





# INTRODUCTION

## THE PURPOSE OF THIS DOCUMENT

This document summaries the detailed landscape and civil investigations, community engagement and design standards that have informed the concept design for Nimbin Rainbow Road Walking Track stage 1. This document provides technical and design guidance that will guide a review of the Landscape and Civil concept plans to enable the detail design for construction of the walking track and associated infrastructure, landscape assets and environmental regeneration and enhancement.

## COVERING

- Design-Cultural References
- Track Route and Standards
- Topography and Soils
- Entries and Signage
- Track Materials and Landscape
- Infrastructure-Bridges, Elevated Walkways, Shelters, Arbour
- Amenity Landscape and Revegetation
- Infrastructure-Lighting
- Endnotes, Authors Details and Disclaimer

## BACKGROUND

“The Nimbin Rainbow Walking Track has been in planning by the Community of Nimbin for many years. Council was recently successful in obtaining a grant from the NSW Government via the Bushfire Local Economic Recovery Fund (BLERF) to the sum of just over \$2.5m. The objective of the grant is to stimulate the local economy by injecting construction funding into local businesses and also promote projects with long-term revenue outcomes”<sup>1</sup>

## VISION

“Rainbow Road is a dream long in the making. A partnership between the Nimbin Chamber of Commerce, Nimbin Community Centre Inc., Lismore City Council and various government agencies, the vision is for construction of a high standard and regionally significant walking track. Stage 1 of Rainbow Road is a 1.1 km walking track to be built to Australian Walking Track Standards. Its outcomes aim to bolster community resilience in the wake of future disasters by facilitating increased tourism, longer stays and higher revenue opportunities for local businesses. It will provide recreational facilities for local residents while simultaneously delivering a high-quality, nature-based tourism product for the tens-of-thousands of tourists who visit Nimbin each year”<sup>3</sup>

From Cullen Street to Alternative Way and Cecil Street, The Nimbin Rainbow Walking Track Stage 1, will be designed as a high quality tourist attraction, environmentally responsible, inclusive and safe walkway, that connects community and facilitates resilience. It generates key parameters for re-establishing businesses and attractions affected by the impact of bushfire on the Natural Environment nearby.



Figure 1: The Nimbin Pole, 1973. Photograph by Chris Meagher. The image is an iconic image from the 1973 Aquarius Festival, the Australian counterculture festival, held in the village of Nimbin in northern NSW, Australia. The pole was the whimsical brainchild of Anouska Wilde.

## COMMUNITY ENGAGEMENT

The key outcomes of Stakeholder Workshop 1, held at Nimbin on the 18th July 2022 and subsequent engagement and site meetings held with stakeholder and property owners bordering the track or providing right of footway were;

- The track route and design where possible will address sensitivity around proximity of the track to neighbouring properties.
- That major landscape assets are concentrated within the proposed Aquarius Park. Noting “In February 2021, 11a Alternative Way, was purchased by a consortium of Nimbin community organisations, in partnership with Rainbow Power Company. The park will serve as a retreat and experience for visitors and locals alike, adding depth to the walking track experience.”<sup>2</sup>
- That spatial design and signage considers Nimbins’ history celebrating key historical cultural events.
- That drainage is resolved along the boundary of Nimbin Headers Sports Fields and Nimbin Crystal Tourist Park and that the Right of Footway within Nimbin Headers Sporting Fields allows for future development of junior sports fields.
- That the entry from Cullen Street is a highly visible and safe entry.
- That access to Peace Park from Aquarius Park is investigated.

## PLANS AND REPORTS

Documents attached as Addenda

- EFNRRWT1-WORKSHOP1-REPORT 220725
- EFNRRWTS1-WORKSHOP2-REPORT 221007
- EFNRRWT1-THE NIMBIN RAINBOW ROAD WALKING TRACK STAGE 1, NOTES FOR LISMORE CITY -COUNCIL ABORIGINAL ADVISORY COMMITTEE
- NRRWT 40x30 PLAY FIELD OPTIONS SK02 220806
- EFNRRWT1-SK04\_SHARED\_ZONE\_REVA-220815
- EFNRRWT1-CROSSINGS AND TRACK\_REV1-220810
- EFNRRWTS1-SHARED\_ZONE\_REVA-220815 VERS2
- EFNRRWT1-SOLAR LIGHTING SCHEMATIC\_REVB-220829
- EFNRRWT1\_ENTRY\_CULLEN\_STREET\_GOODTIMES\_MEDIA\_ 220825
- EFNRRWT-PRELIMINARY CONCEPT DRAWINGS\_1-9\_REVA-220829
- 22613-CIV-P3-C - CIVIL PRELIMINARY DESIGN - 2022-09-12
- NIMBIN RAINBOW WALKING TRACK - STAGE 1 - STRUCTURAL CONCEPT
- EFNRRWT1-REVIEW OF QUALITY ASSURANCE AND VALUE MANAGEMENT-220921
- EFNRRWT1-REVIEW OF COST ESTIMATES-220921
- EFNRRWTS1-SK09\_LANDSCAPE AND REVEGETATION AREAS 220927
- EFNRRWTS1-REVIEW QA VM RISK ASSESSMENT-220930
- EFNRRWTS1-ALT TRACK ASSESSMENT-221031
- EFNRRWT-LANDSCAPE PLANS REVB-230227
- 22613-CIV-CC-0 - CIVIL DETAILED DESIGN 20.12.2022
- 22613-CIV-CC-1 - CIVIL DETAILED DESIGN - 27-02-2023
- 22613-NWT-E1-DETAILED DESIGN ISSUE - 270223
- EFNRRWT-LA00-31-LANDSCAPE SET\_DA-REVB-230227



# DESIGN - CULTURAL REFERENCES ABORIGINAL COMMUNITY

## CARE FOR COUNTRY AND COMING TOGETHER

### (1) Pre European Settlement

The Aboriginal Communities guidance , verification and partnership is sought to determine the stories that can be shared with the Community in the way of signage and inform the development of Public Art Policy for the track and Nimbin in general.

These may include

- Names for Nimbin and surrounding escarpment that can be seen from parts of the track.
- Creation stories.
- Vegetation names and cultural use if any, specifically Silky Oak and Hoop Pine which are the two tree species that are visually significant on the track.
- The existing name of or potential naming of the creek lines that the walking track crosses at 4 locations.

### (2) Aquarius Festival and the Environmental Movement

The Aboriginal Communities guidance , verification and partnership is sought to identify the physical location of these events and understanding the significance and context for the Aboriginal Community.

Out of desktop research of the Nimbin and the Alternative/ Environmental Movement, and stakeholder comments from workshop 1, locating the site of The Welcome to Country in 1973 was identified as an important historical moment that could inform the design and location of seating, shelters, signage, artworks and activated landscapes and publicly document the general cultural coming together between the festival organisers and attendees and the local and regional Aboriginal Communities.

There was a Welcome to Country ,dance, didgeridoo playing and general conversation during the festival. Post Festival there was a coming together leading to ending logging in environmentally and culturally significant locations.<sup>4</sup>



Figure 2: Performers from Yirrkala Dance Group, brought to the festival with funding from the Federal Government. Photographs reproduced by permission of photographer and festival attendee Dr Ian Cameron.

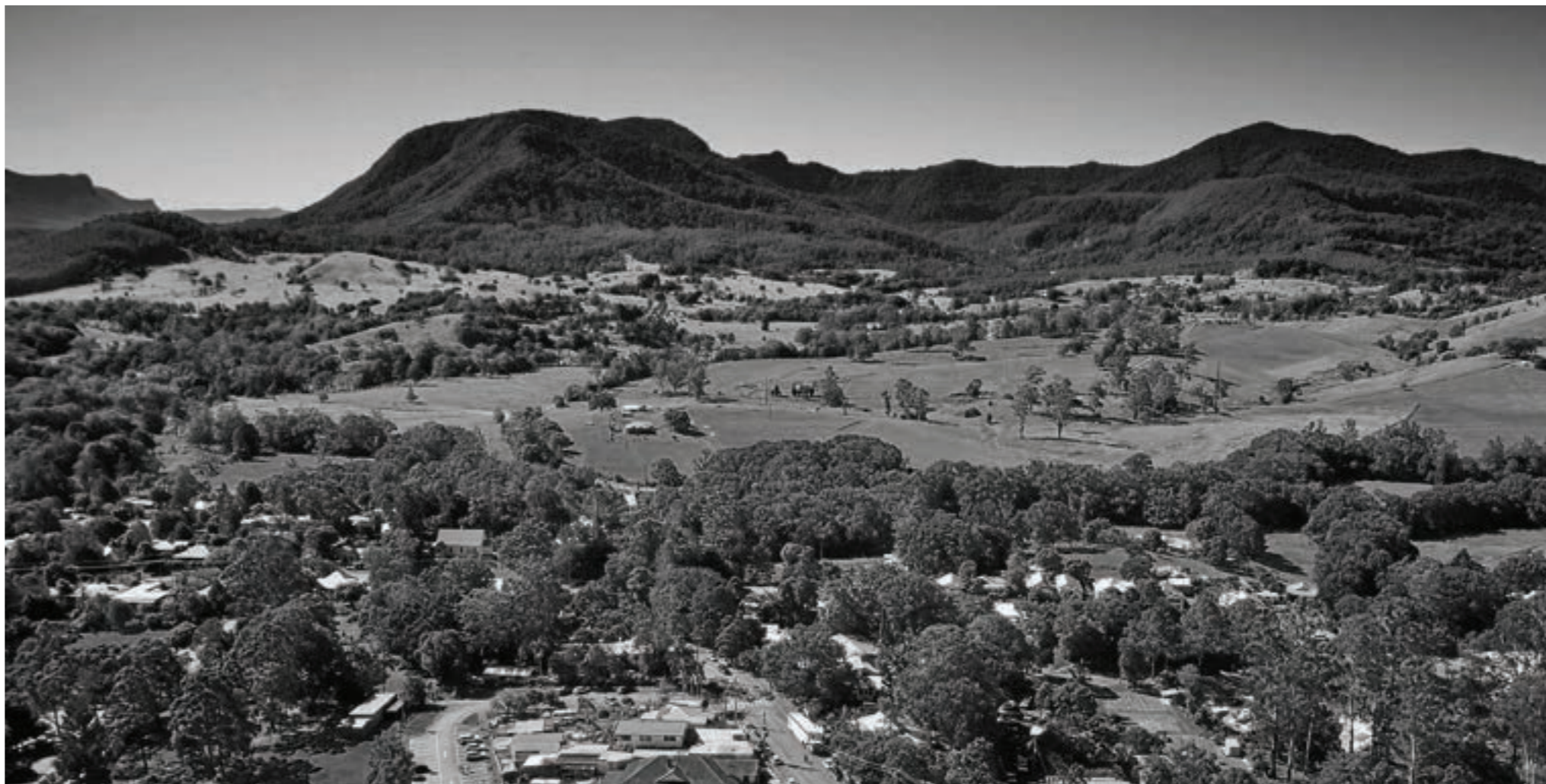


Figure 3: Aerial view, drone above Nimbin looking North to Nightcap National Park.



# DESIGN - CULTURAL REFERENCES AQUARIUS FESTIVAL ALTERNATIVE COMMUNITY ENVIRONMENTAL ART PROTEST MOVEMENT

## AQUARIUS-GATHERING-AQUARIUS FESTIVAL LEGACY.

- At the end of the festival, a meeting was held to discuss an on-going commitment to the spirit of the festival. This resulted in the “May Manifesto”. It spoke of a “concentration of arts and artists”, “survival on earth”, “self sufficiency” on a “tribal basis”, “living in harmony with the natural environment”, “participation rather than consumer entertainment”, “no pre-arranged program of events” and “re-discovering the meaning that agricultural fairs once had for country people”.<sup>5</sup>
  - Psychedelic Hippy Culture imported by the Australian Alternative movement from the American Counter Culture movement of the 1960’s from the Pacific NW referencing American Indian and backwoods arts and crafts motifs.
  - East Asian cultural tropes.
  - Rural Australian built form with special reference to the makeshift dwellings that came out of disused dairy bales that afforded some original festival attendees shelter.
  - Temporary meditation and gathering spaces defined by temporary structures referencing indigenous cultures and the Environmental Art Movement of the late 1960s and 1970s.
- These references Inform, Signage, spatial layout of open space , Art Installations, Gatherings and Events.

## MADIGRASS-FESTIVAL EVENTS

- Cannabis law reform Rally and Festival.
- Informing Signage, Spatial layout of open space , Art Installations, Gatherings and Events.

## PROTEST MOVEMENT-ENVIRONMENTAL SUSTAINABILITY AND REGENERATION

- The anti logging environmental protests at Terrania Creek in the 1970s and Nightcap Range at Mount Nardi in the 1980s led to the declaration of a National Park and in 1989 World Heritage status.
- Regeneration works are proposed along the streams at 15m approximately either side of the stream line that establish Wet Sclerophyll Forest ,stabilising soil along feeder gullies and drainage lines within the track catchment. Area 8000m2.
- Regeneration works are proposed that establish sod grassland and wetland.Area 4000m2.
- Signage will describe ecosystem type and its relation to topography, soils, its structure and species that are endemic to the area and the methods for weed control and ongoing naturalisation and maintenance.
- Signage that describes the role of plants along streams and in wetlands in capturing sediment and nutrient and minimising erosion and water flow velocity.
- Partnerships with community groups such as Landcare are proposed.



Figure 4: First Aquarius Festival, Nimbin, Image by Harry Watson, 1973.



Figure 5: Nimbin MadiGrass, Image from website.



Figure 6: Anti-logging protesters speaking with police in the Terania Creek rainforest in 1979. (Supplied: David Kemp)



# PROPOSED TRACK



Figure 7: Nimbin Rainbow Road Walking Track Stage 1, Concept Aerial View from fly through. EF Landscape Architects, 2023

## LANDS

The proposed track route is through both private and public Lands. A Right of Footway (ROF) is to be established over private lands. Within this ROF track assets are to be minimised and movement off the track onto private lands discouraged and managed in consultation with the landholder. The track links the commercial Village centre of Nimbin with housing development along Alternative Way, Nimbin pool, Peace Park Skatepark, Nimbin Bowling Club and Nimbin Headers Playing Fields. The Track is set in mostly a park like setting with sections of forested glades of Hoop Pine and Silky Oak. Some areas are degraded, some undergoing rehabilitation with active environmental regeneration occurring. Most areas are maintained by intermittent slashing. Over time the environmental assets will have increasing biodiversity and evolve as regeneration is undertaken of ecosystems, improving waterway health.

At the time of issue of these guidelines further investigations and cost analysis is being undertaken at the eastern extent of the Green Track at the proposed extension to Alternative Way to optimise the track route for visitor experience and minimise impact on neighbouring landholders.

## AS 2156.2-2001 WALKING TRACKS PART 1. CLASSIFICATION AND SIGNAGE

The track has been classified as comprising two sections a class 2 track and a class 1 track that allows for access with people with disabilities, meeting the requirements as set out in Table 2 of the standard. The route will be signed in accordance with the standard providing;

- Interpretive Signage- that conveys educational material for natural features and cultural references along the track.
- Regulatory and Descriptive Signage- at all entries that specifies legal requirements and regulations associated with the use of the track along with the general track characteristics.
- Warning Signage- in this instance such as but not limited to water over track, slipperiness, fauna, general weather conditions and periods when the path may not be lit.

The Track will have a generally maximum gradient at 1:10 transitioning to steps and landings over this gradient, small sections above this where consideration is given to the unsuitability for steps may have a steeper gradient. Inspection of the track, assets and natural areas will be carried out by Council at a maximum of 90 days under the standard. It is proposed that maintenance exceeds the standard.

## AS 2156.2-2001 WALKING TRACKS PART 2. INFRASTRUCTURE DESIGN

Consideration has been given to the -"control of the impact of visitors, tracks and track infrastructure on the environment" . The track design does not exacerbate drainage issues and in specific locations ameliorates suboptimal drainage.

Consideration has been given to the -"Provision of access for visitors to the quality of experience they seek, while recognizing the visitors capabilities for safely accessing the points of interest" The track provides access to proposed shelters, seats, and general landscape amenity. Viewing situations are considered for amenity landscaping and environmental works including views to the escarpment. The track is to be accessible in wet weather with non pervious materials proposed and crossings and elevated walkways designed above and for 1 in 100 flood events. The track is to be lit to AS/NZS 1158 3.1 2020: Lighting for roads and public spaces Pedestrian area (Category P) lighting - Performance and design requirements. Where this standard cannot be met or it's not in the communities or the environments interest for it to be met, signage will alert walkers and or advise on hours of advised access.



# TOPOGRAPHY-SOILS-VEGETATION

## EXISTING LANDSCAPE CONSTRAINTS AND PARAMETERS

The track transitions through three soil and landscape types. All historically cleared, highly disturbed and revegetated to varying extents.

The soil landscape of the Lismore - Ballina 1:100 000 Sheet prepared by the Department of Conservation and Land Management (D. Morand, 1994) indicates the track will traverse three soil/landscapes. Minyon (mi), Disputed Plain (dp) and Calico (cl).

From Cullen street to Bridge Crossing 1 the landscape is highly disturbed with urban infrastructure, carparks, sewer lines, drainage easements and slopes of cut and unconsolidated fill. Paddock grasses, amenity landscapes and regeneration along the creek line at the base of the slope at Bridge crossing 1 are the dominant landscape treatments.

Cullen Street to Bridge Crossing 1 is predominately mapped as Minyon (mi). Erosional Residual Landscape, comprising, plateau tops of low rolling hills; slopes are long (300 to 1000m). Vegetation was Tall Eucalypt Open Forest, since logged. Soils are deep (1-2m), moderately well drained, moderately to highly erodible soils of low fertility with localised stony shallow occurrences.

Vegetation would have been, Dry and Moist Blackbutt species with Turpentine and Brush-box species in sheltered gullies.

Bangalow palms (*Archontophoenix cunninghamiana*) *Cyathea* and *Dicksonia* species occurring in moister areas with an understorey comprising Lomandra species, Bracken Fern (*Pteridium esculentum*), Blady Grass (*Imperata cylindrica*) and Kangaroo Grass (*Themeda australis*).

The track from Bridge crossing 1 (Red Track) passing the Nimbin Crystal Tourist Park and Nimbin Headers Sports Fields to Aquarius Park and the majority of (Green Track) is predominately mapped as Disputed Plain (Dp) Transferral Landscape, comprising basalt derived valley infills and alluvial fans. High plasticity reactive soils, low wet strength, localised stoniness, with permanently high water tables. Comprising gently inclined slopes of extremely low to very low relief. Catchment is limited, dominated by sheet flow and erosional streams.

This area has mostly been totally cleared and historically may not of been treed, now dominated by Kikuyu (*Pennisetum clandestinum*) Couch (*Cynodon dactylon*), Paspalum (*Paspalum dilatatum*), Setaria (*Setaria sphacelata*) and Foxtail (*Alopecurus myosuroides*), Rush (*Juncus spp*).

Extensive planting, weed occurrence and both natural regeneration and planted revegetation of native species is occurring along drainage lines.

Coppice's of Hoop Pine and Silky Oak have been established on well drained elevated portions.

Where this soil / landscape type transitions to areas mapped as Calico (cl) in the eastern extents of the track (Green Track), it comprises rolling hills, slopes are moderately long. Soils are moderately deep (1-1.5m) moderately well drained. hardsetting, dispersive/sodic highly erodible soils of low fertility with localised waterlogging. Can have steep slopes and a high mass movement hazard.



Figure 8: Start of Track at rear of Cullen Street



Figure 9: Creek crossing at Bridge 1.



Figure 10: Track alignment between playing fields and tourist park.



Figure 11: Start of track at Alternative Way at Aquarius Park.



Figure 12: Creek crossing at Bridge 2.



Figure 13: Open space at start of green track.



Figure 14: Start of Hoop Pine Forest.



Figure 15: View to dam.



Figure 16, Above: Start of Track Alternative Way East. Figure 17, Below: Soil Mapping (D. Morand 1994.)

This area is extensively cleared tall open forest (Wet Sclerophyll). Common trees include Sydney Blue Gum, (*Eucalyptus saligna*). Brushbox (*Lophostemon confertus*), Broad Leaved Apple (*Angophera subvelutina*), Red Bloodwood (*Eucalyptus gummifera*), Forest Oak (*Casuarina turolosa*) and Salley Wattle (*Acacia floribunda*). Transitioning in wetter areas to Blackbutt (*Eucalyptus pilularis*), Flooded Gum (*Eucalyptus grandis*), Turpentine (*Syncarpia glomulifera*) and Coachwood (*Ceratopeltium apetalum*).

### GENERAL PARAMETERS FOR PLANTING AND LANDSCAPE TREATMENTS ALONG THE TRACK

- Bog and wetland plantings in low poorly drained areas.
- Eucalyptus and Dry Sclerophyll and Dry Rainforest Species on well drained slopes.
- .Subtropical Rainforest and Wet Sclerophyll species and understorey plantings along creek lines and moist gullies.





# ENTRY

## CULLEN STREET SHARED ZONE

INFORMATION-ATTRACTION-REGULATION-HERITAGE

The Cullen Street entry is the marquee entry to the Nimbin Rainbow Road Walking Track. This entry is to be sympathetic with other planned works along Cullen Street. It's the public face of the walk and should be vibrant, colourful, informative, safe and readily accessible. The entry should be immediately recognisable as the start of The Nimbin Rainbow Road Walking Track.

All works undertaken are to enhance and not diminish or structurally alter the Town Hall building.

The side wall of the Town Hall should have a map of the track with interpretive, regulatory and warning signage. The Rainbow motif should be applied to the wall and pavement and repeated at intervals in variations throughout the track as a stencil or infill on the concrete track and in lasercut feature signage. The Rainbow motif provides directional prompts from a distance. Solar Bollards and a kerb crossover provide an option for an initial separation of road and footpath enabling discrete access to the side of the hall from the Cullen Street footpath. At the same time pedestrian movement is encouraged on road from the Cullen Street footpath. A water refill and drinking fountain that would have customised art work and signage is proposed adjacent the Town Hall.

This shared Zone should hold to the regulatory standards below and illustrated at Figure 18:(Right) It is to be a Shared Zone that addresses Transport Roads and Maritime Services Technical Direction, TTD 2016/001 February 2016 .

Shared zones are defined under Rule 24 in the NSW Road Rules (2008). The Cullen Street Shared Zone will have different coloured and textured surface treatments, maintain a kerb where existing except where removed for pedestrian crossover from the Town Hall side entry. A traffic calming device may be required in addition to signage for a traffic speed limit of 10km hour.



Figure 18: Cullen Street Shared Pedestrian Vehicle Zone Concept. Base Image Google Earth. Regulatory and Descriptive Signage at all entries. EF Landscape Architects. 2022.

(1) Regulatory Signage on Cullen Street. (2) Changed road environment utilising pavement marking textures and traffic calming devices. (3) No stopping or parking, (4) Assets such as Art, signage and Water Stations do not provide an opportunity for concealment: Destination signage is located here to encourage movement to the track entry. (5) Maintain side access to Town Hall: (6) Encourage Pedestrian on road movement. (7) Provide signage at the Car park where the Walking Track (off) Road starts, to provide a destination for Pedestrians. Track information and warning signs located here.

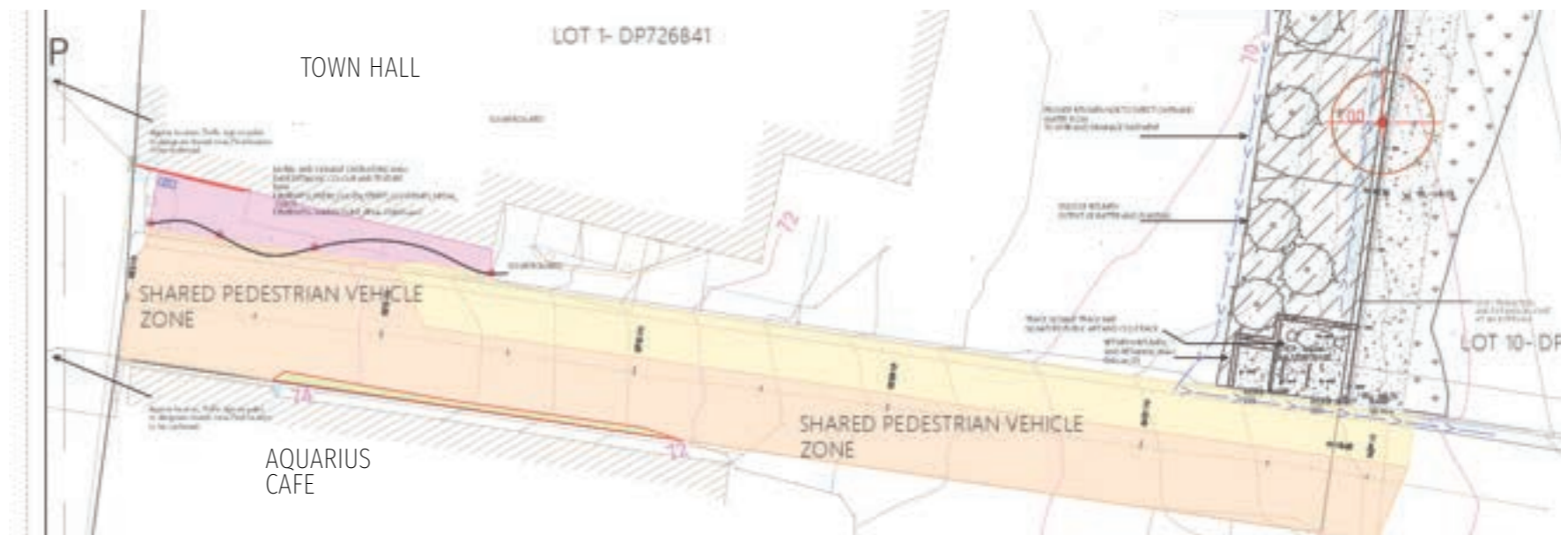


Figure 19: Cullen Street Shared Pedestrian and Vehicle Zone concept. EFNRRWT-02-CULLEN STREET ENTRY\_REVb-230227 (Cropped) . EF Landscape Architects.2023.



# MATERIALS

## WATER REFILL STATIONS

**aquafil,**  
Compact and hard-wearing, the 1500mm-high Aquafil FlexiFountain drinking fountain and bottle refill station offers a convenient source of drinking water in public environments. The unit features two anti-bacterial bottle refill nozzles and a wheelchair-accessible drinking fountain, with the added option of an inbuilt water filter. Customisable signage graphics on the exterior panels, combined with a robust, vandal-resistant design.<sup>6</sup>

**aquaBUBBLER**  
With two wheelchair-accessible side pods and a total of four drinking and refill taps, the Universal 2 aquaBUBBLER is an all-abilities hydration hub. The Universal 2 has ergonomic drinking and bottle refill taps, smooth body contours, and is made of durable & high quality materials.  
Features: 3 Drinking Taps, 1 Water Bottle Refill Tap  
Principal Materials: Polypropylene (body), Stainless Steel (taps, drainage dish, drainage mesh, fittings). Heights (mm): 670 (Preschool), 770 (Kids), 870 (Junior/Seniors), 1020 (Seniors/Adults)  
At Shelters there is an option for drinking fountains See Figure 29.

## CYCLE RACKS AND PUBLIC ART

At each entry a combination of signage and public art will signature the track. The track is signed “no cycles” “no dogs” and has three entries which connects to paths and roads where cycle use is permitted and encouraged. Provision needs to be made for cyclists to leave their bikes securely at these landmarks.

Each entry to the Track; Cullen Street, Alternative Way at Aquarius Park and Alternative Way at the southern end of the green track would have signature cycle racks, a water refill station and regulatory and warning signage that is themed for that part of the track and references the track in its entirety.

## SIGNAGE

**Interpretive Signage-** that conveys educational material for natural features and cultural references along the track.

**Regulatory and Descriptive Signage-** at all entries that specifies legal requirements and regulations associated with the use of the track along with the general track characteristics.

**Warning Signage-** in this instance associated with water over track, slipperiness, fauna, periods when the path may not be lit.

Signage motifs that are emblematic will be repeated throughout the track such as patterns and textures applied to pavements boardwalks and crossings. Interpretive.

A proposed sculptural metal sign @ 3500 mm x 300mm x 500mm positioned at the start of the concrete 2m wide track at the carpark at the rear of Cullen Street will be visible from the Cullen Street footpath. Interpretive.

Custom Laser cut signage that echoes the motifs established at the entry should be repeated at key locations such as crossings, shelters, seating and diversion of the track at Aquarius Park. Motifs should reference environment and biodiversity. Interpretive.



Figure 20: Water refill and drinking station.



Figure 21: Cycle racks and device charging station.



Figure 22: Cycle racks.



Figure 23: Cycle racks.

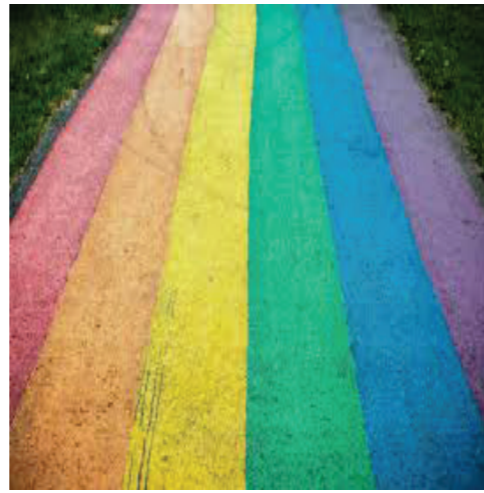


Figure 24: Pavement detailing.

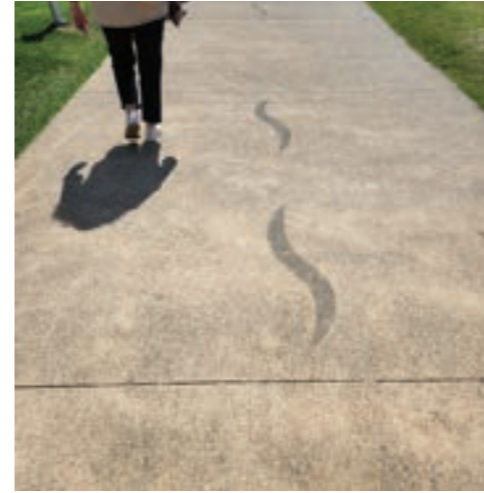


Figure 25: Pavement detailing.



Figure 26: Interpretive Signage Laser Cut.



Figure 27: Interpretive Signage Laser Cut.

## aquafil Filtered Water Drinking Station

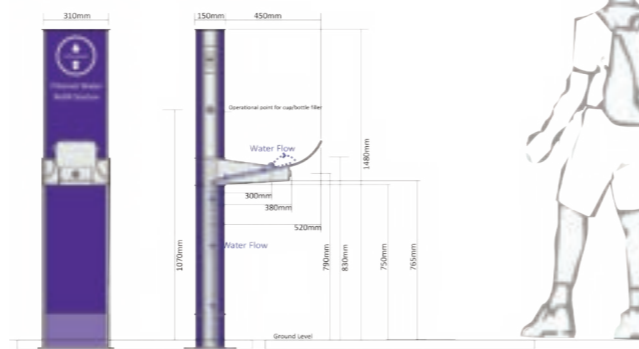


Figure 28. Above: Aquafil Drinking Fountain.

Figure 29. Below: Drinking Fountain Options.



Figure 30, Above: aquaBUBBLER

Figure 31, Below: Metal, Directional Signage.



Figure 32: Directional Signage, Historical reference. Image Chris Meagher



Figure 33: Directional Signage, Consistent with existing and proposed signage in the village.

Digital print panel signs on pedestals, posts and signage shelters possibly integrated with Audio Sign panels proposed for the village are proposed. Interpretive, Regulatory and Descriptive, Warning.

Directional Blades that reference Aquarius Festival Art/Sign works, Ref Figure 32, are proposed. The Nimbin Pole, 1973. Photograph by Chris Meagher. The image is an iconic image from the 1973 Aquarius Festival, the Australian counterculture festival, held in the village of Nimbin in northern NSW, Australia. The pole was the whimsical brainchild of Anouska Wilde.



# TRACK - PAVEMENT

## CONCRETE PAVE 2000MM WIDE

The track route has been designed to connect place, maximise views and follow the existing topography to minimise impact on trees and vegetation generally. The optimal gradient of swales and batters for maintenance of the track is 1:4. To maintain a maximum grade of 10% and to minimise impact on vegetation and limit the extent of cut and fill, gradients of 1:3 and in limited sections 1:2 are considered. Concrete tracks have a cross fall of 2%. Gradients of 1:4 in open areas can be turfed and maintained as mown slopes. Gradients of 1:3 are to be planted and maintained as amenity gardens or naturalised areas. Gradients of 1:2 are engineered slopes and must meet minimum standards for compaction and planted with slope stabilising plant species and incorporate bio engineered solutions for slope stabilisation during the establishment period.. Boulder retaining edges and walls help to meet these standards and provide amenity seating. Landings are to be a minimum of 900mm with steps at a maximum of 18 risers between landings. The track is designed for a higher design life, with light vehicle access for maintenance.

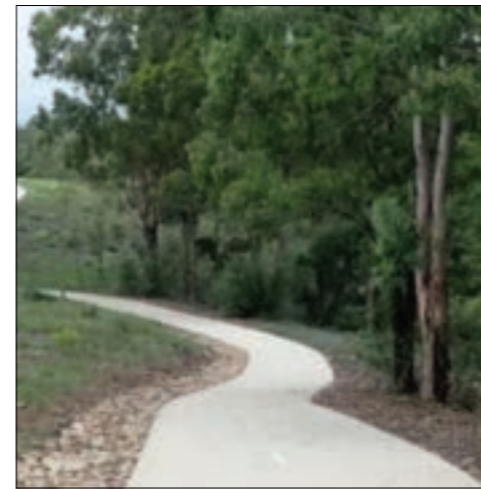


Figure 34: 2000mm concrete pavement.



Figure 35: 2000mm asphalt pavement.



Figure 36: 2000mm concrete stairs.



Figure 37: Cut and fill with 1:4 batters and swales.

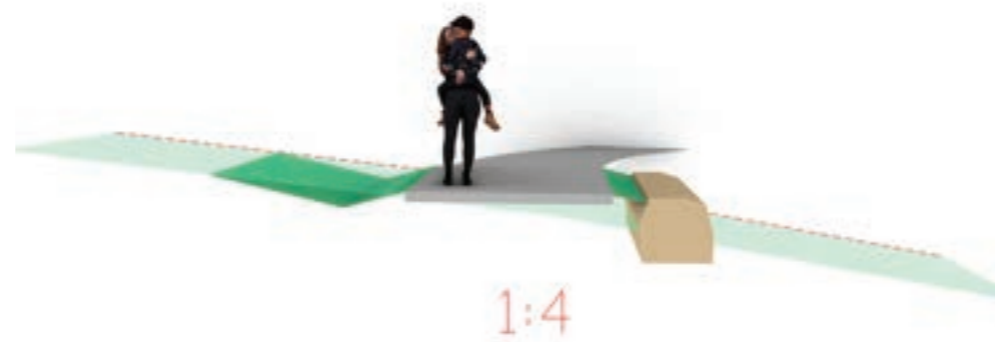


Figure 40: Cut and fill with 1:4 batters and swales with boulder edge at toe of slope



Figure 43: Cut and fill with 1:2 batter, rock swales with boulder edge at top of slope



Figure 38, Above: Fill with 1:4 batters and swales.



Figure 41: Cut and fill with 1:3 batters and swales.



Figure 44, Above: Cut and fill with 1:2 batters and boulder edge at top of slope.



Figure 39, Below: Fill with 1:4 batters and swales.



Figure 42, Below: Cut and fill with 1:3 batters and swales with boulder edge at top of slope.

Figure 45, Image deleted



# STRUCTURES

## BRIDGES AND ELEVATED WALKWAYS

The Bridges and elevated walkways provide access to areas where a concrete, asphalt or gravel path is not possible, sustainable or its construction overly compromises vegetation or slopes. The structures minimise the impact on the environment and preserve the experience of visitors.

Design is to AS 1170 for Serviceability Limit State: AS 1170.1 for Strength and Stability Limit States, Live Loads, Design of Supports, Live Loads on Barriers: AS 1170.2 Wind, AS 1170.4 Earthquake

Barriers on a class 2 track with a fall height of 1m are to be 900mm high with openings with a maximum clear dimension of 500mm vertically (between intermediate rails) and 300mm at the bottom with no maximum dimensions between vertical sections. In-fill material if appropriate or as designed for amenity and signage. Crossings and elevated walkways are designed for velocity of water and impacts. Balustrades are not.

The track Bridge crossings and elevated walkways are designed for a durability of 25 years+.

Two options have been investigated

- The purchase of modular systems, freighted from urban centre or interstate. Installed by suppliers and specified by Engineers as such. Refer Figure 49.

- The design and construction of the structures in situ reducing freight costs and giving greater flexibility to work with site conditions. Site conditions that can be considered include vegetation, soil conditions, access during weather and in permanently wet areas. Refer Figure 53.

Balustrades are to be customised with entry bollards sourced locally from decommissioned rail infrastructure. Design detailing can be incorporated into vertical sections such as laser cut panels that can be back lit. Railings can be further customised for materiality and colour.

To address costs detail design will look at suitability of different material options for joists and bearers

- steel frame supporting reinforced plastic mesh sections or composite boards.
- steel frame or combination steel frame and APR (Composite) joists.
- bridge and boardwalk decking boards are to be APR (Composite) products with boards running at 90 deg to the path.
- The extent of elevated walkways will be determined during detail design.



Figure 46: Local recycled bridge timbers to detail crossings.



Figure 47: Example of bridge detailing.



Figure 48: Example bridge crossing balustrade.



Figure 49: Example bridge crossing module (Landmark). K1103. Condamine.



Figure 50: Example elevated walkway.



Figure 51: Example elevated walkway.



Figure 52: Example bridge crossing transition to concrete path and stairs.

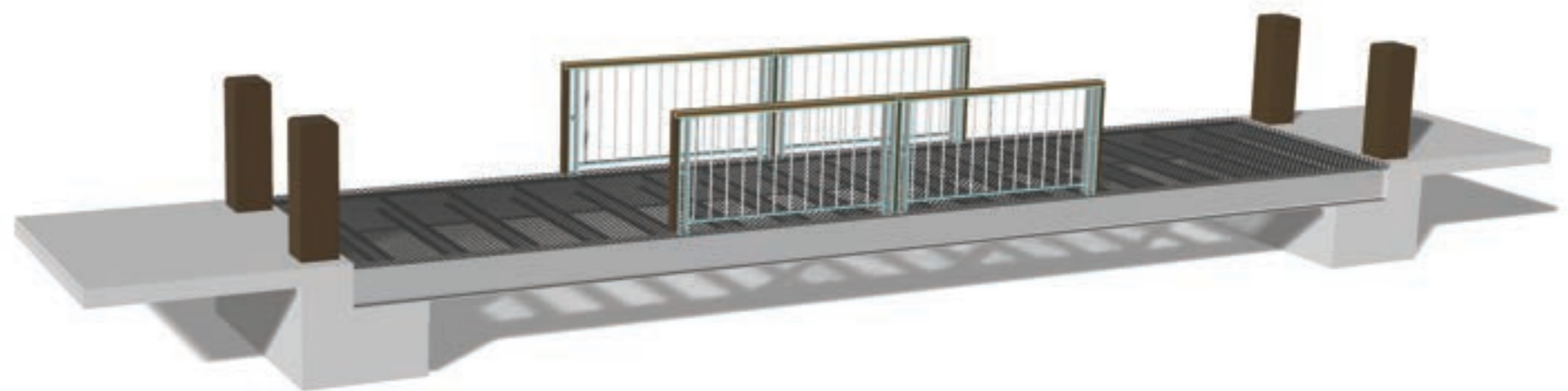


Figure 53: Bridge crossing concept. EF Landscape Architects. 2023.



# STRUCTURES

## SHELTERS

Shelters have been assessed as most economical to supply as flat pack modules and customise with landscape treatments and Art works.

Shelter Specification example 1.

-Pre-cut Colorbond, custom orb roof sheeting - XRW grade (Colour TBC).

-Hot dipped galvanised and powder coated steel posts (Colour TBC).

-LOSP treated, factory stained pine timber roof frame (Standard Stain).

-Stained pine timber front screen frame, with hardwood cleats and slats (Colour varies).

-Stainless steel anti vandal fastening system.

-All remaining brackets and fixings are galvanised steel.

\* Kit form, engineer certified, building application drawings and installation instructions.

Shelter Specification example 1.

Chill Out Tree

Street Furniture Australia

-Stainless Steel Roof frame and trunk

-Perforated Aluminium Powder Coated roof. Perforations can be fully customised.

## ARBOUR

STEEL ARBOUR Refer Figure 58.

-Material, Steel Square Section 100 x 150 mm at 2800mm high extending 2600mm on angle.

-Can within CPTED Principles and maintenance support vegetation.

-Designed to throw shadow that reinforces the impact of the structure and changes with time of day and season

-Can be lit as an art light installation.

-Within engineering constraints introduce laser cut sections vertical and horizontal for signage or art installation.



Figure 54: Example, Arbour.



Figure 55: Example, Arbour.



Figure 56: Chill Out Tree, by Street Furniture Australia.



Figure 57: K309 Peninsula 6.0m x 4.0m skillion roof shelter, by Landmark.

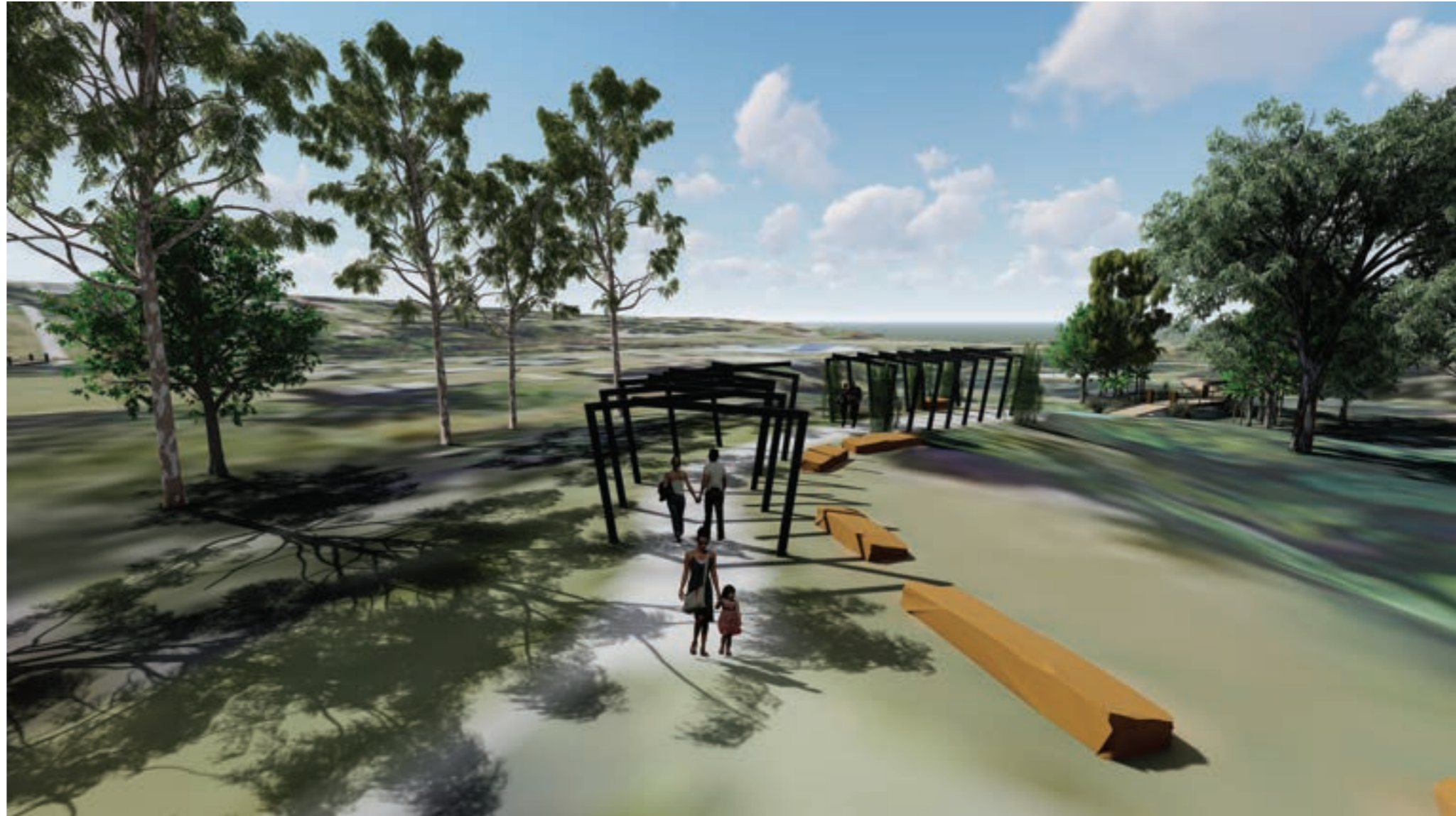


Figure 58: Arbour walkway and columnar seating. Design by EF Landscape Architects.2022.



# MATERIALS

## SEATING AND AMENITY LANDSCAPE

### LANDSCAPE AREAS

All plantings are to be indigenous species that are predominately endemic to the locale. Final species selection is subject to a flora assessment and report and consultation with groups undertaking revegetation works within the track area.

Amenity planting is an extension of these naturalised areas that will be designed to provide slope stability to track infrastructure, can be maintained as to resemble naturalised areas, provide shade and screen to neighbouring properties.

Amenity planting species near paths and shelters will not be poisonous, have foliage that may cut or irritate.

Planting design will be compliant with the principles of Designing for Crime Prevention through Environmental Design.

-Providing clear sight lines and minimising the opportunity for concealment

-Enabling passive surveillance from external areas.

-Ensuring vegetation does not impede lighting.

Amenity planting will allow for indigenous plants that are edible and signed for Bush Tucker suitability in consultation with the Aboriginal Community.



Image 59: In situ Sandstone Blocks.



Image 60: In situ Sandstone Blocks.



Image 61: In situ Columnar Basalt edges and seats.

### ARBOUR

### BENCH SEATS AND PICNIC SETTINGS






-  Revegetation Rainforest 8000m2
-  Revegetation Marshland 4000m2
-  Amenity Landscape 1000m2
-  Creek Crossing
-  Amenity Tree



Image 62: Landscape areas.

### SEATING

Sandstone Blocks placed in groupings that continue a theme established in Nimbin Village. Basalt columns placed as retaining edges and as seats that reference the rock type of the locale.

#### Bench Seat:

Fulcrum Seat 1.8m

Aluminum Timber Effect Slats (Standard Colour Tasmanian Oak)

-Recycled cast aluminium ends (Mill Finish)

-Polished recycled cast aluminium arm rests.

#### Picnic Setting:

FFSB004004 (KF073) Woodgrove 1.8m with bolt-down legs.

-Aluminium Timber Effect Slats (Standard Colour Tasmanian Oak)

-Hot dipped galvanised and powder coated steel frames (Colour TBC).



Image 63: Fulcrum seat, by Landmark.



Image 64: Woodgrove Picnic setting, by Landmark.



# LIGHTING

## SOLAR LIGHTING STANDARDS

Australian and New Zealand lighting standards that cover minor roads, public spaces, cycle way & pathways and car parks (AS/NZS 1158 3.1 2020) were updated in February 2020.

This update added

- a lighting requirement for 5m on either side of the pathway to be lit to 50% of the level of the pathway itself. This gives the path user visibility well beyond the edges of the pathway to deter crime and provide the user with a feeling of safety. (The exceptions to this are when the pathway runs adjacent to a boundary (fence/hedge/wall), or the appropriate authority can make exceptions for reasons such as if it is an area that is sensitive to light pollution (eg: the light will disturb the wildlife).
- Introducing a vertical luminance component to the lower subcategories. (The exception to this is if the light source is lower than 1.5m high, such as lighting bollards) reducing glare allowances for paths and cycle ways.

## SOLAR LIGHTING CONSIDERATION OF SENSORS

Lighting is to encourage night time use of pathway and cycle-ways, to encourage people do get outdoors and use these facilities, it is so important that the illumination is adequate for safety reasons, and just as importantly that the users feel safe. The second reason is to protect the owner of the assets (pathway and lights) from potential litigation if an incident occurs.

Therefore most lit public pathways and cycle ways in Australia are designed to comply with Australian lighting standards (AS/NZS 1158 3.1 2020 Pedestrian lighting). To comply with this standard, there are two important factors to consider if the use of sensor driven lighting is being considered.

1. light levels must be based on the LOWEST lighting level emitted throughout the night – not the sensor driven higher level of light. Therefore to comply with the lighting standard subcategory nominated (E.G. PP5, PP4, PP3 etc) the lighting levels must reach the subcategory when it is at its lowest lighting level.

2. Most sensor driven solar lights have as sensor range (maximum distance from how far the sensor is located where it will detect a pedestrian) of eight meters, however the necessary distances between light poles to meet these lighting standards is often somewhat more than double this distance. What this creates is a situation where a pedestrian or cyclist moving down the pathway may only have activated one of the sensors, therefore only the light behind the user is at full illumination, the light in front of the user is in power saver mode.

Please note this applies for stand-alone sensors on each light pole, some meshed systems can illuminate all the lights on the path with a sensor at the beginning of both ends of the pathway.

Often the best solution is to run the lights at constant illumination all night.7

## PARAMETERS

Solar tilt angle 40° positioning on pathway will maximise North orientation and extend life and efficiency of batteries by maximising charging.

It's recommended that solar panels are not integrated with luminaires to maximise orientation and performance.

The solar panel size is to be adequately balanced in conjunction with the luminaire power setting and the capacity of the battery system.

Possibly consider use of track till say 1 am with signage indicating the track is unlit second part of night to address concerns of neighbouring properties.

Low voltage wiring required between Master panels and light poles to address luminaires with inadequate solar exposure. Standalone units can be utilised where solar exposure is optimal.

Where concerns or design standards cannot be met for light spillage into private property solar bollards present an alternative to pole installation.

## ONGOING MAINTENANCE

Vegetation in the vicinity of lighting is to be removed/pruned so proposed lighting levels are maintained.

Example Luminaire, GFS-DEFENDER 55

LED 25 years

Battery 10-13 + years

Driver 15+ years

Solar Panel 30+years

Unit casing 30+ years

Solar lighting provides exceptional lighting outcomes, with high reliability, and will cost less up-front as no trenching and limited cabling is required. With the ongoing power savings cost, this can make the total life cycle cost of solar competitive with 240v hard wired installation.

Detail design will determine the optimal light product, configuration and whole of lifecycle cost.

## 240V HARD WIRED ALTERNATIVE-SITE AND OPERATIONAL CONSTRAINTS

-Hard wired systems require deep trenching which is impractical due to limited ROF and disturbance to sub-grade prior to constructing concrete paths.

-Disturbance to tree roots, access for trenching machinery, access to grid and probable upgrade to transformers and ongoing power purchasing cost.

-The above mitigates any upfront cost saving for individual lighting units and replacement costs for solar drivers and batteries over time.



Figure 65: Solar Bollard ABS Series.



Figure 66: Solar Bollard ABS Series



Figure 67: Leadsun AE6 Series



Figure 68: Leadsun AE6 Series



Figure 69: Leadsun AE6 Series

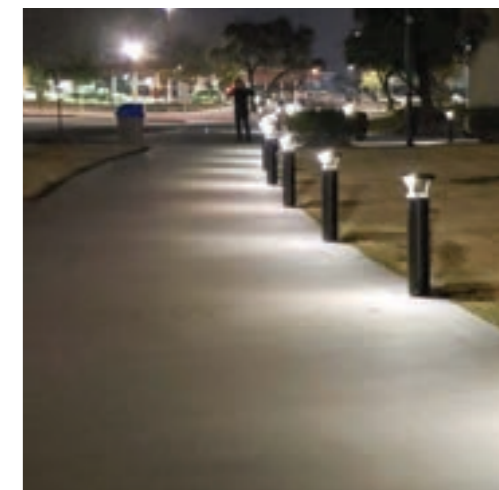


Figure 70: Example Bollard set out



# ENDNOTES - AUTHORS DETAILS AND DISCLAIMER

Endnotes

- 1 Lismore City Council
- 2 Nimbin Chamber of Commerce Web Site
- 3 Nimbin Chamber of Commerce Web Site
- 4 References researched include,

Black Fellas and Rainbow Fellas: Convergence of Cultures at the Aquarius Arts and Lifestyle Festival, Nimbin, 1973, Authors Alethea Scantlebury DOI: <https://doi.org/10.5204/mcj.923> Scantlebury, A. (2014). Black Fellas and Rainbow Fellas: Convergence of Cultures at the Aquarius Arts and Lifestyle Festival, Nimbin, 1973. M/C Journal, 17(6). <https://doi.org/10.5204/mcj.923>  
 The Link to this citing is. <https://journal.media-culture.org.au/index.php/mcjournal/article/view/923>

The National Film and Sound Archive notes in their summary text for Film Archive TITLE: Nimbin Aquarius Festival – Pastor Don Brady and dancers, NFSA ID 778774, YEAR 1973, COURTESY Megan McMurchy and Jeune Pritchard, the Brady family on behalf of the Jawiyaba Warra Aboriginal Corporation and the Kuku Yalanji community.  
 “In 1973, the Aquarius Festival moved off campus to the Northern New South Wales town of Nimbin. Organised by the Australian Union of Students, the 10-day alternative festival was a coming together of counter cultural ideas, workshops and performances. The festival was the first of its kind to seek permission from the area’s Traditional Owners, the Bundjalung nation, and to include a Welcome to Country. The push to engage the Indigenous community was prompted by Indigenous activists, and it was purportedly Gary Foley who asked festival organisers if they had sought permission from the local Aboriginal community to host the festival. In response to these calls to action, the festival organisers secured two Australia Council for the Arts grants to further Aboriginal participation. San people from the Kalahari Desert, including artist Bauxhau Stone, visited Aboriginal communities and missions around the country and invited people to attend the festival.”

The Link to this citing is. <https://www.nfsa.gov.au/collection/curated/nimbin-aquarius-festival-pastor-don-brady-and-dancers>  
 5 <http://www.milesago.com/festivals/aquarius73.htm>  
 6 Aquafil flexifountain AQ-FF1500BF  
 7 <https://orcasolarlighting.com.au/planning-solar-pathway-cycle-way-lighting-with-the-use-of-sensors-you-need-to-know-this.html>

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Cover Image-EFNRRWT1-CROSSINGS AND TRACK\_REVf-220810.

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## NIMBIN RAINBOW ROAD WALKING TRACK STAGE ONE

