Talbot Mackenzie & Associates
Consulting Arborists

838-842 Admirals Road, Esquimalt

Construction Impact Assessment &

Tree Preservation Plan

PREPARED FOR: GT Mann Contracting Ltd.
1551 Broadmead Avenue
Victoria, BC
V8P 2V1

PREPARED BY: Talbot, Mackenzie & Associates

Michael Marcucci – Consulting Arborist
ISA Certified # ON-1943A
TRAQ – Qualified

DATE OF ISSUANCE: January 23, 2018

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Jobsite Property: 838-842 Admirals Road, Esquimalt

Date of Site Visit: December 21, 2017

Site Conditions: Two residential properties. No construction activity present.

Summary: Oaks #986 and 990, and Plum #128 will require removal. We recommend that the five municipal Horsechestnut trees growing underneath the power lines be removed due to their poor structural condition and the potential impacts from the underground parkade and sidewalk. Garry Oak #984 will likely be significantly impacted by the excavations for the underground parkade and pathway. If tree retention is desired in the long-term, we recommend restricting the extent of excavation to within the footprint of the existing house's foundation and eliminating the below-grade pathway adjacent to this tree.

Scope of Assignment: To inventory the existing bylaw protected trees and any trees on neighbouring properties that could be potentially impacted by construction or that are within 3 meters of the property line. Review the proposal to demolish the two existing houses and construct a four-storey 30 unit residential building and comment on how construction activity may impact existing trees. Prepare a tree retention and construction damage mitigation plan for those trees deemed suitable to retain given the proposed impacts.

Methodology: We visually examined the trees on the property and prepared an inventory in the attached Tree Resource Spreadsheet. Each by-law protected tree was identified using a numeric metal tag attached to its lower trunk. Municipal trees and neighbours' trees were not tagged. Information such as tree species, DBH (1.4m), crown spread, critical root zone (CRZ), health, structure, and relative tolerance to construction impacts were included in the inventory. The by-law protected trees with their identification numbers were labelled on the attached Site Plan. The conclusions reached were based on the information provided within the attached Site Plan from Praxis Architects Inc. (dated 2017.12.15).

Summary of Tree Resource: 14 trees and shrubs were inventoried. No nearby trees were identified on neighbouring properties. NT 01-09 are municipal trees, most of which are Horsechestnut trees that have been severely pruned for the primary hydro lines above them. There are three large Garry Oak trees on the subject property (#984, 986, 990).

Private Trees to be Removed:

- **Garry Oaks #986 and 990** (78 and 87cm DBH respectively): Located within the proposed building footprint.

- **Purple Leaf Plum #128** (multiple stems): Located less than 1.5 metres from the underground parking excavation and will require multiple large diameter stems be removed for building clearance.

- **English Holly #92** (two stems, 26 and 18cm in DBH): Located within the underground parking footprint.

- **Municipal Horsechestnut Trees NT 04-08**

  In our opinion, these five municipal Horsechestnut trees are not suitable for retention. They are in poor structural condition due to being topped for the three primary hydro lines above them. NT 08 will be 1.5m from the underground parking and will likely require removal as a result. NT 06 will require removal for the proposed water service. This water service excavation may have an impact on NT 05 and NT 07 as well. The underground parkade will be approximately 4m away from the remaining trees; even with shoring techniques restricting the excavation to 4m, there will likely be some root loss.

  It is our understanding that a sidewalk is proposed on Naden Street directly adjacent to the trees, which will have additional impacts. If the trees are to be retained, the roots will need to be preserved underneath the sidewalk, which will require raising the sidewalk and building on organic materials. Considering the poor structural condition of these trees and their location underneath the primary hydro lines, in our opinion it would be more suitable to remove these trees and replant with smaller growing trees more suitable to the location.

Trees with Retention Status To Be Determined

- **Garry Oak #984** (79cm DBH)

  There is a 1.8m tall retaining wall that runs 1.5m south and a 3.5m west of the tree (along the sidewalk and along the neighbouring driveway. The rooting area of the oak has thus been confined mostly to the north and east, so we expect to find a significantly higher density of roots in this area compared to if the roots had not been confined on two sides.

  The proposed underground parkade is located 5m north of this tree. Even if sheet piling or other shoring techniques are used to restrict the extent of excavation to approximately 5m, we expect that a significant amount of root loss will occur. Additionally, the pathway that runs from the sidewalk to the doorway of the underground parkade will require significant excavation (approximately 1.5m in depth) to match the height of the underground parking floor height. Working room will also be required to construct a retaining wall adjacent to this pathway which will likely result in significant root loss.

As a result of these excavations, we anticipate that the health of the tree will be significantly impacted and may decline as a result. If tree retention is desired in the long-term, we recommend restricting the extent of excavation to within the footprint of the existing house foundation (approximately 2m from where the underground parking is currently proposed) and eliminating the below-grade pathway which requires excavation.

Additionally, the grading plans (A06, South side) show the finished grade as below the existing grade around the tree. If this occurs, the tree will likely have to be removed immediately. If the tree is to be retained, we would recommend no significant grade change in this area.

Despite these impacts, it is our understanding that tree retention is desired and thus have included mitigation measures. We recommend that the retaining wall adjacent to the sidewalk and neighbour's driveway be left in place to prevent further damage to roots that could be growing against it. To minimize additional root loss, we recommend that the existing sewer and drain services east of Garry Oak #984 be capped and abandoned instead of being excavated and removed. This will minimize the amount of excavation required.

Trees to be Retained

- **NT 9 English Hawthorn:** This municipal tree will not be impacted.

- **English Holly Trees NT 1-3**
  These three English Holly trees on municipal property can be retained if desired. The new driveway is approximately in the same footprint as the old driveway, in the area adjacent to these trees.

Other Mitigation Measures

- **Barrier fencing:** The areas surrounding the trees to be retained should be isolated from the construction activity by erecting protective barrier fencing. Where possible, the fencing should be erected at the perimeter of the critical root zones. The barrier fencing must be a minimum of 4 feet in height, of solid frame construction that is attached to wooden or metal posts. A solid board or rail must run between the posts at the top and the bottom of the fencing. This solid frame can then be covered with plywood, or flexible snow fencing. The fencing must be erected prior to the start of any construction activity on site (i.e. demolition, excavation, construction), and remain in place through completion of the project. Signs should be posted around the protection zone to declare it off limits to all construction related activity. The project arborist must be consulted before this fencing is removed or moved for any purpose.

- **Arborist Supervision**: All excavation occurring within the critical root zones of protected trees should be completed under supervision by the project arborist. Any roots encountered must be pruned back to sound tissue to reduce wound surface area and encourage rapid compartmentalization of the wound. In particular, the following activities should be completed under the direction of the project arborist:

    - Excavation for the underground parking and pathway within the CRZ of Garry Oak #984
    - Excavation of any underground services within the CRZ of Garry Oak #984
    - If trees NT 4-7 are retained, excavation within their CRZs associated with the underground parking and sidewalk

- **Methods to avoid soil compaction:** In areas where construction traffic must encroach into the critical root zones of trees to be retained, efforts must be made to reduce soil compaction where possible by displacing the weight of machinery and foot traffic. This can be achieved by one of the following methods:

    - Installing a layer of hog fuel or coarse wood chips at least 20 cm in depth and maintaining it in good condition until construction is complete.
    - Placing medium weight geotextile cloth over the area to be used and installing a layer of crushed rock to a depth of 15 cm over top.
    - Placing two layers of 19mm plywood.
    - Placing steel plates.

- **Demolition of the existing building:** The demolition of the existing house and any services that must be removed or abandoned, must take the critical root zone of the trees to be retained into account. If any excavation or machine access is required within the critical root zones of trees to be retained, it must be completed under the supervision and direction of the project arborist. If temporarily removed for demolition, barrier fencing must be erected immediately after the supervised demolition.

- **Mulching**: Mulching is an important proactive step to maintaining the health of the trees to be retained and mitigating construction related impacts and overall stress. Mulch should be made from a natural material such as wood chips or bark pieces and be 5-8cm deep. As much of the area within two times the dripline of the tree should be mulched, both inside and outside of the critical root zone. No mulch should be touching the trunk of the tree. See "methods to avoid soil compaction" if the area is to have heavy traffic.

- **Blasting:** Care must be taken to ensure that the area of blasting does not extend beyond the necessary footprints and into the critical root zones of surrounding trees. The use of small low-concussion charges and multiple small charges designed to pre-shear the rock face will reduce fracturing, ground vibration, and overall impact on the surrounding environment. Only explosives of low phytotoxicity and techniques that minimize tree damage should be used. Provisions must be made to ensure that blasted rock and debris are stored away from the critical root zones of trees.

- **Irrigation Systems:** The installation of any in-ground irrigation system must take into account the critical root zones of the trees to be retained. Prior to installation, we recommend the irrigation technician consult with the project arborist about the most suitable locations for the irrigation lines and how best to mitigate the impacts on the trees to be retained. This may require the project arborist supervise the excavations associated with installing the irrigation system. Excessive frequent irrigation and irrigation which wets the trunks of trees can have a detrimental impact on tree health and can lead to root and trunk decay.

- **Arborist Role:** It is the responsibility of the client or his/her representative to contact the project arborist for the purpose of:
  - Locating the barrier fencing
  - Reviewing the report with the project foreman or site supervisor
  - Locating work zones, where required
  - Supervising any excavation within the critical root zones of trees to be retained
  - Reviewing and advising of any pruning requirements for machine clearances

- **Review and site meeting**: Once the project receives approval, it is important that the project arborist meet with the principals involved in the project to review the information contained herein. It is also important that the arborist meet with the site foreman or supervisor before any demolition, site clearing or other construction activity occurs.

Please do not hesitate to call us at (250) 479-8733 should you have any further questions. Thank you.

Yours truly,
Talbot Mackenzie & Associates
ISA Certified Consulting Arborists

Encl. 1-page tree resource spreadsheet, 1-page site plan with barrier fencing locations and tree labels, 1-page preliminary servicing, 1-page original survey

Disclosure Statement

Arborists are professionals who examine trees and use their training, knowledge and experience to recommend techniques and procedures that will improve their health and structure or to mitigate associated risks.

Trees are living organisms, whose health and structure change, and are influenced by age, continued growth, climate, weather conditions, and insect and disease pathogens. Indicators of structural weakness and disease are often hidden within the tree structure or beneath the ground. It is not possible for an Arborist to identify every flaw or condition that could result in failure or can he/she guarantee that the tree will remain healthy and free of risk.

Remedial care and mitigation measures recommended are based on the visible and detectable indicators present at the time of the examination and cannot be guaranteed to alleviate all symptoms or to mitigate all risk posed.

838-842 Admirals Rd, Esquimalt
Tree Resource Spreadsheet

Tree ID	Common Name	Latin Name	DBH (cm)	Crown Spread (m)	CRZ (m)	Relative Tolerance	Health	Structure	Remarks and Recommendations	Retention Status X = Removal TBD = To be Determined
92	English Holly	*Ilex aquifolium*	26, 18	6.0	3.5	Good	Good	Fair		X
128	Purple Leaf Plum	*Prunus cerisifera*	48, 46, 41, 41, 32	14.0	10.0	Moderate	Fair	Fair/poor	Codominant union at base with included bark	X
984	Garry Oak	*Quercus garryana*	79.0	16.0	8.0	Good	Good	Fair	1.8m tall retaining walls 1.5m south and 3.5m west of tree, confining root growth	TBD-Significant Health Impacts
986	Garry Oak	*Quercus garryana*	78.0	12.0	8.0	Good	Good	Fair	Asymmetric crown	X
990	Garry Oak	*Quercus garryana*	87.0	15.0	8.5	Good	Good	Fair	Asymmetric crown , slight lean	X
NT 01	English Holly	*Ilex aquifolium*	26, 21, 18	5.0	4.0	Good	Good	Fair	Municipal	Retain
NT 02	English Holly	*Ilex aquifolium*	Multistem	3.0	2.5	Good	Good	Fair	Municipal	Retain
NT 03	English Holly	*Ilex aquifolium*	Multistem	3.0	2.5	Good	Good	Fair	Municipal	Retain
NT 04	Horsechestnut	*Aesculus hippocastanum*	34.0	7.0	4.0	Moderate	Fair	Poor	Municipal. Topped severely for three primary hydro lines above. Slight lean and asymmetric	X
NT 05	Horsechestnut	*Aesculus hippocastanum*	51.0	11.0	6.0	Moderate	Fair	Poor	Municipal. Topped severely for three primary hydro lines above	X
NT 06	Horsechestnut	*Aesculus hippocastanum*	57.0	13.0	7.0	Moderate	Fair	Poor	Municipal. Topped severely for three primary hydro lines above	X
NT 07	Horsechestnut	*Aesculus hippocastanum*	53, 39	14.0	9.0	Moderate	Fair	Poor	Municipal. Topped severely for three primary hydro lines above. Codominant union at DBH level with reaction wood	X
NT 08	Horsechestnut	*Aesculus hippocastanum*	23.0	5.0	3.0	Moderate	Fair	Fair/poor	Municipal. Leaning away from hydro lines. 1.5m from property line.	X
NT 09	English Hawthorn	*Crataegus laevigata*	25.0	5.0	2.5	Good	Good	Fair	Municipal. 2m from property line trajectory	Retain

Prepared by:
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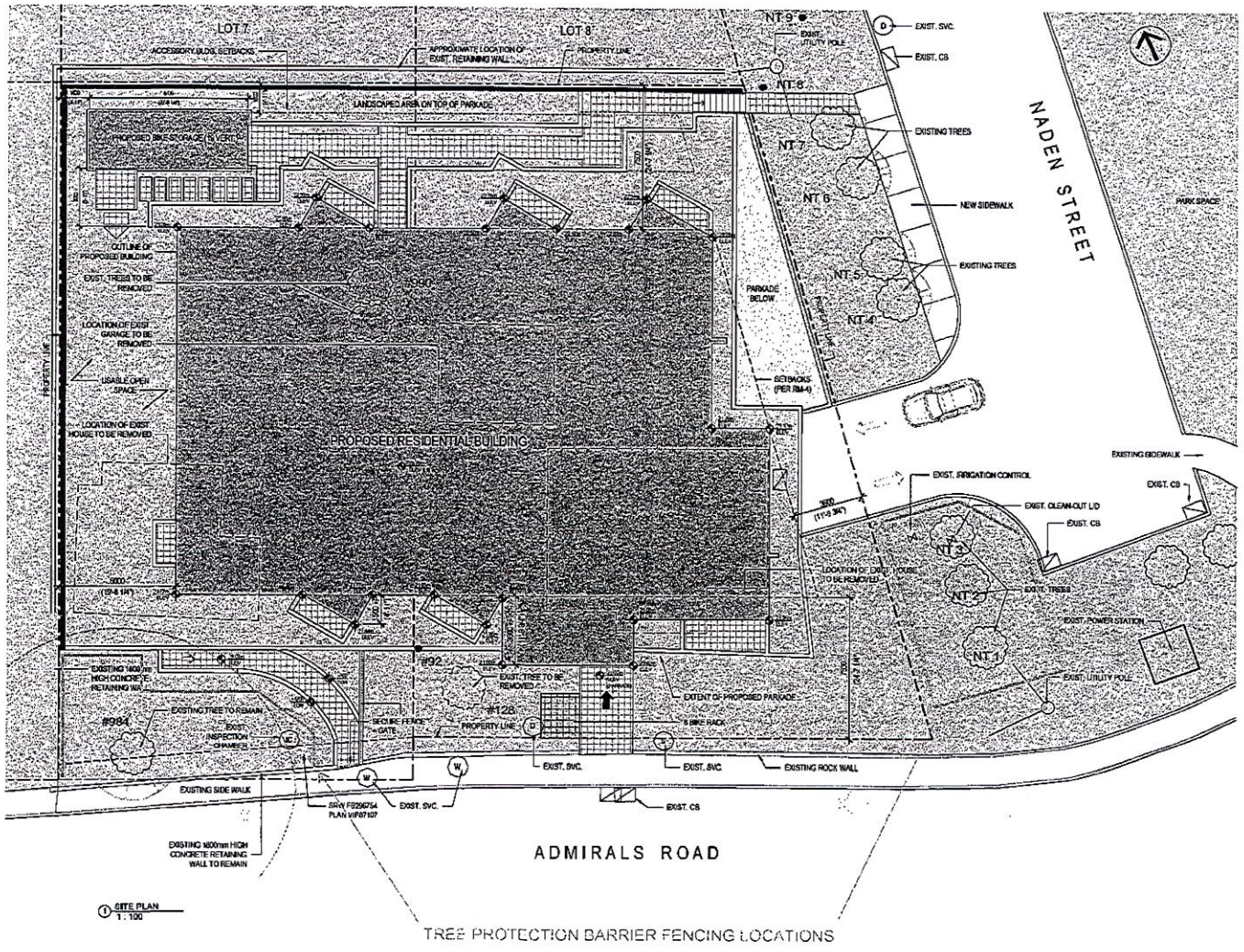


TREE PROTECTION BARRIER FENCING LOCATIONS

PRAXIS architects inc.

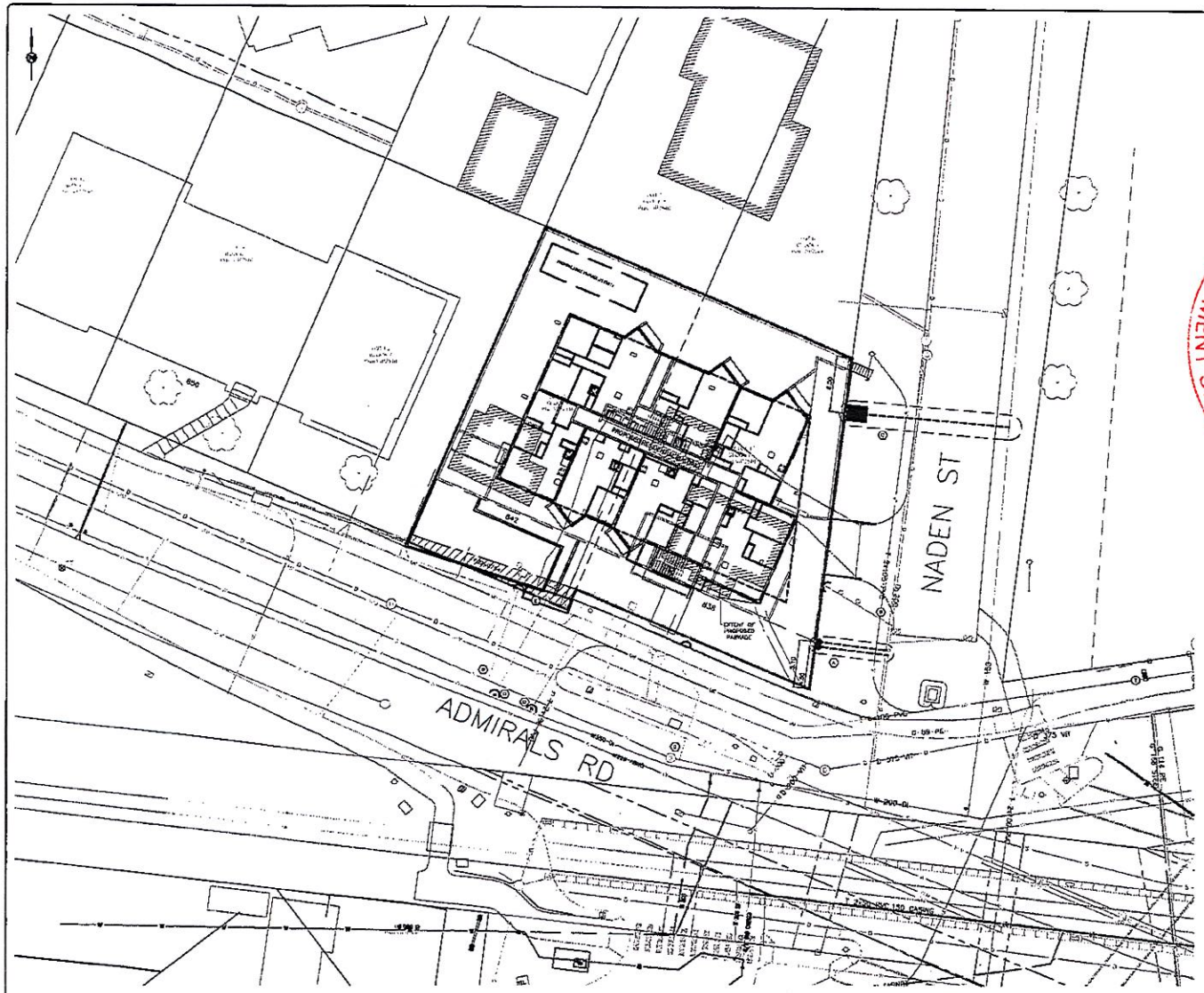
838-842 ADMIRALS ROAD

838-842 ADMIRALS ROAD PROJECT NO. 17-013

SITE PLAN

2017.12.15 - REZONING APPLICATION

A01



DETAILED CONSTRUCTION NOTES:

A. TOWNSHIP OF ESQUIMALT TO INSTALL 150mm SEWER AND DRAIN SERVICES AT DEVELOPERS EXPENSE. SEWER AND DRAIN ELEVATIONS TO BE CONFIRMED PRIOR TO CONSTRUCTION.

B. TOWNSHIP OF ESQUIMALT TO CAP EXISTING SEWER AND DRAIN SERVICES AT DEVELOPERS EXPENSE.

C. CITY OF VICTORIA TO INSTALL 150mm FIRE AND 100mm WATER SERVICE AT DEVELOPERS EXPENSE.

D. CITY OF VICTORIA TO CAP EXISTING WATER SERVICES AT DEVELOPERS EXPENSE.

E. CONTRACTOR TO REMOVE EXISTING DRIVEWAY AND REINSTATE CURB, WALL AND SIDEWALK.

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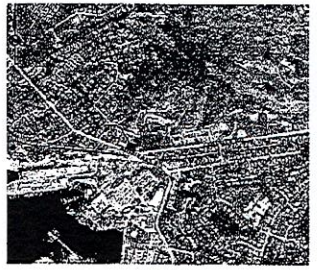
FEB 06 2018
CORP. OF TOWNSHIP OF ESQUIMALT
DEVELOPMENT SERVICES



KEY PLAN
NTS

GT MANN
838/842 ADMIRALS ROAD
CONCEPTUAL
SERVICING PLAN

Scale horiz. 1:200
Sheet 1 of 1
Eng. Project No. 30895

J E ANDERSON & ASSOCIATES
SURVEYORS - ENGINEERS
VICTORIA NANAIMO PARKSVILLE
PHONE: 250-727-2214 FAX: 250-727-2285

PRELIMINARY ONLY

W:_Projects\30895 – GT MANN – 838/842 Admirals\07 – Engineering\02 – Drawings & Sketches (Eng)\30895 Base.dwg Plot Date: November 21, 2017

SITE PLAN OF LOT 16 and LOT 17, EXCEPT PART IN PLAN VIP86845, BOTH IN BLOCK 7, SECTION 10, ESQUIMALT DISTRICT, PLAN 2546

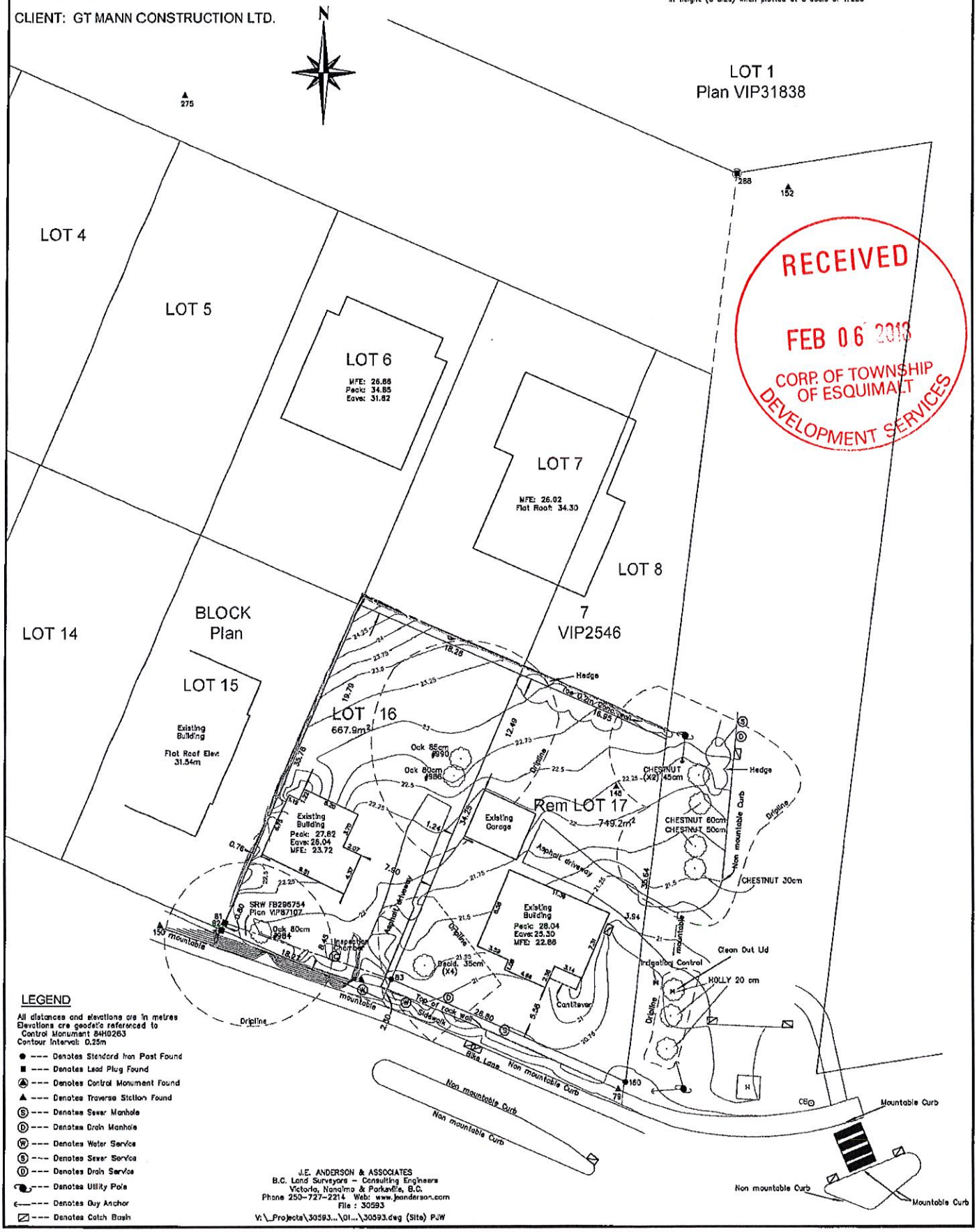
Address: 838-842 Admirals Road, Esquimalt
Date: August 3, 2017

CLIENT: GT MANN CONSTRUCTION LTD.

Scale 1:250

0 2.5 5 10 15 20 25

The intended plot size of this plan is 432mm in width by 580mm in height (C Size) when plotted at a scale of 1:250



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DEVELOPMENT SERVICES

LEGEND

All distances and elevations are in metres
Elevations are geodetic referenced to Control Monument 84H0263
Contour Interval: 0.25m

- ● --- Denotes Standard Iron Post Found
- ■ --- Denotes Lead Plug Found
- ⊕ --- Denotes Control Monument Found
- ▲ --- Denotes Traverse Station Found
- Ⓢ --- Denotes Sewer Manhole
- Ⓓ --- Denotes Drain Manhole
- Ⓦ --- Denotes Water Service
- Ⓢ --- Denotes Sewer Service
- Ⓓ --- Denotes Drain Service
- --- Denotes Utility Pole
- ←--- Denotes Guy Anchor
- --- Denotes Catch Basin

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