Elizabeth Taylor
Town Planner
23 Vallely Street
FRESHWATER QLD 4870

DSC Ref: CA 1685/2016
My Ref: ET15-027

07 December, 2016

Chief Executive Officer
Douglas Shire Council
PO Box 723
MOSSMAN QLD 4873

Attention: Mr Simon Clarke

Dear Madam,

RESPONSE TO COUNCIL INFORMATION REQUEST IN RELATION TO THE REEF MARINA REDEVELOPMENT – COMBINED APPLICATION

The following response is provided to Council's Information Request (IR) issued by correspondence dated 30 November, 2016.

For ease of reference each item is reproduced below, followed by a response.

COMPLIANCE WITH PRELIMINARY APPROVAL DATED 18 MAY 2016:

1. On 18 May 2016, Council issued a preliminary approval under Section 241 of the Sustainable Planning Act 2009 for Staging Self-Assessable Development and Code Assessable Development in accordance with a Precinct Plan, a Staging Plan and other Supporting Plans, subject to conditions, over this land and other land at this location.

   Please address the Combined Applications' compliance with the approved plans and conditions that attach to the preliminary approval.

   Response

   The Combined Application seeks approval for development which complies with the list of approved land uses by Precinct and stage, listed in the Preliminary Approval (PA) as follows:

   - Precinct 1- Stages 1a and 1b - Holiday Accommodation/Multi-unit Housing (and including public waterfront access and part of the arbour

park/rainforest walk);

- Precinct 2 – Stages 2a, 2b and 2c - Holiday Accommodation/Multi-unit Housing, Restaurants, Shopping and Business Facilities, possible Tavern, Marina (Duck Pond) (and short/medium term retention of existing lawful uses, being the Slipway and allied Marine Industries and including public waterfront access, the public plaza, and balance of the arbour park/rainforest walk and upgraded marine facilities in the Duck Pond and along the Dickson Inlet frontage);

- Precinct 3 – Stage 3a- Holiday Accommodation/Multi-Unit Housing (and integration with the adjacent arbour park/rainforest walk and retention and upgrading of the existing public car park);

- Precinct 4 – retained/upgraded for existing commercial purposes and including The Green;

- Precinct 5 – retained/upgraded for existing service purpose.

All proposed land uses listed above in each Precinct/Stage are land uses approved and listed in the PA.

The proposed form of development complies with all Conditions of approval in the PA dated 18 May, 2016:

CONDITION	COMMENT
1: Compliance with Precinct Plan V1.11- dated February 2016 and Precinct Table	Complies
2: Compliance with Staging Plan V1.11 dated 11 February, 2016	Complies
3: Compliance with Access Plans- Vehicular and Pedestrian V1.11 dated 11 February, 2016	Complies
4: Compliance with Design controls in Planning Scheme	Generally Complies
5: Submit to Council an Urban Design Theme Report	Yes
6: Provide linkages between redeveloped stages and longer term stages and upgrade longer term stage	Yes
7:Maintain sight-line through public plaza across the Duck Pond to Dickson Inlet.	Complies
8: Retain Bally Hooley	Yes

IDAS FORM DETAILS:

2. IDAS Form 7. 06. Table A indicates that the Boardwalk and The Rainforest are to be contributed for community purposes. Please clarify the intent of this statement and indicate the physical extent of this contribution in plan form.

Response

The Boardwalk, the Rainforest Walk and the Public Plaza are public spaces that will be maintained at no cost to Council and integrated throughout the site through a Body Corporate arrangement.

These public space elements will not be "handed over' to Council as public land, but will be protected in perpetuity as public open space by Access Easements. The public benefit of this is that the maintenance of these spaces is not the responsibility of the public purse/rate payers.

A Plan showing the general extent of these public open space elements is attached at Appendix 1.
The Plan shows the integration of both the public and private landscape/recreation spaces throughout the site, which collectively creates a dominant, lush and verdant tropical landscape setting for the surrounding building elements; in line with one of the primary objectives of TRM Master Plan and Council's various planning documents.

The principles outlined in *The Luxuriant City: Key Principles for Landscape Responsive Medium-Rise Residential Design in the Subtropics* (Loneragan, Subtropical Cities Conference 2011) referred to below in Item 9 of this correspondence, informed the landscape/public space design process.

MODIFICATIONS TO THE EXISTING COMMERCIAL BUILDING:

3. The application involves the demolition of a significant portion of existing commercial floor space at the Marina. Please provide elevations and floor plan details of the proposed modifications to the existing commercial building associated with this demolition.

   Response

   The western wing of the existing Shopping Centre will be demolished up to the south west entry point and a new entry created linking with the Rainforest Walk, as indicated on drawings DA-IR-103, DA-IR-104 and DA-IR105- SHOPPING CENTRE MODIFICATIONS, refer Appendix 2.

   It is intended to reuse the existing steel mall columns and arches as a trellis structure for the Rainforest Walk with the addition of batten screens and the retention of some roofing sections to provide shade.

   An Artist's impression showing the arched trellised Rainforest Walk, is also attached at Appendix 2.

LOT RECONFIGURATION PLAN:

4. Please provide a Lot Reconfiguration Plan that clearly identifies individual lots and proposed easements. Preliminary Approval has not been addressed with respect to the provision of general public access easements (or similar) across the site to provide public waterfront access.

Furthermore, please supply the revised Lot Reconfiguration Plan distinctly overlain on top of the overall Master Plan for clarity.

Response

The Lot Reconfiguration Plan, drawing DA-S-108 Revision 3 and Reconfiguration Plan/Master Plan Overlay, drawing DA-IR-109, Revision 3 are attached at Appendix 3.

LOT 103:

5. Clarify the transition between public and private domain adjacent to the Plaza, particularly adjacent to the Duck Pond.

Response

A chain mesh fence will be built behind the commercial plaza containers and the vehicle access way to the commercial pontoon and slipway, to ensure separation of industrial areas from the public. The fence will be hung with printed screen banners to provide visual interest, shield the industrial uses from public view and create a backdrop for the commercial containers.

The fence at the western end of the plaza will pivot so that the fence can be moved to allow public access to the pontoon for fresh seafood sales or positioned to maintain public/commercial separation when required for pontoon/slipway operations (for example, when masts are removed from vessels for re-rigging, etc.).

http://www.color-x.com/large-format-printing/construction-barricades/

6. Amended detailing is to be provided, nominally by Landscape Architect, to address how the temporary plaza may look as an urban space (i.e. provide similar images to those provided previously for 'The Green').

Response

It is no longer proposed to construct a “temporary” Public Plaza and then a final Public Plaza in association with the redevelopment of Stage 2b, down the track. The Public Plaza will be constructed in association with Stage 2a.

A Perspective showing how the Public Plaza may look as an urban space, is attached at Appendix 4.

LAND TENURE FOR WATER-BASED ELEMENTS:

7. Clarify the proposed future tenure of the 'over-water structures' that appear to be outside proposed Lot 1; including the floating pontoon structure, boardwalk and the over- water dining covered area.

   In your response, it is important that you address responsibilities assigned for the on-going future maintenance of these facilities.

   Response

   The over-water structures, specifically the floating pontoon structures, Boardwalk and the over- water dining area will be within the area of the new marine lease to be issued by DNRM contemporaneously with the freeholding. As such, these structures will be owned and maintained by The Reef Marina Pty Ltd.

ACCESS TO THE FLOATING PONTOON WALKWAY/SAFETY:

8. Will access to the floating pontoon be restricted? What safety measures will be installed to ensure safety of users given the presence of crocodiles in the Inlet?

   Response

   The Floating Pontoon Walkway is private infrastructure and will include controlled gate access. When the Cruise Ship Transfer component is in use, unrestricted public access will be available to the designated areas. The gates will be locked at night. A User Management Plan will be developed and provided to all vessels using the Dickson Inlet pontoon, outlining procedures to minimize conflict between marine users and wildlife. This will include protocols to follow when crocodiles are sighted; pontoon use at night; visual inspections prior to general openings in the morning. The Department of Environment and Heritage Protection (DEHP) provides useful general advice for marine activities at boat ramps where crocodiles have been sighted and this advice will be reviewed and developed, as appropriate, for the Dickson Inlet pontoon.

REPORTS: APPENDIX 3: URBAN DESIGN GUIDE & PERSPECTIVES – STUDIO TEKTON PTY LTD:

9. Page 7 of the Urban Design Guide & Perspectives report states:

   The "informal relaxed character and charm are still evident in parts of Macrossan Street and is uniquely Port Douglas. Recent commercial developments lack consideration of the Port Douglas character and could be located/found anywhere."

   and further:

   "Recent Master Plans refer to a *"Character defined by its tropical latitude, waterfront location, and mix of tourism and marine activity."*

   and:

   "Green elements should be a *defining element."*

and:

"Green infrastructure as a foil to the urban fabric to the town centre."

These statements are acknowledged and reinforced in the report. However, the examples of other guiding waterfront developments, both being from South Western Australia, are neither tropical locations, nor are they defined by a character where "green" infrastructure dominates over built form.

Therefore, it is not clear how the architecture and urban design elements of the proposed development responds to this critical issue. Please, specifically clarify in what way the proposed built form responds to this issue, and is not a development that *'could be located/found anywhere'.*

Response

The two waterfront developments used in the Urban Design report were selected as examples familiar to a number of Councillors. Fremantle was seen as a better example than the intensely development Mandurah example.

The review allowed an analysis of the development parameters to understand the Planning Controls leading to each outcome. The analysis showed that a plot ratio of 2:1, site cover of 85% and limited setbacks leads to an intensely building dominated development outcome as demonstrated by the Mandurah Ocean Marina. The Fremantle example allowed space for large Norfolk Island pine trees which helps significantly to connect with the character of older Fremantle while still achieving a plot ratio of 1:1 and a 75% site cover.

The Reef Marina proposal has a plot ratio below 1:1 and more significantly, a site cover 48% or less which means that there is significantly more site area available to accommodate “green infrastructure,” allowing buildings to recede and the Port Douglas character to permeate this waterfront development, in contrast with most other waterfront developments where buildings dominate. In addition, there are no extensive basement parking areas, maximising the landscape area available for deep planting and significant trees.

The principles outlined in *The Luxuriant City: Key Principles for Landscape Responsive Medium-Rise Residential Design in the Subtropics* (Loneragan, Subtropical Cities Conference 2011) are equally valid for Port Douglas. This paper included the following findings:

- Allow space for the landscape. Significant vegetation and luxuriant trees require significant area. This can be accommodated within the site (including within the front setback) or appropriating the adjoining public domain (either streets or parks) where there are mutually beneficial outcomes.
- Carefully consider basement design at the building/public space interface to achieve connectivity rather than creating barriers. Partially raised basements are particularly problematic.
- Minimal building setbacks do not necessarily result in poor landscape opportunities at ground level. The public domain becomes critical in achieving high quality landscape which can be enhanced by visual permeability (rather than visual barriers to achieve dwelling privacy) and strategies to reduce building verticality.

- Using building setback areas for significant planting. This can make a positive contribution to public space without compromising issues associated with security or resorting to solid walls along the property lines.
- Incorporating the public domain as part of the overall design rather than residual space outside project parameters. This suggests that it is necessary to rethink the nature of the street and consider it as an integrated landscape element rather than purely an access and service corridor.

These principles were used to inform the design approach to the Reef Marina, particularly ensuring that building car parking is limited in extent and there is plenty of external area available for deep landscape planting with no basement or semi-basement parking. This contrasts with many recent developments in Cairns and elsewhere where site area is taken up with vehicular circulation or basement and semi-basement parking leaving little area on the site for significant planting to help reinforce the sense of place. This approach will ensure that the Port Douglas character as exemplified in Macrossan Street will be continued within The Reef Marina redevelopment as a key design response.

10 The Images appended to the report are not consistent with statements that reflect the 'green' tropical character of Port Douglas. They also appear to conflict with the landscaping proposals contained within the Landscape Concept Report. Please reconsider the use of these images or alternatively provide images that integrate the ideas promoted in the Landscape Concept report with the architectural images.

Response

The images appended to the Urban Design report were intended to convey how the built -form responds to the Port Douglas tradition and were to be read in conjunction with the Scott Carver Landscape Approach with the landscaping simplified to help convey the architectural intent. Images- DA -IR –112, DA -IR –113, DA -IR –114 and DA -IR –116, conveying both the architectural intent and landscape response have been produced and are included in Appendix 5.

The development approach is a direct response to the generally smaller incremental Port Douglas tradition with:

- The development is broken down into a series of smaller discrete elements with different programs (townhouses, apartment building, short term accommodation, mixed use).
- Buildings use a variety of roof profiles, including gables and hips to provide visual interest.
- Buildings are stepped and angled to provide a series of different relationships to the public realm adding to the visual experience and avoiding a single building plane.

REPORTS: APPENDIX 12: LANDSCAPE CONCEPT REPORT REV 1 – SCOTT CARVER PTY LTD:

11. The Staging shown on Drawing Ref 20160045 is confusing and needs clarification. For example:

- Is it proposed to combine Stage 1A, 1B and 2A into a single development stage?

Response

Stage 1 Site Plan including walkable waterfront will be staged as shown and completed with Stage 2A

- The walkable waterfront is to be delivered in which nominated stage?

Response

The walkable waterfront will be staged. Refer to drawing DA-IR-101 SITE PLAN STAGE 1 at Appendix 6, to see the extent and connections of the first stage of the Boardwalk.

- In which stage will Coral Close be constructed as a complete piece of infrastructure? Currently, it is shown to be partially completed in Stage 2A, with the balance completed in Stage 2B.

Response

Coral Close will be constructed as part of 2A.

- How will future interim stages be left in an interim state pending future development?

Response

Any vacant areas relating to future stages will be landscaped as required in the Preliminary Approval to provide "attractive interim spaces that provide logical connections across precinct boundaries until such time that future stages are developed."

- 'The Green' is proposed as part of which stage (Note – The preliminary approval issued for the land provides no clarity with respect to the staging of 'The Green')?

Response

The Green largely exists already and will be improved independently of the development stages.

- 'The Green' has preliminary approval for a range of varying uses associated with Precinct 4: noting that 'Park & Open Space' is exempt development. As per item 3 herein, please clarify the intent of 'The Green' in terms of the preliminary approved set of land uses and the statements made on the IDAS forms in terms of 'The Green' being 'contributed for community purposes'.

Response

The Green will remain part of the marina and will not be contributed for community purposes. The Green will act as an informal open space, which may be used as a venue for outdoor recreational activities, such as buskers, street performers, local community group activities etc. Any future long term plans for The Green have yet to be determined.

12. From a landscape planting perspective, please comment on the likely success of the proposed planting species (e.g. for the Rainforest Walk) in terms of the soil conditions likely to be found on site (i.e. planting in compacted, marine fill, possibly subject to acid sulphate materials).

Response

Scott Carver acknowledges the intent of the DSC Policy No.7 (August 2006) – Minimum Design Requirements for Development and the section relating to landscape soil conditions.

The depth of potential acid sulfate soil ground conditions has not been qualified and is often variable subject to the underlying ground profile and fill overlay. Once this is fully understood a specific site design response can be formulated. In general, the planting depth of advanced tree / palm materials will be @1.0m allowing for 200L containerised stock 500diam x 550mm deep container. The nominal 1.0m planting depth allows for a separation drainage layer to be installed between existing ground conditions and new profile levels.

The recommended planting approach is to use a 50:50 soil mix of organic imported and site soil to avoid soil stratification. This method allows for soil to be tested and soil additives to be included to achieve a compliant Australian Standard mix appropriate to a tropic environment. Irrigation and water management are equally important to management of the soil profile and chemical exchange.

The final species selection and management regime will be further confirmed once the ground conditions are fully investigated.

13. What exactly is the 'Rainforest Walk' as the key linking feature through the site? Does it include an arbour or other structural elements that promote the sense of linkage? Please, clarify further and/or provide details.

Response

The existing west wing mall column and arch structure will be retained where possible including sections of roof and the addition of battens to create a trellis frame for vines and plantings.

An Artist's impression showing the arched trellised Rainforest Walk, is attached at Appendix 2.

PLANS: STAGE 1A:

14. Provide details of fencing.

Response

Fencing extent added to Plan DA-1A-102 Revision 0, refer Appendix 7. Fencing will be 1200 high to waterfront and 1800 high to east, powder coated tubular aluminium fencing. The fencing will be largely hidden by planting.

15. Air conditioning units often detract significantly from the external appearance of buildings in Far North Queensland. Provide details of the location and appearance of any external air conditioning units (if proposed).

Response

Air conditioning equipment will be placed on the roof decks, as indicated on drawing DA-1A-105 Revision 02 (previously provided) and screened from public view.

16. Provide a specific colour pallet for the proposed buildings (a range of colours are noted in the Studio Tekton Report).

Response

Refer Appendix 8 for Colour palette.

PLANS: STAGE 1B:

17. Provide details of fencing.

Response

Fencing extent added to Plan DA-1B-101 Revision 03, refer Appendix 9. Fencing will be 1200 high to waterfront and 1800 high to east powder coated tubular aluminium fencing.

18. Air conditioning units often detract significantly from the external appearance of buildings in Far North Queensland. Provide details of the location and appearance of any external air conditioning units (if proposed).

Response

All air conditioning equipment will be screened from public view.

19. Provide a specific colour pallet for the proposed buildings (a range of colours are noted in the Studio Tekton Report).

Response

Refer Appendix 8 for Colour palette.

PLANS: STAGE 2A:

20. Identify the servicing delivery arrangements for the commercial component.

Response

A loading/unloading bay has been located on Coral Close to service the commercial area. Refer to PDR letter dated 30 November 2016 and attached Sweep Paths, attached at Appendix 10.

21. Confirm that the proposed gym is for the exclusive use of residents/short-term residents of the Reef Marina, and not for the use of the general public.

Response

The gym is for exclusive use of residents/guests of the Marina and The Marina Residences only.

22. Air conditioning units often detract significantly from the external appearance of buildings in Far North Queensland. Provide details of the location and appearance of any external air conditioning units (if proposed).

Response

All air conditioning equipment will be screened from public view.

23. Provide a specific colour pallet for the proposed buildings (a range of colours are noted in the Studio Tekton Report).

Response

Refer Appendix 8 for Colour palette.

DETAILED PLANS: STAGE 2A (PART 1):

24. Ascending steps appear to commence within car parking space 14 providing access to the internal breeze-way corridor in Level 1. Please amend or clarify this detail.

Response

There are no stairs commencing in the car park – revised drawing DA-2A-102 revision 3, amended to provide clarity, refer Appendix 11.

25. Ascending steps appear to provide access directly from the lobby to

inside Unit 19. Please clarify or amend this detail.

Response

The stairs are restricted access and allow direct access/communication for the Manager from Unit 19 (managers unit) to the Reception. This is not a publicly accessible stair.

26. Clarify the solid lines on Level 1 in the breezeway corridor. Are these walls to screen living areas adjacent to the common corridor, or screens or void spaces to the car parking below?

Response

These lines are screens to separate the patio from the common area and are not voids to the car park below - revised drawing DA-2A-104 Revision 3, amended to provide clarity, refer Appendix 11.

DETAILED PLANS: STAGE 2A (PART 2):

27. Ascending steps appear to commence within car parking space 11 providing access to the internal breeze-way corridor in Level 1. Please amend or clarify this detail.

Response

There are no stairs commencing in the car park – revised drawing DA-2A-103 Revision 3, amended to provide clarity, refer Appendix 11.

28. Clarify the solid lines on Level 1 in the breezeway corridor. Are these walls to screen living areas adjacent to the common corridor, or screens or void spaces to the car parking below?

Response

These lines are screens to separate the courtyard from the common area and are not voids to the car park below - revised drawing DA-2A-105 Revision 3, amended to provide clarity, refer Appendix 11.

PLANS: STAGE 2C:

29. Identify the Goods Receiving Area (REC) and the service delivery arrangements for the Commercial component.

Response

A loading/unloading bay has been located on Coral Close to service the Stage 2C commercial area. Refer to PDR letter dated 30 November 2016 and attached Sweep Paths attached at Appendix 10.

30. Provide details of any fencing (if proposed).

Response

No additional fencing proposed.

31. Air conditioning units often detract significantly from the external appearance of buildings in Far North Queensland. Provide details of the location and appearance of any external air conditioning units (if proposed).

Response

All air conditioning equipment will be screened from public view.

32. Provide a specific colour pallet for the proposed buildings (a range of colours are noted in the Studio Tekton Report).

Response

Refer Appendix 8 for Colour palette.

PLANS: STAGE 3A:

33. Amend the Stage 3A Site Plan and Stage 3 Plans to reflect driveway access to Unit 1's garage.

Response

Drawing DA – 3A – 102 Revision 03 amended and attached at Appendix 12.

34. Provide details of any fencing (if proposed).

Response

Fencing extent added to DA-3A-101 Revision 03, refer Appendix 12. Fencing will be 1800 high to east powder coated tubular aluminium fencing.

35. Air conditioning units often detract significantly from the external appearance of buildings in Far North Queensland. Provide details of the location and appearance of any external air conditioning units (if proposed).

Response

All air conditioning equipment will be screened from public view.

36. Provide a specific colour pallet for the proposed buildings (a range of colours are noted in the Studio Tekton Report).

Response

Refer Appendix 8 for Colour palette.

GENERAL ITEMS:

37. The location of the Central Refuse Area and Transformer at the entrance to proposed Coral Close needs review. It is noted that it is shown partially on plans that accompany Stage 2C as part of an entry statement. Either provide more detail on how the Central Refuse Area and Transformer are integrated into the entry statement so as to be unobtrusive or select a more discrete location within the site for these facilities that can be appropriately disguised/hidden from view.

Response

Refer to drawing DA-IR-106 MARINA ENTRY STRUCTURE at Appendix 13, for details.

The colour scheme for the entry structure will be:

Roof:	Colorbond Surfmist.
Walls:	Reef Marina White.
Window/door/Louvers:	Duratec Zeus White.
Screen Enclosure:	Duratec Eternity Charcoal Pearl or Paint to match.

38. Provide details of the maintenance shed close to the units in Stage 3A.

Response

Refer to drawing DA-IR-107 MAINTENANCE SHED at Appendix 14, for details.

The colour scheme for the building will be:

Roof:	Colorbond Surfmist.
Walls:	Reef Marina White.
Window/door/Louvers:	Duratec Zeus White.

39. Provide details of the proposed over- water dining covered area adjacent to Stage 2A.

Response

Refer to drawing DA-IR-108 OVER- WATER PAVILION at Appendix 15, for details.

The colour scheme for the structure will be:

Roof:	Colorbond Basalt (under “living’ green roof).
Roof:	Danpalon polycarbonate roof system –

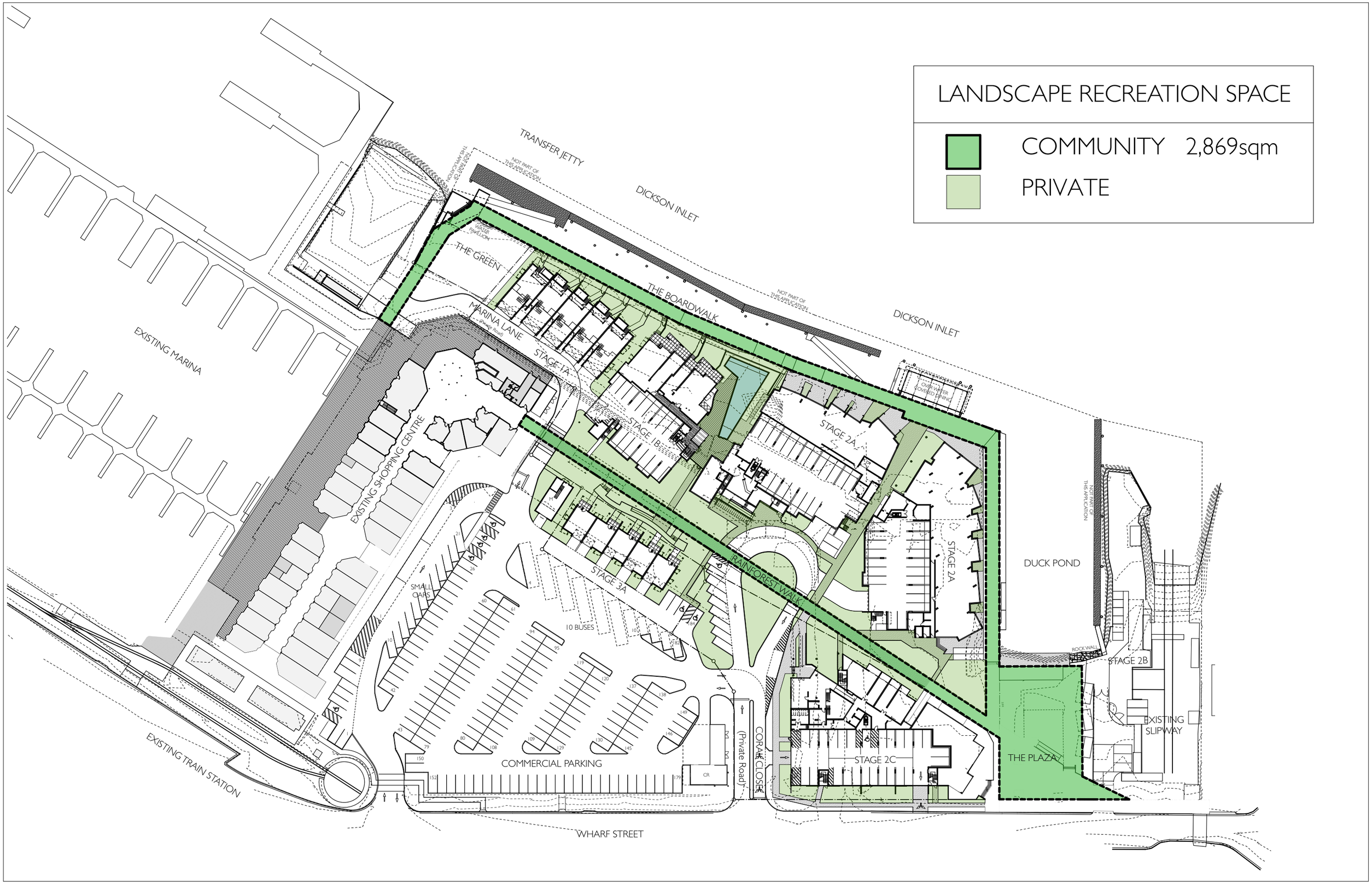
Bronze.	
“Living” Green Roof:	Elmich metal roof to “living” green roof on metal roof.
Structure:	Dulux Vivid White

This concludes TRM’s response to the DSC IR. My client looks forward to Council’s favourable consideration of the Combined Application in due course.

Yours faithfully,

Elizabeth Taylor
Town Planner

APPENDIX: 1



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THE REEF MARINA

PORT DOUGLAS QLD

THE REEF MARINA PORT DOUGLAS

DRAWN: SG AT EB
CHECKED: JL
APPROVED: PR JL

DATE 7/12/2016

PLAZA, BOARDWALK & RAINFOREST WALK

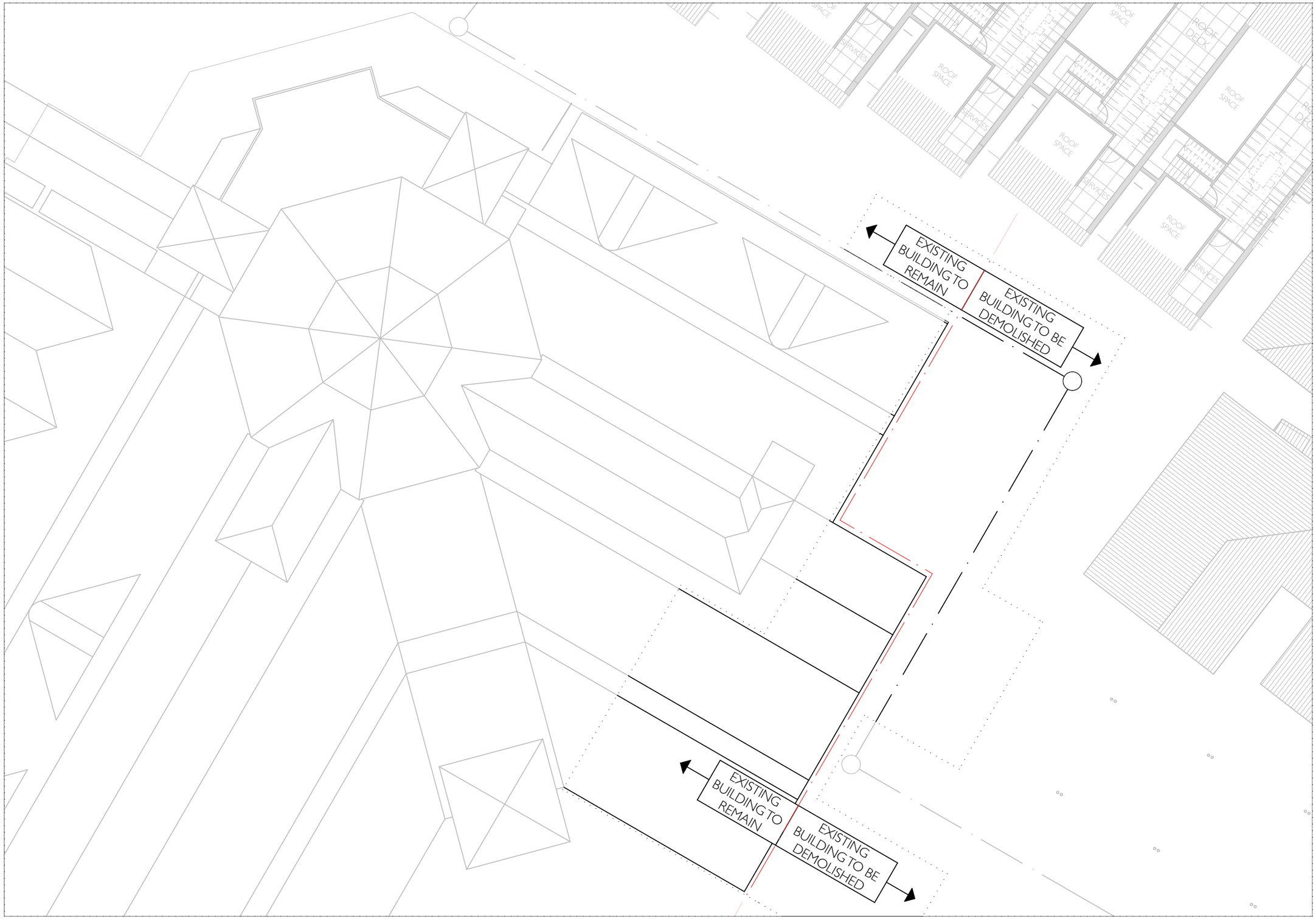
1:1000

N

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-IR-102	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 2



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THE REEF MARINA

PORT DOUGLAS QLD

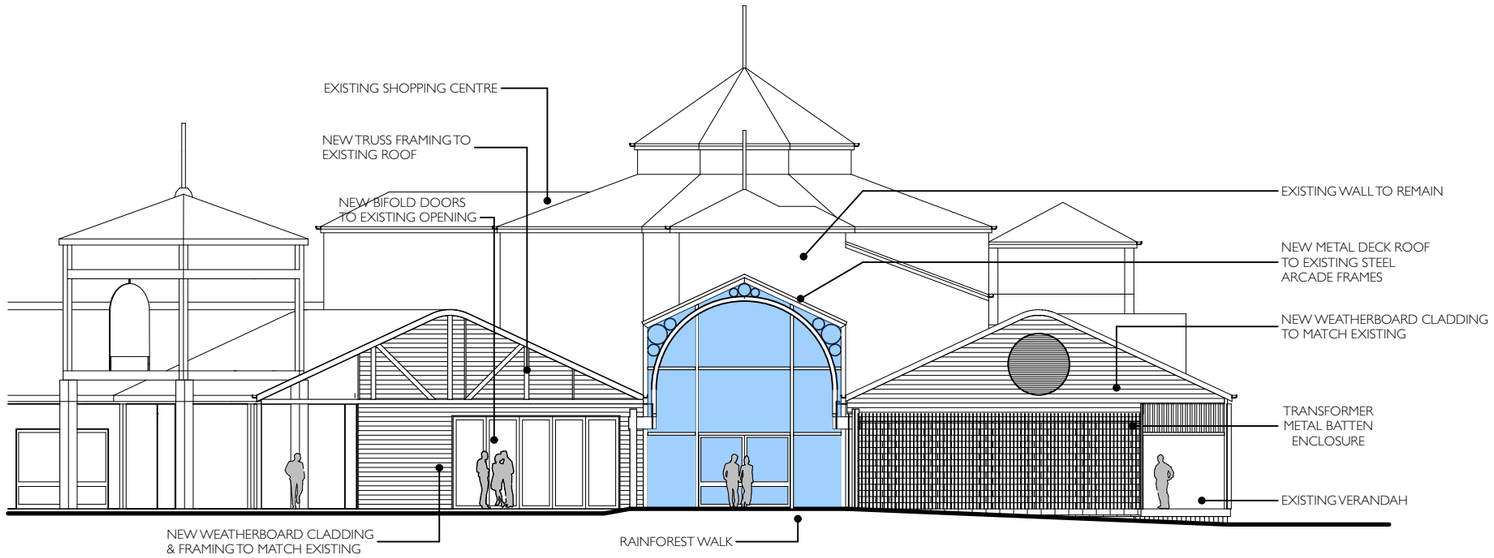
DRAWN: EB
CHECKED: JL
APPROVED: PR JL

DATE 30/11/2016

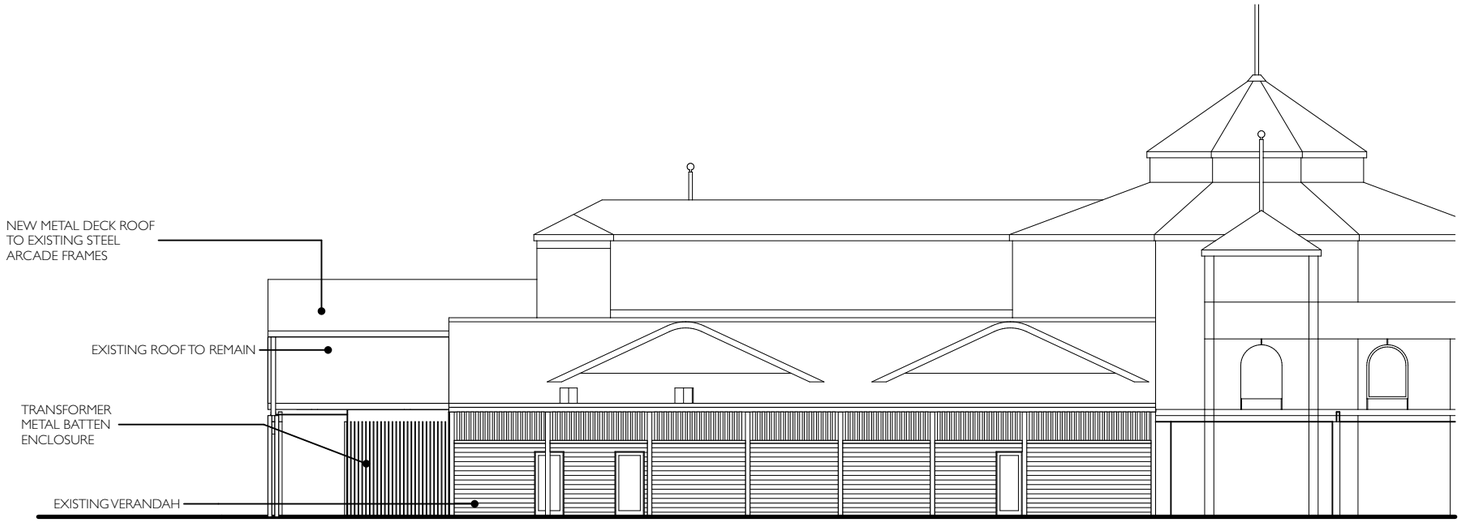
SHOPPING CENTRE MODIFICATIONS
1:200

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-IR-104	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln



NORTH ELEVATION
1:200



WEST ELEVATION
1:200

EAST ELEVATION
1:200

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THE REEF MARINA

PORT DOUGLAS QLD

DRAWN: SG EB AT
CHECKED: JL
APPROVED: PR JL

DATE 6/12/2016

SHOPPING CENTRE MODIFICATIONS

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-IR-105	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

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THE REEF MARINA

PORT DOUGLAS QLD

DRAWN: OTC
CHECKED: JL
APPROVED: PR JL

DATE 30/11/2016

SITE PERSPECTIVE - RAINFOREST

PROJ NO.	DWG NO.	REVISION:	01
160303	DA-IR-117	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

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THE REEF MARINA

PORT DOUGLAS QLD

DRAWN: EB
CHECKED: JL
APPROVED: PR JL

DATE 30/11/2016

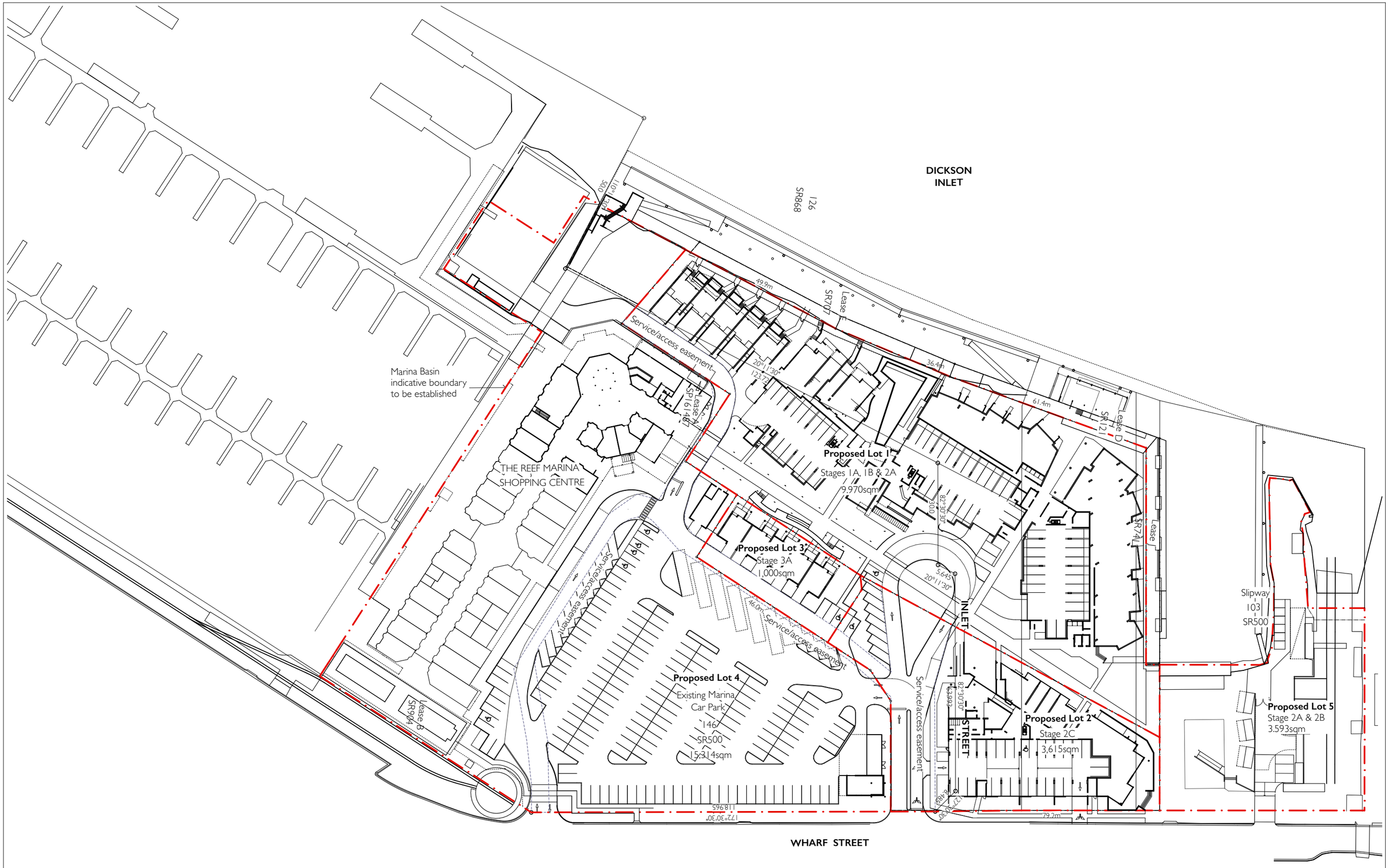
SHOPPING CENTRE MODIFICATIONS

1:200

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-IR-103	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 3



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THE REEF MARINA

PORT DOUGLAS QLD

DRAWN: SG EB AT
CHECKED: JL
APPROVED: PR JL

DATE 6/12/2016

PROPOSED SITE & LOT CONFIGURATION

1:1000

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-IR-109	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

DICKSON
INLET

126
SR868

110°11'30"
50.0

PUBLIC ACCESS EASEMENT

49.9m

SR707
Lease E

Service/access easement

20°11'30"
123.72

36.4m

61.4m

Lease D
SR1211

Marina Basin
indicative boundary
to be established

Lease A
SP161487

THE REEF MARINA
SHOPPING CENTRE

Proposed Lot 1
Stages 1A, 1B & 2A
9,970sqm

82°30'30"
30.0

PUBLIC ACCESS EASEMENT

Lease C
SR741

Proposed Lot 3
Stage 3A
1,000sqm

20°11'30"
5.645

Service/access easement

46.0m Service/access easement

INLET

Slipway
103
SR500

Proposed Lot 4
Existing Marina
Car Park
146
SR500
15,314sqm

Service/access easement

82°30'30"
63.993

STREET

Proposed Lot 2
Stage 2C
3,615sqm

PUBLIC ACCESS EASEMENT

Proposed Lot 5
Stage 2A & 2B
3.593sqm

Lease B
SR904

172°30'30"
8.485

172°30'30"
118.965

79.2m

WHARF STREET

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THE REEF MARINA

PORT DOUGLAS QLD

THE REEF MARINA
PORT DOUGLAS

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APPROVED: PR JL

DATE 7/12/2016

PROPOSED LOT PLAN
1:1000

N

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-S-108	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 4

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PORT DOUGLAS QLD

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APPROVED: PR JL

DATE 30/11/2016

SITE PERSPECTIVE - PLAZA

PROJ NO.	DWG NO.	REVISION:	01
160303	DA-IR-115	STATUS:	DEVELOPMENT APPLICATION

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APPENDIX: 5

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THE REEF MARINA

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APPROVED: PR JL

DATE 30/11/2016

SITE PERSPECTIVE - NORTH WEST

PROJ NO.	DWG NO.	REVISION:	01
160303	DA-S-112	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

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DATE 30/11/2016

SITE PERSPECTIVE - SOUTH WEST

PROJ NO.	DWG NO.	REVISION:	01
160303	DA-IR-113	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

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DATE 30/11/2016

SITE PERSPECTIVE - AERIAL FROM EAST

PROJ NO.	DWG NO.	REVISION:	01
160303	DA-IR-114	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

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THE REEF MARINA

PORT DOUGLAS QLD

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DATE 30/11/2016

SITE PERSPECTIVE
- STAGE 1 FROM NORTH WEST

PROJ NO.	DWG NO.	REVISION:	01
160303	DA-IR-116	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 6

DEVELOPMENT SUMMARY					
STAGE 1a					
Multi-Residential					
5 x 3 Bedroom					
Total		5			
Site Area & Site Cover					
Refer Site Plan					
Gross Floor Area					
Refer Site Plan					
Landscaped Rec Areas		**Land Rec**	**Soft Land.**	**Bal/Tce**	**Req.**
Unit 1		93.9	70	93.9	75
U nit 2		51.2	24.1	82.9	75
Unit 3		56.8	28.05	83.2	75
Unit 4		62	33.1	82.9	75
Unit 5		137	106.4	93.6	75
Total		**401**	**262**	**437**	**375**
Parking		**Req.**	**Prov.**		
Cars		5	10		
Bikes - Units		1.7	5		
Bikes - Visitors		0.4	1		

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THE REEF MARINA

PORT DOUGLAS QLD

THE REEF MARINA PORT DOUGLAS

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DATE 30/11/2016

STAGE 1A SITE PLAN

1:200

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-1A-101	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 7

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PORT DOUGLAS QLD

THE REEF MARINA
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DATE 30/11/2016

STAGE 1A GROUND LEVEL PLAN

1:200

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-1A-102	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 8

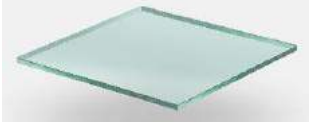
Ref:1401REEF/COUNCIL/MCU/IR/COLOUR PALLETE 2016 12 05

THE REEF MARINA
PORT DOUGLAS

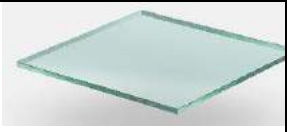
COLOUR PALLET
STAGE 1a

WALL COLOURS	M1	Dulux Vivid White	
	M2	Dulux Paving Stone	
	C1 CFC Weatherboard	Dulux Waza Bear	
ROOF, GUTTERING/FASCIA		Colorbond Surfmist	
BALUSTRADES, WINDOWS/DOORS, LOUVRES		Dulux Duratec Eternity Bronze Pearl	
WINDOW TINT		Viridian CoolTone Green	
WINDOW AWNING		Colorbond Surfmist (supports to match Dulux Duratec Eternity Bronze Pearl)	

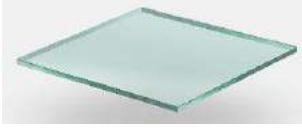
STAGE 1b

WALL COLOURS	M1	Dulux Vivid White	
	M2, CFC Weatherboard	Dulux Coalition	
ROOF, GUTTERING/FASCIA		Colorbond Surfmist	
BALUSTRADES, WINDOWS/DOORS, LOUVRES		Dulux Duratec Eternity Pewter Pearl	
WINDOW TINT		Viridian CoolTone Green	
WINDOW AWNING		Colorbond Surfmist (supports to match Dulux Duratec Eternity Pewter Pearl)	

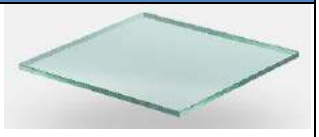
STAGE 2a

WALL COLOURS	M1	Dulux Vivid White	;
	C1/C2 on L1/L2	Dulux Jodhpurs Quarter	
	C1-Ground	Dulux Blue Smart	
	C2-Ground	Dulux Orange Keeper	
	C3-Ground	Dulux Midas Touch	
ROOF, GUTTERING/FASCIA		Colorbond Surfmist	
BALUSTRADES, WINDOWS/DOORS, LOUVRES		Dulux Duratec Appliance White	
WINDOW TINT		Viridian CoolTone Green	
WINDOW AWNING		Colorbond Surfmist (supports to match Dulux Duratec Zeus Timberland)	

STAGE 2c

WALL COLOURS	M1	Dulux Vivid White	
	C2	Dulux Bracken Green	
	C3, CFC Weatherboard	Dulux Hawker's Gold	
ROOF, GUTTERING/FASCIA		Colorbond Surfmist	
BALUSTRADES, WINDOWS/DOORS, LOUVRES		Dulux Duratec Eternity Nickel Pearl	
WINDOW TINT		Viridian CoolTone Green	
WINDOW AWNING		Colorbond Surfmist (supports to match Dulux Duratec Eternity Nickel Pearl)	

STAGE 3

WALL COLOURS	M1	Dulux Vivid White	
	C1, CFC Weatherboard	Dulux Sea Note	
ROOF, GUTTERING/FASCIA		Colorbond Surfmist	
BALUSTRADES, WINDOWS/DOORS		Dulux Duratec Intensity Reef	
LOUVRES		Sea Note	
WINDOW TINT		Viridian CoolTone Green	
WINDOW AWNING		Colorbond Surfmist (supports to match Dulux Duratec Intensity Reef)	

APPENDIX: 9

DEVELOPMENT SUMMARY					
STAGE 1b					
Multi-Residential			**Number**		**Land Rec**
2 x 4 Bedrm, 3 Bath.			2		150
2 x 3 Bedrm, 3 Bath			2		120
4 x 3 Bedrm, 2 Bath			4		240
2 x 1 Bedrm, 2 Bath			2		90
4 x 1 Bedrm, 1 bath			4		120
Total			**14**		**720**
Site Area & Site Cover					
Refer Site Plan					
Gross Floor Area					
Refer Site Plan					
Landscaped Rec Areas		**Land Rec**	**Soft Lan**	**Bal/Tce**	
Unit 1		118.9	106	93.9	
Unit 2		114.1	98	82.9	
Common		711	377		
Total		**944**	**581**	**177**	
Parking		**Req.**	**Prov.**		
Cars		14	16		
Bikes - Units		4.7	5		
Bikes - Visitors		1.2	2		

LEGEND	
ST	STORE
T	TRANSFORMER
HC	HIRE CAR PARKING SPACE
CR	CENTRAL REFUSE
MR	MARINA REFUSE
M	MAINTENANCE SHED
BR	BICYCLE RACKS
POS	PRIVATE OPEN SPACE
ELEC	ELECTRICAL ROOM
MSB	MAIN SWITCH BOARD
REC	GOODS RECEIVING AREA
	FENCING
	BATTENED SCREEN
	LANDSCAPE
	EXTERNAL PAVING
3.0	EXISTING CONTOURS
3.25	PROPOSED LEVELS

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THE REEF MARINA

PORT DOUGLAS QLD

DRAWN: SG AT EB
CHECKED: JL
APPROVED: PR JL

DATE 30/11/2016

STAGE 1B SITE PLAN
1:200

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-1B-101	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 10

30 November 2016 PDR 16470

Studio Tekton Pty Ltd

PO Box 199
Spring Hill Qld 4004

Attention: John Loneragan

Dear John,

RE: Planning application for the redevelopment of the Reef Marina at Wharf St Port Douglas – Council RFI regarding delivery arrangements to Stage 2A and 2C.

We have reviewed Douglas Shire Council's information request for the above project in respect of arrangements for the delivery of goods to any business located in stage 2A and 2C.

We advise that it was always the intent that goods for these areas would be unloaded at the loading/unloading bay provided on the internal private service road. The location of this bay is shown on our attached drawing 16470 SK-TP02. Goods can be unloaded at this point and taken by trolley (or carried) to any of the business locations.

The bay caters for a medium rigid vehicle (MRV) and the attached plan shows the vehicle path and demonstrates that it can enter and leave the bay without disrupting other traffic. The swept paths also demonstrate that an MRV can easily negotiate the loop road. It is anticipated, given the type of operations considered, that this would be the maximum delivery vehicle size. Chevrons have been provided to prevent other vehicles parking in the vicinity of this bay and preventing access.

Should the need arise, the swept path diagram also demonstrates that an MRV could reverse into the stage 2A carpark and leave in a forward gear. This movement would be the exception and only carried out early in the day or if the parking bays were available for a short term.

The use of the proposed loading/unloading bay in this fashion is an acceptable approach.

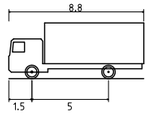
Yours faithfully
PDR Engineers

Alan McPherson
Senior Civil Engineer

www.pdrengineers.com.au t: +61 7 4051 5599 f: +61 7 4051 5455 e: admin@pdrengineers.com.au
Office: Level 1 / 258 Mulgrave Road, Westcourt QLD 4870 Mail: PO Box 2551, Cairns QLD Australia 4870
ABN: 88 126 211 461

MRV / FNQROC GARBAGE TRUCK REVERSE TURN PLAN

SCALE: 1:500



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.533m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

LEGEND

VEHICLE OUTLINE

FORWARD MOVEMENTS

WHEEL TRACKING

VEHICLE SWEPT PATH

REVERSE MOVEMENTS

WHEEL TRACKING

VEHICLE SWEPT PATH

ISSUE	DESCRIPTION	DATE
B	REVISED CARPARK LAYOUT	12/09/16
A	FOR PRELIMINARY REVIEW	01/09/16

Drawing Status: **PRELIMINARY**

SCALE 1:500 | Orig. Sheet A1

DO NOT SCALE DRAWINGS

Scales Before Reduction

5 0 5 10 15 20 25 m

pdr engineers

Level 1, 258 Mulgrave Road
PO Box 2551
CAIRNS QLD 4870

Ph: (07) 4051 5599
Fax: (07) 4051 5455
Email: admin@pdrengineers.com.au

A.B.N. 88 126 211 461
A.C.N. 126 211 461

Client: **STUDIO TEKTON PTY LTD**

Project: PROPOSED REEF MARINA DEVELOPMENT

Drawing Title: TURN PATH PLANS Sheet 2

Drawn	Designed	Verified
NP	-	-
Approved		Date
-		NOV. '16
Drawing Number		Revision
16470-SK-TP02		A

APPENDIX: 11

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THE REEF MARINA

PORT DOUGLAS QLD

THE REEF MARINA PORT DOUGLAS

DRAWN: SG AT EB
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APPROVED: PR JL
DATE 30/11/2016

STAGE 2A GROUND LEVEL PLAN (1 of 2)

1:200

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-2A-102	STATUS:	DEVELOPMENT APPLICATION

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PORT DOUGLAS QLD

THE REEF MARINA
PORT DOUGLAS

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DATE 30/11/2016

STAGE 2A LEVEL 1 PLAN (1 of 2)

1:200

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-2A-104	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

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THE REEF MARINA

PORT DOUGLAS QLD

THE REEF MARINA PORT DOUGLAS

DRAWN: SG AT EB
CHECKED: JL
APPROVED: PR JL

DATE 30/11/2016

STAGE 2A LEVEL 1 PLAN (2 of 2)

1:200

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-2A-105	STATUS:	DEVELOPMENT APPLICATION

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THE REEF MARINA

PORT DOUGLAS QLD

THE REEF MARINA
PORT DOUGLAS

DRAWN: SG AT EB
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APPROVED: PR JL
DATE 30/11/2016

STAGE 2A GROUND LEVEL PLAN (2 of 2)

1:200

N

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-2A-103	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 12

DEVELOPMENT SUMMARY					
STAGE 3a					
Multi-Residential					
5 x 2 Bedroom					
Site Area & Site Co		**Ground**	**L1**		
Site Area		1,000			
Site Cover		305	307		
		31%	31%		
Gross Floor Area		**Ground**	**L1**	**L2**	
GFA		147	275		
Total		**422**			
		0.42			
Landscaped Rec Ar		**Land Rec**	**Soft Lan**	**Bal/Tce**	**Req.**
Unit 1		59	48.6	14.7	45
U nit 2		34	23.0	14.7	45
Unit 3		37	24.8	14.7	45
Unit 4		37	23.1	14.7	45
Unit 5		41	22.9	14.7	45
Communal		192	85.5		
Total		**400**	**228**	**74**	**225**
		40%			
Parking					
Cars					
Res.	1 Bedroom	5	5		
	Studio	1.7	2		
Total			7		
Bikes - Units		1.7	5		
Bikes - Visitors		0.4	1		

LEGEND

ST	STORE
T	TRANSFORMER
HC	HIRE CAR PARKING SPACE
CR	CENTRAL REFUSE
MR	MARINA REFUSE
M	MAINTENANCE SHED
BR	BICYCLE RACKS
POS	PRIVATE OPEN SPACE
ELEC	ELECTRICAL ROOM
MSB	MAIN SWITCH BOARD
REC	GOODS RECEIVING AREA
	FENCING
	BATTENED SCREEN
	LANDSCAPE
	EXTERNAL PAVING
3.0	EXISTING CONTOURS
3.25	PROPOSED LEVELS

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THE REEF MARINA

PORT DOUGLAS QLD

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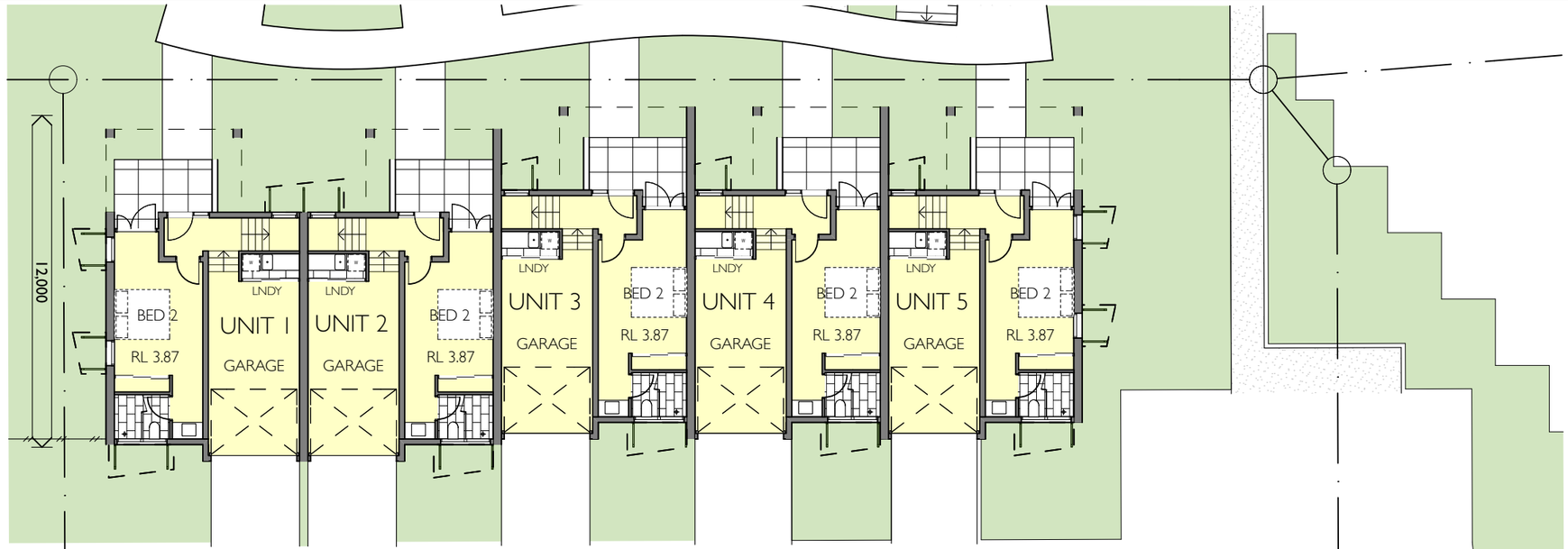
DATE 30/11/2016

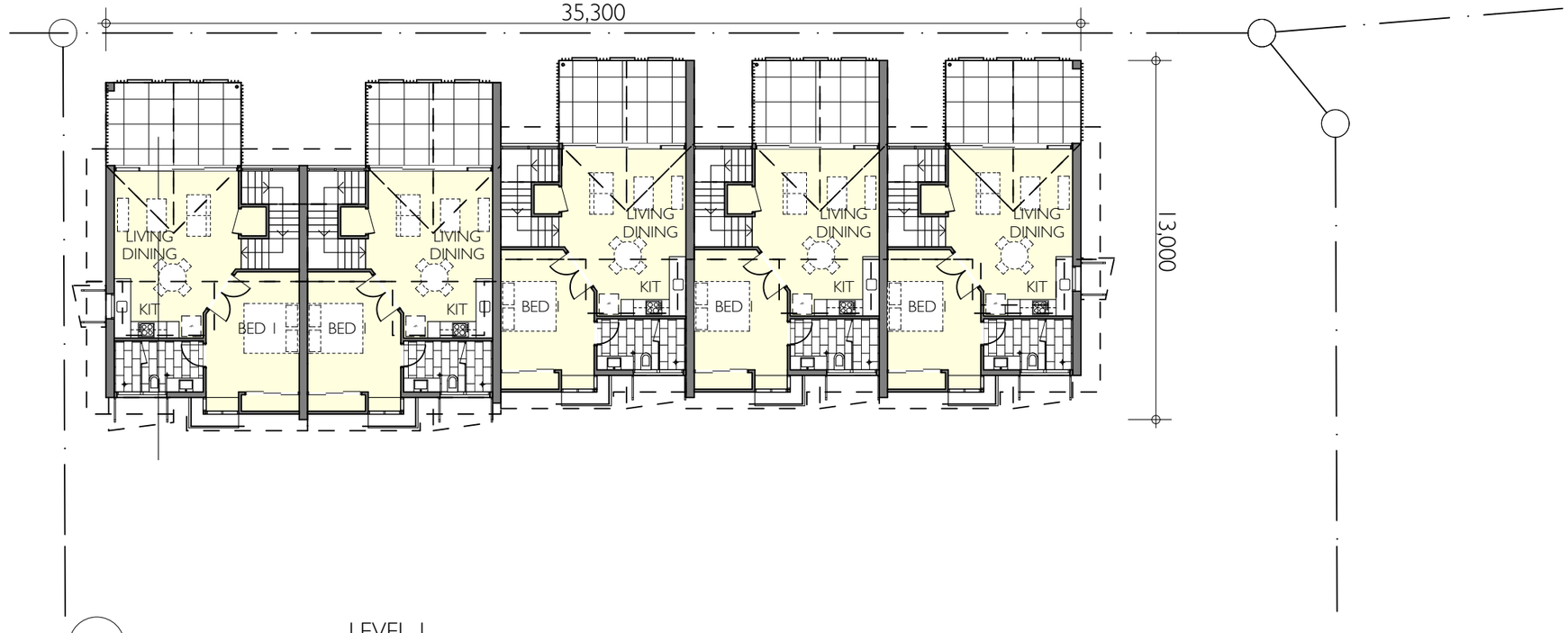
STAGE 3A SITE PLAN
1:200

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-3A-101	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln



GROUND FLOOR
1:200



LEVEL 1
1:200

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THE REEF MARINA

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THE REEF MARINA
PORT DOUGLAS

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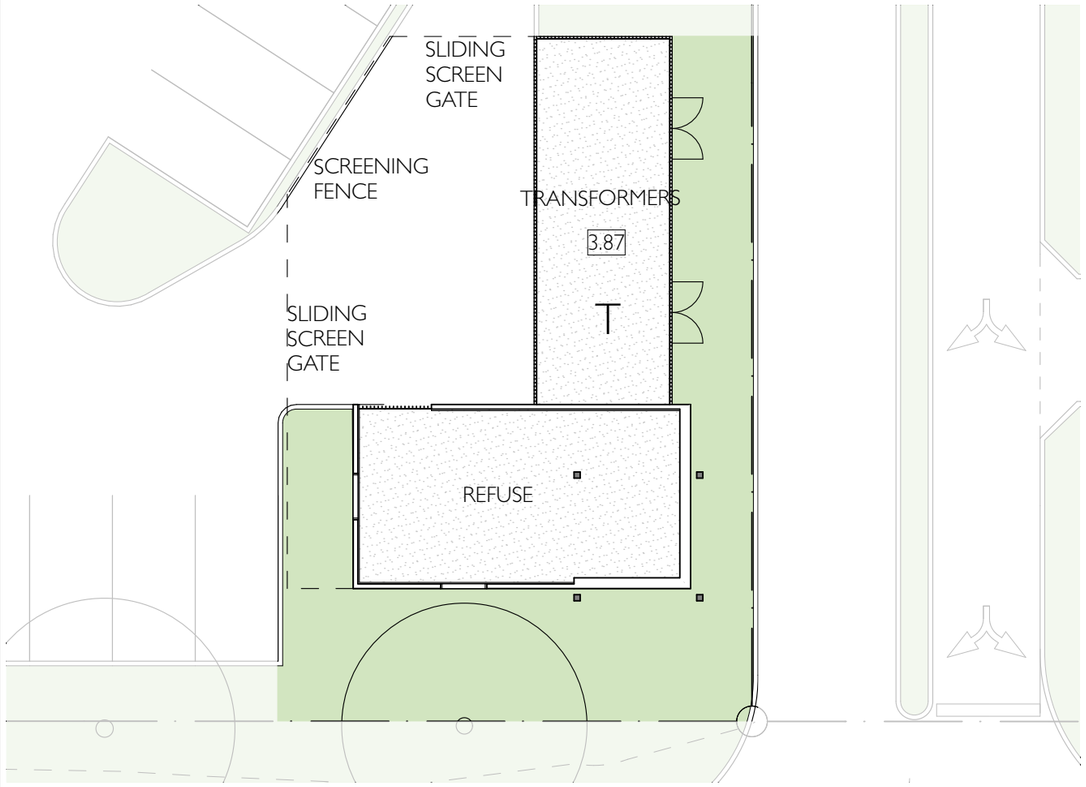
DATE 7/12/2016

STAGE 3A PLANS

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-3A-102	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

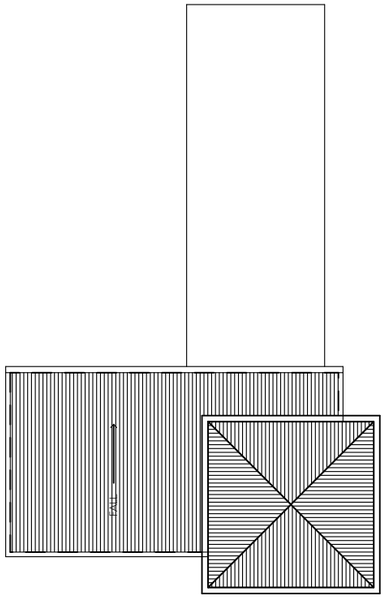
APPENDIX: 13



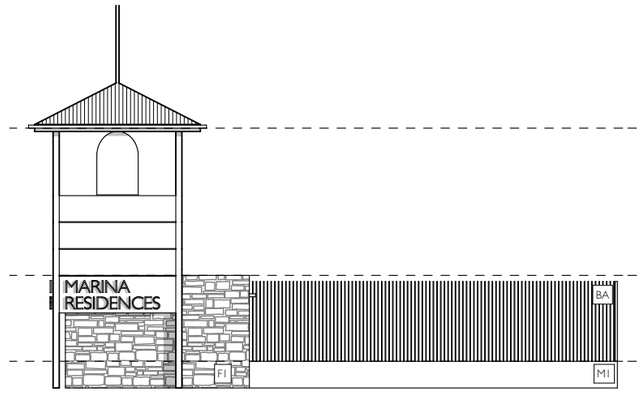
SITE PLAN
1:200

LEGEND

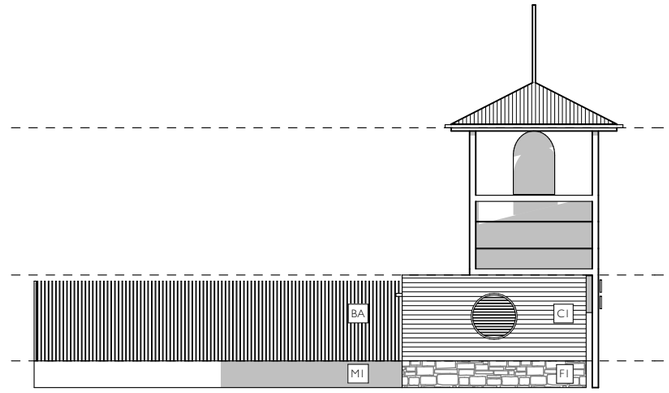
B1	GLAZED BALUSTRADE IN STAINLESS STEEL FRAME
B2	CFC WEATHERBOARD + GLAZED BALUSTRADE
B3	GLAZED BALUSTRADE IN STAINLESS STEEL FRAME
B4	GLAZED BALUSTRADE IN STAINLESS STEEL FRAME
B5	STAINLESS STEEL + WIRE BALUSTRADE
BA	BATTENED SCREEN
C1	CFC WEATHERBOARD CLADDING
C2	CFC WEATHERBOARD CLADDING
F1	IRREGULAR STONE FEATURE WALL
L1	POWDERCOATED ALUMINIUM LOUVRES
LS	STACKING LOUVRE SHUTTERS
PE	POWDERCOATED ALUMINIUM PERGOLA
PL	PANEL LIFT DOOR
M1	RENDERED MASONRY COLOUR 1
M2	RENDERED MASONRY COLOUR 2
MD	METAL DECK ROOFING
S1	POWDER COATED SHADING DEVICE WITH METAL DECK ROOFING
S2	POWDER COATED SHADING DEVICE WITH METAL DECK ROOFING
S3	POWDER COATED SHADING DEVICE WITH METAL DECK ROOFING



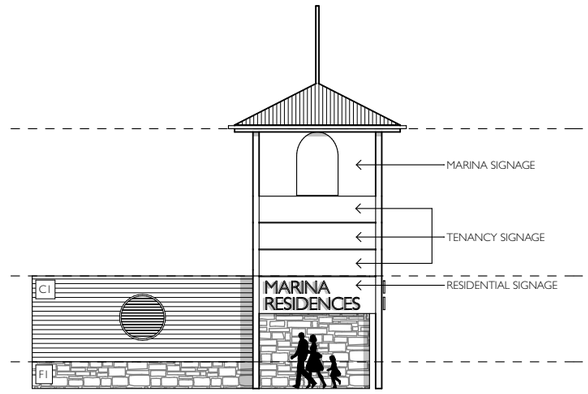
ROOF
1:200



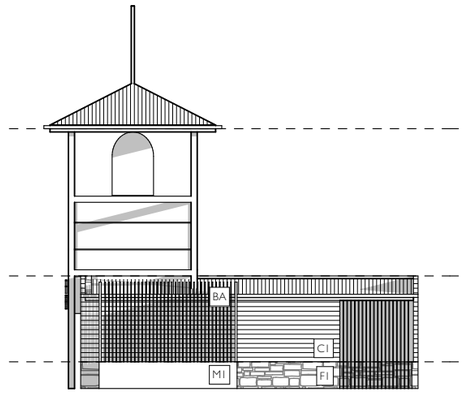
NORTH ELEVATION
1:200



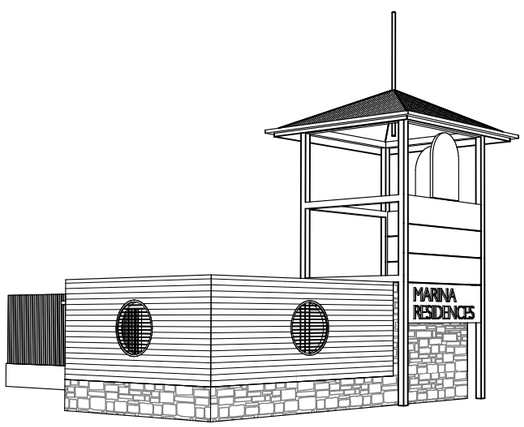
SOUTH ELEVATION
1:200



EAST ELEVATION
1:200



WEST ELEVATION
1:200



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THE REEF MARINA

PORT DOUGLAS QLD

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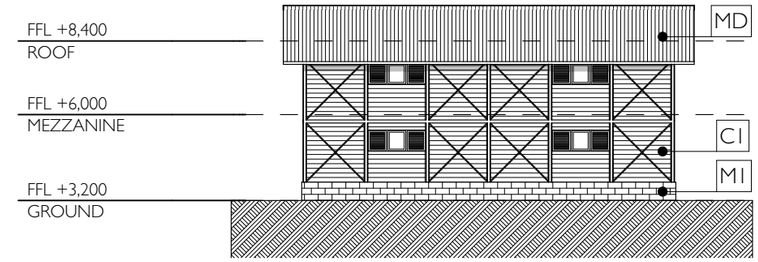
MARINA ENTRY STRUCTURE
CENTRAL RUBBISH AREA

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-IR-106	STATUS:	DEVELOPMENT APPLICATION

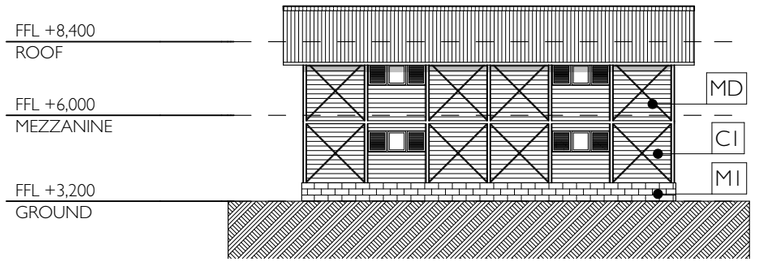
/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 14

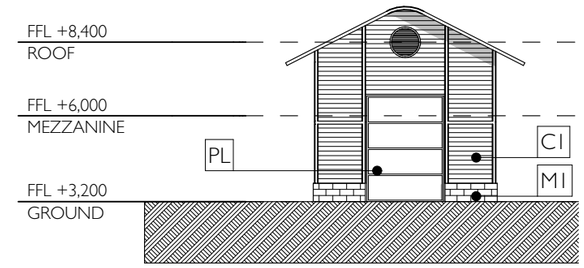
SITE PLAN
1:200



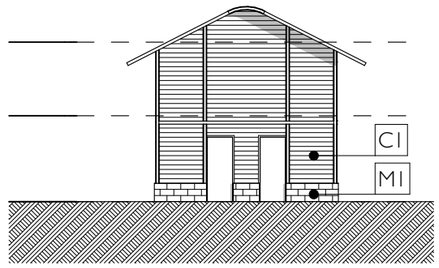
NORTH ELEVATION
1:200



SOUTH ELEVATION
1:200

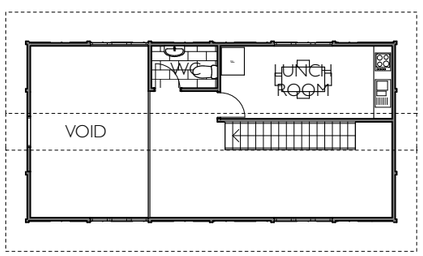


EAST ELEVATION
1:200

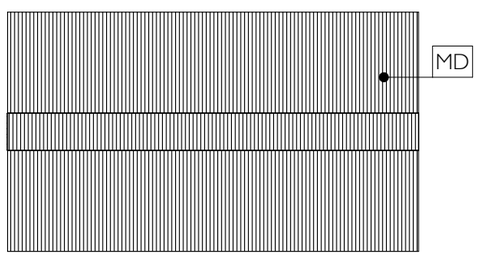


WEST ELEVATION
1:200

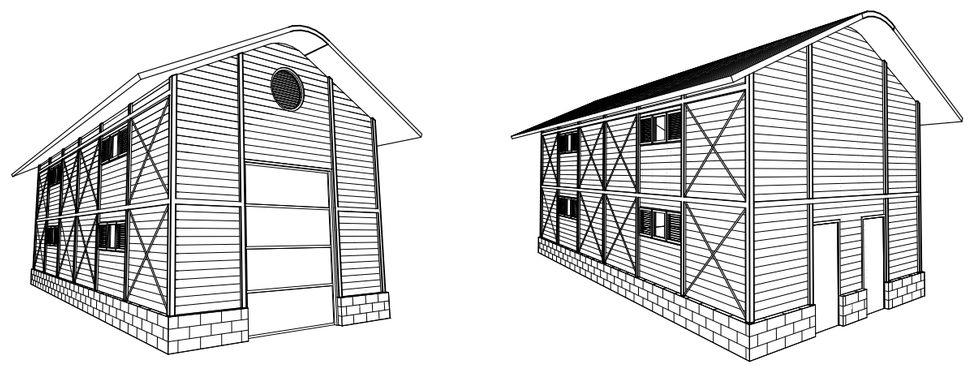
B1	GLAZED BALUSTRADE IN STAINLESS STEEL FRAME	
B2	CFC WEATHERBOARD + GLAZED BALUSTRADE	
B3	GLAZED BALUSTRADE IN STAINLESS STEEL FRAME	
B4	GLAZED BALUSTRADE IN STAINLESS STEEL FRAME	
B5	STAINLESS STEEL + WIRE BALUSTRADE	
BA	BATTENED SCREEN	
C1	CFC WEATHERBOARD CLADDING	
C2	CFC WEATHERBOARD CLADDING	
F1	IRREGULAR STONE FEATURE WALL	
L1	POWDERCOATED ALUMINIUM LOUVRES	
LS	STACKING LOUVRE SHUTTERS	
PE	POWDERCOATED ALUMINIUM PERGOLA	
PL	PANEL LIFT DOOR	
PO	POLYCARBONATE WITH TIMBER BATTEN SCREEN TO UNDERSIDE	
M1	RENDERED MASONRY COLOUR 1	
M2	RENDERED MASONRY COLOUR 2	
MD	METAL DECK ROOFING	
S1	POWDER COATED SHADING DEVICE WITH METAL DECK ROOFING	
S2	POWDER COATED SHADING DEVICE WITH METAL DECK ROOFING	
S3	POWDER COATED SHADING DEVICE WITH METAL DECK ROOFING	



MEZZANINE
1:200



ROOF
1:200



PERSPECTIVES

MAINTENANCE SHED

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THE REEF MARINA

PORT DOUGLAS QLD

DRAWN: SG EB AT
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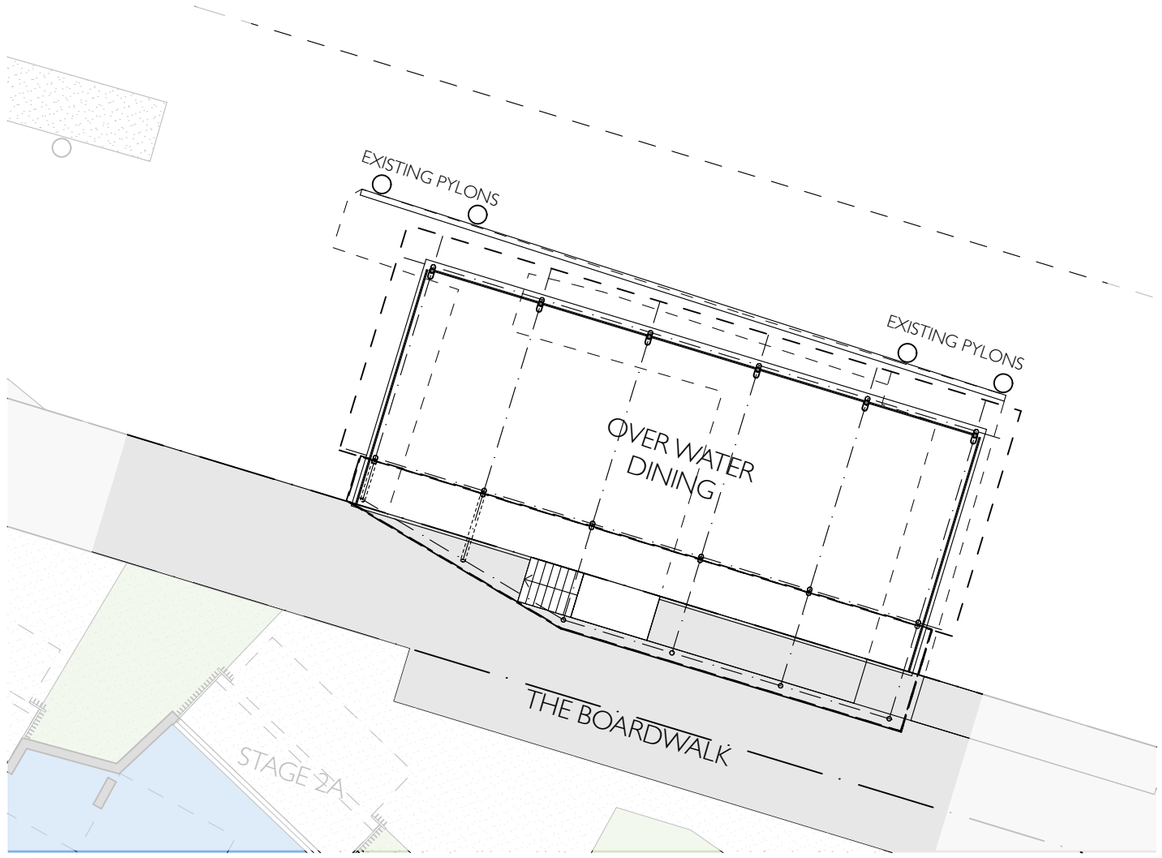
DATE 6/12/2016

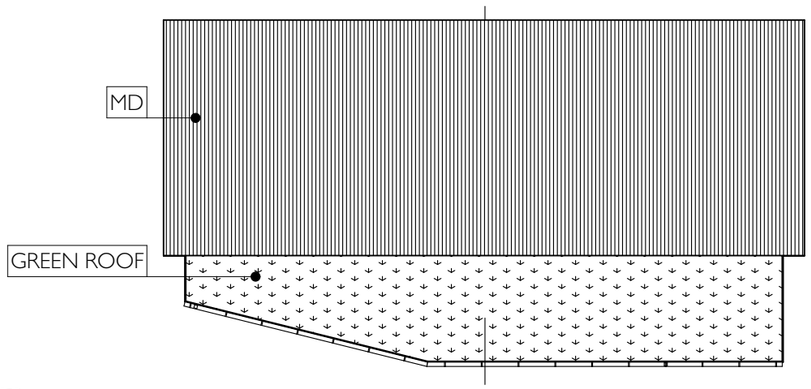
PROJ NO.	DWG NO.	REVISION:	03
160303	DA-IR-107	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

APPENDIX: 15



SITE PLAN
1:200



ROOF PLAN
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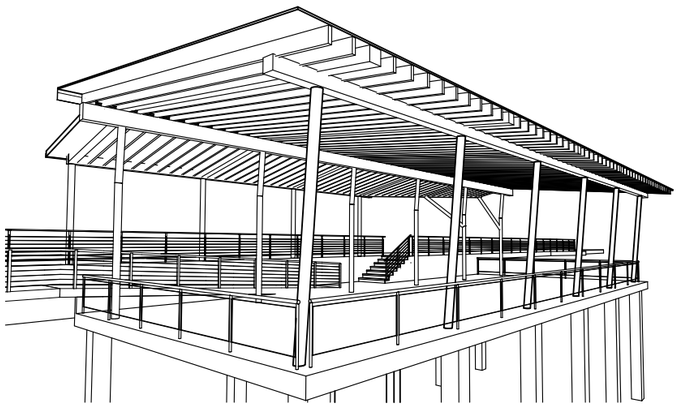
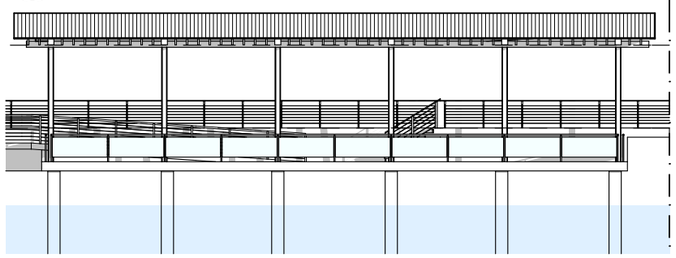
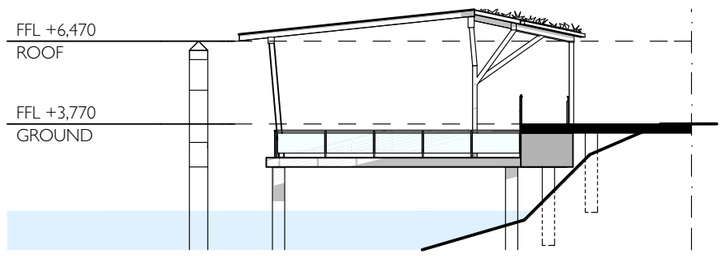


PERSPECTIVE

LEGEND	
B1	GLAZED BALUSTRADE IN STAINLESS STEEL FRAME
B2	CFC WEATHERBOARD + GLAZED BALUSTRADE
B3	GLAZED BALUSTRADE IN STAINLESS STEEL FRAME
B4	GLAZED BALUSTRADE IN STAINLESS STEEL FRAME
B5	STAINLESS STEEL + WIRE BALUSTRADE
BA	BATTENED SCREEN
C1	CFC WEATHERBOARD CLADDING
C2	CFC WEATHERBOARD CLADDING
F1	IRREGULAR STONE FEATURE WALL
L1	POWDERCOATED ALUMINIUM LOUVRES
LS	STACKING LOUVRE SHUTTERS
PE	POWDERCOATED ALUMINIUM PERGOLA
PL	PANEL LIFT DOOR
M1	RENDERED MASONRY COLOUR 1
M2	RENDERED MASONRY COLOUR 2
MD	METAL DECK ROOFING
S1	POWDER COATED SHADING DEVICE WITH METAL DECK ROOFING
S2	POWDER COATED SHADING DEVICE WITH METAL DECK ROOFING
S3	POWDER COATED SHADING DEVICE WITH METAL DECK ROOFING



WEST ELEVATION
1:200



SOUTH ELEVATION
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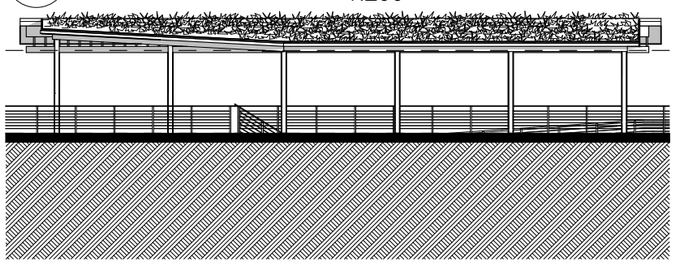

EAST ELEVATION
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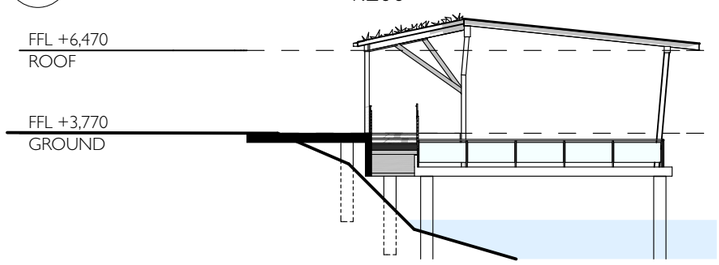
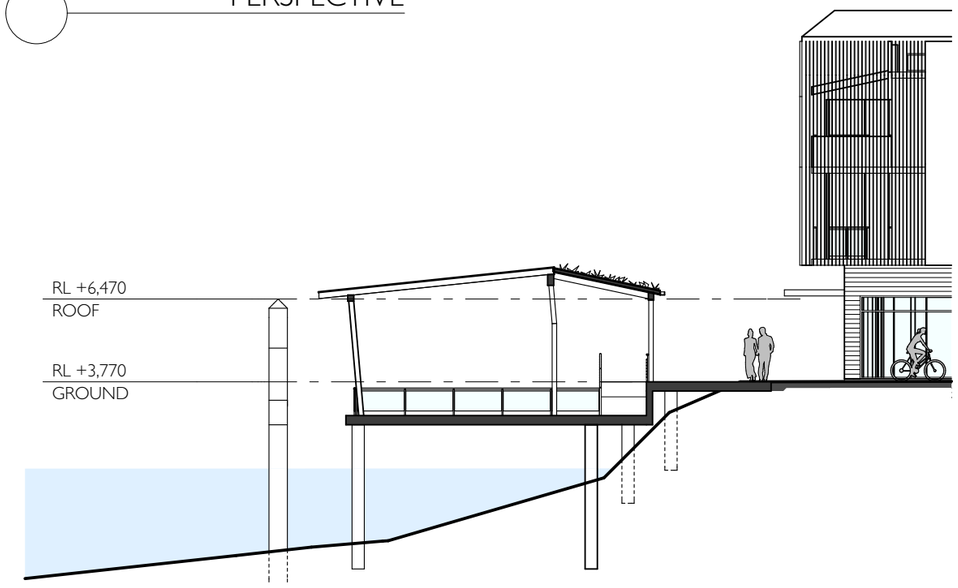


NORTH ELEVATION
1:200



SECTION A
1:200

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THE REEF MARINA

PORT DOUGLAS QLD

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OVER WATER PAVILION

PROJ NO.	DWG NO.	REVISION:	03
160303	DA-IR-108	STATUS:	DEVELOPMENT APPLICATION

/Volumes/YODA/Project Files/2016/160303 The Reef Marina/3.0 Design/3.1 Design (Arch)/3.1.2 Sketch Design/160303 Reef Marina Site.pln

metal roof to green roof

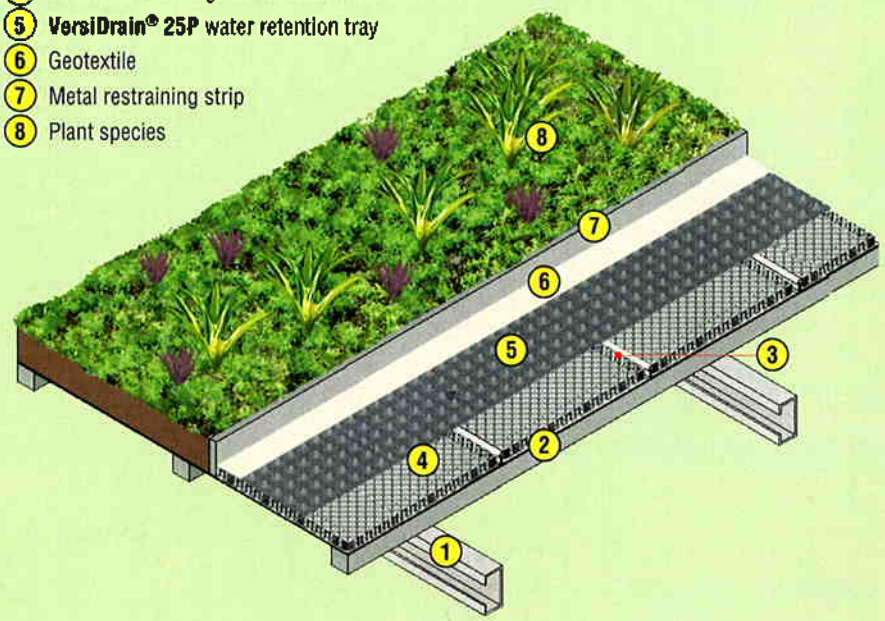
Elmich (Far East) Pte Ltd has developed a system that allows the low cost conversion of metal sheet roofs to environmentally friendly green roofs.

The Aramsa Garden Spa, a garden sanctuary set in the heartland of Bishan Park in Singapore, had an unattractive exposed metal roof which detracted from the aesthetically pleasing spa environment. The metal roof created excessive noise during periods of rainfall and did not provide insulation against high ambient tropical temperatures and humidity.

The components included **VersiCell®**, interlocking drainage and air insulation cells, **VersiDrain® 25P**, a drainage and water retention tray, filter fabric, lightweight 'soil-less' growing media and selected plant species specifically adapted to Singapore's tropical environment.

Aluminium battens, to prevent soil media movement, were anchored onto the metal sloping roof. **VersiCell®** drainage cells were placed between the metal ribs to provide an insulation barrier and a level surface for subsequent installation of **VersiDrain® 25P** drainage and water retention trays. A lightweight filter

1. Steel C-section
2. Steel purlin
3. Metal roof
4. **VersiCell®** drainage/air insulation cell
5. **VersiDrain® 25P** water retention tray
6. Geotextile
7. Metal restraining strip
8. Plant species

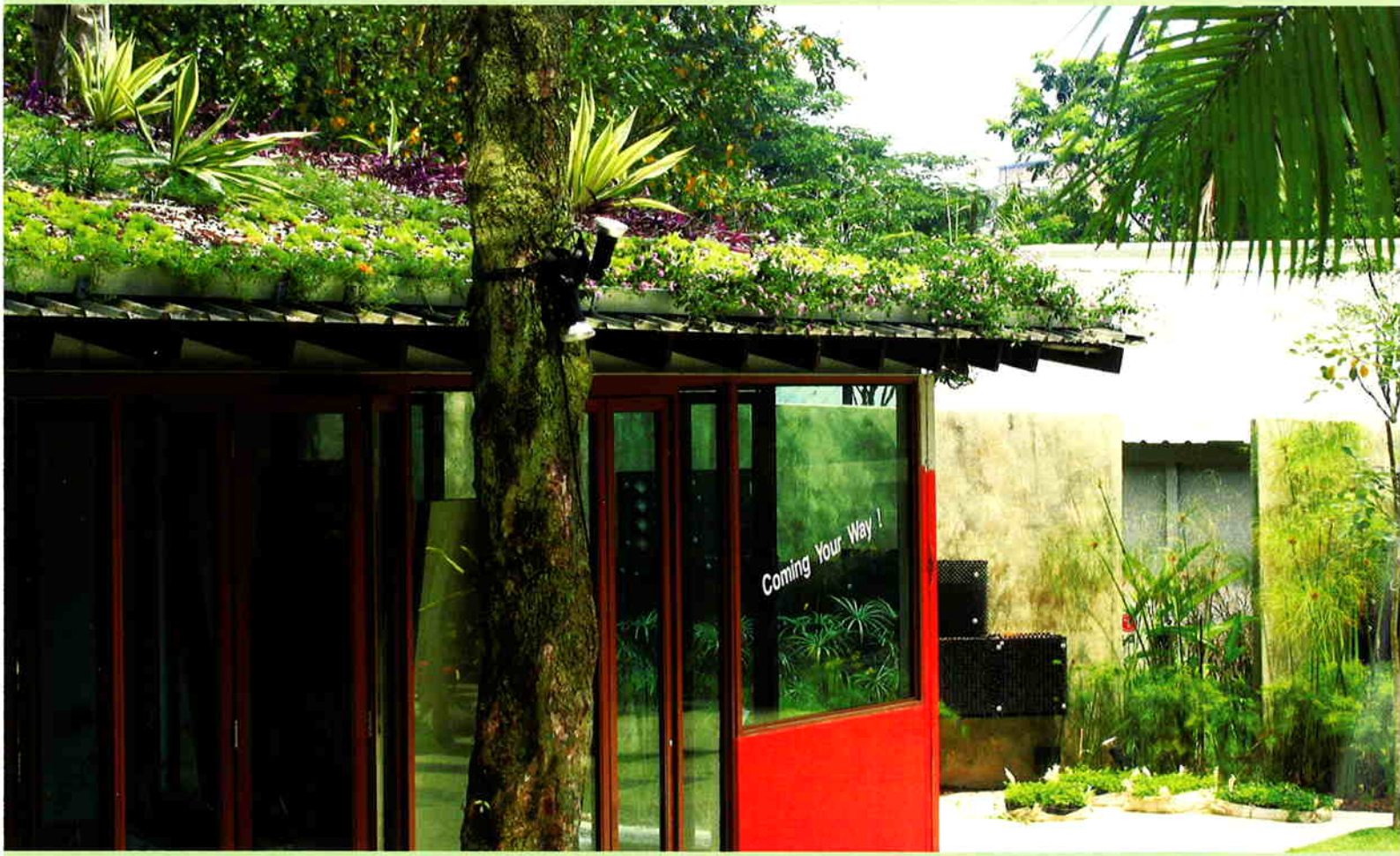


fabric was positioned on the drainage and retention trays and a 100 mm layer of a lightweight pH stabilized soil-less mix then installed on the filter fabric. Key factors in the selection of the proprietary growing media included readily available components, water retention properties, low weight (80 kg/m^2 wet weight) and low heat absorbency.

Locally sourced plant species selected for hardiness, colour, height, the ability to tolerate high tropical rainfall conditions followed by hot and dry periods and low maintenance were planted into the growing media. Plant species included: Furcraea Foetida, Zephyranthes, Tradescantia Pallida, Sedum Mexicanum, Pedillanthes and Rhoeo.

The Aramsa Garden Spa is now reaping the benefits of converting an unattractive metal roof that was not in keeping with the aesthetics associated with the and spa environment. The planted roof, with its range of coloured flowering plants, provides an aesthetically pleasing view and an attractive environment for butterflies and birds. The reduced energy consumption as a consequence of minimized heat absorption due to increased thermal insulation saves cost and creates improved comfort inside the building as well as noise elimination from impact of heavy rainfall.

Elmich is an ISO 9001 certified company that ensures the most appropriate and cost effective system is installed



ELMICH

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