Proposal

Lot 51 on MCH 567 is an almost unique parcel of land, the development of which presents interesting challenges, located as it is in Tuan a community which will, over the next hundred years face its own challenges, as the effects of climate change impacts, rollout.

This circumstance calls for special solutions.

The most relevant of the assessment benchmarks (and there are many) for DA RAL21-0138 (DA21) is in my opinion not *reconfiguring a lot* nor the *works service and infrastructure* codes but one of the overlay codes - ***Coastal Protections.***

This is not to infer that the other codes are not important, they are, but for this particular development, the purpose of the *coastal protection* overlay code should be the paramount driving force in the delivery of the development.

This code reminds us of the single most significant feature, existing at present, in relation to land use, in the future and of which are known today, the significant environmental forces in play, such that, in just one generation of the human species, planet wise, we face a force, the likes of which has not existed in the lived experience of the human species over the last 5,000 years – rapid climate change.

Fraser Coast Regional Council, in its due diligence, has already over the last 20 years engaged specialists in providing reports[1], with a planning horizon of the next 70 years, into the prognosis for its communities on the front line of this existential threat - land to be impacted by the rapid rising of sea levels of the planet - coastal communities.

We shall visit some of them in this proposal.

.....

Assessment benchmark

8.2.6 Coastal protection overlay code

8.2.6.2 Purpose and overall outcomes

(1) The purposes of the *Coastal protection overlay code* is to ensure that development is designed, constructed and operated to:-

Firstly:

> (a) avoid the **social**, **financial** and **environmental** COSTS arising from the adverse impacts of **coastal hazards*, taking into account the predicted effects of CLIMATE CHANGE;

[1] References

coastal hazard' include tidal inundation.

Then

AO4 (a)- ***layout*** *of the development so as to minimise the* ***footprint*** *of the development of the part within the erosion prone area and* ***locates*** *the development as* ***far landward*** *as possible;*

(a) the practical ***design life*** *of the development in the context of* ***future erosion*** *threat (refer section 5 of the Queensland coastal plan – Coastal hazards guideline)*

State Planning Policy for Coastal Protection Guideline 2011 advises:

'Planning schemes for coastal areas should reflect a coastal hazard adaptation strategy for urban areas that are **projected** to be within a high hazard area by the year 2100'[2]

(c) *the ability for buildings or structures to be* ***decommissioned***, ***disassembled*** *or* ***relocated*** *either on the site or to* ***another site****;*

(d) ***use of appropriate foundations*** *for the building or structure;*

We shall indue course visit all these core principles in this proposal

.....

Science

At present the current prescribed statutory height requirement for sea level rising by 2100 is 0.8m above existing Highest Astronomical Tide.[3](HAT)

The current scientific consensus (2024), based upon current global circumstances, is that sea levels will rise by between **1.3m to 1.6m** by 2100.[4] A possibility of levels twice as high as the current prescribed height, and on a longer vision, scientists involved in researching developed rating system to evaluate the plausibility of climate model simulations, published , as recent at 5 months ago, (2024), in the most recent IPCC's report, are advising that *the models that lead to potentially catastrophic warming are to be taken seriously.*[5]

[2] State Planning Policy for Coastal Protection Guideline 2011-[P2]

[3] Set at RL 2.33 AHD - International Coastal Management - 25th March 2024

[4] Ref (6)-WCRP-Climate.Org

[5] Ref (17)-Science Daily.com

This proposal embraces a strategy to build in long-term flexibilities for developments in areas most likely to bear the brunt of the rollout of *Climate Change.*

.....

Legal Process

Because I wish to change the development application in a way that goes to how we interpretate *assessment benchmarks*, that may be viewed, in some quarters of Council as an undesirable departure from the historical way Council handles these particular development type, I am seeking some feedback from Council.

My understanding is that there are 3 facilities for changing development application.

1. Before the decision notice has been issued[6]; and
2. After the decision notice has been issued but before the appeal period has expired;[7] and
3. Utilising the facility of the Planning and Environment Court.[8] [P&Ec]

However, as you would be aware the P&Ec facility only gets generated as a consequence of

   a. an appeal against a condition - or
   b. resolution on a point of law.

Because administratively these changes would at present need to be handled by Ward - the nominated representative of the applicant, I would like to relieve Ward of that additional workload and that responsibility under his name. My understanding is that to do this, under option 1 or 2, a change would need to done to amend the current Form 1.

However, once the matter gets referred to the planning environment court the *Applicant* or this representative, becomes responsibility for managing the matter before the court.

One of the reasons for our meeting today is the solicit which path Council prefers.

.....

Planning Scheme

Part 5 of the Scheme provides in 5.3.3, the authority for determining a DA's **compliance** with an *assessment benchmark.*

In subsection (4) it provides that for **code** assessable development

*The proposed development **complies** with the provisions of a benchmark when the proposal complies with the*

[6] PA16-[S52]
[7] PA16-[S74]
[8] P&Ec A-[S46(2)

- ***purpose*** *and*
- ***overall outcome***

of the code

This the position that I will adopt for this development.

.....

Flood Report

Although the development is not located in a *flood hazard overlay* the applicant has adopted the approach that would achieve the intent of that situation.

The new draft flood study report, relevant to the changed development of 3 September 2024 is to hand from Stormwater Consulting.

It advises the following:

For the 1% AEP flood event on lot 51:

(a) The depth are as follows:

Approximates		
Depth	**%**	**M2**
900	0.7	280
800	0.6	240
700	3	1,200
600	1	400
500	7	2,800
400	11	4,400
300	31	12,400
200	25	10,000
100	14	5,600
0	7	2,800
Total		40,120

(b) The velocity of flood water has a maximum of - less than 1 km/hr.
(c) Duration - Unsafe Inundation = 10 to 11 hours.
(d) About 7% of lot 51 is not covered by any water at all.
(e) The maximum increase in water level heights as a consequence of afflux, if impacted by the intended fill, are:

(i.) In two areas comprising less than 2 % of site area - have a rise greater than 50 mm.

(ii.) The remainder:

A. 38% less than 50mm; with

B. 60% no change

(f) The depth of water over any driveway accesses would not exceed 300mm.

(g) Afflux (Change) on the:

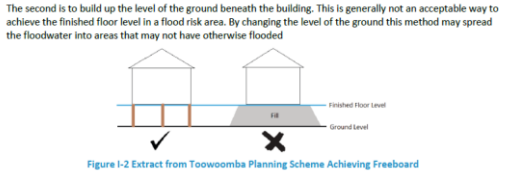
(i.) Western boundary (Forestry) - has no effect on flood height

(ii.) Northern boundary (Knights Property) - reduces flood height 10mm, in some position, the remainer no change.

(iii.) Eastern boundary (Wilkinson Road) - reduces flood height between 50 to 20mm in some positions - the remainer no change.

(iv.) Southern boundary (Forestry) - increases flood height by 20mm for an approximate area of 3000m2.

Flooding Response



The second is to build up the level of the ground beneath the building. This is generally not an acceptable way to achieve the finished floor level in a flood risk area. By changing the level of the ground this method may spread the floodwater into areas that may not have otherwise flooded

Finished Floor Level
Fill
Ground Level

Figure I-2 Extract from Toowoomba Planning Scheme Achieving Freeboard

Recommendation

Suspended floor designs provide a sensible alternative to slab on ground houses in flood risk areas. Provided the following requirements are met, a development application may not be required:

- For low and medium risk areas the floor level is a minimum 0.8m above the DFE and this must include a minimum of 0.5m maintained from the DFE to the base of the structure (including any slung services etc)
- For high risk areas the floor level is a minimum 1.0m above the DFE and this must include a minimum of 0.7m maintained from the DFE to the base of the structure (including any slung services etc)
- If understorey screening or any other barriers are present for planning streetscape provisions, these do not take up more than 50% of the understorey area and do not impede the flow of floodwater through the understorey. Otherwise, the minimum amount of areas is to be taken up by screening
- Structures and foundations are designed in accordance with the Department Housing and Public Works – Qld Development Code MP 3.5 – Construction of buildings in flood hazard areas

Material (left) retrieved from Council's website[9] indicates that at some stage Council gave consideration to the most appropriate way to deal with building within an area identified as being susceptible to periodic flooding.

The proposal is to adopt this option for buildings on the subject development site.

For the following reasons:

1. Freestanding residential buildings have a minimum 'usability' design life of 50 years and some buildings still exist in Queensland that were constructed over a century ago. Responsible decision-making requires taking this reality into consideration when considering land use planning.

2. Fixing infrastructure such as domestic buildings into the ground (slab-on-ground) provides for no flexibility in response to changing circumstances. Placing buildings on columns provides options not available for slab-on-ground construction.

3. Provides, a cost-effective method of addressing the ever-changing circumstances

[9] References 10

which in the future will present larger flooding events than those currently the subject of engineering calculations for current flood heights, thus requiring a solution, which can simply and relatively inexpensively be accommodated, for building on column, by raising the floor level by an amount to buy perhaps some decades more of responsible continued service in residential accommodation.

4. Placing buildings on columns, provide the minimum interruption for overland flow, removing the necessity of dealing with changes to adjoining properties as the consequence of increasing flood levels, caused by climate change.

5. Then there is the flexibility for those parcels of land for which, in the final analysis, **retreat** is the only option to rising sea levels[10]. Buildings supported by columns provide the maximum amount of flexibility and infrastructure investment recovery in relocating a particular premises, plus with the minimum of disruption and ease of implementation.

6. Queensland's building codes have already in place design standards, for buildings to be built in areas with the potential for flooding. These codes could be made mandatory for the construction of the dwellings on lots made available by this development.

7. Finally, this proposal is absolutely ideal when considering the very nature of the future of the Tuan coastal village.

.....

Utilities

Power

The proposal is to subsidise per lot, off-grid power systems to provide standard power requirements for an average floor area of Class 1 dwelling (236m2)[11] on a cambered envelope of 800m2 with the 2000m2 lot size.

The applicant is prepared to accept a development condition in this regard.

The process will be rolled out using the current identical process used by NBNCo in relation to areas where hardwired telephone services are no longer intended to be supplied. That is, a unit cost per site, is paid upfront for by the developer, and installation is delivered by appropriate service provider at the building work stage for any particular lot.

The purpose in adopting this option is twofold:

Item A

[10] References -3(p46),5(p5),6(p31),15(p23).

[11] House Sizing Australia:- -architectureanddesign.com.au

The recent climatic events in North Queensland demonstrates that the existing hardwired network system has not been designed with climate change in mind[12]. The recent failure of a subs station in north Queensland plus the over 8000 houses that lost power some for several days[13] demonstrates the principal of how the current system is not fit for purpose in this changed environment.

Further, recent storms in the state have seen numerous occasions when numbers of houses are left without power for various periods of time due to line damage from falling trees.

These interrupting to power supplies for periods of time would have resulted in economic loss and a measure of inconvenience to the owners of household.

Item B

And then there's the matter of 2100 sea level rises.

If/when the predictions are realised or too conservative, then the adoption of the advice provided by consultants to Council[14] - the option of **retreat**, - this system would have the following advantages - as advocated.

A. The relocation of houses equipped with solar electricity as part of the infrastructure, means the relocation would be less disruptive and more cost-effective
B. There is no cost to the community to fund the removal of hardwired distribution systems that would normally be a cost to the community, and
C. Disruption to hardwire supply to an area the size of Tuan would rationally be undertaken over a period of some decades. With the properties first inundated being first to be abandoned. However, those with several years of utility of use still available, may wish to continue in residence. No disruption occurs with stand-alone system incorporated in the buildings structure, and
D. The flexibility in the situation proposed for stand-alone (off-grid), will provide better outcome than for hardwired connections, with less cost, easier relocation and less down time, for owner of the building and infrastructure.

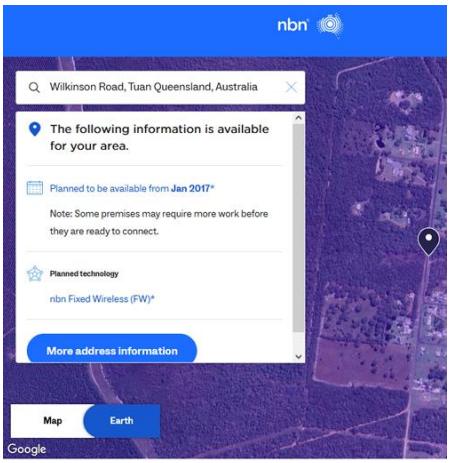
Communications

Advice has been provided by Telstra and confirmed by NBNCo that no new copper connections are to be provided to any future developments.

While developments in the urban areas of cities and towns are required to prepare for the arrival of optic fibre, by pre-reinstalment of pits and conduit. Discussions with NBNCo

[12] Esdnews.com.au
[13] Wikipedia.org
[14] References-2,4,5,7.

indicate that there is no information available as to when or even if optic fibre facility may be provided to Tuan



NBNCo also advised, that their response in these situations is to provide a wireless telephone system, either via a tower or satellite, at the choice of the owner of the building.

NBNCo has in place, under legislation, a requirement for developers to make a development contribution to cover the costs of the equipment and installation.

The proposal is that communication for this development will be wireless under this process.

Planning Report

The planning report provided in support of the development application DA21 advised

Coastal Management

The site is impacted by the mapped extent of EPA (Erosion Prone Area) and storm tide inundation. The actual extent of this impact is questionable given the adjoining site contains dams within this area and the nearest dam to the site is fresh water rather than brackish or salt.

It is our understanding the site has no intrusion of marine plants.

Given the adjoining residential land use and the location of the site, it is a reasonable conclusion the proposed development will not impact on coastal processes or ecology.

And

Coastal Protection

The site is impacted by the mapped extent of EPA (Erosion Prone Area) and storm tide inundation.

……

Pursuant to the contour information for the site, the land is relatively level, between 2 and 3 metres AHD. It is evident the levels fall at the northern boundary to the adjoining dam with the accompanying residential dwelling.

……

*The location of the site does not provide evidence the site contributes towards coastal process in this locality however could be subject to storm surge (to be mitigated by **site filling** as required by the Assessment Manager).*

And

The site is located within the **trigger area for Wetland Protection areas and **high impact earthworks** will be required in the development of the site.*

* This impediment was removed as a consequence of September 2024 amended development

.....

Consultants Reports

The following are pertinent extracts from some of the reports commissioned by Council, over the last 20 years for Coastal Management going forward.

1. **Cardno - Fraser Coast Shoreline Erosion Management Options Assessment 2011[FCSEMOA]**

   2.9.2 Management Policies and Options

   There are a range of different policies available for management of shoreline erosion, including:[15]

   1. *No Active Intervention;*
   2. *Planning;*
   3. ***Managed Retreat;***
   4. *Hold the Line; and*
   5. *Managed Realignment*

   The next step would be to identify policies and options that reduce the level of risk, both in the present day and in the future.[16]

2. **Hervey Bay Coastal Protection Strategy (WBM, 2004)**

   The former Hervey Bay City Council had, for a number of reasons, difficulty in implementing the shoreline erosion management options identified in the Hervey Bay Coastal Protection Strategy (WBM, 2004) (see discussion in Lawson et al., 2007).
   When scoping the methodology for the development of a SEMP for the new Fraser Coast LGA in 2009, FCRC sought to adopt an approach that would minimise the risk of these issues arising again.
   FCRC determined that it was necessary to adopt an approach that went beyond the SEMP guidelines outlined in the old QCP and incorporated more rigorous consultation and participation by the key stakeholders involved in management of the coastal zone.[17]

[15] Cardno- FCSEMOA 2011-[p24]
[16] Cardno- FCSEMOA 2011-[p25]
[17] Cardno- FCSEMOA 2011 [p8]

Because of the often-contentious nature and politicisation of climate change related matters, Councils can be reticent to engage broadly with the community and other stakeholders outside their organisation[18]

4. Fraser Coast Coastal Hazard Adaptation Economic Analysis [FCCHAEA]

Fraser Coast Council CHAS Phase 7

A confidential Final Report prepared for Fraser Coast Council- Friday 26 March 2021

*This location includes the coastal settlements of Maaroom, Boonooroo, **Tuan**[19], Poona and Tinnanbar on the mainland shoreline of Great Sandy Strait, as well as the surrounding areas of Boonooroo Plains.*

Residential properties in Maaroom, Boonooroo Tuan, and Poona are at risk from coastal hazards under both current and future climates, with the risks increasing significantly between 2050 and 2100. Areas of the foreshore at Tuan, and Poona are also at risk from coastal hazards.

Specific impacts from coastal hazards include:

- *damage to community coastal assets (including boat ramps)*
- *loss of foreshore areas*
- *damage and disruption to roads and other community assets*
- *damage to private properties*
- *damage to ecosystems.* [20]

6.2 Options for managing coastal hazards

Planned transition: *Commence planning for transition in the **near term** and retreat and relocate important infrastructure in the future **as required**.*
*Indicative cost estimates suggest that construction of seawalls to protect each of the population centres in the Great Sandy Strait communities would cost close to **$50 million** by 2100.*

Even if there was available funding for implementation and the environmental constraints could be overcome, seawalls are unlikely to assist these communities in all instances. Coastal inundation would still occur via the creeks and there would be issues with drainage during rainfall events.

*Next steps for this location should include development of a plan to support the local community, in particular to prepare for increasing risks of inundation, and identify appropriate options for **planned transition** for those assets most at risk by 2050.*[21]

[18] Developing a Coastal Hazard Adaptation Strategy: Minimum Standards and Guideline for Queensland Local Governments-[P7]
[19] Wikipedia Demographics: -2016 census-population of 153 people. 2021 census, population of 140 people.
[20] FCCHAEA-[P27]
[21] FCCHAEA-[P30]

Fraser Coast SEMP [FSCEMP]

Risk Assessment Discussion Paper- LJ2907/R2713

Prepared for Fraser Coast Regional Council- 17 May 2011- Cardno Pty Ltd

2.3.1 Climate Change Predictions[22]

Year of End of Planning Period	Projected Sea Level Rise
Year 2050	0.3 metres
Year 2060	0.4 metres
Year 2070	0.5 metres
Year 2080	0.6 metres
Year 2090	0.7 metres
Year 2100	0.8 metres

Current prediction - Sourced via AI.

11 February 2025 (Just 14 years after predictions)

What are the predicted effects of sea level rise by the end of the 21st century?

By the end of the 21st century, sea level rise is expected to have significant impacts on coastal regions and communities. Here are some key predictions:

Global Sea Level Rise: Under high-emission scenarios, global sea levels could rise by **1.3 to 1.6 meters** by 2100. This is a significant increase that could lead to widespread coastal flooding [Ref].

Coastal Flooding: Many coastal cities and low-lying areas will experience more frequent and severe flooding.[Ref]

Under the current emission rates of greenhouse gases do you know what sea levels the scientists are predicting by the end of the 22nd century?

By the end of the 22nd century, scientists predict that sea levels could rise significantly under current greenhouse gas emission rates. High-end estimates suggest that sea levels could rise by **9 to 10 meters (about 30 to 33 feet)** due to the collapse of major Antarctic ice shelves and increased ice discharge.[Ref]

If all the land-based ice was to melt what is the predicted height of sea levels above the existing level?

If all the land-based ice on Earth were to melt, it is estimated that global sea levels would rise by approximately **60 meters (about 195 feet)**. This includes the melting of glaciers, ice caps, and the ice sheets of Greenland and Antarctica[Ref]

And further in the Discussion Paper Council was advised as to options:

The ***Do-Nothing*** policy is probably only viable in areas, such as parks and reserves where little or inconsequential infrastructure exist.

[22] FSCEMP –[P6]

In built up areas where services (both underground and aerial) exist it is more likely that the **Managed Retreat** or *Hold the Line* policies become more favourable and economically viable.

Managed Retreat implies that present development in the coastal zone can be removed (or relocated) and that subsequent to the move the area is allowed to erode.

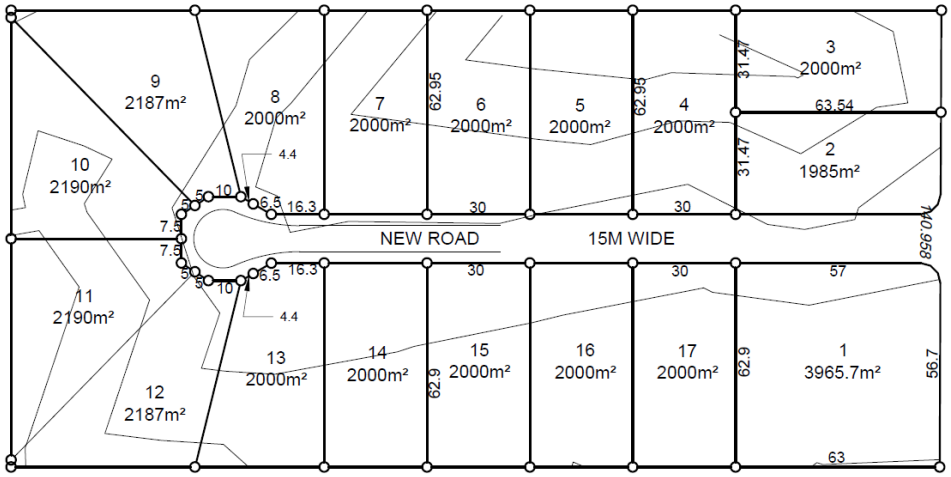
This policy would require careful planning and identification of triggers to determine the optimal time to make the likely significant investment in the early relocation of services and other infrastructure to secure areas.

The **Hold the Line** policy implies the development of protection works that can arrest coastal erosion.[23]

Plans in Support

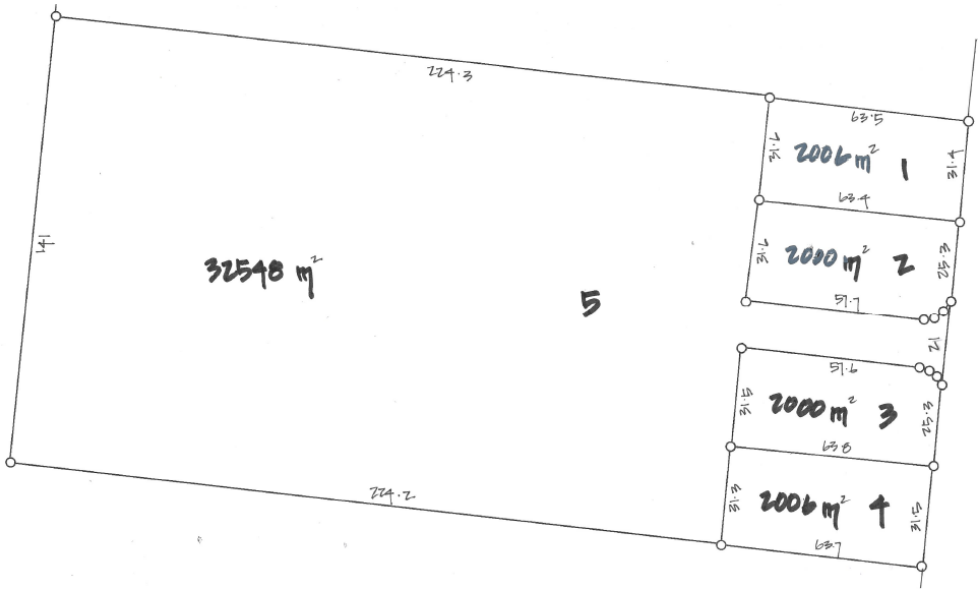
Plans so far submitted

Initial



Amended

[23] FSCEMP –[P17]



Plans submitted in support of the development application indicate the size of the allotments.

All other information concerning the development is contained by textual description within documents supporting the application.

Tuan

It was difficult to locate any accurate historical information on the establishment of the fishing village, which come to be known as Tuan. However, it's reasonable to assume the establishment would have been in the last quarter of the 19th century, particularly as a consequence of the discovery of gold in Gympie in 1867.

I think there would be little challenge to the assumption that Tuan started off as a fishermen camp, plying their trade in the Great Sandy Strait and providing much-needed seafood resources to the burgeoning population areas around Maryborough and Gympie.

We also know that in the 2016 census, the locality of Tuan had a population of **153** people and in the 2021 census, the population was **140** people. A **decline** of 8.3% while in the same period that the Queensland went from 4,703,193 people to 5,156,138 million. An **increase** of 9.7%.

We know there is approximately 158 parcels of land in Tuan ranging in size from 754 m² up to 4.01 ha. Of those properties, 118 have structures erected on them. The other 40 remained vacant - giving in 2021, an occupancy density of **1.18 person** per structure.

Tuan has a geographic area of approximately 82ha with a spatial density of **1** person to every **5870**m2. Tuan sits nestled between the 51,600 ha of forestry reserve and the vast reaches of the Great Sandy Strait, with 25 kilometres and a 19-minute drive to the nearest town.

Under the current projected *Coastal Management Sea Level Rise* benchmark, **only 47** of the **existing properties** in Tuan will **not** be impacted by sea level rises - by the year **2100**.

Boasting, no shop or tourist accommodation facilities or employment opportunities. Tuan's only attraction remains the attention of persons interested in boating and fishing or living in a quite beach house location. [24]

"Indicative cost estimates suggest that construction of seawalls to protect each of the population centres in the Great Sandy Strait communities would cost close to $50 million by 2100."[25]

Conclusion

The proposal for the development of lot 51, taking all of the above into consideration, is as follows:

1. Lots 1 to 4 will comprise of 2000 m² in area with all lots having an area of land 800 m² (40mX20m) levelled and slightly camber to prevent the ponding of rain water under the Class 1 Dwellings.
2. All Class 1 dwelling (Dwelling) constructed on the lots will be built: -
   (a) upon columns, with floor heights set at the 0.5% AEP to ensure their protection from inundation by water from:
      (i.) storm surge,
      (ii.) overland flooding and
      (iii.) the current predicted 2100 sea level rise value and
   (b) to the *Queensland Development Code* including *MP 3.5 Construction of buildings in flood hazard areas.*
2. Have vehicle access from the Dwellings to Wilkinson's Road via driveways, with have less than 300mm of inundation in a 1% AEP event.
3. Portions of the land on the site that are currently below the RL AHD2.4 (*erosion prone area* overlay) will be filled to that level to remove them from the overlay and protect them from salt water intrusion from the current level of a predicted **storm surge**.
4. Electricity will be provided by a solar and battery system (System) to produce sufficient energy and storage capacity to provide the design needs of 20kWk/day and battery capacity of 15Kwh. This System will be funded by the developer with a cap of $35,000 per dwelling house and installed during the building work process for each lot.
5. Communication system (phone and internet) will be provided by Wireless technology installed under supervision of NBNCo.
6. On-site wastewater management system in accordance with the requirements of *Queensland Plumbing and Wastewater Code* will be installed during the building work process for each lot.
7. Each lot will have 45,000 litre aboveground water storage connected to rainwater drainage systems for buildings and structures. These systems will be equipped with

[24] Urban Planet Planning Report 20 June 2024

[25] References -17(p42)

pumping and treatment mechanisms to provide potable water for household use. The water will be stored in containers that ensure a separate reserve supply is available in emergencies such as bushfire events.

Summation

One could be forgiven for holding the position that, as Australia has the lowest population density of any continent on the planet, protecting certain land for medium-term land use is not a rational strategy. But despite the fact Australia has a density of 1 person to every 30ha, 85% of Australians choose to crowd into urban areas that are within 50 kilometres of the coastline[26]

Adopting the proposed development strategy would serve as a benchmark for continued development in desirable but high-risk areas, affected by long-term climate change.

This allows for medium-term land use, as a resource, without prohibiting such utilisation, simply by providing options for adjustment and recovery facilities with low-cost outlooks, should future circumstances require modification and or abandonment of these locations.

Warren Bolton

Monday, 17 February 2025

[26] ABS Regional Populations -2023

References

Code	Document
1	Assessment of the seawall at Toogoom
2	Uncertainty complexity and concepts of good science in climate change modelling
3	Fraser Coast Shoreline Erosion Management Plan- Gap Analysis Report-2011 Cardno
4	FCRC- Planning our changed coastline- Council commentary
5	Fraser Coast coastal hazards adaptation strategy (CHAS)-coastal futures planning at changing coastline phase 6 adaptation options compendium QCoast 2100
6	Developing a coastal hazard adaption strategy- 2016
7	Insights into the future of Fraser Coast - KPMG- 2020
8	Coastal hazard technical guide [DEHP]- 2013
9	Hard protection structures as a principle of coastal Roseville Management- 2018
10	Flood risk-based planning- unidentified
11	Request for quotations of consultancy- inundation risk amendments-2021
13	Catastrophically predictions are more plausible than we thought- October 2024
14	The 2024 State of the climate report- perilous times on planet Earth's- bioscience 2024
15	Appendix B risk assessment discussion paper- Cardno Fraser Coast SEMP May 2011
16	Appendix C preliminary indicative of options costing - Cardno July 2012
17	Fraser Coast Coastal Hazard Adaptation Economic Analysis - CHAS phase 7- March 2021- AITHER Report
18	Strategic Outcome – Flood constrained land is avoided and the functions of flood plains are maintained and protected
19	New insights into climate science 2024/2025 WCRP
20	Climate Science Incites
21	Coastal futures: planning our changing shoreline FCRC 2025
22	FCRC shoreline erosion management plan- publication
23	FCRC shoreline erosion management plan- website
24	Fraser Coast shoreline erosion management options- assessment - Cardno 2012