Live & Work	5.91	15.6
Park	1.94	5.0
Commercial	0.24	0.6
Existing Church	1.50	4.0
Buffers	2.19	5.8
Bio-filtration Pond	1.01	2.7
Roads	4.94	13.0
Totals	37.80	100.0

For the purposes of this study, only the Business Park and Live/Work land uses were used to generate trips. The City's Planning Department has indicated that the Commercial/Retail land use is intended to serve the East Newton NCP area only, intended to attract local trips or possibly pass-by trips only.

The Live/Work land use proposed for the site is the first of its kind for the City of Surrey and consequently little is known, at this point, about the development density, built form or trip generation characteristics of this type of development.

A number of land use scenario's were evaluated including all Business Park (no Live/Work) and various Floor Area Ratio's (FAR's) ranging from 0.50 to 1.0. The recommended scenarios, from a transportation perspective are either the all Business Park or the combined Business Park and Live/Work scenarios with an overall average Floor Area Ratio (FAR) not exceeding 0.50 for both scenarios.

2.2.3 Trip Generation

Trip generation for the site was evaluated using the ITE Trip Generation Handbook for three different land use types: Industrial Park, Office Park; and, Business Park. Based on the descriptions of each land use type in the handbook and based on discussions with Planning Department staff, it was deemed that the Business Park land use type would be most representative of the land uses anticipated in the site. In the table below, the trip generation used is illustrated in bold text.

Land Use	AM Peak			PM Peak		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Industrial Park (LUC 130)	882	132	1,014	230	865	1,095
Office Park (LUC 750)	2,042	252	2,294	291	1,647	1,938
Business Park (LUC 770)	1,740	307	2,047	368	1,304	1,672
Business Park / Live Work	1,585	280	1,865	355	1,259	1,614

As shown in the table above, the highest trip generation occurs during the AM peak. Since the proposed land uses are almost exclusively employment in nature, the trips generated by employees which is typically more sharply peaked in the AM than in the PM. That is, people tend to arrive at work at the same time but depart from work at a variety of times.

2.2.4 Trip Distribution

The trips were distributed to the network based on the Regional Travel Model as shown in the table below.

Sector of Surrey/GVRD	PM Inbound	PM Outbound
North on 152 Street		
N Surrey	11%	15%
NE Sector; Fraser North	6%	5%
NE Surrey	8%	8%
Richmond; S Delta	8%	4%
Vancouver, Burnaby, New West	17%	3%
W Van; N Van and CBD	2%	0%
South on 152 Street		
E Surrey	3%	6%
Fraser S; External	8%	11%
S Surrey; White Rock	8%	13%
SW Surrey	7%	11%
W Surrey	13%	13%
West on 68 Avenue		
NW Surrey	8%	9%
East Newton	1%	2%

2.2.5 Trip Assignment

Vehicle trips were assigned to the network for four scenarios: 1999 Background; 1999 Background + Site Generated; 2009 Background; 2009 Background + Site Generated. The background trips were forecast based on an average annual growth rate of 3%. In addition, for the 2009 traffic volumes for 148 Street, additional volume (over and above the 3% growth) was added to reflect the anticipated development of the East Newton South residential neighbourhood. It should also be noted that no site generated traffic was assigned to 66A Avenue due to the school zone between 149 Street and 151 Street. This results in a conservative analysis as it is likely that some traffic will use 66A Avenue even with the school zone.

The trip assignment is shown in Appendix "A".

2.2.6 Vehicle Traffic

Due to the relatively high existing and future background traffic volumes on 152 Street, access to the site, particularly during peak periods, will have to be accomplished through signalised intersections. Based on analyses of 66A Avenue as an unsignalized intersection, all of the left turn traffic out of the site (westbound to southbound) will have to use the signalised intersection at 68 Avenue. Effectively, the intersection at 66A Avenue functions as a right-in-right-out and left in only and eastbound or westbound through traffic must use 68 Avenue. Due to the volume of traffic generated by the site, both the 66A Avenue and 68 Avenue intersections will have to be signalised. Funnelling all of the traffic through the 68 Avenue intersection is not possible - the intersection will fail.

152 Street is one of only three major arterial roadways that traverses the entire length of Surrey and as such, it is not desirable to impede the flow of traffic on this corridor any more than is absolutely necessary. As a result, it is essential that the signals on 152 Street (64, 66A, 68 and 72 Avenues) must be coordinated

As shown on the following table, the intersections of 72 Avenue/152 Street and 64 Avenue/152 Street are critical within the road network. The 72 Avenue intersection is critical in the 1999 Scenario with full buildout in the AM peak and is critical during both peak periods in 2009 without the development of the NCP.

Intersection Level of Service

Intersection	1999 Bkgd.		1999 Full		2009 Bkgd.		2009 Full	
	AM	PM	AM	PM	AM	PM	AM	PM
72 Ave./152 St.		B	F	C	F	F	F	F
68 Ave./152 St.		A	C	B	A	B	F	D
66 Ave./152 St.		A	B	B	A	A	D	B/C
64 Ave./152 St.		B	D	C	D	C	F	F
148 St./64 Ave.		A		B		B		B
148 St./68 Ave.		B		B		B		C

Note: The intersection of 148 Street and 68 Avenue was analysed as four way stop control.

The 1999 AM background was not analyzed as there are currently no operational problems with 152 Street.

The analyses of the intersections of 152 Street at 66A Avenue and 68 Avenue assume that there are no network constraints up-stream of these intersections. As shown in the table, however, both the 64 Avenue and the 72 Avenue intersections are anticipated to operate a LoS F which will constrain the traffic demand at the 66A Avenue and 68 Avenue intersections. It is possible to improve the operating LoS of all of the intersections if additional Left Turn capacity could be provided (64 & 72 - E/W; 66A & 68 - N/S). Both 64 Avenue and 72 Avenue are constructed to ultimate therefore it is not feasible to anticipate significant increases in capacity at these intersections. It was discussed with the City of Surrey Engineering Department to provide two southbound left turn lanes at each of 66A Avenue and 68 Avenue but this concept was rejected because of the capacity constraints at 64 Avenue and 72 Avenue.

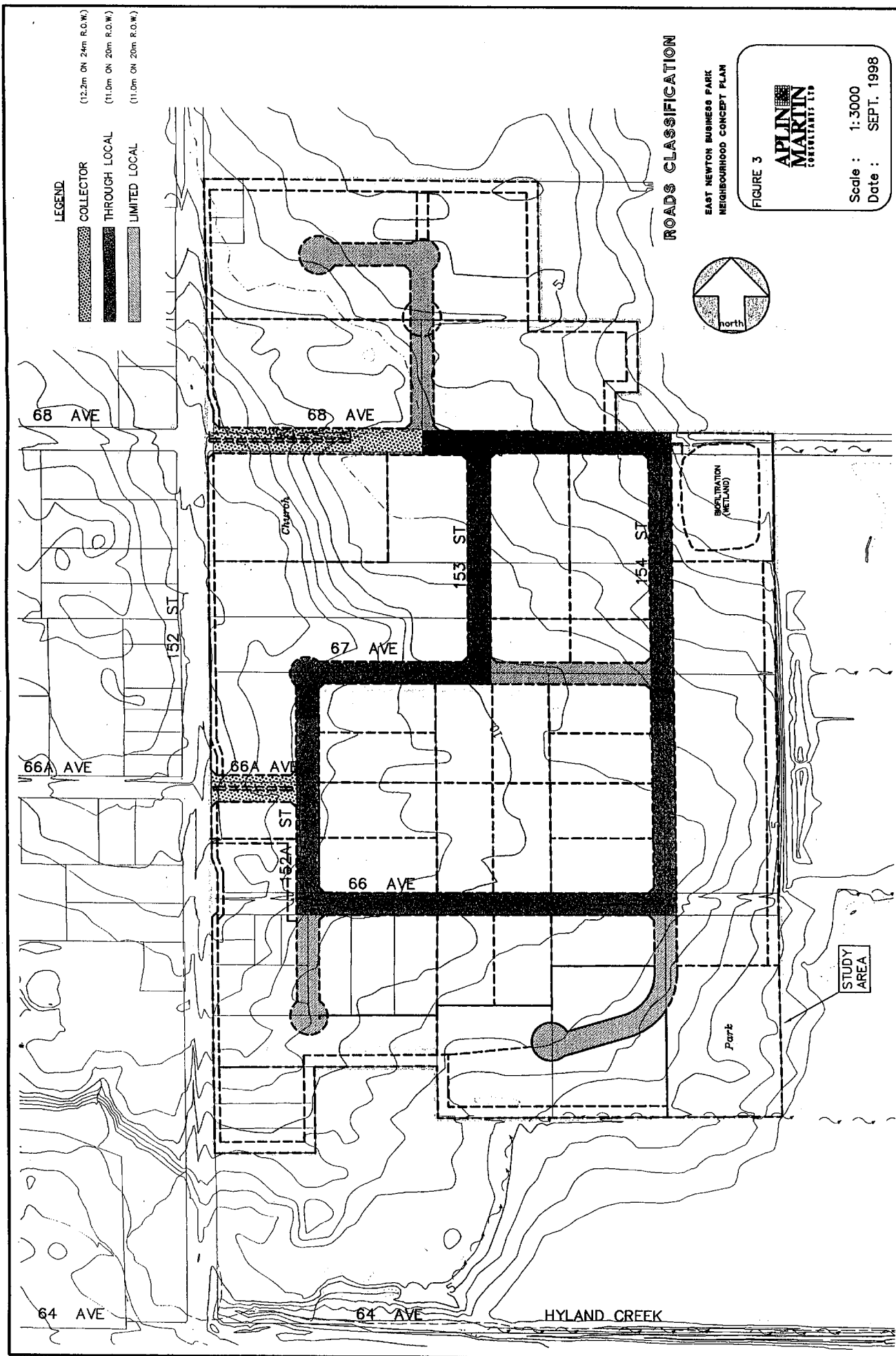
152 Street was recently constructed to its ultimate roadway width of 19.0 metres of asphalt. However, the sidewalk along the east side of 152 Street will need to be added along the entire frontage of 152 Street that is adjacent to the NCP study area. In addition a land dedication of approximately 1.5 metres is a requirement and would be dedicated during each phase of development along 152 Street. Presently the median on 152 Street consists of painted lines. A permanent raised median for controlling traffic at the two intersections would be required when this development proceeds.

2.2.7 Internal Road Network

The internal road network can be summarised as two distinct classes of roads: Industrial Collector and Industrial Local. The Industrial Collector (collector) road is the road that forms a crescent around the perimeter of the site, connecting 68 Avenue to 66A Avenue. The Industrial Local roads are all of the other internal roads. Figure 3 indicates the Road Classification plan. The limited local roads and the through local roads are all 11.0 metres on a 20.0 metre road dedication as shown in Figure 4. The 11.0 metre roads allow for two-way traffic with parking on one side of the roadway. The through collector roads are 12.2 metres plus a 2.0 metre median on 24.0 metres of dedication. The 12.2 metre width allows for left turn chanelization and allows for the construction of a median treatment (Figure 5).

Figure 6 depicts the roads options. "Fixed Roads" are needed as connections to key nodes and provision of perimeter vehicular flow through the site. "Flexible Roads" are roads that can be shortened or moved to assist in the accommodation of large developments or large lots within the study area. "Alternate Roads" are roads that can be shortened or even eliminated depending upon the size of the development. Lots that are approximately one or two acres in size would require the extension of the "Alternate Roads" as depicted on Figure 6.

The owner of the agricultural property to the south of the NCP study area is exploring options to develop the land. Notwithstanding that this land is located within the Agricultural Land Reserve,



LEGEND

- COLLECTOR
(12.2m ON 24m R.O.W.)
- THROUGH LOCAL
(11.0m ON 20m R.O.W.)
- LIMITED LOCAL
(11.0m ON 20m R.O.W.)

ROADS CLASSIFICATION

EAST NEWTON BUSINESS PARK
NEIGHBOURHOOD CONCEPT PLAN



FIGURE 3

**APLIN
MARTIN**
CONSULTANTS LTD

Scale : 1:3000
Date : SEPT. 1998