

# AHCARB803 Edaphic Interactions of Trees and Structures Form

<b>Prerequisite competency completion</b>		
Has the candidate successfully completed the <b>required prerequisite unit</b> requirements of AHCARB803 Analyse edaphic interactions of trees and structures?	<b>Yes/No (Y/N)</b>	<b>Signed (Initialled)</b>
AHCARB701 Analyse tree biomechanics		
<b>Required reports completion</b>		
Has the candidate successfully completed the <b>required reports</b> ?	<b>Yes/No (Y/N)</b>	<b>Signed (Initialled)</b>
Structural damage and stability report		
Glossary of construction, architecture and engineering terminology		
<b>Mandatory Equipment (as a minimum)</b>		
Has each of the mandatory equipment items been used to gather evidence for assessment?	<b>Yes/No (Y/N)</b>	<b>Signed (Initialled)</b>
computer		
word processing software		
internet connection		
digital camera with macro		
diagnostic tools including sounding hammer, trowel, probe, cordless drill		
soil testing equipment		
digital dissection microscope 10–100x		
compound microscope		
microtome, staining and slide mounting equipment		
slides and coverslips		
temporary/permanent mountant		
histochemical stains		
<b>Knowledge Evidence</b>		
Has the candidate successfully completed the <b>Knowledge Evidence</b> requirements by demonstrating knowledge of each of the line items below?	<b>Yes/No (Y/N)</b>	<b>Signed (Initialled)</b>
repose angle of soil materials		
soil plasticity		
soil moisture content		
field capacity of soil		

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effects of soil moisture on soil cohesion and plasticity		
modes of soil liquefaction		
soil texture		
soil cohesion		
shear strength of the soil		
load bearing capacity		
mass of soil plate		
root morphology		
root division		
root distribution		
buttressing		
species development of tap root systems		
anatomical features of tree roots		
identification of tree roots based on anatomical features		
research, experimental modelling and demonstration methods		
forces and pressures exerted into or through the soil, directly and indirectly by trees		
estimation and measurement of dimensions of roots exerting a force on a structure		
calculation of the total surface area of the roots exerting a force on a structure		
calculation of the force exerted by roots per unit of surface area of structure		
calculation of the total force exerted by roots of a given surface area		
measurement of volume of structures		
calculation of the mass of structures		
impact of gravity on mass		
affect of leverage on the forces exerted by tree roots onto structure		
factors of root–soil matrix interactions		
area of contact between root and soil		
elasticity of roots		
tensile strength of roots		
breaking stress of roots		
root cross-sectional morphology		
extent of root plate damage		
extent of root plate deficiencies		
extent of root plate defects		

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impact of static and dynamic testing for root plate stability		
likelihood of root failure by root breakage		
likelihood of anchorage failure by soil breakage or slippage		
effects of increasing mass		
effects of use of curved structures		
effects of soil mass and friction		
effects of, increasing the modulus of rupture		
effects of use of anchors, braces and props		
portfolio of research		
personal annotations and calculations		
report preparation		
test results and assumptions		
relative stability of tree		
whole tree failure		
design suggestions for mitigation of damage and whole tree failure		
harm by roots on structures		
expert witness reports		
expert witness report on harm by roots on structures		
construction language terminology		
engineering language terminology		
installation and protection measures		
concepts, basic science and technology of structural engineering		
concepts, basic science and technology of construction		
concepts, basic science and technology of architecture		
<b>Performance evidence</b>		
Has the candidate successfully demonstrated the <b>Performance Evidence</b> requirements of the unit of competency AHCARB803 Analyse edaphic interactions of trees and structures, and as per listed line items below?	<b>Yes/No (Y/N)</b>	<b>Signed (Initialled)</b>
researching repose angle of soil materials		
researching soil plasticity		
measuring soil moisture content and field capacity of soil		
researching the effects of soil moisture on soil cohesion and plasticity		
researching modes of soil liquefaction		
determining soil texture		

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assessing level of soil cohesion		
determining shear strength of the soil of concern		
researching load bearing capacity of soil of concern		
determining mass of the soil plate		
determining root morphology, division and distribution		
determining amount of buttressing of tree		
determining species development of tap root system		
researching identifying anatomical features of tree roots		
identifying tree roots based on anatomical features		
researching, experimentally modelling or demonstrating forces and pressures exerted into or through the soil, directly and indirectly by trees		
estimating and measuring dimensions of roots exerting a force on a structure of concern		
calculating total surface area of the roots exerting a force on a structure of concern		
calculating force exerted by roots per unit of surface area of structure		
calculating total force exerted by roots of a given surface area		
measuring and determine volume of structure of concern		
researching and calculate mass of the structure and adjacent structures		
considering the impact of gravity on mass		
determining affect of leverage on the forces exerted by tree roots onto structure of concern		
determining factors of root–soil matrix interactions		
considering area of contact between root and soil		
considering elasticity, tensile strength and breaking stress of roots		
investigating root cross-sectional morphology		
assessing extent of root plate damage, deficiencies or defects		
estimating impact of static and dynamic testing for root plate stability		
evaluating the likelihood of root failure by root breakage		
evaluating the likelihood of anchorage failure by soil breakage or slippage		
researching and considering effects of increasing mass		
researching and considering methods for, and effects of, increasing the modulus of rupture		
researching and considering effects of use of curved structures		

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researching and considering effects of soil mass and friction		
researching and considering effects of use of anchors, braces and props		
compiling a portfolio of above research including personal annotations and calculations		
preparing report on likelihood of tree causing damage to structure of concern including all test results, assumptions and calculations		
providing design suggestions to mitigate likelihood of damage to a similar replacement structure		
preparing report on relative stability of tree as a result of a defective or damaged root plate		
providing design suggestions to mitigate likelihood of whole tree failure as a result of defective or damaged root plate		
preparing expert witness report on harm by roots on structures; or on stability of tree with a defective or damaged root plate, as required		
reviewing construction and engineering language terminology		
discussing installation and protection measures to non-arboricultural team members		
resolving issues in construction and engineering terminology		
communicating in the language, concepts, basic science and technology of construction, architecture and engineering allied professions		
<b>Assessment conditions</b>		
It is an industry requirement that competency in this unit requires the preparation of a minimum of <b>two (2) different</b> reports: <ul style="list-style-type: none"> <li>• a report on harm by roots on structures</li> <li>• a report on stability of tree with a defective or damaged root plate</li> </ul>		
Have the assessments incorporated the assessment conditions and met the industry requirements for competency in this unit <b>as per listed line items below?</b>	<b>Yes/No (Y/N)</b>	<b>Signed (Initialled)</b>
Has the assessment confirmed the completion of a report on the harm by roots on structures?		
Has the assessment confirmed the completion of a report on the stability of tree with a defective or damaged root plate?		
Assessment may be conducted in a simulated or real work environment; however, determination of competency requires the application of work practices under work conditions.	<b>Yes/No (Y/N)</b>	<b>Signed (Initialled)</b>
Have assessments been demonstrated consistently over time?		

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Have assessments been demonstrated in a suitable range of contexts?			
Have assessments been demonstrated with a productivity-based outcome?			
Have assessments been demonstrated with multiple assessment events and reports?			
<b>Assessor Declaration</b>			
<b>Assessors must satisfy current standards for RTOs in the assessment of arboriculture units of competency.</b>		<b>Yes/No (Y/N)</b>	<b>Signed (Initialled)</b>
<b>Has assessment been conducted only by persons who have:</b>			
<ul style="list-style-type: none"> <li>tree biomechanics vocational competencies at least to the level being assessed?</li> </ul>			
<ul style="list-style-type: none"> <li>current tree biomechanics skills directly relevant to the unit of competency being assessed?</li> </ul>			
<b>Assessor name</b>	<b>Assessor qualification</b>	<b>Year</b>	<b>Full Signature</b>
<b>Competency Determination</b>			
This section determines the skills and knowledge required to analyse the edaphic interactions of trees and structures.			<b>Competent /Not yet competent</b>
<b>The candidate is competent in analysing the edaphic interactions of trees and structures.</b>			
<b>Competency Assessment Completion</b>			
<b>Assessor name</b>	<b>Date</b>	<b>Full Signature</b>	

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