Township of
ESQUIMALT

GREEN BUILDING CHECKLIST

The purpose of this Checklist is to make property owners and developers aware of specific green features that can be included in new developments to reduce their carbon footprints to help create a more sustainable community.

Creating walkable neighbourhoods, fostering green building technologies, making better use of our limited land base and ensuring that new development is located close to services, shops and transit are some of the means of achieving sustainability.

The Checklist which follows focuses on the use of **Green Technologies** in new buildings and major renovations. The Checklist is not a report card, it is a tool to help identify how your project can become 'greener' and to demonstrate to Council how your project will help the Township of Esquimalt meet its sustainability goals. It is not expected that each development will include all of the ideas set out in this list but Council is looking for a strong commitment to green development.

There are numerous green design standards, for example, Built Green BC; LEED ND; Living Building Challenge; Green Shores; Sustainable Sites Initiative. Esquimalt is not directing you to follow any particular standard, however, you are strongly encouraged to incorporate as many green features as possible into the design of your project .

As you review this checklist, if you have any questions please contact **Development Services at 250.414.7108** for clarification.

New development is essential to Esquimalt. We look forward to working with you to ensure that development is as green and sustainable as possible.

Other documents containing references to building and site design and sustainability, which you are advised to review, include:

- Esquimalt's Official Community Plan
- Development Protocol Policy
- Esquimalt's Pedestrian Charter
- Tree Protection Bylaw No. 2664
- A Sustainable Development Strategic Plan for the Township of Esquimalt

Adopted on January 10th, 2011

"One-third of Canada's energy use goes to running our homes, offices and other buildings. The federal government's Office of Energy Efficiency (Natural Resources Canada) reports that a corresponding one-third of our current greenhouse gas (GHG) emissions come from the built environment."
[Green Building and Development as a Public Good, Michael Buzzelli, CPRN Research Report June 2009]

Please answer the following questions and describe the green and innovative features of your proposed development. Depending on the size and scope of your project, some of the following points may not be applicable.

Green Building Standards

Both energy use and emissions can be reduced by changing or modifying the way we build and equip our buildings.

1	Are you building to a recognized green building standard? If yes, to what program and level?	Yes	(No)
2	If not, have you consulted a Green Building or LEED consultant to discuss the inclusion of green features?	Yes	(No)
3	Will you be using high-performance building envelope materials, rainscreen siding, durable interior finish materials or safe to re-use materials in this project? If so, please describe them.	(Yes)	No
4	What percentage of the existing building[s], if any, will be incorporated into the new building? BARE LOT _____ %		
5	Are you using any locally manufactured wood or stone products to reduce energy used in the transportation of construction materials? Please list any that are being used in this project. _____		
6	Have you considered advanced framing techniques to help reduce construction costs and increase energy savings?	(Yes)	No
7	Will any wood used in this project be eco-certified or produced from sustainably managed forests? If so, by which organization? _____ For which parts of the building (e.g. framing, roof, sheathing etc.)? _____		
8	Can alternatives to Chlorofluorocarbon's and Hydro-chlorofluorocarbons which are often used in air conditioning, packaging, insulation, or solvents] be used in this project? If so, please describe these. _____	(Yes)	No
9	List any products you are proposing that are produced using lower energy levels in manufacturing. _____		
10	Are you using materials which have a recycled content [e.g. roofing materials, interior doors, ceramic tiles or carpets]?	(Yes)	No
11	Will any interior products [e.g. cabinets, insulation or floor sheathing] contain formaldehyde?	Yes	(No)

Water Management

The intent of the following features is to promote water conservation, re-use water on site, and reduce storm water run-off.

Indoor Water Fixtures

12	Does your project exceed the BC Building Code requirements for public lavatory faucets and have automatic shut offs?	Yes	(No)
13	For commercial buildings, do flushes for urinals exceed BC Building Code requirements?	Yes	No
14	Does your project use dual flush toilets and do these exceed the BC Building Code requirements?	Yes	No
15	Does your project exceed the BC Building Code requirements for maximum flow rates for private showers?	Yes	No
16	Does your project exceed the BC Building Code requirements for flow rates for kitchen and bathroom faucets?	Yes	No

Storm Water

17	If your property has water frontage, are you planning to protect trees and vegetation within 60 metres of the high water mark? [Note: For properties located on the Gorge Waterway, please consult Sections 7.1.2.1 and 9.6 of the Esquimalt Official Community Plan.]	(Yes)	No	N/A
18	Will this project eliminate or reduce inflow and infiltration between storm water and sewer pipes from this property?	(Yes)	No	N/A
19	Will storm water run-off be collected and managed on site (rain gardens, wetlands, or ponds) or used for irrigation or re-circulating outdoor water features? If so, please describe. _____	Yes	(No)	N/A
20	Have you considered storing rain water on site (rain barrels or cisterns) for future irrigation uses?	Yes	(No)	N/A
21	Will surface pollution into storm drains will be mitigated (oil interceptors, bio-swales)? If so, please describe. _____	Yes	No	(N/A)
22	Will this project have an engineered green roof system or has the structure been designed for a future green roof installation?	Yes	No	(N/A)
23	What percentage of the site will be maintained as naturally permeable surfaces?	60 %		

Waste water

24	For larger projects, has Integrated Resource Management (IRM) been considered (e.g. heat recovery from waste water or onsite waste water treatment)? If so, please describe these. _____	Yes	No	(N/A)

Natural Features/Landscaping

The way we manage the landscape can reduce water use, protect our urban forest, restore natural vegetation and help to protect the watershed and receiving bodies of water.

25	Are any healthy trees being removed? If so, how many and what species? 1 F112	(Yes)	No	N/A
	Could your site design be altered to save these trees?			
	Have you consulted with our Parks Department regarding their removal?			

26	Will this project add new trees to the site and increase our urban forest? If so, how many and what species? _____	Yes	No	N/A
27	Are trees [existing or new] being used to provide shade in summer or to buffer winds?	Yes	No	N/A
28	Will any existing native vegetation on this site be protected? If so, please describe where and how. _____	Yes	No	N/A
29	Will new landscaped areas incorporate any plant species native to southern Vancouver Island?	Yes	No	N/A
30	Will xeriscaping (i.e. the use of drought tolerant plants) be utilized in dry areas?	Yes	No	N/A
31	Will high efficiency irrigation systems be installed (e.g. drip irrigation; 'smart' controls)?	Yes	No	N/A
32	Have you planned to control invasive species such as Scotch broom, English ivy, Himalayan and evergreen blackberry growing on the property?	Yes	No	N/A
33	Will topsoil will be protected and reused on the site?	Yes	No	N/A

Energy Efficiency

Improvements in building technology will reduce energy consumption and in turn lower greenhouse gas [GHG] emissions. These improvements will also reduce future operating costs for building occupants.

34	Will the building design be certified by an independent energy auditor/analyst? If so, what will the rating be? _____	Yes	No	N/A
35	Have you considered passive solar design principles for space heating and cooling or planned for natural day lighting?	Yes	No	N/A
36	Does the design and siting of buildings maximize exposure to natural light? What percentage of interior spaces will be illuminated by sunlight? 90 %	Yes	No	N/A
37	Will heating and cooling systems be of enhanced energy efficiency (ie. geothermal, air source heat pump, solar hot water, solar air exchange, etc.). If so, please describe. _____ If you are considering a heat pump, what measures will you take to mitigate any noise associated with the pump? _____	Yes	No	N/A
38	Has the building been designed to be solar ready?	Yes	No	N/A
39	Have you considered using roof mounted photovoltaic panels to convert solar energy to electricity?	Yes	No	N/A
40	Do windows exceed the BC Building Code heat transfer coefficient standards?	Yes	No	N/A
41	Are energy efficient appliances being installed in this project? If so, please describe.			
42	Will high efficiency light fixtures be used in this project? If so, please describe. LED	Yes	No	N/A
43	Will building occupants have control over thermal, ventilation and light levels?	Yes	No	N/A
44	Will outdoor areas have automatic lighting [i.e. motion sensors or time set]?	Yes	No	N/A
45	Will underground parking areas have automatic lighting?	Yes	No	N/A

Air Quality

The following items are intended to ensure optimal air quality for building occupants by reducing the use of products which give off gases and odours and allowing occupants control over ventilation.

46	Will ventilation systems be protected from contamination during construction and certified clean post construction?	Yes	No	N/A
47	Are you using any natural, non-toxic, water soluble or low-VOC [volatile organic compound] paints, finishes or other products? If so, please describe. _____	Yes	No	N/A
48	Will the building have windows that occupants can open?	Yes	No	N/A
49	Will hard floor surface materials cover more than 75% of the liveable floor area?	Yes	No	N/A
50	Will fresh air intakes be located away from air pollution sources?	Yes	No	N/A

Solid Waste

Reuse and recycling of material reduces the impact on our landfills, lowers transportation costs, extends the life-cycle of products, and reduces the amount of natural resources used to manufacture new products.

51	Will materials be recycled during demolition of existing buildings and structures? If so, please describe. _____	Yes	No	N/A
52	Will materials be recycled during the construction phase? If so, please describe. _____	Yes	No	N/A
53	Does your project provide enhanced waste diversion facilities i.e. on-site recycling for cardboard, bottles, cans and or recyclables or on-site composting?	Yes	No	N/A
54	For new commercial development, are you providing waste and recycling receptacles for customers?	Yes	No	N/A

Green Mobility

The intent is to encourage the use of sustainable transportation modes and walking to reduce our reliance on personal vehicles that burn fossil fuels which contributes to poor air quality.

55	Is pedestrian lighting provided in the pathways through parking and landscaped areas and at the entrances to your building[s]?	Yes	No	N/A
56	For commercial developments, are pedestrians provided with a safe path[s] through the parking areas and across vehicles accesses?	Yes	No	N/A
57	Is access provided for those with assisted mobility devices?	Yes	No	N/A
58	Are accessible bike racks provided for visitors?	Yes	No	N/A
59	Are secure covered bicycle parking and dedicated lockers provided for residents or employees?	Yes	No	N/A
60	Does your development provide residents or employees with any of the following features to reduce personal automobile use [check all that apply]: ☐ transit passes ☐ car share memberships ☐ shared bicycles for short term use ☐ weather protected bus shelters ☐ plug-ins for electric vehicles			

Is there something unique or innovative about your project that has not been addressed by this Checklist? If so, please add extra pages to describe it.

Talbot Mackenzie & Associates

Consulting Arborists

January 5, 2017

Paul Robertson
910 Yarrow Place
Victoria, BC V9A 7H9

Re: 910 Yarrow Place

Assignment: To review the proposed construction plans for the above-mentioned property and comment on how the proposal may impact the existing bylaw-protected trees on the property. Prepare a tree retention and construction damage mitigation plan for those trees deemed suitable to retain.

Methodology: Using the plans provided, we inventoried the trees on the property. Information such as tree species, size (dbh), crown spread, critical root zone (crz), health and structural condition, relative tolerance to construction impacts and general remarks and recommendations was recorded in the attached tree resource spreadsheet.

Tree Resource: (see attached tree resource spreadsheet.)

Observations:

- From our review of the existing trees and the plans provided, it will be necessary to remove ornamental trees numbered 53 and 54 as they will be too heavily impacted by the proposed building footprint.
- Douglas fir #52 has been previously topped and we anticipate it will be impacted by the proposed driveway footprint. The desire is to remove this tree in favour of the adjacent arbutus tree.
- Arbutus tree #51 will be impacted by the proposed driveway excavation and proposed grade changes for the house location. Although the desire is to retain the tree, its retention will depend on the size and density of the roots encountered during the excavation and the ability to mitigate any impacts from the proposed changes within its critical root zone. If significant roots are encountered that cannot be retained, we will recommend that this tree be removed to eliminate any associated risk.
- The ability to retain the Douglas fir tree identified as n.t. 4 on the neighbouring property will depend on the extent of excavation that must occur within its critical root zone. If significant roots are encountered that cannot be retained, we will recommend that this tree be removed to eliminate any associated risk.

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- The remaining trees on the property offer a good opportunity for retention providing their critical root zones can be protected during the construction process.
- It should be noted that the Garry oak trees located on the municipal property are currently having portions of their critical root zones eroded by water movement from the waterway and there is some undermining occurring. Two of the trees are beginning to show some decline symptoms that are likely related to the impacts, and as the erosion progresses it will likely have further impacts on both the tree health and stability.

Recommendations:

- **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 to be erected 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 (see attached diagram). 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.

- **Stump removal:** If arbutus #51 is to be retained, we recommend that the stump from Douglas fir #52 be left in place rather than removed.

- **Arborist supervision:** Any excavation that is proposed within the critical root zone of the trees to be retained, such as arbutus #51 and the neighbour's Douglas fir n.t.4, must be supervised by the project arborist. Any roots critical to the tree's survival must be retained and any non-critical roots in direct conflict with the excavation must be pruned to sound tissue to encourage new root growth. It may be necessary to excavate using a combination of hand digging, small machine excavation and hydro excavation to expose roots in conflict with the proposed excavation. At that time, it can be determined if they can be pruned without having a significant impact on the trees. If it is found that large structural roots must be pruned to accommodate the proposed construction, it may be necessary to remove additional trees to eliminate any risk associated with them.

- **Driveway:** Where the proposed driveway encroaches into the critical root zone of arbutus #51, we recommend that it be constructed in such a way that any proposed excavation is minimized and the driveway is constructed over the existing grades where possible. We have attached s specification for a floating permeable driveway surface. As the driveway grades must meet the proposed garage grades, it may not be possible to retain this tree and will have to be determined at the time of excavation.

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- **Servicing:** Only the proposed water service is shown on the plans provided and is shown to be located within the proposed driveway. If services must be located within the critical root zones of trees to be retained, it must be reviewed with the project arborist. Installing services within critical root zones will likely require a combination of hand digging, small machine or hydro excavation. If significant roots are encountered that are critical to the health and stability of the trees and they cannot be retained, it may be necessary to remove additional trees.

- **Concrete work:** Provisions must be made to ensure that no concrete wash or left over concrete material be permitted to wash into the root zone of the trees. This may involve using plastic or tarps or similar methods to temporarily isolate the root zones of the trees from any of the concrete installation or finishing work.

- **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 for the road upgrades and service footprints that are 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

Tom Talbot & Graham Mackenzie
ISA Certified, & Consulting Arborists

Encl. 1-page plans, floating driveway specifications, barrier fencing specifications,tree resource spreadsheet

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.

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Tree Resource
910 Yarrow Place

Tree #	*d.b.h. (cm)*	*Species*	*Crown Spread*	*Condition Health*	*Condition Structure*	*Relative Tolerance*	*Remarks / Recommendations*
51	30, 27, 23, 27, 36, 33	Arbutus	19.0	Fair	Fair	Poor	Multi-stemmed tree, near proposed driveway. Retention will depend on extent of required driveway excavation.
52	71.0	Douglas fir	11.0	Fair	Fair/poor	Poor	Previously topped, large deadwood. Proposed for removal to benefit adjacent Arbutus.
53	22, 25, 24	English Walnut	9.0	Fair	Fair	Moderate	History of small limb failure. Will be heavily impacted by proposal and require removal.
54	27.0	Apple	6.0	Fair	Fair	Moderate	Some canker, small broken limb. Within proposed building footprint.
55	31, 29	Garry oak	12.0	Fair	Fair	Good	High crown, co-dominant at soil line. No impacts anticipated.
56	34.0	Garry oak	10.0	Good	Fair	Good	High crown. No impacts anticipated.
n.t. 1	37.0	Garry oak	12.0	Fair	Fair	Good	Some erosion within critical root zone, weighted over water, large deadwood. Located on municipal property.
n.t. 2	22.0	Garry oak	7.0	Fair/Poor	Poor	Good	Undermined by water movement, epicormic growth. Located on municipal property.
n.t. 3	36.0	Garry oak	7.0	Fair	Poor	Good	Undermined by water movement, large deadwood. Located on municipal property.
n.t.4	44.0	Douglas fir	7.0	Fair	Good	Poor	Located on neighbour's property, some epicormic growth. Retention will depend on extent of necessary excavation within the critical root zone.

Prepared by:
Talbot Mackenzie & Associates
ISA Certified, and Consulting Arborists
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Recommended Nursery Stock

Large Shrubs
Total: 44

Botanical Name	Common Name	Size
Ilex crenata 'Sky Pencil'	Sky Pencil Holly	2m ht.
Ribes sanguineum	Red Flowering Currant	#5 pot
Rosa nutkana	Nootka Rose	#5 pot
Taxus x media 'Hicksii'	Hicks Yew	2m ht.

Medium Shrubs
Total: 10

Botanical Name	Common Name	Size
Symphoricarpos albus	Snowberry	#5 pot

Small Shrubs
Total: 218

Botanical Name	Common Name	Size
Buxus 'Green Velvet'	Green Velvet Boxwood	#1 pot
Cornus stolonifera 'Kelseyi'	Kelsey Dogwood	#1 pot
Erica carnea 'Springwood White'	Springwood White Heather	#1 pot
Lavandula officinalis	English Lavender	#1 pot

Perennials, Annuals and Ferns
Total: 138

Botanical Name	Common Name	Size
Blechnum spicant	Deer Fern	#1 pot
Carex densa	Dense Sedge	#1 pot
Juncus effusus	Common Rush	#1 pot

Notes:

1. All work to be completed to current BCSLA Landscape Standards
2. All soft landscape to be irrigated with an automatic irrigation system

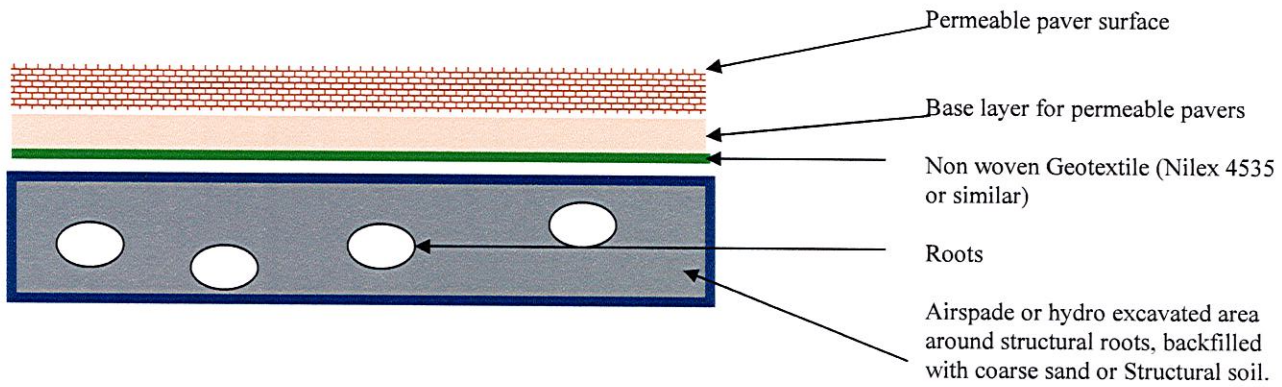
910 Yarrow Place | Landscape Concept Plan

Nov 28-16

LADR LANDSCAPE ARCHITECTS
28-495 Dupplin Rd. Victoria B.C. V8Z 1B8
Phone: (250) 596-0105 Fax: (250) 412-0596

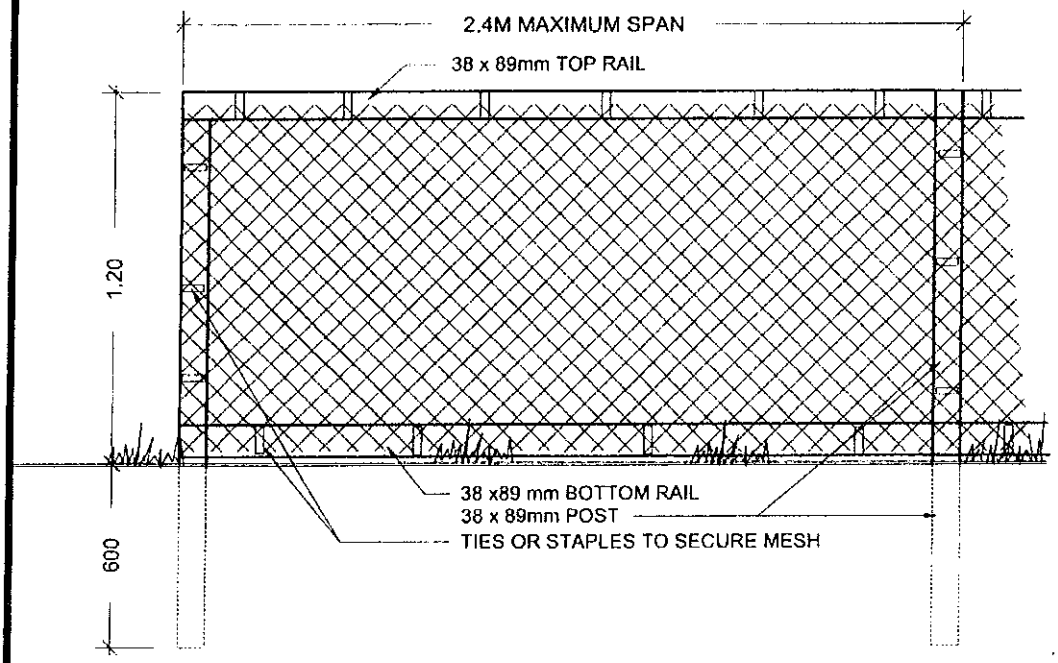
Project No: 0000 MMM-DD-YY

Diagram –Permeable paver driveway crossing over Critical Root Zone



Specifications for permeable paver driveway crossing over critical root zone

1. Excavate to a 6-8 inch depth, for the required permeable driveway surface, under the supervision of an ISA Certified Arborist.
2. Excavation for area around structural roots with an Airspade or by Hydro Excavation to bearing layer of soil if required.
3. Backfill area around roots with coarse sand or a structural soil mix
4. A layer of medium weight non woven Geotextile (Nilex 4535 or similar) is to be installed over the backfilled area of the driveway.
5. Construct base layer and permeable surface over Geotextile layer to required grade.



TREE PROTECTION FENCING

FENCE WILL BE CONTRUCTED USING
38 X 89 mm (2"X4") WOOD FRAME:
TOP, BOTTOM AND POSTS. *
USE ORANGE SNOW-FENCING MESH AND
SECURE TO THE WOOD FRAME WITH
"ZIP" TIES OR GALVANZIED STAPLES

* IN ROCKY AREAS, METAL POSTS (T-BAR
OR REBAR) DRILLED INTO ROCK WILL BE
ACCEPTED

DETAIL NAME:

TREE PROTECTION FENCING

DATE:	Oct 30/07
DRAWN:	DM
APP'D.	RR
SCALE:	N.T.S.

E105
DRAWING