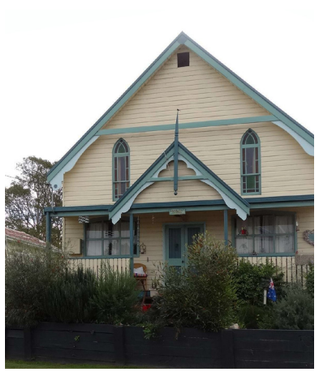
Figure 1.43 Looking across Flo Clark Park, across Sportsmans Creek to the heritage village and floodplain to the west

Figure 1.44 Looking across to the village from Sportsmans Park - key panoramic water views of Sportsmans Creek and the Clarence River are a feature of this park.



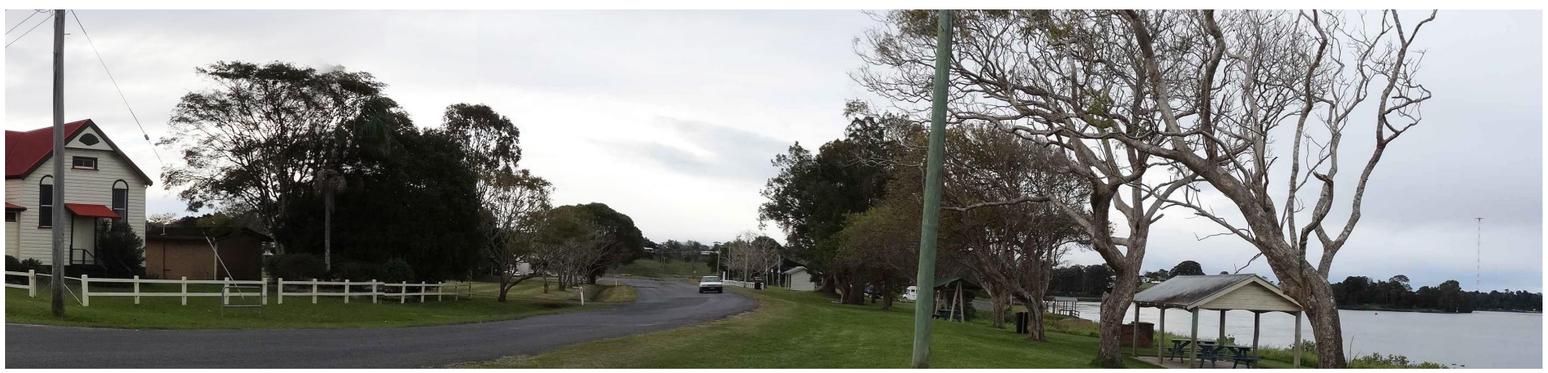


Figure 1.45 The Heritage Village has special built form, landscape and contextual character that must be respected. View corridors to water between housing and across parklands are special elements through the town.

06 URBAN DESIGN VISION & OBJECTIVES

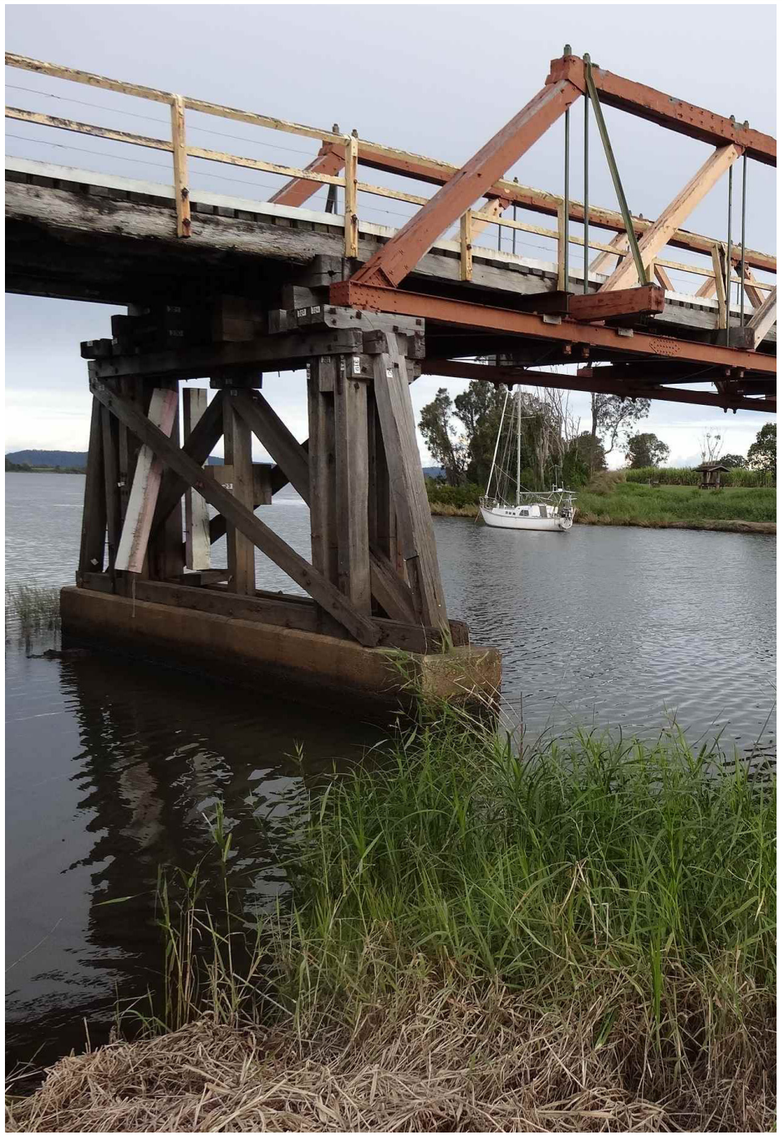


Figure 1.46 Contextual View - Sportsmans Creek bridge

URBAN DESIGN VISION

Key to the success of this project is to sensitively integrate the new bridge crossing in the landscape. It is considered that the location of the bridge is critical to minimise impacts to a number of sensitive areas as identified in our landscape character analysis. Second to this is the structural treatment of the bridge itself; hence the route is the determining factor.

The new bridge would allow the use of heavy vehicles along this route and this would influence the magnitude of impact on the affected areas. Hence careful consideration is required on the new alignment. This alignment should take into consideration the future desired character of the setting and in particular the heritage ensemble within the Heritage Village.

The bridge should consider views onto the waterways as part of the arrival sequence into Lawrence from the south. It should not dominate the landscape but express simple clear lines sympathetic to the rural setting.

URBAN DESIGN OBJECTIVES

Based on our site analysis, the following urban design project objectives have been identified. These objectives will assist in identifying a short list of preferred options to be further developed:

- Retain the integrity of the Heritage Village and minimise impacts to public parks and recreational facilities.
- Minimise impacts to the overall natural landscape character and quality of the setting, including waterways and floodplain.
- Locate the structures so that they do not obstruct key views / vistas that give the township and the landscape character its special quality.
- Mitigate impacts to the sensitive environs such as the floodplain, heritage elements, local residences etc.
- Develop a route/alignment which provides effective linkages to Rutland Street.
- Provide user-friendly facilities for pedestrians and cyclists.
- Develop a scheme that is compatible with the desired future character and land use of the township.

07 PRELIMINARY ROUTE OPTIONS

A number of preliminary strategic options were identified within the general study area. The identified options were tested in more detail against a number of feasibility parameters such as vertical grade/alignment, impacts to existing roads and budget. From this process six preliminary options were selected for further investigation (see adjacent figure).

OPTION 1 - FLOODPLAIN WEST

As the most western option, it locates the alignment away from the Heritage Village and within the floodplain, acting as a local bypass. A key attribute of this option is good connectivity with Rutland Street, a clear legible alignment that minimises impacts to the Heritage Village and situating the bridge crossing away from Flo Clark Park and the boat ramp facility.

This option provides the best outcome for Flo Clark Park/Sportsmans Park, it is however considered the most intrusive into the overall landscape setting as it does not utilise the existing urban structure of the township, fragments the floodplain and impacts on panoramic vistas from the Higher Village.

It should be noted, that this alignment will affect commercial operators such as the Lawrence General Store and the Lawrence Tavern by making these properties less accessible.

Finally, the new alignment is partially isolated from the township for pedestrian and cyclist who may prefer a direct route to points of interest such as Lawrence General Store, Sportsmans Park, Lawrence Memorial Park and the Lawrence Tavern.

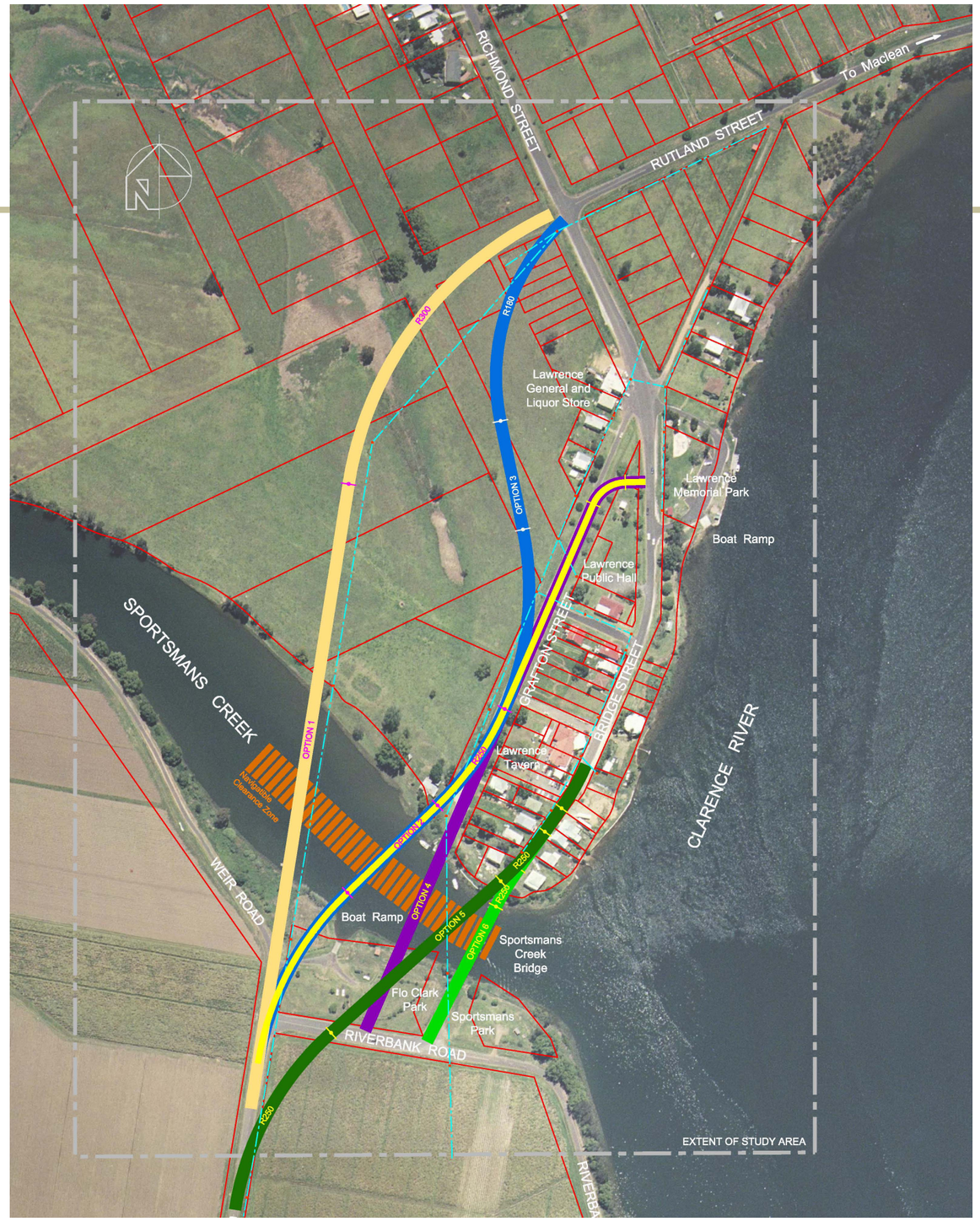


Figure 1.47 Preliminary Concept Options by KBR.

OPTION 2 - GRAFTON STREET WEST

This option predominantly follows Grafton Street and drifts westward in the vicinity of Sportsmans Creek and provides good connectivity with Lawrence Road.

As with Option 1, it limits impacts to Flo Clark Park and the boat ramp facility, allowing the full consolidation of Flo Clark Park with Sportsmans Park. Although the bridge would be located closer to Flo Clark Park compared to Option 1, it would settle better within the landscape setting due to some vegetative curtilage and its lesser dominance within the floodplain.

This option provides good connectivity to the Heritage Village and commercial operators would be less impacted than Option 1. The intersection with Bridge Street, although less user-friendly for motorists, would ensure low speed in the vicinity of the hub. Its alignment is also considered more user-friendly for cyclist/ and pedestrians.

It should be noted that the Lawrence Tavern, located along Bridge Street would be impacted by the new alignment, losing exposure to through traffic. However, its close proximity to Grafton Street would provide opportunities to allow access from Grafton Street by utilising the existing cross street.

It should be noted that this option would strongly impact a private property at the end of Grafton Street including some of the vegetative curtilage.

OPTION 3 - FLOODPLAIN EAST

The third option locates the alignment combines the alignments of Option 1 and 2 by partially making use of Grafton Street as a way to connect with the Heritage Village. The northern section of the alignment is situated within the floodplain and makes good connection with Rutland Street, bypassing the group of buildings identified as the Hub, including the Lawrence General Store.

As with Option 1, key attributes of this option is good connectivity with Rutland Street and lawrence Road, minimising impacts to the Heritage Village and situating the bridge crossing west of the boat ramp. It also provides good connectivity with the Heritage Village and a less isolated alignment, more user-friendly for pedestrians and cyclist than Option 1.

Whilst this option limits impacts to Flo Clark Park/Sportsmans Park, it is however considered somewhat intrusive into the floodplain setting,and ephemeral wetlands, and it impacts upon panoramic vistas from the Higher Village.

It should be noted, that this alignment, although better than Option 1, will affect commercial operators such as the Lawrence General Store and the Lawrence Tavern by making these properties less accessible. As with Option 2, access to the Lawrence Tavern can be gained through the local cross street.

OPTION 4 - GRAFTON STREET

This option follows Grafton Street and situates the new bridge structure west from the existing crossing. By utilising the existing urban structure, the route mitigates impacts to the natural landscape setting whilst also allowing the consolidation of the heritage village.

This option provides a similar connectivity as option 2, however it bisects Flo Clark Park and isolates the boat ramp from the rest of the park. It does allow the consolidation of Flo Clark Park with Sportsmans Park which is seen positively. On the other hand, the bridge would be visually prominent at this location from the park and some contextual views would be lost.

Predominantly three residences along Grafton Street would be impacted with the new alignment, however the generous setbacks of these residences assist in ameliorating this situation compared to Bridge Street. This option provides similar access to commercial operators within the Heritage Village as Option 2.

This option would generally settle well in the landscape with stands of trees on both sides of the creek providing some curtilage and visual integration. However, it would be a dominant element from within Flo Clark Park resulting in the loss of some contextual views.

OPTION 5 - BRIDGE STREET WEST

This corridor along Bridge Street and just west of the existing bridge retains a similar route as in the existing situation. It leads the through traffic including heavy vehicles through the Heritage Village, partially dissecting the community and potentially raising safety issues for pedestrians/cyclist.

A key constraint with this option is the bisection of Flo Clark Park. Its horizontal alignment is user-friendly for motorists however, this may bring safety issues regarding speeding within the tight confines of the Heritage Village.

In addition, this option is likely to impact private properties and cause disruption during construction. Overall, this option will adversely impact the Heritage Village's future character and potentially raise safety issues. There is also no room for a cycle path.

OPTION 6 - BRIDGE STREET

This corridor along Bridge Street provides a compact and logical alignment that replicates the existing situation. It minimises the extent and apparent impact of the works, however, it would lead the heavy vehicle traffic through the Heritage Village, partially bisecting the community and potentially raising safety issues for pedestrians/cyclist.

A key constraint is the existing bridge structure, requiring the new bridge to be built directly adjacent to the existing. This is likely to impact private properties and cause disruption during construction.

Overall, this option limits its impacts by emulating the existing situation. It however may negatively influence the desired future character of the village providing limited flexibility in its future planing and development.

08 SHORT- LISTED OPTIONS ASSESSMENT

Figure 1.48 Contextual View - Sportsmans Creek bridge

The adjacent table provides an overview of each option measured against the identified urban design objectives. We have provided a rating scale from 1 to 5, whereby 5 meets the objective best, and 1 the least.

It can be concluded that from this preliminary urban design options assessment, Option 4 performed the worst against the criterion. Option 3 and 2 were ranked the lowest respectively. Both having a similar alignment. These two options also provided the least rating contrast between the different objectives/criterion, delivering a good performance across the various objectives.

In order to narrow down the four identified Preliminary Options for further development, a team workshop was held including Roads and Maritime and Clarence Valley Council representatives. This was undertaken by testing each option against key project wide criteria and objectives based on the principles of a multi criteria analysis (MCA).

The options were reconciled against four overriding broad objectives relevant to the success of the project as outlined below:

OBJECTIVE	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Retain the integrity of the Heritage Village and minimise impacts to public parks and recreational facilities.	5	4	4	3	1	1
Minimise impacts to the overall natural landscape character and quality of the setting.	1	4	3	3	4	5
Locate the structures so that they do not obstruct key views / vistas that give the township and the landscape character its special quality.	2	4	3	2	3	5
Mitigate impacts to the sensitive environs such as the floodplain, heritage elements, local residences etc ;	2	4	3	3	2	2
Develop a route/alignment which provides effective linkages to Rutland Street and Lawrence Road.	5	3	5	2	3	2
Provide user-friendly facilities for pedestrians and cyclists.	1	3	2	4	5	5
Develop a scheme that is compatible with the desired future character and land use of the township.	2	4	3	4	1	1
Totals	18	26	23	21	19	21

Table 1.1 Preliminary Urban Design Options Assessment

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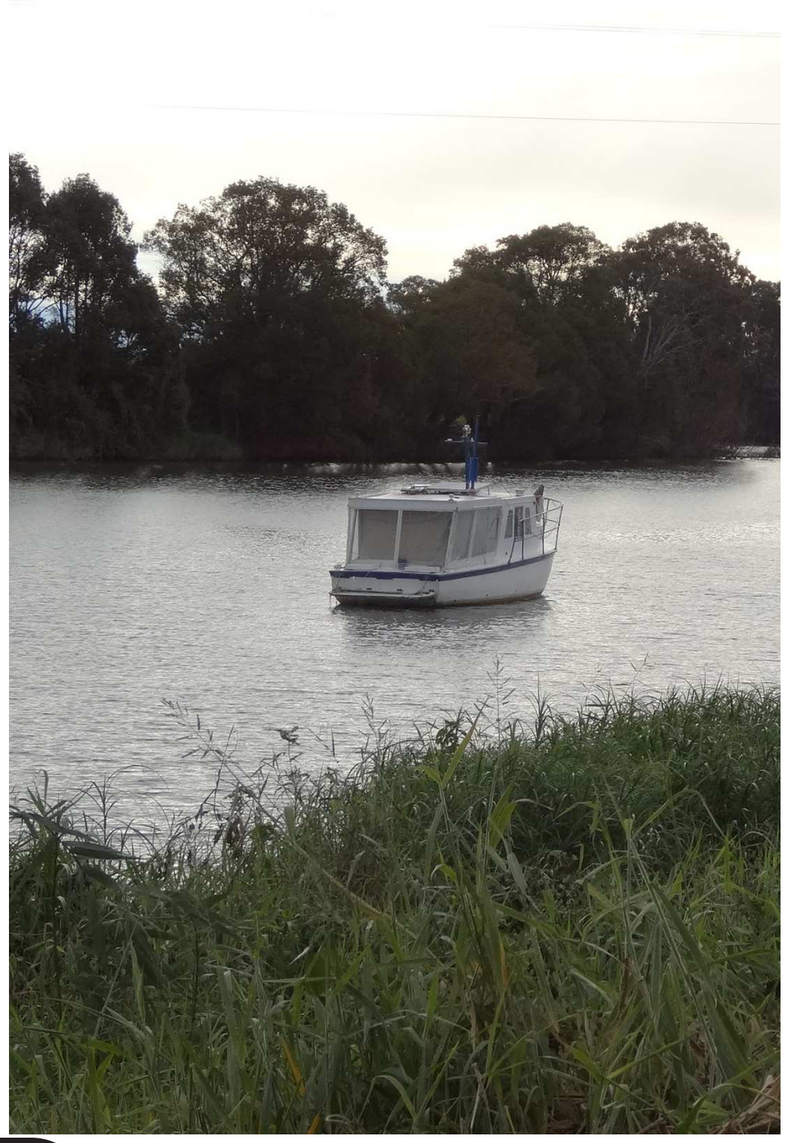
Figure 1.49 Contextual View - Sportsmans Creek bridge

09 URBAN DESIGN PRINCIPLES



Specific urban design principles have been developed tailored to the short-listed options to guide the design process and mitigate visual and landscape character impacts. The short-listed options will be tested against these design principles and a preferred option will be recommended.

BUILT FORM ELEMENTS

- Design a structure that is aesthetically resolved without visually dominating the setting.
- Consider a super structure that reinforces the horizontal plane to visually integrate with the waterways and floodplain.
- Consider a superstructure that extends above the deck. This will make the bridge more prominent as a landmark feature that marks the entry into town.
- Avoid visual clutter and keep the singular components of the structure simple and legible.
- Develop a pier shape that minimises the footprint at ground level to mitigate flooding impacts.
- Reinforce the horizontality of the structure by maximizing the span in relation to pier height. This will help the structure to visually settle better within the floodplain setting.
- Start bridge structure when 3 metres clearance under the structure can be achieved and introduce retaining structures at abutments as required. This will give the structure an open appearance whilst minimizing concealed/ dark spaces.

LANDSCAPE & VISUAL STRATEGIES

- Develop landscape strategies to settle the new bridge into the rural setting through retaining open views to floodplain/wetlands, designing planting to mark certain areas such as bridge abutments and road intersections.
- Minimise large fill batters at abutments/approaches to the structure, to ensure minimal impact on vegetation, flooding and floodplain character.
- Where the old bridge is being removed, provide a multi functional space for the community that relates to the environmental setting and history of the area.
- Improve pedestrian connectivity and cyclist movement through the town, especially focussing on a safer relationship between the town and the water.
- Maximise retention of existing native vegetation close to the new corridor, to reduce visual impacts and respect ecology/vegetation of the town.
- Incorporate initiatives that reinforce the strategies as outlined in *The Clarence River Way, 2010.*
- Reinforce the indigenous vegetation associations that were there originally- to promote biodiversity and also settle the new elements into the surrounding landscape.
- Respect the streetscape character of Grafton Street, and improve legibility for the changed network patterns through the town- ie. the shift of the main road to the west.

10 CONCEPT DESIGN

THE ALIGNMENT

Based on the short-listed options assessment, Option 2 has been selected for further development. This option was considered to best meet the overall project objectives. The alignment of this option has been refined to integrate key mitigation measures including:

- The retention of significant vegetation that assists in settling the structure into the landscape.
- Utilising existing infrastructure corridors / elements such as the Grafton Street alignment.
- Minimising the overall height of the bridge structure to reduce the presence of the structure and its approaches.
- Limiting impacts to heritage elements.

Key refinements include:

- Refinement of the alignment to avoid the removal of a mature tree.
- Re-configuration of the intersection between Bridge Street and Grafton Street to enhance safety.
- Clearly defining the entry into Lawrence from the south to reduce speeds and enhance safety.
- Locating the northern approach to the bridge further west, to ensure local access is maintained.

Figure 1.50 Concept Design Plan

Figure 1.51 Indicative Photomontage of the Sportsmans Creek new bridge.

THE BRIDGE

The bridge has been conceived as a simple structure composed out of precast concrete girders with an overall span of 154 metres. The overall bridge span is dictated by the geotechnical instability of the embankments.

To minimise the height of the bridge and its approaches, the abutment height has been minimised to approximately 1.3 to 1.5 metres. This will ensure that the abutment is not hidden, defining the end points of the bridge whilst minimising gradients on the approaches. This will also mitigate the overall presence of the bridge within the floodplain setting.

The rhythm of the pier spacing varies whereby a central larger span of 35 metres is expressed and the various span lengths are proportional to the height to span length ratio. This ensures a visually more pleasing structure.

The parapet height has been minimised through the introduction of a traffic rail barrier system, allowing views towards the creek and floodplain beyond to be maximised and reducing the apparent bulk of the structure. This approach also reinforces the horizontality of the structure and retains an elegant proportion between superstructure and parapet depth. To further minimise the parapet depth, drainage pipes have been concealed between the girders.

The piers have been conceived as two circular columns 1.5 metre in diameter combined with a headstock. This arrangement provides an efficient structural resolution of the pier that is cost effective and simple to construct. To reduce the dominance of the headstock, the cantilevered ends taper away from the pier, making this element appear more slender. This is further reinforced by tapering / slanting the front face towards the structure, creating a more dynamic appearance, whilst reinforcing the slenderness of this element.

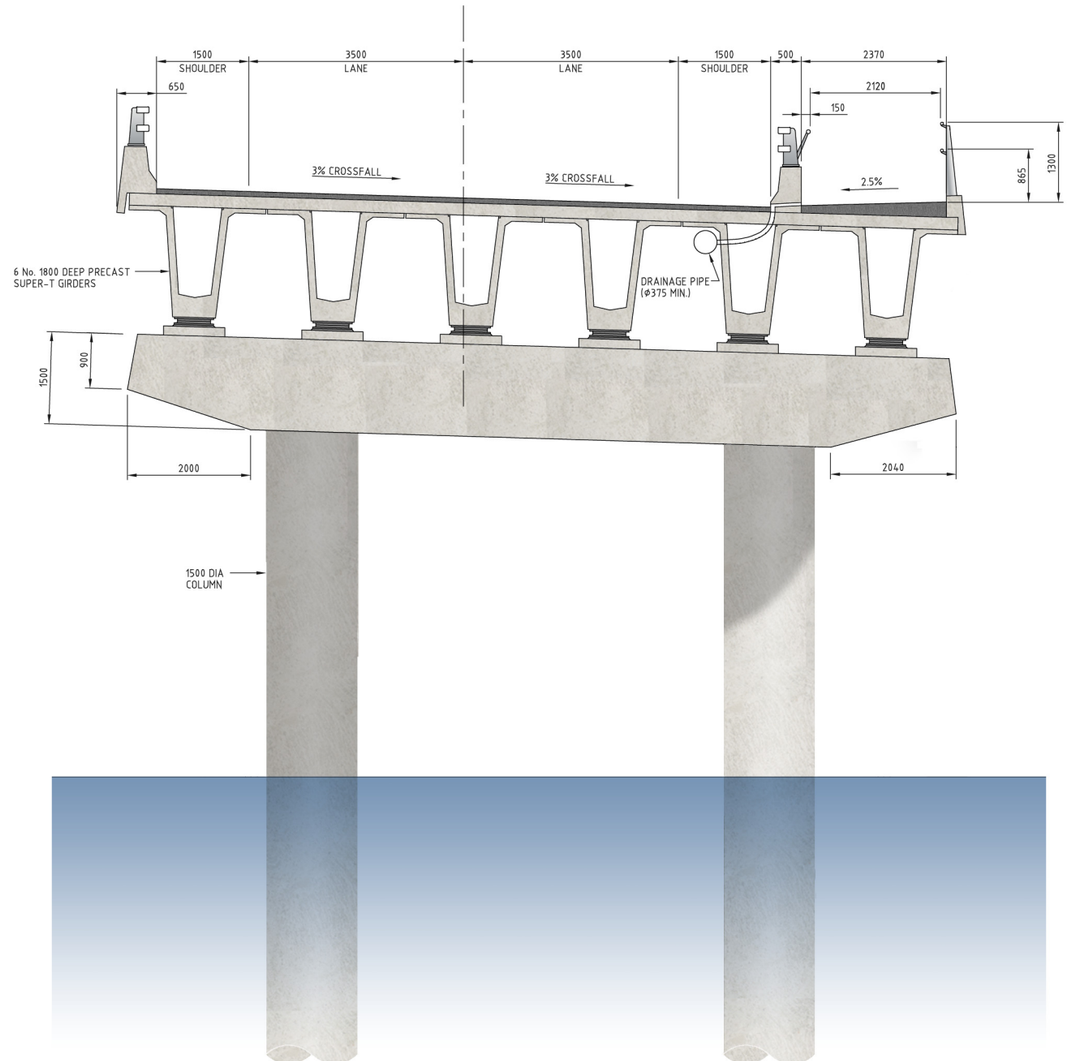


Figure 1.52 Proposed bridge structure and pier arrangement.

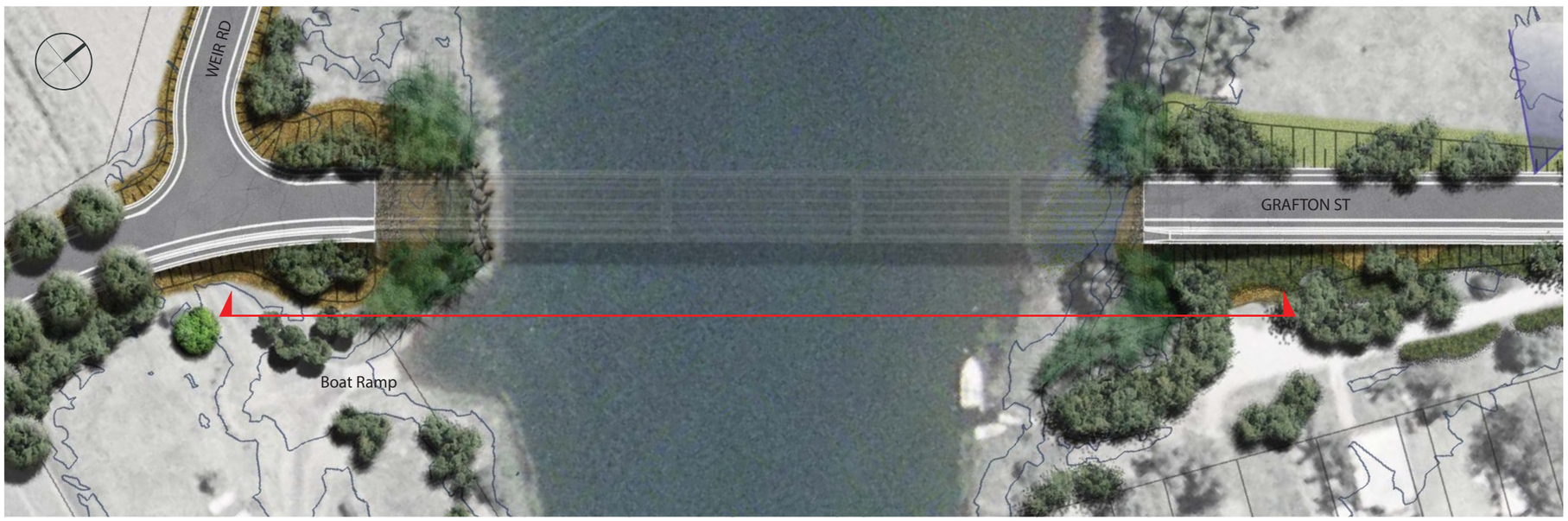


Figure 1.53 Detail plan of the new bridge.

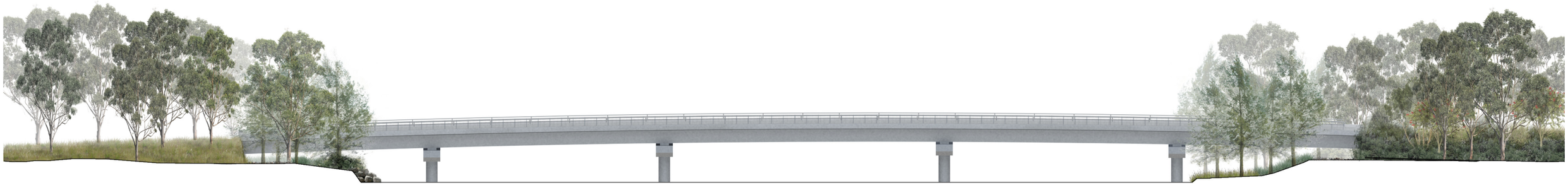


Figure 1.54 Elevation of the new bridge which shows the pier spacing and height of the structure.

LANDSCAPE CONCEPT

Key elements incorporated into the design:

- Gentle batters to bridge abutments to be formed to allow gentle transitions to the adjacent landscape for better integration.
- New boat ramp access road to be installed with exit/entrance onto Riverbank Road.
- New grassland and contouring to seamlessly join Flo Clark Park with Sportsmans Park with an opportunity to position heritage interpretation signage over the old bridge approach route.
- Reinforce the woodland planting character on new bridge approaches and the realignment of Grafton Street.
- New avenue planting of Jacaranda's will assist in reinforcing Grafton Street as the main street and mark the entrance to the heritage village precinct.
- Open views to the floodplain to be retained.
- Careful positioning of new plantings to mark intersections, provide screening to residents and maintaining key views to the Clarence River/ Sportsmans Creek.
- Treatment of the old bridge abutment to incorporate a meeting place.

PLANTING STRATEGY

Planting Design Approach

The new planting would utilise the indigenous plant communities found on the coastal floodplain of Clarence Valley. The natural vegetation of the Clarence Valley consisted of riparian zones along watercourses beyond which lay wetlands with woodlands fringing the fresh water or saline wetlands.

The selected species for planting are to be derived from the Coastal Floodplain Wetland vegetation class which incorporates species of the Endangered Ecological Community (EEC), Subtropical Coastal Floodplain Forest. Keith (2004).

Selected species will need to be chosen to ensure they are tolerant of 'disturbed' Acid Sulfate soils if found to be present.

Planting Themes

The concept plans outlines different vegetation themes which are described below.

Jacarandas

- To reinforce the existing avenue planting alongside the Lawrence Memorial Park and to define the entrance to the town centre when approaching from the north.

Riverine Planting – Mixed canopy, Coastal Floodplain Wetlands
Casuarina glauca, Melaleuca ericifolia, Eucalyptus robusta , Glochidion ferdinandi

- To be planted in areas either side of the new bridge abutments adjacent the creek bank. No shrub layer is proposed to allow views through to the creek. Sedges/rushes would be planted at the toe of the creek bank.

Woodland planting – Mixed Canopy, Coastal Floodplain Wetlands
Angophora sp, Eucalyptus sp. Lophostemon suaveolens , Melaleuca linariifolia, Melaleuca styphelioides

- To be planted on the battered slopes to the new bridge abutments consisting of mixed canopy trees species. The ground plane would be planted with native grasses to allow views through to the creek and beyond whilst providing a more natural transition to adjacent existing mown grass areas.
- Elsewhere along Grafton Street groupings of mixed species are proposed which will frame views across to the ephemeral wetlands and provide some screening to adjacent residential properties.

Indigenous shrubs and groundcovers - *Lomandra, Microleana, Imperata species*

Mixed native species to be planted in swathes along the edge of the new battered slope on the east side of Grafton Street which will contribute to the town setting and entrance to the town.

Wetland Planting – Coastal Floodplain Wetlands
Juncus sp, Elaeocharis sp, Schoenoplectus sp

- Salt tolerant wetland species would be planted along the waters edge which will assist in providing bank stabilization and improve water quality where the old bridge abutment on the southern side of the creek will be removed.

Parkland Grass (native grasses)

- As groundcover to new battered slopes to allow a transition to adjacent mown grass areas and to allow the new structure to 'settle' into the setting.
- As groundcover to a new contoured area on the south bank of the creek where the existing bridge approach is removed.

LEGEND

Landscape Elements

- Batters as shown
- Retaining walls
- Pedestrian walkway

Vegetation

- Jacarandas
- Woodland planting (utilising Coastal Floodplain Wetland species)
- Riverine (utilising Coastal Floodplain Wetland species)
- Indigenous shrubs & groundcovers
- Indigenous grasses and tussocks
- Wetland planting
- Parkland grass (native grass)

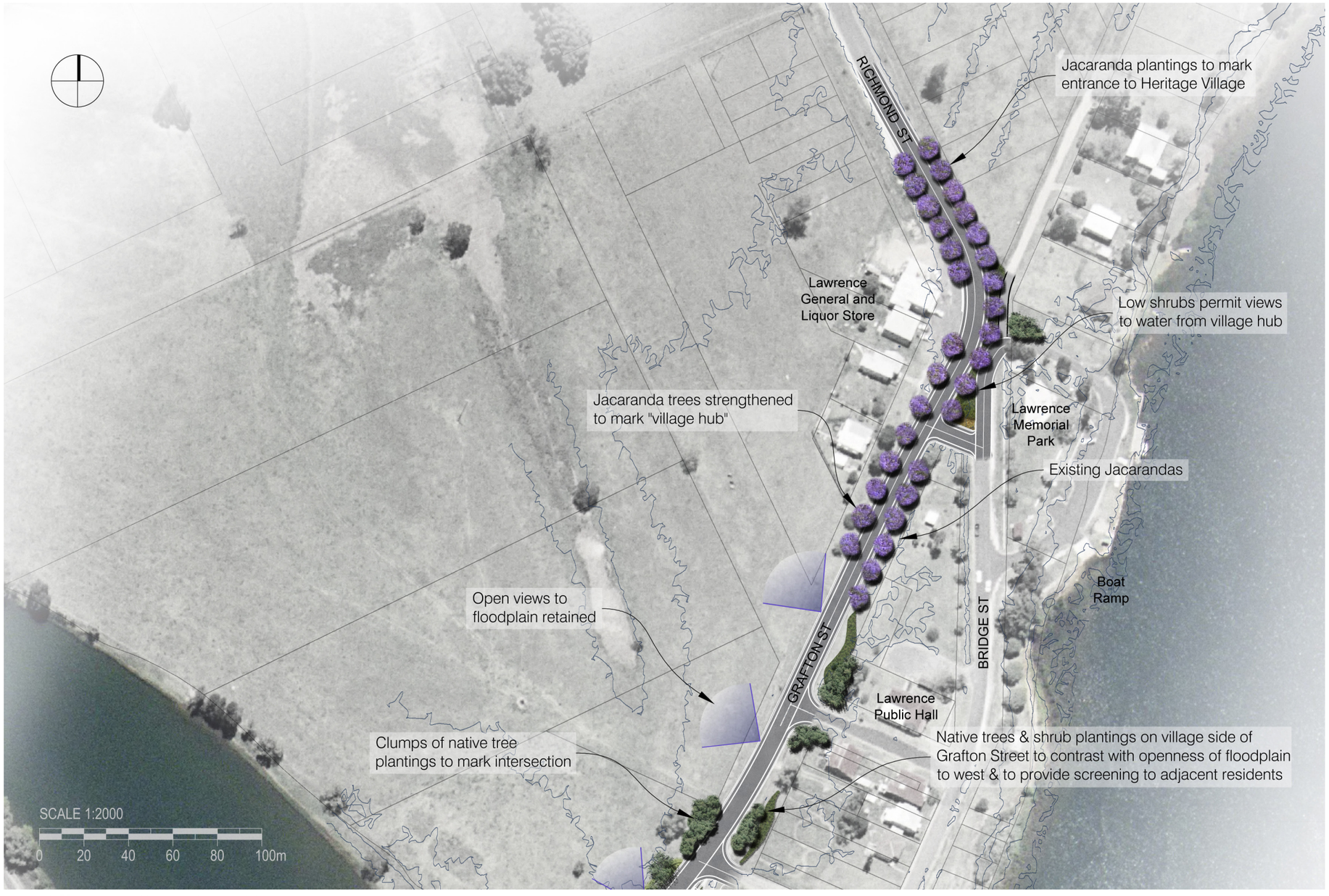


Figure 1.55 Landscape Concept Plan - Part 1

LEGEND

Landscape Elements

- Batters as shown
- Retaining walls
- Pedestrian walkway

Vegetation

- Jacarandas
- Woodland planting (utilising Coastal Floodplain Wetland species)
- Riverine (utilising Coastal Floodplain Wetland species)
- Indigenous shrubs & groundcovers
- Indigenous grasses and tussocks
- Wetland planting
- Parkland grass (native grass)

Figure 1.56 Landscape Concept Plan - Part 2

Figure 1.57 Indicative Photomontage of the Sportsmans Creek new bridge

PLANT SPECIES MIXES

The selected species for revegetation need to take into consideration the locality for new planting and the existing dominant species present to ensure there is appropriate integration with adjacent planting.

Sample species list for the indigenous plant communities include:

Coastal Floodplain Wetlands

Trees

Angophora floribunda	Rough barked apple
Angophora subvelutina	Broad-leaved apple
Casuarina glauca	Swamp Oak
Eucalyptus amplifolia	Cabbage Gum
Eucalyptus grandis	Flooded Gum
Eucalyptus robusta	Swamp Mahogany
Eucalyptus tereticornis	Forest Red Gum
Lophostemon suaveolens	Swamp Turpentine

Small Trees/Shrubs

Callistemon linearifolius	Netted Bottle Brush
Desmodium acanthocladum	Thorny Pea
Glochidon ferdinandi	Cheese Tree
Melaleuca ericifolia	Swamp Paperbark
Melaleuca linariifolia	Snow in Summer
Melaleuca styphelioides	Prickly-leaved Teatree
Myoporum acuminatum	Waterbush, Pointed Boobialla

Grasses and Groundcovers

Baumea juncea	Bare twig-rush
Carex appresa	Tussock sedge
Cyndon dactylon	Couch
Echinopogon ovatus	Forest hedgehog grass
Gahnia clarkei	Tall saw-sedge
Juncus kraussii subsp australiensis	Sea rush
Juncus usitatus	Common Rush
Lomandra longifolia	Spiny-headed mat-rush
Microlaena stipoides var stipoides	Weeping Grass
Phragmites australis	Common Reed

Wetland/Creek edge

Bacopa monniera	Brahmi (high salt tolerance)
Cotula coronipifolia	Waterbuttons (high salt tolerance)
Juncus usitatus	Common Rush
Phragmites australis	Common Reed
Schoenoplectus litoralis	River Club Rush

Coastal Floodplain Wetlands
Trees

Angophora floribunda
‘Rough Barked Apple’

Angophora subvelutina
‘Broad-leaved Apple’

Casuarina glauca
‘River She Oak’

Eucalyptus amplifolia
‘Cabbage Gum’

Eucalyptus robusta
‘Swamp Mahogany’

Lophostemon suaveolens
‘Swamp Turpentine

Small Trees and Shrubs

Breyniia oblongifolia
‘Breynia’

Callistemon linerifolius
‘Netted Bottle Brush’

Glochidon ferdinandi
‘Cheese Tree’

Melaleuca ericifolia
‘Swamp Paperbark’

Melaleuca linariifolia
‘Snow in Summer’

Myoporum acuminatum
‘Waterbush, Boobialla’

Grasses and groundcovers

Dichondra repens

Imperata cylindrica

Lomandra longifola
‘Spiny headed mat-rush’

Microleana stipoides var stipoides
‘Weeping Grass’

Viola hederacea

Wetland/Creek edge (salt tolerant)

Bacopa monniera
‘Brahmi’

Cotula cronipifolia
‘Waterbuttons

Juncus usitatus
‘Common Rush’

Phragmites australis
‘Common Reed’

Schoenoplectus litoralis
River Club Rush

Figure 1.58 Plant palette - typical species

11 LANDSCAPE CHARACTER IMPACT ASSESSMENT

Based on the concept design the following landscape character impact has been assessed. The landscape character impact is based on the aggregate of an area's built, natural and cultural character and sense of place. In this regard, it is measured by the combination of the area's sensitivity and the magnitude (scale, character and distance).

The table below illustrates how the level of sensitivity and magnitude are combined to achieve an overall level of impact for both the landscape character impact and the visual impact. It should be noted that the ratings are measured relative to each other rather then assigned through an absolute scale. Hence the resulting landscape character impact rating is project specific and identifies those areas with the highest and lowest impacts.

Sensitivity \ Magnitude	high	moderate	low	negligible
high	high impact	high- moderate	moderate	negligible
moderate	high- moderate	moderate	moderate-low	negligible
low	moderate	moderate-low	low	negligible
negligible	negligible	negligible	negligible	negligible

Table 1.2 Landscape Visual Impacts Rating Table - RMS EIA Guidance Note EIA-N04.

The sensitivity of each landscape character zone has been assessed in Chapter 05 - Landscape Character Analysis and is summarised in the table below.

character zones	sensitivity
Higher Village	high
Ephermeral Wetlands	moderate
River Bend	moderate
The Hub	high
Heritage Village	high
The Parks	high
Sugarcane Fields	low
Waterways	high

Table 1.3 Summary of the landscape character zones sensitivity ratings.

Higher Village

The magnitude of impact within this zone is considered negligible as the works would not directly affect the sense of place. Some properties may have distant views towards the bridge, yet the general character of the landscape setting with its expansive vistas would no change. Hence a negligible landscape character impact is assessed for this zone.

Ephemeral Wetlands

The character and visual quality of the floodplain would not change. Within some areas (closer towards the bridge), the proposal would be more noticeable. The redirection of movement along the floodplain's verge (Grafton Street), would however slightly increase the urbanity of the setting. Hence, a low rating is assessed for the magnitude of impact. This results in a moderate to low landscape character impact.

River Bend

The proposed works would have a negligible magnitude of impact within this zone, as the proposed works in the vicinity are of a minor nature. The overall landscape character impact is considered to be negligible.

The Hub

This significant intersection would be re-configured, and although the character of the intersection would change, its sense of place will not be dramatically affected. Hence a low magnitude of impact is assessed. This results in a moderate landscape character impact.

Heritage Village

The Heritage Village would be strongly impacted in a beneficial way by the removal of through traffic, even though no major physical transformation is proposed within this location. The magnitude of impact is considered high as the heritage value of the historic ensemble would likely increase and the environmental quality of the setting would improve. This results in a high landscape character impact that is considered positive for the township.

The Parks

The magnitude of impact to this zone is considered moderate as the open spaces would be consolidated creating a more significant park that also capitalises views towards the Clarence river. The removal of the bridge is considered a loss in terms of the identity of the setting, and would have a moderate magnitude of impact. This results in an overall moderate to high landscape character impact for this zone. It should be noted, that this impact brings positive outcomes to the community through consolidation of open spaces whilst also negative outcomes through the removal of the existing bridge.

Sugarcane Fields

A negligible magnitude of impact is expected within this zone as its general character and sense of place would not be affected. Hence, a negligible landscape character impact is assessed.

Waterways

The proposal would have a limited impact on the aesthetic, functional and environmental quality of the creek and river. Its magnitude of impact is considered moderate driven by two key aspects. The removal of the existing bridge with its quaint appeal, acting as a landmark within the setting, influences the character of the area, diminishing its identity. The proposed bridge would have a stronger utilitarian character contributing less to the individuality of the setting. The removal of the existing bridge may impact endangered micro-bat communities, reducing the environmental value of the area. This results in a moderate to high landscape character impact.

character zones	sensitivity	magnitude	impact
Higher Village	high	negligible	negligible
Ephermeral Wetlands	moderate	low	moderate-low
River Bend	moderate	negligible	negligible
The Hub	high	low	moderate
Heritage Village	high	high	high
The Parks	high	moderate	moderate-high
Sugarcane Fields	low	negligible	negligible
Waterways	high	moderate	moderate-high

Table 1.4 Landscape Character Impact - Summary Table

12 VISUAL IMPACT ANALYSIS

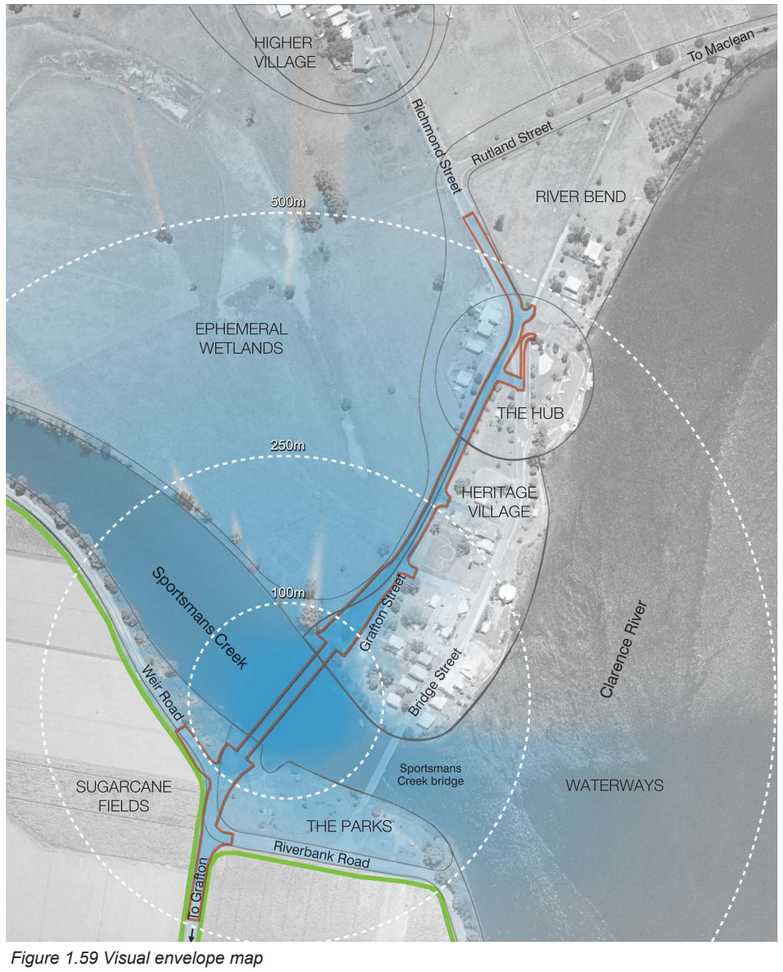


Figure 1.59 Visual envelope map

VISUAL ENVELOPE

In order to assess the visual impact, a Visual Envelope Map or the proposal's visual catchment from the surrounding area has been prepared. The visual catchment is defined either by topographical features, built form elements or screening vegetation.

The proposal has a limited visual exposure due to a number of factors such as built form elements and vegetative screening or due to distant view corridors that limit the magnitude of impact for the viewer.

The most exposed areas are those adjacent to the proposal and include Sportsmans Creek, Flo Clark Park and Sportsmans Park. Also the private properties within the heritage village and facing Sportsmans Creek would have a considerable exposure to the new bridge.

Private properties from within the higher village would obtain distant views towards the proposal by which the overall landscape setting would dominate. The roadworks in the vicinity of the Hub and along Grafton Street are considered of a minor nature with limited visual exposure except for those properties directly facing these elements of the proposal.

The sugarcane fields would screen any views towards the proposal except after harvesting time, limiting the visual exposure, whilst the Ephemeral wetlands with their low-lying vegetation would have a high visual exposure.

The visual impact assessment has been based by selecting representative viewpoints from the surrounding areas. Due to the limited accessibility into some private properties, the particular viewpoints are along the road's verge, local streets and parks. The viewpoints however discuss the likely visual effects these properties would experience as a result of the proposal.

In order to determine the visual impact, sensitivity values have been assigned to the various viewpoints. The sensitivity rating combined with the visual magnitude of impact rating determines the visual impact for each viewpoint and is based on the matrix shown in chapter 11.

It should be noted that the ratings are measured relative to each other rather then assigned through an absolute scale. Hence the resulting visual impact rating is project specific and identifies those areas with the highest and lowest impacts.

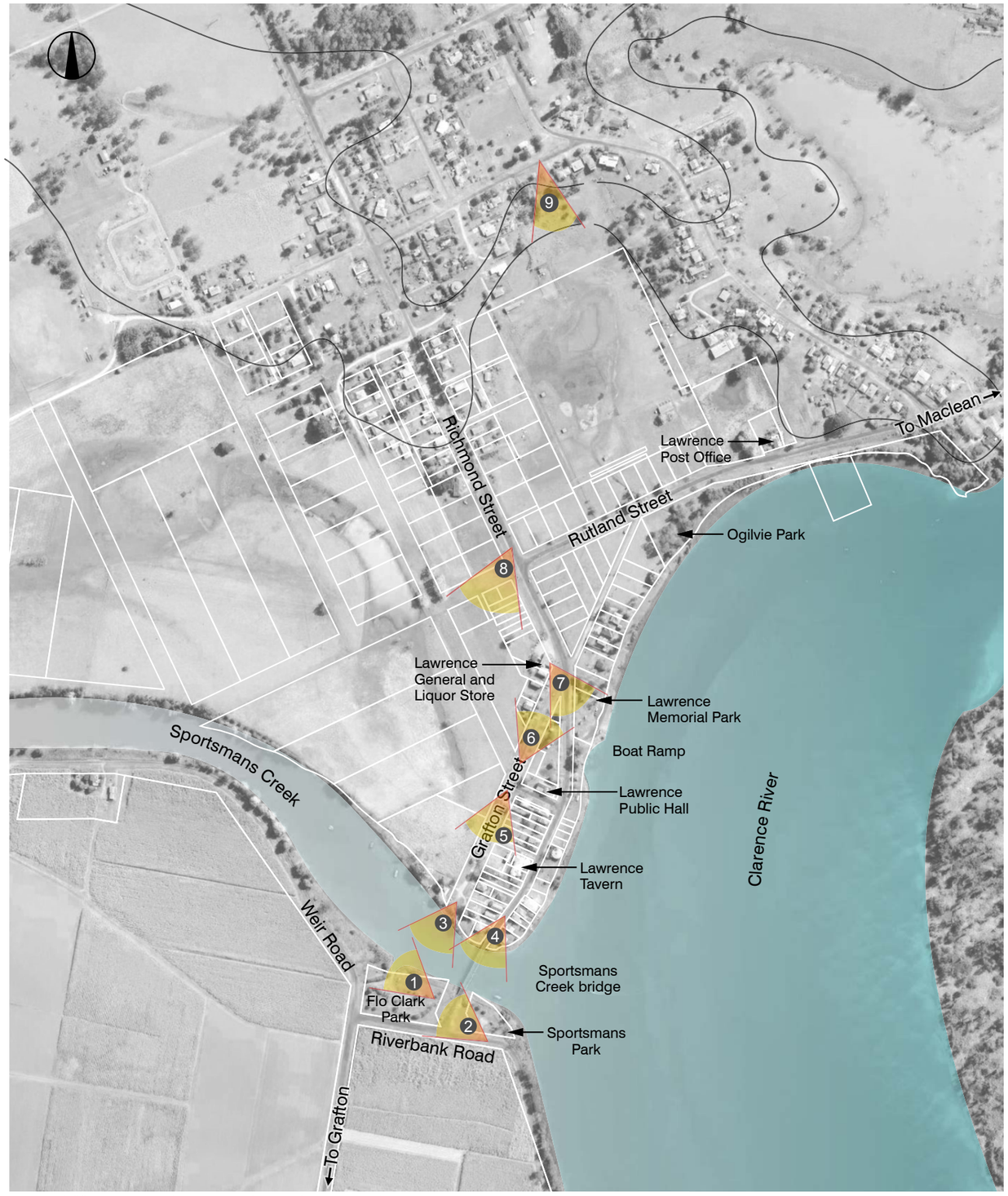


Figure 1.60 Visual impact assessment - selected viewpoints

VIEWPOINT	1
Description of the setting	View from Flo Clark Park looking west towards the boat ramp.
Element visible of the proposal	Mid-distant views towards the bridge, partially dominating the skyline. The retention of mature trees contributes to settling the structure in the landscape.
Category of viewer	Park and boat users, recreational activities.
Nature of impact	Adverse
Visual sensitivity	Moderate due to the semi-transient nature of some park users in combination with more static views by other park users. The public space nature contributes to this rating.
Magnitude of impact	Moderate
Overall rating of visual impact	Moderate
Comment / mitigation measures	The proposal's alignment minimises impacts to existing mature trees, the situation of the bridge as part of the township entry is not out character with the setting, its slender design minimises the overall presence of the bridge, allowing the overall floodplain and river setting to dominate.

VIEWPOINT	2
Description of the setting	View from Riverbank Road looking west towards Flo Clark Park.
Element visible of the proposal	The proposal would remove the existing embankment of the existing bridge approach.
Category of viewer	Road users
Nature of impact	Adverse
Visual sensitivity	Low due to the transient nature of the road, yet moderate due to the general scenic quality of the landscape. Hence an overall moderate rating is assessed.
Magnitude of impact	Moderate with beneficial outcomes by opening vistas to the creek and park
Overall rating of visual impact	Moderate to low
Comment / mitigation measures	The proposal consolidates open space and enhances views towards the Clarence River. The removal of the existing embankment would create a flowing space.

VIEWPOINT	3
Description of the setting	View from the northern creek shore at the end of Grafton Street looking south.
Element visible of the proposal	The bridge would be a significant element in the setting.
Category of viewer	Residential property owners.
Nature of impact	Adverse
Visual sensitivity	High due to the surrounding residential land use and interface with the waterway.
Magnitude of impact	High
Overall rating of visual impact	High
Comment / mitigation measures	The river setting would still be the dominant feature, with the proposed bridge being a significant element within this setting. The slenderness of the structure would minimises its presence and the removal of the existing bridge would visually and spatially reconnect private properties to the Clarence River. Contributing to this would be the relocation of traffic away from this more sensitive properties.

VIEWPOINT	4
Description of the setting	View along Bridge Street looking south towards the existing bridge.
Element visible of the proposal	Partial removal of the abutment and removal of the bridge.
Category of viewer	Residential property owners.
Nature of impact	Beneficial
Visual sensitivity	High due to the nature of the viewer.
Magnitude of impact	Low
Overall rating of visual impact	Moderate
Comment / mitigation measures	The removal of the existing bridge and part of the embankment would visually and spatially reconnect some private properties more towards the Clarence River. The relocation of traffic away from this sensitive viewers is considered positive.

VIEWPOINT	5
Description of the setting	View looking south along Grafton Street.
Element visible of the proposal	The proposal would widen the existing road, the bridge approach would be visible in the distance.
Category of viewer	Road users
Nature of impact	Adverse
Visual sensitivity	Low due to the transient nature of the road users.
Magnitude of impact	Moderate
Overall rating of visual impact	Moderate to low
Comment / mitigation measures	The widening of the road would not greatly change the visual quality of the setting, although it would slightly reinforce its urbanity. Hence in this case the character and sense of place is more impacted, particularly by the introduction of more traffic.

VIEWPOINT	6
Description of the setting	View looking north along Grafton Street.
Element visible of the proposal	The proposal would widen the existing road detracting from the rural setting.
Category of viewer	Road users and some residents
Nature of impact	Adverse
Visual sensitivity	Moderate due to the predominant transient nature of the setting.
Magnitude of impact	Moderate as the road would become a more dominant feature, yet the avenue of trees define the road corridor with its wide reserve.
Overall rating of visual impact	Moderate
Comment / mitigation measures	The widening of the road would slightly detract from the rural setting. The avenue of trees would help define the entry sequence into the township. The relocation of through traffic provides a positive development to the heritage precinct along Bridge Street.

VIEWPOINT	7
Description of the setting	View of the intersection between Bridge Street and Grafton Street looking towards the Clarence River.
Element visible of the proposal	Re-arrangements of the intersection layout including partial removal of existing bitumen and the introduction of a link road between Grafton Street and Bridge Street.
Category of viewer	Residential and commercial property owners.
Nature of impact	Adverse
Visual sensitivity	Moderate due to the mixed land use.
Magnitude of impact	Low
Overall rating of visual impact	Low to moderate
Comment / mitigation measures	The formalisation of the intersection and articulation of paved areas would enhance legibility and introduce some greenery. The relocation of the main traffic away from the park/boat ramp would enhance this setting.

VIEWPOINT	8
Description of the setting	View from the low grounds of Richmond Street looking southeast.
Element visible of the proposal	Distant views to the bridge and approaches.
Category of viewer	Road users and farmers.
Nature of impact	Adverse
Visual sensitivity	Low due to the transient nature of the viewer.
Magnitude of impact	Low
Overall rating of visual impact	Low
Comment / mitigation measures	No mitigation measures proposed.

VIEWPOINT	9
Description of the setting	View from the high grounds of Richmond Street looking towards Lawrence Memorial Park and the Bridge Street heritage precinct.
Element visible of the proposal	Minor realignment of Bridge Street and Grafton Street, re-arrangement of the intersection and widening of Grafton Street.
Category of viewer	Residential property owners.
Nature of impact	Adverse
Visual sensitivity	High due to the land use.
Magnitude of impact	Negligible
Overall rating of visual impact	Negligible
Comment / mitigation measures	The proposal would have little effect on the areas beyond its immediate vicinity.

VISUAL IMPACT SUMMARY

The resulting impact is summarised in the adjacent table. From the nine viewpoints assessed, only one is considered to have a high impact as a consequence of the proposal. Another three have been assessed with a moderate impact.

Although three of the viewpoints have a high sensitivity as a result of the landuse, nature of the viewer or direct interface with the waterway only one of these viewpoints results in a high impact. This particular view has been assessed looking directly towards the site of the proposed bridge.

Viewpoints five, six, and seven are assessed looking towards areas effected by the associated road widening works and have been assessed with a moderate to moderate-low impact. The impacts are considered positive as traffic would be relocated away from the heritage precinct, and an improvement to the legibility of the road network would enable enhancement of the overall setting.

viewpoint	sensitivity	magnitude	impact
1	Moderate	Moderate	Moderate
2	Low	Moderate	Moderate-low
3	High	High	High
4	High	Low	Moderate
5	Low	Moderate	Moderate-low
6	Moderate	Moderate	Moderate
7	Moderate	Low	Moderate-low
8	Low	Low	Low
9	High	Negligible	Negligible

Table 1.5 Visual Impact - Viewpoint Assessment Summary

13 CONCLUSION

The project is considered of a limited scale considering the overall context and expanse of the setting. The most affected areas are situated in the vicinity of the proposed new creek crossing, specifically Flo Clark Park and the heritage village.

A key aspect of the design is the clear resolution of structural elements of the bridge creating a ‘clean’, robust and simple design that is sympathetic to the rural / semi-rural setting.

The landscape character impact assessment identified the Heritage Village with a high impact, which in this case is considered positive due to the removal of traffic, thereby enhancing the amenity and safety to this area. Accessibility to areas of interest such as the pub and church would be warranted, thereby limiting the effects of the new road network.

Also in the case of Flo Clark Park, the moderate to high landscape character impact is a direct result of the positive contribution of the project by consolidating open space with Sportsmans Park. This is further underpinned by the enhanced access for pedestrians and cyclists to this destination from the town.

Although the landscape character impact identified a moderate to high impact within the waterways, mitigation measures would be investigated in the concept design phase such as the introduction of habitat spaces within the new bridge structure for micro-bat communities.

Regarding the visual impact, only one viewpoint was identified with a high impact. This is driven by the residential land use and proximity to the proposed bridge structure, impacting panoramic views. All other viewpoints assessed resulted in a moderate or lower rating, underpinning the limited visual impact of the project.

Although the town would loose a unique heritage bridge that contributes to the identity and character of the town, and in particular of the Heritage Village by complementing its setting, the proposal provides a multitude of benefits that off-set the loss of the historic structure.

The general impact of the proposal has little effect on the long term visual quality of the setting and provides future opportunities to further enhance the urban structure and use of the Heritage Village.

Finally, the proposal provides a critical piece of infrastructure that enhances safety and efficiency of the transport route and improves access for the local community to Flo Clark Park.