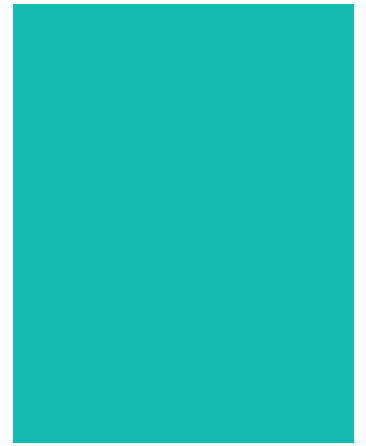


Precinct Landscape and Revegetation Plan

Prepared for Precinct 1 at Alkimos Beach as required by Condition 12 of the Approval (EPBC 2012/5902)



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1. Introduction

1.1 Background

The development of Alkimos Beach (previously known as South Alkimos) received approval from the Minister for Environment on the 30th June 2012 for the clearing of approximately 97 ha of native vegetation for urban development at Lot 1004, 80L Romeo Road and 2611 Marmion Avenue, Alkimos, WA (EPBC 2011/5902).

Alkimos Beach is a 224ha development consisting of residential housing, mixed use development, public open space (POS), schools and conservation reserves. LandCorp and Lend Lease have engaged Georgiou Group to commence the first stage of earthworks and civil construction for Alkimos Beach. Construction of roads commenced in early 2013 with built form construction underway. The project has completed Stage 1 & 2 of landscaping (excluding the streetscape works) and is now in construction on Stage 3 & 4 POS D and E.

1.2 Purpose and Scope

This document has been prepared to address the requirements of Condition 12 of the approval. Condition 12 of the approval requires the preparation of a Precinct Landscape and Revegetation Plan (PLRP) for the project area. Condition 12 states:

*To protect habitat for listed threatened species the person taking the action must prepare and submit a Precinct Landscape and Revegetation Plan (PLRP) for the **project area**, for approval by the **Minister**. The PLRP must include:*

- a) Measures to establish the equivalent of at least 5ha of **Carnaby's Black-Cockatoo** habitat on the **project area**, through streetscape and landscape planting;*
- b) At least 50% of plantings of trees and shrubs in streetscape and landscape planting must consist of plant species known to be **primary feeding plants** for **Carnaby's Black-Cockatoo**;*
- c) Timeframes and survival targets proposed for plantings;*
- d) Contingency measures if survival targets are not achieved;*
- e) Monitoring and reporting measures;*
- f) Roles and responsibilities of contractors, staff and the person taking the action; and*
- g) Timeframes for the implementation and the management of the above measures.*

*The PLRP must be submitted to **the Department** within 12 months of the date of approval. If the **Minister** approves the PLRP, the approved plans must be implemented. No **construction** can commence in the area shown as the No Clearing area on Attachment C until the PLRP is approved by the **Minister**.*

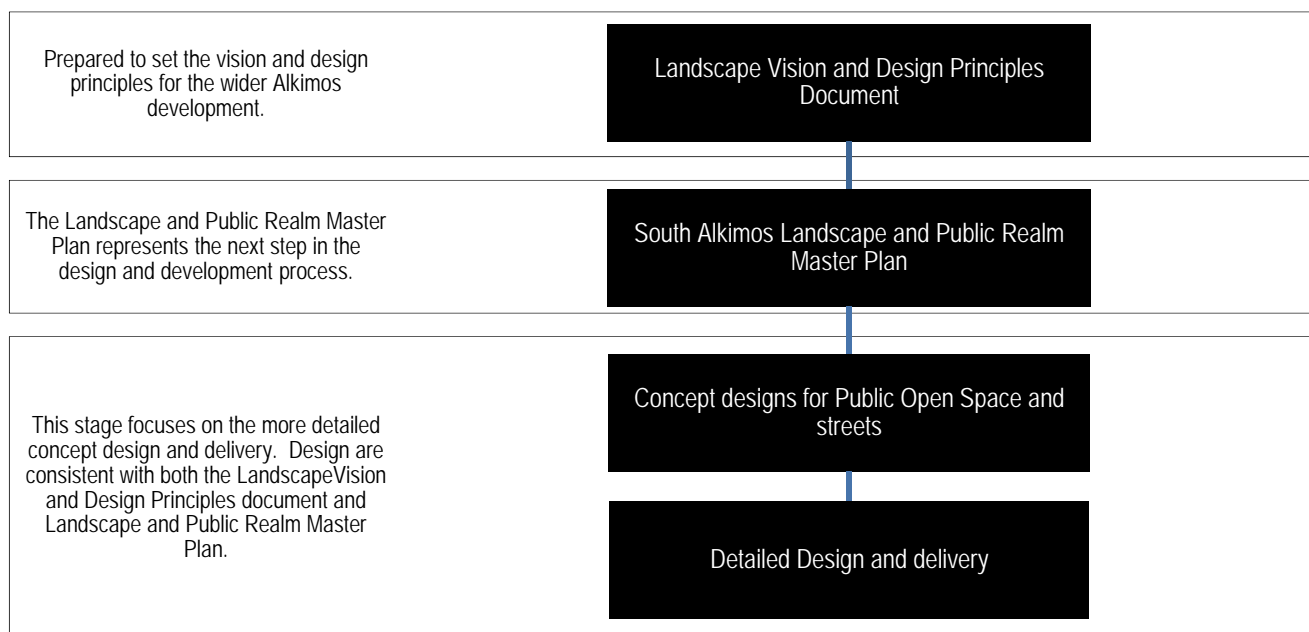
This PLRP applies to the **project area** which as stipulated under the approval refers to the entire 224ha of the project site. Note that the clearing of habitat within this footprint is addressed in the Approval under Conditions 8 and 9 and the management of the retained habitat is addressed under Condition 10 and 11 of the Approval. The Annual Report required under Condition 3 of the Approval will record progress against the targets set in this report.

As stipulated under Condition 10, 11 and 12 of the approval, construction cannot commence within close proximity of the foreshore zone until all three Management Plans are approved by the Minister. Approval of this management plan and the Conservation Area Management Plan and Foreshore Management Plan (required by Condition 10 and 11 respectively) will remove this restriction and allow the rehabilitation works within the foreshore to progress sooner.

2. Supporting documents

In line with the State Local Structure Plan for South Alkimos and ongoing detailed subdivision plans, a number of landscape documents have been prepared. The following figure shows a diagram of the hierarchy of reports prepared by the project team's Landscape Architect's, AECOM. These have been included in the Appendices of this report and provide a plethora of information about landscaping across the site.

Figure 1: Hierarchy of Landscape Reports



2.1 Landscape Vision and Design Principles Document

Firstly the Landscape Vision and Design Principles document (AECOM 2012a) (**Appendix A**) was prepared to guide the vision and design for landscape across LandCorp's landholdings (including Alkimos City Centre, Central Alkimos and South Alkimos). In order to deliver a responsive and appropriate design six key objectives have been defined to guide the landscape design process for the Alkimos Beach project (found on Page 16). These are;

- Livability and Community Wellbeing
- Connectivity and Linkages
- Environmental Sensibility
- Climate Adaptation and Water
- Culture, Recreation and Open Space
- Character and Identity.

A number of the elements of these objectives relate to the Conditions, listed in the Table below.

Table 1: EPBC Act links to Landscape Vision and Public Realm Document

Objective	Page #	Element relevant to the PLRP
Livability and Community Wellbeing	17	Foster a sense of responsibility to and respect for nature and conservation work to help protect native plants and animals that inhabit the site, in particular Carnaby's Black Cockatoo and the Graceful Sun Moth.
Climate Adaptation and Water	18	Improve the water holding capacity of sandy soils (by the use of soil amendments). This will reduce the requirement for irrigation.
		Ensure at least 85% of new plant material in the public realm is a local species and ensure that 50% or greater of street trees are native species suited to their intended location.
		Orientate planting around the wetter months of the year to ensure seedling survival and

		minimise irrigation requirements.
Character and Identity	20	Planting at Alkimos will be comprised of predominately indigenous vegetation – native and local

2.2 Landscape Public Realm Master Plan

Following on from the Landscape Vision and Design Principles document, the Landscape Public Realm Master Plan (LMP) (**Appendix B**) represents the next step in the design process, discussing park typologies and streetscape design. Under 'Streetscape Design' section the South Alkimos Street Planting Strategy is included which indicates the species which are:

1. Native
2. Listed on the DEC's plant for Carnaby's species list
3. Collected as part of the seed collection undertaken across South Alkimos.

The streetscape planting palette is broken across three areas including Coastal, Neighbourhood and Urban. The delineation of these areas is included on Page 36 of the document. It is important to note that some of the parks will be more natural spaces and others more urban. Therefore the planting strategy will focus on establishing the majority of plants for Carnaby's in the conservation spaces and the parabolic dune linkage across the site. In addition, primary feeding plants are more suited to the yellow secondary dune sands rather than the calcareous white fore dune sands found at Alkimos. Therefore the planting strategy will focus on establishing the majority of Carnaby trees in the western Neighbourhood and Urban portion of the site.

2.3 Concept design, detailed design and delivery

As each individual park is required is under goes a concept design process that draws on the Vision and Principles document and Landscape Public Realm Master Plan. The concept design is converted into a detailed design including detailed specifications on the location of plants and precise species types. With the City of Wanneroo endorsement, the construction and delivery of the park can commence.

An update on the status of delivery will be provided in the annual compliance report.

3. Planting Schedule

Under the Conditions the streetscape and landscape must replicate greater than 5ha of Carnaby's Black Cockatoo habitat and target 50% of streetscape and landscape for Carnaby's Black Cockatoo habitat. This relates to Conditions 12 a and b of the approval. For the purposes of this plan, the planting schedule has been broken into two categories:

1. Replication of greater than 5ha of Carnaby's Black Cockatoo habitat
2. Target 50% of streetscape and landscaping planting for Carnaby's Black Cockatoo habitat.

3.1 Replicating greater than 5ha

Condition 12 (a) of the approval relates to the replicating greater than 5ha of Carnaby's Black Cockatoo habitat through planned future landscape and streetscape across the development. DOTE and Lend Lease determined the approach to meet this requirement during the finalisation of the approval for the project in May / June 2012. It was determined that this requirement specifically relates to established trees list on the DEC Plants for Carnaby's¹ list using the ratio as follows:

500 trees : 1 ha of habitat

Therefore in order to replicate greater than 5ha of Carnaby's Black Cockatoo habitat, the following ratio will be applied:

2500 trees : 5 ha of habitat

The landscape street hierarchy strategy included in Page 52 of the Landscape and Public Realm Master Plan (AECOM 2012b) delineates the streetscapes at Alkimos Beach. Primary feeding plants are more suited to the yellow secondary dune sands rather than the calcareous white fore dune sands found at Alkimos. Therefore the planting strategy will focus on establishing the majority of plants for Carnaby's in the western Neighbourhood and Urban portion of the site. As such, the earlier precinct has a higher percentage of Carnaby trees as the soil type is more suitable.

Table 2 provides a Precinct by Precinct break down of the Carnaby tree targets (refer to **Appendix D** for map). These targets will be delivered as part of the detailed design of parks and streetscapes in each precinct.

Table 2: Precinct break down of Carnaby tree targets

Precinct	Area (ha)	Carnaby Tree Target
1	49.67	1500
2	50.72	500
3	49.64	500
4	33.19	500
Total		2500 or 5 ha of habitat

For each stage of the development a Plant Schedule is prepared. As the project is only in the preliminary stages of construction, only the planting schedule for the first two stages is available. Future Plant Schedule's will be supplied annually as part of the Annual Compliance Report to track the progress against the tree targets. **Appendix C** includes the Plant Schedule for Stage One and Two Planting. Stage One and Two are both within the Escarpment Village (Precinct One) – refer to the Staging Plan in **Appendix C**.

All future planting schedules and landscape designs will be in accordance with the principles in the PLRP. It is incumbent on the landscape architect AECOM to ensure that planting schedules meet the PLRP requirements. Lend Lease will conduct an

¹ All species on the DEC Plants For Carnaby's List and Birdlife Plants for Carnaby's species list have been included.

audit of tree planting for each stage upon completion and submit the results annually as part of the Annual Compliance Report.

The following table demonstrates the number of trees under the Plants for Carnaby's list schedule for Stage 1 and 2. This is the format expected to be included in the Annual Compliance Report.

Table 3: Trees for Carnabys – April 2013

Botanical Name	Common Name	Locally Native	Plants for Carnabys	Seed Collected	Stage 1	Stage 2	Total	Plants for Carnabys
<i>Agonis flexuosa</i>	WA Peppermint	Y	Y	N	80	0	80	80
<i>Allocasuarina fraseriana</i>	Common Sheoak	Y	N	Y	33	16	49	0
<i>Araucaria columnaris</i>	Cook Island Pine	N	N	N	19	2	21	0
<i>Callitris preissii</i>	Cypress Pine	Y	Y	N	8	0	8	8
<i>Casuarina equisetifolia</i>	Horse Tail Sheoak	Y	N	N	144	0	144	0
<i>Corymbia ficifolia</i>	Red flowering gum	Y	Y	N	0	27	27	27
<i>Corymbia maculata</i>	Spotted gum	Y	Y	N	30	5	35	35
<i>Eucalyptus gomphocephala</i>	Tuart	Y	Y	Y	13	4	17	17
<i>Eucalyptus utilis</i>	Coastal Moort	Y	N	N	19	4	23	0
<i>Ficus macrocarpa</i>	Morton Bay Fig	Y	Y	N	3	0	3	3
<i>Melaleuca lanceolata</i>	Rottneest Island Tea Tree	Y	N	N	24	0	24	0
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark	Y	N	N	22	24	46	0
<i>Morus nigra</i>	Black Mulberry	N	N	N	1	0	1	0
<i>Santalum acuminatum</i>	Native Peach Quandong	Y	N	N	2	0	2	0
<i>Tipuana Tipu</i>	Tipuana	N	Y	N	1	0	1	1
<i>Xanthorrhoea preissii</i>	Grass tree	Y	Y	Y	*	*	*	*
TOTAL:								171
								Or 0.342ha

* Direct Transplant. Numbers to be confirmed

3.2 Target 50% of landscape and streetscape for Carnaby habitat

Condition 12 (b) of the approval states that at least 50% of plantings of trees and shrubs in streetscape and landscape planting must consist of plant species known to be primary feeding plants for Carnaby's Black-Cockatoo. For the purposes of this report, the following table has set a Plants for Carnaby's Target for the parks across South Alkimos. In accordance with the principles set under the Landscape Public Realm Master Plan (**Appendix B**), some parks will be a more active or passive use while others will be for conservation and restoration of habitat. The Plants for Carnaby targets set in **Table 4** have responded accordingly (refer to **Appendix E** for supporting map). Overall the planting across South Alkimos will meet the 50% under Condition 12 (b) of the approval. It is proposed in **Section 4** of this report, that the monitoring and review of this target will be undertaken as part of the Annual report required by Condition 3 of the approval.

Established Carnaby habitat does have a diversity of species including shrubs and trees not considered foraging habitat and not included on the DEC Plants for Carnaby list. As part of this landscape strategy, the project acknowledges that the landscape must provide a diversity of species. In the instance that the existing Plants for Carnaby's list does not provide a great enough diversity of species that are suitable to a coastal environment and endorsed by the City of Wanneroo, Lend Lease will investigate opportunities to include a greater diversity species on that list.

Table 4: Carnaby Planting Targets – April 2013

Stage	Park	Actual Area	Planting area (m2)	Planting area (ha)	Use	Classification	Target	Pro-Rata % based on area ²
1	A	1996	1996	0.1996	Local	Passive Open Space	20%	0.14%
1	B1	16100	4830	0.483	Neighbourhood	Passive Open Space	20%	0.33%
Future	B2		11270	1.127	Neighbourhood	Reflect and Restore - Dune Link	70%	2.71%
Future	C	8110	8110	0.811	Neighbourhood	Reflect and Restore - Dune Link	70%	1.95%
3	D	917	917	0.0917	Local	Passive Open Space	20%	0.06%
4	E	2296	2296	0.2296	Local	Passive Open Space	20%	0.16%
8	F	12687	12687	1.2687	Neighbourhood	Passive Open Space	20%	0.87%
Future	G	2432	2432	0.2432	Local	Natural - Conservation Interface	70%	0.59%
Future	H	44487	4448.7	1	Conservation POS	Natural - Conservation (to plant 2ha across H and I)	70%	2.41%
Future	I	19837	1983.7	1	Conservation POS	Natural - Conservation (to plant 2ha across H and I)	70%	2.41%
Future	J	14496	14496	1.4496	Neighbourhood	Reflect and Restore - Dune Link	70%	3.49%
Future	K	17070	17070	1.707	Neighbourhood	Reflect and Restore - Dune Link	70%	4.11%
Future	L	12232	12232	1.2232	Neighbourhood	Reflect and Restore - Dune Link	70%	2.94%
Future	M	14048	14048	1.4048	Neighbourhood	Reflect and Restore - Dune Link	70%	3.38%
Future	N	3435	3435	0.3435	Neighbourhood	Passive Open Space	20%	0.24%
Future	O	1921	1921	0.1921	Local	Passive Open Space	20%	0.13%
Future	P	10255	10255	1.0255	Neighbourhood	Active Park - Include area of high natural value	50%	1.76%
Future	Q	6418	6418	0.6418	Neighbourhood	Passive Open Space	20%	0.44%
Future	R	11970	11970	1.197	Neighbourhood	Natural - Conservation interface	70%	2.88%
Future	S	20251	20251	2.0251	Neighbourhood	Reflect and Restore - Dune Link	70%	4.87%
Future	T	4635	4635	0.4635	Neighbourhood	Natural - Conservation Interface	70%	1.12%
Future	U	40015	40015	4.0015	Neighbourhood	Active Park - Include area of high natural value	50%	6.88%
Future	Other	8522	8522	0.8522	Local Green Links	Small local green link with some natural planting	20%	0.59%
Future	ROS	411884	41188.4	1	Regional Open Space	To plant 1ha in accordance with Condition 11	70%	2.41%
Ongoing	Road Reserve	509968	50996.8	5.09968	Estimated Road Reserve	Estimated planting of 10% of road reserve area only	50%	8.77%
Total				29 ha			Total %	55.64%

Note that revegetation in Park H, Park I and in the ROS is managed under Condition 10 and 11 of the approval.

² The pro rata percentages in Table 4 are calculated based on the planting area of the park, the target for CBC species within that park divided by the total planting area (29ha). Each park contributes to the overall target of 50% of CBC species in streetscape and landscape.

For example, for the ROS the planting area is 1ha and the target for this area is 70% of CBC species, the pro rata % would equal 1ha by 70% divided by 29ha of planting. This is equal to 2.41%.

4. Monitoring, Reporting and Review

This section relates to Condition 12 c, d, e and g of the approval.

Implementation of the Carnaby Black Cockatoo planting targets in the developable area of Alkimos for pre, during and post construction of the area have been included in **Table 2**. Review of the implementation of this report will be undertaken as part of the compliance review conducted annually as a requirement of Condition 3 of the Approval.

Table 5: Implementation and reporting of targets

Design	Planting	Maintenance	Reporting
Ensuring that greater than 50% of plants within the streetscape are from the DEC Plants for Carnaby's list	Plant in accordance with landscape specifications.	Conduct appropriate maintenance for planting.	Report annually on the planting schedules for completed or tendered stages of works.
Ensuring that at a minimum of 2500 trees are from the DEC Plants for Carnaby's list	Record the location of trees for Carnaby's during the planting phase.	Conduct appropriate maintenance for street trees include recording any stress of plants for Carnaby's such as dieback or lack of water.	Annual assessment of the performance against targets included in Annual Compliance Report.

4.1 Design and planting targets

All future planting schedules and landscape designs for parks will be in accordance with the principles in the PLRP. It is incumbent on the landscape architect AECOM to ensure that planting schedules meet the PLRP requirements.

Due to City of Wanneroo requirements streetscape works in residential streets will be completed at the time of the front yard landscaping by the landscape contractor. In this instance is incumbent on the landscape contractor to ensure that planting schedules meet the PLRP requirements.

Lend Lease will conduct an audit of tree planting for each stage upon completion and submit the results annually as part of the Annual Compliance Report.

4.2 Survival targets

As the planting is primarily in a residential zone the survival targets vary from any revegetation undertaken in a conservation space. Both the streetscape and POS have a higher frequency of maintenance and better access by maintenance staff and facilities. For all planting to occur within parks and streetscape, the survival target is 90%. This is a requirement by the Landscape Contractor LD Total. LD Total is contractually bound to meet the 90% survival target and must at its own cost mitigate (replace) any failed trees. Prior to handover, the landscape contractor must meet all of the specifications within the landscape contract including 90% tree survival to enable practical completion to be issued and final payment for the contracted work.

The survival of planting with the Conservation POS (Park H and I) and the Regional Open Space will be managed through the implementation of the Conservation Area Management Plan and Foreshore Management Plan required by Condition 10 and 11 of the Approval respectively.

4.3 Timeframes for the implementation

It should be noted that high level maintenance of streetscape and public open space will be undertaken during the establishment period - generally the first year. Handover to the City of Wanneroo (CoW) will be undertaken following 2 years. Following handover, maintenance of streetscape and POS will be managed by the CoW. Handover across the site will be staged in accordance with the park and street delivery. All parks and streets are expected to be handed over by the completion of the project. Refer to the staging plan in **Attachment B** for the breakdown of park and street delivery across the Estate.

4.3.1 City of Wanneroo process

For each stage or park a detailed design is submitted to the City of Wanneroo for their review and support. The City of Wanneroo's review assesses the design to ensure it complies with the City's standards and confirm that ultimately the City will be able to manage the area following the required 2 year maintenance period. Following the completion of a park, the City's officers visit the park to ensure it meets the specifications (and therefore agreed Carnaby's Black Cockatoo species agreed during the design assessment). Management of the park in the long term is undertaken by the City.

Once the park is handed over to the City after the required Lend Lease maintenance period, the requirements of the condition for that park are considered complete. The City of Wanneroo accepts no liability for the requirements of the Conditions of Approval and will not report on the ongoing management of the Carnaby species.

For the ROS and Conservation POS, the City of Wanneroo will review and support the State level Foreshore Management Plan and Conservation Area Management Plan. These plans will deliver on the Carnaby targets set in this PLRP and include the federal plans (delivered under Condition 10 and 11 of the approval).

4.4 Restriction on Clearing

Clearing within the 'no clearing area' on attachment C of the approval will not commence until the Management Plans required under Condition 10-12 of the approval are approved. Lend Lease will notify the department within 30 days of clearing commencing within the 'no clearing area' on attachment C of the approval.

4.5 Annual reporting requirements

As discussed the Annual Compliance Report is required as part of Condition 3 of the approval. In accordance with the PLRP the following details are required:

1. Provide an update of any completed or tendered landscape for future stages
2. Report against planting targets
3. Report against survival of landscape

5. Responsibilities and Accountabilities

Condition 12 f relates to the roles and responsibilities of contracts, staff and the person taking the action (being LandCorp and Lend Lease). The following table delineates the roles and accountabilities of the stakeholders involved in the design, delivery and maintenance of the streetscape and landscape.

Stakeholder	Responsibility	Timeframe
LandCorp and Lend Lease	Oversee the implementation of the landscaping in accordance with the targets of the approval	Applicable to the whole Estate
	Report annually against the performance of landscaping against the targets of the approval	Annual reporting – Condition 3
	Ensure that adequate maintenance is undertaken two years following the landscapes completion	Stage by stage, as required
	Coordinate the handover of parks and streets with the City of Wanneroo	Stage by stage, as required
Landscape Architect	Ensure the designs of streetscapes and public open space is in accordance with the requirements of the approval	Applicable to the whole Estate
	Ensure the tender documentation commits to the plants for Carnaby targets in the design	Applicable to all tender documentation
	Keep record of the specific numbers detailed in each tender documentation	Applicable to all tender documentation
	Advise LandCorp and Lend Lease of any modifications to the design or delivery of landscape	If required
Landscape Contractor	Plant in accordance with landscape specifications	Applicable to all landscaping
	During the maintenance period ensure that greater than 90% of species survive	Applicable to all landscaping
City of Wanneroo	The requirements of Condition 12 are met at the handover to the City. Management of the park in the long term is undertaken by the City.	Stage by stage, as required
	Following the maintenance period of the Conservation POS and ROS, the City will manage the conservation space in accordance with the State Coastal Planning Policy (SPP2.6).	When required

Appendix A:
Landscape Vision and Design Principles Document (AECOM 2012a)

Appendix B:
Landscape and Public Realm Master Plan (AECOM 2012b)

Appendix C:
Stage One and Two Planting Schedule

Appendix D:
Precinct by precinct planting targets

Appendix E:
Park letter reference