



City of
Richmond

Report to Development Permit Panel

To: Development Permit Panel

Date: June 28, 2018

From: Wayne Craig
Director, Development

File: DP 11-566011

Re: Application by Omicron Architectural Engineering Construction Ltd. for a
General Compliance Ruling at 15111 Williams Road and Richmond Key 195105

Staff Recommendation

That the attached plans involving changes to the development design be considered in General Compliance with Development Permit DP 11-566011.

Wayne Craig
Director, Development
(604-247-4625)

WC:db
Att. 5

Staff Report

Origin

Omicron Architectural Engineering Construction Ltd., on behalf of Ecowaste Industries Ltd., has requested a General Compliance Ruling regarding a previously issued Development Permit (DP 11-566011) for the Richmond Industrial Centre development at 15111 Williams Road and Richmond Key 195105 (Attachment 1), which was endorsed by the Development Permit Panel at its meeting held on July 13, 2016, and approved by Council on January 23, 2017.

The main changes to the approved Development Permit include the following:

1. Straightening Pierson Road by shifting the southern end approximately 40 m to the east (Attachment 2). Modifications to the statutory right-of-way (SRW) legal documents and the related Servicing Agreement plans (SA13-641028, SA14-677209, SA16-737220) will be required to reflect the change in alignment and the associated works (e.g. frontage improvement relocations, fill adjustments, off-site landscaping, etc.).
2. Modifications to the lease lot configurations, conceptual building layouts and on-site landscaping and parking.
3. Modifications to the configuration and landscaping selections for the ESA/RMA compensation planting area at the south foot of Pierson Road. The modifications are required to address the implications of additional fill needed to accommodate the shifting of the Pierson Road – Francis Road intersection eastward along Francis Road. This extra fill will result in a slight (approximately 30 m²) encroachment into the ESA/RMA compensation area. The encroachment is addressed through increased habitat compensation as discussed in the analysis section of this report.

Attachment 3 shows the relevant approved Development Permit plans which require adjustments (the areas of adjustment are cloud outlined on each sheet). Attachment 4 shows the proposed replacement Development Permit plans.

Background

Development surrounding the subject site is as follows:

- To the north: A 54 ha (132.5 acre) Agriculture (AG1) zoned parcel owned by Ecowaste Industries and operated as a landfill site under the authority of the Ministry of Environment.
- To the east: No. 7 Road Canal and Port Metro Vancouver's Port terminal and associated industrial lands. These properties are zoned "Industrial (I)".
- To the south: A Canadian National Railway right-of-way (ROW) and a 30.35 ha (75 acre) lot owned by Port Metro Vancouver (PMV) are located immediately south of the development site. The PMV site is currently vacant, but is expected to be used for port related industrial uses. The western most portion of PMV's site is being prepared for the proposed Vancouver Airport Fuel Facilities Corp. (VAFFC) jet fuel receiving facility. The PMV site is zoned "Industrial (I)".

On the south side of Williams Road, is a 3.8 ha (9.5 acre) “Industrial (I)” zoned parcel owned by the VAFFC. The VAFFC is proposing to use this property for its YVR marine terminal facility for offloading jet fuel from marine vessels.

To the west: Across the Savage Road road allowance, five large lots all within the Agricultural Land Reserve (ALR). Zoning on four of the properties is Agricultural (AG1); while zoning on the fifth lot is Golf Course (GC). The golf course is known as “Country Meadows”. Only one (1) of these lots is currently being farmed.

Finding of Facts

Neither Pierson Road nor Zylmans Way are dedicated roads. As part of the Development Permit considerations associated with the approved Development Permit (DP 11-566011) Statutory Right-of-Ways (SROWs) were registered over these two private roads to allow public right-of-passage (PROP) once the roads have been constructed. These roads will be designed and constructed through City Servicing Agreements. The straightening of Pierson Road will necessitate a corresponding adjustment to the SROW associated with that road alignment. The analysis section of this report outlines the implications and rationale behind the proposed road realignment.

Analysis

Pierson Road Realignment

The proposal involves moving the southern end of Pierson Road approximately 40 m to the east; allowing for a straightening of Pierson Road between Blundell Road and Francis Road. See Attachment 2 for an overlay showing the existing and proposed Pierson Road alignment. The rationale for straightening Pierson Road is to allow for more efficient use of the land base. Building footprints and parking layouts for the proposed developments adjacent to Pierson Road, particularly for areas in vicinity of buildings #2, 7, 9 and 10 (as shown on the Development Phasing Plan in Attachments 3 and 4), will be significantly improved with the more regular lot shapes. Neither Engineering staff nor Transportation staff have concerns with the Pierson Road realignment and these roads will be reviewed through amendments to the current Servicing Agreements.

Lease Lot Area Configuration and Conceptual Building Footprints

Under the original Development Permit application conceptual building sizes, building footprints and parking areas were provided in the development phasing plan drawings. While Ecowaste Industries is taking a “build to suit” approach to the development, each Building Permit application is reviewed by City staff to ensure compliance with the master plans approved as part of the original Development Permit (DP 11-566011). The modifications proposed through this application were considered by staff to be significant enough to warrant the General Compliance ruling.

In the proposed revised conceptual layout, five building lease lot areas and three building footprints would be adjusted. The adjustments will result in a relatively small increase in the site’s total floorspace of approximately 743 m² (8,000 ft²) for an overall build out total of approximately 266,678 m² (2,870,500 ft²). What this modest space increase does not convey is the more important aspect of improved and more useable building footprints which will be more attractive to today’s high tech industrial users. Even with the proposed overall floorspace to

increase the total proposed floorspace of 0.41 FAR will be well below the 1.0 FAR maximum permitted under the “Industrial (I)” zone for the 652,110 m² site.

While parking requirements will be determined with each “build to suit” application, the revised conceptual layout appears to be more typical and more efficient in the vicinity of buildings 9 and 10 in particular. The new layout will improve the truck yards for both buildings by making them larger and more flexible for circulation and trailer storage. Actual parking requirements and final layouts will be confirmed with each subsequent Building Permit application.

Landscape Adjustments

The proposed road/lease lot adjustments will result in a reconfiguration of the landscaping related to each on-site building application and landscaping along the Pierson Road street frontages as a result of the road realignment. Adjustments to the Pierson Road street frontages landscaping will be addressed via modified plan submissions as part of the Servicing Agreement(s).

On-site building related landscaping would be addressed with each Building Permit application and reviewed against the landscaping master plans approved as part of the original Development Permit (DP 11-566011). The proposed landscape revisions will result in an increase of 40 additional trees, 313 additional shrubs and 730 m² (7,858 ft²) more seeded areas over the originally approved Development Permit plans.

ESA/RMA Compensation Area

Because development north of Francis Road will be built atop the Ecowaste landfill, their grade elevations will be significantly higher than the grade elevations for the portion of the development south of Francis Road (i.e. up to 15 m GSC north of Francis Road vs. 5 to 7 m GSC south of Francis Road). In order for Francis Road to connect to Pierson Road, the original development proposed fill to be added to Francis Road to gradually rise up to Pierson Road. With the proposed shifting of the Pierson Road/Francis Road intersection eastward by 40 m, as shown in Attachment 2, the required fill within the Francis Road Right of Way will also extend further eastward with the effect of creating a slope encroachment into the area where the future ESA/RMA compensation area will be located just south of Francis Road. Engineering staff have reviewed this proposal and have no concerns with the additional fill proposed but will monitor the fill works through the required Servicing Agreements to ensure compliance with City Engineering standards.

To mitigate the impacts of the 30 m² slope encroachment into the future ESA/RMA compensation area from the extra fill on the Francis Road Right of Way, the applicant’s environmental consultants, Keystone Environmental, have redesigned the proposed compensation enhancement by adjusting the shape of the proposed wetland and its cross section profile. In addition, they have refined the species selection list to better suit the modified terrain. As a result, the revised compensation planting area increases the aquatic net benefit by 952 m² over the approved Development Permit plans to 1,132 m² and increases the terrestrial net benefit by 1,000 m² over the approved Development Permit plans to 5,088 m². Overall, the habitat balance under the revised plan will increase by approximately 22.6%.

The revised plans include updated representative planting sections and plant selection lists. All of the proposed plant selections are native species selected for suitability to the terrain where they will be planted. A report by Keystone Environmental comparing the approved Development Permit plan for the ESA/RMA compensation area and the proposed revised plan is provided in Attachment 5.

Legal Agreement Revisions

Under the approved Development Permit (DP 11-566011), a detailed set of legal agreements were registered on Title, including Statutory Right-of-Ways associated with the road alignments, covenants to ensure on-site and ESA/RMA landscaping will be installed, covenants for planted ALR buffers, covenants outlining development phasing including utility construction phasing and Public Art contributions.

The proposed adjustments to the Development Plans provided in Attachment 4 will require amendments to five legal documents that were registered in association with DP 11-566011. The table below provides a summary overview of the nature of the changes involved.

Table 1: Legal Documents Requiring Adjustment

Legal Documents Requiring Amendment	Summary of Changes Required
No Build Covenant over lands north of Francis Road	Replace Phasing Plan
No Build Covenant over lands south of Francis Road	Replace Phasing Plan
Public Art and Landscaping Covenant over the entire development site	Replace Phasing Plan. Replace Landscape Plan and Planting List
Surveyor Plan EPP 65854 and Application	Replace the surveyor reference plan.
Covenant, Statutory Right of Way and Rent Charge (public right of passage) over the entire development site	Replace the surveyor reference plan Replace Phasing plan

The proposed shifting of Pierson Road and the related filling within the Francis Road Right of Way will also affect the alignment of an emergency access route through the site that was required as part of the approved Development Permit (DP 11-566011).

The Statutory Right-of-Way and Covenant registered on Title is flexible enough to accommodate the proposed alignment shifts, but a requirement for submission of a report by a qualified surveyor, confirming that the affected area complies with the relevant sections of the Building Code providing for emergency access (i.e. BCBC 3.2.5.6) is required. Submission of this confirmation will be required prior to Council approval of the proposed General Compliance. Full design of the crossing will be addressed through the development's Servicing Agreement.

Conclusions

Omicron Architectural Engineering Construction Ltd. has requested a General Compliance Ruling on the approved Richmond Industrial Centre development at 15111 Williams Road and Richmond Key 195105 to accommodate the straightening of Pierson Road and more efficient use of the available land. The proponent's modifications will also result in improved landscaping for on-site areas and the ESA/RMA compensation area.

Staff have no objections to the proposed revisions and recommend support of this General Compliance request for the proposed changes to the approved Development Permit and related legal agreements as outlined in this report.



David Brownlee
Planner 2
(604-276-4200)

DCB:blg

Attachments:

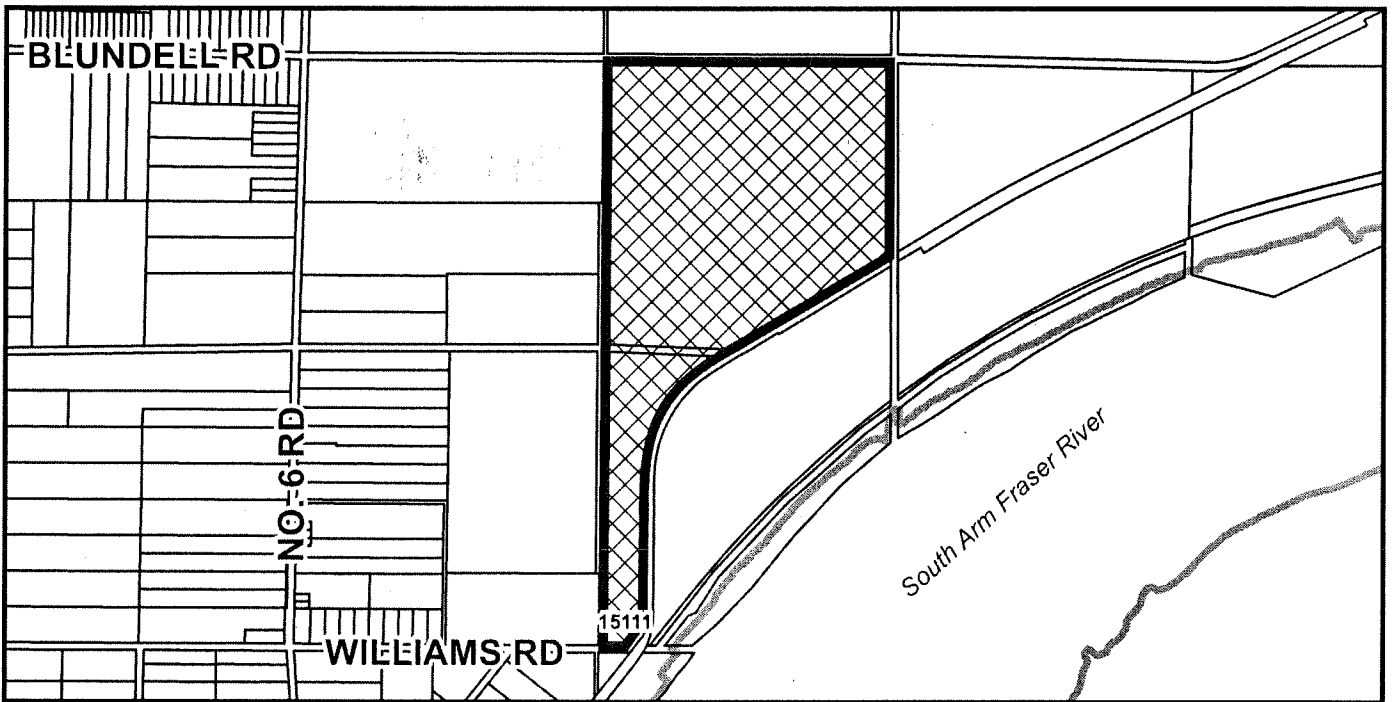
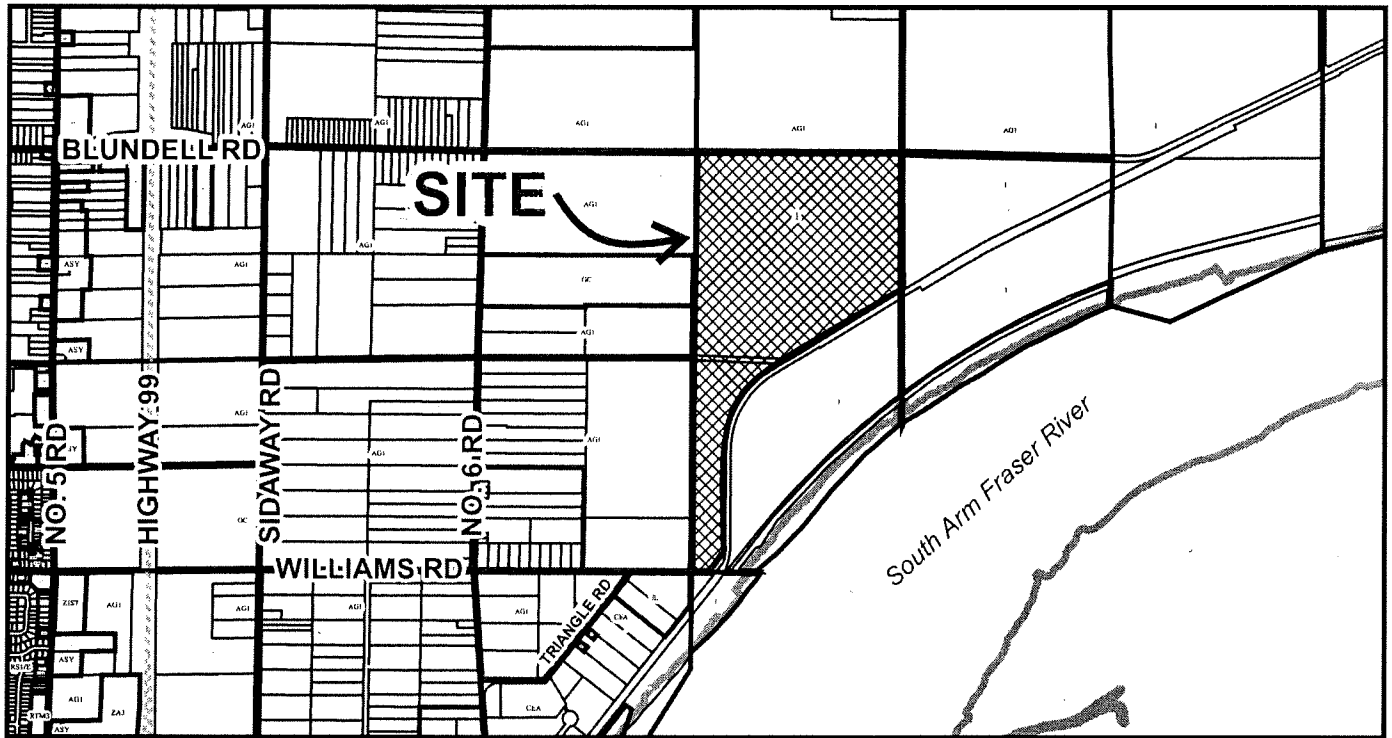
- Attachment 1: Location Map
- Attachment 2: Overlay Plan Showing the Existing and Proposed Pierson Road Alignment
- Attachment 3: Copies of Relevant Approved Development Permit Plans With Changes Outlined
- Attachment 4: Proposed Replacement Development Permit Plans
- Attachment 5: Keystone Environmental Report – RIC Graymont/Pierson Road Realignment Compensation Wetland Feasibility Ecowaste.

The following are to be met prior to Council approval:

- Registration of the modified legal documents as outlined in Table 1.
- Confirmation by a qualified surveyor that the emergency access area affected by the proposed realignment of Pierson Road comply with the Access Route Design section (BCBC 3.2.5.6) of the Provincial Building Code.



City of Richmond



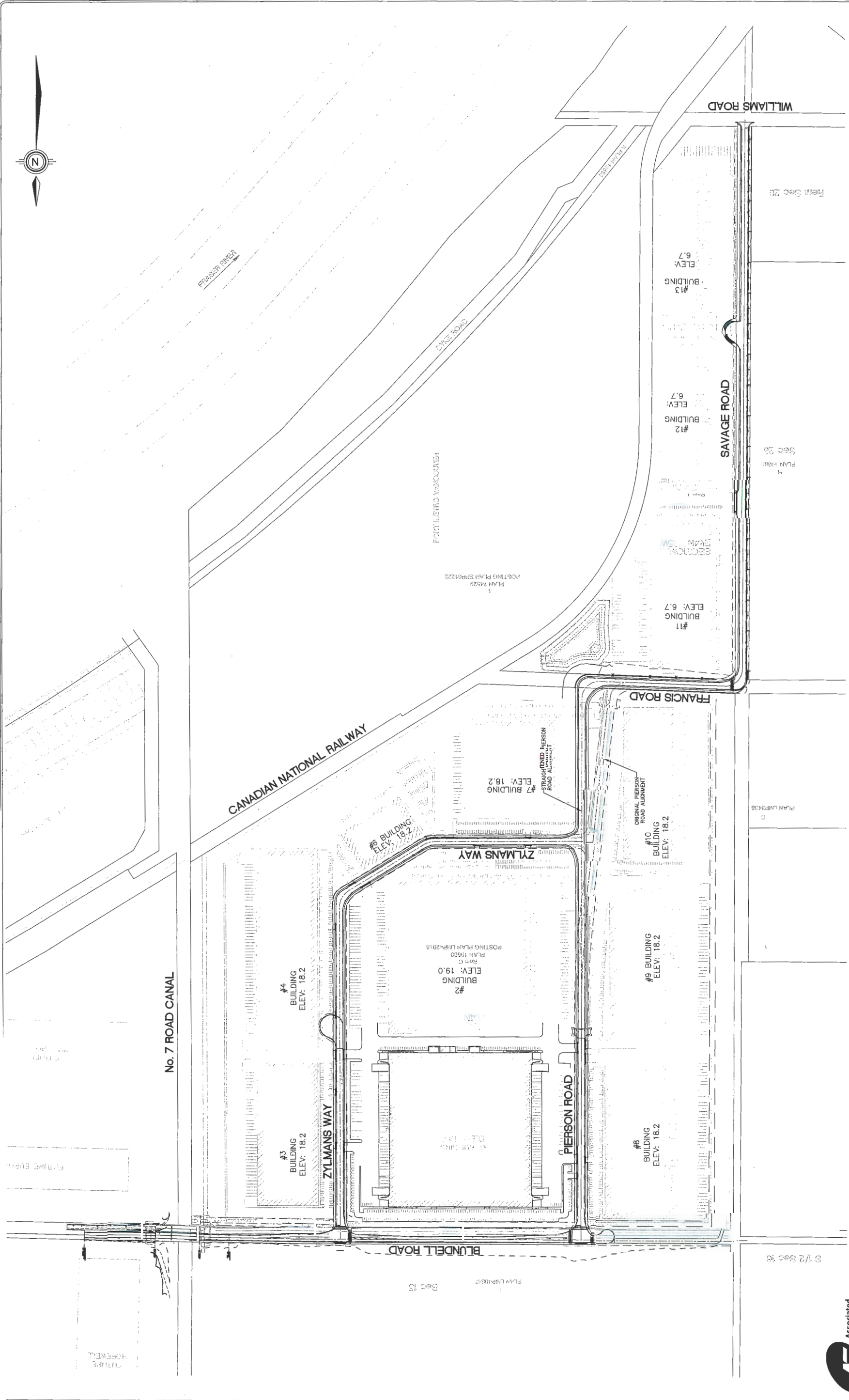
DP 11-566011

Original Date: 06/08/18

Revision Date:

Note: Dimensions are in METRES

ATTACHMENT 2: Overlay Plan Showing The Existing And Proposed Pierson Road Alignment



City of Richmond
 8911 No. 3 Road Richmond B.C. V6V 2E1

TITLE: ECOWASTE INDUSTRIES LTD.
 RICHMOND INDUSTRIAL CENTRE - PHASE 1 AND PHASE 2
 ROADWORKS
 PIERSON ROAD REALIGNMENT
 PHASING PLAN

DESIGN: L.P. CITY FILE NO. SA18-737220
 DRAWN: L.Y. DWG. NO.: 2743-01-C-SK010
 CHECKER: C.C. SCALE: 1:2500 DATE: 2016/09/17
 ENGINEER: L.P. SEC. NO.: 27-4-5 SK. NO.: 01

NO.	DATE	BY	DN	DESCRIPTION
A	2017/09/22	L.P.	C.C.	PIERSON ROAD STRAIGHTENING CONCEPTUAL REVIEW

REFERENCE DRAWINGS

A1	PROPERTY ACQUISITION
A2	UTILITY PLAN & PROFILE
A3	ROAD CONSTRUCTION
A4	STORM SEWER INSTALLATION
A5	WATERMAIN INSTALLATION
A6	CONCRETE STREET LIGHTING
A7	TRAFFIC SIGNALS
A8	TRAFFIC SIGNAL REGULATION
A9	OTHER

NOTE: PRICE LOCATION OF ALL UTILITIES / SERVICES BEFORE STARTING CONSTRUCTION.

BENCHMARKS

ALL ELEVATIONS ARE TO GEODETIC DATUM AND REFER TO RICHMOND BENCHMARK NUMBER:

ELEVATION: _____ FIELD BOOK # _____
 CITY WORK ORDER # _____ TENDER / PROJECT # _____
 CONTRACT WORK ORDER # _____ ACCOUNT # _____

B.C. GAS SERVICES

THE DEVELOPER OR CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXISTING LOCATION OF GAS SERVICE LINES, AND WHERE NECESSARY ARRANGE FOR THEIR RELOCATION IN ORDER TO FACILITATE INSTALLATION OF THE WORKS SHOWN ON THESE PLANS. A LIST OF SERVICE LINE LOCATIONS MAY BE OBTAINED FROM:

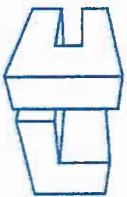
B.C. 1 CALL
 TELEPHONE: 1-800-444-5885
 WEBSITE: www.bcgas.com

NOTE: B.C. GAS REQUIRES 10 DAYS NOTICE PRIOR TO THE COMMENCEMENT OF ANY WORK.

Associated Engineering
 3010 Louisa Street
 Richmond, B.C. V6V 1W5
 Tel: 604-271-1111
 Fax: 604-271-4103

ATTACHMENT 3: Copies Of Relevant Approved Development Permit Plans With Changes Outlined

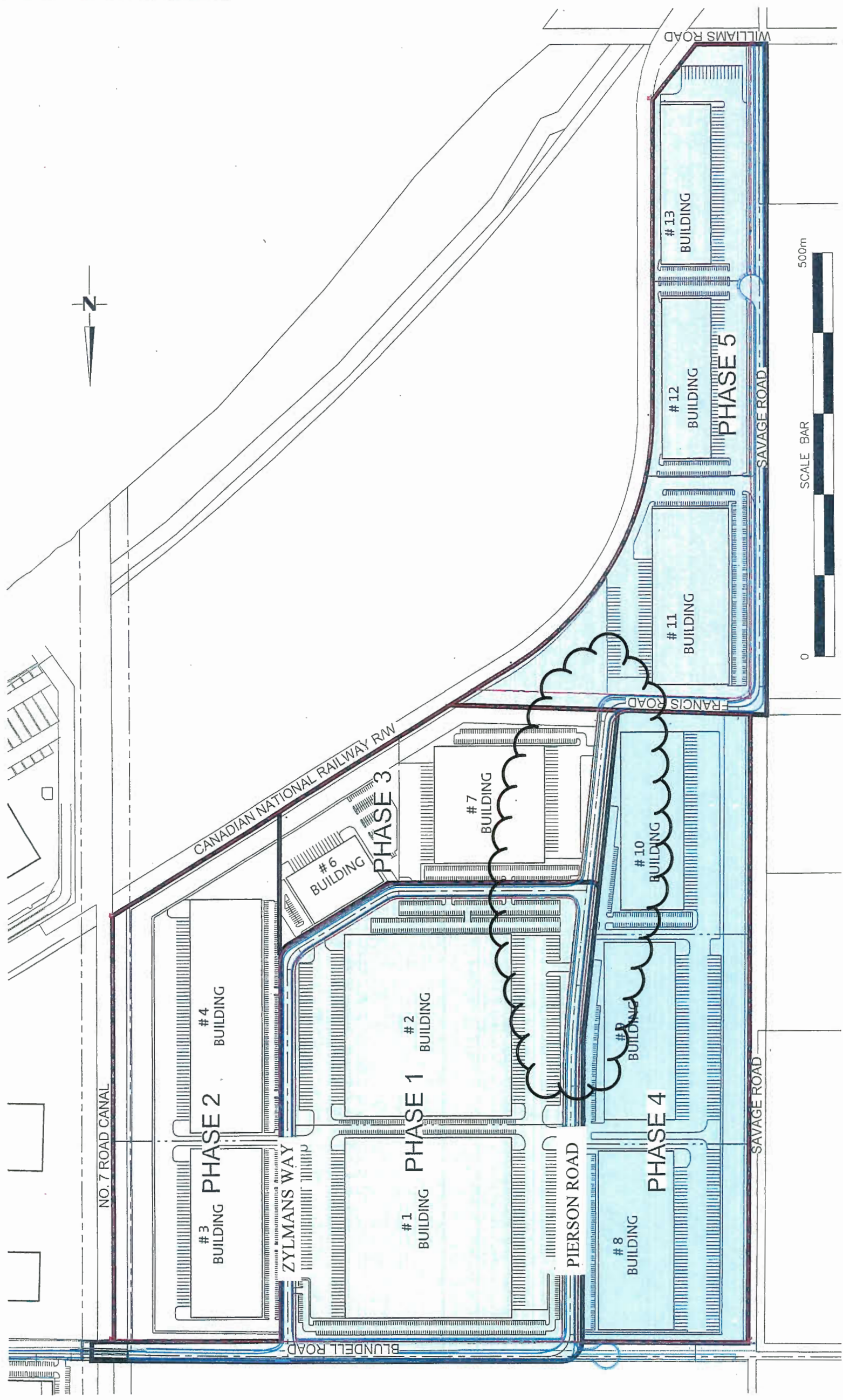
DEVELOPMENT PHASING PLAN



Richmond Industrial Centre

RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011

DP 11-566011



I HEREBY CERTIFY this to be a true and correct copy of P 2 of 19 to DP 11-566011 approved by Richmond City Council on January 23, 2011
Claudia Jesson
CLAUDIA JESSON, Acting Corporate Officer

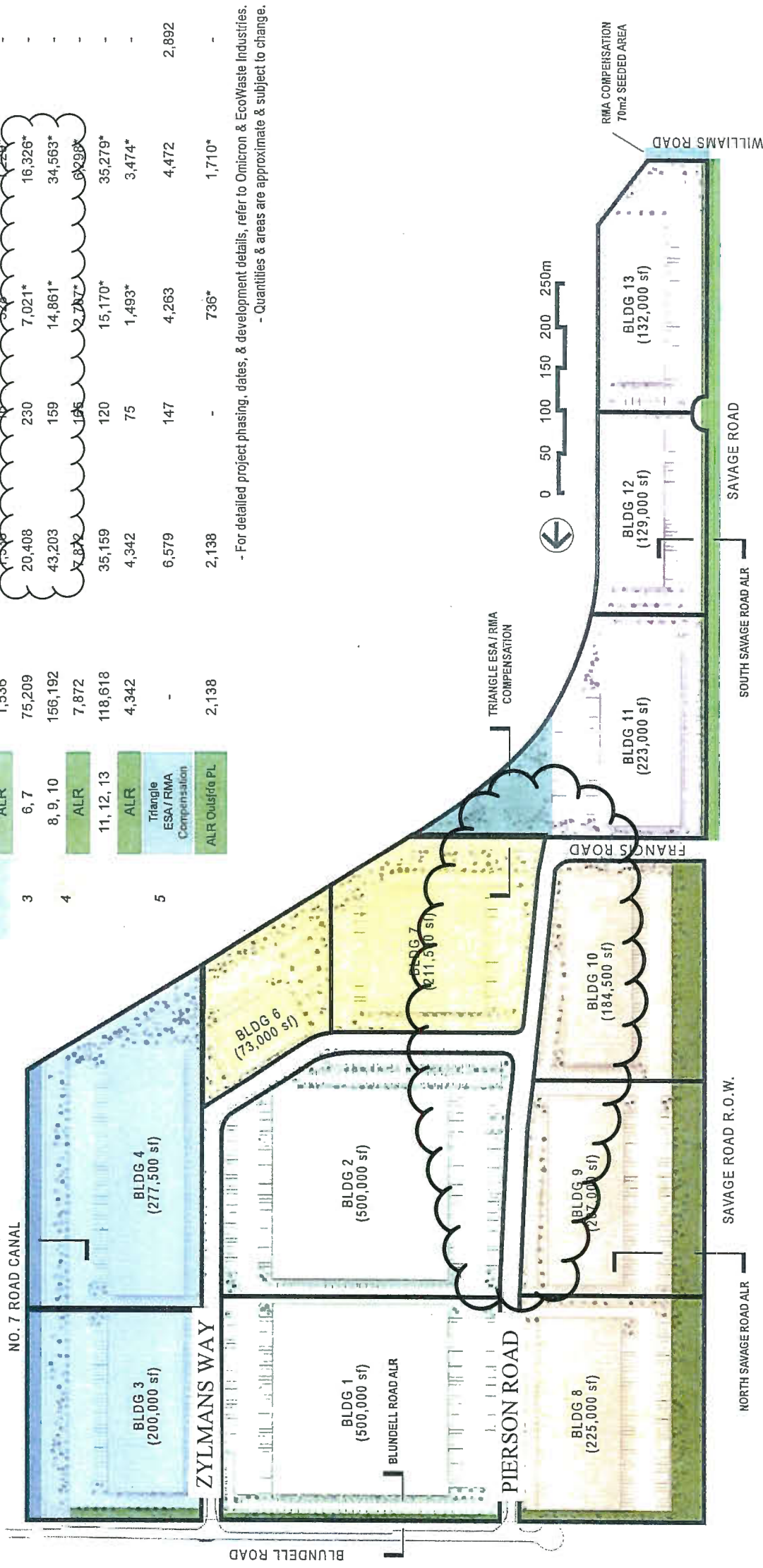
JUL 13 2016

ATTACHMENT 3

Planting Strategy Plan

PLANTING PER PHASE		Lot Area (m2)	Total Landscape Area (m2)	Trees (ea)	20%* Shrubs (ea)	80%* Seed Areas (m2)	Wetland Plants
Phase	Building # / Area						
No. 7 RD / BRIDGE	No. 7 Canal RMA	-	1,598 planted / 2,123 invasive m2	-	-	-	-
1	1, 2	179,536	15,778	237	3,733	3,731	-
2	3, 4	122,551	2,704	28	5,427*	12,623*	-
3	6, 7	75,209	1,536	16	11,631*	27,049*	-
4	8, 9, 10	156,192	43,203	159	7,021*	16,326*	-
5	11, 12, 13	118,618	7,872	120	14,861*	34,563*	-
	ALR	4,342	35,159	75	15,170*	35,279*	-
	Triangle ESA / RMA Compensation	2,138	6,579	147	1,493*	3,474*	2,892
	ALR Outside PL	2,138	2,138	-	736*	1,710*	-

- For detailed project phasing, dates, & development details, refer to Omicron & EcoWaste Industries.
 - Quantities & areas are approximate & subject to change.



Plan #2

JUL 13 2016

I HEREBY CERTIFY this to be a true and correct copy of P 3 of 19 to DP 11-566011 approved by Richmond City Council on Jan 23, 2016
 Claudia Jesson, Acting Corporate Officer

LANDSCAPE PLAN AND PLANTING OVERVIEW

Proposed Plant Lists - Site & ALR Buffer

REPRESENTATIVE TREE LIST

No.	BOTANICAL NAME	COMMON NAME	SIZES & NOTES
1	AMELANCHIER ALNIFOLIA	SERVICEBERRY	MIXED 7, 10 POTS
2	BETULA NIGRA	RIVER BIRCH	MIXED 7, 10 POTS
3	CRATAEGUS SPP.	HAWTHORN	MIXED 7, 10 POTS
4	MALUS FUSCA	PACIFIC CRAB-APPLE	MIXED 7, 10 POTS
5	PICEA SPP	SPRUCE	MIX 1.2 - 2.5M HT
6	PINUS CONTORTA	SHORE PINE	MIX 1.2 - 2.5M HT
7	PRUNUS EMARGINATA	BITTER CHERRY	MIXED 7, 10 POTS
8	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	MIX 1.2 - 2.5M HT
9	ROBINA PSEUDOCACIA	BLACK LOCUST	MIX 1.2 - 2.5M HT
10	QUERCUS PALUSTRIS	PIN OAK	MIX 1.2 - 2.5M HT

REPRESENTATIVE SHRUBS, GRASSES & SEED LIST

No.	BOTANICAL NAME	COMMON NAME	SIZES & NOTES
1	ARCTOSTAPHYLOS UVA-URSI	KINKINNICK	4" POTS
2	CAREX SPP	SEDGE, VARIOUS	1 POTS
3	FESTUCA SPP	BLUE FESCUE	1 POTS
4	POTENTILLA FRUTICOSA	SHRUBBY CINQUEFOIL	5 POTS
5	PHYSOCARPUS OPULIFOLIUS	NINEBARK	5 POTS
6	RIBES SANGUINEUM	FLOWERING CURRANT	5 POTS
7	ROSA NUTKANA	NOOTKA ROSE	5 POTS
8	RUBUS PARVIFLORUS	SALMONBERRY	5 POTS
9	SALIX HOOKERIANA	HOOKER'S WILLOW	5 POTS
10	SPIREA DOUGLASSII	HARDHACK	5 POTS
11	SYMPHORICARPOS ALBUS	SNOWBERRY	5 POTS
12	NATIVE GRASS AND WILDFLOWER SEED	COASTAL REVEGETATION MIX, SUPPLEMENTED WITH CAMASSIA & ERYTHRONIUM	

Proposed Plant Lists - ESA/RMA Comp.

REPRESENTATIVE TREE LIST

No.	BOTANICAL NAME	COMMON NAME	SIZES & NOTES
1	*RED ALDER	ALNUS RUBRA	MIX 1.2 - 2.5M HT
2	*BLACK COTTONWOOD	POPULUS BALSAMIFERA OR P. TRICHOCARPA	MIX 1.2 - 2.5M HT
3	BITTER CHERRY	PRUNUS EMARGINATA	MIX 1.2 - 2.5M HT
4	*PACIFIC WILLOW	SALIX LUCIDA SSP. LASIANDRA	5 POTS
5	*SITKA SPRUCE	PICEA SITCHENSIS	MIX 1.2 - 2.5M HT
6	WESTERN RED CEDAR	THUJA PLICATA	MIX 1.2 - 2.5M HT

REPRESENTATIVE SHRUBS & WETLAND PLANTS

No.	BOTANICAL NAME	COMMON NAME	SIZES & NOTES
1	SASKATOON	AMELANCHIER ALNIFOLIA	5 POTS
2	*RED-OSIER DOGWOOD	CORNUS SERICEA OR C. STOLONIFERA	5 POTS
3	PACIFIC WINEBARK	PHYSOCARPUS CAPTIATUS	5 POTS
4	*SNOWBERRY	SYMPHORICARPOS ALBUS	5 POTS
5	*THIMBLEBERRY	RUBUS PARVIFLORUS	5 POTS
6	*SALMONBERRY	RUBUS SPECTABILIS	5 POTS
7	HOOKER'S WILLOW	SALIX HOOKERIANA	5 POTS
8	*RED ELDERBERRY	SAMBUCUS RACEMOSA VAR. ARBORESCENS	5 POTS
9	CAITAIL	TYPHA LATIFOLIA	1 POTS
10	SLOUGH SEDGE	CAREX LYNGBYEI	1 POTS
11	*BEAKED SEDGE	CAREX ROSTRATA	1 POTS
12	COMMON RUSH	JUNCUS EFFUSUS	1 POTS
13	HARDSTEM BULRUSH	SCIRPUS LACUSTRIS	1 POTS

Note: 50% of plants selected should be from those identified with an (*) as per the City of Richmond's Criteria for the Protection of Environmentally Sensitive Areas.

Additional Plan added, Adjusted current plan to 3a and added 3b for the wetland.

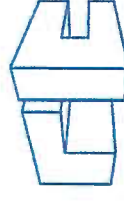
Plan #3

I HEREBY CERTIFY this to be a true and correct copy of P 4 of 19 to DP 11-566011 approved by Richmond City Council on January 23, 2016

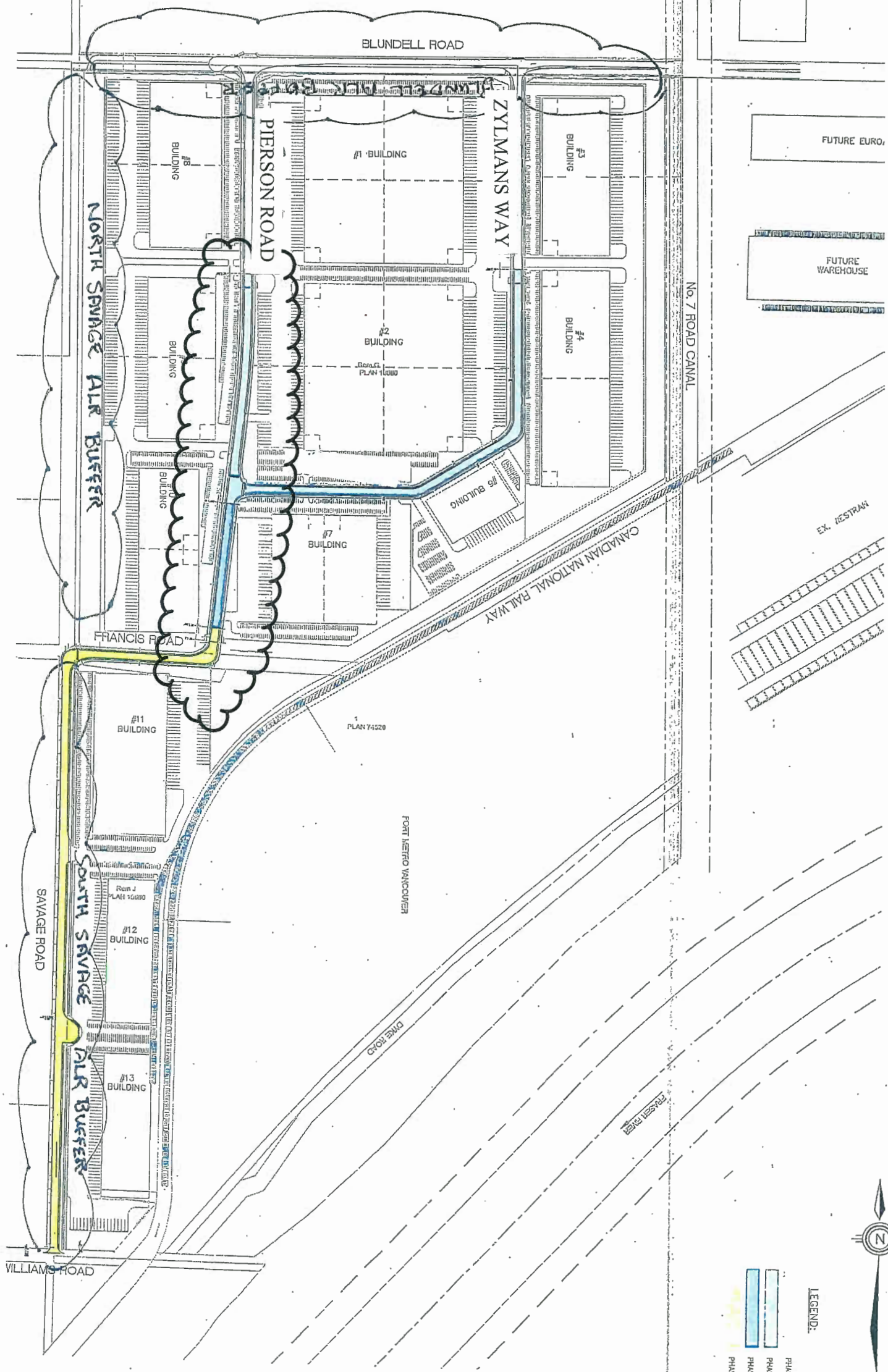
Christina Jenson
 CLAUDIA JESSON, Acting Corporate Officer

JUL 13 2016

GENERAL SITE PLANTING LIST



ALL BUFFER LOCATIONS



FUTURE HOPEWELL

FUTURE EURO

FUTURE WAREHOUSE

EX. RESTRAIN

PLAN 74520

FORT METRO VANCOUVER

#11 BUILDING

#12 BUILDING

#13 BUILDING

Rein J
PLAN 150890

NORTH SAVAGE AIR BUFFER

SOUTH SAVAGE AIR BUFFER

BLUNDELL ROAD

PIERSON ROAD

ZYLMANS WAY

No. 7 ROAD CANAL

FRANCIS ROAD

SAVAGE ROAD

WILLIAMS ROAD



LEGEND:

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4

RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011



DP 11-566011

I HEREBY CERTIFY this to be a true and correct copy of P 5 of 19 to DP 11-566011 approved by Richmond City Council on January 23, 2017.

Claudia Jesson
CLAUDIA JESSON, Acting Corporate Officer

Plan # 11/a

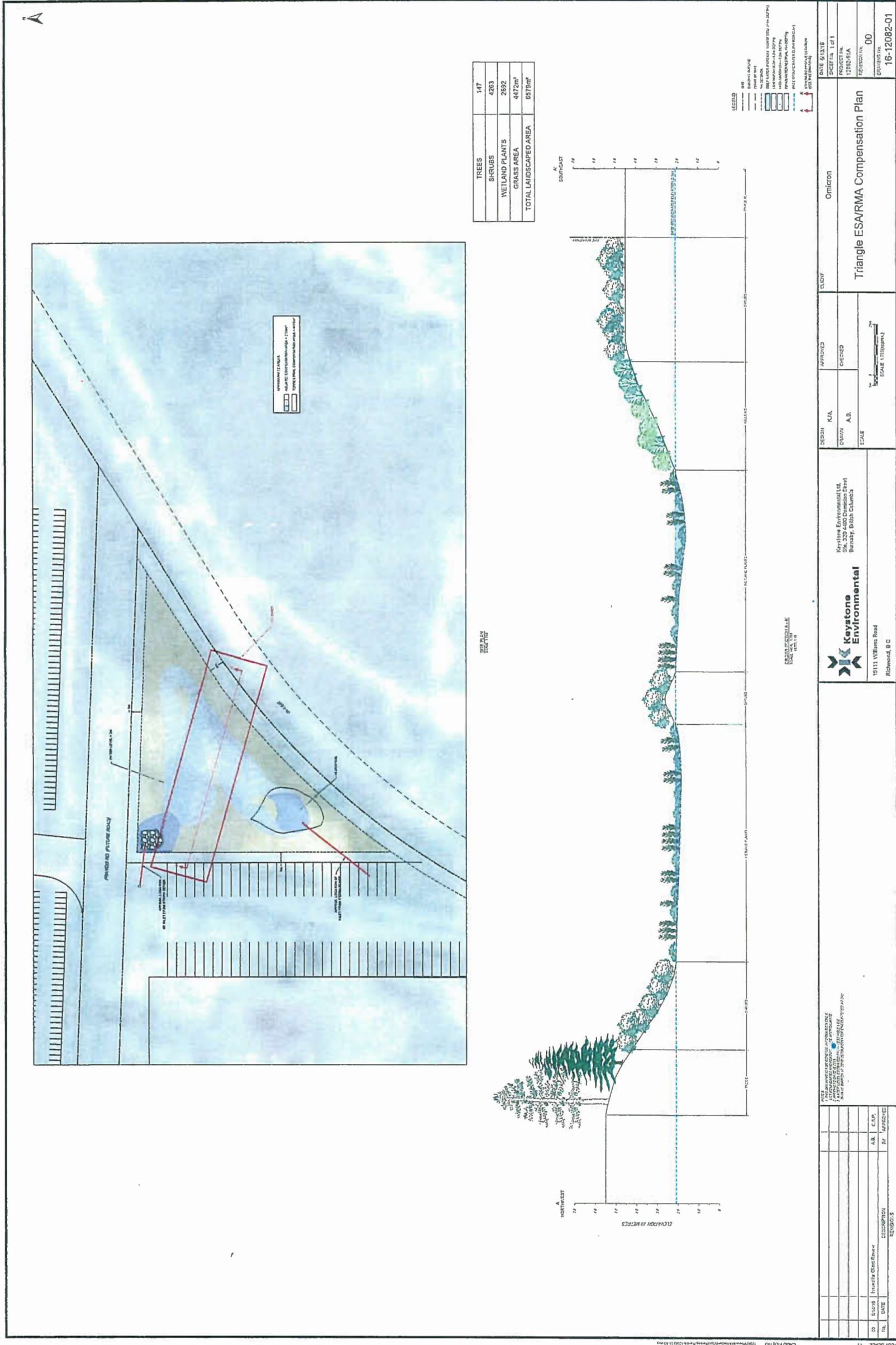
JUL 13 2016

TRIANGLE ESA / RMA COMPENSATION SECTION, PLAN & PLANTING LIST

RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011



DP 11-566011



New plans are split into Plan 5a and 5b.

Plan # 5

JUL 13 2016

HEREBY CERTIFY this to be a true and correct copy of P 1 of 14 to DP 11-566011 approved by Richmond City Council on January 23, 2017
 Claudia Jesson, Acting Corporate Officer

Richmond Industrial Centre Habitat Balance Sheet and Proposed Compensation

Site / Photo Number	Habitat Type	Lot 1101 (Ecowaste Property)	Lot 1123 (Neighbouring Property)	Road ROWs	Total	Compensation Ratio (Impact to Replacement)	Required Compensation Area	Compensated for Like Habitat	Compensated in Same Ecological Unit
Impacted ESA / RMA Requiring Compensation (m²)									
1	ESA	-	480	Savage Rd: 1,600	2,080	2:1	1,040	Yes	No [†]
		-	2,164	Savage Rd: 205	2,369	2:1	1,185	Yes	No [†]
2a	Freshwater Aquatic	-	-	Savage / Francis Rd: 105	147	2:1	74	Yes	No [†]
3a	RMA	-	-	Williams Rd: 42	142	2:1	71	Yes	No [†]
2b		-	-	Savage / Francis Rd: 101	142	2:1	71	Yes	No [†]
3b		-	-	Williams Rd: 41	142	2:1	71	Yes	No [†]
4	ESA	-	-	Williams Rd: 75	75	2:1	38	No*	No [†]
5	RMA	-	-	Blundell Rd: 732	732	1:1.5	1,098	Yes	Yes
Non-impacted Areas to be Removed from ESA (m²)									
6	ESA	6,688	54	Savage / Francis Rd: 5,566	12,308	-	-	-	-
							Required Compensation Sub-Total	3,506	-
							+ Additional 25% for Net Benefit / Local Values	4,383	-
							Total Required Aquatic Compensation	1,440	-
							Total Required Terrestrial Compensation	2,943	-

HABITAT BALANCE SHEET

RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011



Richmond Industrial Centre

DP 11-566011

Site / Photo Number	Location	Compensation Habitat Type	Impacted Habitat Type / Location	Compensation Area	Total Compensation Area	Compensated for Like Habitat	Compensated in Same Ecological Unit
7	Ecowaste "Triangle Lot" Constructed Wetland	Freshwater Aquatic	ESA Lot 1123 and Road ROWs	1,040	1,588	Yes	No [†]
			RMA Road ROWs	74		Yes	No [†]
			ESA Storm Water Outfall	38		No*	No [†]
			ESA Additional Net Benefit	436		-	-
8	Williams Road Entrance Culvert Removal & Watercourse Restoration	Riparian Terrestrial	ESA Lot 1123 and Road ROWs	1,185	3,230	Yes	No [†]
			RMA Road ROWs	71		Yes	No [†]
			ESA Additional Net Benefit	1,974		-	-
9	No. 7 Road Canal Riparian Restoration	Riparian Terrestrial	RMA Additional Net Benefit	2	3,731	-	-
			RMA Additional Net Benefit	70		-	-
			RMA No. 7 Road Canal ROWs	1,098		Yes	Yes
			RMA Additional Net Benefit	2,633		-	-
Total Proposed Aquatic Compensation				1,620			
Total Proposed Terrestrial Compensation				7,031			
Aquatic Net Benefit (1,620 - 1,440)				180			
Terrestrial Net Benefit (7,031 - 2,943)				4,088			

* Brackish intertidal aquatic impacts from the storm water outfall will be compensated as part of the upland constructed wetland (unlike habitat), based on the limited area of impacts and limited value an isolated brackish compensation area would provide.

† Compensation habitat will not be located in the same contiguous ecological unit based on the inability to establish compensation areas on the Ecowaste property that maintain direct connectivity to impacted areas beyond the property boundaries. Providing compensation habitat in a concentrated area at >25% of the replacement ration is considered to represent a no net loss of habitat.

I HEREBY CERTIFY this to be a true and correct copy of P 4 of 19 to DP 11-566011 approved by Richmond City Council on January 23, 2017

CLAUDIA JESSON, Acting Corporate Officer

JUL 13 2016

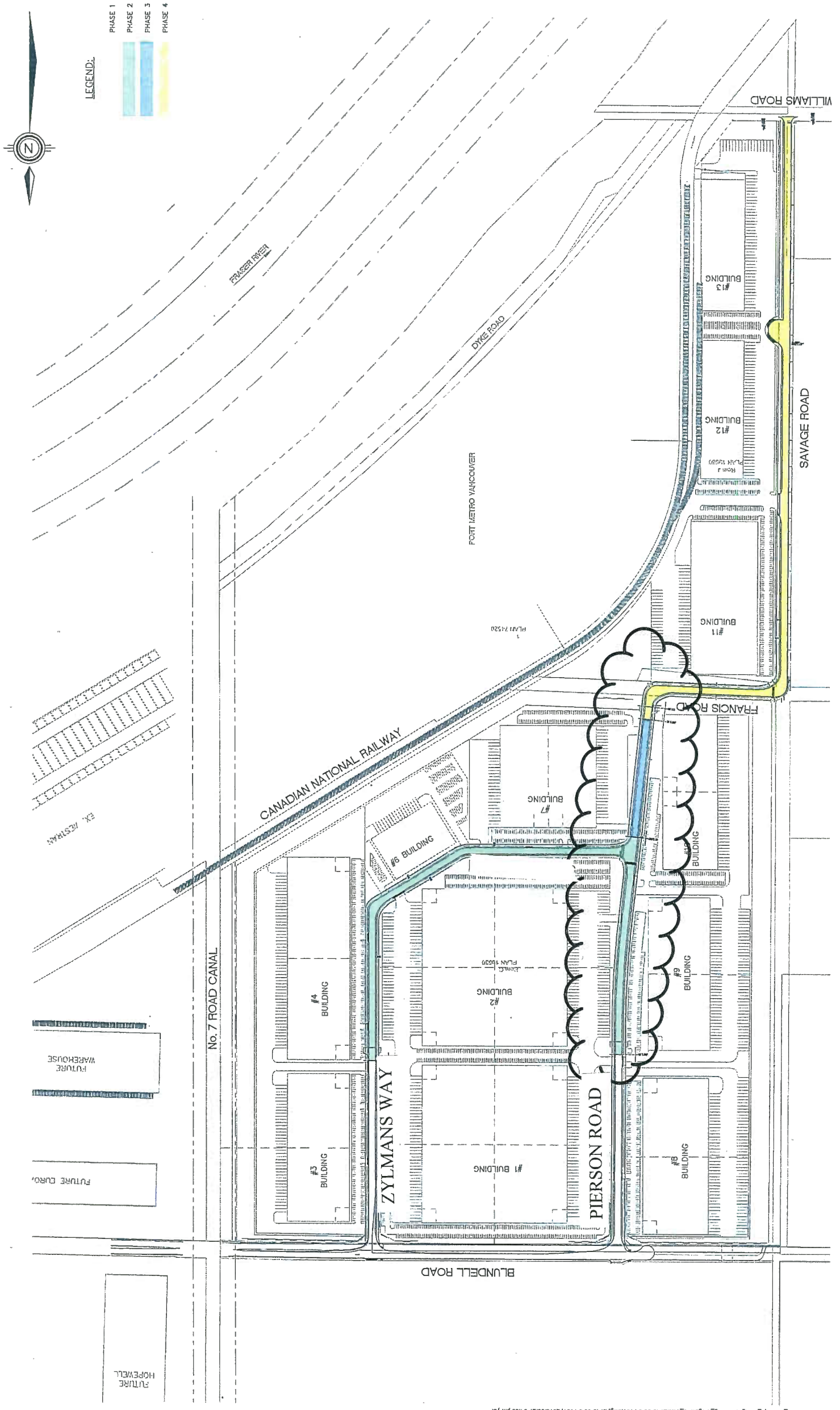
Plan #7



RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011

NP 11-566011

ROAD PHASING PLAN



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I HEREBY CERTIFY this to be a true and correct copy of P 11 of 19 to DP 11-566011 approved by Richmond City Council on January 23, 2016
Claudia Jesson
CLAUDIA JESSON, Acting Corporate Officer

Plan #9
JUL 13 2016

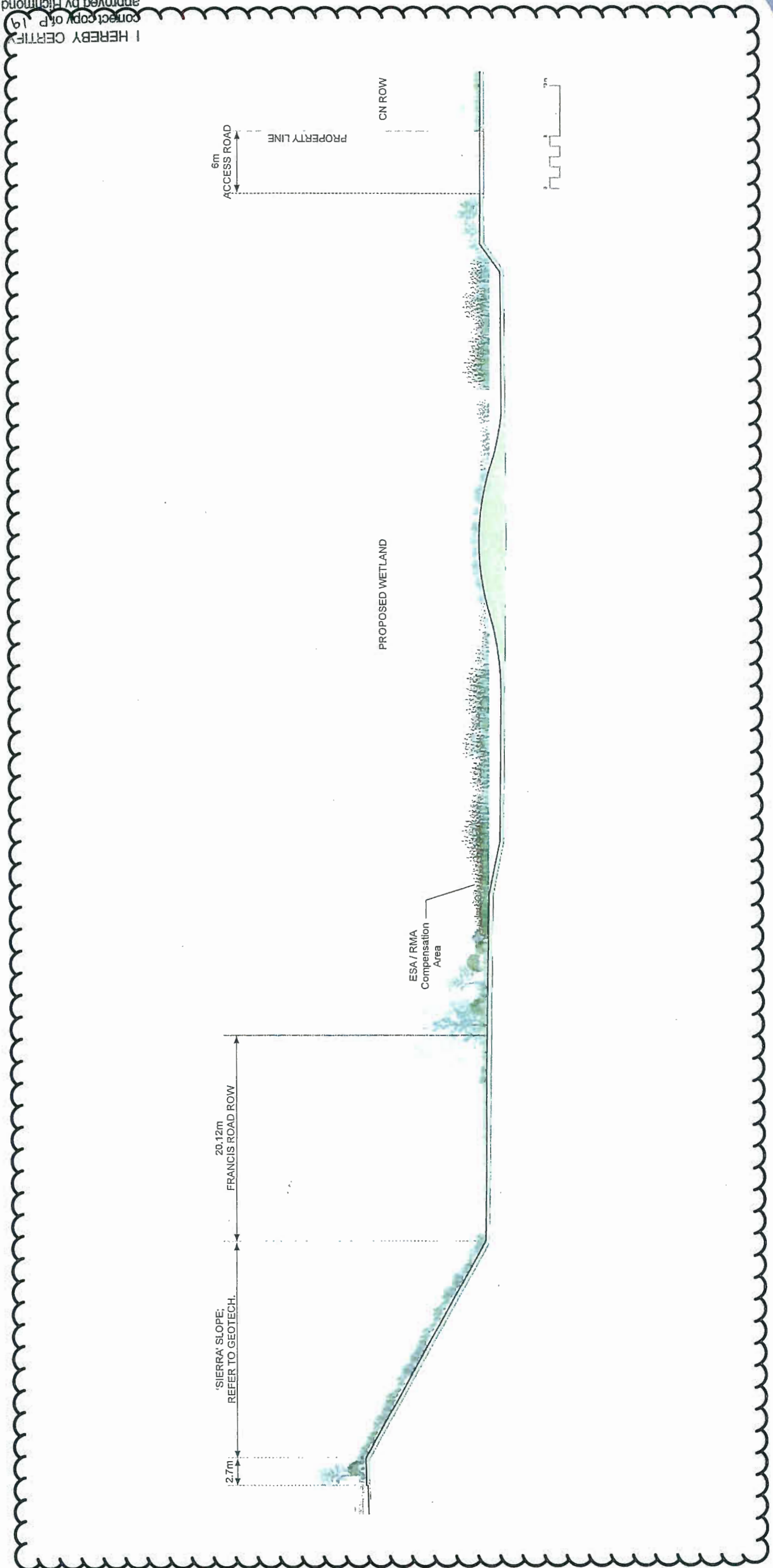
ONSITE COMPENSATION AREA

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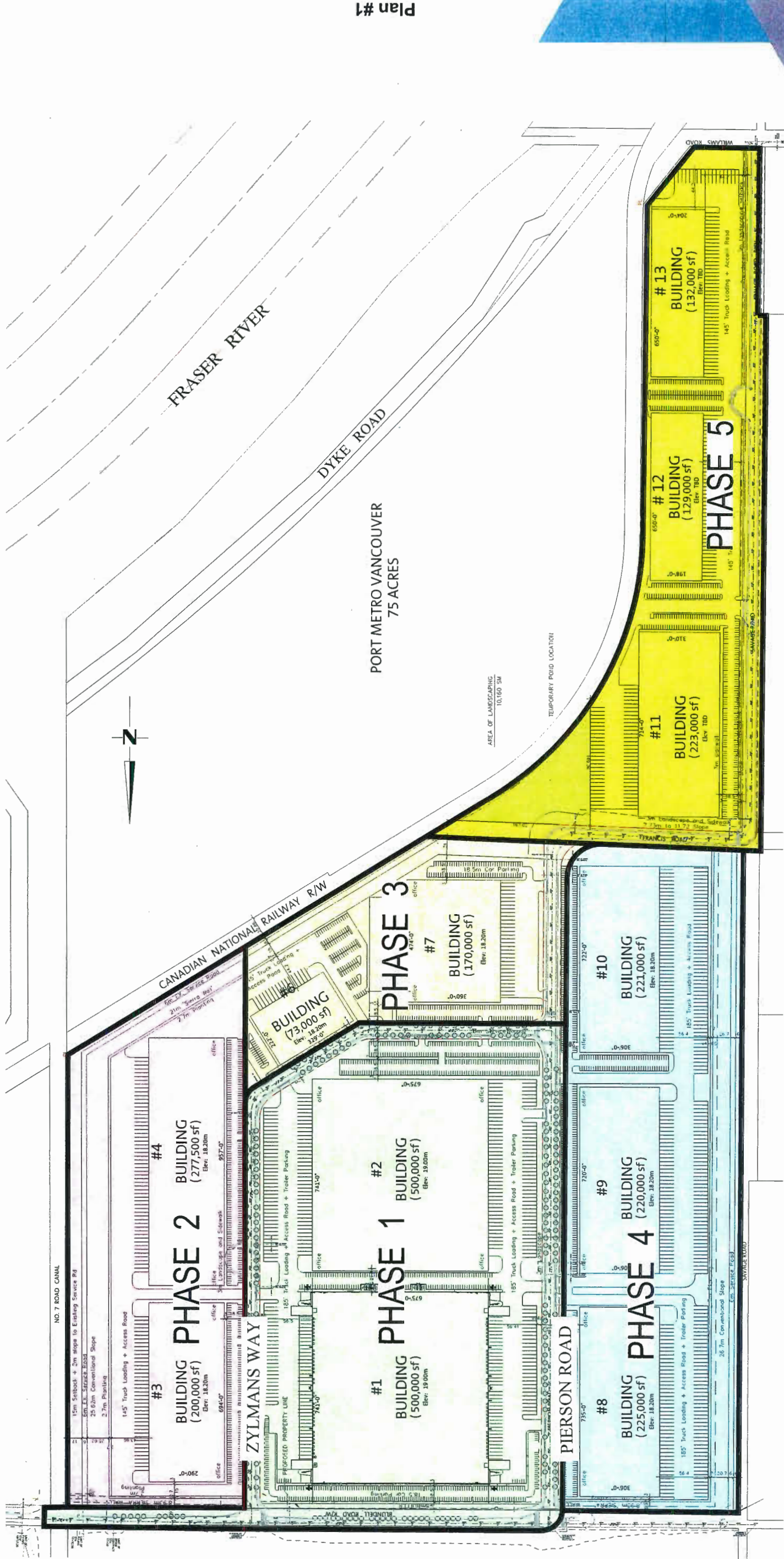
RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011

DP 11-566011



I HEREBY CERTIFY that this is to be a true and correct copy of P 19 of 19 to DP 11-566011 approved by Richmond City Council on January 23, 2017
Claudia Jesson
CLAUDIA JESSON, Acting Corporate Officer
Plan # 17 JUL 13 2016

ATTACHMENT 4: Proposed Replacement Development Permit Plans



Plan #1

DEVELOPMENT PHASING PLAN

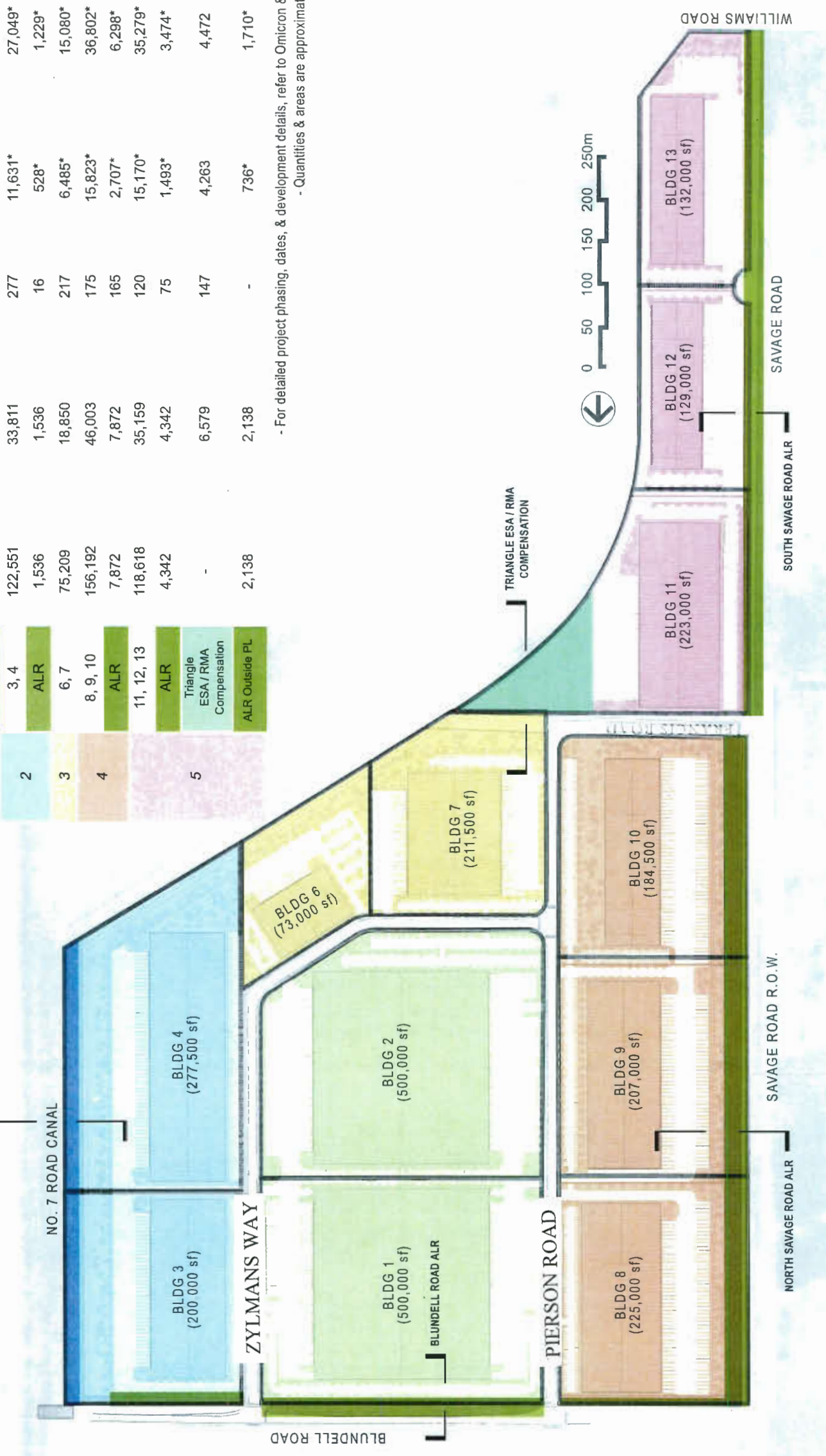


DP 11-566011 RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
 FILE NO. DP 11-566011

Planting Strategy Plan

PLANTING PER PHASE		Lot Area (m2)	Total Landscape Area (m2)	Trees (ea)	20%* Shrubs (ea)	80%* Seed Areas (m2)	Wetland Plants
Phase	Building # / Area						
No. 7 RD / BRIDGE	No. 7 Canal RMA	-	1,598 planted / 2,133 invasive mgmt	-	3,733	3,731	-
1	1, 2 ALR	179,536	15,450	274	5,314*	12,360*	-
2	3, 4 ALR	122,551	33,811	277	11,631*	27,049*	-
3	6, 7	75,209	18,850	217	6,485*	15,080*	-
4	8, 9, 10 ALR	156,192	46,003	175	15,823*	36,802*	-
5	11, 12, 13 ALR	118,618	35,159	120	15,170*	35,279*	-
	Triangle ESA / RMA Compensation	4,342	7,872	165	2,707*	6,298*	-
	ALR Outside PL	-	4,342	75	1,493*	3,474*	-
		2,138	6,579	147	4,263	4,472	2,892
			2,138	-	736*	1,710*	-

- For detailed project phasing, dates, & development details, refer to Omicron & EcoWaste Industries.
- Quantities & areas are approximate & subject to change.



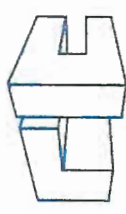
Plan #2

LANDSCAPE PLAN AND PLANTING OVERVIEW

DP 11-566011

RICHMOND INDUSTRIAL CENTRE DEVELOPMENT

FILE NO. DP 11-566011



Richmond Industrial Centre

Proposed Plant Lists - Site & ALR Buffer

REPRESENTATIVE TREE LIST

No.	BOTANICAL NAME	COMMON NAME	SIZES & NOTES
1	AMELANCHIER ALNIFOLIA	SERVICEBERRY	MIXED 7, 10 POTS
2	BETULA NIGRA	RIVER BIRCH	MIXED 7, 10 POTS
3	CRATAEGUS SPP.	HAWTHORN	MIXED 7, 10 POTS
4	MALUS FUSCA	PACIFIC CRAB APPLE	MIXED 7, 10 POTS
5	PICEA SPP	SPRUCE	MIX 1.2 - 2.5M HT
6	PINUS CONTORTA	SHORE PINE	MIX 1.2 - 2.5M HT
7	PRUNUS EMARGINATA	BITTER CHERRY	MIXED 7, 10 POTS
8	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	MIX 1.2 - 2.5M HT
9	ROBINIA PSEUDACACIA	BLACK LOCUST	MIX 1.2 - 2.5M HT
10	QUERCUS PALUSTRIS	PIN OAK	MIX 1.2 - 2.5M HT

REPRESENTATIVE SHRUBS, GRASSES & SEED LIST

No.	BOTANICAL NAME	COMMON NAME	SIZES & NOTES
1	ARCTOSTAPHYLOS UVA-URSI	KINKINNICK	4" POTS
2	CAREX SPP	SEDGE, VARIOUS	1 POTS
3	FESTUCA SPP	BLUE FESCUE	1 POTS
4	POTENTILLA FRUTICOSA	SHRUBBY CINQUEFOIL	5 POTS
5	PHYSOCARPUS OPULIFOLIUS	NINEBARK	5 POTS
6	RIBES SANGUINEUM	FLOWERING CURRANT	5 POTS
7	ROSA NUTKANA	NOOTKA ROSE	5 POTS
8	RUBUS PARVIFLORUS	SALMONBERRY	5 POTS
9	SALIX HOOKERIANA	HOOKER'S WILLOW	5 POTS
10	SPIREA DOUGLASSII	HARDHACK	5 POTS
11	SYMPHORICARPOS ALBUS	SNOWBERRY	5 POTS
12	NATIVE GRASS AND WILDFLOWER SEED	COASTAL REVEGETATION MIX, SUPPLEMENTED WITH CAMASSIA & ERYTHRONIUM	

Proposed Plant Lists - SPEA Comp.

REPRESENTATIVE TREE LIST

No.	BOTANICAL NAME	COMMON NAME	SIZES & NOTES
1	*RED ALDER	ALNUS RUBRA	MIX 1.2 - 2.5M HT
2	*BLACK COTTONWOOD	POPULUS BALSAMIFERA OR PTRICHOCARPA	MIX 1.2 - 2.5M HT
3	BITTER CHERRY	PRUNUS EMARGINATA	MIX 1.2 - 2.5M HT
4	*PACIFIC WILLOW	SALIX LUCIDA SSP. LASIANDRA	5 POTS
5	*SITKA SPRUCE	PICEA SITCHENSIS	MIX 1.2 - 2.5M HT
6	WESTERN RED CEDAR	THUJA PLICATA	MIX 1.2 - 2.5M HT

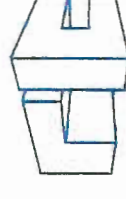
REPRESENTATIVE SHRUBS & WETLAND PLANTS

No.	BOTANICAL NAME	COMMON NAME	SIZES & NOTES
1	SASKATOON	AMELANCHIER ALNIFOLIA	5 POTS
2	*RED-OSIER DOGWOOD	CORNUS SERICEA OR C. STOLONIFERA	5 POTS
3	PACIFIC NINEBARK	PHYSOCARPUS CAPTATUS	5 POTS
4	*SNOWBERRY	SYMPHORICARPOS ALBUS	5 POTS
5	*THIMBLEBERRY	RUBUS PARVIFLORUS	5 POTS
6	*SALMONBERRY	RUBUS SPECTABILIS	5 POTS
7	HOOKER'S WILLOW	SALIX HOOKERIANA	5 POTS
8	*RED ELDERBERRY	SAMBUCUS RACEMOSA VAR. ARBORESCENS	5 POTS
9	CATTAIL	TYPHALATIFOLA	1 POTS
10	SLOUGH SEDGE	CAREX LYNGBEYI	1 POTS
11	*BEAKED SEDGE	CAREX ROSTRATA	1 POTS
12	COMMON RUSH	JUNCUS EFFUSUS	1 POTS
13	HARDSTEM BULRUSH	SCIRPUS LACUSTRIS	1 POTS

Note: 50% of plants selected should be from those identified with an (*) as per the City of Richmond's Criteria for the Protection of Environmentally Sensitive Areas.

GENERAL SITE PLANTING LIST

DP 11-566011 RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011



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GENERAL NOTES

- CRITERIA FOR THE PROTECTION OF ENVIRONMENTALLY SENSITIVE AREA:
- EXISTING TREES (NATIVE) AND OTHER NATIVE VEGETATION SHOULD BE RETAINED, WHERE POSSIBLE - ALL TREES MUST BE AUTHORIZED BY PARKS PRIOR TO REMOVAL
- BUFFER AREAS AROUND NATIVE TREES TO BE RETAINED SHOULD BE CLEARLY MARKED
- WHERE AREAS ARE DISTURBED DURING CONSTRUCTION, THE CONTRACTOR SHOULD REPLANT USING NATIVE PLANTS
- REFER TO INVASIVE SPECIES MANAGEMENT MEASURES IN PROJECT'S ENVIRONMENTAL PROTECTION PLAN AND THE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
- THE FINAL TREE PROTECTION FENCE IS TO BE INSTALLED ALONG THE PERIMETER OF THE RESTORATION PLANTING AREA, BETWEEN THE PLANTING AREA AND MAINTAINED GRASS AREA

GENERAL PLANTING SPECIFICATIONS:

- RESTORATION PLANTINGS SHOULD BE BASED ON 1 TREE OR SHRUB PER 1 SQUARE METRE DENSITY WITHIN FULLY CLEARED AREAS, THIS MAY VARY DEPENDING UPON DENSITY OF EXISTING NATIVE SPECIES
- ALL TREE/SHRUB SPECIES SHOULD BE OF GUARANTEED NURSERY STOCK
- STOCK PLANTED DURING THE FALL (SEPT. - OCT.) AND SPRING (MARCH - APRIL) HAS THE GREATEST LIKELIHOOD OF SURVIVING
- THE BOTANICAL NAME SHOULD BE USED WHEN ORDERING STOCK TO ENSURE THAT THE DESIRED NATIVE SPECIES IS BEING PURCHASED. EACH SPECIMEN SHOULD BE TAGGED WITH THE BOTANICAL NAME AND THE TAG SHOULD BE LEFT ATTACHED AFTER PLANTING
- CONIFEROUS TREES SHOULD COMPRISE NOT LESS THAN 10% NOR MORE THAN 25% OF THE TREE STOCK PLANTED
- TREE STOCK SHOULD BE 2m IN HEIGHT WHEN PURCHASED AND PLANTED AT LEAST 2m APART
- PLANTING ON A GIVEN AREA BEING ENHANCED MUST BE SUCCESSFUL TO AN 80% TAKE. IF MORE THAN 20% DIE OVER ONE YEAR, REPLANTING IS REQUIRED
- A MINIMUM OF 50% OF TREES AND SHRUBS PLANTED SHOULD BE FRUIT-BEARING SPECIES
- GROWING MEDIUM IS TO BE FREE OF ANY SUBSOILS, ROOTS, NOXIOUS GRASS, WEEDS, TOXIC MATERIALS, STONE OVER 30 MM DIAMETER, FOREIGN OBJECTS, AND POSSESS AN ACIDITY RANGE (pH) OF 5.5 TO 7.5
- A FIVE YEAR MONITORING AND MAINTENANCE PLAN IS TO BE CARRIED OUT. PLANT MAINTENANCE IS TO INCLUDE WATERING, SELECTIVE PRUNING, AND CLEARING OF INVASIVE SPECIES (I.E., BLACKBERRY AND JAPANESE KNOTWEED)
- AFTER PLANTS HAVE BEEN PLANTED, A NATIVE SEED MIX APPROVED BY THE CITY SHALL BE APPLIED TO EXPOSED SOILS TO MINIMIZE EROSION AND COLONIZATION BY INVASIVE SPECIES
- RESTORATION PLANTING TO BE "SITE FIT" AND PLACED TO MINIMIZE DISTURBANCE TO ROOT ZONES OF EXISTING RETAINED TREES
- ISA CERTIFIED ARBORIST TO BE ON SITE TO OVERSEE ALL GRUBBING AND RESTORATION PLANTING AROUND RETAINED TREES

NEW PLANTS TO BE INSTALLED			
SYMBOL	COMMON NAME	LATIN NAME	COUNT
Cs	RED-OSIER DOGWOOD	<i>Cornus sericea</i>	1278
Rs	SALMONBERRY	<i>Rubus spectabilis</i>	884
Sh	HOOKE'S WILLOW	<i>Salix hookeriana</i>	174
Ss	SITKA WILLOW	<i>Salix sitchensis</i>	526
Sr	RED ELDERBERRY	<i>Sambucus racemosa</i>	633
(P)	WESTERN RED CEDAR	<i>Thuja plicata</i>	12
(C)	VINE MAPLE	<i>Acer circinnatum</i>	27
	TOTAL		3534

- NOTE:
- PLANT SPACING AND COUNT TO BE DETERMINED FOLLOWING INVASIVE REMOVAL
 - PLANT SPECIES SELECTED TAKES CONSIDERATION ENVIRONMENTAL FEATURES OF THE AREA

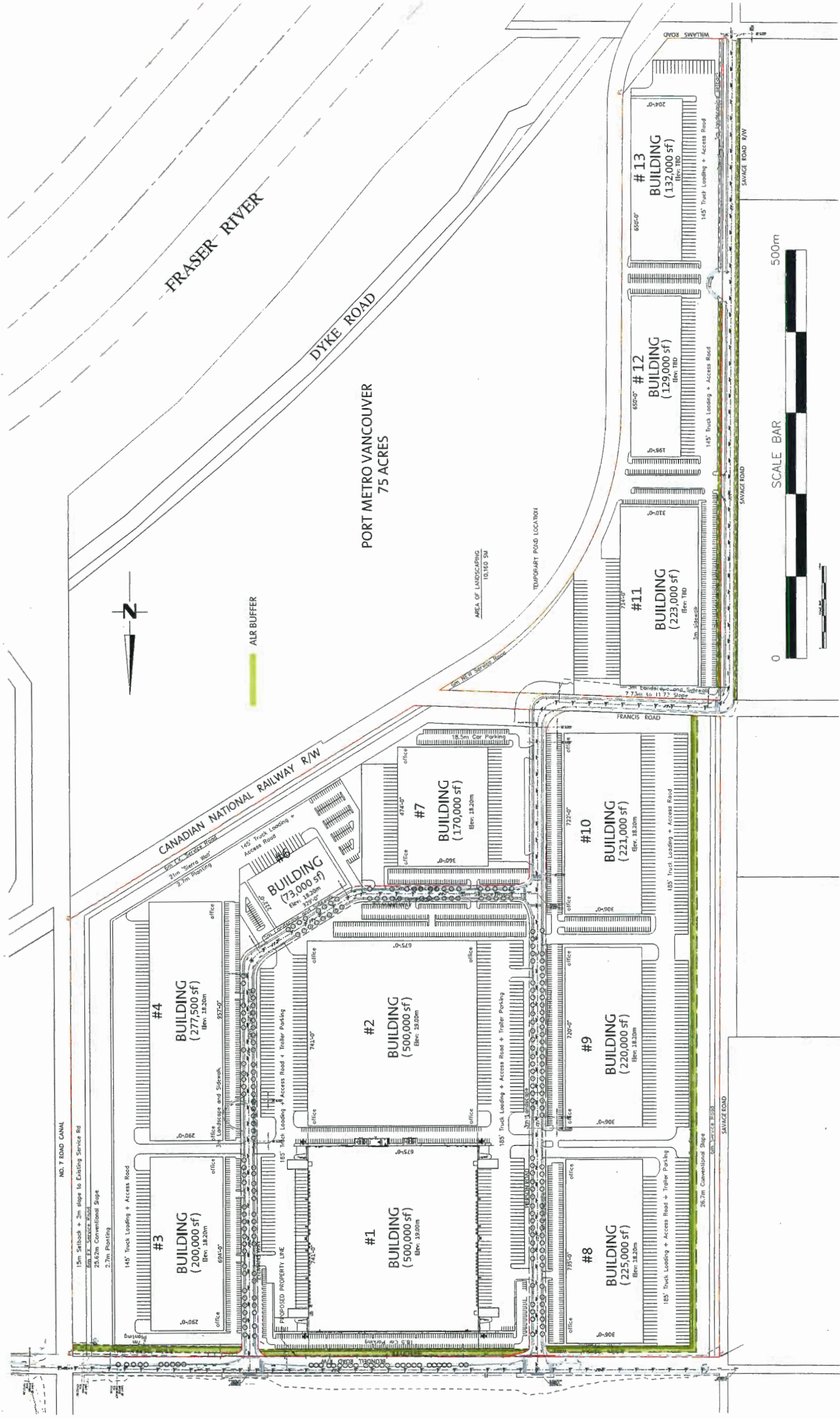
GENERAL SITE PLANTING LIST

DP 11-566011 RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011



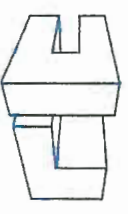
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80% NATIVE FORBS SEED MIX ROADSIDE RIPARIAN COASTAL SEED MIX			
SUPPLIER	PREMIER PACIFIC SEEDS LTD	SEED MIX	% BY SEED COUNT
APPLICATION TYPE	COASTAL ROADSIDE RIPARIAN	SEEDS LB	
FUNCTION	<ul style="list-style-type: none"> FAST GROWING EROSION AND SEDIMENT CONTROL POLLINATOR ATTRACTANT MITIGATE INVASIVE PLANT GROWTH IN DISTURBED SOILS LOW GROWTH HEIGHT 	% BY WEIGHT	
BOWING TIME	ANY TIME, IDEALLY NOT IN PROLONGED DROUGHT OR FROST	SEEDS LB	1.24
SOWING RATE	20-30 KG/HA	SEEDS LB	7.06
COST	\$22-50/KG	SEEDS LB	3.53
NOTES	ANNUAL RYEGRASS ESTABLISHES QUICKLY. IF THE PLANTING AREA IS HIGHLY DISTURBED AND SUBJECT TO SIGNIFICANT EROSION, OR IS IN PROXIMITY TO INVASIVE PLANTS AND/OR INVASIVE PLANT ROOT MATERIAL THIS IS THE PREFERRED SEED MIX.		
<i>Achillea millefolium</i> , YARROW*	0.25	2,800,000	1.24
<i>Agrostis scabra</i> , TACKLEGRASS*	1	4,000,000	7.06
<i>Anaphalis margaritacea</i> , PEARLY EVERLASTING*	0.25	8,000,000	3.53
<i>Aster subspicatus</i> , DOUGLAS ASTER*	0.25	1,120,000	0.49
<i>Deschampsia cespitosa</i> , TUFTED HAIRGRASS*	5	2,100,000	18.55
<i>Festuca occidentalis</i> , WESTERN FESCUE*	5	489,000	4.41
<i>Festuca ovina</i> , SHEEP'S FESCUE QUATRO	21	530,000	19.89
<i>Festuca rubra</i> var. <i>rubra</i> , CREEPING RED FESCUE	15	455,000	12.05
<i>Festuca rubra</i> , NATIVE RED FESCUE*	20	600,000	21.19
<i>Lolium multiflorum</i> , ANNUAL RYEGRASS (DIPLOID)	30	217,000	11.5
<i>Lupinus polyphyllus</i> , BIG LEAF LUPINE*	2	23,000	0.08
*NATIVE TO COSTAL BRITISH COLUMBIA	100		100



Plan #4a

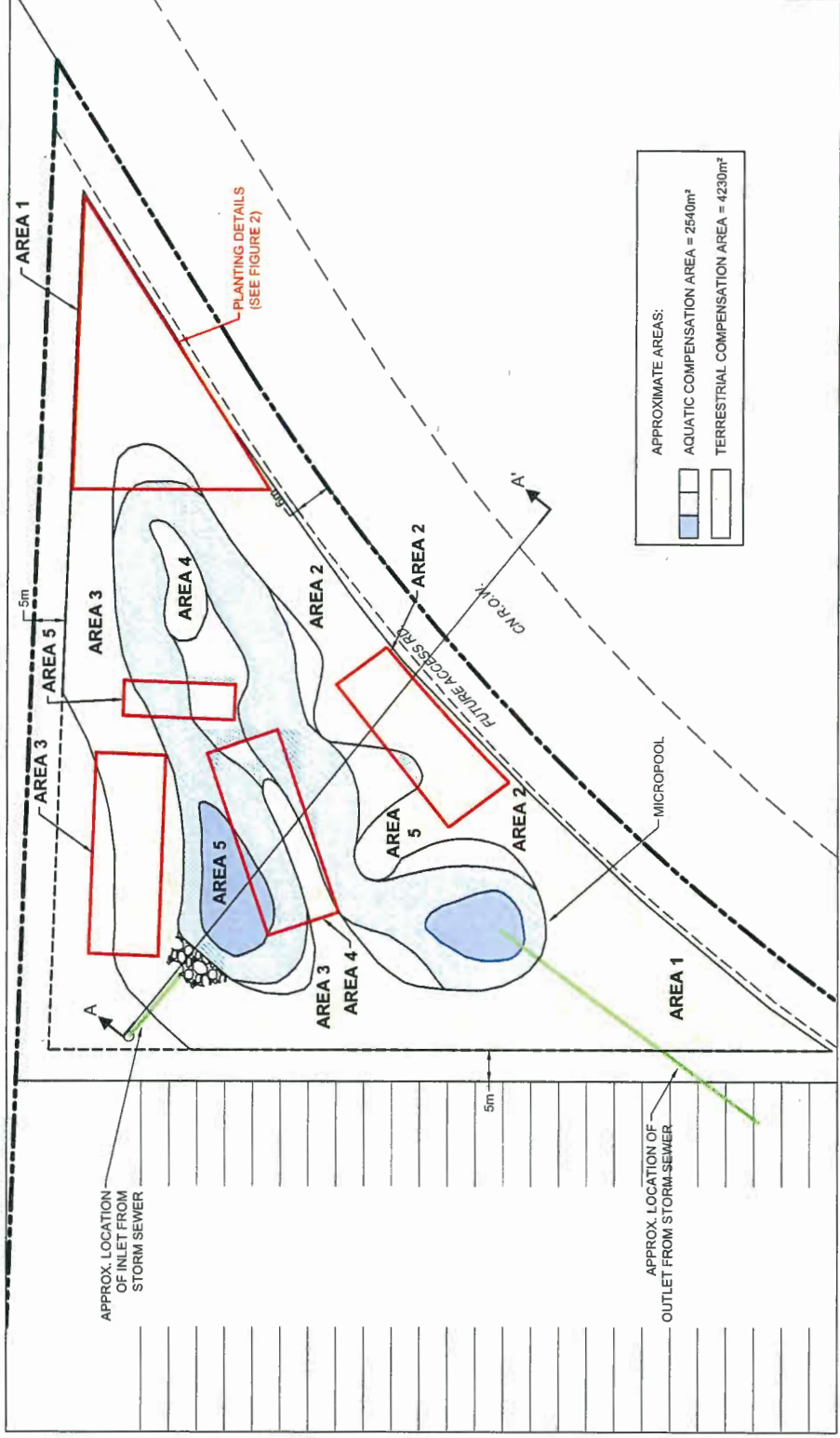
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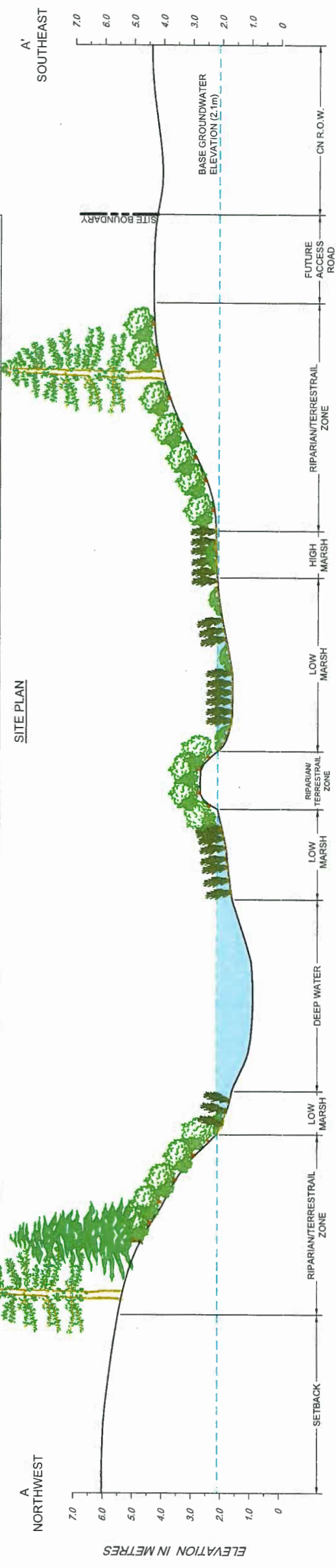
DP 11-566011 RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011

ALR BUFFER LOCATIONS

- LEGEND**
- SITE
 - BUILDING OUTLINE
 - RIGHT OF WAY
 - 5m SETBACK
 - DEEP WATER (FOREBAY, MICROPOOL) (>1m DEPTH)
 - LOW MARSH (0.2m - 0.5m DEPTH)
 - HIGH MARSH (0m - 0.2m DEPTH)
 - RIPARIAN/TERRESTRIAL (0m DEPTH)
 - BASE GROUNDWATER ELEVATION (2.1m)
 - A A' SCHEMATIC PROFILE LOCATION (SEE THIS DRAWING)

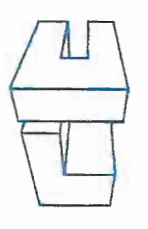


Plan #5a



TRIANGLE ESA / RMA COMPENSATION SECTION, PLAN & PLANTING LIST

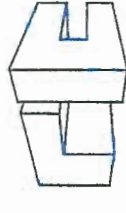
DP 11-566011 RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
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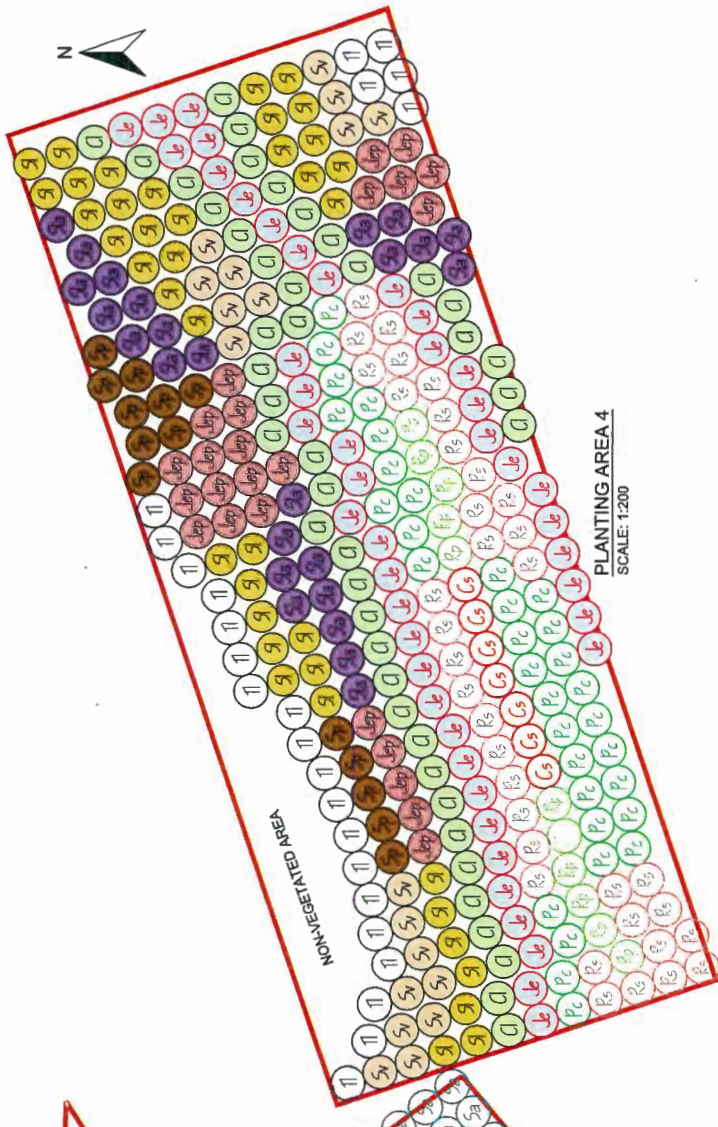
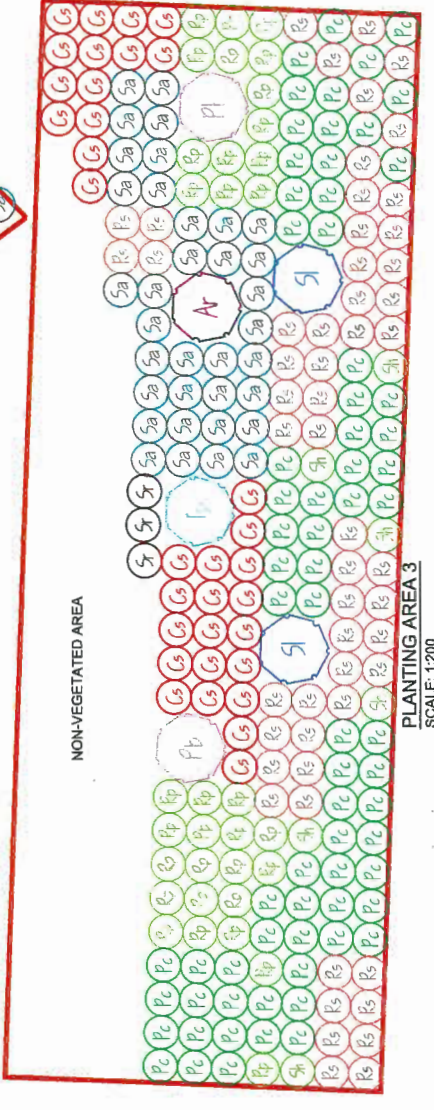
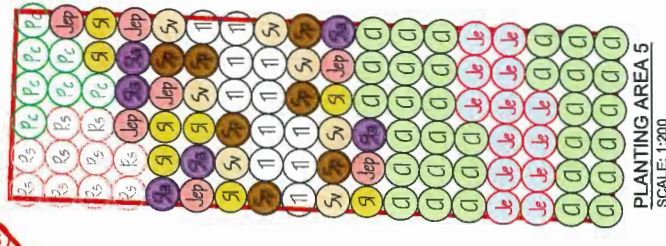
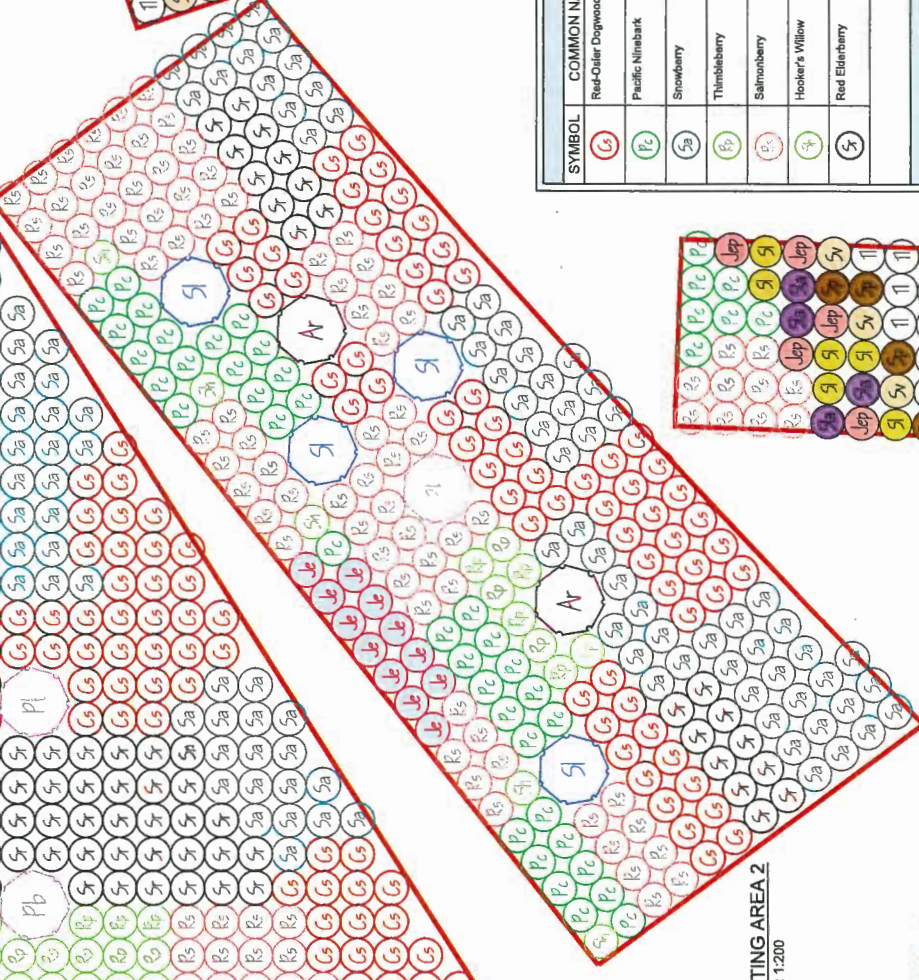
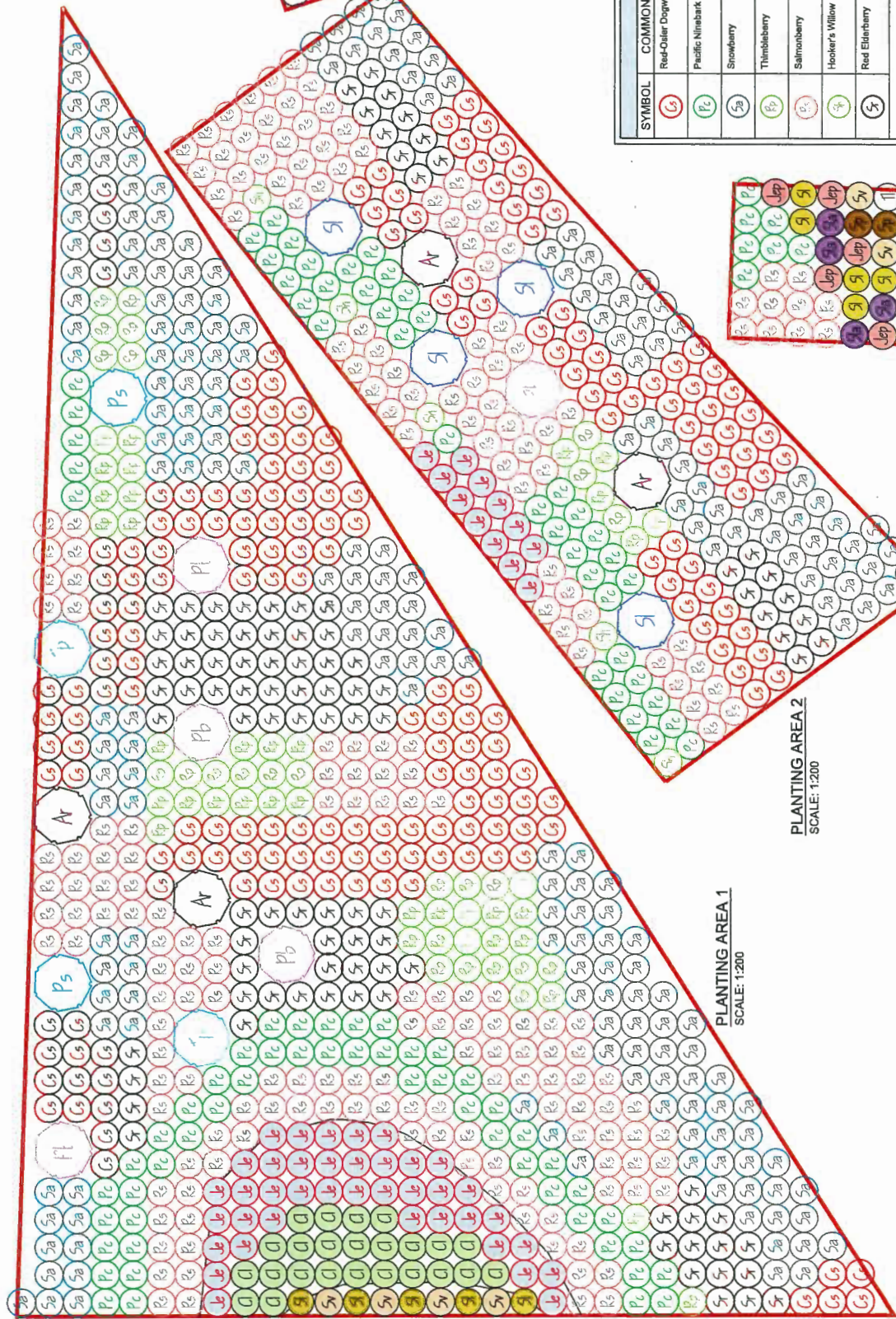
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TRIANGLE ESA / RMA COMPENSATION SECTION, PLAN & PLANTING LIST

DP 11-566011 RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011



Richmond Industrial Centre



SYMBOL	COMMON NAME	SHRUBS COUNT	SPECIFICATIONS
Ar	Red-Outer Dogwood	823	no. 2 pot; multi-stemmed; densely branched; well established
Pb	Pacific Ninebark	640	no. 2 pot; multi-stemmed; densely branched; well established
Ss	Snowberry	649	no. 2 pot; multi-stemmed; densely branched; well established
Pb	Thimbleberry	367	no. 2 pot; multi-stemmed; densely branched; well established
Ss	Salmonberry	973	no. 2 pot; multi-stemmed; densely branched; well established
Ar	Hooker's Willow	99	no. 2 pot; multi-stemmed; densely branched; well established
Ss	Red Elderberry	307	no. 2 pot; multi-stemmed; densely branched; well established
SHRUBS SUBTOTAL		4118	
WETLAND			
Pl	Cattail	343	recommended depth 0.75m
Gs	Slough Sedge	260	recommended depth 0.15m
Ss	Common Rush	332	recommended depth 0.08m
Ps	Hardstem bulrush	356	recommended depth 0.30m
Ar	Arrowhead	298	recommended depth 0.30m
Ss	Basket grass	277	recommended depth 0.30m
Ss	Soft stem bulrush	205	recommended depth 0.30m
Ss	Soft rush	147	recommended depth 0.30m
WETLAND SUBTOTAL		2218	

SYMBOL	COMMON NAME	TREES COUNT	SPECIFICATIONS
Ar	Red alder	29	1.2m container grown (min. no. 7 pot); densely branched; well established
Pb	Black Cottonwood	28	1.2m container grown (min. no. 7 pot); densely branched; well established
Ar	Pacific Willow	37	1.2m container grown (min. no. 7 pot); densely branched; well established
Ps	Sitka spruce	5	1.2m container grown (min. no. 7 pot); densely branched; well established
Ar	Western Red Cedar	5	1.2m container grown (min. no. 7 pot); densely branched; well established
Pb	Bitter Cherry	9	1.2m container grown (min. no. 7 pot); densely branched; well established
TREES SUBTOTAL		112	

Plan #5b

Richmond Industrial Centre Habitat Balance Sheet and Proposed Compensation

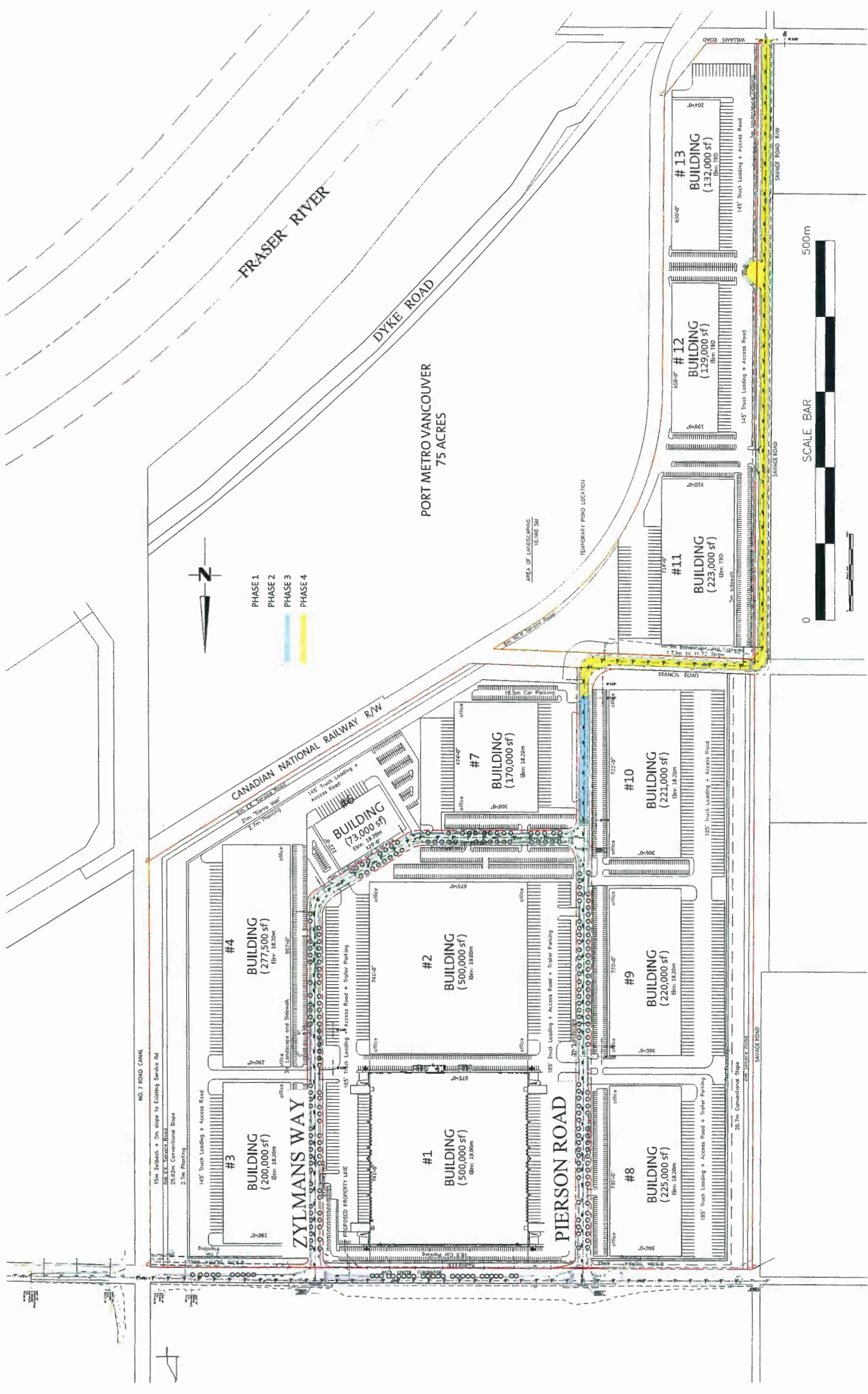
Site / Photo Number	Habitat Type	Lot 1101 (Ecowaste Property)	Lot 1123 (Neighbouring Property)	Road ROWs	Total	Compensation Ratio (Impact to Replacement)	Required Compensation Area	Compensated for Like Habitat	Compensated in Same Ecological Unit
Impacted ESA / RMA Requiring Compensation (m²)									
1	ESA	-	480	Savage Rd: 1,600	2,080	2:1	1,040	Yes	No†
	Freshwater Aquatic	-	480	Savage Rd: 1,600	2,080	2:1	1,040	Yes	No†
	Riparian Terrestrial	-	2,164	Savage Rd: 205	2,369	2:1	1,185	Yes	No†
2a	Freshwater Aquatic	-	-	Savage / Francis Rd: 105	147	2:1	74	Yes	No†
3a	RMA	-	-	Williams Rd: 42	-	-	-	-	-
2b	Riparian Terrestrial	-	-	Savage / Francis Rd: 101	142	2:1	71	Yes	No†
3b	Riparian Terrestrial	-	-	Williams Rd: 41	-	-	-	-	-
4	ESA	-	-	Williams Rd: 75	75	2:1	38	No*	No†
	Storm Water Outfall - Brackish Aquatic	-	-	Williams Rd: 75	75	2:1	38	No*	No†
5	RMA	-	-	Blundell Rd: 732	732	1:1.5	1,098	Yes	Yes
	No.7 Canal Bridge - Riparian Terrestrial	-	-	Blundell Rd: 732	732	1:1.5	1,098	Yes	Yes
Non-Impacted Areas to be Removed from ESA (m²)									
6	ESA	6,688	54	Savage / Francis Rd: 5,566	12,308	-	-	-	-
Required Compensation Sub-Total 3,506									
+ Additional 25% for Net Benefit / Local Values 4,383									
Total Required Aquatic Compensation 1,440									
Total Required Terrestrial Compensation 2,943									

Site / Photo Number	Location	Compensation Habitat Type	Impacted Habitat Type / Location	Compensation Area	Total Compensation Area	Compensated for Like Habitat	Compensated in Same Ecological Unit
7	Ecowaste "Triangle Lot" Constructed Wetland	Freshwater Aquatic	ESA Lot 1123 and Road ROWs	1,040	2,540	Yes	No†
			RMA Road ROWs	74		Yes	No†
			ESA Storm Water Outfall	38		No*	No†
			ESA Additional Net Benefit	1,388		-	-
8	Williams Road Entrance Culvert Removal & Watercourse Restoration	Riparian Terrestrial	ESA Lot 1123 and Road ROWs	1,185	4,230	Yes	No†
			RMA Road ROWs	71		Yes	No†
			ESA Additional Net Benefit	2,974		-	-
9	No. 7 Road Canal Riparian Restoration	Riparian Terrestrial	RMA Additional Net Benefit	32	70	-	-
			ESA Additional Net Benefit	32		-	-
			RMA Additional Net Benefit	70		-	-
9	No. 7 Road Canal Riparian Restoration	Riparian Terrestrial	RMA No. 7 Road Canal ROWs	1,098	3,731	Yes	Yes
			RMA Additional Net Benefit	2,633		-	-
Total Proposed Aquatic Compensation				2,572	2,572	-	-
Total Proposed Terrestrial Compensation				8,031	8,031	-	-
Aquatic Net Benefit (2,572 - 1,440)				1,132	1,132	-	-
Terrestrial Net Benefit (8,031 - 2,943)				5,088	5,088	-	-

* Brackish intertidal aquatic impacts from the storm water outfall will be compensated as part of the upland constructed wetland (unlike habitat), based on the limited area of impacts and limited value an isolated brackish compensation area would provide.

† Compensation habitat will not be located in the same contiguous ecological unit based on the inability to establish compensation areas on the Ecowaste property that maintain direct connectivity to impacted areas beyond the property boundaries. Providing compensation habitat in a concentrated area at >25% of the replacement ratio is considered to represent a no net loss of habitat.

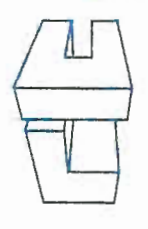




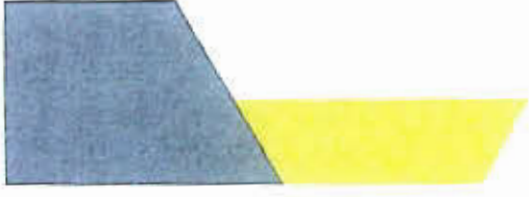
Plan #9

ROAD PHASING PLAN

DP 11-566011 RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011



**Richmond
Industrial
Centre**



SIERRA SLOPE,
REFER TO GEOTECH

20.12m
FRANCIS ROAD ROW

6m
ACCESS ROAD

PROPERTY LINE

ESA / RMA
Compensation
Area

PROPOSED WETLAND

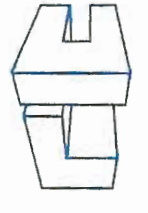
CN ROW



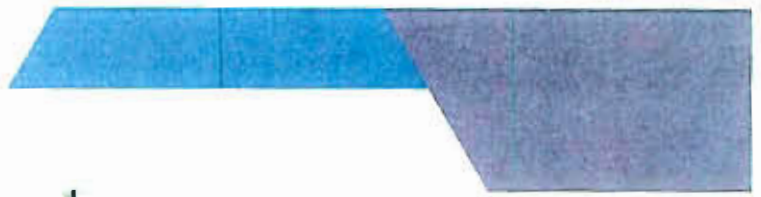
Plan #17

ONSITE COMPENSATION AREA

DP 11-566011 RICHMOND INDUSTRIAL CENTRE DEVELOPMENT
FILE NO. DP 11-566011



Richmond
Industrial
Centre





March 22, 2018

Ms. Alisa Bailey
Omicron Canada Inc.
Fifth Floor, Three Bentall Centre
595 Burrard Street
Vancouver, BC V7X 1L4

Dear Ms. Bailey:

**Re: RIC Graymont/Pierson Road Realignment Compensation Wetland Feasibility
Ecowaste – Richmond Industrial Centre Project
15111 Williams Road, Richmond, BC
Project No. 13650**

In response to the City of Richmond's comments from the October 26, 2017 Richmond Industrial Centre Project meeting, Keystone Environmental Ltd. (Keystone Environmental) is pleased to present this letter to Omicron Canada Inc. (Omicron) outlining the feasibility of redesigning the proposed compensation wetland for the project. The redesign is required in order to accommodate the proposed realignment of Graymont/Pierson Road, while maintaining compliance with the compensation area requirements of the project's environmental submittals.

It is understood that straightening of the proposed Grayson/Pierson Road alignment is being considered, which will result in shifting the southern end of the road approximately 40 m to the east. This realignment will impact the proposed footprint of the "Triangle Lot" compensation wetland. This compensation wetland is required for offsetting impacts to aquatic and riparian habitat in City of Richmond designated Environmentally Sensitive Areas (ESAs) and Riparian Management Areas (RMAs) resulting from the project. The Richmond Industrial Centre Habitat Balance Sheet and Proposed Compensation letter submitted to the City of Richmond in March 2016 commits the project to result in a net benefit to aquatic and riparian habitat.

BACKGROUND

The proposed development of the Richmond Industrial Centre will cause the loss of approximately 4,800 m² of low-value habitat within designated ESAs and RMAs. The Savage Road ESA low-value habitat area impacted by the proposed development was classified by the City as a "freshwater wetland". As noted in our July 2015 Environmental Impact Assessment, water quality in this ESA was not characteristic of the tannic/sphagnum type water quality

documented in the bog-forest ESA located further north adjacent to the Blundell Road right-of-way. Vegetation present in the on-site ESA, including cattail, salmonberry, hardhack, and birch snags, typical to disturbed areas experiencing seasonal inundation. Wetland-bog species such as Labrador tea, bog laurel, and blueberry were not present.

The proposed compensation wetland in the “Triangle Lot” is intended to replicate similar conditions within the impacted Savage Road ESA, with a mixture of woody and herbaceous species to be included in the planting plan. Although the impacted Savage Road ESA is affected by seasonal stormwater fluctuations, the proposed constructed wetland is intended to accept stormwater flow fluctuations, while maintaining a consistently wetted area. The proposed compensation wetland is planned to be constructed to control water levels and minimize sediment accumulation, and therefore, is not considered characteristic of a classified natural wetland (i.e., bog, fen, marsh) undergoing successional processes.

The primary purpose of the proposed compensation area is to provide high-value aquatic and terrestrial habitat for similar low-value habitat impacted within the impacted Savage Road ESA. The proposed constructed habitat wetland is planned to include significant shallow areas to support the growth of emergent and submergent aquatic plants, deeper pools for diverse habitats for amphibians, waterfowl, and other wildlife, and terrestrial areas (riparian) with diverse native species that will incorporate snags and wildlife trees to offset for loss of similarly functioning habitat.

WETLAND FEASIBILITY

The City of Richmond has expressed concern about the ability of the proposed wetland to maintain an acceptable wetted area, and about the apparent isolation of the proposed compensation area from the Fraser River and adjacent ESA forested areas. A Wetland Feasibility Study and Conceptual Design was developed by Keystone Environmental, dated May 3, 2016, suggesting that a wetland is feasible based on the available information (i.e., groundwater elevations, etc.) at that time.

A hydrogeological assessment was recommended and is in progress to collect hydrogeological data (soil, seasonal groundwater elevations, and water quality) to support the ongoing wetland feasibility and design, and to help address the City’s concerns that the proposed wetland will provide a functioning habitat. This is currently in progress and data will be provided as they become available.

An update report titled *Revision 2 – Wetland Hydrogeological Assessment – Fall 2017 Update Report* by Keystone Environmental, dated February 6, 2018, was provided to the City for their review. This report summarized the works and data collected from June through October 2017. This update report included the following information:

- Installation of four new monitoring wells (installed in July 2017), including location, depth, topographical survey, and borehole log information.
- Collection and laboratory analyses of soil samples (collected during the new well installation, July 2017).
- Collection of groundwater samples from six monitoring wells (four new wells and two existing wells, collected in August 2017), to represent the dry summer conditions.

- Collection of groundwater table elevations, including the installation of pressure transducers (and routine data download) to monitor groundwater levels in the six monitoring wells over an extended period of time.
- Conduct hydraulic testing (slug-bail) at the six monitoring wells, to assess the hydraulic characteristics of the materials present in the proposed wetland area.

Since May 2016, recent changes to the proposed design of the development (straightening of the proposed Grayson/Pierson Road alignment) have resulted in reducing the area available in the “Triangle Lot” for the proposed compensation wetland. This letter re-evaluates the wetland feasibility based on the new design constraints.

The proposed road realignment will require changing the design slope of the wetland to 3 (H) to 1 (V), the previous design allowed for a 4 (H) to 1 (V) design slope. The proposed riparian planting plan for the wetland will be revised to include plant species suitable for the increased slope. Tree species, including western redcedar (*Thuja plicata*) and Sitka spruce (*Picea sitchensis*), originally proposed for the sloped areas on the north and west sides of the wetland is planned to be replaced with Pacific willow (*Salix lucida* ssp. *lasiandra*) and hooker’s willow (*Salix hookeriana*), which are more suitable for slopes that may become seasonally inundated. This does not preclude planting of larger coniferous trees, such as cedar or spruce outside sloped areas. Additional trees is planned to be included on the flatter riparian area on the southeast side of the wetland. A detailed revised planting plan will be submitted to the City of Richmond for approval.

The March 2016 values were presented to the City of Richmond during the DP Approval process, which showed the minimum area required to adequately compensate for impacted ESAs/RMAs. In 2016, the wetland area was estimated based on conceptual layout that incorporated approximately 10 m setbacks from two sides of the “Triangle Lot,” which had a smaller footprint than when a more detailed layout was developed.

As requested by the City, changes to the wetland compensation areas as a result of the road realignment will be compared to the March 2016 values. The March 2016 and revised November 2017 Habitat Balance Sheets are provided as an attachment to this letter, highlighting changes to the “Triangle Lot” compensation wetland areas.

The following table presents a comparison of the aquatic and terrestrial riparian compensation areas for the “Triangle Lot” wetland areas presented in the March 2016 habitat balance with areas in the November 2017 redesign based on the proposed road realignment.

Habitat Type	March 2016 Wetland Design (m ²)	November 2017 Wetland Design (m ²)	Area Difference (m ²)	% Difference
Aquatic Area	1,588	2,540	+952	+60%
Terrestrial Riparian Area	3,230	4,230	+1,000	+31%
Total “Triangle Lot” Habitat Area	4,818	6,770	+1,952	+41%

The proposed realignment of Graymont/Pierson Road is feasible from a habitat compensation perspective, and is considered to maintain the functioning wetland habitat and achieve a net habitat balance as required by the City of Richmond. The proposed realignment will result in a slight (approximately 30 m²) encroachment into the "Triangle Lot." However, the total habitat areas available for the compensation wetland is being increased by 1,952 m² (when compared to March 2016 values), resulting in an overall net increase in both aquatic and riparian areas. It is understood the "Triangle Lot" wetland is planned to undergo detailed design and planting plan revisions to accommodate the new road footprint, and potential design responses to data collected from the Wetland Hydrogeological Assessment (currently in progress).

This letter has been prepared solely for the internal use of Omicron Canada Inc. and the City of Richmond, pursuant to the agreement between Keystone Environmental Ltd. and Omicron Canada Inc. By using the report, Omicron Canada Inc. and the City of Richmond agree that they will review and use the report in its entirety. Any use, reliance or decisions made based on this report by other parties without prior written approval by Keystone Environmental Ltd. are the responsibility of such parties and Keystone Environmental Ltd. accepts no responsibility for damages, if any, suffered by other parties as a result of decisions made or actions based on this report.

We trust that this letter provides an appropriate level of detail regarding the feasibility of redesigning the compensation wetland to accommodate the proposed realignment of Pierson Road. If you have any questions or require additional information, please do not hesitate to contact the undersigned.

Sincerely,

Keystone Environmental Ltd.



Thuy Wong, P.Eng., P.E.
Project Engineer



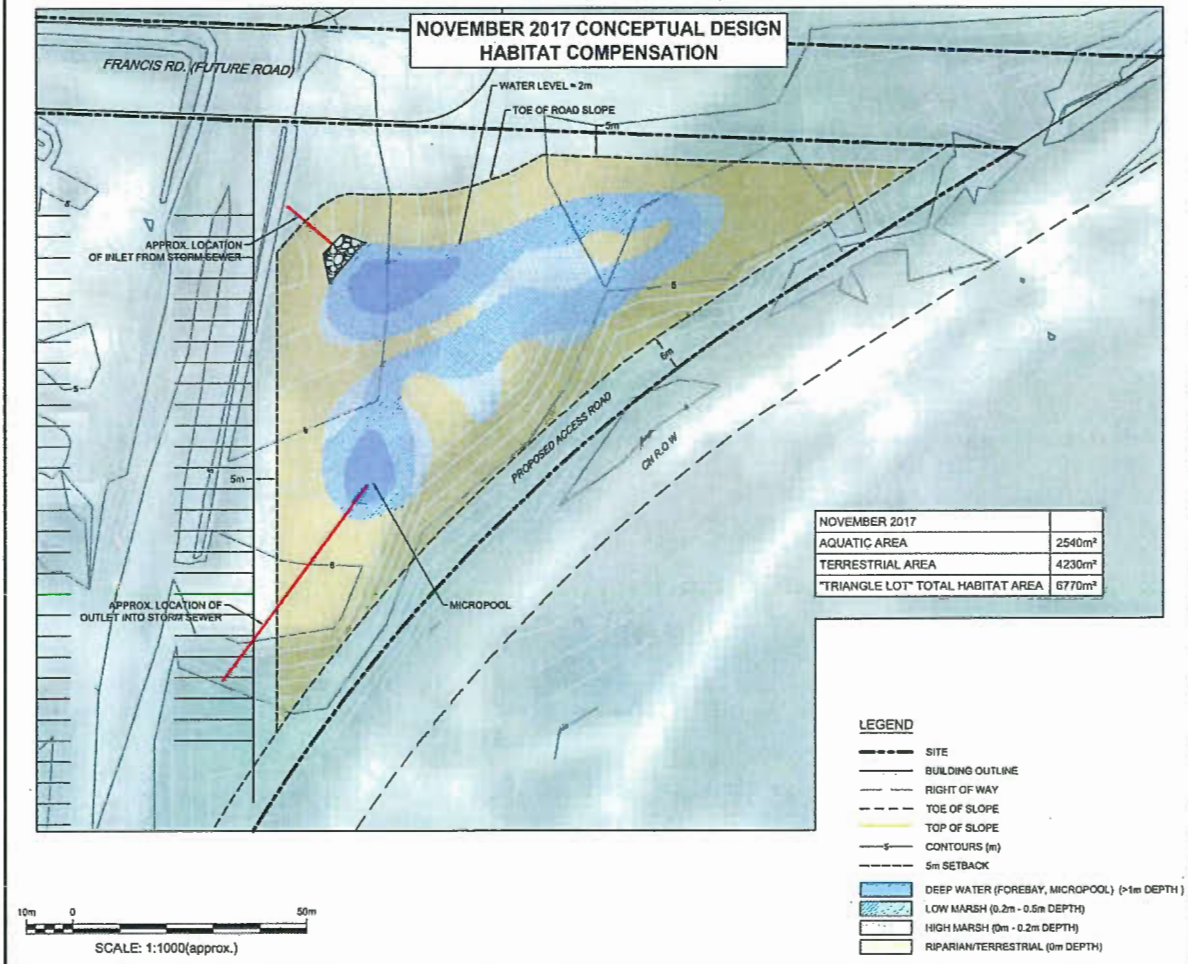
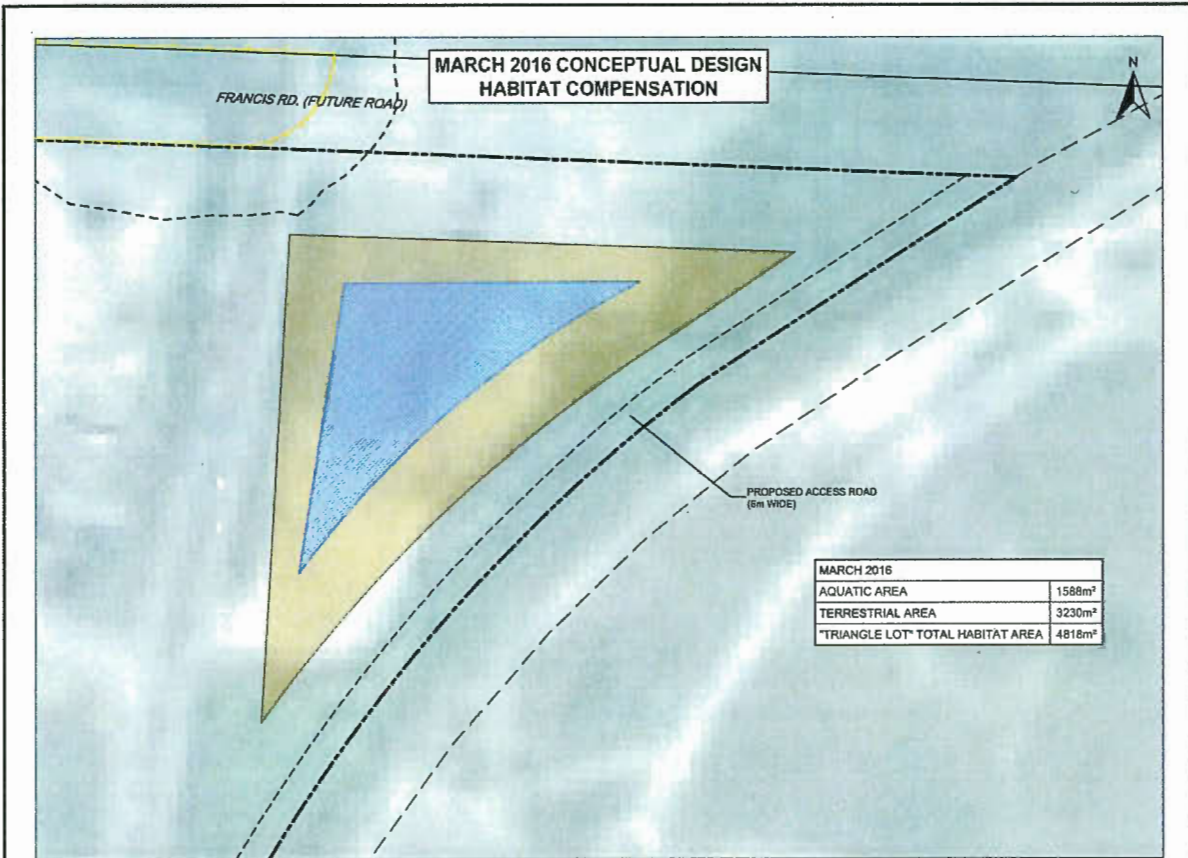
Craig Patterson, R.P.Bio.
Project Manager

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ATTACHMENTS:

- Figure 1 – "Triangle Lot" Habitat Plan, March 2016 & November 2017
- March 2016 and November 2017 Richmond Industrial Centre Habitat Balance Sheets

FIGURE



Richmond Industrial Centre Habitat Balance Sheet and Proposed Compensation - March 2016

Site / Photo Number	Habitat Type	Lot 1101 (Ecowaste Property)	Lot 1123 (Neighbouring Property)	Road ROWs	Total	Compensation Ratio (Impact to Replacement)	Required Compensation Area	Compensated Like Habitat for Like Habitat	Compensated in Same Ecological Unit
Impacted ESA / RMA Requiring Compensation (m²)									
1	Freshwater Aquatic	-	480	Savage Rd: 1,600	2,080	2:1	1,040	Yes	No*
2a	Riparian Terrestrial	-	2,164	Savage Rd: 205	2,369	2:1	1,185	Yes	No*
3a	Freshwater Aquatic	-	-	Savage / Francis Rd: 105	147	2:1	74	Yes	No*
2b	Freshwater Aquatic	-	-	Williams Rd: 42					
3b	Riparian Terrestrial	-	-	Savage / Francis Rd: 101	142	2:1	71	Yes	No*
4	Storm Water Outfall-Brackish Aquatic	-	-	Williams Rd: 41	75	2:1	38	No*	No*
5	No.7 Canal Bridge-Riparian Terrestrial	-	-	Williams Rd: 75	732	1:1.5	1,098	Yes	Yes
Non-Impacted Areas to be Removed from ESA (m²)									
6	Riparian Terrestrial	6,688	54	Savage / Francis Rd: 5,566	12,308	-	-	-	-
							Required Compensation Sub-Total	-	-
							+ Additional 25% for Net Benefit / Local Values	4,383	-
							Total Required Aquatic Compensation	1,440	-
							Total Required Terrestrial Compensation	2,943	-
Proposed Habitat Compensation (m²)									
Site / Photo Number	Location	Compensation Habitat Type	Impacted Habitat Type / Location	Compensation Area	Total Compensation Area	Compensated Like Habitat for Like Habitat	Compensated in Same Ecological Unit		
7	Ecowaste "Triangle Lot" Constructed Wetland	Freshwater Aquatic	ESA Lot 1123 and Road ROWs	1,040	1,588	Yes	No*		
			RMA Road ROWs	74		Yes	No*		
			ESA Storm Water Outfall	38		No*	No*		
			ESA Additional Net Benefit	436		-	-		
8	Williams Road Entrance Culvert Removal & Watercourse Restoration	Riparian Terrestrial	ESA Lot 1123 and Road ROWs	1,185	3,230	Yes	No*		
			RMA Road ROWs	71		Yes	No*		
			ESA Additional Net Benefit	1,974		-	-		
			RMA Additional Net Benefit	32		-	-		
9	No. 7 Road Canal Riparian Restoration	Riparian Terrestrial	RMA Additional Net Benefit	70	3,731	-	-		
			RMA Additional Net Benefit	70		-	-		
			RMA No. 7 Road Canal ROWs	1,088		Yes	Yes		
			RMA Additional Net Benefit	2,633		-	-		
				Total Proposed Aquatic Compensation	1,620	-	-		
				Total Proposed Terrestrial Compensation	7,031	-	-		
				Aquatic Net Benefit (1,620 - 1,440)	180	-	-		
				Terrestrial Net Benefit (7,031 - 2,943)	4,088	-	-		

* Brackish intertidal aquatic impacts from the storm water outfall will be compensated as part of the upland constructed wetland (unlike habitat), based on the limited area of impacts and limited value an isolated brackish compensation area would provide.
 † Compensation habitat will not be located in the same contiguous ecological unit based on the inability to establish compensation areas on the Ecowaste property that maintain direct connectivity to impacted areas beyond the property boundaries. Providing compensation habitat in a concentrated area at >25% of the replacement ration is considered to represent a no net loss of habitat.

Richmond Industrial Centre Habitat Balance Sheet and Proposed Compensation - November 2017

Site / Photo Number	Habitat Type	Lot 1101 (Ecowaste Property)	Lot 1123 (Neighbouring Property)	Road ROWs	Total	Compensation Ratio (Impact to Replacement)	Required Compensation Area	Compensated Like Habitat for Like Habitat	Compensated in Same Ecological Unit
Impacted ESA / RMA Requiring Compensation (m²)									
1	Freshwater Aquatic	-	480	Savage Rd: 1,600	2,080	2:1	1,040	Yes	No [†]
2a	Riparian Terrestrial	-	2,164	Savage Rd: 205	2,369	2:1	1,185	Yes	No [†]
3a	Freshwater Aquatic	-	-	Savage / Francis Rd: 105	147	2:1	74	Yes	No [†]
2b	Riparian Terrestrial	-	-	Williams Rd: 42	142	2:1	71	Yes	No [†]
3b	Riparian Terrestrial	-	-	Savage / Francis Rd: 101	75	2:1	38	No*	No [†]
4	Storm Water Outfall - Brackish Aquatic	-	-	Williams Rd: 75	792	1:1.5	1,088	Yes	Yes
5	No.7 Canal Bridge - Riparian Terrestrial	-	-	Blundell Rd: 732	12,308	-	-	-	-
6	Riparian Terrestrial	6,688	54	Savage / Francis Rd: 5,566	Required Compensation Sub-Total	-	3,506	-	-
					+ Additional 25% for Net Benefit / Local Values	-	4,363	-	-
					Total Required Aquatic Compensation	-	1,440	-	-
					Total Required Terrestrial Compensation	-	2,943	-	-
Proposed Habitat Compensation (m²)									
Site / Photo Number	Location	Compensation Habitat Type	Impacted Habitat Type / Location	Compensation Area	Total Compensation Area	Compensated Like Habitat for Like Habitat	Compensated in Same Ecological Unit		
7	Ecowaste "Triangle Lot" Constructed Wetland	Freshwater Aquatic	ESA Lot 1123 and Road ROWs	1,040	2,540	Yes	No [†]		
			RMA Road ROWs	74		Yes	No [†]		
			ESA Storm Water Outfall	38		No*	No [†]		
			ESA Additional Net Benefit	1,388		-	-		
8	Williams Road Entrance Culvert Removal & Watercourse Restoration	Riparian Terrestrial	ESA Lot 1123 and Road ROWs	1,185	4,230	Yes	No [†]		
			RMA Road ROWs	71		Yes	No [†]		
			ESA Additional Net Benefit	2,974		-	-		
			RMA Additional Net Benefit	32		-	-		
9	No. 7 Road Canal Riparian Restoration	Riparian Terrestrial	RMA Additional Net Benefit	70	3,731	-	-		
			RMA No. 7 Road Canal ROWs	1,098		Yes	Yes		
			RMA Additional Net Benefit	2,633		-	-		
					Total Proposed Aquatic Compensation	-	2,572	-	-
					Total Proposed Terrestrial Compensation	-	8,031	-	-
					Aquatic Net Benefit (2,572 - 1,440)	-	1,132	-	-
					Terrestrial Net Benefit (8,031 - 2,943)	-	5,088	-	-

* Brackish intertidal aquatic impacts from the storm water outfall will be compensated as part of the upland constructed wetland (unlike habitat), based on the limited area of impacts and limited value an isolated brackish compensation area would provide.
 † Compensation habitat will not be located in the same contiguous ecological unit based on the inability to establish compensation areas on the Ecowaste property that maintain direct connectivity to impacted areas beyond the property boundaries. Providing compensation habitat in a concentrated area at >25% of the replacement ratio is considered to represent a no net loss of habitat.