Health + Wellness Precinct:

- Provide a quiet environment for the practice of Traditional Chinese Medicine, with treatment and short-stay facilities.
- Provide a fitness centre to complement the precinct.

Hotel Precinct:

- Design for a resort-style hotel, with dining and convention facilities, sited to optimise the spectacular overlook to Currambene Creek and the valley corridor.
- Provide guest rooms within the hotel as well as self-contained guest suites sited above the floodplains of Currambene Creek.
- Integrate the hotel sensitively into the topographical features of the site.
- Design for the functional requirements and servicing of the resort hotel.

Information Precinct:

- Provide a Visitor Information Centre and associated parking at the north-eastern entrance to the tourist development from Forest Road, prior to approaching the Temple Sanctuary, Town Centre and Educational Precincts.
- The design of the Information Centre will provide an introduction to the facilities within the site, tourist services and amenities, as well as a place for the hiring of golf buggies as an optional transport mode around the site.
- Provide a cultural information area for the education of visitors to the Shaolin order, the philosophy of the site and its design, Aboriginal cultural appreciation and ecologically sustainable measures implemented within the design of the site.

Heritage/ Former Homestead Precinct:

- Implement an Interpretation Strategy of the archaeological remains of the former Comberton Grange homestead site that showcases the former pastoral land use, and farming and grazing practices of the site.
- Retain the precinct as a viewing area for visitors that overlook the Currambene Creek valley.

Residential Precincts:

- Site residential precincts comprising clusters of dwellings to sensitively integrate with the environmental characteristics of the site (i.e. topography and drainage patterns), minimising on excavation and ground disturbance.
- Design for allotments to cater to a variety of housing types, from large rural allotments to smaller allotments, with potential for townhouses and villas developments.
- Ensure the dominance of landscape coverage over the built form to reinforce the rural ambience of the site.
- Provide adequate bushfire control measures with the incorporation of asset protection zones within the precincts.
- Provide a landscaped network of streets and pathways that encourage vehicular, cycle and pedestrian modes of transport.
- Provide vistas of landscaped corridors comprising groves of indigenous species of trees.
- Establish view corridors to key features of the development.

- Design dwellings with best ecologically sustainable design practices for passive and active design measures to include siting and building orientation, design for thermal comfort, natural ventilation, microclimate control, energy systems, water conservation and management, and energy sufficient fittings and appliances.

Chinese Garden Precinct:

- Develop a Chinese Garden enclosing the existing man-made lake located at the central portion of the site, of traditional design encompassing the classical elements of Chinese garden design of garden enclosure of waterside pavilions and walkways around a small lake, as a place of contemplation, retreat and cultural appreciation.

Agricultural and herbal farms:

- Provide for the agriculture of herbs and vegetables within the site for self-sustainability and education sited to optimise community involvement in cultivation.

Golf course:

- Provide a golf course within the asset protection zone of the northern development area of the site for recreational purposes, as a landscape feature and bushfire buffer zone.

7.6 Description of the Proposed Development

The Concept Application is for a tourist and residential development on the site. The application requests the Minister, under the former s75R of the EP&A Act, to enable the proposed development to be permissible under Shoalhaven LEP. A description of the components of the tourist and residential development is as follows:

7.6.1 Buddhist Temple Sanctuary Precinct

- Precinct area: 44 hectares approx.
- Development area: 72,000m^2 (walled precinct).

The focal area and the main attraction of the development is the Buddhist Temple Sanctuary (Figure 7.3) comprising a traditional Chinese temple layout (Figure 7.4) and architectural design and elements (Figures 7.5-7.8). It will be the first temple built outside China utilising Chinese traditional design and construction methods, using centuries' old methods of construction, being tongue and groove without the use of nails.

The Temple Sanctuary Precinct is sited within the former pine plantation with the Temple complex sited in an elevated position along a ridge line along the central portion of this site, bordered by the tributaries and riparian corridors of Georges Creek to the north-east, south-east and south-west, and by the proposed ring-road from the north-west to the south-east.

The Temple complex, surrounded by fortress walls above an embankment, is oriented with its rear to Mount Cambewarra (west of north) and its entry towards Jervis Bay (east of south). The design of the Temple complex is of traditional temple layout (200m x 360m), design and architectural style, comprising prayer and meditation halls (the main hall accommodating 330 people), library, dining hall and residential accommodation for initially 30, and up to 50, monks-in-residence, arranged around a series of courtyards. Several of the main temple buildings exceed 13m in height.

The Temple complex is designed as a quiet, contemplative precinct sited within landscaped setting of indigenous forest, evoking the Chinese meaning of Shaolin. A pagoda, up to 6 storeys in height, is sited to the rear of the complex. A pagoda forest of will be sited within this precinct.

The Temple Sanctuary is accessed from the main ring-road. A coach and visitor drop-off area is located at the entrance to the Temple Sanctuary. Off-street surface parking for approximately 176 vehicles and 6 coaches are located opposite the entrance to the temple, screened from the roadway and entry by groves of trees.

The urban design of the proposed buildings, their overall layout and architectural character are described in Section 7.16.1 of this report.

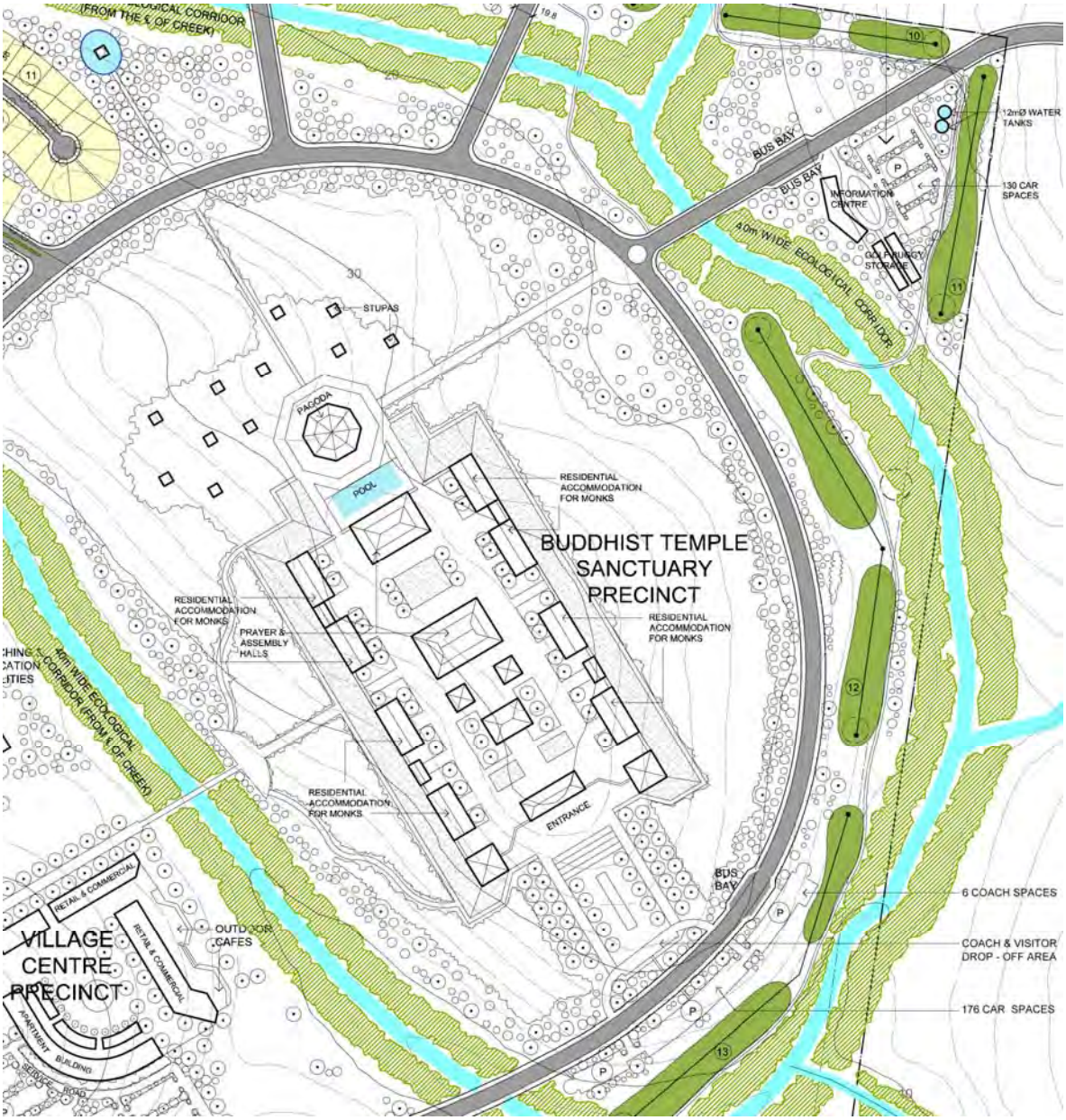

Figure 7.3: Buddhist Temple Sanctuary Precinct

Figure 7.4: Illustrative perspective of a Shaolin Temple Sanctuary

Figure 7.5: Main entrance – Shaolin Temple, Hunan, PRC

Figure 7.6: Pagoda forest, Hunan, PRC

Figure 7.7: Temple Sanctuary courtyard, Hunan, PRC

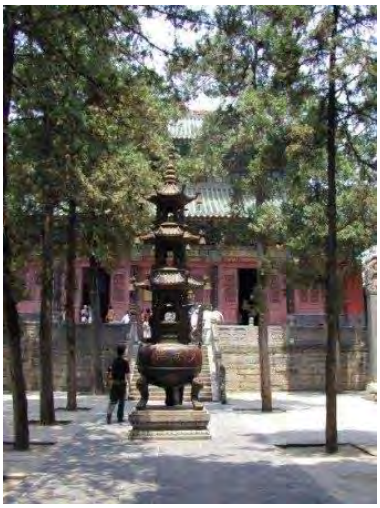

Figure 7.8: Sanctuary courtyard

To the south-west of the Buddhist Temple Sanctuary Precinct are the Shaolin Town Centre, Educational and Health & Wellness Precincts. These precincts form the core and focal attractions of the Shaolin tourist development. These precincts are independently contained by the tributaries of Georges Creek and by an encircling ring road which links via a new entry road (to the north-east) to Forest Road.

7.6.2 Education Precinct – Martial Arts Training Centre/ Kung-Fu Academy

- Precinct area: 5.3 hectares approx.
- Development area: 12,000m^2 approx.
- Maximum height: 2 storeys.

The Kung-Fu Academy is sited within the former pine plantation, west of the Temple Sanctuary, with entry to the facility from the main ring-road (Figure 7.9). The Educational Precinct is flanked by the tributaries and riparian corridors of Georges Creek (to the north-east and south) and the main ring-road to the west. The Educational Precinct is accessed directly from the main ring-road, with pedestrian access is provided from this precinct to the Shaolin Village Centre.

The **Kung-Fu Academy**, an educational and martial arts training facility run by the Shaolin (Figure 7.10), comprises a series of educational and accommodation precincts of 2 storey buildings encircling intimate courtyards. Facilities include classrooms, gymnasium, library, refectory, academic and administrative offices, as well as residential accommodation for initially 150 students and 15 staff, expanding up to 300 students and 30 staff.

A sports field, sized for soccer, within an amphitheatre configuration, will be used for outdoor sports as well as martial arts demonstrations and traditional theatre.

Off-street surface parking areas will be located within the Precinct, with approximately 56 car spaces near the facility and 70 car spaces to support the Sports Field.

Figure 7.9: Educational Precinct


Figure 7.10: Martial arts students

The school will have a religious flavour and offer a pastoral direction of belief, behaviour and discipline, with strong emphasis on martial arts as sport. It is anticipated that there will be ultimate accreditation with the Department of Education as a private school, similar to the Independent Schools in NSW. It is anticipated that 80% of these students will come from China to learn English and gain an education, for future settlement.

The facility will additionally offer holiday programs, as holiday camps for school children to learn about martial arts, or to external organisations for recreational purposes.

The urban design of the proposed buildings, their overall layout and architectural character are described in Section 7.16.2 of this report.

7.6.3 Village Centre Precinct

- Precinct area: 8 hectares approx.
- Development area: Initially 5,000m^2 GFA developing up to 20,000m^2.
- Maximum height: 2 storeys for commercial/ retail precinct, additional 4 storeys for multi-unit residential flat building above.
  Convention Centre – maximum 3 storeys.

The Village Centre is located south-west of the Temple Sanctuary Precinct with access directly from the main ring-road (Figure 7.13).

The Village Centre Precinct is located at the heart of the development to serve the local needs of the tourist and residential community. The precinct comprises a cluster of buildings enclosing public domain areas of a central landscaped urban plaza and pedestrian streets, with active frontages of retail, food outlets, commercial, cultural and community services facilities. The precinct will cater for extensive outdoor eating, passive recreation and displays within its public domain areas (Figures 7.11 and 7.12).

It is anticipated that 50% of commercial tenants will be from outside residential precincts. The development will be tourist oriented, with an Asian flavour of arts, crafts and herbal

outlets, but with convenient stores such as chemists, bakery, fast-food, small supermarket, etc. to cater for the residents of and visitors to the development.

A Convention Centre for 300 people is proposed within this precinct.

Required patrons and staff parking and servicing areas for the facilities will be located within the precinct, with approximately 358 off-street surface parking spaces.

A multi-unit residential flat building for serviced apartments is proposed on the southern side of the Village Centre, comprising up to 4 storeys above retail and commercial uses. These apartments are anticipated to be occupied by overseas and regional visitors wishing to stay from a week to up to 3 months. Residential uses within the retail/ commercial precinct will ensure that there will be a development density and a mix of day and evening activities within the precinct.

Residential parking will be located within the basement levels of the building.

Pedestrian linkages is provided from this precinct to the Temple Sanctuary (to its north-east) and to the Health + Wellness and Educational Precincts (to its north-west).

Figure 7.11: Village Centre Precinct – public domain

Figure 7.12: Village Centre Precinct – alfresco dining

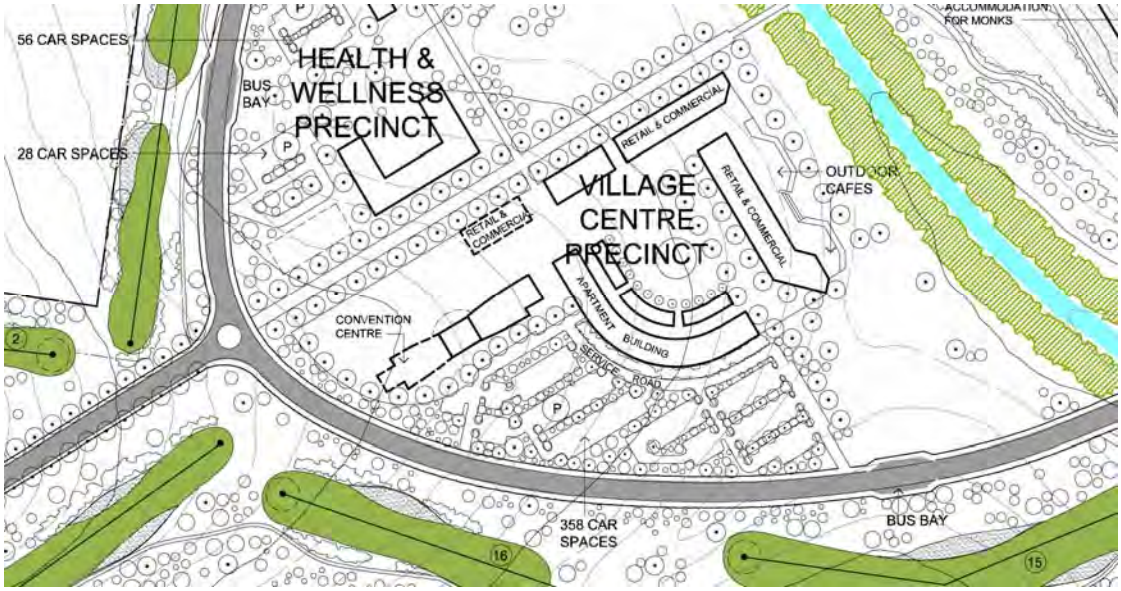

Figure 7.13: Village Centre and Health + Wellness Precincts

The urban design of the proposed buildings, their overall layout and architectural character are described in Section 7.16.3 of this report.

7.6.4 Health + Wellness Precinct

- Precinct area: 2.3 hectares approx.
- Development area: Initially 6,000m^2 GFA, developing up to 10,000m^2 GFA approx.
- Maximum height: 2 storeys

A Traditional Chinese Medicine (TCM) Centre, for the practice of traditional Chinese medicine, naturopathy and herbal practices and acupuncture procedures, is located adjacent to the Shaolin Village Centre Precinct, sited within a tranquil setting (Figure 7.13). The facility will operate like a normal medical centre accommodating short stay treatments and physical wellness with consultation and treatment rooms, recovery rooms, waiting areas and administrative offices. The facility may implement programs of wellness to up to a week's duration.

Approximately 28 off-street surface parking spaces for staff and patrons of the facility will be located within the precinct.

The urban design of the proposed buildings, their overall layout and architectural character are described in Section 7.16.4 of this report.

7.6.5 Hotel Precinct

- Precinct area: 13.4 hectares approx.
- Development area: 100 rooms initially (including cabins), with max. 250 rooms
- Maximum height: 3 storeys

The Hotel Precinct is located within the south-western portion of the site, within the area of cleared land overlooking Currambene Creek, close to the proposed road extension to Comberton Grange Road (Figure 7.14).

Within the Hotel Precinct will be a 4 star hotel, with an initial development of 100 rooms, inclusive of self-contained cabins. The hotel will expand up to 250 rooms with additional dining facility for 100 patrons. The Hotel will be up to 3 storeys in height from the road and up to 3 storeys in overall height, gently sloping towards the lower slopes of Currambene Creek. The character of the hotel is illustrated in Figures 7.15-7.17.

The Hotel will accommodate the public visiting the tourist facility, with dining/ café and convention facilities, and associated accommodation for its staff, comprising:

- Restaurant for 200 patrons;
- Café for 100 patrons; and
- Meeting rooms for 60 and 150 people.

The Hotel will have an entrance court for vehicles and coaches, with approximately 130 off-street surface parking spaces adjacent to the site, as well as a level of below entry parking for patrons and staff.

Self-contained tourist cabins for up to 6 people (average 4) will be sited on the southern slopes of the Hotel Precinct within a landscaped setting, overlooking Currambene Creek (Figure 7.16). The cabins will be linked by a 3m wide roadway traversed only by golf buggies.

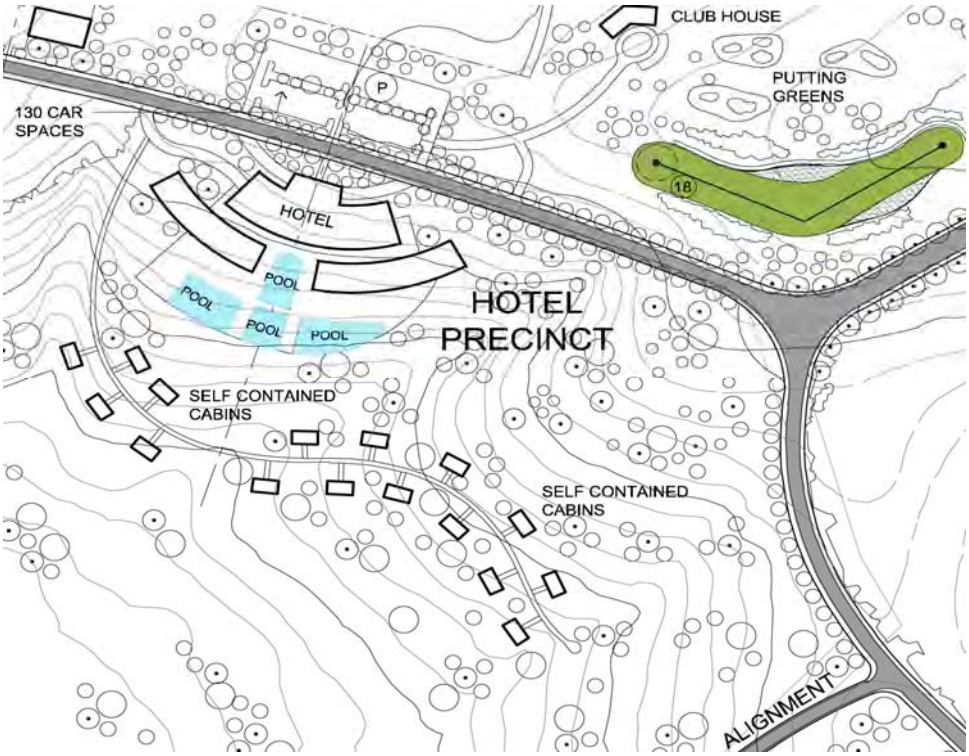

Figure 7.14: Hotel Precinct

Figure 7.15: Hotel interiors style

Figure 7.16: Tourist cabins integrated into the hillside below Hotel

Figure 7.17: Eco camping cabins

Additionally, the site may accommodate ecological tents in select areas within the Hotel Precinct and around the existing lake within the Chinese Garden Precinct (Figure 7.17).

The urban design of the proposed buildings, their overall layout and architectural character are described in Section 7.16.5 of this report.

7.6.6 Information Precinct

- Precinct area: 2.26 hectares approx.
- Development area: Up to 1,000m^2 GFA approx.
- Maximum height: 1 storey

A Visitor Information Centre will be located within the Information Precinct near the Forest Road entrance to the tourist development (Figure 7.18). The Information Centre will provide information about the site facilities and the Shaolin Order as well as tourist amenities and administration offices. There is potential for a small museum for cultural information and displays to be located within the centre.

A large car parking area, for approximately 130 cars, is sited within this precinct with the availability of small golf carts/ buggies for use within the site. A bus bay for two buses/ coaches will be accommodated at the precinct, along the entry road to the site.

The urban design of the proposed buildings, their overall layout and architectural character are described in Section 7.16.6 of this report.

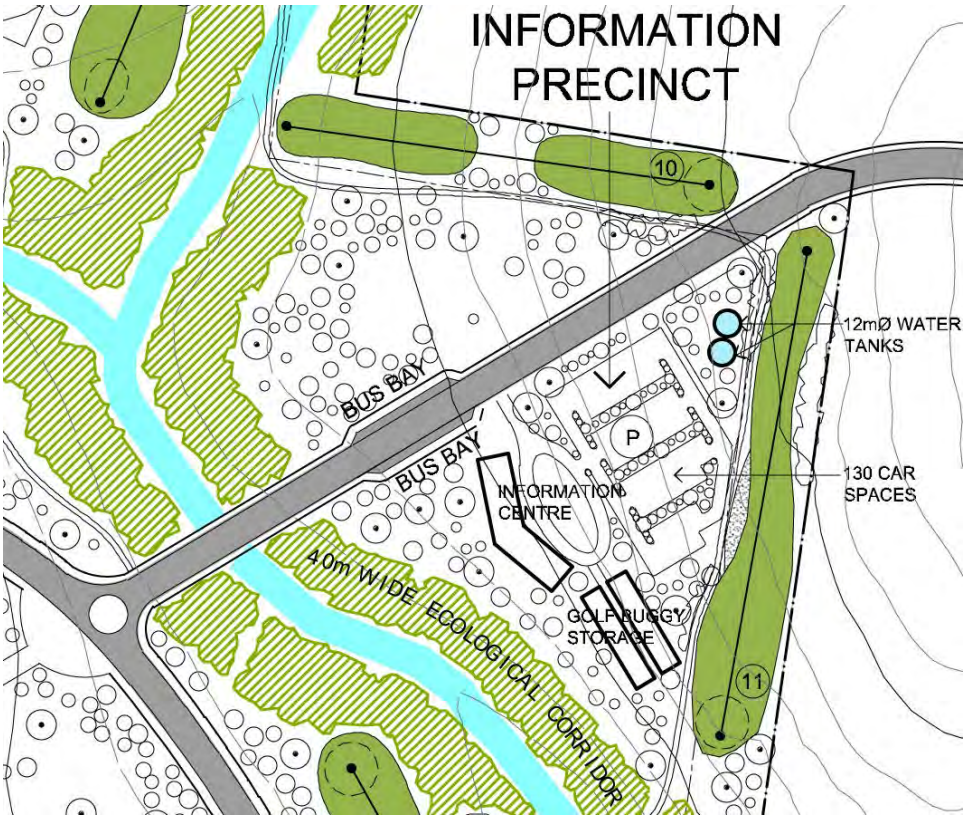

Figure 7.18: Information Precinct

7.6.7 Heritage/ Former Homestead Precinct

A Heritage Precinct (Figure 7.19) will be ostensibly left unoccupied with remnants of the footprint of the former homestead, sheds and stockyards. The Heritage Precinct will be retained as a viewing area/ lookout for visitors of the pastoral landscape. This precinct is identified as having both Aboriginal and European heritage value and will incorporate an Interpretation Strategy for the archaeological remains of these pastoral uses.

The road provides a turning area for coaches at the entrance to this precinct. Off-street surface parking for approximately 24 cars is located adjacent to the roadway.

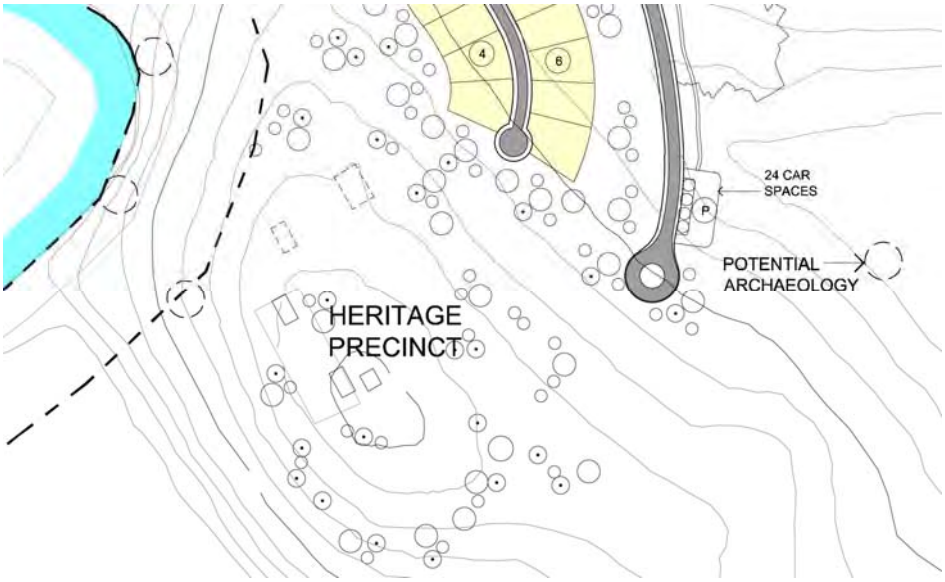

Figure 7.19: Heritage/ Former Homestead Precinct

7.6.8 Residential Precincts

300 residences will be provided within several precincts of Comberton Grange, at:

- Northern portion of the former pine plantation, north of the Temple Sanctuary (**Residential Precinct A**);
- Western portion of the former pine plantation, north-west of the Temple Sanctuary (**Residential Precinct B**);
- South-western portion of the site within the cleared land of the site above Currambene Creek (**Residential Precinct C**).

Residential Precinct D will comprise a multi-unit residential development with serviced apartments for tourist purposes.

Dwellings within Residential Precincts A, B & C will comprise a range of housing typologies of:

- Detached dwellings on medium-sized allotments (approx.760m^2) – A & B; and
- Detached dwellings on large allotments (approx. 1500m^2) – C.

The residential precincts of detached dwellings are sited sensitively on the perimeter of the tourist development, with its overall design and siting to reflect the spiritual and aesthetic character of the development. These dwellings are self-contained for permanent occupancy, with a significant proportion designed to be adaptable.

Residential Precinct A

- Numbers of allotments: 173 allotments
- Lot sizes: 760m^2 approx. (20m wide x 38m deep)
- Maximum dwelling height: 2 storeys

Residential Precinct A (Figure 7.20) is sited at the northern portion of the Comberton Grange site within the former pine plantation. The Precinct accommodates detached dwellings on medium sized allotments and is sited within an area of the site with low potential visual sensitivity and low visual impact. The Precinct is accessed from the main ring-road via a series of local streets.

Figure 7.20: Residential Precinct A

The Precinct is sited on gentle slopes falling from north to south and south-east. The allotments are orientated north-south, sloped with views to the riparian corridors of the Georges Creek tributaries. Allotments are setback from the northern and western site boundaries of this portion of the site by an average of 50m to provide an asset protection zone (APZ) for bushfire protection, with a golf course located within the APZs. Trees and shrubs surrounding the fairways will be planted in accordance with *Planning for Bush Fire Protection* (2006). The rear boundary of the southern allotments fronting Georges Creek will be sited at least 62m from the centre line of the creek to provide an APZ, a flood protection zone and an ecological corridor (of 40m) for existing Swamp Mahogany Forest located along these creeklines and tributaries. Planting within the APZ will be in accordance with bushfire protection requirements. A 40m ecological corridor will also be created along the Georges Creek tributary east of the precinct.

Dwelling allotments are sited within open space corridors (approximately 24m wide) which traverse the precinct, providing parkland settings for the dwellings and recreational areas for its residents. These corridors will be informally planted with clusters of trees indigenous to the area, intermixed between community gardens and agricultural farms.

The architectural style of the dwellings should be of contemporary design and designed and serviced to be ecologically sustainable (Figures 7.22 & 7.23).

Residential Precinct B

- Numbers of allotments: 49 allotments
- Lot sizes: 760m^2 approx. (20m wide x 38m deep)
- Maximum dwelling height: 2 storeys

Residential Precinct B (Figure 7.21) is located at the north-western portion of the Comberton Grange former pine plantation site. The Precinct accommodates detached dwellings on medium sized allotments and is sited within an area of the site with low potential visual sensitivity and low visual impact. The Precinct is accessed from the main ring-road via a series of local streets.

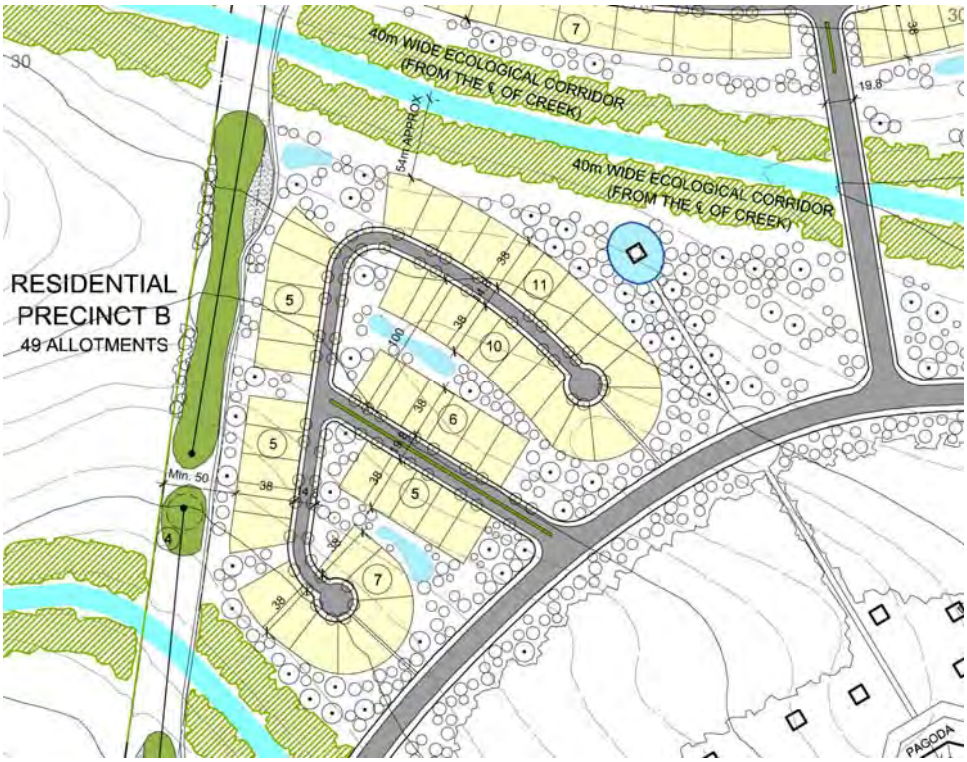

Figure 7.21: Residential Precinct B

The Precinct is sited on gentle slopes falling northwards and southwards from the ridge line on which the Temple Sanctuary is sited. The allotments are oriented north-south with views to the riparian corridors of the Georges Creek tributaries. Allotments are set back from the western site boundary by an average of 50m to provide an APZ for bushfire protection, with a golf course is located within the APZ. Trees and shrubs surrounding the fairways will be planted in accordance with *Planning for Bush Fire Protection* (2006). Allotments on the northern and southern side of the precinct

fronting Georges Creek are set back at least 62m from the centre line of the creek to provide an APZ, a flood protection zone and an ecological corridor (of 40m) for existing Swamp Mahogany Forest located along these creeklines.

Open space corridors run between dwellings (approximately 20-24m wide) providing parkland settings for the dwellings and recreational areas for its residents. The precinct is set back approximately 20m from the ring-road. These corridors will be informally planted with clusters of trees indigenous to the area.

The architectural style of the dwellings should be of contemporary design and designed and serviced to be ecologically sustainable (Figures 7.22 & 7.23). Additionally, allotments may be divided into smaller allotments for housing typologies such as attached and semi-attached dwellings.

Figure 7.22: Detached residential typologies in Residential Precincts A & B

Figure 7.23: Zen designed residential interiors

The urban design of the proposed buildings in Residential Precincts A and B, their overall layout and architectural character are described in Section 7.16.8 of this report.

Residential Precinct C

- Number of allotments: 78 allotments
- Lot sizes: 1,500m^2 approx. (30m wide x 50m deep)
- Maximum dwelling height: 2 storeys

Residential Precinct C (Figure 7.24) is sited on the higher slopes of the cleared area overlooking Currambene Creek, within a zone of very high potential visual sensitivity and is highly visible from areas south of Currambene Creek. The dwellings are sited within the backdrop of natural, densely forested area directly to its north.

Residential Precinct C accommodates detached dwellings on large allotments, within clusters of hamlets, sited clear of existing natural watercourses and drainage lines, sited to follow the slope of the land with minimal excavation. Dwellings are orientated to view the Currambene Creek valley, sited on wide allotments to enable clusters of trees to be dispersed within each allotment and to maximise privacy for each residence. Trees are to be planted around the dwellings, to screen from visual impact, but in copses in accordance with *Planning for Bush Fire Protection* (2006).

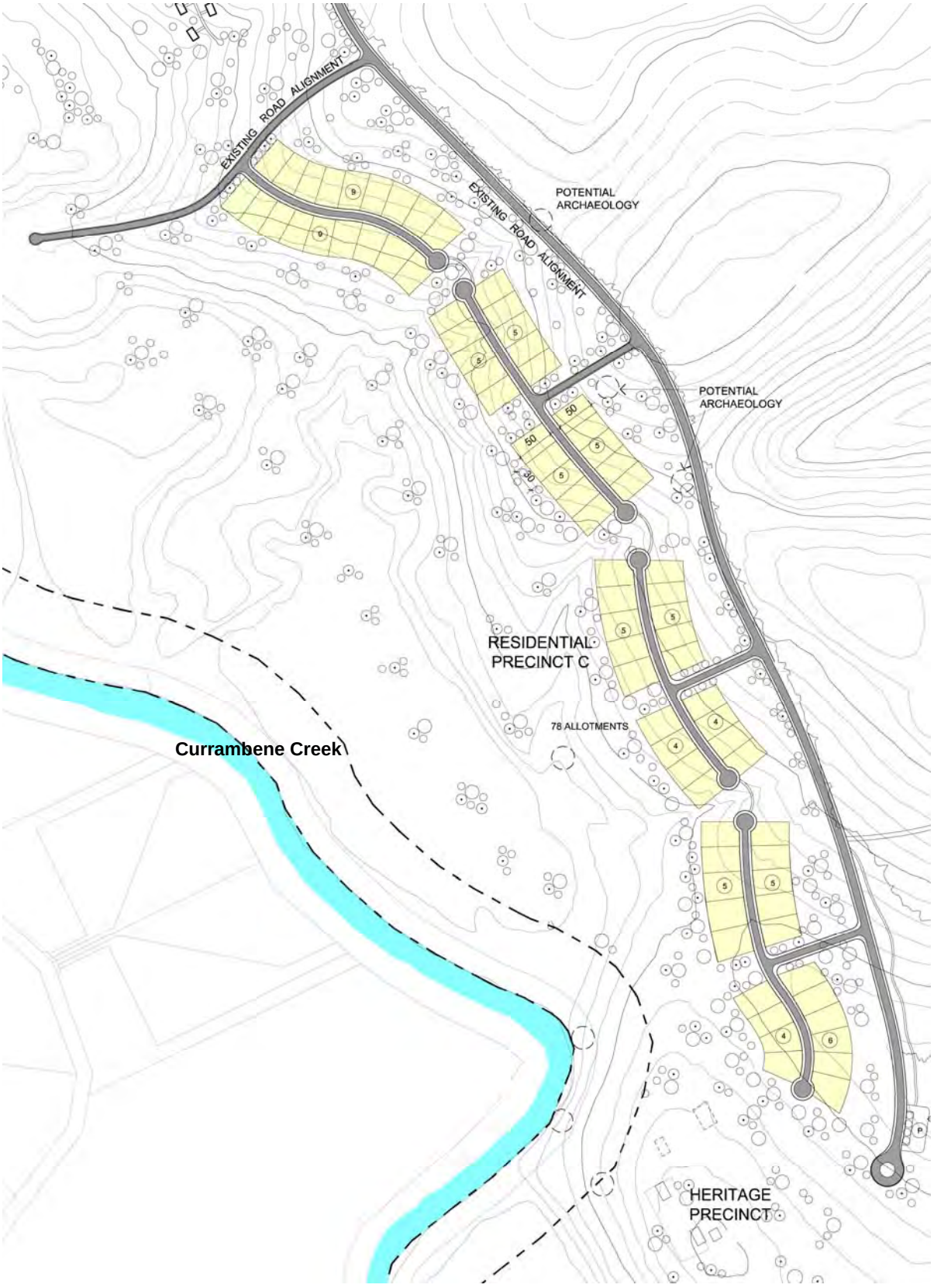

Figure 7.24: Residential Precinct C

The Precinct is accessed from a new internal road which links to the existing unformed Comberton Grange Road at the western portion of the site to the former Comberton Grange homestead site towards the south-east of the site.

The architectural style of the dwellings should be of contemporary design, sensitively sited so as to integrate with the surrounding landscape and with the slope of the land (Figure 7.25).

The urban design of the proposed buildings in Residential Precinct C, their overall layout and architectural character are described in Section 7.16.9 of this report.

Figure 7.25: Dwelling typologies with building form and external colours and finishes to blend into the background landscape

Residential Precinct D

- Numbers of dwellings: To future determination.
- Maximum height: maximum 4 storeys above retail-commercial development

Residential Precinct D (Figure 7.26) will comprise a multi-unit residential apartment within the Village Centre Precinct accommodating single, two and three bedroom serviced apartments for tourist purposes, accommodating families and those wishing to stay within Comberton Grange for retreat, tourist or health purposes on a weekly to monthly duration. A large proportion of dwelling units will be designed with universal housing design guidelines.

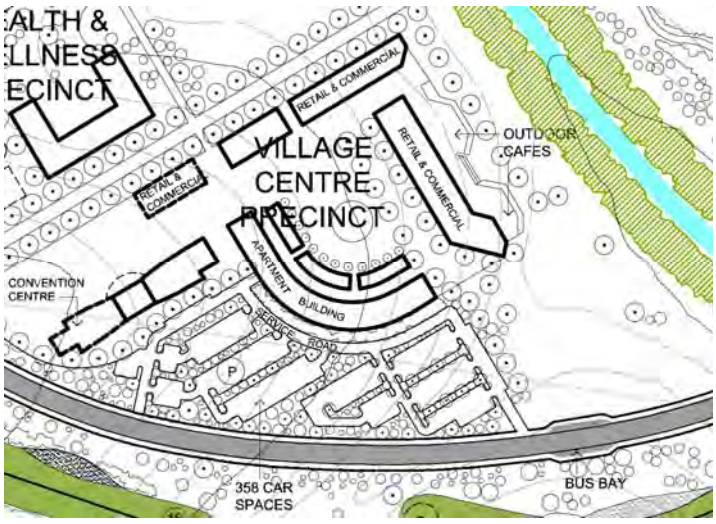

Figure 7.26: Residential Precinct D within Village Centre Precinct

7.6.9 Chinese Garden Precinct

This precinct has an existing man-made lake (Figure 7.28). A traditional Chinese garden is proposed to encircle the existing lake near the quarry, with gardens, pavilions and walkways to provide a precinct for quiet contemplation (Figure 7.29). A Chinese pagoda, with viewing tower, will be sited to align with the axis of the Temple (Figure 7.30).

This precinct (Figure 7.27) is accessed from Forest Road as well as a vehicular roadway from the main ring-road within the Comberton Grange site. Parking areas will be discretely located within this precinct.

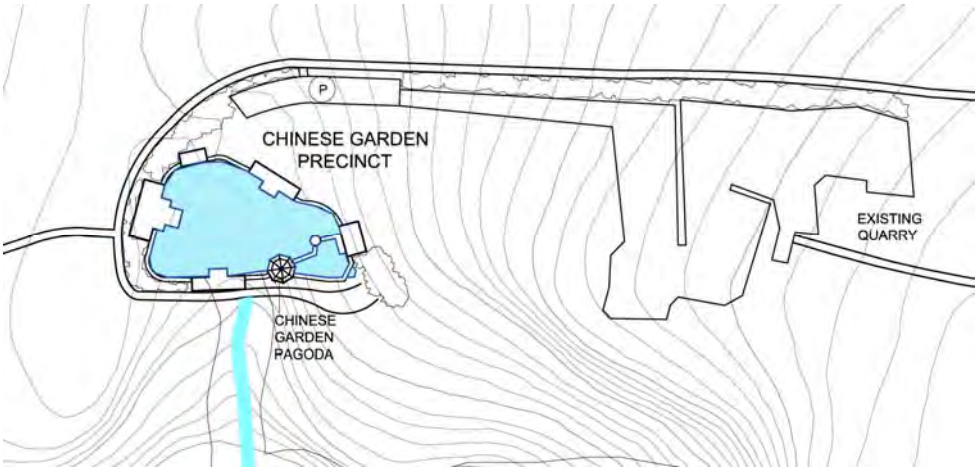

Figure 7.27: Chinese Garden Precinct

Figure 7.28: Views of existing dam near quarry

Figure 7.29: Transformation into a traditional Chinese garden encircling the lake

Figure 7.30: Traditional Chinese pagoda to mark the Temple axis and a viewing tower

7.6.10 Golf course and Clubhouse

- Development area (Clubhouse): Up to 300m^2 GFA approx.
- Maximum height: 1 storey

An 18 hole golf course is proposed within the site (Figure 7.31). The golf course will commence near the Hotel Precinct, traversing along the western side of the "axial" road leading to the former Pine Plantation site. The golf course will be sited along the perimeter of the former pine plantation land, predominantly within the asset protection zone, bordering this portion of the site. The course will traverse along the eastern side of the "axial" road to return near the Hotel Precinct.

The golf course (Figure 7.32) will be of international standard comprising:

- 4 x 3 pars (up to 210-250m);
- 9 x 4 pars (250-470m); and
- 5 x 5 pars (471-690m).

A Clubhouse, up to 300m^2 in area, will be sited east of the Hotel Precinct. The Clubhouse will have adjacent parking for golf buggies and cars. Adjacent to the Clubhouse will be a driving range and putting greens.

The golf course will utilise ESD measures in the construction, management and maintenance of the course which will include:

- Use of drought resistant plants and indigenous trees, planted in accordance with APZ requirements;
- Use of recycled water for irrigation;
- Construction of dams near the course for water storage; and
- Bioremediation filters and drainage swales to prevent fertilizers from entering surrounding natural watercourses.

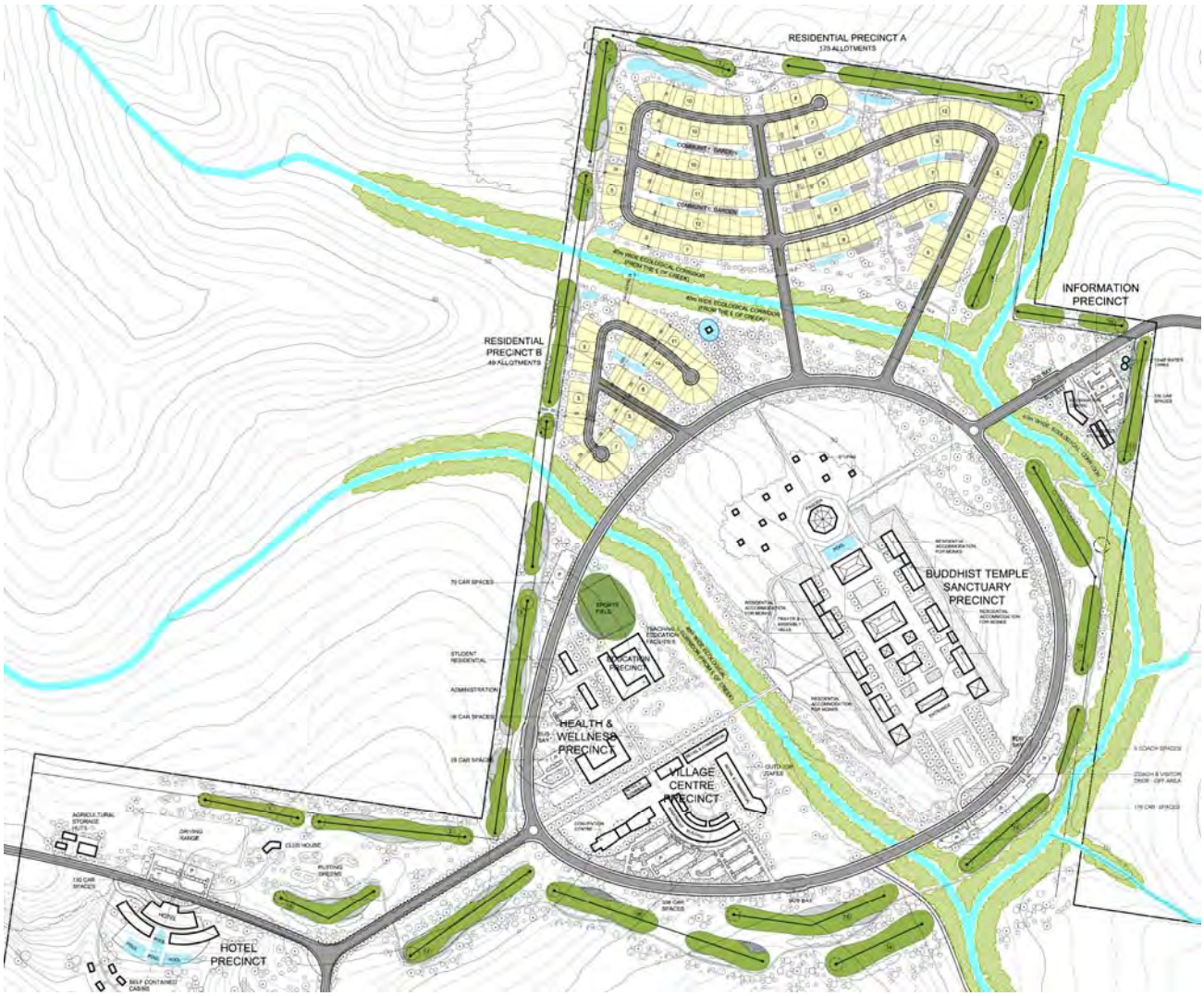

Figure 7.31: Golf course

Figure 7.32: Golf course images

7.6.11 Agricultural and herbal farms

Community gardens of agricultural and herbal farms will be located within the:

- open space corridors of Residential Precincts A & B of the site;
- residual open space areas within the northern portion of the site;
- open space directly north of the agricultural storage huts near Comberton Grange Road entrance; and
- on the upper slopes of Currambene Creek not impacted by archaeologically sensitive areas, east of the Hotel Precinct.

These farms are to be tendered by the monks, hired gardeners and residents.

Huts for the storage of agricultural products are proposed near the Comberton Grange Road entrance, north-west of the Hotel Precinct.

7.6.12 Future land uses

To increase the potential employment benefits to the Shoalhaven region and to augment the tourism purpose of this development, as identified the *South Coast Regional Strategy*, future land uses for the site may include:

- Film and media production facilities, particularly in the genre of Kung-Fu movies;
- Artists and graphic production studios to augment these facilities; and
- Seniors' housing – in line with the Shaolin's practice of benevolence and well-being.

For desired urban form and detailed design guidelines/ controls for each development precinct, refer to Section 7.13: *Urban Design, Layout, Building Form and Future Character*.

7.6.13 Development Summary

The proposed development facilities, areas staging of development, and staffing are summarised as follows:

Precinct	**Area (approx.) (GFA)**	**Stage 1**	**Maximum Development** (inclusive of Stage 1)
Buddhist Sanctuary Precinct	44 hectares		
▪ Monks-in-residence (located within the Temple Precinct)	72,000m^2 (200m x 360m excluding Pagoda)	30 people/ staff)	50 people/ staff
▪ Prayer Hall		330 seats	330 seats
Educational Precinct	5.3 hectares		
▪ Educational & residential buildings ▪ (Students-in-residence)	12,000m^2 (2 storeys)	150 students	300 students
▪ Staff (in residence – 6 people)		15 people	30 staff
▪ Sports field (+ exhibition demonstrations)	100m x 70m (min)		
Village Centre Precinct (7.6.3)	8 hectares		
▪ Retail/ commercial/ dining spaces	5,000m^2 initially & up to 20,000m^2	100 staff	400 staff
▪ Residential Precinct D – serviced apartments	10,000m^2 max.		10,000m^2 max.

Precinct	Area (approx.) (GFA)	Stage 1	Maximum Development (inclusive of Stage 1)
▪ Convention Centre		300 people	600 people
▪ Amphitheatre (within public domain)			
Wellness Precinct (7.6.4)	2.3 hectares		
▪ Clinics for traditional Chinese medicine practitioners, treatment areas	6,000m^2 initially & up to 10,000m^2	20 staff & practitioners	50 staff & practitioners
Hotel Precinct (7.6.5)	13.4 hectares		
▪ Accommodation		100 rooms (200 person capacity)	250 rooms (500 person capacity)
		12 staff	30 staff
▪ Restaurant		100 patrons	200 patrons
		8 staff	20 staff
▪ Café		50 patrons	100 patrons
		4 staff	8 staff
▪ Convention areas with meeting rooms for 60 & 150 people		Shared with above or temporary staff	Shared with above or temporary staff
Information Precinct (7.6.6)	2 hectares		
▪ Information Centre, Museum, Administration & golf cart hire facilities	1,000m^2	4-6 staff	4-6 staff
Heritage Precinct (7.6.7)			
Residential Precincts A, B & C (7.6.8)	56.65 hectares		
▪ Dwellings		100 dwellings	300 dwellings
Recreation			
▪ Clubhouse (for golfers) (7.6.10)	Up to 300m^2	3 staff	3 staff
▪ Golf course (7.6.10)	18 holes	Maintenance as above	
▪ Chinese garden complex (7.6.9)			
Agricultural (7.6.11)			
▪ Agricultural huts (storage) ▪ Agricultural & herbal farms	Up to 1,000m^2	6 staff	10 staff

7.7 Site Access and Movement

A hierarchy of internal roads is provided through the development area, linking from Princes Highway to:

- Forest Road (from the north-east of the site) and;
- Comberton Grange Road (from the west of the site).

7.7.1 Princes Highway

Princes Highway, between Forest Road and has been upgraded from Forest Road to Jervis Bay Road (to the south), to 4 lanes dual carriageway, with the duplication of the two-lane bridge over Currambene Creek. Additional upgrades include Highway

intersections at Comberton Grange Road, Parma Road and Falls Road, including U-turn facilities at Forest Road, Comberton Grange Road and Parma Road to allow landowners directly fronting the Highway to have safe access in all directions.

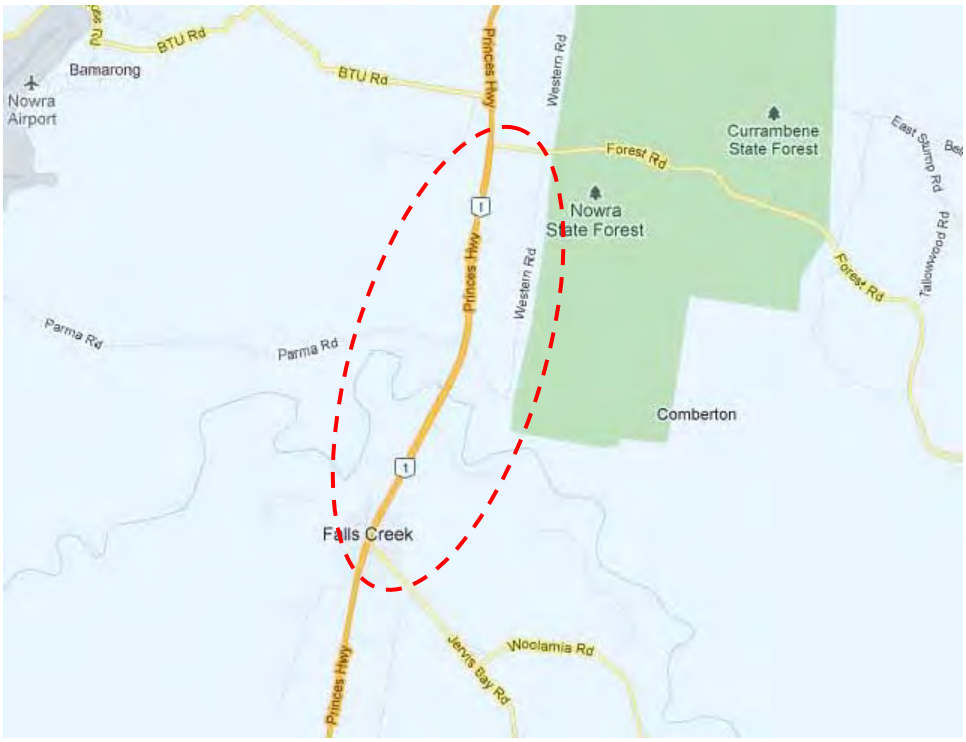

Figure 7.33: Princes Highway upgrade by RTA

7.7.2 Northern access road

The primary entrance to the proposed development is from Forest Road, along the alignment of Charcoal Road (East). This proposed alignment is supported by Forest NSW and Shoalhaven City Council. Proceedings for land acquisition for Charcoal Road and land in Forest Road to facilitate a safe intersection are being undertaken between the above authorities, with this process anticipated to be completed within 6 months.

Forest Road has been upgraded and is sealed for its full length. The RTA has, in the last few years, constructed seagull treatment at the intersection of Forest Road with Princes Highway to improve the safety of right turn exit from Forest Road to the Highway. RTA will additionally realign BTU Road to the north and construct seagull junctions at this intersection with Princes Highway.

From this eastern entrance at the northern portion of the site, the entry road to the development is aligned along the axis of the Temple Pagoda, which provides on entry, a direct view to the Pagoda. The traffic consultant recommends a 2 lane sealed carriageway with the minimum width of 6.7m with 1m wide sealed and 1m gravel shoulders. The recommended sign-posted speed limit on this road in a rural environment should be a maximum of 80km/hour.[21]

[21] Lyle Marshall & Associates Pty Ltd, *Traffic Impact Assessment for Proposed Shaolin Tourist & Residential Devlopment, Comberton Grange, S. Nowra, NSW* (2012).

At the intersection of the Northern Access Road with Forest road, a well-designed roundabout is recommended by the traffic consultant as the safest form of intersection control, with lighting required for driver safety.

A ring-road encircles the Buddhist Temple Sanctuary, Village Centre, Wellness and Educational Precincts, with these precincts accessed from this ring-road. Recommended vehicular speed is 50km/hour limit along this road.

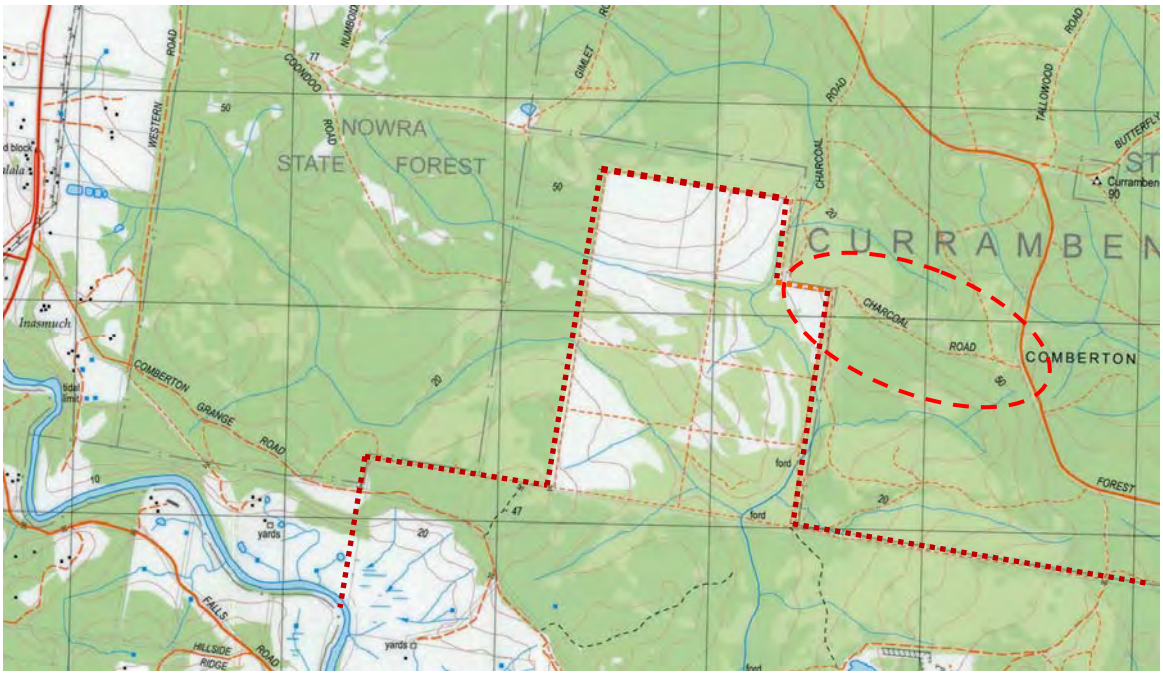

Figure 7.34: Approved preferred road access from Forest Road via existing Charcoal Road (unformed)

7.7.3 Comberton Grange Road access

Comberton Grange Road provides a secondary, emergency access into the site. An existing vehicular track leads from Comberton Grange Road to the former homestead and outbuildings on the north-eastern slopes of Currambene Creek. The track is a dirt track of approximately 3-4m in width located on the upper slopes overlooking the Creek. The track is proposed be retained, upgraded and sealed to form an internal access road to residential allotments and facilities located at the southern portion of the site.

Based on Council's discussions with properties at Comberton Grange Road, to mitigate adverse impacts on existing residents by traffic use from the Comberton Grange development, access via Comberton Grange Road will be restricted to emergency use.

At the intersection of Comberton Grange Road and Princes Highway is left in/ left out at the Highway, with right turn into Comberton Grange Road constructed by the RTA as part of their road safety works.

The Hotel Precinct is located adjacent to the Comberton Grange Road extension into the site. From the Comberton Grange Road extension, the road connects to the ring-road encircling the Temple Sanctuary, Village Centre and Kung-Fu Academy Precincts. This road aligns with the axis of the Main Hall of the Temple Sanctuary and with the main access route into the Village Centre Precinct (to the north-east), and with the entry forecourt of the Hotel Precinct (to the south-west).

7.7.4 Internal road network

A hierarchical network of roads and streets is proposed for the site. This comprises the:

- **The main ring-road system (Type A)** – 18m wide, two way, road reserve, with:
  - 4.5m wide vehicular carriageway in each direction (totalling 9m wide carriageway). (SCC DCP 10 recommends 7-9m for local distributer road);
  - 1m wide low landscaped strip at each side of the roadway;
  - 2m wide shared cycle and buggy lane on each side of the roadway; and
  - 1.5m wide pedestrian footpath on each side of the roadway.

  Along each side of the road reserve will be bio-retention swales and an informal landscape of existing/ indigenous trees.

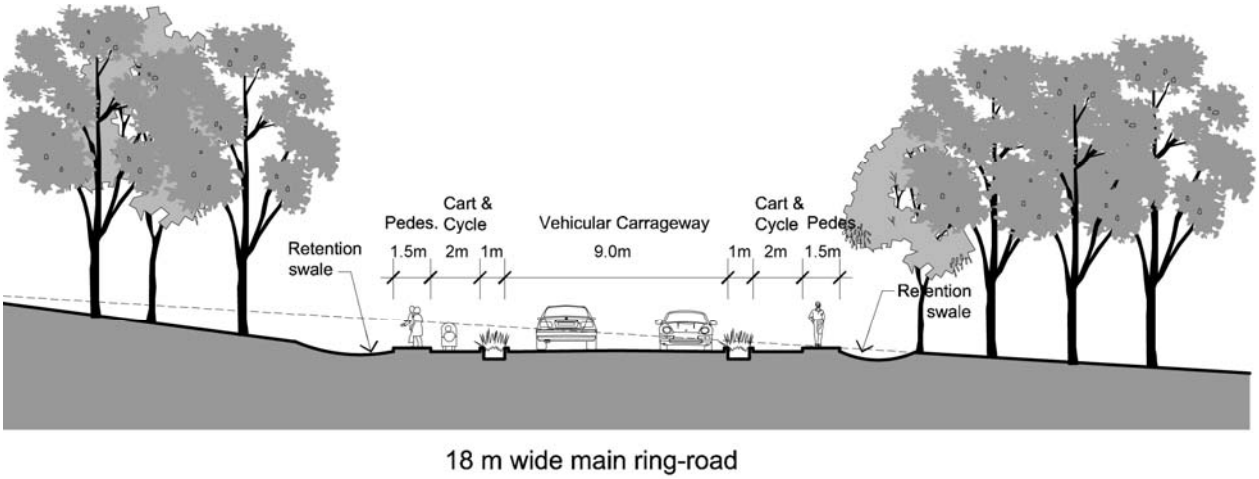

Figure 7.35: Road Type A

- **Entry road from Forest Road (portion of road within the site) and link road between Northern and Southern precincts (Type B)** – 14m wide, two way, road reserve, with:
  - 3.5m wide vehicular carriageway in each direction (totalling 7m wide carriageway);
  - 2m wide shared cycle and buggy lane on each side of the roadway; and
  - 1.5m wide pedestrian footpath on each side of the roadway.

  Along each side of the road reserve will be bio-retention swales with informal landscape of existing/ indigenous trees.

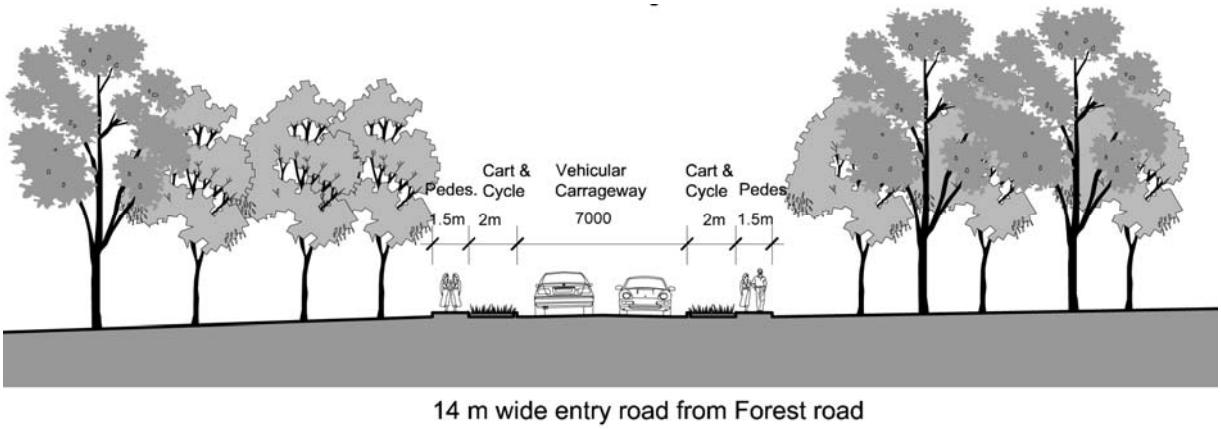

Figure 7.36: Road Type B

- **Collector roads from ring-road to Residential Precincts A & B (Type C)** – 19.8m wide, two way, road reserve, with:
  - 12m wide carriageway comprising:
    - 3.5m wide vehicular carriageway in each direction (totalling 7m wide carriageway). (SCC DCP10 recommends 7m for local collector road); and
    - 2.5m wide parallel parking lane in each direction;
  - 2m wide landscaped swale/ water catchment area between each direction of the carriageway;
  - 3m wide verge at each side of the roadway comprising:
    - 1.8m wide grass verge and services zone;
    - 1.2m wide footpath.

  Bicycles and buggies are encouraged to use the road carriageway, which is not anticipated to contain heavy traffic. Informal planting of groves of indigenous trees will align each side of the road reserve.

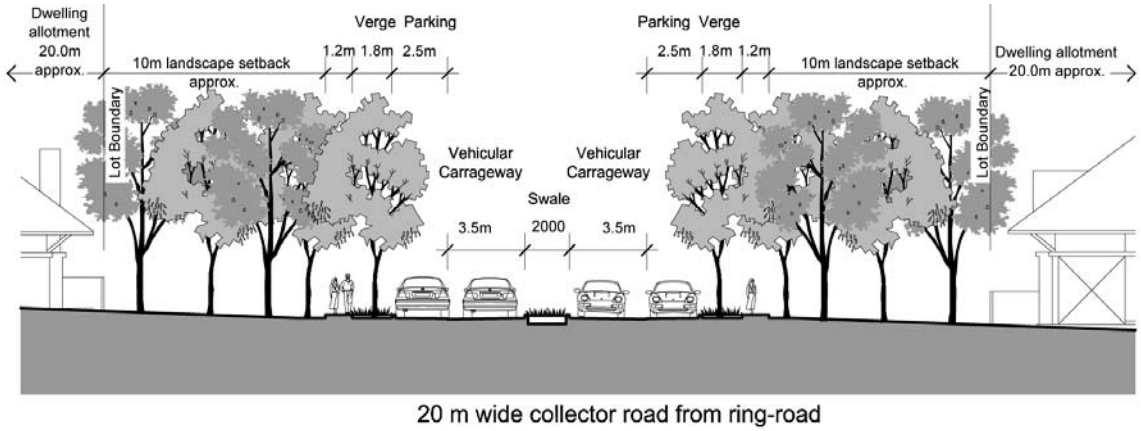

Figure 7.37: Road Type C

- **Collector road from Comberton Grange Road extension at the western boundary of the site, above the Hotel Precinct and Residential Precinct C (Type D)** – 15m wide, two way, road reserve, with:
  - 12m wide carriageway comprising:
    - 3.5m wide vehicular carriageway in each direction; and
    - 2.5m wide parallel parking lane in each direction;
  - 3m wide pedestrian footpath on the southern side of the roadway.

  Bicycles and buggies are encouraged to use the road carriageway, which is not anticipated to contain heavy traffic.

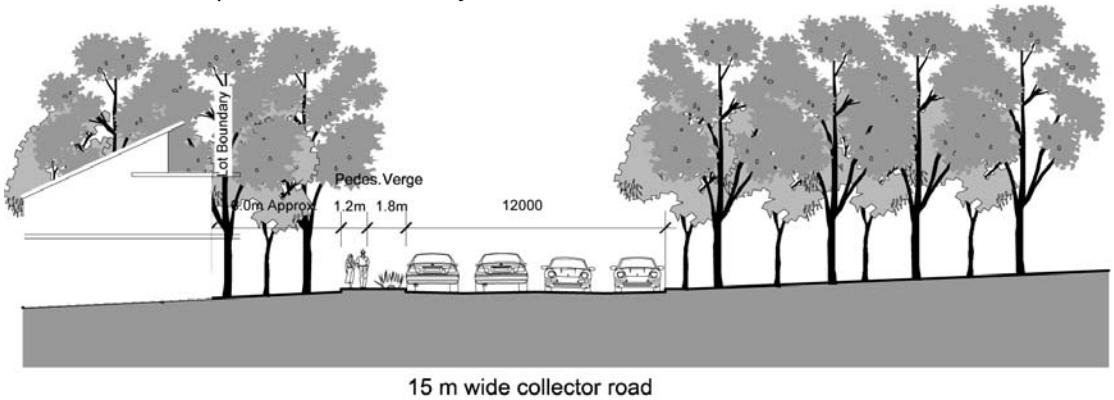

Figure 7.38: Road Type D

Local network of roads within Residential Precincts (Type E) – 14.8m wide, two way, road reserve, with:

- 7.6m wide carriageway for travel and parking;
- 3.6m wide verge at each side of the roadway comprising:
  - 1.8m wide street tree zone adjacent to the carriageway;
  - 1.2m wide footpath/ grassed verge;
  - 0.6m wide landscaped services zone adjacent to the front boundary.

Bicycles and buggies are encouraged to use the road carriageway, which is not anticipated to contain heavy traffic.

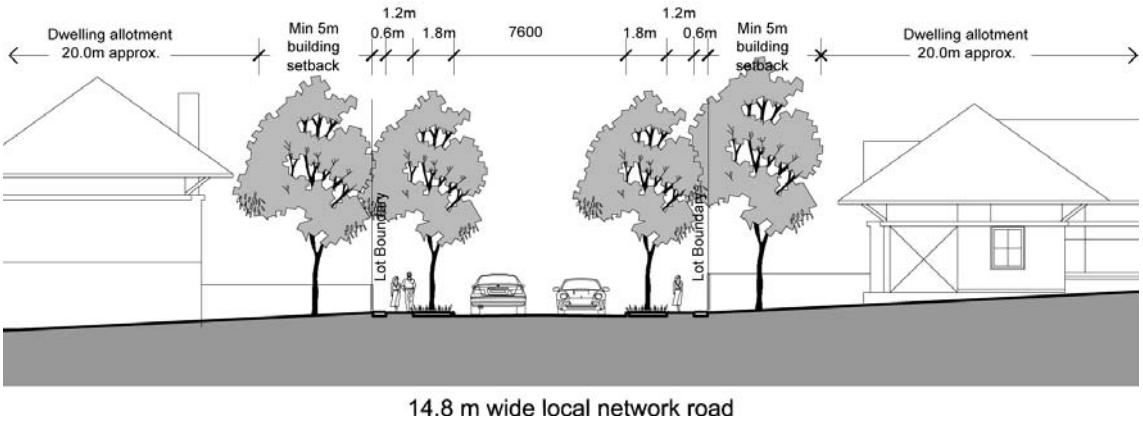

Figure 7.39: Road Type E

For Road Hierarchy Layout, refer to Figures 7.40 and 7.41 and to **Appendix 1**.

7.7.5 Emergency and bushfire access

Fire emergency evaluation and management trails are provided around the golf course, to tourist and residential precincts. These are minimum 3.5m wide.

For Residential Precincts A and B located adjacent to APZ corridors, access is provided from local streets and open space corridors, to maintain the APZ areas.

For emergency and bushfire access, refer to Figures 7.40 and 7.41 and to **Appendix 1**.

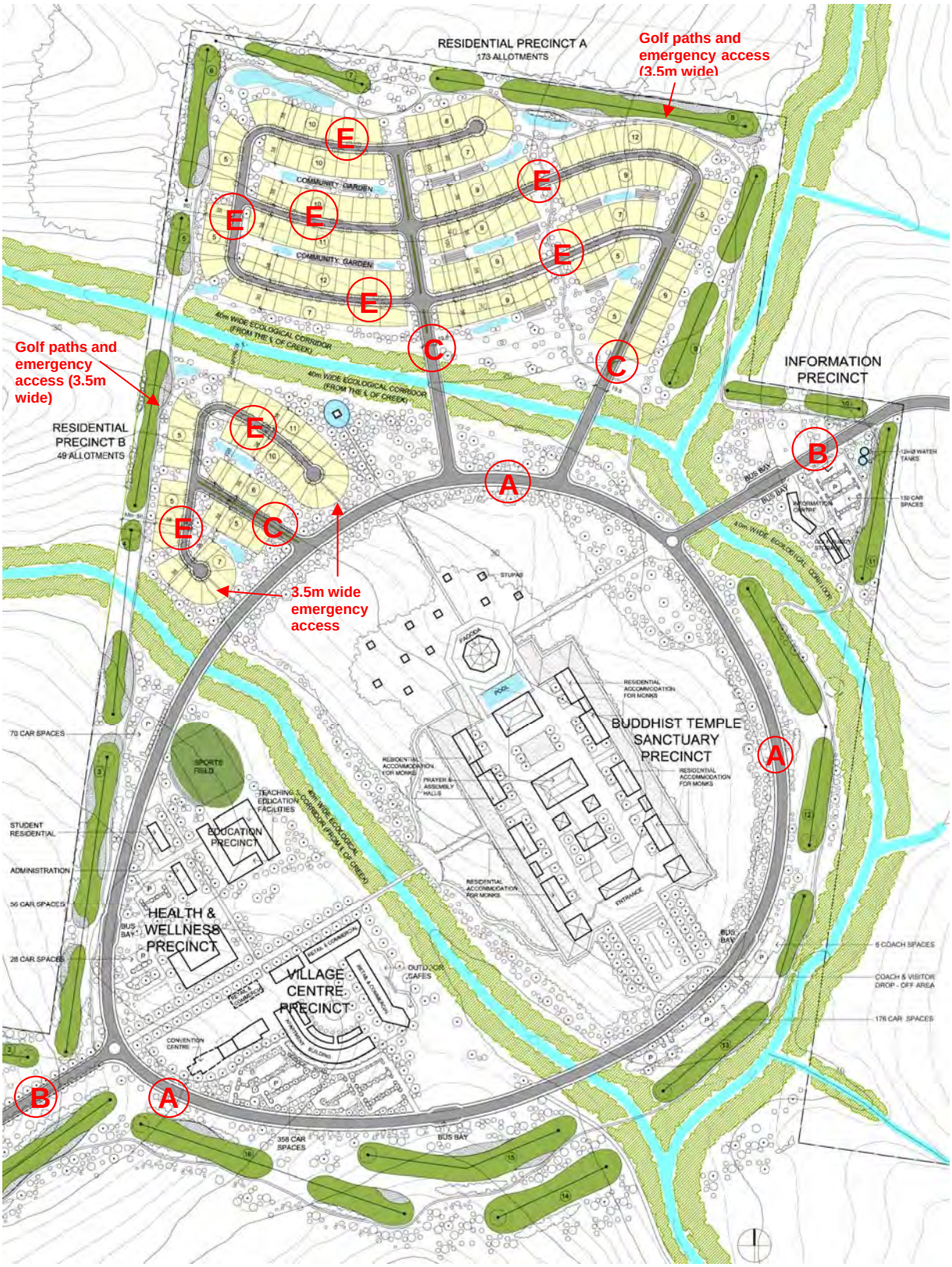

Figure 7.40: Road network hierarchy – Northern portion of site

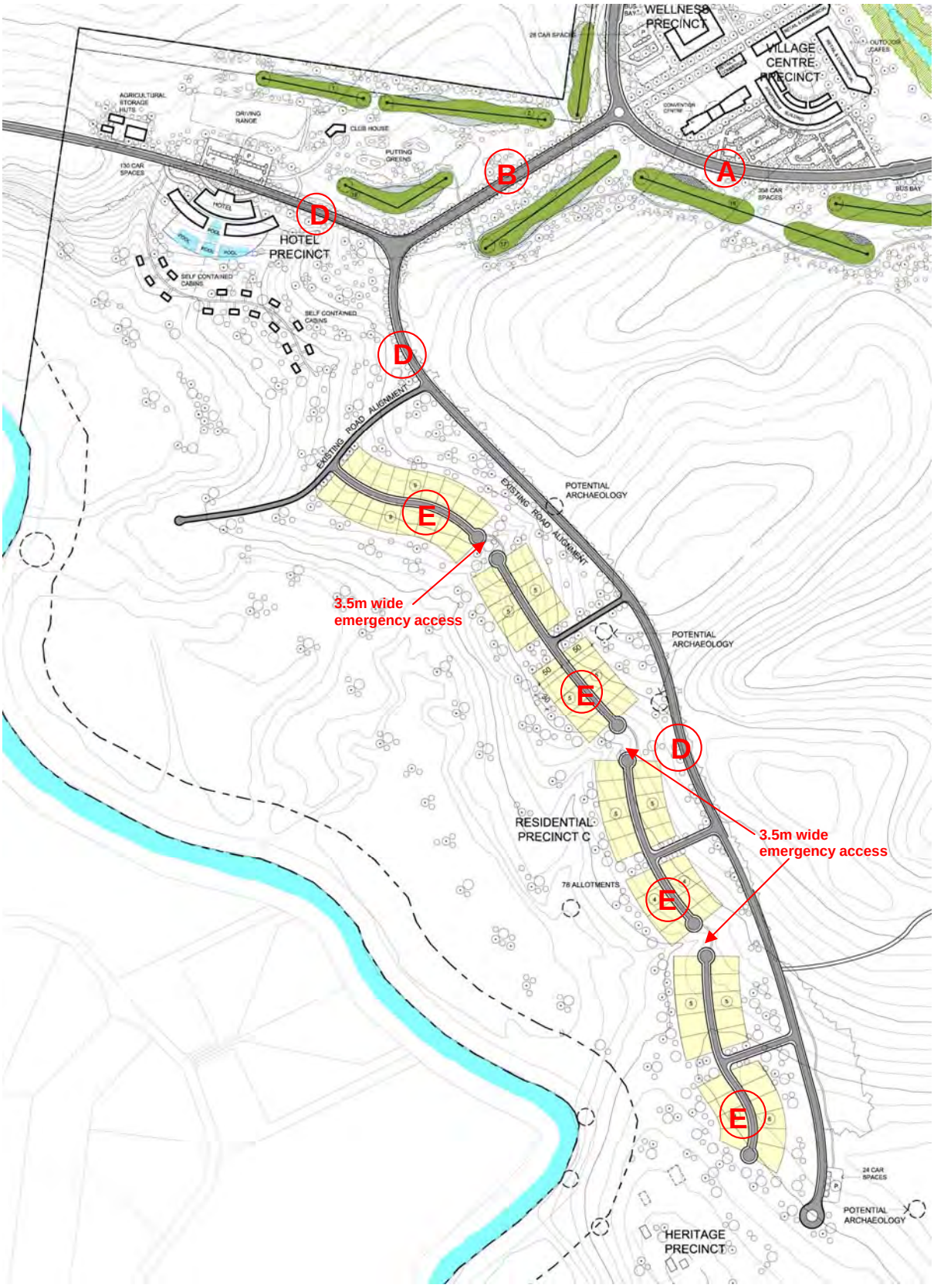

Figure 7.41: Road hierarchy network – Southern portion of site

7.8 Pedestrian Access

7.8.1 Pedestrian pathways

Pedestrian access is provided along each side of roads and streets within footpaths.

Dedicated pedestrian access, in the form of minimum 3m wide and up to 10m wide pathways, is provided between:

- The Temple Sanctuary Precinct and the Town Centre and Education Precincts;
- Village Centre Precinct and the Health + Wellness and Education Precincts.

For Pedestrian Network Layout, refer to Figures 7.42 and 7.43, and **Appendix 1**.

7.8.2 Eco-trails

A series of pedestrian trails and walkways will be developed throughout the site for connectivity between facilities and to forest and woodland areas. These will be existing trails within the forested areas of the site, upgraded as required for safety of access.

Figure 7.42: Public pedestrian network – Northern portion of site

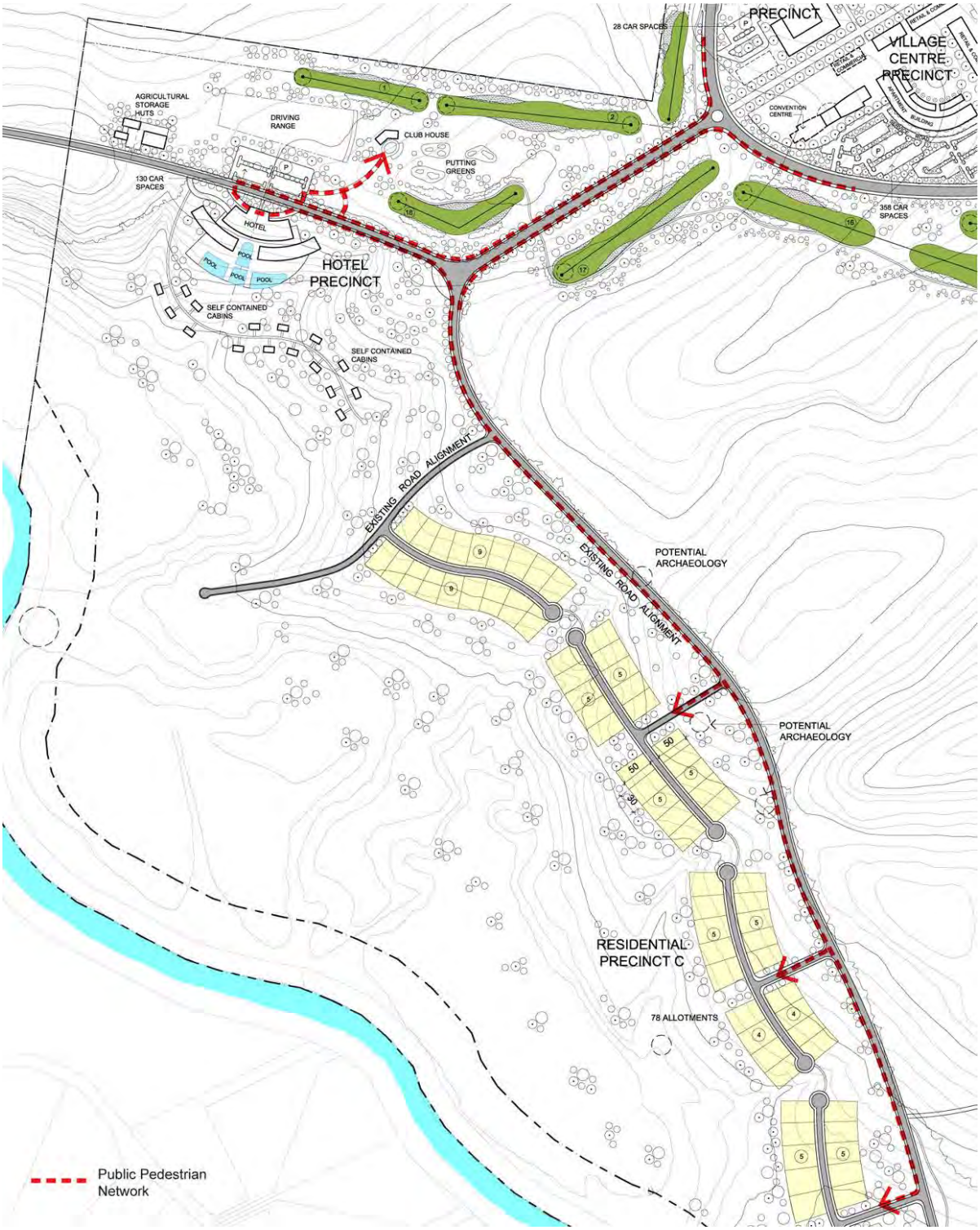

Figure 7.43: Public pedestrian network – Southern portion of site

7.9 Parking and Service Areas

Parking and service/ loading areas are located within each precinct of the site. Entry roads into each precinct are designed to accommodate coach and emergency access and circulation. A dedicated coach parking area for 6 coaches is located adjacent to the Buddhist Temple Sanctuary Precinct.

Parking areas are to comply with AS/NZS 2890.1 – 2004 – Part 1: *Off-street car parking* and AS/NZS 2890.6 – 2009: Part 6: *Off-street car parking for people with disabilities*.

Off-street parking for residences within Residential Precincts A, B & C is integrated within each dwelling allotment. Residential parking for Residential Precinct D within the Village Centre will be located in basement level(s) below the building.

Off-street surface parking areas are located within the various precincts and close to facilities within the site. These comprise:

▪ Information Precinct	130 car spaces (approx.)
▪ Buddhist Temple Sanctuary Precinct	176 car spaces (approx.)
▪ Town Centre Precinct	358 car spaces (approx.)
▪ Health + Wellness Precinct	28 car spaces (approx.)
▪ Education Precinct	126 car spaces (approx.)
▪ Hotel Precinct	130 car spaces (approx.)
▪ Heritage Precinct	24 car spaces (approx.)
Total:	**972 car spaces (approx.)**

On-street parking is available along local residential roads.

7.10 Golf Carts, Bicycle Access and Parking

The use of an electric mode of travel in the form of golf carts (for both residents and visitors) and cycling are encouraged within the site (Figure 7.44). Dedicated shared carts and cycle paths are to be provided within the entry, link and ring-road road network of the development and shared within the collector and local road network.

A facility for the hiring and storage of the buggies is located at the Information Precinct.

Bicycle and cart parking will be located on the site adjacent to the entries to key tourist facilities. This will reduce the number of car parking spaces to be provided on the site.

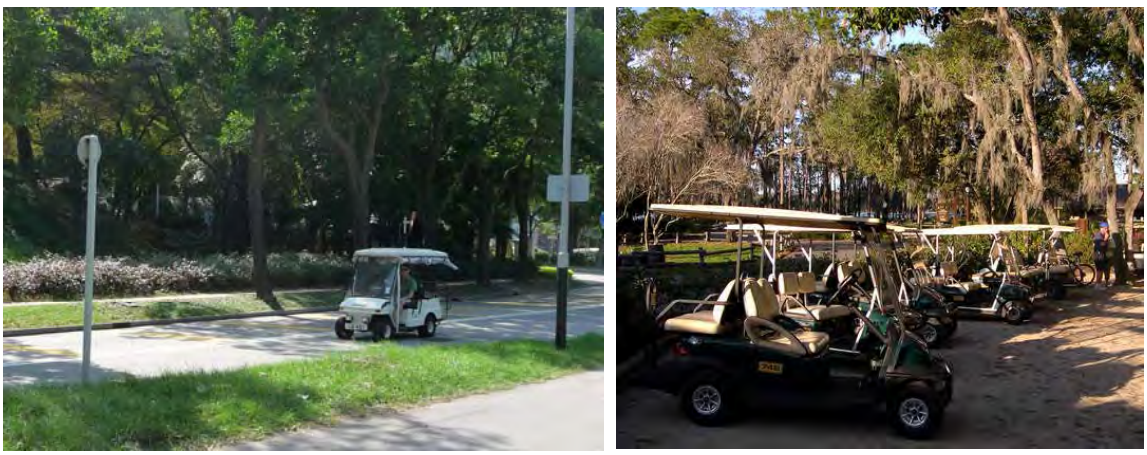

Figure 7.44: Transportation by golf carts proposed for the site

7.11 Bus Service

For the large number of tourists who arrive by coaches or buses, a mini-bus service that does a circuit of the ring road could be provided as the walking distance between areas of interest are too great. This service could be provided by a private bus operator or by the Temple Foundation if and when the demand arises.

Indented bus bays are provided along the ring road, at the Information, Temple, Village Centre and between the Health + Wellness and Education Precincts. Additionally, buses can stop along the ring road at designated stops near the residential precincts to cater for residents.

7.12 Mobility/ Disabled Access and Facilities

The *Commonwealth Disability and Discrimination Act 1992* (DDA 1992) is a Federal anti-discrimination law that requires any premises legally accessible to the public to be accessible to people with a disability. Section 23 of the Disability Discrimination Act makes it unlawful to discriminate on the grounds of disability in providing access to or use of premises that the public can enter or use.

"Premises" as defined in the DDA extends to the whole of the built environment which includes existing and new buildings, heritage buildings, and the public domain of pathways, public parks, gardens and car parking areas.

The Disability (Access to Premises – Buildings) Standards 2010 was launched on 15 March 2010. The Premises Standard is a legislative instrument which will commence operation on 1 May 2011 in line with the 2011 edition of the BCA which will be revised to align with the Access Code in the Premises Standards.

An objective of the *Disability (Access to premises – Buildings) Standards 2010* is:

> *"To ensure that dignified, equitable, cost-effective and reasonably achievable access to buildings, and facilities and services within buildings, is provided for people with a disability."*

The *Building Code of Australia* (BCA) contains provisions for access to and within buildings for people with a disability. The BCA applies to building work on both new and existing buildings.

Universal access for key pedestrian routes will be implemented, where possible, within the topographical constraints of the site.

Disabled facilities will be provided to all public facilities, complying with *Disability (Access to premises – Buildings) Standards 2010*. Disabled parking will be provided close to entrances of public facilities complying with AS 1428.1 – *Design for access and mobility* (2009) and AS/NZS 2890.1 – *Off-street car parking* (2004).

7.13 Infrastructure Services

Refer to Figure 7.45.

7.13.1 Electrical services

An existing Integral Energy Zone Substation is located at South Nowra near BTU Road intersection, approximately 6km from the site, with existing overhead transmission lines located along the eastern side of the Pacific Highway, crossing over to the western side near Parma Road.

The maximum electrical demand for the total development has assessed and determined to be approximately 3.8MVA with diversified load estimated at 2.7MBA.

The South Nowra Zone Substation has the capacity to supply the proposed development, but modifications to their network are required, with a new 1kV high voltage feeder via a new underground cable service from site to substation (6km). Local power will be sited underground, predominantly for bushfire and visual reasons. Services will be located within a dedicated services corridor along landscaped verges of the new road network.

To reduce the energy demand from the supply authority, the use of renewable energy systems will be implemented. Photovoltaic (PV) systems will be implemented, depending on the:

- Extent of suitable roof area and/ or locations for free-standing PV installations; and
- Power generated by and economic feasibility of PV installations.

For smaller buildings with relatively light energy demands, the use of PV systems for energy generation combined with solar hot water heating systems and gas boosting will be implemented. These measures will make a considerable impact on the energy demands required by these building functions during the day. This energy generated can significantly offset the energy demands during the evening.

The use of PV systems will be fully explored in the detailed design of buildings within the development. Options for renewable energy use include:

- Exporting power to the authority grid during the day and import power at night; &
- Store energy generated within the site for use as required.

In terms of air conditioning, hybrid or mixed mode mechanical systems, efficient fittings and appliances, and energy management systems will be implemented in the detailed design of each building.

Automatic timers, building controls and electrical services will be designed within buildings to reduce energy use.

7.13.2 Communications

An existing communications hub is located on the eastern side of Princes Highway, near Parma Road, approximately 4km from the site. The hub is supplied with underground optical fibre cabling.

The proposed development will require new underground incoming copper and fibre lead-in services, which will be sourced from the existing communications hub.

7.13.3 Gas powered services

The nearest gas authority main is located 6km from the site at Gimlet Road. The use of natural gas instead of electrical power will be explored for systems that present an intensive energy demand (such as commercial laundry services, cooking facilities, etc.), as an ESD solution.

Additionally, the use of gas powered co-generation systems will be investigated in the detailed development of the project.

7.13.4 Water supply services

The authority trunk main (450mm diameter) runs through the eastern side of the site in a north-south direction, approximately 4km from the proposed development. Potable cold water supply can be sourced from this trunk water main which services the Callala Beach and Callala Bay areas.

A. Site water demands

Anticipated water consumption for the built development is 435,000 litres (435KL) per day. Additional requirements for the irrigation of the 18 hole golf course, site and agricultural irrigation amounts to an additional 363,000 litres (363KL) per day. Total water demand for the site amounts to 798,300 litres (798.3KL) per day.

B. Potable and non-potable systems

The development is proposed to operate from two water sources:

- Potable from the 450mm authority trunk water main to reservoir tanks located near the entrance to the site from Forest Road; and
- Reclaimed water for non-potable uses – for landscape, agriculture and golf course irrigation will be strategically located in the landscape corridors.

Dual pipe reticulation is proposed for potable and non-potable sources for each development, with:

- Potable water: Basins, baths, showers, domestic and commercial cooking, and cleaning. Only 35% of overall average daily water demand is required to be of this standard.
- Non-potable water: Toilet flushing, domestic clothes washing, landscape and grounds irrigation and mechanical cooling.

C. Potable water system

Potable water can provide 35% of the overall daily water demand.

A potable water storage reservoir will be located on the site and sized to meet peak variations in demand. The storage reservoir, in the form of a storage tank (stainless steel or colorbond zincalume) will reduce peak loads on the authority supply and provide back-up in the event of a loss of supply. The proposed storage capacity of the tanks will be 1300KL, which is one day projected water demand supply. The required rate of flow for the potable water supply will be approximately 15L/s. The size of each tank will be approximately 12m diameter x 3m high. The proposed location of the tank is within the Information Precinct, north of the car parking area, in close proximity to the entry roadway. The tank will be screened from the entry roadway by vegetation and trees.

From the reservoir, potable water reticulation will serve the buildings proposed on the site via a series of ring main connections. In accordance with the Local Water Authority Design Guidelines the system will be designed to deliver a minimum of 150kPa to all buildings, with booster pumps provided if head pressure from the storage reservoirs cannot be achieved. All residential, retail and commercial buildings will be fitted with sub-meters and backflow prevention.

D. Non-potable water system

65% of the total site water demand can potentially be provided from non-potable water. Non-potable water sources could potentially be from:

- Treated captured rainwater (greywater reuse)
- Treated stormwater (grey and blackwater reuse); and
- Ground water aquifers.

The implementation of rainwater harvesting is currently preferred as the non-potable water source. Further consideration of the demand and cost of implementation of the above options will be undertaken at the detailed design of the buildings.

E. Hot water service

Central hot water systems will be provided for each building. Pre-heated solar systems are proposed to be utilised and integrated into the design of each building. Alternative options, particularly for commercial and institutional buildings, include waste heat from mechanical plant, geothermal and heat pumps.

7.13.5 Fire hydrant system

A separate fire storage system will be provided in accordance with NSW Code of Health Guidelines to provide water for fire fighting requirements.

Water for fire will be supplied by the site water main, with 4 hours of fire water storage provided. Anticipated fire water storage requirement for the site is approximately 300,000 litres (300KL). The water tank for fire will be located adjacent to the potable water tank in the Information Precinct.

A brigade booster assembly and on-site booster pumps will be located adjacent to the tank in the Information Precinct, in a position accessible to the Fire Brigade. A 150mm fire hydrant ring main will reticulate throughout the development with external hydrants and individual connections for large buildings.

Water captured in local dams channelled from stormwater from paved surfaces and roads, located within the site, can be used fire fighting as well as landscape irrigation.

7.13.6 Sewerage

Shoalhaven City Council's sewer pressure main is located approximately 6km from the proposed development, east of the site along Forest Road.

Sewage from the site would connect to the Authority sewer main via sewer pumping stations to the point of connection to the authority's main. Sewer drainage infrastructure will be designed to follow natural contours to immediate pump stations located throughout the development, discharging to a main sewer pump station.

Currently, the recycling of sewer with use of grey or blackwater treatment systems for non-potable water purposes is not economical and requires long term maintenance, as grey/ black water must be treated, disinfected and filtered before storage and general reuse. This would be further investigated at the time of development.

7.13.7 Trade waste

Trade waste will be treated via approved grease arrestors, with discharge waste to sewer or to a blackwater treatment plant. The latter method is subject to future investigation.

7.13.8 Stormwater drainage

Stormwater drainage comprising roof water will be used for non-potable water purposes of toilet flushing, clothes washing, localised landscape irrigation and mechanical plant. Rainwater tanks will be sized accordingly to the relevant catchment areas and water demands.

Stormwater drainage from ground water systems will be centrally directed through pipes adjacent to roadways, directed to surface dams for use in golf course irrigation and landscape irrigation.

Stormwater drainage will captured and treated be directed through a gross pollutant trap fitted with hydrocarbon separation before being used for landscape irrigation or discharged into the creek system. Water sensitive urban design techniques will be implemented to dissipate the flow, naturally retard the flow with swales and treat the flow with wetlands before discharging to the riparian/ creek system. The design solution will maintain or improve the water quality of water bodies and prevent its degradation, and to protect ecosystems and natural habitats.

The management of stormwater captured from ground water systems will be discussed in Section 8.10 of this report. Stormwater harvesting tanks/ dams will be sized according to the relevant catchment areas and water demands.

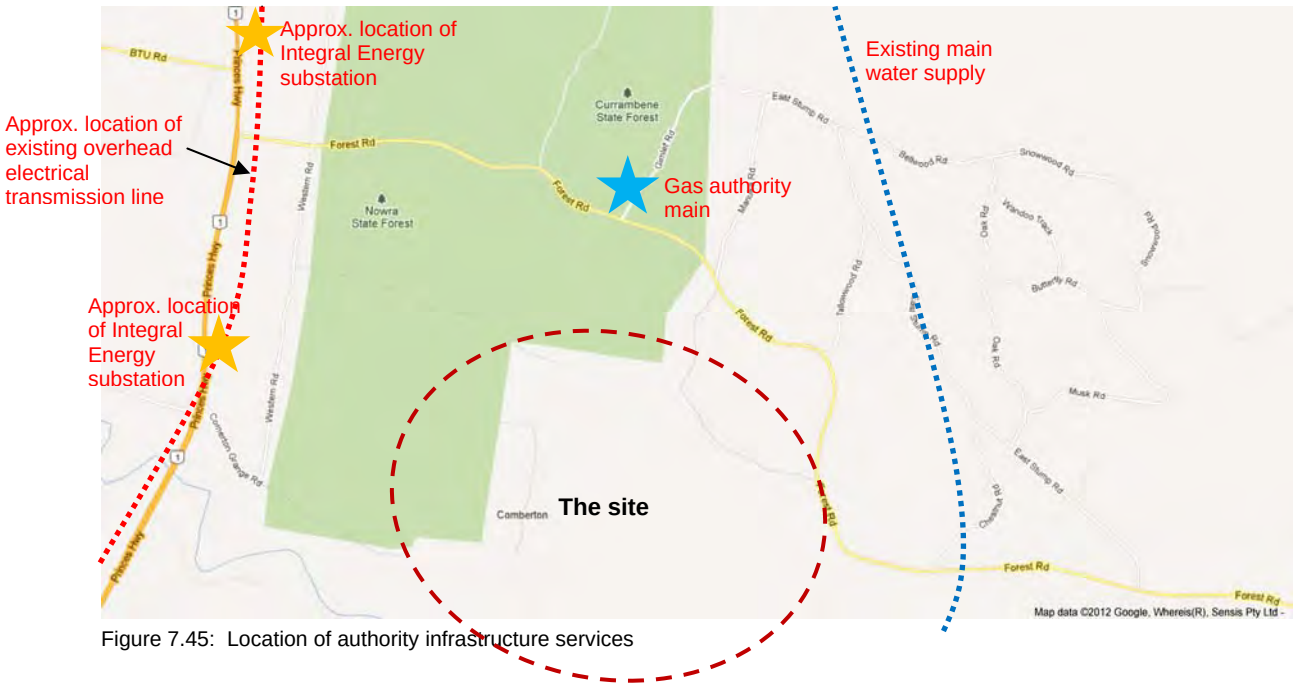

Figure 7.45: Location of authority infrastructure services

7.14 ESD Strategies

7.14.1 Vision and objectives

A vision for the development is to undertake an ecological sustainable development (ESD) approach to the siting and design of the development, and in the implementation of sustainable practices in the management of the facility and the education of its users.

The environmental objectives for the site's development are to:

- Provide an interdisciplinary and coordinated ESD approach to all aspects of siting, design, material selection and management of the development; and
- Maintain the ecological value of the site.

7.14.2 Masterplan approach and ESD principles

An environmental brief and development guidelines have been developed for the masterplanning, siting and design of buildings and infrastructure on the site, and in the management of the finished development. The environmental brief will provide a sustainable approach to the site's development, with consideration of the site's environmental and physical constraints, climate and the development's functional brief to provide a high-level environmental outcome. The environmental principles of *Green Globe Precinct Planning and Design Standard* (PPDS) form the environmental criteria for site development, which are to:

- Create an improving quality of life for the occupants and users;
- Protect and conserve ecosystems through a respect for the site;
- Reduce environmental global and local impacts through the conservation of energy and resources;
- Support local communities and economies; and
- Source materials and energy within the local bioregion.

7.14.3 Environmental strategies

The ecologically sustainable development of the site is guided by the following environmental strategies of:

1. Sustainable masterplanning approach;
2. Precinct location and site planning – with consideration of site considerations, site infrastructure, site planning and design measures, and response to climate;
3. Energy efficiency and conservation – with consideration of passive design strategies of siting and building orientation and building design, active systems design and transport;
4. Water conservation and management;
5. Soil and waste management;
6. Resource conservation;
7. Chemical use;
8. Waste water and stormwater management;
9. Social commitment; and
10. Economic commitment.

7.14.4 Sustainable masterplanning approach

The development will be guided by an ESD approach – from the masterplanning of the site, the design of individual precincts and buildings, selection of building materials and finishes, construction methods, to the management of the facilities.

7.14.5 Precinct location and site planning

Site considerations

The site is of high environmental value. Detailed site analysis has provided a design for the site that limits site development to not intrude on:

- Flood prone areas and water courses;
- Areas with acid sulphate soils;
- Areas of indigenous or archaeological significance;
- Areas with endangered ecological communities, native landscapes and habitat communities of high conservation value.

Site infrastructure

Due to lack of proximity of authorities' infrastructure mains, climate responsive design and ESD strategies will be implemented to increase the thermal performance of buildings and reduce reliance on external energy and water sources.

Site planning and design measures

Development areas are limited to existing cleared sites or areas with secondary vegetation or low vegetation value.

Orientate residential allotments to fall along the natural slope of the land. Limit building Allotments are of adequate site area (and with limitation of building coverage/ footprints) to enable greater soft landscape to building coverage for climate response building design and microclimate control.

Response to climate

A climate responsive design approach has been implemented in the siting and design of buildings and dwellings with development to be designed to optimise the use of:

- Passive design strategies to the design of the buildings;
- Microclimate control of the external environment; and
- Active systems that conserve energy and minimise operational energy and CO_2 production.

7.14.6 Energy efficiency and conservation

The combination of active and passive design strategies will be implemented in the development. This comprises optimum measures for passive design of buildings and the implementation of active strategies to contribute to the internal environmental comfort of the building.

A. Passive Design

The use of passive design strategies will be optimised in the building design and in the energy efficiency and performance of each building, to reduce the need for active cooling and heating. Guidelines/ controls that will be implemented for the development include:

Siting and building orientation:
Orientate buildings for passive solar heating and cooling, with siting to be considered along with topography and views. Ideally, areas with maximum daytime use should be placed on the northern side of the building.

Residential allotments are primarily aligned across the topography of the site, which run in an east-west direction overlooking vegetated creeks. The width and depth of the allotments enables dwellings to be designed for optimum solar access, for private open spaces (rear yards) of each dwelling allotment to receive solar access, and to enable the planting of trees within each allotment for microclimate control to residences.

Building design:
The following climate responsive design guidelines/ controls are proposed for the design dwellings and non-residential buildings:

- **Orientate** daytime living areas, private open spaces and courtyards in a polar (northerly) direction to optimise solar access in winter (preferably 5^0W to 20^0E of north). Locate service areas (garage and laundry) and amenities to less favourable aspects (west and south). Ensure a good portion of the roof is orientated northwards for installation of solar panels.
- Design the **building envelope** that responds to the topographical features of the site, its climatic conditions (cold winds from the south, particularly to the southern residential precinct overlooking the valley). Design the pitch of the roof (25-35^0) to assist in holding the roof down in high winds.
- Design for a **compact floor plan** to suit the function of the use and to minimise site utilisation. Partition internal spaces where function permits to shut off space and heat as required.
- Locate windows to prevailing summer breezes for **natural ventilation** for indoor air quality and thermal comfort, and for structural cooling of the fabric of the building. Consider ceiling heights to optimise retention of internal warmth or coolness and air extraction.
- Optimise the **entry of daylight** through windows and glazed walls, light shelves and roof lights, to reduce the use of artificial light. Balance the entry of daylight with placement of windows to avoid unwanted solar (heat) gain in summer. Consider the use of high performance glazing with low U-values and high solar heat gain coefficient (SHGC) to reduce solar loss.
- Use of **shading devices** to reduce entry of heat in summer to windows and glazed walls, to include:
  - Wide eaves and overhangs to exclude summer sun;
  - External blinds or awnings (preferably controlled) with 85-100% shading to east and west glazing;
  - Balconies and verandahs as buffer spaces to external walls, augmented by transparent or lattice screens to reduce glare and heat gain but allow for ventilation and indirect light into interior spaces which open onto them;
  - Courtyards to allow for light, air, amenity and privacy, particularly to provide for northerly oriented private spaces;
- Design for optimum **thermal performance** of the building's walls, floor and roof, with selection of materials with high thermal mass for walls and roof (masonry, concrete or denser lining materials). This can be achieved through thermal mass

and insulation to walls, floors and roofs to reduce transmission of temperature and to retain heat gain in winter. Measures include:

- Walls – use of cavity masonry or reverse masonry walls (sustainable in possessing high thermal mass, of low maintenance, high durability load bearing capacity and recyclable qualities) to northerly facing facades. Insulate to the value of R3;
- Floors – utilising the ground to insulation in temperate climate conditions, with insulation under the slab or suspended floor system, with value of R2. to depth of minimum 300mm, and to slab edges (40mm closed cell polystyrene and fibre cement cover board up to wall junction);
- Roof/ ceiling – install up to R5 insulation with the use of sarking (condensation barrier of reflective foil insulation to achieve R1.5), air gap and insulation to ceiling to achieve minimum of R3.5 or more;

- **Draught seal** doors and windows with proprietary seals to minimise heat loss;
- Design for **external microclimate control** with landscaping, planting of canopied deciduous trees to control solar access and promote evaporative cooling, windbreaks to shelter external areas from extreme climatic conditions, green walls of deciduous vines or climbers for cooling of walls.

B. Active design

Active systems augment the passive design strategies, particularly on this site which lack of proximity to infrastructure services. The environmental goal for the site is to adopt active systems that reduce power consumption demand, minimise operational energy and CO_2 production to complement the building design and its management. The advantages for implementation of sustainable active systems are the environmental and cost benefits of reducing demand on the power authority's supply and thereby reducing the cost of provision for total reliance of external sources of power.

ESD active systems are to be selected to create a comfortable internal environment in extreme conditions, to provide hot water and space heating and cooling. Co and tri-generation approaches are to be explored. Adoption of ecologically sustainable methods of power generation and selection of fittings and appliances will contribute significantly to the reduction of power required by each household, as:

- water heating contributes to approximately 25% of the energy use of a home;
- space heating and cooling contributes to approximately 38% of home energy use;
- energy generated by light fittings and appliances (including refrigeration) contributes to approximately 32% of home energy use.

Efficient active design measures proposed to be implemented to buildings include:

- Installation of photo-voltaic (PV) systems for energy generation and solar hot water system with supplementary gas booster, aimed at providing up to 90% hot water needs. Design with roof pitch (around 24^0) to suit the optimum pitch for PV modules. The PV system can export power to an authority grid during the day and import power at night;
- Provision of hydronic pipes set into the slab for internal winter heating, which are heated by photovoltaic panels in the roof augmented by a backup gas system. In-slab systems provide the combination of radiant, convective and conductive heat in winter;

- Implementation of a hybrid or mixed mode system of natural ventilation and fans, supplemented by air conditioning to modify climate in extreme climate conditions;
- Installation and selection of energy efficient fittings and appliances, such as:
  - Energy efficient lighting and light fittings, with use of LEDs or compact fluorescent globes;
  - Dishwashers and washing machines that use externally heated water from solar systems rather than self-heated water;
  - Use of solar lighting for outdoor areas.
- Implement energy management with:
  - Setting of thermostat of between 60-65^{0}C on hot water systems and timer or manual boost systems to avoid heating when not required;
  - Separate switching for light fittings; and
  - Use of electric timers or motion sensors on lights to switch lights on and off, particularly for use in commercial environments.

Commercial, hotel and educational facilities are to be augmented with:

- Provision of REED switches to automatically disable air conditioning in rooms once windows are opened;
- Provision of CO_2 sensors in underground parking areas to allow exhaust fans to run only when necessary;
- Implement high energy filters on air-conditioning units to reduce supply air intake quantities to use less energy; and
- Implement individually controlled air-conditioning units to rooms not occupied all day.

C. Transport

The development is an integrated residential, educational, commercial/ retail and tourist development with proximity of living and employment. The design for all modes of transport in the internal road network, the promotion of use of electric golf carts, bicycles and walking within the site and localised parking areas are aimed at encouraging sustainable modes of transport.

7.14.7 Water conservation and management

The environmental goal is to implement water-efficient strategies to minimise potable water use, its supply to the site and its discharge onto the site and its natural waterways.

Water usage generated by showers, hand basins, washing machines and laundry amounts to approximately 70% of household water consumption. To reduce water usage generated by these recyclable water sources, the implementation of water efficient strategies proposed includes:

- Rainwater harvesting to reduce potable water usage;
- Use of water efficient appliances; and
- Monitoring of water uses via a water management system.

Water management strategies – internal measures

To reduce water usage within each building, the following water management strategies are proposed:

- Capturing of rainwater from roofs and stored in rainwater tanks adjacent to each dwelling for use for toilet flushing, laundries, landscape and hard surface irrigation;

- Use of water efficient fixtures of shower heads and taps (with minimum 3 star WELS-rated showerheads, 5 star-rated basin taps and 4-star rated dual flush toilets); and
- Implementation of dual water system that uses reclaimed stormwater runoff from each allotment to be piped into bioretention trenches within the secondary roadway system, rain gardens and wetlands prior to water disposal onto natural waterways and site landscape.

Commercial, hotel and educational facilities are to be augmented with:

- Use of water flow controllers or electronic sensors with flow timers in hot and cold water outlets to reduce consumption and hot water demand;
- Use of water meters to enable users to monitor water usage; and
- Reduce the installation of bathtubs in hotel.

Water management strategies – external measures

External measures to reduce the need for irrigation of landscaping proposed to be implemented include:

- Use of drought tolerant plants in landscaping;
- Mulch garden areas to conserve water by preventing evaporation and run-off; and
- Capturing of stormwater runoff in underground tanks to irrigate external landscaped areas.

7.14.8 Solid and waste management

Waste reduction measures proposed to be implemented in the residential, educational, commercial, retail, food and hotel facilities include:

- Recycling facilities and collection for each dwelling, non-residential facilities and public facilities, with collection areas actively promoted;
- Use of worm farms for food waste in restaurants and cafes, with bio-waste converted to nutrients and used as fertiliser for on-site agricultural cultivation;
- Implementation of sediment control during construction to prevent sand, soil and construction materials from polluting the natural waterways;
- Reduction of paper waste with increased use of electronic communication in hotel, commercial and educational facilities and the promotion of electronic communication in the management of the development;
- Reduction in the use of packaged toiletry items with use of high quality toiletry dispensing system to save substantial amounts of toiletry bottles each year; and
- Eliminate the use of bottled water by installing filtered water drinking fountains in publically used external and internal spaces.

7.14.9 Resource conservation (materials)

The design and selection of materials will contribute to the sustainability of the development. Measures to be implemented include:

- Selection of materials that effectively modify climate extremes;
- Selection of environmentally save materials and processes in building construction for low environmental impacts;
- Maximise the use of renewable resources and extend product durability. If using timber in building and external fabric, source from sustainable developed forests for use;

- Use of recycled or sustainable timber for flooring and furniture;
- Minimal use of materials with VOCs in paint, sealants, glues and finishes selections;
- Selection of materials with a lifespan to match the projected life and use of the building;
- Optimise the use of locally produced materials and where appropriate, use light-weight material to reduce transportation energy;
- Avoid waste from non-biodegradable chemicals that affect the composition of the atmosphere such as HCFCs and HFCs used as refrigerants or in air conditioning systems;
- Use of ammonia and isobutene refrigerants in mini-bars and refrigerators; and
- Minimise life cycle maintenance.
- Adopt ESD measures in the recycling of construction waste produced and in the selection of materials and construction practice with consideration of use of:
  - recycled aggregate in concrete;
  - industrial waste by-products in concrete;
  - high strength/ post-tensioned concrete with lower cement content to reduce the amount of CO_2 released;
  - proportion of recycled steel; and
  - FSC certified recycled timber in building frames.

7.14.10 Chemical use

To minimise or avoid the use of toxic chemicals in building materials and finishes, and the toxic effects of salinity, pesticides and pollutants on the site, the selection of materials and finishes for the development are to:

- Avoid the use of toxic chemicals;
- Use low VOC finishes – in paints, sealants and fittings.

7.14.11 Waste water and stormwater management

Refer to Section 7.13 – *Stormwater Management and Water Sensitive Urban Design Strategies* of this report.

7.14.12 Social commitment

Measures that enhance the users' understanding and integration with the natural and social environments of site development that respects the users and optimises their health and well-being are to be implemented.

7.14.13 Economic commitment

The proposed development will contribute to the economic vitality of the region, creating employment and tourist opportunities.

7.15 Stormwater Management and Water Sensitive Urban Design (WSUD) Strategies

Water Sensitive Urban Design (WSUD) Strategies will be implemented in designing for waste water and stormwater management, with key principles to:

- **Protect natural systems** of the site (of creeks, riparian zones and natural drainage courses);
- **Protect water quality** by improving the quality of stormwater runoff draining from the development to natural waterway, through filtration and retention;
- **Integrate stormwater treatment into the landscape** by incorporating multiple use corridors that maximise the visual and recreational amenity of the development, with integration of natural drainage systems within open space areas and pathways;
- **Reduce runoff peak flows** from development by local detention measures and by minimising impervious areas;
- **Add long-term value** by minimising drainage infrastructure costs to the development, whilst retaining and enhancing natural landscape features;
- **Reduce potable water demand** by using stormwater as a resource through capture and reuse for non-potable purposes.

WSUD measures will be integrated within the local road corridors and in the open space corridor (20-25m in width) to the rear of dwelling allotments of the northern residential development precinct. WSUD measures integrated within public open space/ recreation corridors and road corridors throughout the entire development will provide social and economic benefits of cost effective multi-functional landscaped areas. WSUD measures to be implemented will include the use of:

- Grassed or vegetated swales or filtration trenches for primary treatment, conveyance and detention. These are proposed adjacent to the roadways, in landscaped areas, to convey stormwater downstream, with vegetation used to be capable of withstanding design flows and be of sufficient density to provide good filtration.
- Bio-retention systems for secondary treatment, conveyance and detention. Bio-retention swales are implemented in a 2m zone at the centre of the primary local road network to provide efficient treatment of stormwater through fine filtration, detention and conveyancing functions.
- Wetlands and rain gardens for tertiary treatment of filtering stormwater. Detention and possible reuse are proposed along the 50m ecological zone on both sides of creeks and tributaries. Stream and riparian vegetation rehabilitation can be implemented to improve the health of streams and water quality.
- Receiving waters will have appropriate level of water quality will be achieved through implementation of stormwater management strategies, WSUD measures of water treatment and retention of riparian and buffer zones;
- Use of open space areas and playing fields as detention basins for stormwater capture.

7.16 Urban Design Guidelines for Precinct and Building Design

The proposed Concept Masterplan provides the urban design framework of the land use of each precinct, layout of buildings and residential allotments, network of streets, public domain precincts of open landscaped areas and urban squares/ plazas, landscaping and car parking areas. The development area for each precinct is provided in Section 7.6: *Description of the Proposed Development*, and the Concept Masterplan provides indicative "footprints" of development parcels for each precinct.

The urban design of the proposed building within each precincts, their overall layout and future character are described as follows:

7.16.1 Buddhist Temple Complex

7.16.1.1 Central/ axial buildings (religious core)

Building form and design

- Religious buildings are located along the central axis of the Temple Complex with design to suit the functional religious requirements of the Order.
- Traditional Chinese temple architectural design and detailing (timber joinery, windows and doors) with steeply pitched tiled roofs with deep sweeping eaves in dark blue/ grey colour.
- External materials will be of timber or masonry (face or painted).

Building height

- Single to 2 storeys with 4-5m floor to floor height.

7.16.1.2 Surrounding buildings (accommodation for resident monks)

Building form and design

- Residential accommodation for monks is proposed to be located along the eastern and western perimeters of the walled Temple Complex. These are to be in linear clusters, designed to suit the functional requirements of residential accommodation for monks, with ancillary dining, service, private and public amenity facilities.
- Traditional Chinese architectural design with steeply pitched tiled roofs in dark blue/ grey colour.
- Architectural detailing (timber joinery) can be simplified with form to complement the religious core buildings.
- The buildings are to frame and provide definition to the function and shape of the outdoor spaces of courtyards, pedestrian pathways and entries.
- External materials will be of masonry (face or painted).
- Building width – maximum 15m to optimise the provision of natural ventilation and light to each room.
- Implement ESD measures in the selection of materials and services to buildings.
- Where air-conditioning is used, ensure that exposed plant is discretely located or hidden from view from within the compound and from external vantage points.

Building height

- Single storey with 2.7m minimum floor to ceiling height.

7.16.1.3 Fortress walls surrounding Temple Complex

- Of face brick or masonry construction with raked embankment walls.
- Height – minimum 2.1m.

7.16.1.4 Public domain – within the Temple Complex

- Outdoor spaces to be of traditional Chinese Temple precinct and garden design.
- Predominance of hard landscaping with disciplined use of feature trees and perimeter landscaping to buildings, still ponds and small grassed or pebbled gardens.
- Provide for universal access to and within the Temple Complex.
- Design public domain areas for high pedestrian amenity with walkways to suit the functional requirements of access, select paving materials for durability, slip resistance and low maintenance, and landscaping for microclimate control and to suit the function of the spaces.
- Lighting to comply with AS 1158.3.1 (2005): *Lighting for roads and public spaces – Pedestrian areas (Category P) lighting – Performance and design requirements*.
- Provide for public amenity, a complementary suite of street furniture within the precinct of rubbish bins, appropriate bench seating.

7.16.1.5 Landscaping – within the Temple Sanctuary Precinct

- Provide an indigenous forest surrounding the Temple Complex of Scribbly Gum-Bloodwood Woodland or Blackbutt-Turpentine Forest species which are indigenous to the forested areas within and surrounding the site, to ensure a seamless integration of this precinct with the surrounding landscape.
- Tree planting within the 60m APZ buffer zones are to have large gaps between groups of trees to restrict potential spread of fire, with spaces under trees cleared of flammable fuel (shrub and long grass).
- Landscaping to Temple Complex entrance is to comprise signature and feature trees, thematic to Chinese Temple species to denote entry into this precinct.
- Landscaping, plant selection and landscape elements within Temple Complex to be thematic to Chinese gardens, with use of high quality paving, well-designed integrated suite of street furniture (seating, rubbish bins, etc.) and good quality lighting.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.
- Provide pedestrian connections to surrounding precincts.

7.16.1.6 Car parking area

- Asphalt surfaced car parking area with formed kerbs.
- At entry driveway to the Temple Complex, provide one way vehicular access with perimeter short-term parking, disabled parking and drop-off/ pick-up areas. Provide minimum 1.5m wide footpath along the outer perimeter of the driveway to link with footpaths along the ring road system and across to the car parking area.
- Entry to the car parking area is to be one-way in (from the northern driveway) and out (from the southern driveway), and sign marked as such.

- Provide a nominal setback of 10m from the road to provide for adjacent drainage swale and perimeter landscaping of indigenous trees for screening and microclimate control of parking areas.
- Car parking layout and dimensions are to comply with AS 2890.1 (2004): *Parking facilities – Off-street car parking* and Shoalhaven City Council (SCC) *Car Parking Code* (DCP No.18) on parking layout and dimensions, access and manoeuvrability.
- Provide for disabled parking spaces of 1 per 50 car parking spaces or part thereof. Design of spaces to comply with AS 2890.6: *Parking facilities – Off-street parking for people with disabilities*.
- Provide for bus/ coach parking within the parking area.
- Provide for delineated safe pedestrian access from the car parking to the Temple Complex entrance.
- Incorporate stormwater control measures in the design of the car parking area for collection or filtration into landscaped areas to reduce the level of stormwater entering surrounding streams.
- Lighting to comply with AS 1158.1 (2005): *Lighting for roads and public spaces – Vehicular traffic (Category V) lighting*.
- Landscaping to car parking is to comply with the landscape design requirements of SCC *Car Parking Code* and as identified in the section 7.18: *Landscape Design* of this report.

7.16.2 Education Precinct

7.16.2.1 Building form and design

- Contemporary architectural design and building forms that meet the functional requirements of the educational facility with classrooms and administrative facilities, with flexibility in building design to accommodate future changes.
- Buildings are to frame and provide definition to the function and shape of outdoor spaces of courtyards, pedestrian pathways and entries.
- Building width – minimum 9m (for single-sided classrooms) to 15m (for double-sided classrooms).
- Facades are to incorporate high quality finishes appropriate to the functional use of the buildings and surrounding spaces.
- Provide weather protection for circulation around and access to buildings in the form of colonnades, awnings, etc., integrated with the architectural form and design of the building.
- Implement ESD measures in building siting, orientation, design, infrastructure servicing and use of materials. Provide for natural ventilation and lighting.
- Where air-conditioning is used, ensure that exposed plant is discretely located or hidden from view.

7.16.2.2 Building height

- 2 storeys with minimum 2.7m floor to ceiling height.

7.16.2.3 Public domain

- Provide defined entrance and address to the precinct.
- Outdoor spaces should be designed to encourage a range of activities to suit the functional external requirements of the facility to take place, with quiet areas, gathering spaces and accessways. Materials and landscaping to suit the functional requirements of the space.
- Courtyards contained within classroom buildings are to be quiet intimate areas for passive recreation of sitting, socialising, etc. These spaces should be of high environmental quality with landscape elements of feature tree(s) for shading of the public space in summer and solar access in winter, with use perimeter planting.
- Design public domain areas for high pedestrian amenity with walkways to suit the functional requirements of access, select paving materials for durability, slip resistance and low maintenance, and landscaping for microclimate control and to suit the function of the spaces.
- Provide linkages within the site and to surrounding precincts.
- Provide for universal access from car parking area to buildings within the precinct.
- Lighting to comply with AS 1158.3.1 (2005): *Lighting for roads and public spaces – Pedestrian areas (Category P) lighting – Performance and design requirements*.
- Provide a complementary suite of street furniture within the precinct of rubbish bins, appropriate bench seating, etc.

7.16.2.4 Landscaping

- Use feature trees (deciduous or evergreen) along pedestrian pathways and focal areas.
- Provide trees for shade and microclimate control along pathways, within courtyards and car parking areas, along the perimeter of the sports field and around buildings.
- Open space areas surrounding sports field and buildings are to be informally landscaped with indigenous species suitably planted for APZ buffer areas.
- Sports field to be grassed with natural embankments for viewing by spectators.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.
- Retain natural drainage corridors.
- Incorporate stormwater control measures in the design of landscaped areas to reduce level of stormwater entering surrounding streams.

7.16.2.5 Car parking area

- Asphalt surfaced car parking area with formed kerbs.
- Provide a nominal setback of 10m from the road to provide for adjacent drainage swale and perimeter landscaping of indigenous trees for screening and microclimate control of parking areas.
- Car parking layout and dimensions are to comply with AS 2890.1 (2004): *Parking facilities – Off-street car parking* and Shoalhaven City Council (SCC) *Car Parking Code* (DCP No.18) on parking layout and dimensions, access and manoeuvrability.
- Provide for disabled parking spaces of 1 per 50 car parking spaces or part thereof. Design of spaces to comply with AS 2890.6: *Parking facilities – Off-street parking for people with disabilities*.

- At entry driveway to the Education Precinct, provide for one way vehicular access with perimeter short-term parking, disabled parking and drop-off/ pick-up areas.
- Provide for delineated safe pedestrian access from the car parking area to the entrance of the Educational Precinct buildings.
- Landscaping to car parking is to comply with the landscape design requirements of SCC *Car Parking Code*, and as identified in the section 7.18: *Landscape Design* of this report.
- Incorporate stormwater control measures in the design of the car parking area for collection or filtration into landscaped areas to reduce the level of stormwater entering surrounding streams.

7.16.3 Village Centre Precinct

7.16.3.1 Building form and design

Retail and commercial buildings

- Contemporary architectural forms and building design to meet the functional requirement for mix of retail, dining, commercial and community uses incorporating flexibility in building design, with ancillary support facilities.
- Design buildings surrounding the Urban Plaza to frame the urban square/ plaza and spaces and their function. Provide building widths to suit retail and commercial purposes.
- Ensure a mix range of users with differing types of retail, dining, commercial and community uses to add vibrancy to the precinct.
- Orientate buildings to optimise solar access, outlook and pedestrian activity.
- Provide uniformity of design and treatment of built form in the design of the buildings fronting the urban plaza.
- Facades are to incorporate high quality finishes appropriate to the functional use of the buildings and surrounding spaces.
- Maximise active retail, dining and commercial frontages to the public domain for vitality and passive surveillance. Provide clear glazing to shopfronts with retail areas, particularly dining, to address and open up to the pedestrian street. Minimise the extent of blank walls fronting urban spaces.
- Implement ESD measures in building siting, orientation, design and use of materials. Provide for optimum natural ventilation and lighting.
- Provide for weather protection to shopfronts and outdoor dining areas in the form of awnings, colonnades, etc. Awnings are to be between 3.2m and 4.5m above footpath level. The design of awnings and colonnades are to be integrated with the architectural form and design of the building.
- Where air-conditioning is used, ensure that exposed plant is discretely located or hidden from view.
- Provide for service requirements to buildings.
- Outdoor dining areas within the central urban square and adjacent to the riparian zones can be sheltered with ephemeral shelters.

Convention Centre

- Convention Centre will be a feature building within the precinct.
- Design Convention Centre to meet the functional requirements for a public hall, convention facilities and gathering spaces with ancillary support amenities.

- Implement ESD measures in building design, infrastructure and use of materials.
- Contemporary architectural forms that address the public domain of urban spaces and streets. These could be in the form of more economic solutions such as the use of tensile roof structures.
- Articulate blank walls fronting urban spaces to create interest and to avoid monotony.
- Facades are to incorporate high quality finishes appropriate to the functional use of the buildings and surrounding spaces.
- Where air-conditioning is used, ensure that exposed plant is discretely located or hidden from view.
- Provide for service requirements to buildings.

Residential building (Residential Precinct D)

- Design for the functional requirements of residential uses.
- Residential building to comply with the objectives and guidelines for quality design in State Environmental Planning Policy 65 – *Design Quality of Residential Flat Development* (SEPP 65), the *Residential Flat Design Code* and the *Residential Flat Design Pattern Book*.
- The residential building for use as serviced apartments is to comprise a mix of single, two and three bedroom dwellings, with the application of universal housing guidelines to a majority of these dwellings for flexibility of use by all age groups.
- Implement ESD measures in building siting, orientation, design and use of materials. Provide for optimum natural ventilation and lighting.
- Facades are to incorporate high quality finishes appropriate to the functional use of the buildings and surrounding spaces.
- Provide for separate access to the retail, commercial and residential portions of the precinct and maintain privacy of access to each component.

7.16.3.2 Building height

- 2 storeys for retail and commercial premises, with minimum 3.5m floor to ceiling height at ground floor level and minimum 2.7m (optimum 3m) at upper floor levels.
- Convention Centre – maximum 3 storeys. Height to suit the functional requirements of the facility.
- Residential building – 4 storeys above retail/ commercial uses. Maximum 2.7m floor to ceiling height per storey.

7.16.3.3 Public domain

The design of the public domain within the Village Centre Precinct should serve the functional and social needs of its users and enable people to connect and affiliate with other people. The spaces must serve as oases to stimulate, enable social participation, provide the function of retail and dining, escape from urban overload and security. The design of the public spaces should excite and delight.

Design of public areas/ precincts must satisfy the following key criteria of:

A. Comfort;
B. Relaxation;
C. Active engagement with the environment;
D. Passive engagement with the environment; and
E. Discovery

A. Comfort

Comfort determines the length of time people remain within a place. Social and psychological comforts are key elements that satisfy people's positive experiences in public places. Provide security in the attention to features that reduce threats to safety and to increase comfort in the setting.

The public open space must have:

- Places to rest – with design of spaces, selection and placement of sufficient seating being important aspects of successful public spaces. Comfortable and sufficient seating is to be provided, with consideration of the orientation of seating, its proximity to areas of access, seating for individuals and groups, seating that enables social activities of reading, eating, talking, resting and privacy, with selection of seats that are movable, with and without backs.
- Comfort – relief from the sun in summer and access to the sun in winter; and
- Shelter from sun, rain and inclement weather.

B. Relaxation

The public space should incorporate areas for relaxation and contemplation, with the design of natural features, such as trees and other greenery, that offer opportunities for retreat and relaxation.

C. Active engagement

Urban public places provide venues for ceremony, celebration and festivity. These spaces are to be designed as the stage of gatherings, special events, performances and as gathering places for activities such as weekend markets for local artisans and growers.

Public spaces additionally play a crucial role in providing a setting where people can gather and socialise with friends and community, and are to be designed with areas for social engagement. These spaces are of particular importance to the elderly, whose social life often centres around public spaces. The elderly tend to group around perimeters of public areas.

D. Passive engagement

Public open spaces are to be designed with areas that allow for "people-watching" and to observe performers and formal activities, which is an important attraction of public spaces.

Public open spaces are to include various physical features that have relaxing and restorative qualities, such as water features, landscape features.

E. Discovery

Public spaces are to be places of discovery and stimulation, with the sense of discovery enhanced by the design of these spaces.

Implementation

- Create a high quality public domain of place-making and social interaction. The public urban spaces of streets and outdoor parks and urban squares are to be designed as a linked variety of "outdoor living areas" for specific uses as social spaces and focus activity areas for visitors to and residents of the tourist and residential development.
- Design public domain areas for high pedestrian amenity with walkways to suit the functional requirements of access, select paving materials for durability, slip resistance and low maintenance.
- Design for high environmental amenity to allow for solar access in winter and shade in summer, minimise windy conditions, with landscape for feature and microclimate control, and comfort.
- Retain a central focal urban gathering place/ plaza at the centre of the Village Centre Precinct with quality hard paving, shade and feature trees. A central feature (art or water feature) can be sited within this urban plaza. Encourage external dining areas directly adjacent to internal retail spaces. Design for privacy of use and spatial separation from public walkways, but not disconnection, through measures such as slight level changes, separation by vegetation, etc.
- Provide for universal access with the precinct.
- Design for pedestrian as well as service requirements to the precinct.
- Provide for a hierarchy of landscaped pedestrian paths within the precinct and to external areas. A primary axial sharedway, for pedestrian and service/ emergency access, is to be sited along the east-west axis of the Temple Sanctuary Precinct. The walkway is to be approximately 8-10m in width, flanked by an avenue of feature trees. A north-south pedestrian walkway links the Village Centre Precinct to the Education and Health & Wellness Precincts. The walkway, of approximately 5m wide, is to be flanked by an avenue of trees.
- Lighting to comply with AS 1158.3.1 (2005): *Lighting for roads and public spaces – Pedestrian areas (Category P) lighting – Performance and design requirements*.
- Provide a complementary suite of street furniture within the precinct of rubbish bins, appropriate bench seating, etc.
- Siting of outdoor dining areas must not compromise pedestrian access within the urban spaces.
- Prepare a Signage Strategy for consistency in signage location, design and application to retail/ commercial shopfronts and within the Village Centre Precinct.

7.16.3.4 Landscaping

- Use feature trees (deciduous or evergreen) within urban plazas, focal areas and pathways for spatial organisation and orientation, and for microclimate control.
- Surrounding open space areas to be informally landscaped with indigenous trees and plants, with utilisation of tree planting for shading to buildings and microclimate control to external spaces.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.
- Retain natural drainage corridors.
- Incorporate stormwater control measures in the design of landscaped areas to reduce level of stormwater entering surrounding streams.

7.16.3.5 Car parking area

- Asphalt surfaced car parking area with formed kerbs.
- Provide setback from the road to provide for adjacent drainage swale and perimeter landscaping of indigenous trees for screening and microclimate control of parking areas.
- Car parking layout and dimensions are to comply with AS 2890.1 (2004): *Parking facilities – Off-street car parking* and Shoalhaven City Council (SCC) *Car Parking Code* (DCP No.18) on parking layout and dimensions, access and manoeuvrability.
- Provide for delineated safe pedestrian access from the car parking area to the Town Centre Precinct with a footpath along at least one side of the service road.
- Provide for disabled parking spaces of 1 per 50 car parking spaces or part thereof. Design of spaces to comply with AS 2890.6: *Parking facilities – Off-street parking for people with disabilities*.
- Landscaping to car parking is to comply with the landscape design requirements of SCC *Car Parking Code* and as identified in the section 7.18: *Landscape Design* of this report.
- Incorporate stormwater control measures in the design of the car parking area for collection or filtration into landscaped areas to reduce the level of stormwater entering surrounding streams.

7.16.3.6 Service road network

- Provide road network, accessed from the surrounding ring road, to service the Village Centre Precinct and access the proposed car parking area. The road is to be setback of minimum 10m from the residential building to the service road and landscaped with screen planting for residential amenity of visual and acoustic privacy.
- Access to proposed residential development and to its underground parking area is to be from this roadway.

7.16.4 Health and Wellness Precinct

7.16.4.1 Building form and design

- Contemporary architectural design and forms to meet the functional requirement of a health care and wellness facility, to include the provision of consulting and treatment rooms, pre and after care areas, public waiting, administrative, amenity and service areas.
- The buildings are to frame and provide definition to the function and shape of outdoor spaces of courtyards, pedestrian pathways and entries.
- Building width – generally not exceeding 20m for optimisation of natural light and ventilation, depending on functional requirements.
- Allow for sheltered entrance, ambulance access to and accommodate the emergency requirements of the building use.
- Implement ESD measures in orientation, building design and use of materials. Provide, where possible, for natural ventilation and lighting.
- Where air-conditioning is used, ensure that exposed plant is discretely located or hidden from view.
- Provide for service requirements to the building.

- Facades are to incorporate high quality finishes appropriate to the functional use of the buildings and surrounding spaces.

7.16.4.2 Building height

- 2 storeys with 2.7-3m floor to ceiling height per storey.

7.16.4.3 Public domain

- Provide defined entrance and address to the precinct.
- Provide for quality external spaces designed to suit the functional requirements of the spaces and for high pedestrian and environmental amenity. Select paving materials for durability, slip resistance and low maintenance, and landscaping for microclimate control and to suit the function of the spaces.
- Provide intimate courtyards, landscaped for rest and relaxation.
- Provide linkages within the precinct and to surrounding precincts.
- Provide for universal access to and within the precinct, to the buildings and within the public facilities of the building and 10% of consulting rooms.
- Lighting to comply with AS 1158.3.1 (2005): *Lighting for roads and public spaces – Pedestrian areas (Category P) lighting – Performance and design requirements*.
- Provide a complementary suite of street furniture within the precinct of rubbish bins, appropriate bench seating, etc.

7.16.4.4 Landscaping

- Use feature trees (deciduous or evergreen) along pedestrian pathways.
- Landscape courtyards to provide areas of rest and recuperation with privacy to these areas.
- Surrounding open space and parking areas to be informally landscaped with indigenous trees and plants with utilisation of tree planting for shading to buildings and microclimate control to external spaces.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.
- Retain natural drainage corridors.
- Incorporate stormwater control measures in the design of landscaped areas to reduce level of stormwater entering surrounding streams.

7.16.4.5 Car parking area

- Asphalt surfaced car parking area with formed kerbs.
- Provide setback from road for drainage swales and perimeter landscaping.
- Car parking layout and dimensions are to comply with AS 2890.1 (2004): *Parking facilities – Off-street car parking* and Shoalhaven City Council (SCC) *Car Parking Code* (DCP No.18) on parking layout and dimensions, access and manoeuvrability.
- Provide for disabled parking spaces of 1 per 50 car parking spaces or part thereof. Design of spaces to comply with AS 2890.6: *Parking facilities – Off-street parking for people with disabilities*.
- Provide for delineated safe pedestrian access from the car parking area to the entrance of the Health & Wellness Precinct.

- Landscaping to car parking is to comply with the landscape design requirements of SCC *Car Parking Code* and as identified in the section 7.18: *Landscape Design* of this report.
- Incorporate stormwater control measures in the design of the car parking area for collection or filtration into landscaped areas to reduce the level of stormwater entering surrounding streams.

7.16.5 Hotel Precinct

7.16.5.1 Building form and design

- Contemporary architectural design and residential building forms to meet the functional requirement of a hotel with conference, dining and administrative facilities. Design to incorporate high residential amenity.
- Site the building to optimise views to valley below.
- Sensitively site the building(s) to integrate with the surrounding landscape and designed to minimise visual impact from surrounding vantage points.
- Provide privacy to external terraced areas from surrounding roads by utilising the building form, whilst optimising on outlook. Optimise solar access and protect external outdoor recreational areas from windy conditions in winter.
- Facades are to incorporate high quality finishes appropriate to the functional use of the buildings and surrounding spaces.
- Implement ESD measures in building siting, orientation, design and use of materials. Provide for natural ventilation and lighting.
- Provide for some underground parking within the facility with surface parking north of the proposed Comberton Grange Road extension.
- Cabins to be single storey, integrated with the topographical features of the precinct. Site to allow for visual and acoustic privacy between dwellings, of optimum 10m spatial separation. Landscape to provide for privacy.

7.16.5.2 Building height

- Maximum height 3 storeys above ground level.

7.16.5.3 Public domain

- Provide defined entrance to the Hotel with one way vehicular entry area and footpath along the entry side of the driveway. Footpath to adjoining internal entry driveway to be minimum 1.5m in width.
- Provide drop-off/ pick-up area adjacent to the building entrance. Entrance is to be sheltered.
- Provide clear signage directions to Hotel and car parking area(s).
- Provide for universal access to the entry of the Hotel and within the key public areas of the building.
- Public open space is anticipated to be incorporated within the building design, in its passive recreation terraces of pool decks and outdoor dining facilities.
- Open areas are to be design according to the functional requirements of the spaces.

7.16.5.4 Landscaping

- Use feature trees for precinct and entry delineation.
- Surrounding valley below and car parking areas to be informally landscaped with indigenous trees and plants for shading of buildings, screening and microclimate control to external spaces.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.
- Retain natural drainage channels.
- Incorporate stormwater control measures in the design of landscaped areas to reduce level of stormwater entry into Currambene Creek.

7.16.5.5 Car parking area

- Asphalt surfaced car parking area with formed kerbs.
- Provide setback from road for drainage swales and perimeter landscaping.
- Car parking layout and dimensions are to comply with AS 2890.1 (2004): *Parking facilities – Off-street car parking* and Shoalhaven City Council (SCC) *Car Parking Code* (DCP No.18) on parking layout and dimensions, access and manoeuvrability.
- Provide for disabled parking spaces of 1 per 50 car parking spaces or part thereof. Design of spaces to comply with AS 2890.6: *Parking facilities – Off-street parking for people with disabilities*.
- Provide for delineated safe pedestrian access from the car parking area to the entrance of the Hotel.
- Landscaping to car parking is to comply with the landscape design requirements of SCC *Car Parking Code*.
- Incorporate stormwater control measures in the design of the car parking area for collection or filtration into landscaped areas to reduce the level of stormwater entering surrounding streams.

7.16.6 Information Precinct

7.16.6.1 Building form and design

- Contemporary architectural design and building form to meet the functional requirement for an information facility with flexible internal areas to be able to incorporate a small museum, media room, amenities and administration offices.
- Sensitively site the buildings to integrate with the surrounding landscape.
- Buildings are to be set back to provide Asset Protection Zone as required in Section 8.7 – *Bushfire* of this report and the Bushfire Assessment report.
- Implement ESD measures in building siting, orientation, design and use of materials with optimisation of natural light and ventilation.
- Facades are to incorporate high quality finishes appropriate to the functional use of the buildings and surrounding spaces.
- Provide for covered (light weight open structure) and secured storage (perimeter fencing) of golf buggies for hire adjacent to the Information Centre. Roof form and design to be thematically integrated with the design of the Information Centre.

7.16.6.2 Building height

- Single storey.

7.16.6.3 Public domain

- Provide defined entrance to the precinct with one way vehicular entry area with footpath along one side of driveway. Footpath to adjoining internal entry driveway to be minimum 1.5m in width.
- Provide clear signage directions to Information Centre and car parking area.
- Provide for universal access to the entry of the precinct and within the key public areas of the building.
- Provide drop-off/ pick-up area adjacent to the building entrance. Entrance is to be sheltered.

7.16.6.4 Landscaping

- Use feature trees and planting for entry delineation and entrance embellishment.
- Landscaping to car park and within the precinct to be informally landscaped with indigenous trees and plants for shading of parking areas, screening and microclimate control to external spaces.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.
- Incorporate stormwater control measures in the design of landscaped areas to reduce level of stormwater entry into Currambene Creek.

7.16.6.5 Car parking area

- Design for width of entry driveway for one way entry and to suit the function of its use.
- Asphalt surfaced car parking area with formed kerbs.
- Provide nominal setback of 10m from the road for drainage swales and perimeter landscaping.
- Car parking layout and dimensions are to comply with AS 2890.1 (2004): *Parking facilities – Off-street car parking* and Shoalhaven City Council (SCC) *Car Parking Code* (DCP No.18) on parking layout and dimensions, access and manoeuvrability.
- Provide for disabled parking spaces of 1 per 50 car parking spaces or part thereof. Design of spaces to comply with AS 2890.6: *Parking facilities – Off-street parking for people with disabilities*.
- Provide for delineated safe pedestrian access from the car parking area to the entrance of the building.
- Landscaping to car parking is to comply with the landscape design requirements of SCC *Car Parking Code* and as identified in the section 7.18: *Landscape Design* of this report.
- Incorporate stormwater control measures in the design of the car parking area for collection or filtration into landscaped areas to reduce the level of stormwater entering surrounding streams.

7.16.7 Heritage/ Former Homestead Precinct

7.16.7.1 Building form and design *(if desired, to be subject to future approval)*

- Traditional or contemporary architectural design and building form to meet the functional requirement for a small lookout and café facility with broad encompassing verandahs for external dining areas, near the site of the former European homestead. Design to incorporate ESD measures in building design and use of materials with optimisation of natural light and ventilation.
- Sensitively site the buildings to integrate with the surrounding landscape.
- Implement ESD measures in building siting, orientation, design, infrastructure servicing and use of materials. Provide for natural ventilation and lighting.

7.16.7.2 Building height *(if desired, to be subject to future approval)*

- Single storey.

7.16.7.3 Public domain

- Provide defined entrance to the precinct with one way vehicular entry area with footpath along one side of driveway. Footpath to adjoining internal entry driveway to be minimum 1.5m in width.
- Entrance is to be sheltered.
- Provide clear signage directions to Heritage Precinct and car parking area.
- Provide for universal access to the entry of the precinct and within the key public areas of the building.

7.16.7.4 Landscaping

- Landscaping within precinct to be of indigenous trees and plants.
- Provide copses of tree planting to screen adjacent residential allotments from Heritage Precinct.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.
- Incorporate stormwater control measures in the design of landscaped areas to reduce level of stormwater entry into Currambene Creek.
- Provide landscaping to car parking area.

7.16.7.5 Car parking

- Rolled/ compacted blue metal or asphalt surfaced car parking area with formed kerbs.
- Car parking layout and dimensions are to comply with AS 2890.1 (2004): *Parking facilities – Off-street car parking* and Shoalhaven City Council (SCC) *Car Parking Code* (DCP No.18) on parking layout and dimensions, access and manoeuvrability.
- Provide for disabled parking spaces of 1 per 50 car parking spaces or part thereof. Design of spaces to comply with AS 2890.6: *Parking facilities – Off-street parking for people with disabilities*.
- Landscaping to car parking is to comply with the landscape design requirements of SCC *Car Parking Code* and as identified in the section 7.18: *Landscape Design* of this report.

7.16.8 Residential Precincts A and B

Detached dwellings are to be sited on allotments of approximately 760m^2 (20m wide x 38m deep).

7.16.8.1 Site coverage and landscaped area

Objective:

- The dwelling is to be sited within a landscaped setting and configured so that there is sufficient space on the site to allow for a generous rear garden, a landscaped front garden and for spatial separation between adjacent dwellings.

Guidelines:

- Site coverage for a:
  - 2 storey building is to be maximum 40% of the total lot area; and
  - single storey building is to be maximum 50% of the total lot area.
- Site coverage shall allow for landscaped areas (of minimum 20% of the total lot area) to provide soil permeability to limit stormwater runoff.
- Site coverage should provide for adequate private open space for the passive recreational requirements of the residents of each dwelling and to accommodate on-site car parking of 2 vehicles.
- Provide for planting of trees within the site with minimum of 2 trees per allotment.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.

7.16.8.2 Setbacks

Objective:

- Dwellings require setbacks for privacy, enable solar access and streetscape character.

Guidelines:

- Front façade to be set back at least 5m from the front boundary – to enable a landscaped front garden to be created, for privacy and to enable a vehicle to be wholly sited within the site.
- Garages are to be recessed at least 1m from the front façade.
- Provide minimum 2m setback from side boundaries to maintain privacy and solar access. Garages or carports may be set back 1.5m at ground floor level from side boundaries.
- Set building back sufficiently from rear boundary (minimum 5m) to allow for adequate area for large trees and recreation.
- On corner lots, the dwelling should address both streets.

7.16.8.3 Siting, dwelling design and building form

Objectives:

- Provide well-planned and functional homes for comfort and residential amenity, with optimum regard to ESD principles with implementation of ESD measures in building siting and design.
- Site and design dwellings with building forms to sensitively integrate with the topographical features and character of the site.

- Design to achieve a consistently high quality collection of well-designed dwellings that comprise a variety of dwelling designs and mixture of building materials that contribute to the quality and coherence of the streetscape and neighbourhood.
- Design and siting of dwellings must additionally consider the amenity for the occupants of the dwelling and of surrounding properties.
- Provide for view sharing in the siting and design of the dwellings.

Guidelines:

- The dwelling is to be sited with:
  - Orientation for optimum solar access and control, with living rooms to the north, north-east or north-west;
  - Entrance from the street;
  - Retention of important natural features of the site with rear and front yards to enable planting of trees.
  - Protection of visual and acoustic privacy and solar access to adjacent dwellings.
  - Provide for vehicle access and parking
- Floor space ratio to not exceed 0.5:1 for dwellings and outbuildings combined.
- Dwellings are to be sited to have regard to/ be integrated with the topographical characteristics and features of the site, to minimise cut and fill, have regard to natural drainage patterns and optimise view sharing.
- Dwellings are to be either single of 2 storeys in height.
- Provide generous ceiling heights of minimum 2.7m to allow for sufficient daylight and ventilation.
- Optimise ESD principles in the siting and design of the dwelling, for at least natural lighting, natural ventilation and solar access. Implement ESD measures in building design, infrastructure servicing and use of materials.
- Orientate living areas to the north, north-east or north-west, and facing landscaped areas. Provide quality solar access to internal and external living areas to achieve at least 3-4 hours of solar access in winter.
- Provide well-designed and functional outdoor spaces which integrate well with the living areas of the dwelling.
- Provide storage areas within houses.
- Design for diversity of built form, with consideration of all facades of the dwelling and ensure facades include modulation, articulation, sizing and proportion of fenestration, avoidance of excessively long expanses of walls.
- Garages should not dominate the façade of the dwelling in design and width, be recessed from the front façade to reduce their visual impact on the streetscape. Garages are to be setback at least 1m from the front dwelling façade, with garage openings to be less than 50% of the width of the dwelling.
- The use of deep eaves is encouraged (minimum 600mm) to provide shading and weather protection of windows and doors. Alternative shading devices may be used.
- Provide for entries that address the street and covered for weather protection.
- Double garages are only permitted on lots 12.5m wide or greater. Triple garages are not permitted.
- Reduce the width of the driveway at the street and incorporate landscaping around the driveway, particularly between the driveway and the side fence.

- Integrate location of rainwater tanks, garbage bins, air conditioning and condenser units into the overall design of the dwelling and its siting within the allotment.
- Design to provide for residential amenity as well as provide opportunities for passive surveillance of the street and open space corridors. Landscaping at lot boundaries can achieve privacy and shading.
- Select materials with consideration of their appearance, quality, maintenance and durability.

7.16.8.4 Private open space

Objective:

- Provide well designed and functional private open spaces to suit residential living.

Guidelines:

Principle private open space(s) are to:

- Be sized to accommodate passive recreation and be easily accessible from the main internal living areas – minimum size of 6m x 6m.
- Be sited to receive 3 hours or more of sunlight between 9am-3pm in mid-winter to at least half of the external space.
- Be able to accommodate a large tree, 8-15m high at maturity for shading and microclimate control of the space.
- Accommodate soft landscaped areas as well as hard paving.
- Provide for the planting of minimum one medium sized tree for shade and microclimate control.

7.16.8.5 Streetscape

Objectives:

- The streetscape and landscape character of the street is to be created by well-defined front gardens, building forms, front fences and street trees.
- Corner dwellings, their design, setback and address to surrounding streets, are equally as important as they provide neighbourhood landmarks.
- The dwelling façade should be dominant with the garage designed as a recessive element on the street elevation of the dwelling.

Guidelines:

- Create attractive landscaped front gardens that include small trees and low planting, with predominance of soft landscaped areas.
- Front fencing defines the allotment from the street, the street edge and the private space of the residence. To contribute to the streetscape, front fencing should be consistent in height. Desired height of front fencing is 700-1000mm with 50% open appearance. Design of the fencing within the front garden should extend to the side boundaries.
- Letter boxes should be incorporated into the design of the front fence.
- Side fencing should not exceed 1.8m in height.
- Rear fencing to golf courses and open space corridors should be between 700-1000mm in height with 50% open appearance. Rear fencing is to be complemented by landscaping of dense shrubs or hedges along the rear boundary alignment.

7.16.8.6 Open space corridors

Objectives:

- Open space corridors are located to the rear of residential allotments. These form local parks located in close proximity to dwellings and have the function of recreational use, visual amenity and wildlife corridors. They additionally create linkages to surrounding residential precincts and the wider landscape.

Guidelines:

- Corridors are to be informally landscaped with copses of indigenous trees within APZ landscape design criteria.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.
- Corridors can accommodate community gardens for agriculture, with provision of ponds/ dams to capture recycled water for irrigation.

7.16.8.7 Universal housing design guidelines

Objectives:

- Provide universal housing design guidelines for dwellings that aim at providing the flexible usability of dwellings for a range of future needs of all age groups, particularly for the elderly, to ensure that ageing-in-place can occur without implementing major structural changes to the dwelling.
- Ensure approximately 80% of dwellings within these precincts are designed with universal housing guidelines.

Guidelines:

Provide universal housing measures to dwellings to include:

- Direct access – Direct and level access from the car parking space to the house.
- Car parking – car parking space to be at least 6m in length with potential to be 3.8m wide internally.
- Front entry door – minimum internal clearance of 860mm.
- Internal entry doorways – minimum internal clearance of 820mm.
- Internal entry level corridors – minimum width of 1000mm.
- Ground floor facilities – to comprise living/ family room, a flexible space for use as bedroom, and a bathroom.
- Living/ family room circulation space –at least 2.25m diameter (clear of furniture).
- Bedroom on ground/ entry level – large enough for queen size bed, wardrobe and circulation space (e.g. 3.5m x 3.2m or 3.7m x 3.0m).
- Bathroom dimensions and features at ground/ entry level – minimum 2.4m x 2.4m with hobless shower, full floor waterproofed and strengthened walls around the toilet and shower to suit future grab rails.
- Kitchen dimensions – minimum of 2.7m between walls.
- Laundry – with minimum clear circulation space of 1.55m diameter.
- Window heights – window sills on ground/ entry level at a maximum height of 730mm above floor level (excluding the bathroom and kitchen).

(Reference: Additionally refer to Landcom Universal Housing Guidelines (2008))

7.16.9 Residential Precinct C

Detached dwellings are to be sited on allotments of approximately 1,500m^2 (30m x 50m).

7.16.9.1 Site coverage and landscaped area

Objective:

- The dwelling is to be sited within a landscaped setting and configured so that there is sufficient space on the site to allow for private open space, a landscaped front garden, spatial separation between adjacent dwellings for minimising visual impact and privacy.

Guidelines:

- The dwellings within this precinct will predominantly be 2 storeys in height. Site coverage is to be maximum 35% of the total lot area.
- Provide for soft landscaped areas (of minimum 40% of the total site area) to enable soil permeability to limit stormwater runoff and to minimise the visual impact of dwellings within this rural setting.
- Site coverage should provide for adequate private open space for the passive recreational requirements of residents of each dwelling and to accommodate on-site parking of 2 vehicles.
- Provide for planting of trees to ameliorate the impact of dwellings within its rural setting, informally landscaped with copses of indigenous trees suitably planted for APZ buffer areas, with minimum of 4 trees per allotment.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.

7.16.9.2 Setbacks

Objective:

- Dwellings require setbacks for privacy, provide streetscape character and enable solar access.

Guidelines:

- Front façade is to be set back at least 5m from the front boundary – to enable a front garden to be created, for privacy and to enable a vehicle to be wholly sited within the site.
- Garages are to be recessed at least 1m from the front façade.
- Provide minimum 3m setback from side boundaries for tree planting around the dwelling of each allotment, and to site dwellings within a highly landscaped site.
- Set building back sufficiently from rear boundary (minimum 12m) to allow for adequate area for large trees and recreation.

7.16.9.3 Siting, dwelling design and building form

Objectives:

- Site and design dwellings with building forms that sensitively integrate with the topographical features and rural character of the site.
- Provide well-planned and functional homes for comfort and residential amenity, with optimum regard to ESD principles with implementation of ESD measures in building siting and design.

- Design to achieve a consistently high quality collection of well-designed dwellings that comprise a variety of dwelling designs and mixture of building materials that contribute to the quality and coherence of the streetscape and its rural setting.
- Design and siting of dwellings must additionally consider the amenity for the occupants of the dwelling and of surrounding properties.
- Provide for view sharing in the siting and design of dwellings.

Guidelines:

- The dwelling is to be sited with:
  - Orientation for optimum solar access and control, with living rooms to the north, north-east or north-west;
  - Entrance from the street;
  - Retention of important natural features of the site with rear and front yards to enable planting of trees;
  - Protection of visual and acoustic privacy and solar access to adjacent dwellings;
  - Provide for vehicle access and parking.
- Floor space ratio (FSR) to not exceed 0.5:1 for dwellings and outbuildings combined.
- Dwellings are to be sited to have regard to/ be integrated with the topographical characteristics and features of the site, with building and roof forms designed to minimise building bulk and visual impact, to minimise cut and fill, have regard to natural drainage patterns and optimise view sharing.
- Dwellings are to be either single of 2 storeys in height, but stepped to respond to site topography.
- Provide generous ceiling heights of minimum 2.7m to allow for sufficient daylight and ventilation.
- Optimise ESD principles in the siting and design of the dwelling, for at least natural lighting, natural ventilation and solar access. Implement ESD measures in building design, infrastructure servicing and use of materials.
- Orientate to optimise views but design to enable entry of sun into living areas and external private open spaces to achieve at least 3-4 hours of solar access in winter.
- Provide well-designed and functional outdoor spaces which integrate well with the living areas of the dwelling.
- Provide storage areas within houses.
- Design for diversity of built form, with consideration of all facades of the dwelling and ensure facades include modulation, articulation, sizing and proportion of fenestration, avoidance of excessively long expanses of walls.
- Garages should not dominate the façade of the dwelling in design and width, be recessed from the front façade to reduce their visual impact on the streetscape. Garages are to be setback at least 1m from the front dwelling façade, with garage openings to be less than 50% of the width of the dwelling.
- Incorporate deep eaves (minimum 600mm) to provide shading and weather protection of windows and doors. Alternative shading devices may be used.
- Provide for entries that address the street and covered for weather protection.
- Double garages are only permitted on lots 12.5m wide or greater. Triple garages are not permitted.

- Reduce the width of the driveway at the street and incorporate landscaping around the driveway, particularly between the driveway and the side fence.
- Integrate location of rainwater tanks, garbage bins, air conditioning and condenser units into the overall design of the dwelling and its siting within the allotment.
- Design to provide for residential amenity as well as provide opportunities for passive surveillance of the street and open space corridors. Landscaping at lot boundaries can achieve privacy and shading.
- The precinct is within an area of high visual sensitivity. Select materials with consideration of their appearance, visual impact, quality, maintenance and durability.

7.16.9.4 Private open space

Objective:

- Provide well designed and functional private open spaces to suit residential living.

Guidelines:

Principle private open space(s) are to:

- Be sized to accommodate passive recreation – minimum size of 6m x 6m.
- Verandahs and balconies overlooking the valley are encouraged.
- Be sited to receive 3 hours or more of sunlight between 9am-3pm in mid-winter to at least half of the external space.
- Be able to accommodate a large tree, 8-15m high at maturity for shading and microclimate control of the space.
- Accommodate soft landscaped areas as well as hard paving.
- Provide for the planting of minimum one medium sized tree for shade and microclimate control.

7.16.9.5 Streetscape

Objectives:

- The streetscape and landscape character of the street is to be created by well-defined front gardens, building forms, front fences and street trees.
- The dwelling façade should be dominant with the garage designed as a recessive element on the street elevation of the dwelling.

Guidelines:

- Create attractive landscaped front gardens that include small trees and low planting, with predominance of soft landscaped areas.
- Front fencing defines the allotment from the street, the street edge and the private space of the residence. To contribute to the streetscape, front fencing should be consistent in height. Desired height of front fencing is 700-1000mm with 50% open appearance. Design of the fencing within the front garden should extend to the side boundaries.
- Letter boxes should be incorporated into the design of the front fence.
- Avoid the provision of side fencing and rear fencing. Where provided as a matter of privacy and containment, fences should be between 700-1000mm in height with 50% open appearance. The visual impact of fences is to be ameliorated with landscaping of dense indigenous shrubs, hedges of indigenous species.

7.16.9.6 Open space corridors

Objectives:

- Open space corridors are located to the rear of residential allotments. These are in close proximity to dwellings and have the function of recreational use, visual amenity and wildlife corridors. They additionally create linkages to surrounding residential precincts and the wider landscape.

Guidelines:

- Corridors are to be informally landscaped with copses of indigenous trees within APZ landscape design criteria. Siting of trees is to ameliorate the impact of buildings on the landscape.
- Select plant species suitable for purpose with specific regard to water conservation, landscape maintenance and fire-resistant features.
- Corridors can accommodate community gardens for agriculture, with provision of ponds/ dams to capture recycled water for irrigation.

7.16.9.7 Universal housing design guidelines

Objectives:

- Provide universal housing design guidelines for dwellings that aim at providing the flexible usability of dwellings for a range of future needs of all age groups, particularly for the elderly, to ensure that ageing-in-place can occur without implementing major structural changes to the dwelling.
- Due to topographical constraints of the site, ensure the minimum of 40% of dwellings within this precinct is designed with universal housing guidelines, without compromising the visual impact of dwellings within this sensitive location.

Guidelines:

Provide universal housing measures to dwellings to include:

- Direct access – Direct and level access from the car parking space to the house.
- Car parking – car parking space to be at least 6m in length with potential to be 3.8m wide internally.
- Front entry door – minimum internal clearance of 860mm.
- Internal entry doorways – minimum internal clearance of 820mm.
- Internal entry level corridors – minimum width of 1000mm.
- Ground floor facilities – to comprise living/ family room, a flexible space for use as bedroom, and a bathroom.
- Living/ family room circulation space – of at least 2.25m diameter (clear of furniture).
- Bedroom on ground/ entry level – large enough for queen size bed, wardrobe and circulation space (e.g. 3.5m x 3.2m or 3.7m x 3.0m).
- Bathroom dimensions and features at ground/ entry level – minimum 2.4m x 2.4m with hobless shower, full floor waterproofed and strengthened walls around the toilet and shower to suit future grab rails.
- Kitchen dimensions – minimum of 2.7m between walls.
- Laundry – with minimum clear circulation space of 1.55m diameter.
- Window heights – window sills on ground/ entry level at a maximum height of 730mm above floor level (excluding the bathroom and kitchen).

(Reference: Additionally refer to Landcom Universal Housing Guidelines (2008))

7.17 Bushfire Construction Requirements

7.17.1 Building construction requirements for bushfire protection

Construction for bushfire protection of the proposed buildings shall be in accordance with AS 3959 (2009): *Construction of buildings in bushfire-prone areas* and *Planning for bushfire protection* (NSW Rural Fire Service 2006). Construction standards to be to the required bushfire assessment level (BAL) and to be read in reference to the Bushfire Assessment Report and Section 8.7 of this EA Report. Bushfire Attack Levels applicable to the subject site are in Table 3.1 of the *Bushfire Protection Assessment Report* prepared by Conacher Environmental Group. The BAL level applicable to each precinct is the **minimum** required construction standard for the buildings and construction standards can exceed the required levels.

A. Construction standard for BAL 12.5

Floors

- No construction requirements for concrete slabs on ground or elevated timber/ steel floors.

External walls are to be of:

- Non-combustible construction; or
- Fibre cement external cladding (minimum 6mm thick); or
- Bushfire resisting timber (of species specified in AS 3959).

Bushfire shutters/ screens for windows and doors, windows and doors are to be of:

- Non-combustible material; or
- Bush-fire resisting timber (of species specified in AS 3959).

Roofs and roof accessories are to be:

- Roof tiles are to be fully sarked with flammability index of not more than 5 and located below the roof battens, with no gaps.
- Sheet roofs are to be fully sarked with flammability index of not more than 5 and sealed at fascia or wall lines by mesh, mineral wool or other non-combustible material.
- Roof penetrations to comply with AS 3959.
- No construction requirements for fascias, bargeboards and eaves linings.

Refer in detail to AS 3959.

B. Construction standard for BAL 19

Floors

- No construction requirements for concrete slabs on ground or elevated timber/ steel floors.

External walls are to be of:

- Non-combustible construction; or
- Fibre cement external cladding (minimum 6mm thick); or
- Bushfire resisting timber (of species specified in AS 3959).

Bushfire shutters/ screens for windows and doors, windows and doors are to be of:

- Non-combustible material; or
- Bush-fire resisting timber (of species specified in AS 3959).

Roofs and roof accessories are to be:

- Roof tiles are to be fully sarked with flammability index of not more than 5 and located below the roof battens, with no gaps.
- Sheet roofs are to be fully sarked with flammability index of not more than 5 and sealed at fascia or wall lines by mesh, mineral wool or other non-combustible material.
- Roof penetrations to comply with AS 3959.
- No construction requirements for fascias, bargeboards and eaves linings
- Box gutters to be of non-combustible material and flashed at the junction with roof with non-combustible material.

Refer in detail to AS 3959.

C. Construction standard for BAL 29

Floors

- No construction requirements for concrete slabs on ground;
- Elevated floors to comply with AS 3959.
- Non-combustible enclosure to sub-floor space.
- Unenclosed sub-floor space to have supporting floor structure of non-combustible or bushfire resisting timber.

External walls are to be of:

- Non-combustible construction; or
- Fibre cement external cladding (minimum 6mm thick); or
- Bushfire resisting timber (of species specified in AS 3959).

Bushfire shutters/ screens for windows and doors, windows and doors are to be of:

- Non-combustible material; or
- Bush-fire resisting timber (of species specified in AS 3959).

Roofs and roof accessories are to be:

- Roof tiles are to be fully sarked with flammability index of not more than 5 and located below the roof battens, with no gaps.
- Sheet roofs are to be fully sarked with flammability index of not more than 5 and sealed at fascia or wall lines by mesh, mineral wool or other non-combustible material.
- Roof penetrations to comply with AS 3959.
- Fascias, bargeboards and eaves lining to be of fibre cement sheeting (minimum 4.5mm thick) or bushfire-resisting timber.
- Box gutters to be of non-combustible material and flashed at the junction with roof with non-combustible material.

Refer in detail to AS 3959.

7.17.2 Access

As the site is in a bush fire area, the **public road system** (perimeter and internal roads) should provide alternative access or egress for fire fighters and residents during a bush fire emergency if part of the road system is cut by fire[22]. Comberton Grange Road will serve as emergency access/ egress to and from the site.

Perimeter roads should be provided to separate bushland from urban areas and forms part of the APZ. Roads through undeveloped bushland are to maintain a 20m APZ. Perimeter roads comprising ring-road around the key facilities and access road into the site are minimum 20m wide.

For internal roads:

- At least one alternative access road needs to be provided for individual dwellings or groups of dwellings more than 200m from a public through road. The routes of these roads should be selected to ensure that both roads are unlikely to be simultaneously cut by a fire;
- Short access roads are preferable to long ones for the safe evacuation of residents and for emergency service personnel; and
- Roads should be planned for suitable widths to permit access into and out of the area during emergency situations.

Existing roads and access tracks are to be upgraded to meet the performance standards for access and egress roads in *Planning for Bushfire Protection* (2006).

The provision of maintained APZ along access roads may also be required by the Rural Fire Service (RFS).

7.17.3 Public road design

Provide design solutions for public roads with:

- Public roads to be all weather roads;
- Perimeter roads to be provided with at least 2 traffic lane width (with minimum 8m carriageway, kerb to kerb);
- Perimeter road linked to an internal road system at an interval of no greater than 500m in urban areas;
- Traffic management devices are constructed to facilitate access by emergency services vehicles;
- Public roads to have a maximum cross fall of 3^0;
- Provision of through roads, with dead end roads not recommended;
- Dead end roads, if unavoidable, are maximum 200m in length, incorporate a minimum 12m outer radius turning circle, and clearly sign posted as a dead end;
- Curves of roads (other than perimeter roads) are a minimum inner radius of 6m, with minimum distance between inner and outer curves of 6m;
- Maximum grades for sealed roads are not to exceed 15^0 and an average grade of maximum 10^0, whichever is the lesser gradient;
- Minimum vertical clearance of 4m above the road at all times;

[22] Section 4.2.7, *Planning for Bushfire Protection*, 2006

- Capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles (approximately 15 tonnes for areas with reticulated water and 28 tonnes for all other areas);
- Public roads greater than 6.5m wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression;
- One way only public access roads to be minimum 3.5m wide;
- Parking bays are a minimum of 2.6m wide from kerb edge to road pavement, with no services or hydrants located within the bays;
- Public roads directly interfacing bush fire hazard vegetation provide roll top kerbing to the hazard side of the road; and
- For rural-residential areas, where a distance of greater than 70m to the nearest hydrant point to the most external part of a proposed building – provide minimum carriageway width of 4m.

Refer additionally to Section 4.1.3: Public Roads in *Planning for Bush Fire Protection* (2006).

7.17.4 Internal road design with a SFPP (Special Fire Protection Purpose) development

Internal roads design is to enable safe access for emergency services and their operation, with design solutions of:

- Internal roads to be all weather and sealed;
- Internal perimeter roads to be provided with at least 2 traffic lane widths (with minimum 8m carriageway, kerb to kerb) and shoulders on each side;
- Provision of through roads;
- Dead end roads of maximum 100m in length from a through road, incorporate a minimum 12m outer radius turning circle and are clearly sign posted as a dead end;
- Maximum grades to not exceed 15^0 and average grades are not more than 10^0; and
- Internal road surfaces and bridges to have a capacity to carry fully-loaded fire fighting vehicles (15 tonnes).

Refer additionally to Section 4.2.7: Internal Roads, *Planning for Bush Fire Protection* (2006).

7.17.5 Fire trail design

Provide design solutions for fire trails with:

- Minimum 3.5m carriageway width generally for unobstructed routes;
- Maximum grade of 15^0 if sealed and maximum 10^0 if unsealed;
- Cross fall of the rail of maximum 10^0; and
- Maintain 4m minimum vertical clearance to any overhanging obstructions including tree branches.

Refer additionally to Section 4.1.3: Fire Trails, *Planning for Bush Fire Protection* (2006).

7.17.6 Water services

If the proposed development is to be connected to Council's reticulated water supply, the reticulated mains supply, fire hydrant spacing, sizing and pressure are to comply with the requirements of AS 2419.1(2005): *Fire hydrant installations – System design, installation and commissioning*.

The provision of on-site dedicated water supply for bushfire fighting purposes should be implemented. The extent and design for on-site storage of water for use during a bushfire emergency should be determined in consultation with the RFS.

7.17.7 Infrastructure services

The proposed design is to comply with the following requirements for:

Reticulated water supply

- Reticulated water supply to use a ring main system for areas with perimeter roads, with access points to SFPP developments;
- Fire hydrant services to comply with AS 2419.1(2005). Where this cannot be met, the RFS requires a test report of the water pressures anticipated by the relevant water supply authority. Location, number and sizing of hydrants shall be determined using fire engineering principles;
- Hydrants are not to be located within road carriageways; and
- All above ground water and gas service pipes external to the building are to be metal, including and up to any taps.

Non-reticulated water supply

- Minimum dedicated water supply required for fire fighting purposes for each occupied building is to be in accordance to Table 4.2 of *Planning for Bush Fire Protection* (2006). For SFPP developments, minimum 10,000 litres dedicated water supply for each occupied building;
- A suitable connection for fire fighting purposes is made available and located within the IPA and away from the structure;
- Provision of a 65mm Storz outlet with a metal Gate or Ball valve;
- Provide underground tanks with 200mm access hole to allow tankers to refill directly from the tank, with a hardened ground surface for truck access within 4m of the hole;
- Above ground tanks to be of concrete or metal, with protected stands for raised tanks. Tanks on the hazard side of a building are to be provided with shielding for protection of fire fighters; and
- External above ground pipes to be metal and pumps are to be shielded.

Electrical services

- Electrical transmission lines are to be underground, where practical;
- Where overhead electrical transmission lines are proposed:
  - Lines are installed with short pole spacing (30m) unless crossing gullies, gorges or riparian areas; and
  - No part of a tree is closer to a power line than the distance nominated in Vegetation Safety Clearances, Energy Australia, NS179, April 2002.

Gas services

- Reticulated or bottled gas to be installed and maintained in accordance with AS 1596 (2002) and relevant authorities' requirements, with metal piping to be used;
- All fixed gas cylinders to be kept clear of all flammable materials to a distance of 10m and shielded on the hazard side of the installation; and
- If gas cylinders are to be kept close to the building, the release valves are to be directed away from the building and minimum 2m from any combustible materials. Gas cylinder connections are to be metal.

Refer additionally to Section 4.1.3 & 4.2.7, *Planning for Bush Fire Protection* (2006).

7.17.8 Landscaping

Landscaping for bush fire protection to ensure careful attention to:

- species selection;
- location relative to their flammability;
- avoidance of continuity of vegetation (horizontally and vertically);
- removal of under-storey species, trimming of lower limbs of trees to assist in reducing fire penetration into the canopy;
- favour use of rainforest species;
- avoid introducing weed species into an area;
- use of trees as wind breaks that allows 30-60% of the wind to pass through; and
- on-going maintenance of APZ to remove flammable fuels (leaf litter, twigs & debris).

7.17.9 Additional bushfire protection measures

Due to the presence of a bushfire hazard within 100m of the proposed dwellings, additional safeguards against ember attack are considered to be warranted, to include:

(i) All gutters and roof valleys to be fitted with leaf exclusion barriers which have a flammability index of not more than 5 when tested to AS1530.2 (1993): *Methods for fire tests on building materials, components and structures.*

(ii) Incorporation of aluminium, bronze or non-corrosive metal mesh screens with a maximum aperture size of 1.8mm on all open-able windows and door screens such that entire open-able portion of the window remains screened when the window is open.

(iii) Installation of ember-proof skylights and vents.

(iv) Installation of ember-proof seals in all cracks and joints.

(v) Regular inspections and maintenance of APZs within the site to be undertaken by the owners/ managers according to *Planning for Bushfire Protection* (2006).

(vi) The requirements for access, APZs and adequate water supply within the proposed development should be discussed with the Rural Fire Service.

(vii) An Evacuation Plan for the site.

(viii) Prohibition of the use of surface mulching, e.g. fine peaty material or wood chips.

Within a SFPP development, public access roads must have internal road widths and design that enable safe access for emergency services and allow crews to work with equipment about the vehicle. Acceptable solutions for public access roads include:

- Internal roads are two-wheel drive, sealed, all weather roads.

- Internal perimeter roads are provided with at least two traffic lane widths (carriageway 8m minimum kerb to kerb) and shoulders on each side, allowing traffic to pass in opposite directions.
- Roads are through roads and dead end roads are not more than 100m in length from a through road, incorporate a minimum 12m outer radius turning circle, and are clearly sign posted as a dead end.
- Maximum grades do not exceed 15^0 and average grades are not more than 10^0.
- The internal road surfaces and bridges have a capacity to carry fully-loaded fire fighting vehicles.

7.18 Landscape Design

The landscape design of the development will draw from the surrounding landscape infused with elements of Asian landscape cultures. The overall aim of the landscape design is to maintain its natural landscape setting of forested areas for a viable ecosystem, highlighted by exotic planting with Asian themes in key focal areas. The Buddhist philosophy to provide an ideal environment of harmony, tranquillity and serenity for human enrichment underpins the overall design of the development.

The aim of tree planting to roads/ streets, within public urban and open spaces, and around buildings is to:

- Provide for pedestrian amenity of shade and microclimate control of the built environment;
- Improve ecological corridors through landscape connections; and
- Improve visual amenity and attractiveness of the overall site.

7.18.1 Landscape strategies

The overall landscape strategies for the site will include the:

- Retention and re-establishment of indigenous plant species within the majority of the site;
- Creation of distinct settings within each precinct with a suitable planting and materials palette;
- Accent trees to define key pedestrian pathways and focal areas;
- Integration of water sensitive urban design principles;
- Creation of a harmonised environment through blending of contemporary environmental measures with Buddhist views of nature; and
- Create landscaped and linked open space corridors throughout the site that include way-finding, interpretation, education, recreation and ecologically sensitive amenities to assist users in understanding the cultural and natural landscape.

7.18.2 Landscape treatment to majority of the site (A)

The landscape treatment for the site will consist of the use of indigenous species found locally within the area, to reinforce the existing visual character and ecological values of the site. Selection will also consider bushfire resistance properties of introduced indigenous planting, the suitability of species to provide shade and screening where required and naturally drought resistance to reduce the need for watering. Existing native vegetation will be retained, where appropriate, and incorporated into the overall landscaping of the site. Areas of natural landscape will

be retained and augmented where required, with tree planting of species indigenous to the natural vegetation. These areas comprise landscape:

- Around the Temple complex within the Temple Precinct;
- Abutting the primary circular road network, entry roads and access roads leading to residential precincts;
- Within open space corridors, detention basins and water collection ponds of the residential precincts and in residual open space areas;
- Around the golf course fairways;
- Surrounding the Hotel; and
- In residual open space areas around Village Centre, Education and Information Precincts at the interface of riparian corridors along the Georges Creek tributaries.

Trees species for augmentation in the above areas, indigenous to the site, subject to fire-resistance requirements, will comprise:

- Blackbutt (*Eucalyptus pilularis*);
- Southern Blue Gum (*Eucalyptus saligna/ E.botryoides*);
- Spotted Gum (*Corymbia aculate*);
- White Stringbark (*Eucalyptus globoidea*);
- Red Bloodwood (*Corymbia gummifera);*
- Grey Ironbark *(Eucalyptus paniculate*);
- Scribbly Gum (*Eucalyptus sclerophylla*); and
- Brown Stringybark (*Eucalyptus capitellata*).

Within the golf courses, only the fairways will be grassed with appropriate drought-resistant species, with planting around the golf course comprising species indigenous to the area and suitable for fire-prone areas. Refer to *Australian Native Plants for Fire Protection* (www.apsvic.org.au/plant_fire_resistant.html)

7.18.3 Avenue planting (B)

Avenue planting to vehicular roadway between the ring road system and the Hotel Precinct/ Residential Precinct C are to be selected from a planting palette comprising:

- Illawarra Flame (*Brachychiton acerifolius*);
- Jacaranda (*Jacaranda mimosifolia*);
- Brushbox (*Lophostemon confertus*); and
- Native figs

7.18.4 Local street tree planting (C)

Street tree planting within the local roads of the residential precincts are to be selected from a planting palette comprising:

- White Stringybark (*Eucaplytus globoidea*);
- Grey Gum (*Eucalyptus punctate*);
- Scribbly Gum (*Eucalyptus racemos*); and
- Spotted Gum (*Eucalyptus sclerophylla*).

7.18.5 Accent planting (D)

Accent planting will occur at the:

- Entry to the Buddhist Temple Sanctuary Precinct;

- Delineated pedestrian pathways connecting the Village Centre, Health + Wellness and Education Precincts; and
- Village Centre Precinct.

Accent trees are to be selected from a planting palette comprising:
- Flowering Crabapple (*Malus floribunda*) which displays an abundance of white flowers – deciduous;
- Manchurian Pear (*Pyrus ussurensis*) – deciduous;
- Flowering Cherry Tree (*Prunus serrulata*);
- Crepe Myrtle (*Lagerstroemia indica*);
- Claret Ash (*Fraxinus angustifolia*);
- Japanese Maples (*acer palmatum* varieties);
- Chinese Tallow trees (*Sapium sebiferum*);
- Chinese Elm *(Ulmus glabra, Ulmus parvifolia);* and
- Black Locust *(Robinia pseusocacia)*.

7.18.6 Planting within Temple Sanctuary (E)

Water planting within feature ponds within the Temple Precinct could comprise:
- Native Water Lily (*Nymphoides species*);
- Water Lily (*Nelumbo nucifera*); and
- St. Johns Lily (*Crinum asiaticum var. sinnicum*).

Other feature ornamental planting include:
- Japanese maples (*acer palmatum* varieties);
- Chinese tallow trees (*Sapium sebiferum*);
- Black Bamboo (*Phyllostachys nigra*); and
- Mondo grass (*Ophiopogon japonicas* varieties).

7.18.7 Planting within car parking areas (F)

Planting within car parking areas shall comply with Shoalhaven City Council's landscape requirements for car parks, with:

Trees:
- Mexican Alder *(Alnus jorrulensis)*;
- Wallangarra White Gum (*Eucalyptus scoparia)*;
- Mahogany Gum *(Eucalyptus botryoides)*;
- Blackbutt *(Eucalyptus pilularis)*;
- Claret Ash (*Franxinus x Raywoodii)*;
- Honey Locust *(Gleditsia tricanthos)*;
- Jacaranda *(Jacaranda minosifolia)*;
- Brushbox (*Lophostemon confertus)*;
- London Plane *(Plantanus acerifolius)*;
- Black Locust *(Robinia pseusocacia)*;
- Chinese Tallow Tree *(Sapium sibiferum)*; and
- Chinese Elm *(Ulmus glabra, Ulmus parvifolia)*.

Shrubs:
- Abelia (*Abelia grandiflora)*;
- Golden Wattle *(Acacia longifolia)*;
- Banksia (*Banksia ericofolia*)*;*

- Callistemon *(Callistemon spp.)*; and
- Grevillea *(Grevillea spp.)*

7.18.8 Georges Creek tributaries corridor planting (G)

Regenerate and augment existing trees surrounding the tributaries of Georges Creek in the northern part of the site (former Pine Plantation), which comprise:

- Blackbutt (*Eucalyptus piluaris*); and
- Southern Blue Gum (*Eucalyptus saligna/ E. botryoides*).

7.18.9 Currambene Creek corridor planting (H)

Renegerate trees surrounding Currambene Creek with:

- Water Gums (*Tristaniopsis laurina*);
- She Oaks (*Allocausuarina littoratis*); and
- Swamp Oaks (*Casuarina glauca*).

7.18.10 Chinese Garden Precinct

The Chinese Garden Precinct will specifically be designed in the theme of traditional Chinese Garden design by specialists.

For Landscape Masterplan, refer to Figures 7.46 and 7.47, and **Appendix 1**.

Figure 7.46: Landscape Masterplan – Northern portion of site

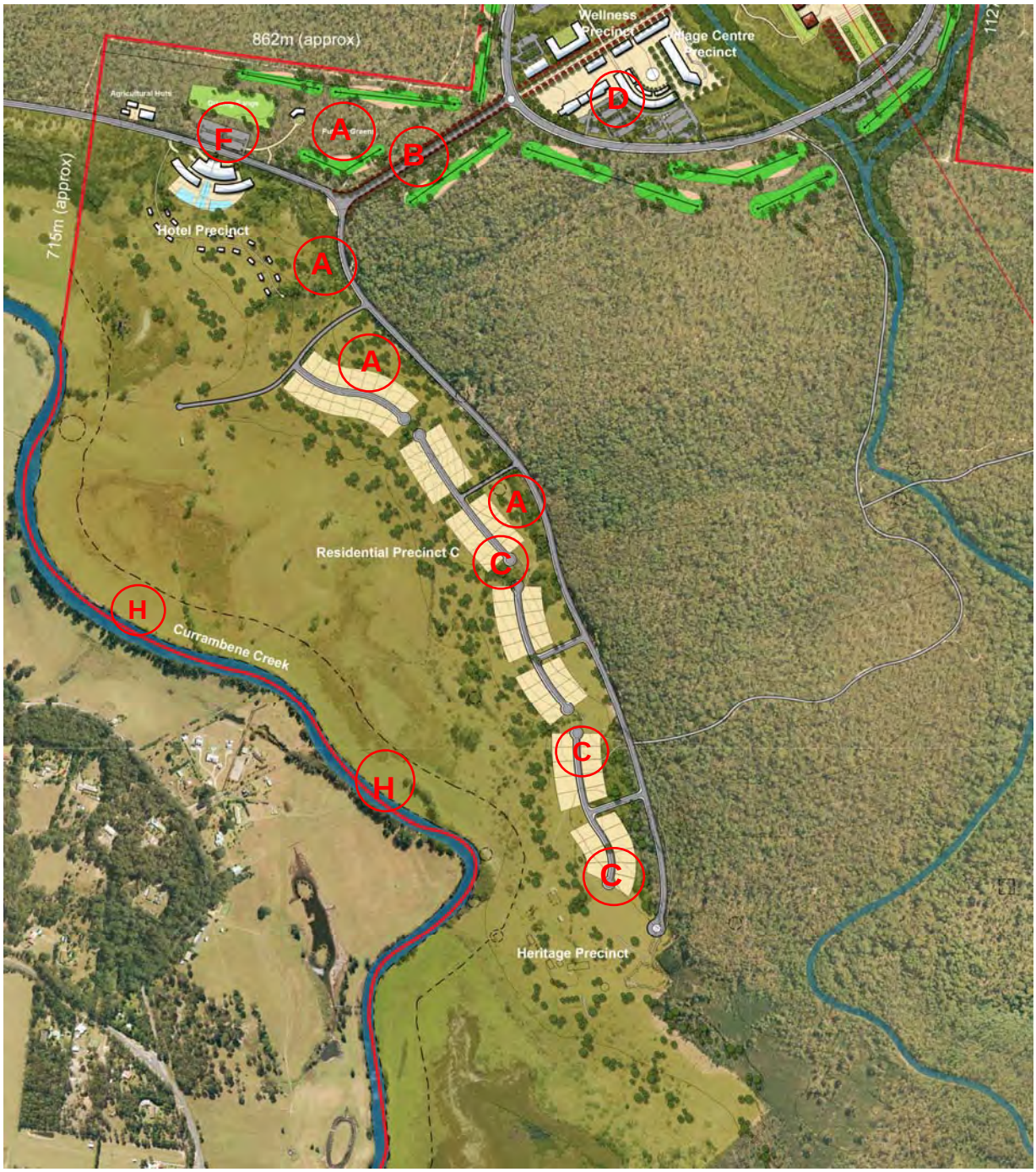

Figure 7.47: Landscape Masterpl.an – Southern portion of site

7.19 Property Ownership

The *South Coast Regional Strategy* and its accompanying report, the *South Coast Sensitive Urban Lands Review,* state that:

> *The land developed for tourism and residential purposes should be retained in one ownership.*

The site will be subdivided under the community land legislation of the *Community Land Development Act 1989 (NSW*). The proposed tourist and residential development (and its subdivisions) will be developed with a common theme and managed in a community title arrangement in accordance with the requirements of the *Community Land Management Act 1989 (NSW)*. Under the Management Act, the land will be developed with a common theme.

The residential component of the land will be divided into individual allotments with each lot owners responsible for the care and maintenance of their homes and lots.

The remaining tourist component of the land comprising the Buddhist Temple, Village Centre, Educational, Health and Wellness, Hotel, Heritage and Chinese Garden precincts, and the buildings within these precincts, golf course and associated clubhouse, will be managed under the *Community Land Management Act 1989*, under the ownership of the Shaolin Temple Foundation (Australia) Limited.

7.19.1 Objectives

The objectives of the proposed titling for the site (and its consequence management structure) are:

- To ensure the site, when subdivided, accommodates the physical integration of the tourist component with the residential component;
- To place all “common areas” (such as open spaces, bushland areas, asset protection zones and accessways (such as roads) in one ownership;
- To put in place arrangements for the management, maintenance and funding of the “common areas” (e.g. the standard to which they are used to managed, the parties who will pay for them and the parties who can use them); and
- To put in place arrangements to allow public access (and the conditions of access) over some parts of the “common areas”.

7.19.2 Subdivision

The community land legislation provides great flexibility in determining the subdivision pattern of the site.

A community plan will be established with subdivision undertaken in stages, as subsequent plans comprising community development lots (being the development precincts) in the community plan.

Accordingly, community development lots can be further subdivided to create subsidiary schemes (which can be precinct schemes or neighbourhood schemes). These subsidiary schemes may have their own management arrangements or may be governed by the community management statement.

Applying the above principles to the site, each of the precincts (comprising the Temple Sanctuary, the Educational, Health + Wellness, Village Centre, Information, Hotel and tourist cabins, serviced apartments, golf course and the 300 residential dwellings) could each be the subject of a separate subsidiary scheme.

Each subsidiary scheme could either have its own internal management arrangements (through the management statement lodged with the relevant subsidiary plan), or could be the subject of overriding management arrangements contained in the community management statement.

7.19.3 Management

A community management statement is registered with the community plan, which sets out the management regime for Comberton Grange. This is the vehicle by which the built environment and the open areas are managed and administered by the community association.

This will occur as follows:

- The community association will have the responsibility to manage and administer the common areas (whether contained on community association land, on subsidiary body land or lots);
- Management plans may be adopted by the community association;
- Management plans cover a variety of topics – which may comprise:
  - Landscape management plan;
  - Stormwater management plan;
  - Threatened species management plan;
  - Fire/ emergency evacuation plan;
  - Bushfire management plan;
  - Vegetation management plan for the conservation area;
  - Vegetation management plan for the balance of the site.
- The community management statement may also contain procedures governing the manner in which improvements may be erected on Comberton Grange. This is done by introducing the concept of a Design Review Panel from whom approval must be obtained to erect or change improvements anywhere on the site.

7.20 Staging of the Development

The proposed development will be constructed in stages. The Shaolin Temple (the key feature of the tourist development) will be constructed at the first stage of the development. Other facilities, such as educational buildings, the Traditional Chinese Medical Centre, hotel and retail-commercial buildings within the Village Centre Precinct, and associated road network, will be developed accordingly, depending on investor support and financial capability. The residential precincts will be also developed incrementally, at the same timeframe as the tourist development.

8.0 ASSESSMENT OF IMPACTS OF THE PROPOSAL

This section of the report provides an assessment of the key environmental issues for the project as nominated by the Director-General's Environmental Assessment Requirements dated 20 October 2010.

For each key issue, the existing environment is described, the potential impacts of the Masterplan Development proposal and proposed management and mitigation measures.

8.1 Indigenous Heritage

Director-General's Requirements

Heritage and Archaeology

Identify whether the site has significance to Aboriginal cultural heritage and identify appropriate measures to preserve any significance. The assessment must address the information and consultation requirements of the draft *Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation* (DEC 2005) and *Interim Community Consultation Requirements for Applicants* (DEC 2004). The cultural heritage assessment should include areas not previously surveyed including the former pine plantation. Note that the personal/ contact details of any individual should not be publicly disclosed without first making it known to those concerned that their details may be publicly disclosed in the EA.

The *Aboriginal Cultural Heritage Assessment – Shaolin Temple and Academy, Comberton Grange, Jervis Bay, NSW* (July 2012) was prepared by Navin Officer, Heritage Consultants Pty Ltd to address the indigenous heritage and archaeology of the site – **Appendix 2**.

The cultural heritage assessment is of areas potentially affected by the proposed Shaolin Temple development. The assessment included literature review and database searches, field inspections and Aboriginal consultation.

The *South Coast Sensitive Urban Lands Review* identified a key environmental issue on the Comberton Grange site is cultural heritage, and that development is considered acceptable if adequate measures are taken to ensure that there is no significant disturbance to areas with high cultural heritage values.

8.1.1 Existing environmental features

Indigenous sites

There are 25 Aboriginal cultural heritage recordings, including 4 archaeologically sensitive areas/ Potential Archaeological Deposits (PADs), within the Comberton Grange study area. With the exception of the reported burial location (CG7), no areas of particular Aboriginal cultural sensitivity were identified within the study area.

8.1.2 Assessment of potential impacts

Assessment Criteria

Aboriginal archaeological sites have been assessed using five potential categories of significance:

- Significance to contemporary aboriginal people;
- Scientific or archaeological significance;
- Aesthetic value;
- Representatives; and
- Value as an educational and/or recreational resource.

Cultural significance can be defined as the cultural values of a place held by the local and wider contemporary Aboriginal community. Places of significance may be landscape features as well as archaeologically definable traces of past human activity. The significance of a place can be the results of factors which include continuity of tradition, occupation or action, historical association, custodianship or concern for the protection and maintenance of places, and the value of sites as tangible and meaningful links with the lifestyle and values of community ancestors.

Archaeological impacts

The majority of the Aboriginal cultural recordings that would potentially be impacted by the permissible development area identified in the *South Coast Sensitive Urban Lands Review* (October 2006) have been assessed to be of low archaeological significance. These sites have low archaeological research potential and no specific concerns on the sites Aboriginal cultural heritage values.

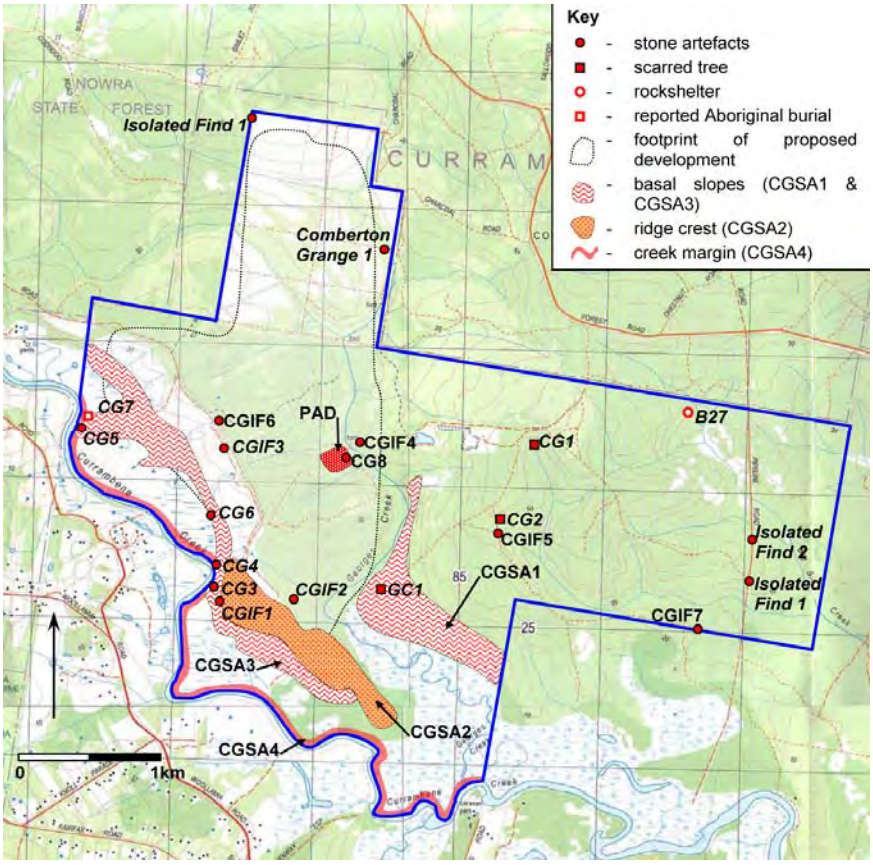

Figure 8.1: Location of Aboriginal sites, areas of PAD & archaeologically sensitive areas on the site

As such, the majority of the identified Aboriginal sites within the Comberton Grange study area will not be impacted by the proposed development area. However several recordings are situated in close proximity to the development area. These comprise:

Archaeological find	Location of archaeology	Archaeological description	Significance assessment
Isolated Find 1	Located in the far north-west corner of the former Pine Plantation in a disturbed area that was used as the main access point to the Pine Plantation. The proposed golf course is located near this find.	A quartz core artefact (recorded in 1993) This area has been subject to mechanical disturbance and impact associated with traffic along the trails.	The artefact could **not** be **located** during the current archaeological survey. It is unlikely that artefacts at this site could be found without recourse to vegetation clearance and/ or excavation. Recording considered to be of **low significance** within a local context.
Comberton Grange 1- Former Pine Plantation	Located near the eastern boundary of the former Pine Plantation. The proposed golf course is located near this find.	A small artefact scatter comprising a silcrete flake and a chert flake (recorded in 1993) on a fire trail 30m west of Georges Creek in the former Pine Plantation. The area has been subject to extensive mechanical disturbance and the provenance of the artefacts is unclear.	The artefact could **not** be **located** during the current archaeological survey. It is unlikely that artefacts at this site could be found without recourse to vegetation clearance and/ or excavation. Recording considered to be of **low significance** within a local context.
Isolated find CGIF2	Located east of the southern end of Residential Precinct C within the forested area, with Residential Precinct C is sited west of this find. CFIF2 is **not within the proposed development area**.	A silicified wood, broad platform flake (previously recorded) located on low gradient upper spurline slopes. The artefact may represent a disturbed remnant from a former site or an isolated discard.	The artefact could **not** be **located** during the current archaeological survey. It is unlikely that artefacts at this site could be found without recourse to vegetation clearance and/ or excavation. Recording considered to be of **low significance** within a local context.

Archaeological find	Location of archaeology	Archaeological description	Significance assessment
Isolated find CGIF3	Located near within Residential Precinct C, but **not in the proposed development area**.	A grey silcrete flake (previously recorded) situated on low gradient upper ridge slopes. The artefact may represent a disturbed remnant from a former site or an isolated discard.	The artefact could **not** be **located** during the current archaeological survey. It is unlikely that artefacts at this site could be found without recourse to vegetation clearance and/ or excavation. Recording considered to be of **low significance** within a local context.
Isolated find CGIF6	Located near the existing road along the upper slopes of Currambene Creek. The existing road alignment will be maintained.	A single stone artefact on a low gradient ridge crest. The artefact was exposed on an informal vehicle tract that extends up to the N-E from the main access track.	The subsurface archaeological potential of the area is considered to be of **low significance** within a local context.
CG6	Located on the mid-slopes along Currambene Creek, south-west of Residential Precinct C and is **not in the proposed development area**.	A scatter of 4 stone artefacts located 9m apart on an eroded portion of an unsurfaced vehicle track situated on the basal slopes of a narrow spurline. The location of this artefact is within the archaeologically sensitive area of CGSA3.	These recordings have been assessed to be of **low to moderate significance** within a local context.
CGIF4	Located within the central forest area, the trail is not anticipated to be developed, but trail retained for forestry maintenance purposes.	A single stone artefact along a west facing slope bordering Georges Creek on a fire trail.	The subsurface archaeological potential of the area is considered to be of **low significance**.
CG8 & associated PAD	Located within the central forest area, this area is not anticipated to be developed and is **not within the proposed development area**.	A scatter of at least 14 artefacts visible along a section of fire trail less than 100m from Georges Creek, situated on a relatively undisturbed and elevated landform close to fresh water.	CG8 and the associated PAD has a high potential to contain a low to moderate density of artefacts and low to moderate potential for insitu archaeological material. The overall find is of **moderate archaeological potential**.

Archaeological find	Location of archaeology	Archaeological description	Significance assessment
CGSA2 (Comberton Grange Sensitive Area 2)	Located along the upper slopes of Currambene Creek, south-west of the Georges Creek tributary and south of Residential Precinct C. It is **not within the development area**.	The area identified as being sensitive extends for about 1600m along the undulating ridge crest and associated saddle, and averages 200-300m in width.	This area may have been the focus of activities such as camping, and is assessed to be of **moderate archaeological potentia**l. The assessment of the heritage significance of this archaeologically sensitive area is dependent on the results of further archaeological investigations in the form of subsurface testing.
CGSA3 (Comberton Grange Sensitive Area 3)	Located along the upper slopes of Currambene Creek, along the cleared lands. The area is south-west of Residential Precinct C and the Hotel Precinct. Development (which includes walking trails and agriculture) is **not proposed within this area**.	CGSA3 encompasses the SW facing basal slopes (pastureland) adjacent to wetlands & Currambene Creek. Previous disturbance in this zone are vegetation clearance, fencing and grazing. These slopes are likely to have been primary access routes between the woodlands to the north and wetlands & estuaries to the south, with areas likely used for activities such as camping.	This area is assessed to be of **moderate to high archaeological potential**.

Refer to Figure 8.1.

The majority of sites of Aboriginal and archaeological sensitivity will not be impacted by the proposed development. However, 4 recordings are situated either partially or wholly within the proposed development footprint. These are Comberton Grange 1, Isolated Find 1, CGIF3 and CGIF6.

Comberton Grange 1 and Isolated Find 1, located within the northern (former Pine Plantation) portion of the site could not be relocated during field survey and is unlikely that these previously recorded artefacts could effectively be salvaged prior to any ground disturbance work that may occur in this area.

CGIF3 and CGIF6, located at the central portion of the site, are considered to be of significance within a local context and have low archaeological research potential.

These recordings raised no specific concerns in regard to Aboriginal cultural heritage values by Aboriginal representatives who participated in the field survey.

Refer to Figure 8.2.

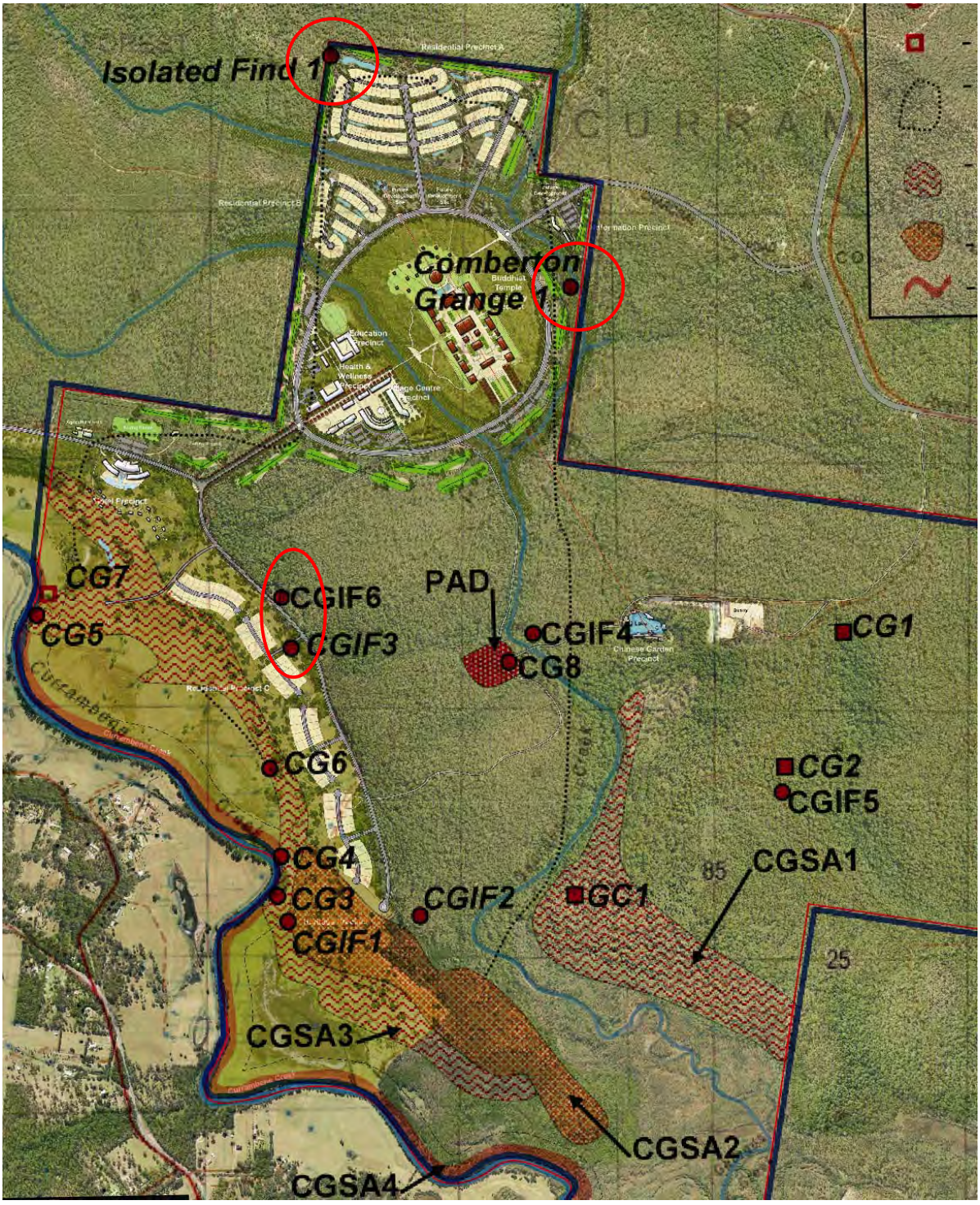

Figure 8.2: Location of areas of Aboriginal and archaeological significance overlaid with proposed development area

The Aboriginal Cultural Heritage consultant concludes that there are no absolute constraints to the proposed development and that it is unlikely that any archaeological resource encountered during archaeological testing programs would prevent construction provided that recommended mitigation actions are followed.

8.1.3 Mitigation and management measures

The consultant report recommends that:

Area	Significance	Recommendations
▪ Comberton Grange 1 ▪ Isolated Find 1 ***Location:*** Northern portion of the site)	These sites could not be relocated during survey for this project. These recordings are considered to be of **low significance**.	If impacts are anticipated at these sites, the location of each site is inspected by a qualified archaeologist, together with representatives from the registered Aboriginal organisations, immediately after initial clearance and ground disturbance works. Any artefacts visible at that time should be collected/ moved from the area of impact.
Isolated find CGIF3 & CGIF6 ***Location:*** Above Residential Precinct C	These recordings are located within the proposed development area and are considered to be of **low significance**.	These recordings will be directly impacted. Prior to the commencement of ground disturbance works; the artefacts should be collected/ moved from the area of impact by a qualified archaeologist together with representatives from the registered Aboriginal organisations.
Artefact scatters CG3-CG6 ***Location:*** Above Currambene Creek.	These items are not within the development area and are of **low to moderate significance**.	
Archaeologically sensitive area CGSA2 ***Location:*** SE of Residential Precinct C.	Of **moderate archaeological potential**.	If impacts are anticipated in certain portions of CGSA2 and CGSA3, a program of archaeological subsurface investigation should be conducted prior to development impact, to determine the presence, extent and integrity of any potential archaeological deposits that may be impacted by the development. While a broad area has been identified for each of these recordings, subsurface investigations would be focussed within those sections of lower gradient, and/ or places with relatively deep and undisturbed soil deposits. It is likely that testing would involve excavation (either by hand or mechanical excavator) of test pits along a series of transects within the areas of highest potential in each archaeologically sensitive area. Testing would only be necessary within those areas that are going to be impacted by the development.
Archaeologically sensitive area CGSA3 ***Location:*** SW of Residential Precinct C.	Of **moderate to high archaeological potential**.	

The protocols for the unanticipated discovery of archaeological material and suspected human remains are to be adopted and complied with during construction activities involving ground surface disturbance and excavation.

Artefacts are to be recorded and collected as prescribed in the Aboriginal Heritage Assessment Report, with any recovered Aboriginal objects managed according to a long term management strategy determined in consultation with the JLALC (Jerrinja Local Aboriginal Land Council) and other registered Aboriginal stakeholders.