APPENDIX 1

Alternative Methods of Weed Control

Method	Positives	Negatives
Manual Removal – removal of weeds by hand or handheld tools or machinery e.g. weed rippers	Effective method within instantly visible result Targeted approach	Labour intensive - a significant investment in additional staffing resources required if this method was to be adopted Potential hand arm vibration issues for staff Costly Time consuming Unlikely to remove roots resulting in quick plant re-establishment Requires ongoing and repeated treatment throughout the year Carbon footprint increase when petrol engines are used May damage tarmac surfaces especially if they are in poor condition Increase noise levels for public and operators where petrol driven machinery is used Can deplete soil volumes when roots are removed (particularly noticeable in plantings and around headstones)
Foam - a non-chemical weed control system - combines heat with biodegradable foam which acts as a thermal blanket to insulate hot water	Non chemical control system More effective than hot water – thermal blanket retains heat in kill zone Fewer treatments required when compared to hot water and steam Has multiple uses e.g. can be used to clean equipment in addition to weed control Can be used in all weather conditions	Increased CO2 output when compared to herbicide application on foot (vehicle and fuel required) Slow method of treatment Less effective control on perennial and woody weed species Potential access issues – equipment cannot easily access all areas where weeds are controlled and may be inaccessible to some Suitable for a limited number of settings only given restrictions on equipment accessing all areas

		Reports from trials by others that staff find the equipment unwieldy Transportation of water required Significant capital investment in machinery required and a significant increase in staffing to operate and completed the recommended 3 applications required by year
Thermal – control method using wet heat such as steam, hot water	Non chemical control method Plants dehydrate and die within a few hours or days	Wet heat quickly lost to the atmosphere (weather limited) which can reduce effectiveness Requires multiple applications throughout the year (due to little effect on root structure and quick re-growth) Requires vehicle and fuel Suitable for a limited number of settings only given restrictions on equipment accessing all areas Potentially slow and limited to water capacity Capital investment and additional staff, vehicle and fuel resources would be required Health and safety issues relating to high heat and potential burns if not used correctly/safely
Flame – use of flames to destroy vegetative matter using propane-fuelled flames, control delivered by passing an open flame over the weed	Non chemical means of control Can be used all year round.	Heat burns vegetation only therefore there is little impact on root structure Regrowth will soon follow control A significant number of treatments required each season to achieve effective control Risks to health and safety from naked flame and through transportation and storage Fire risk, including risks to infrastructure Cannot be used near vehicles Can damage property/infrastructure

		Additional staffing resources required for this method of control Uses propane gas to fuel flame
Electricity – method of control using electrical currents to destroy plants	Can provide effective treatment Useful for spot weeding	Time intensive treatment resulting increased labour input and costs Regular manual adjustment of voltage required to cater for size of weed Health & safety risks from incorrect use Potential to initiate fire Recommended cordoning off areas from public during treatments Cannot be used in wet conditions. Care needed around conductive items such as fences, signs, gates etc Capital investment and additional staff resources would be required
Acetic Acid – control using the active ingredient found in vinegar	Will kill most vegetation by burning through leaves and drawing moisture out. Effective within a few days	Effectiveness does not last long Must be handled with extreme care to avoid risk of irritation Unpleasant smell Weather dependent (needs to be applied in dry conditions) Cannot be used on soft surfaces like soil or sand No effect on root system so repeated treatments required and therefore higher labour costs Additional staff would be required to resource additional applications needed
Fatty Acids – Pelargonic acid found in plant and naturally dries out weeds	Natural origin Fast acting – signs of treatment within 2-3 hours	Contact acting – not translocated so does not kill roots (at least three times) More expensive than Glyphosate with a much higher

	Can be mixed with residual herbicide (flazasulfuron)	application rate – so more product required More applications required (5 – 6) each year to achieve effective weed control Increased staffing and material budgets required to resource greater number of treatments required for effective control
Strimming – mechanical, petrol driven method to cut grass / weeds around perimeters, and to control vegetation in larger areas, around difficult terrain or close to obstacles	Effective for large areas of vegetation Effective for difficult terrain Aesthetically more pleasing – achieves a tidier appearance Can be carried out all year round	Potential hand-arm vibration issues for operators Carbon footprint increase from petrol engines Labour intensive Equipment and servicing costs Increased risk of claims from flying debris No effect on root structures so does little to reduce re-growth Repeated treatments required Limited to certain weather conditions Supplementary tasks like blowing and sweeping required to remove arisings Previous budget saving have already reduced current strimming operations from monthly to every two months during the growing season Significant increase in staffing and material budgets required to resource greater number of operations required for effective control Risks of damage to assets from contact with strimmer wires