



APPLICATION FORM FOR A RESOURCE CONSENT

PLEASE FILL IN ALL THE FIELDS

Application details

I/We Darren and Phillipa Bain

(must be the FULL name(s) of an individual or an entity registered with the New Zealand Companies Office. Family Trust names and unofficial trading names are not acceptable; in those situations, use the trustee(s) and director(s) names instead) hereby apply for:

☒ Land Use Consent ☐ Subdivision Consent

I opt out of the fast-track consent process: ☒ Yes ☐ No

(only applies to controlled activities under the district plan, where an electronic address for service is provided)

Brief description of the proposed activity:

Removal of T666 Pin oak due to the recent discovery of 2 Major defects. 5mtr crack in the trunk. 2 x bark inclusion, 1 over power lines the other over the section and the house

Have you applied for a Building Consent? ☐ Yes, Building Consent Number ABA

☒ No

Site location/description

I am/We are the: ☒ owner, ☐ occupier, ☐ lessee, ☐ prospective purchaser etc) of the site (tick one)

Street address of site: 27 King Street, Mosgiel

Legal description: Lot 11 Block IV deeds plan 183

Certificate of Title: CFR OT 393/55 Ltd

Contact details

Name: Phillipa Bain (☒ applicant ☐ agent (tick one))

Address: 27 King Street, Mosgiel

Postcode: 9024

Email: Rp@atelectrica.co.nz

Chosen contact method (this will be the first point of contact for all communications for this application)

I wish the following to be used as the address for service (tick one): ☒ Email ☐ Post ☐ Other:

Ownership of the site

Who is the current owner of the site? Darren and Phillipa Bain

If the applicant is not the site owner, please provide the site owner's contact details:

Address:

Postcode:

Phone (daytime):

Email:

THIS FORM MUST BE COMPLETED FOR ALL PLANNING APPLICATIONS THAT ATTRACT A FEE. ALL FIELDS ARE MANDATORY.

Deposit Payment Payee Details:

Mailing Address of Deposit Payee (please provide PO Box number where available):

Daytime contact phone number:

Fees

Development contributions

Occupation of the site

Please list the full name and address of each occupier of the site:

Monitoring of your Resource Consent

To assist with setting a date for monitoring, please estimate the date of completion of the work for which Resource Consent is required. Your Resource Consent may be monitored for compliance with any conditions at the completion of the work. (If you do not specify an estimated time for completion, your Resource Consent, if granted, may be monitored three years from the decision date).

urgent removal - Health & Safety (month and year)

Monitoring is an additional cost over and above consent processing. You may be charged at the time of the consent being issued or at the time monitoring occurs. Please refer to City Planning's Schedule of Fees for the current monitoring fee.

Detailed description of proposed activity

Please describe the proposed activity for the site, giving as much detail as possible. Where relevant, discuss the bulk and location of buildings, parking provision, traffic movements, manoeuvring, noise generation, signage, hours of operation, number of people on-site, number of visitors etc. Please provide proposed site plans and elevations.

We will engage a qualified arborist to remove the dangerous tree.

The trunk will be cut to ground level, not removed entirely.

Safety will be restored to the property's occupants.

Description of site and existing activity

Please describe the existing site, its size, location, orientation and slope. Describe the current usage and type of activity being carried out on the site. Where relevant, discuss the bulk and location of buildings, parking provision, traffic movements, manoeuvring, noise generation, signage, hours of operation, number of people on-site, number of visitors etc. Please also provide plans of the existing site and buildings. Photographs may help.

Family Home - 4 occupants - 1 dog

700sqm Section, house in the middle.

T666 in the far corner 6mtr from the family home, and the neighboring home. Small yard out the back.

Please See GreenTrees Report, supplied

(Attach separate sheets if necessary)

District plan zoning

What is the District Plan zoning of the site?

General Residential 2

Are there any overlaying District Plan requirements that apply to the site e.g. in a Landscape Management Area, in a Townscape or Heritage Precinct, Scheduled Buildings on-site etc? If unsure, please check with City Planning staff.

No

Breaches of district plan rules

Please detail the rules that will be breached by the proposed activity on the site (if any). Also detail the degree of those breaches. In most circumstances, the only rules you need to consider are the rules from the zone in which your proposal is located. However, you need to remember to consider not just the Zone rules but also the Special Provisions rules that apply to the activity. If unsure, please check with City Planning staff or the Council website.

7.3.2(3) Removal of a scheduled tree. NC.

Affected persons' approvals

I/We have obtained the written approval of the following people/organisations and they have signed the plans of the proposal:

Name:

Address:

Name:

Address:

Please note: You must submit the completed written approval form(s), and any plans signed by affected persons, with this application, unless it is a fully notified application in which case affected persons' approvals need not be provided with the application. If a written approval is required, but not obtained from an affected person, it is likely that the application will be fully notified or limited notified.

Assessment of Effects on Environment (AEE)

In this section you need to consider what effects your proposal will have on the environment. You should discuss all actual and potential effects on the environment arising from this proposal. The amount of detail provided must reflect the nature and scale of the development and its likely effect. i.e. small effect equals small assessment.

You can refer to the Council's relevant checklist and brochure on preparing this assessment. If needed there is the Ministry for the Environment's publication "A Guide to Preparing a Basic Assessment of Environmental Effects" available on www.mfe.govt.nz. Schedule 4 of the Resource Management Act 1991(RMA) provides some guidance as to what to include.

No Native birds visit this tree.
 Positive effect to the power network
 Positive effect to the two homes under it.
 Safe environment for the two home occupants
 and people and vehicles outside the property and
 moving past it on King Street.
 The tree is unsafe as outlined in the attached
 (Attach separate sheets if necessary) Report from GreenTrees.

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The following additional Resource Consents from the Otago Regional Council are required and have been applied for: ☐ Yes ☐ No
☐ Water Permit ☐ Discharge Permit ☐ Coastal Permit ☐ Land Use Consent for certain uses of lake beds and rivers ☒ Not applicable

Assessment of Objectives and Policies

In this Section you need to consider and assess how your application proposal aligns with the relevant objectives and policies in the District Plan relating to your activity. If your proposal is a discretionary or non-complying activity under the District Plan more attention to the assessment will be necessary as the objectives and policies of the District Plan may not always be in support of the proposed activity.

Objective 7.2.2

- Policy 7.2.1.1 (a) There is significant risk to person/public Safety of Property
- (c) The removal of the tree is necessary to avoid significant adverse effects on public infrastructure
- (d) These adverse effects cannot be reasonably mitigated through pruning and the effects outweigh the loss of amenity from the removal of the tree

Assessment 7.7.2 - 2 Aligns with the above objectives
Adverse effects on amenity

Assessment 7.8.2 - 1. Also aligns with the above objectives

Declaration

I certify that, to the best of my knowledge and belief, the information given in this application is true and correct.

I accept that I have a legal obligation to comply with any conditions imposed on the Resource Consent should this application be approved.

Subject to my/our rights under section 357B and 358 of the RMA to object to any costs, I agree to pay all the fees and charges levied by the Dunedin City Council for processing this application, including a further account if the cost of processing the application exceeds the deposit paid.

Signature of: ☒ Applicant ☐ Agent (tick one):



Date: 11/9/24

Privacy – Local Government Official Information and Meetings Act 1987

You should be aware that this document becomes a public record once submitted. Under the above Act, anyone can request to see copies of applications lodged with the Council. The Council is obliged to make available the information requested unless there are grounds under the above Act that justify withholding it. While you may request that it be withheld, the Council will make a decision following consultation with you. If the Council decides to withhold an application, or part of it, that decision can be reviewed by the Office of the Ombudsmen.

Please advise if you consider it necessary to withhold your application, or parts of it, from any persons (including the media) to (tick those that apply):

- ☐ Avoid unreasonably prejudicing your commercial position
- ☐ Protect information you have supplied to Council in confidence
- ☐ Avoid serious offence to tikanga Māori or disclosing location of waahi tapu

What happens when further information is required?

If an application is not in the required form, or does not include adequate information, the Council may reject the application, pursuant to section 88 of the RMA. In addition (section 92 RMA) the Council can request further information from an applicant at any stage through the process where it may help to a better understanding of the nature of the activity, the effects it may have on the environment, or the ways in which adverse effects may be mitigated. The more complete the information provided with the application, the less costly and more quickly a decision will be reached.

Further assistance

Please discuss your proposal with us if you require any further help with preparing your application. The Council does provide pre-application meetings without charge to assist in understanding the issues associated with your proposal and completing your application. This service is there to help you.

Please note that we are able to provide you with planning information but we cannot prepare the application for you. You may need to discuss your application with an independent planning consultant if you need further planning advice.

City Planning Staff can be contacted as follows:

IN WRITING: Dunedin City Council, PO Box 5045, Dunedin 9054

IN PERSON: Customer Services Centre, Ground Floor, Civic Centre, 50 The Octagon

BY PHONE: (03) 477 4000

BY EMAIL: planning@dcc.govt.nz

There is also information on our website at www.dunedin.govt.nz

Information requirements

- ☐ Completed and Signed Application Form
- ☐ Description of Activity and Assessment of Effects
- ☐ Site Plan, Floor Plan and Elevations (where relevant)
- ☐ Written Approvals
- ☐ Payee details
- ☐ Application fee (cash, eftpos, direct credit or credit card (surcharge may apply))
- ☐ Certificate of Title (less than 3 months old) including any relevant restrictions (such as consent notices, covenants, encumbrances, building line restrictions)
- ☐ Forms and plans and any other relevant documentation signed and dated by Affected Persons

In addition, subdivision applications also need the following information:

- ☐ Number of existing lots
- ☐ Number of proposed lots
- ☐ Total area of subdivision
- ☐ The position of all new boundaries

In order to ensure your application is not rejected or delayed through requests for further information, please make sure you have included all of the necessary information. A full list of the information required for resource consent applications is in the Information Requirements Section of the District Plan.

OFFICE USE ONLYHas the application been completed appropriately (including necessary information)? ☐ Yes ☐ NoApplication: ☐ Received ☐ RejectedReceived by: ☐ Counter ☐ Post ☐ Courier ☐ Other:

Comments:

*(Include reasons for rejection and/or notes to handling officer)*Planning Officer: Date:

Re: Application for Urgent Resource Consent – Removal of Pin Oak at 27 King Street

Dear city planner,

I am writing to formally request urgent consent for the removal of a mature Pin Oak tree T666 located at 27 King Street

A professional re-inspection of the tree on 04.08.25 confirmed the presence of a significant trunk crack extending approximately 5.0m, from a branch removal cut down to the root collar buttresses. This defect, which has existed for an estimated 15 years, represents a permanent structural weakness that cannot be remediated. This has been overlooked by 3 different arborists recent inspections.

Given the tree's position, failure poses a serious health and safety risk to two nearby residential dwellings and adjacent electrical utility lines. Expert arboricultural guidance confirms that trunk cracks typically warrant removal, and no practical mitigation measures are available.

In light of these findings, I respectfully seek urgent consent for removal of the tree to prevent potential harm to people, property, and infrastructure. A full risk assessment and supporting summary are enclosed with this application.

My family are very nervous under this tree with the spring winds upon us.

Please do not hesitate to contact me should you require further information or clarification.

Yours faithfully,

Phillipa Bain



2. Background

- A spiral trunk crack, approximately 5.0m in length, was first identified on 15.07.25 and confirmed on re-inspection on 04.08.25.
- The crack extends from a branch removal cut at 5.0m height to the root collar buttresses.
- Although partially occluded, the crack has existed for ≥ 15 years and remains a structural defect for the life of the tree.
- This has been overlooked by 3 arborists in recent inspections.

3. Risk Assessment

- The mid-canopy is heavily loaded due to historical canopy raising, increasing wind stress during Sou'west and Nor'west gales.
- Expert arboricultural guidance confirms that trunk cracks typically warrant removal, as no remediation options exist.
- The defect places the tree at medium to high risk of failure, particularly in severe weather.

4. Potential Consequences

In the event of failure, the target zone includes:

- Two residential dwellings; and
- Adjacent electrical utility lines.

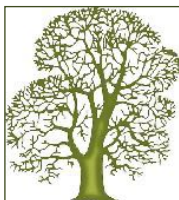
The resulting harm to people, property, and infrastructure could be significant.

5. Urgency

Due to the permanent structural defect and lack of viable mitigation strategies, removal is the only practical option. Urgent consent is sought to allow safe removal before adverse weather conditions increase the likelihood of failure.

6. Conclusion

The Pin Oak represents an unacceptable and unmanaged risk. In the interests of public safety and property protection, urgent consent for its removal is respectfully requested.



GreenTrees Ltd

Peter Waymouth - Consulting Arborist
11 Bouverie St, Dunedin, NZ, 9010p 03 473 8065
m 027 432 9646
e pw@greentrees.co.nz

06.08.25

Phillipa & Darren Bain
27 King St
Mosgiel 9024

Comment: 5.0m Spiral Occluded Trunk Crack - Pin Oak (T666)

Dear Phillipa & Darren,

Overview

On a re-inspection of the trunk crack your Pin Oak tree on 04.08.25, I can confirm that the initial discovery of the trunk crack on 15.07.25 was largely occluded (sealed) by inserting a knife, where the 2 wound-wood interfaces meet. However, on looking closely at the trunk it was clear that the trunk crack traveled down in a spiral from a branch removal cut (10cmØ) at a height of 5.0m on the north face, to a sinus between root collar buttresses on the northwest face.

Evaluation of medium risk (*Refer to page 5 for AI Perplexity framework results*)

The 5.0m long occluded trunk crack has occurred an estimated ≥ 15 years ago. In itself alone, it represents a medium risk because the occlusion or sealing process of adding woundwood remains active today. This suggests that the original crack may have penetrated the wood or xylem to some depth & will be a structural defect in the trunk for the life of the tree. Regardless of the crack being sealed the risk remains, becoming a health & safety issue. By examining the photo on page 2 it is clear the heavy load of clustered branch structure in the mid-canopy is a result of excess canopy raising in the early life of the tree. The windload of gale force prevailing winds from Sou'west & Nor'west will transmit tremendous forces through the heavily loaded branch cluster as the tree sways in a storm. The long trunk crack has no doubt been the result of a twisting action (torque) & caused torsion crack following a spiral grain pattern, as storm forces are dissipated down the trunk & into the ground.

Ed Gilman mentions canopy raising & trunk cracks (quoted from his 'Pruning' book) in my letter of 02.08.25 on page 2 (viz. **Aggressive branches (limbs)**). In addition, on the same page he also notes: '**Trunk cracks:** Cracks in the trunk usually warrant removal')

Conclusion

While a branch with a bark inclusion may be removed to reduce risk or similarly a canopy reduction likewise reduce risk, a trunk crack remains for the life of the tree, as a liability with no remediation strategy available. If in the future tree failure were hypothetically to occur, due to the trunk crack already noted, then there are 2 houses & electric utility wires within immediate the vicinity (target zone) & the resulting harm to people and/or property damage may be significant.

If you have any questions please contact me.

Yours sincerely

Peter Waymouth



5.0m



Bark inclusion

Torque

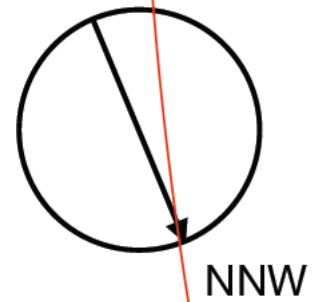
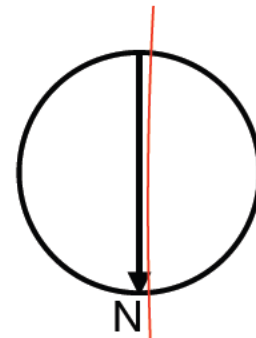
Torque

5.0m Spiral Trunk Crack
Pin Oak T666 North face

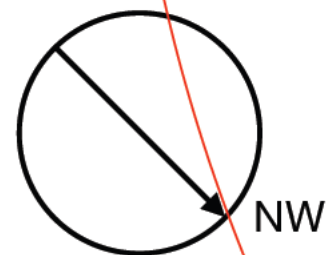
5.0m



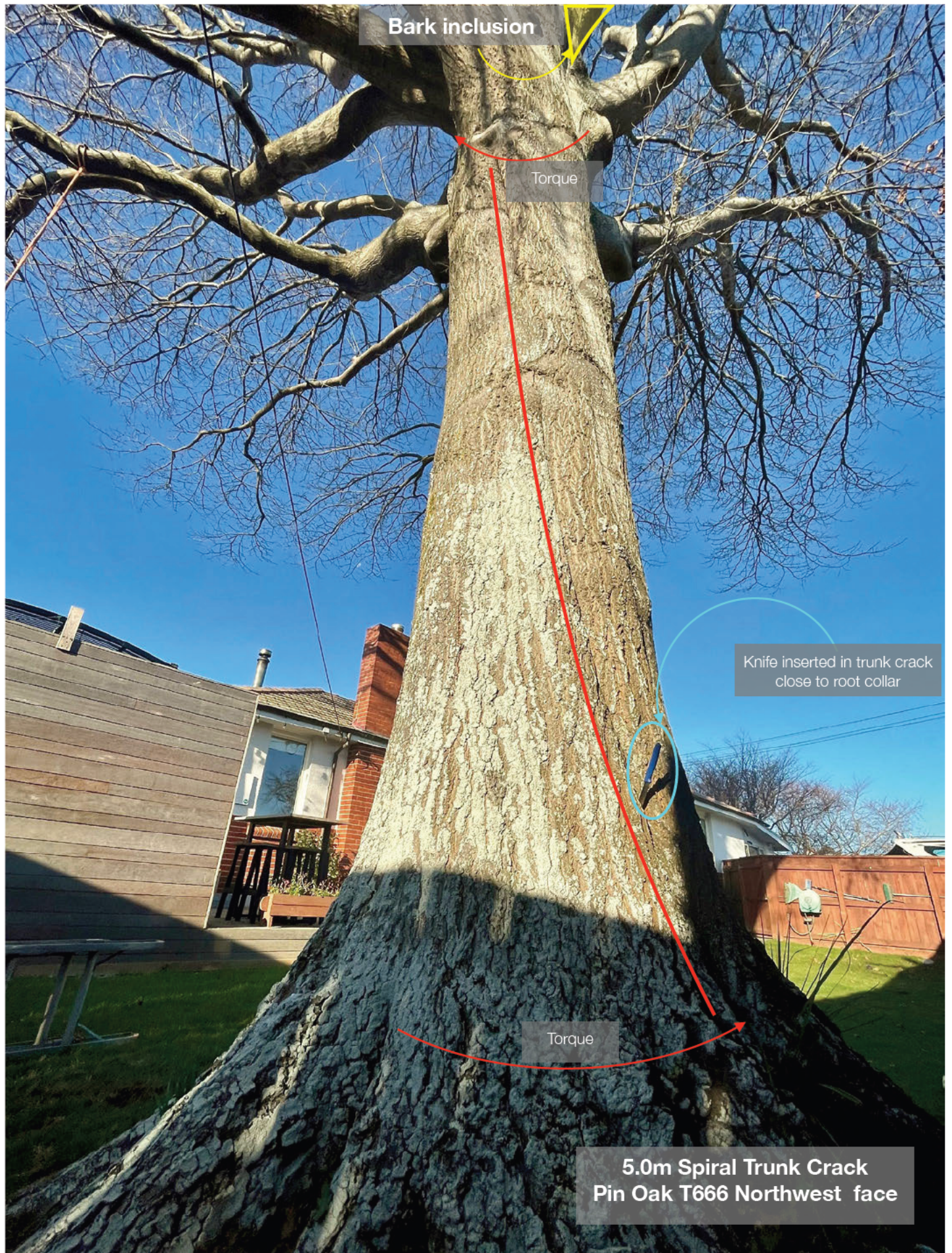
5.0m Spiral Trunk Crack
Pin Oak T666 North face



Knife inserted in trunk crack
close to root collar



5.0m Spiral Trunk Crack
Pin Oak T666 Northwest face



Risk assessment for vertical trunk splits

Perplexity Images Sources

A proper **risk assessment for vertical trunk splits** (cracks) in trees like Pin Oak involves evaluating several factors to determine the likelihood of failure and the potential consequences. Here's a step-by-step overview based on current best practices:

Key Considerations in Risk Assessment

1. Severity and Depth of the Crack

- **Shallow, surface-only cracks** are generally lower risk and may heal naturally.
- **Deep or extensive cracks** that penetrate into the heartwood, are long, or are widening indicate compromised structural integrity and higher risk of failure ^{1 2 3}.

2. Location and Extent

- Cracks near the tree's base or root flare are more critical than those further up, as they undermine the trunk's ability to support the canopy ¹.
- Cracks that extend most or all the way around the trunk, or appear on both sides (creating a chance for the trunk to split apart), are severe.

3. Additional Defects and Signs

- Presence of decay, fungal fruiting bodies, cavities, or oozing sap from the crack increases the risk.
- If the crack is associated with co-dominant stems (branches of similar size emerging from the same point), included bark, or existing weak attachments, the failure risk is greater ^{4 5}.

4. Size and Weight of Affected Part

- Large trees or trunks (>16in diameter) with vertical splits present more danger due to the higher weight that could fall if failure occurs ⁶.
- The heavier the section that could break off or collapse, the higher the risk.

5. Site and Target

- Evaluate what is beneath or near the tree—a high-risk tree is one where a falling trunk or limb could hit people, homes, cars, or high-use areas ^{6 7}.

6. Probability of Failure

- Cracks alone put a tree at moderate risk; cracks combined with decay, multiple/open cracks, or signs that the tree is actively splitting put it at high risk ⁶.
- Assess if the tree leans, has shifted, or if there is movement at the crack.

Risk Rating and Action

- **Low Risk:** Small, superficial cracks; no decay; located away from targets.
- **Moderate Risk:** Deeper cracks with some evidence of minor internal decay, but trunk still sound; moderate targets present.
- **High to Extreme Risk:** Large, deep, or widening cracks especially if accompanied by decay or seen at the trunk base/root flare; significant target and high exposure; tree shows leaning or active movement at crack ^{6 8}.

What To Do

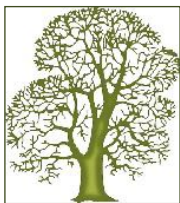
- Severe, deep, or widening cracks—especially if found near the trunk base or accompanied by decay—**require immediate professional inspection by a certified arborist** ^{2 9 10}.
- If a tree poses a high risk to property or people, removal is often the safest option.
- In some cases, cabling, bracing, or corrective pruning may reduce risk, but only if the structural integrity of the trunk is not already fatally compromised.

Summary Table

Factor Evaluated	Risk Increase If...
Crack depth/length	Deep, extends into wood, long or widening
Location	Base/root flare, extends around trunk
Additional defects	Decay, cavities, fungal bodies present
Size/weight of part	Large trunk or major limb affected
Site/target	Near people, homes, high-use areas
Failure signs	Leaning, shifting, movement at crack

Recommendation: Any deep, long, or widening vertical trunk split—especially with signs of decay or movement—should be inspected by a certified arborist. Trees with high-risk splits near potential targets may need to be removed for safety ^{1 6 2 8}.

A systematic assessment using arboricultural checklists and, if needed, advanced techniques (e.g., tomography) can further guide the decision on risk management ^{4 9}.



GreenTrees Ltd

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06.09.25

Phillipa & Darren Bain
27 King Street
Mosgiel 9024

Pin Oak (*Quercus palustris*) - T666 - Revised Tree Risk Assessment

Dear Phillipa & Darren,

Introduction

My apology to you both for not discovering the 5m crack/split in the in the Pin Oak trunk & the 10m 'bark included' branch overhanging the street wires, until recently. After researching the implications of these 2 major defects together, I have made a revised risk assessment for your consideration. The risk rating has risen from 'moderate' to 'high' using the ISA_TRAQ methodology, which calls on remedial action to be taken soon.

5m Trunk _crack/split

The partial occlusion of the 5m crack/split in the trunk does not effectively restore the structural integrity of the trunk, which will have diminished strength to resist twisting effect of future storms. While the wound-wood occlusion of the crack will seal & prevent the entry of biological decay pathogens (ie fungi) into the tree's vascular system (ie phloem & xylem), the physical strength of the original trunk remains compromised for the life of the tree.

10m Branch_ bark included vee-union

Among the 4 to 6 large leader spars clustered in the mid-canopy, there is one 10m x 0.2mØ branch/spar, which leans out over the electricity supply wires on King St. The strength of the attachment vee-union fulcrum is compromised by a 'bark inclusion', meaning that the lever arm action of branch sway exerts huge force on the weak fulcrum point & consequently maybe torn off in a storm, as the tree ages.

Discussion

Initially I put a question to the AI Perplexity application to obtain an ISA_TRAQ framework outline, to fully understand the longterm implications of the above 2 tree defects together (refer to pages 7 & 8); then, to cross-check the AI information against my own reference books. In particular, Dr. Ed Gilman's well known textbook 'An Illustrated Guide to Pruning' on pages 316 & 319 in chapter 14 about storm damage states that: '*cracks in the trunk usually warrant removal*'. This opinion was reiterated in 3 more textbooks in the attached reference list & in my 2 letters to you last August (2nd & 6th). The above research through AI Perplexity, textbooks, & eBook references are all in agreement that '*trunk cracks*' & '*bark inclusions*' are serious structural defects in a tree. With your tree being close to houses, a public street & overhanging electricity utility wires a revised tree risk assessment was required. Bearing in mind climate change & the 2 defects together (as above), the potential for harm to people & property has increased, in relation to tree failure in future storms.

Conclusion

Suggested pruning & cabling as mitigating options over the last year are of no practical use since the recent discovery of the 2 defects together. The 5m spiral torsional '*trunk crack*' & poorly attached 10m branch with '*bark inclusion*' defects require a definitive course of action. A reasonable, balanced & proportionate approach is to consider removal of the Pin Oak (T666) for health & safety reasons, in order to eliminate undue risk to people & property.

Yours sincerely,


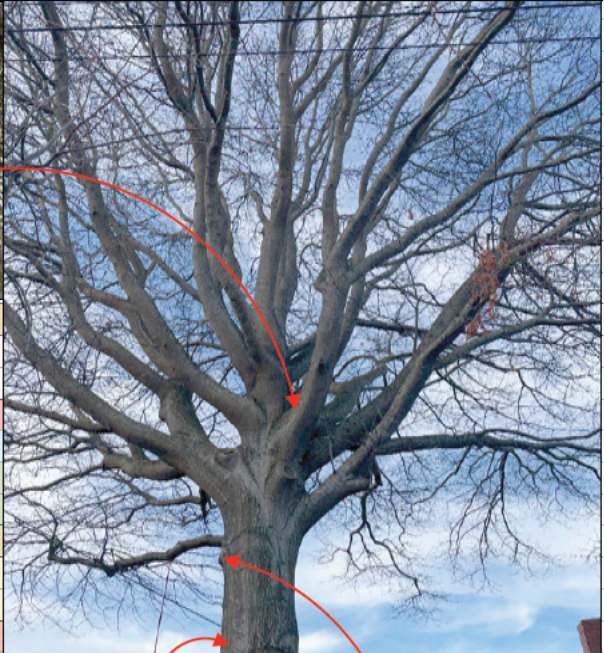
Peter Waymouth

Peter Waymouth

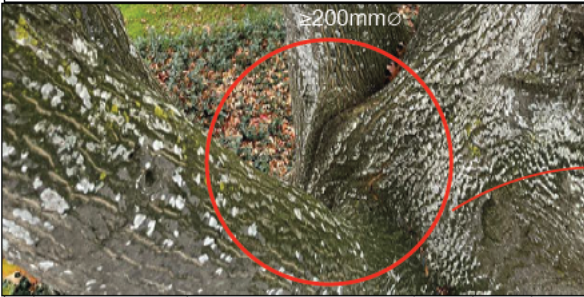

PS George Hepting (USDA forest service pathologist) maintains that '*...pin oak is short-lived, seldom reaching ages over 100 years and diameters of over 3ft. While often planted as a street or shade tree*' (Page 430_Handbook 386)




Tree Characteristics		Client: Phillipa & Darren Bain.		Email pip@a1electrical.co.nz						
Genus	Quercus	Address: 27 King St, Mosgiel								
Species	palustris									
Common name	Pinoak	Assessor: Peter Waymouth		Time Frame: 1 year						
Age (approx)	≤ 65yrs	Tree location (GPS / remote sensor)		Latitude	-45.883051°S					
Live crown ratio (LCR)	≤ 60%	Tools: Camera, Probe, Measuring Tape		Longitude	170.351431°E					
DBH	≤ 0.8mø	Trowel, Binoculars, iPad, Laptop, Clinometer, Calculator		(see over for details)						
Height	≤ 20m	Risk	Low	High	Risk Rating High					
Spread	≤ 20m	Options	Moderate	Extreme						
No.	Target Description & Assessment				Z1	Z2	Z3	O	M	R
1	People: pedestrians passing beneath tree canopy				100%	100%	N/A	3	NO	NO
2	Property: house beneath canopy & electric street cables overhang canopy				100%	100%	N/A	4	NO	NO
Target Zones: Z1 = 100% Dripline, Z2 = 100% Height, Z3 = 150% Height, M = Move Target, R = Restrict Access? Yes/No										
O = Occupancy Rate, 1 = Rare, 2 = Occasional, 3 = Frequent, 4 = Constant										
Site Factors						Topography Aspect				
History of failures	None to date					Flat	Slope °	NW		
Site Changes	None	Grade	Clearing	IncursionTPZ	Root Cuts	Describe: Subdivision infill house ≤10yrs				
Soil Conditions	Low Volume	Saturated	Shallow	Compacted	Paved over roots ≤30%	Describe: Road & footpath				
Weather Patterns	Prevailing Wind: Sou'west		High winds	Ice	Snow	Heavy rain	Storm squalls ≥ 80kph			
Tree Health & Species Profile										
Vigour	Low	Normal	High	Foliage	Leafoff	Healthy	Chlorotic 0%		Necrotic 0%	
Pests	None			Abiotic		Nothing evident				
Species Failure Profile	Branches	Trunk	Roots	Describe: Branch shear in storms (over house & electric street wires)						
Load Factors										
Wind Exposure	Protected	Partial	Full	Funnelling	Crown Size	Small	Medium	Large		
Crown Density	Sparse	Normal	Dense	Interior	Few	Normal	Dense	Vines/Moss		
Recent or planned changes in load factors										
Tree Defects & Conditions Affecting the Likelihood of Failure										
Crown & Branches										
Unbalanced Crown	Dead Branchescm		Cracks			Lightning Damage				
Broken / Hangers	Number		Codominant: 4 to 6 large leaders			Included Bark (multiple)				
Over Extended Branches	Epicormics		Weak Attachments			Cavity/Nest hole.....% circ				
Pruning History	Lion Tailed		Previous Branch Failures			Similar Branches				
Cleaning	Thinned		Dead /Missing Bark		Cankers /Galls / Burls	Sapwood Damage / Decay				
Reduced	Topped		Conks							
Flush Cuts	Raised		Response Growth:							
Other: 10m x 0.2mø branch over house removed 2024 & prior utility pruning (electric wires) has contributed to an unbalanced crown										
Main Concerns: High winds causing failure of over extended branches extending across electric wires & house. Mass damping effectively reduced as canopy raised on sapling Pin Oak without 'structural pruning'. A heavy branch cluster is now concentrated in mid-canopy.										
Load on Defect	N/A	Minor	Moderate	Significant						
Likelihood of Failure	Improbable	Possible	Probable	Imminent						
Trunk					Roots & Root Collar					
Dead / Missing Bark	Codominant Stems		Cankers/Galls/Burls		Collar Buried / Not Visible		Depth.....cm		Stem Girdling	
Abnormal Bark Color	Included Bark		Conks/Mushrooms		Conks / Mushrooms		Decay		Dead	
Sapwood Decay	Trunk Cracks		Poor Trunk Taper		Cavity.....% circ		Sap Ooze		Cracks	
Heartwood Decay	Sap ooze		Lightning Damage		Distance from trunk.....m		Cut/damaged Roots		Root Plate Lifting	
Cavity/Nest Hole% circ	Depth.....cm		Leandegrees		Soil Weakness					
Response Growth: Woundwood inroll has bark striations (istretches) indicating that torsional crack is moving fractionally in storms (ie deep)					Response Growth:					
Main Concerns: Trunk has 5m crack (largely occluded) extending from a pruning wound to the root collar, which has reduced the trunk strength in storms, with added potential to split & fail. The heavy mid-canopy cluster of large branches twists under excessive wind-loadings & has caused the spiral torsional crack down the 5m trunk.					Main Concerns: Some decay may exist but was not detectable by drilling to depth 200mm March 2024. Sonic tomography would allow a non-invasive internal examination of root collar. A resulting colour coded tomograph showing the extent of boundaries between decay & remaining sound wood, being produced as a PDF.					
Defect Load	N/A	Minor	Moderate	Significant	Defect Load	N/A	Minor	Moderate	Significant	
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C						TAR-	i	p	p	i	v	m	h	u	s	l	v	n	m	s	s	of	
O		CONDITIONS				GET	m	o	r	m	l	l	e	i	n	o	i	l	e	i	e	Part	
N	TREE	OF	PART	FALL	GET	PRO	p	s	o	m	o	o	d	g	l	m	k	i	g	n	g	v	
D	PART	CONCERN	SIZE	DIST	No	TECT	r	s	b	i	w	w	i	h	i	e	e	k	l	o	n	e	
CD	TRP	COC	PS	FD	TN	TGP	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	RRP
1	Branch falls	People	15cm	4m	1	NO																	HIGH
2	Branch falls	Property	15cm	4m	2	NO																	HIGH
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Tree Characteristics				Client: Phillipa & Darren Bain.		Email pip@a1electrical.co.nz	
Genus	Quercus			Address: 27 King St, Mosgiel			
Species	palustris						
Common name	Pinoak			Assessor: Peter Waymouth		Time Frame: 1 year	
Age (approx)	≤ 65yrs			Tree location (GPS / remote sensor)		Latitude -45.883051°S	
Live crown ratio (LCR)	≤ 60%			Tools: Camera, Probe, Measuring Tape		Longitude 170.351431°E	
DBH	≤ 0.8mø			Trowel, Binoculars, iPad, Laptop, Clinometer, Calculator		(see over for details)	
Height	≤ 20m			Risk	Low	High	Risk Rating
Spread	≤ 20m			Options	Moderate	Extreme	
No.	Target Description & Assessment					Z1	Z2
1	People: pedestrians passing beneath tree canopy					100%	100%
2	Property: houses beneath canopy & electric street cables overhang canopy					100%	100%
Target Zones: Z1 = 100% Dripline, Z2 = 100% Height, Z3 = 150% Height, M = Move Target, R = Restrict Access? Yes/No							
O = Occupancy Rate, 1 = Rare, 2 = Occasional, 3 = Frequent, 4 = Constant							
Site Factors				Topography Aspect			
History of failures	None to date					Flat	Slope ° NW
Site Changes	None	Grade	Clearing	IncursionTPZ	Root Cuts	Describe: Subdivision infill house ≤10yrs	
Soil Conditions	Low Volume	Saturated	Shallow	Compacted	Paved over roots ≤30%	Describe: Road & footpath	
Weather Patterns	Prevailing Wind: Sou'west		High winds	Ice	Snow	Heavy rain	Storm squalls ≥ 80kph
Tree Health & Species Profile							
Vigour	Low	Normal	High	Foliage	Leafoff	Healthy	Chlorotic 0% Necrotic 0%
Pests	None			Abiotic		Nothing evident	
Species Failure Profile	Branches	Trunk	Roots	Describe: Branch shear in storms (over house & electric street wires)			
Load Factors							
Wind Exposure	Protected	Partial	Full	Funnelling	Crown Size	Small	Medium Large
Crown Density	Sparse	Normal	Dense	Interior	Few	Normal	Dense Vines/Moss
Recent or planned changes in load factors							
Tree Defects & Conditions Affecting the Likelihood of Failure							
Crown & Branches							
Unbalanced Crown	Dead Branchescm			Cracks		Lightning Damage	
Broken / Hangers	Number			Codominant: 4 to 6 large leaders		Included Bark (multiple)	
Over Extended Branches	Epicormics			Weak Attachments		Cavity/Nest hole.....% circ	
Pruning History	Lion Tailed			Previous Branch Failures		Similar Branches	
Cleaning	Thinned			Dead /Missing Bark		Cankers /Galls / Burls	Sapwood Damage / Decay
Reduced	Topped			Conks			
Flush Cuts	Raised			Response Growth:			
Other: 10m x 0.2mø branch over house removed 2024 & prior utility pruning (electric wires) has contributed to an unbalanced crown							
Main Concerns: High winds causing failure of over extended branches extending across electric wires & house. Mass damping effectively reduced as canopy raised on sapling Pin Oak without 'structural pruning'. A heavy branch cluster is now concentrated in mid-canopy.							
Load on Defect	N/A	Minor	Moderate	Significant			
Likelihood of Failure	Improbable	Possible	Probable	Imminent			
Trunk				Roots & Root Collar			
Dead / Missing Bark	Codominant Stems		Cankers/Galls/Burls	Collar Buried / Not Visible	Depth.....cm	Stem Girdling	
Abnormal Bark Color	Included Bark		Conks/Mushrooms	Conks / Mushrooms	Decay	Dead	
Sapwood Decay	Trunk Cracks		Poor Trunk Taper	Cavity.....% circ	Sap Ooze	Cracks	
Heartwood Decay	Sap ooze		Lightning Damage	Distance from trunk.....m	Cut/damaged Roots	Root Plate Lifting	
Cavity/Nest Hole% circ	Depth.....cm	Leandegrees	Soil Weakness				
Response Growth: Woundwood inroll has bark striations (istretches)				Response Growth:			
indicating that torsional crack is moving fractionally in storms (ie deep)							
Main Concerns: Trunk has 5m crack (largely occluded) extending				Main Concerns: Some decay may exist but was not detectable by			
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CONDITIONS										TAR- GET					m o r m l l e i n o i l e i e					Rate																																													
TREE OF PART FALL GET PRO										p s o m o o d g l m k i g n g v																																																							
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Large Pin Oak with 5m torsional crack in trunk & 10m included bark branch overhanging public street. What is the risk of either the trunk or the branch failing using the ISA TRAQ methodology?

 Perplexity

 Images

 Sources

The presence of a **5m torsional crack in the trunk** and a **10m included bark branch overhanging a public street** in a mature Pin Oak suggests a significant risk of structural failure according to ISA TRAQ (Tree Risk Assessment Qualification) methodology, especially in high wind or storm events 1 2 3.

ISA TRAQ Risk Factors

- **Trunk Crack**
 - A long torsional crack (5m) in the main stem represents a major structural defect that can substantially reduce the mechanical strength of the tree 2 3. Cracks are recognized by TRAQ as a high-risk defect, particularly where internal decay, movement, or separation is visible 4 5.
 - If the crack involves significant depth or width, or extends through much of the trunk’s cross-section, the likelihood of failure becomes **probable to imminent** under normal or storm conditions 6 5.
 - The consequence of trunk failure is high due to size and impact potential, especially near public spaces 6 7.
- **Included Bark Branch**
 - A 10m branch with included bark is a textbook weak attachment, susceptible to splitting at the branch union, especially with long, heavy overhanging growth 8 3 9.
 - If this branch overhangs a street used by vehicles and pedestrians, occupancy is frequent, and consequences of failure are significant to severe 10 6.
 - TRAQ methodology classifies included bark unions as **high risk**, particularly if previous failures or similar weak branches are present 11 3.

TRAQ Risk Categories

- **Likelihood of Failure:** For both the trunk (with a major crack) and the large branch (with included bark), the likelihood of failure is at least **probable** and could be **imminent** if decay, movement, or recent changes in load have occurred 6 5.
- **Likelihood of Impact:** Overhanging public street increases likelihood of impacting a target to **medium to high**, especially for vehicles, pedestrians, or property 10 6.
- **Consequences:** The consequence of failure is **severe or catastrophic** for trunk failure, and **significant to severe** for large branch failure, especially if impacting people or vehicles 10 7.

Management Recommendations

- Immediate assessment by a **TRAQ-qualified arborist** is advised to confirm the risk level, use diagnostic tools such as resistance drilling, tomography, or static pull tests, and determine urgency of mitigation 12 13 2.
- **Mitigation options** include removal of the defective branch, cabling or bracing, or in cases of trunk instability, full tree removal may be warranted 2 5.

Summary Table

Defect	Likelihood of Failure	Likelihood of Impact	Consequence	TRAQ Risk Category
5m trunk crack	Probable–Imminent	Medium–High	Severe–Catastrophic	High–Extreme 6 5
10m included bark branch	Probable	Medium–High	Significant–Severe	High 10 3 9

Both defects indicate a **high to extreme risk** for the public, with urgent management advised based on ISA TRAQ guidelines 6 7 5.

Torsional trunk crack significance

 Perplexity 

 Images

 Sources

A **torsional trunk crack** is significant because it signals major structural weakening caused by twisting forces, typically from wind or uneven crown loading ^{1 2}. This spiraling crack pattern can compromise the tree's ability to withstand further torsional or bending stresses and substantially raises the likelihood of catastrophic trunk failure, especially in large or mature specimens ^{3 1}.

Causes and Indicators

- Torsional cracks often arise during strong wind events that twist the trunk beyond its structural capacity, especially in trees with unbalanced crowns or root systems ^{2 1}.
- The crack usually spirals around the trunk, and its presence suggests that internal fibers have separated, reducing the trunk's mechanical strength ^{1 4}.

Structural Implications

- A trunk with a significant torsional crack is far more susceptible to failure under future wind loading or heavy branch movement because the crack weakens the tree's ability to transfer and resist torsional forces ^{4 2}.
- A crack of several meters in length, especially in a mature tree, indicates a high risk: such trees can fail suddenly and unpredictably at or near the crack under load ^{3 2}.

Risk Assessment Guidance

- ISA risk assessment protocols treat extensive trunk cracks as a critical defect, often assigning a **'probable' to 'imminent' likelihood of failure**; immediate action is suggested when targets (people, structures, roads) are present within the fall zone ^{2 3}.
- Sounding and probing are recommended to assess the depth and extent of decay associated with the crack, and to evaluate wall thickness—failures are more likely if sound wood comprises less than 30% of the trunk diameter at the crack ³.

A large, visible torsional crack is a clear indicator of **serious failure risk** and warrants immediate professional attention to determine mitigation or removal options ^{1 3 2}.

Included bark branch failure mechanics

 Perplexity 

 Images

 Sources

Included bark branch failures occur due to weak structural attachments where bark is trapped between the branch and stem, preventing the formation of strong interlocking wood grain ^{1 2}. This defect substantially reduces the mechanical strength of the junction and increases the probability of failure, especially during high winds or when branches become heavy with foliage or precipitation ^{1 3}.

Mechanics of Failure

Formation

- Included bark junctions form when two branches or stems grow close together, trapping bark between them rather than forming normal wood grain connections ^{1 2}.
- The absence of dense, convoluted grain beneath the branch bark ridge (BBR) means the attachment lacks thigmomorphogenically-induced reaction wood, which is normally produced in strong unions to resist tensile forces ².

Weakness and Stress Transmission

- Without interlocking fibers, mechanical loads (wind, weight, torsion) are transmitted through low-friction bark zones, which provide little resistance to splitting ^{2 3}.
- Under bending or shear loads, the branch junction may experience separation, leading to sudden fracturing at the union, often splitting downward into the parent stem ^{1 2}.

Key Indicators and Failure Modes

- Included bark branches are on average **24% weaker** than normally formed junctions, according to biomechanical studies ¹.
- Failure usually initiates at the bark-included zone where tension and compression stresses are least supported, producing lateral or longitudinal cracks, often with one branch being forced off the trunk, sometimes tearing bark and wood as it strips ^{1 3}.
- Factors like large branch diameter, lack of taper, long overextended branches, and heavy end-weight worsen risk, as critical slenderness ratios and branch mass increase loads at the weak junction ³.
- Decay at or near the included junction further reduces load-bearing capacity, making failure much more likely ^{4 3}.

Included bark branch failures are highly unpredictable, often catastrophic, and can occur even without obvious visual warning, especially in mature, overextended, or unpruned branches ^{1 2 3}.

'Common sense risk management of trees'

NTSG (National Tree Safety Group) set of 5 key underpinning principles:

1. trees provide a wide variety of benefits to society
2. trees are living organisms that naturally lose branches & fall
3. the overall risk to human safety is extremely low
4. tree owners have a duty of care
5. tree owners should take a balanced & proportionate approach to tree safety management

References: Title	Author	Pub	IBSN / ID CODE
'Common sense risk management of trees'	The National Tree Safety Group	2011 Forestry Commission, UK	978.0.85538.840.9
'Wood Decay in Living and Dead Trees: A Pictorial Overview'	Shortle & Dudzik	2011 USDA forest service, USA	Report NRS-97
'STEM - A Standard Tree Evaluation Method'	Ron Flook	1996 Ron Flook, NZ	0.473.04039.5
'Tree Roots in the Built Environment'	Roberts, Jackson & Smith	2006 Arboricultural Assn, UK	978.0.90099.859.3
'The Manual of Tree Statics and Tree Inspection'	Wessolly & Erb	2016 Patzer Verlag, Germany	978.3.87617.143.2
'An Illustrated Guide to Pruning'	Ed Gilman	2012 Delmar, Cengage Learning, USA	13.978.1.111.30730.1
'Tree Risk Assessment Manual' 2nd Edition	Dr. Julian Dunster	2017 International Society of Arb, USA	978.1.881956.99.0
'The Body Language of Trees'	Klaus Mattheck	2015 Karlsruhe Inst. of Technology, Germany	978.3.923704.89.7
'Applied Tree Biology'	Andrew Hiron & Peter Thomas	2018 John Wiley & Sons, UK	978.111829.64.00
'The Manual of Woody Landscape Plants'	Michael A. Dirr	1998 Stipes Pub. LLC, USA	0.87563.795.7
'The Illustrated Encyclopedia of Trees'	David More & John White	2005 Timber Press Inc, USA	0.88192.751.1
'The CODIT Principle'	Dujesiefken & Liese	2015 International Society of Arb, USA	978.1.881956.91.4
'Assessment of Tree Forks'	Dr. Duncan Slater	2016 Arboricultural Assn, UK	978.0.900978.61.6
'Branch Junctions'	Dr. Duncan Slater	2022 Arboricultural Assn, UK	978.0.900978.74.6
'Aerial Inspections'	Cox & Melarange	2017 Arboricultural Assn, UK	978.0.900978.62.3
'Tree Surveys'	Fay, Dowson & Helliwell	2016 Arboricultural Assn, UK	0.900978.38.4
'Tree Pruning'	EU working group - TeST	2024 European Arboricultural Standards	EAS.01.2024.(EN)
'Tree Cabling/Bracing'	EU working group - TeST	2022 European Arboricultural Standards.	EAS.02.2022.(EN)
'Tree Assessment'	EU working group - ECoST	2025 European Arboricultural Standards.	EAS.04.2025.(EN)
'Arboricultural Practices'	Lindsey Purcell	2025 Waveland Press Inc, USA	978.1.4786.5174.1
'Tree Steward Manual'	Virginia Cooperative Extension	2012 Virginia Tech Publishing, USA	978.949373.72.7
'Diseases of Forest & Shade Trees of the United States'	George Hepting - July 1971	USDA Forest Service (Handbook 386)	74.607274

Disclaimer: Tree risk assessments consider only known targets & visible/detectable diagnostic conditions observed on inspection date. An assumption of normal prevailing weather patterns over the specified timeframe is a given. Yearly monitoring informs tree management options & ensures the health & safety of assessed trees to provide amenity benefits. After extreme weather events, trees of concern should be inspected.

