



**Queensland
Government**

Department of Aboriginal and
Torres Strait Islander Partnerships

MASTERPLAN - AMENDMENT 2

HAMMOND ISLAND

DEPARTMENT OF ABORIGINAL AND TORRES
STRAIT ISLANDER PARTNERSHIPS

AECOM

CLIENT

Department of Aboriginal and
Torres Strait Islander Partnerships



In partnership with -
Torres Strait Island Regional Council



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01 INTRODUCTION



PROJECT BACKGROUND

The availability and cost of community residential housing in remote indigenous communities is affected by a range of factors including availability of residential land, unmet demand for housing and cost of building, limited housing choice options, and tenure restrictions on land. Housing is also periodically required for Government agencies, Councils and NGOs.

Industrial activity is one of the key pillars of employment in all communities. Councils recognise the need to provide diversity in local employment opportunities, and as such encourage growth by having suitable sites available for use by small business.

The right combination of housing choice and employment opportunity is a key ingredient in the achievement of successful and vibrant communities with a diversified economy. A practical, long term plan for the delivery of new housing, industry and other employment generating land use is intended to provide a clear indication of future growth and development within the community.

In consultation with the Remote Indigenous Land and Infrastructure Program Office (RILIPO), within the Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP), Torres Strait Island Regional Council (TSIRC) have identified the need to prepare Future Residential and Industrial Land Use Master Plan for Hammond Island in line with their Town Planning Scheme.

REPORT PURPOSE

The document encompasses the aspirations and hopes for Hammond Island and as such should be reviewed on an annual basis allowing for the update and addition of new priorities. Information in support of the community's growth should be added as annexures to this document allowing for a central repository of knowledge.

This report contains an overview of investigations and stakeholder consultation undertaken in Hammond Island community. It seeks to provide Council and DATSIP with a readily accessible and easily interpreted summary of the preferred Master Plan option, associated infrastructure requirements and implementation strategy.

Whilst residential expansion is a key element of the preferred Master Plan (and associated enabling infrastructure costs), it should also be noted that there are a number of smaller infill opportunities such as community use facilities, supported accommodation, arts centre redevelopment and marine transport facilities which would serve to enhance quality of life for residents and provide employment opportunities.

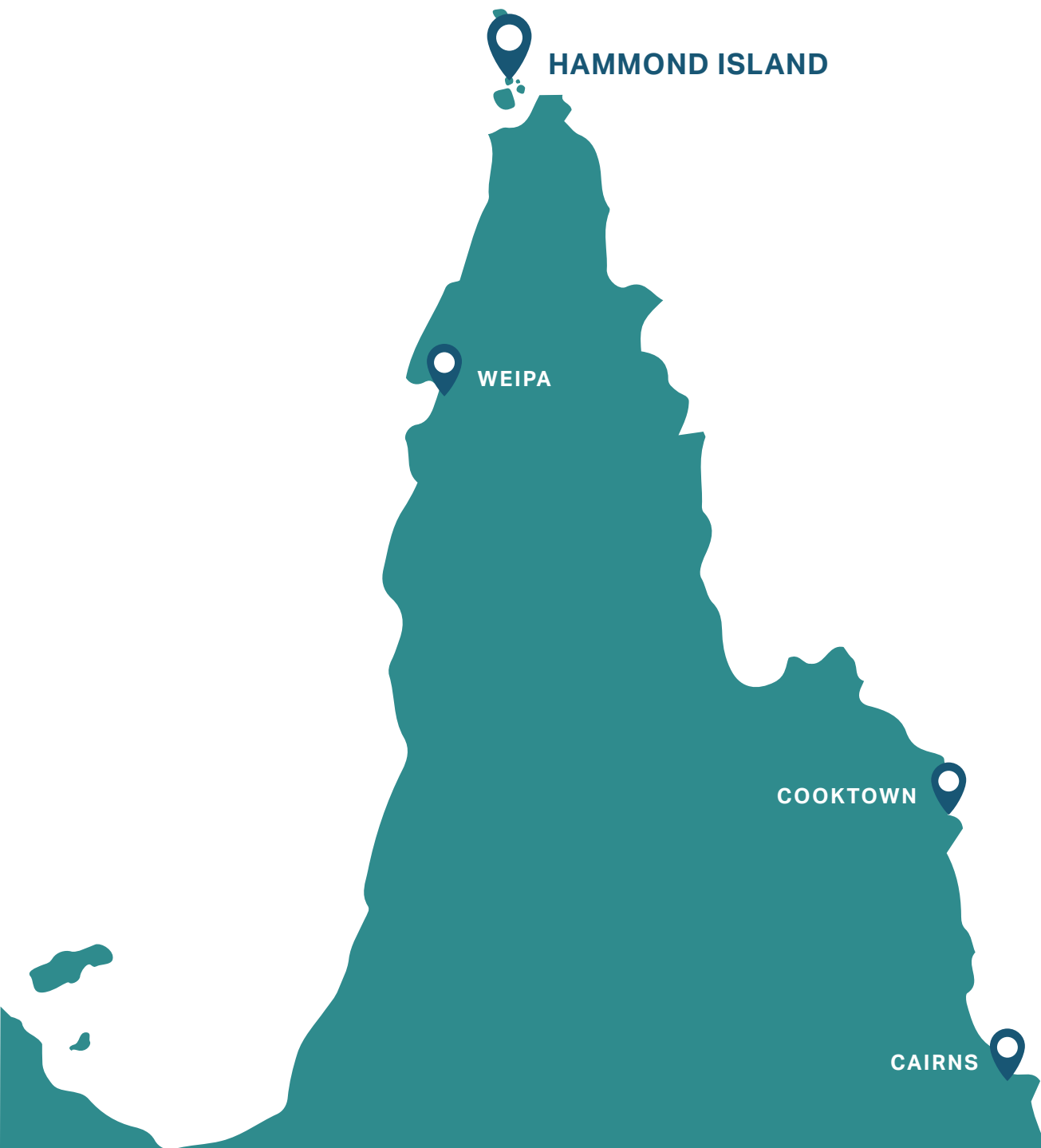
It should be noted that the preferred option and implementation strategy do not represent a funding commitment. It is intended that this report will be utilised by Council as an evidence base to support future applications for a range of potential funding and/or grants.

Future development should reflect planning scheme assessment benchmarks and consider the following design approaches:

- Disaster Resilience - Resilient Queensland 2018-2021
- Crime Prevention through Environmental Design (CPTED) - designing the built environment to create safer neighbourhoods by increasing the perceived likelihood of detection and apprehension
- Healthy by Design - practical guidance in designing walkable and ultimately more liveable communities
- Water Sensitive Urban Design (WSUD) - land planning and engineering approach which integrates the urban water cycle into urban design to minimise environmental degradation and improve aesthetic and recreational appeal
- Climate Change - carbon neutrality, carbon reduction, carbon farming, water security and energy efficiency.

02 COMMUNITY OVERVIEW





LOCATION

Hammond Island is a remote indigenous community located 31km off the northern tip of Queensland, within the Torres Strait Island Regional Council area. The closest township to Hammond Island is Thursday Island, located 1km to the south. Hammond Island is only accessed from Thursday Island and Horn Island via a ferry. The closest major city is Cairns, approximately 800km to the south.

Hammond Island is approximately 15.6km² in size and forms part of the Torres Strait Island Regional Council (TSIRC) Local Government Area (LGA).



TOWNSHIP AND MASTER PLAN AREA

The township is located on the north-eastern coast of Hammond Island. The core focus area for this Master Planning exercise, comprising the existing township and surrounding area, is shown in Figure 1.

COMMUNITY AND GOVERNANCE

Hammond Island is a 15 minute ferry ride from Thursday Island and is a hilly island, with mounds of basaltic rocks.

A reserve was established here in 1881 and Parry-Okeden and Roth were appointed trustees of the reserve in February 1900.

Hammond is also known as Kirriri by the traditional people of the Kaurareg and belongs to the Thursday Island Group. Members of the Kaurareg people were forcibly removed to the village of Poid on Moa Island in 1921 and 1922.

Hammond became the pearling station headquarters for a short time until its relocation to Thursday Island, and earlier in the 20th century gold was mined here. A cattle industry was then set up to supply the population of Thursday Island.

In 1929 a Catholic Mission was established for the children of the Filipinos and Malays, whose forefathers were brought to the Torres Straits as indentured labour.

The language spoken on Hammond Island is the Kalau Kawau Ya dialect and Creole.

Hammond Island is part of the Torres Strait Islands Regional Council, which is the largest of three Councils in the Torres Strait region, governing the outer islands. The Torres Strait Islands Regional Council was formed in 2008 as part of the State Government's amalgamation policy. It is a new local Council, governed under the *Local Government Act* (Qld). Before this, the area was under the jurisdiction of the *Community Services (Torres Strait) Act 1984* (Qld) and each community had its own independent Island Council. The current Council is formed by an elected Mayor and 15 elected Councillors, including the Deputy Mayor. The administrative branch of the Council is lead by the Chief Executive Officer who is responsible for managing the day-to-day affairs of the community and Council employees together with the elected representatives.



FIGURE 1: CORE MASTER PLAN AREA

LAND USE, FACILITIES AND SERVICES

The township of Hammond Island is approximately 60 hectares in size, located on a low lying plateau between Raehome Point and Bruce Point. Clusters of houses extend north along the coast from Raehome Point to Gobau Point. The housing stock on the island is a mix of one and two-storey detached houses.

Secondary education is provided on the nearby Thursday Island.

While Hammond Island does not have an airstrip, its proximity to Thursday Island provides easy access by ferry. The ferry service also connects with Horn Island, the gateway airport for the Torres Strait.

The main water supply for the community is located on Horn Island (Loggy Creek Dam).



LAND USE CATEGORIES

Development of the Master Plan has been undertaken using a number of land use categories. This page provides a summary of each land use.

RESIDENTIAL

Residential land uses primarily relate to the provision of traditional detached housing. Residential land may support a range of dwelling types including detached houses, duplexes and units. Residential land use is often co-located with open space which provides residents easy access to passive and active recreation.



COMMERCIAL

Commercial land uses typically involve business activities which may include the sale of goods (e.g. shops, restaurants) or provision of services (e.g. offices). Commercial activity may be a component of a broader industrial land use.



OPEN SPACE

Open space land uses support a range of informal and formal recreation activities. Informal recreation means the use of open space for activities such as bushwalking, cycling, picnics and playgrounds. Formal recreation means the land includes facilities for specific sporting activities (e.g. football, tennis, netball).



COMMUNITY FACILITIES

Community facilities land accommodates a broad range of activities which relate to core public or community services. Community facilities include uses for health services, education, arts and culture, religion, community support and utility infrastructure (e.g. water and sewage treatment, waste management).



INDUSTRIAL

Industrial land uses generally involve the manufacturing, processing, treatment or repair of goods. Industrial uses are generally categorised based on their level of impact based on noise, air and odour emissions. Examples of industrial land uses includes manufacturing plants, processing plants, workshops and warehouses. Certain industrial uses may also have components of, or similarities to, commercial land uses.



TOURISM

Tourism land uses are focussed on providing goods, facilities, services and entertainment for tourists. This may include caravan parks, campgrounds, short term accommodation, visitor centres or businesses operating tours.



TENURE

TSIRC is currently the Trustee for all land on Hammond Island which is Deed of Grant in Trust (DOGIT) tenure. Hammond Island, along with Poruma (Coconut) Island and St Pauls Community on Moa Island have been participating in a Queensland Government freehold pilot project since 2015.

There is an active native title claim over the entire island, QUD362/2010 / QC2010/003 – Kaurareg People #3, which has not yet been concluded.



FIGURE 2: HAMMOND ISLAND LAND TENURE



FIGURE 3: HAMMOND ISLAND TOWNSHIP LAND TENURE

DOGIT   

DEMOGRAPHICS

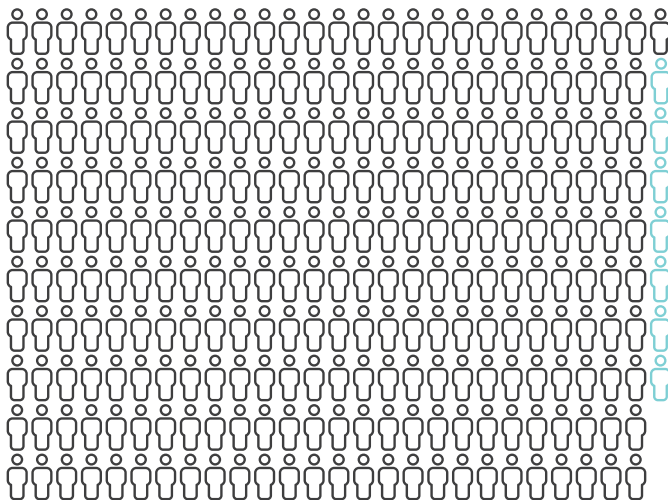
An overview of key population and housing characteristics within the Hammond Island LGA has been derived from the following published sources:

- Australian Bureau of Statistics – 2016 Census of Population and Housing data products (Hammond Island (L) (UCL322057) 15.6 km²):
 - / General Community Profile (Catalogue number 2001.0) (ABS 2016a)
 - / Quickstats webpage (ABS 2016b)
- Australian Bureau of Statistics – 2016 Census of Population and Housing data products (Hammond Island (LOC30700101) 15.6 km²):
 - / Aboriginal and Torres Strait Islander Peoples Profile (Catalogue number 2002.0) (ABS 2016c)
- TSIRC Planning Scheme 2016 - Local Government Infrastructure Plan - Hammond Island.

The 2016 Census data products provide the most recent overview of existing population and housing statistics. Earlier custom projections, published within the TSIRC Planning Scheme, specific to Hammond Island, have therefore been utilised to characterise long term population trends within the community.

261
PEOPLE

TSIRC PLANNING SCHEME



268
PEOPLE

ABS CENSUS

QUEENSLAND



3.2
BEDROOMS
PER HOUSEHOLD



2.6
PEOPLE
PER HOUSEHOLD

AUSTRALIA



3.1
BEDROOMS
PER HOUSEHOLD



2.6
PEOPLE
PER HOUSEHOLD



67*
DWELLINGS

**Based on 2016 Census*



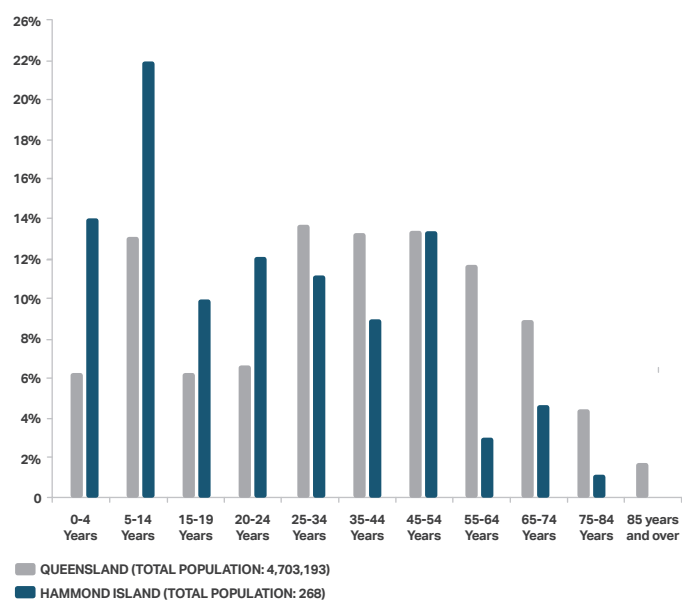
3.1*
BEDROOMS
PER HOUSEHOLD



4*
PEOPLE
PER HOUSEHOLD

POPULATION

The 2016 Census recorded the population within Hammond Island to be 268 persons. Graph 1 provides a summary of the total population and age structure for the 2016 census. It is evident that a large proportion of the population is aged below 14 years. The population profile indicates a lower representation of the 15-19 age group compared to the proportion of the population aged 14 years and under. This is likely attributed to high school age students travelling outside the community to attend boarding school. This aside, the majority of the population is aged between 20-54 years.



Source: (ABS 2016a; ABS 2016d)

Graph 1: POPULATION COUNT AND AGE STRUCTURE - 2016 CENSUS

Table 1 benchmarks the 2016 ABS Census data against previous population projections prepared by the Queensland Government Statistician's Office for the Torres Strait Island Regional Council. It is evident that projections for 2016 are generally consistent with the recorded census total. Based on the Torres Strait Island Regional Council projections, population will increase approximately 24% by 2036, resulting in a total population of 306.

SOURCE	2011	2016	2021	2026	2031	2036
ABS Census	225	268	-	-	-	-
TSIRC Planning Scheme*	245	261	274	286	297	306

*QGSO provided TSIRC customised population projections, derived from the Queensland Government population projections, 2013 edition.

Source: (ABS 2016a) (ABS 2016d) (Torres Strait Regional Council 2016)

TABLE 1: COMPARISON OF PROJECTION/RECORDS OVER TIME

HOUSING

Based on the 2016 Census, there were a total of 57 occupied and 9 unoccupied dwellings on Hammond Island. Table 2 provides a summary of key housing statistics.

ITEM	DETAIL
DWELLING COUNT	
Occupied	57
Unoccupied	9
Total	67
NUMBER OF BEDROOMS	
1 bedroom	0
2 bedrooms	15
3 bedrooms	20
4 or more bedrooms	22
Number of bedrooms not stated	0
Average number of bedrooms per dwelling	3.1
TENURE	
Rented	49
Other	9
Not stated	0

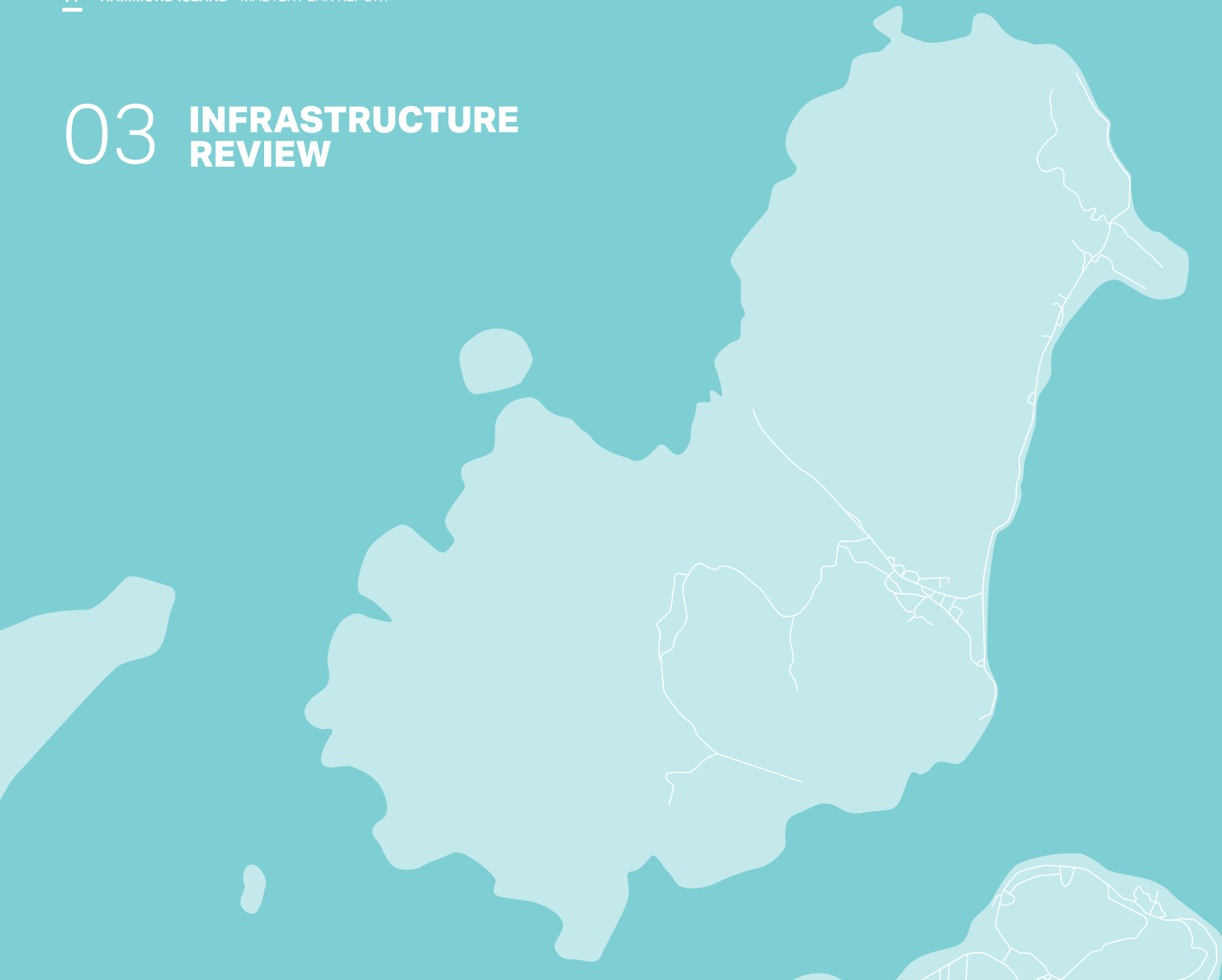
*QGSO provided TSIRC customised population projections, derived from the Queensland Government population projections, 2013 edition.

*Please note that there are small random adjustments made to ABS data values to protect the confidentiality of data. These adjustments may cause the sum of rows or columns to differ by small amounts from table totals.

Source: (ABS 2016a) (ABS 2016b) (Torres Strait Regional Council 2016)

TABLE 2: HOUSING CHARACTERISTICS HAMMOND ISLAND

03 INFRASTRUCTURE REVIEW



The following section provides an overview of the nature and capacity of existing infrastructure servicing the township. Further detailed information regarding existing infrastructure is provided in Appendix B.

WATER SUPPLY

Water supply infrastructure on Hammond Island is comprised of the following elements:

- Raw water sources: The raw water intake for Hammond Island comes from:
 - / Loggy Creek dam on Horn Island. This dam supplies Horn Island, with a connection to Thursday Island and from there to Hammond Island. Supply demands upon this raw water source will be affected by future development across the three communities
 - / There are also household rainwater tanks on some houses for drinking purposes
 - / In the past, groundwater wells have been used on Hammond Island. However, due to septic tank and overland flow contamination they are no longer in use. A filter upgrade project is currently underway to investigate the potential of resuming use of the wells
- Raw water rising main:
 - / Hammond Island's storage reservoirs are connected to Thursday Island through a 3.25 km, DN150 mm submarine pipeline. The pipeline is constructed of HDPE for the submerged section (1.6 km) and uPVC for the overland section on each island (770 m on Thursday Island and 865 m on Hammond Island).
- Water Treatment:
 - / Water from the submarine pipeline is treated on Thursday Island

- Potable water storage reservoirs:
 - / Water storage is comprised of a 430 kL concrete tank and a 90 kL fibreglass tank located on an elevated site to the west of the town
- Gravity feed reticulation system:
 - / The majority of underground mains servicing the town are made up of DN80 mm uPVC or older DN80 mm galvanised pipe
 - / The valves and hydrants in the system, also DN80 mm and over 30 years old, are in excess of their anticipated design life span
 - / Upgrades to the water distribution system were identified in the TSIRC Regional Water and Sewerage Upgrades Design Report (AECOM, 2015) including selective valve and hydrant replacements, as well as approximately 2.8km of water mains. However, these have not yet been completed.

An Average Day (AD) water demand of 360 L/EP/day was adopted for Hammond Island, as per the TSIRC Regional Water and Sewerage Upgrades Design Report (2015). The existing water supply demands are shown in Table 3.

DESCRIPTION	POPULATION (EP)	AD (L/S)	PD (L/S)	PH (L/S)
Residential Lots	290	1.2	2.7	5.4
Non-Residential Lots	-	0.1	0.2	0.5
TOTAL		1.3	2.9	5.9

TABLE 3: EXISTING WATER SUPPLY DEMANDS

SEWERAGE

Hammond Island is currently not serviced by a reticulated sewer system. Wastewater produced in the community is captured and treated via septic systems connected to each property, with effluent being disposed of via absorption trenches and sludge periodically pumped out and disposed of to landfill on the island. The majority of septic systems operate satisfactorily, however there are problems on some lots due to the low permeability of the clay soil which is causing the absorption trenches to fail. This primarily occurs during the wet season.

The MIP4 Hammond Island Sewerage Reticulation & Treatment Project (AECOM, 2009) outlined the infrastructure requirements and cost of a reticulated sewerage system to service the community. The new sewerage system would consist of gravity sewers, sewage pump stations, rising mains and a treatment facility. The treatment facility is most likely to be located to the north of the island, north of the existing solid waste depot. The treated effluent would then be discharged into the ocean via an ocean outfall. However, this sewerage system has not yet been constructed.

An Average Dry Weather Flow (ADWF) of 270 L/EP/day was adopted for Hammond Island. The existing wastewater flows for Hammond Island are shown in Table 4.

DESCRIPTION	ADWF (L/S)	PWWF (L/S)
Residential Lots	0.9	5.0
Non-Residential Lots	0.2	1.2
TOTAL	1.0	6.2

TABLE 4: EXISTING WASTEWATER FLOWS

TRANSPORT

Hammond Island contains a small network of sealed / paved internal roads and unsealed tracks. Where new developments are proposed that require new roads to access the sites, sealed / paved roads complying with the minimum requirements of FNQROC Design Manual D1 – Road Geometry and the desired standards of service provided in the TSIRC Planning Scheme (Jul 2016) will be required.

STORMWATER

There is limited piped drainage at Hammond Island. There are several road culverts at intervals along Hammond-1 St that direct stormwater runoff to the sea.

Stormwater infrastructure will be required to service drainage at any new development. It is anticipated that this can be managed by drainage associated with roadways.

ELECTRICITY SUPPLY AND COMMUNICATIONS

The existing electrical supply on Hammond Island is provided by a central power station comprised of multiple diesel generator sets, located to the east of the town centre. The distribution network is made up of a combination of overhead and underground supply to the property boundary. Extension of existing supply to new properties will be required.

Communications is provided by conduiting. Extension of conduiting to the frontage of new properties will be required.



FIGURE 4: EXISTING INFRASTRUCTURE



04 MASTER PLAN METHODOLOGY



The process to develop the Master Plan sought to balance community goals and aspirations with key social, economic and environmental factors. The intention was to produce a comprehensive framework for the growth and development of Hammond Island.

The adjacent infographic depicts the five stages of the Master Planning process undertaken for Hammond Island.



Stage 1 - Planning Context

Analysis of the current State and local planning framework, supporting the development of opportunities and constraints for future land uses and development.



Stage 2 - Workshop

A Master Planning workshop was held on Hammond Island in April 2018 with participants from Council, DATSIP and AECOM. The workshop aimed to establish aspirations for future development in the community and inform the development of the Concept Plan.



Stage 3 - Concept Plan

Based on the opportunities and constraints identified during the planning analysis and workshop, a concept plan identifying future land use patterns and opportunities was prepared for consultation.



Stage 4 - Consultation

The Concept Plan was provided to Council for community consultation, where community members were invited to provide feedback on the settlement pattern and land uses proposed.



Stage 5 - Final Master Plan

Through community consultation the concept plan was refined into the Final Master Plan. The Master Plan aims to guide the future growth and development in Hammond Island.

05 PLANNING REVIEW



OVERVIEW

This chapter provides an overview of the following policies, plans and legislation which are relevant to the Hammond Island Master Plan:

- State
 - / Queensland State Planning Policy 2017
 - / *Vegetation Management Act 1999*
 - / *Nature Conservation Act 1992*
- Regional
 - / Torres Strait and Northern Peninsula Regional Plan 2009-2029
- Local
 - / Torres Strait Island Regional Council Planning Scheme.

STATE PLANNING POLICY

The [State Planning Policy \(SPP\)](#) identifies State interests that must be reflected in all new Queensland Planning Schemes, ensuring that these interests are represented in development and land use decisions across Queensland. The State interests are grouped under five key themes:

- Liveable communities and housing
- Economic growth
- Environmental heritage
- Safety and resilience to hazards
- Infrastructure.

At its time of preparation, the TSIRC Planning Scheme appropriately integrated the State Planning Policy. Any future amendments to the planning scheme to align with this Master Plan would need to consider the current SPP.

VEGETATION MANAGEMENT ACT 1999

The majority of the island including the township is mapped as Category B Regulated Vegetation which is regulated under the *Vegetation Management Act 1999*. Clearing of vegetation within a Category B area requires approval under the *Vegetation Management Act 1999*.

Vegetation surrounding and in the township is mapped as Of Concern Regional Ecosystems. Appendix C contains a copy of regional ecosystem mapping for the township and surrounding area. Clearing vegetation in these areas would generally not be supported unless the land is located within an urban zone.

NATURE CONSERVATION ACT 1992

The protected plants flora survey trigger map identifies high risk areas under the *Nature Conservation Act 1992* which are likely to contain endangered, vulnerable or near threatened flora species. A flora survey is required prior to any vegetation clearing in mapped high risk areas.

Hammond Island, including the township is mapped a high risk area. Appendix C contains a copy of the flora survey trigger map for Hammond Island.

TORRES STRAIT AND NORTHERN PENINSULA REGIONAL PLAN

Hammond Island is within the Torres Strait region and is subject to the Torres Strait and Northern Peninsula Regional Plan (the Regional Plan) 2009-2029. The Regional Plan provides direction for land use and development with a planning horizon of 2029. The Regional Plan aims to identify the opportunities and challenges for each of the Council areas within the Region and support the implementation of the local Planning Scheme.

The opportunities available to Hammond Island include :

- Sustainable industries (marine based, Indigenous cultural tourism, arts and crafts, construction)
- Enhancing the liveability of the townships to increase attraction and retention of workers and families
- Localised energy generation through alternative and renewable technologies
- Improving the security and reliability of community water supplies
- Regionally significant projects providing social infrastructure supporting resident and non-resident populations.

The challenges impacting the Hammond Island within the Regional Plan include:

- Preparing and implementing a community plans and planning scheme
- High cost of living due to population size, reliance on imports and distance to markets
- Maintaining a viable community population due to lack of opportunity and education
- Absence of secure individual title
- Significant and complex transportation requirements due to remote region and island form
- Job creation
- Addressing disadvantage
- Remoteness and limited infrastructure
- Climatic conditions and seasonal water availability.

PLANNING SCHEME

Hammond Island is a community within the TSIRC Local Government Area (LGA), with development subject to the provisions stipulated in the Zenadth Kes Planning Scheme 2016. The Planning Scheme, adopted in July 2016, was prepared in accordance with the Queensland Planning Provisions (QPP) version 3.1 dated 27 June 2014 and reflects the State interests outlined in the State Planning Policy (SPP).

The preferred land use pattern for Hammond Island township and surrounding area is expressed in the zone map contained within the Hammond Island Local Plan. The zone map for Hammond Island consists of two zones being the Township zone and Environmental management and conservation zone. The areas included in the Township zone include:

- The area is centred around Marietta Road, fronting the bay of Port Kennedy
- All commercial, government and industry uses
- The majority of lots that accommodate dwelling houses including the residential lots located along The Esplanade, stretching north towards Gobau Point.

The zone map identifies a Township Expansion Precinct in the north-western section of the township along Marietta Road. These areas may be suitable for future residential/urban development uses.



FIGURE 5: PLANNING SCHEME ZONE MAP

- Township
- Environmental management and conservation



LOCAL AREA PLAN

The Planning Scheme includes a range of Local Area Plan maps which highlight particular environmental and physical matters which may affect development (similar to traditional overlays). These include:

- Gogobithiay (land, sea and sky) - waterways and areas of environmental value (high, moderate, low)
- Natural Hazards
 - / Landslide, bushfire and acid sulphate soils
 - / Flood and coastal.

It is important to note that certain mapped features may trigger procedural and/or design requirements for development whereas others relate to physical constraints.

Key characteristics for each of these elements include:

- Environmental value - the existing township is identified as having low environmental value, however the surrounding wetlands and hillsides are identified as moderate and high value respectively
- Landslide - hillside areas surrounding the existing township area identified as landslide hazard areas
- Bushfire hazard - land bordering the south of the township is within mapped areas of medium bushfire hazard, with some south-eastern side of the township within the mapped area for potential bushfire impact buffer
- Potential Acid Sulfate Soils - the township is wholly located on land above 5m and below 20m AHD, and bordered by land below 5m AHD with acid sulphate soils
- Flooding - the western and southern areas of the township area are within or border the flood hazard area, due to the flat nature of the land in the township surrounded by elevated land areas
- Coastal - the Storm Tide Inundation Area affects the eastern and western fringes of the township.

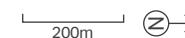
For the purposes of Master Planning, the flooding and coastal hazards represent a physical constraint to future development. Figure 6 overlays these elements to indicate areas of the township which are constrained by these hazards.



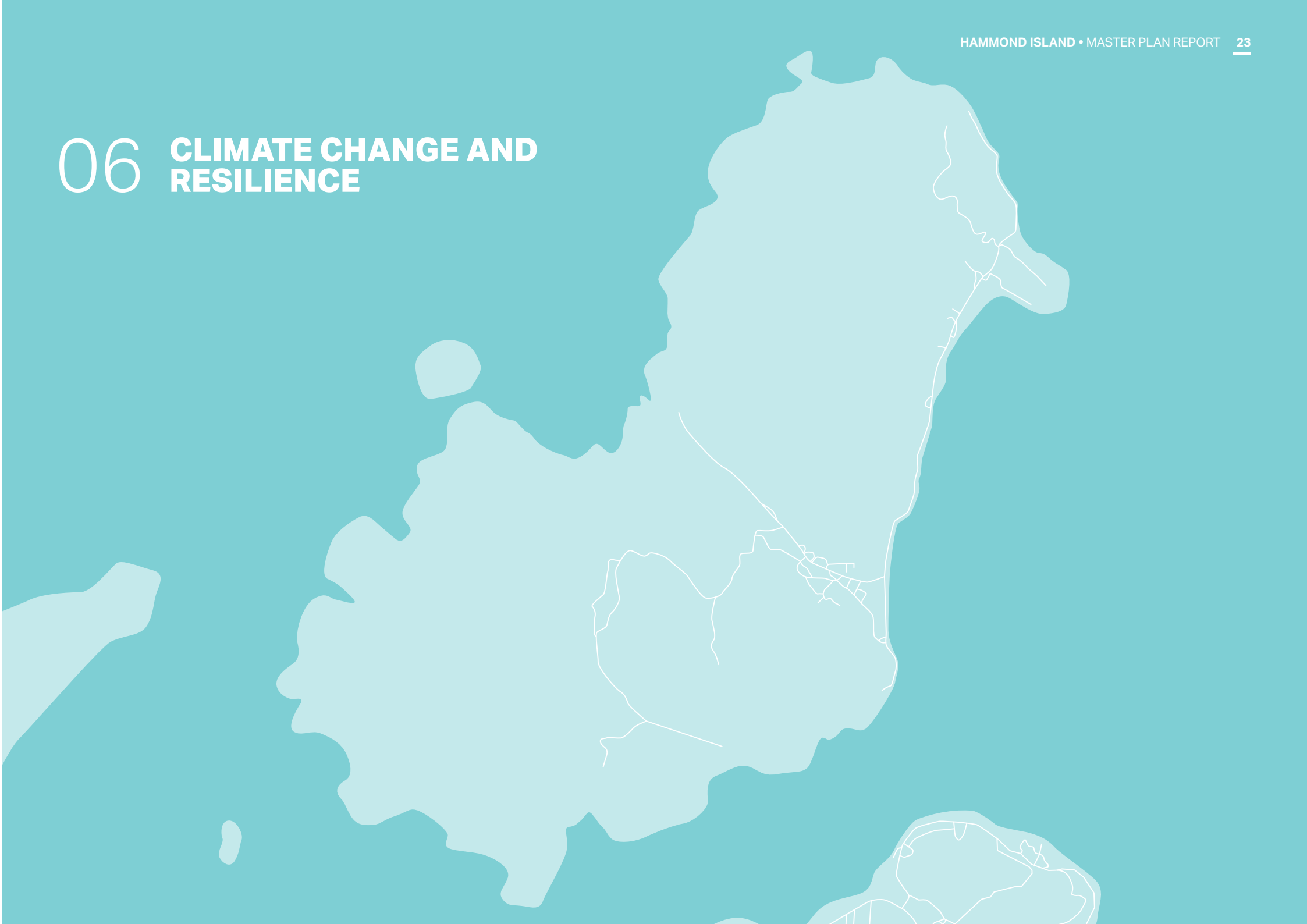
FIGURE 6: PLANNING SCHEME OVERLAYS - FLOOD AND COASTAL HAZARDS

PLANNING SCHEME OVERLAYS

- Storm tide inundation area
- Flood hazard
- ▨ Low lying land
- - - Erosion prone area



06 CLIMATE CHANGE AND RESILIENCE



CLIMATE CHANGE & PLANNING

Climate change is now a key consideration when undertaking community planning with climate adaptation strategies common place for Queensland communities. The increased risk of natural hazards including bush fires, drought, flood and changed precipitation patterns needs consideration when planning for the future vitality and safety of Queensland communities.

The Queensland Government has developed two key strategies that identify the risks that climate change poses to Queensland communities including:

- Queensland Climate Transition Strategy
- Resilient Queensland 2018-2021.

Queensland Climate Transition Strategy

The [Queensland Climate Transition Strategy](#) identifies the Queensland Government's commitment to addressing and mitigating climate change risks for Queensland. The Strategy outlines three climate change commitments as follows:

- 50% renewable energy for Queensland by 2030
- Zero net emissions by 2050
- Interim emissions reduction target of 30% below 2005 levels by 2030.

The actions associated with achieving each of the commitments above are categorised into three pathways as shown in Figure 8. Pathway 3 has bearing on the Master Planning process for Hammond Island. Achieving the Strategy's goals at a regional community level hinges on empowering local governments to enact the actions outlined in Figure 9.

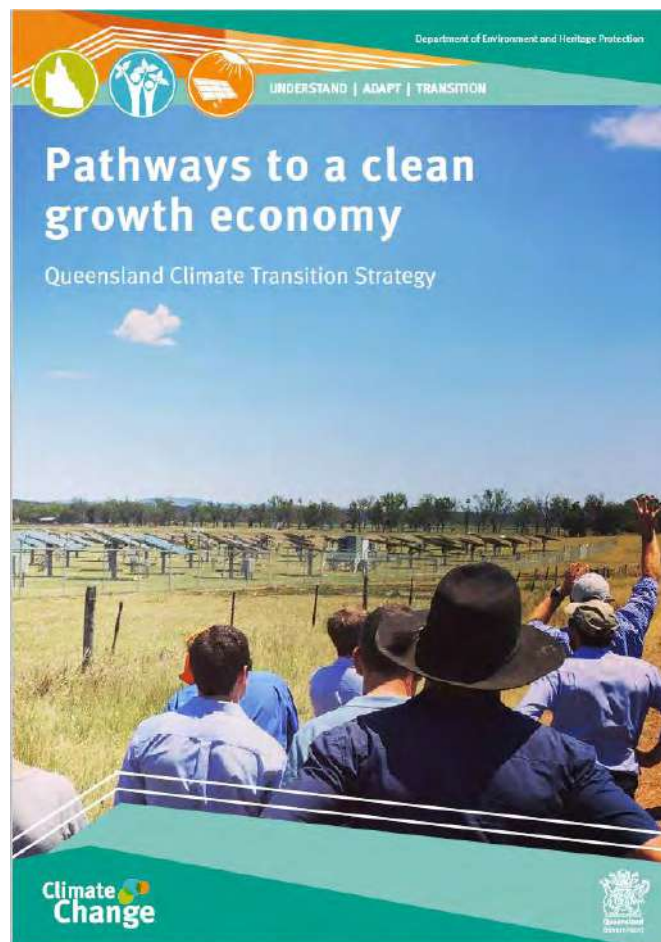


FIGURE 7: QUEENSLAND CLIMATE TRANSITION STRATEGY



FIGURE 8: QUEENSLAND CLIMATE TRANSITION STRATEGY - PATHWAYS

Response 5

Support Queensland communities to take action

Action

5.1	Build leadership capacity within communities to develop place-based climate transition roadmaps
5.2	Our Transition—provide tools, data and financial support for communities
5.3	Zero net pledges and Talking Transition program
5.4	Decarbonise remote communities
5.5	Work with local governments to build climate transition capacity

FIGURE 9: QUEENSLAND CLIMATE TRANSITION STRATEGY - PATHWAY 3, RESPONSE 5 ACTIONS

Resilient Queensland 2018-21

The [Queensland Strategy for Disaster Resilience 2017](#), originally developed in 2014, was updated in 2017 to reflect international best practice on climate change risk and delivering a comprehensive, all-hazards approach to mitigating risk and building disaster resilience in Queensland. The Strategy provides an overarching framework to achieve its four key objectives:

- Queenslanders understand their disaster risk
- Strengthened disaster risk management
- Queenslanders are invested in disaster risk reduction
- There is a continuous improvement in disaster preparedness, response and recovery.

The aim of the Strategy is to build Queensland's disaster resilience through a collaborative whole of government approach to disaster resilience that is regionally coordinated, locally led and supported by state resources.

[Resilient Queensland 2018-21](#) provides a set of actions aligned with the Queensland Strategy for Disaster Resilience 2017. The actions relevant to local governments include:

- Contribute to the development of local and regional resilience and recovery plans
- Talk to the Queensland Government about developing a community resilience assessment and a prioritised action plan.

The full set of actions associated with the strategy should be reviewed when considering implementation of this Master Plan. The strategy is included in Appendix E.

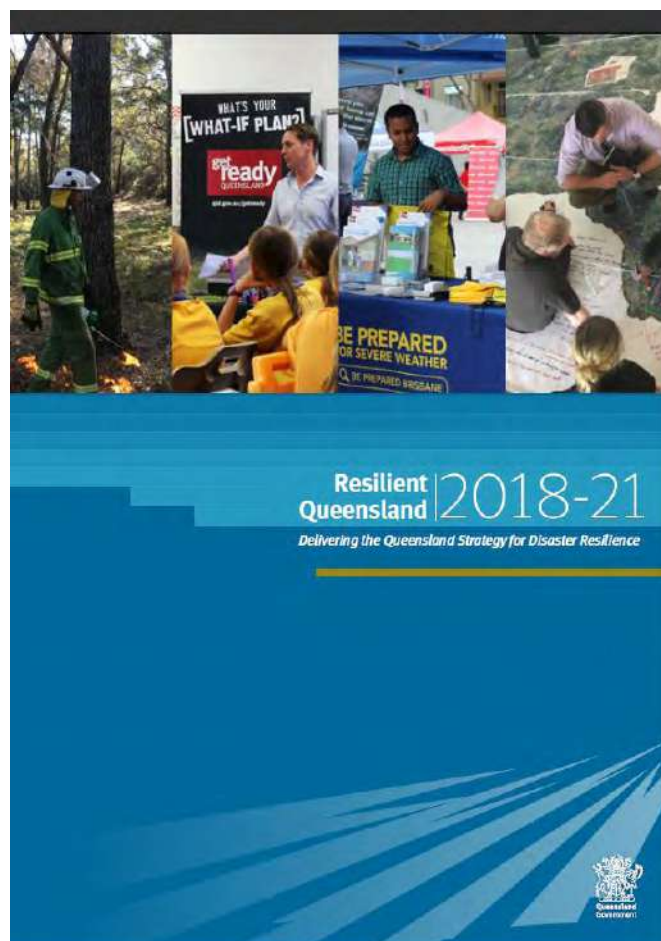


FIGURE 10: RESILIENT QUEENSLAND 2018-21 DRIVERS FOR DISASTER RESILIENCE

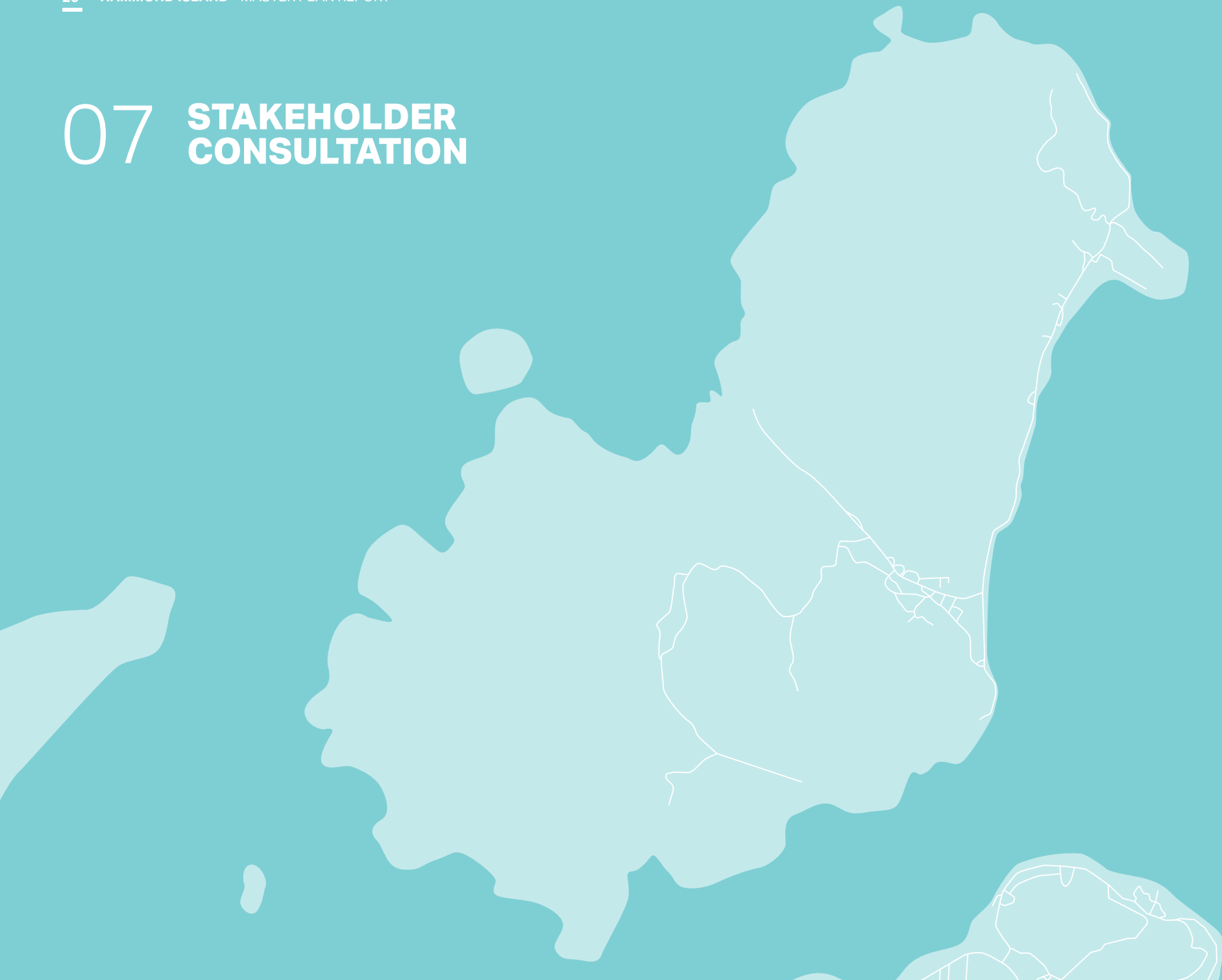
Source: Queensland Government, 2018. *Resilient QUEENSLAND 2018-21 Delivering the Queensland Strategy for Disaster Resilience*



FIGURE 11: RESILIENT QUEENSLAND 2018-21 DRIVERS FOR DISASTER RESILIENCE

Source: Queensland Government, 2018. *Resilient QUEENSLAND 2018-21 Delivering the Queensland Strategy for Disaster Resilience: SUMMARY*, May 2018

07 STAKEHOLDER CONSULTATION



OVERVIEW

Development of the Master Plan has been informed by consultation with community stakeholders. The below chart outlines the phases of engagement and concept development for the Hammond Island Master Plan.

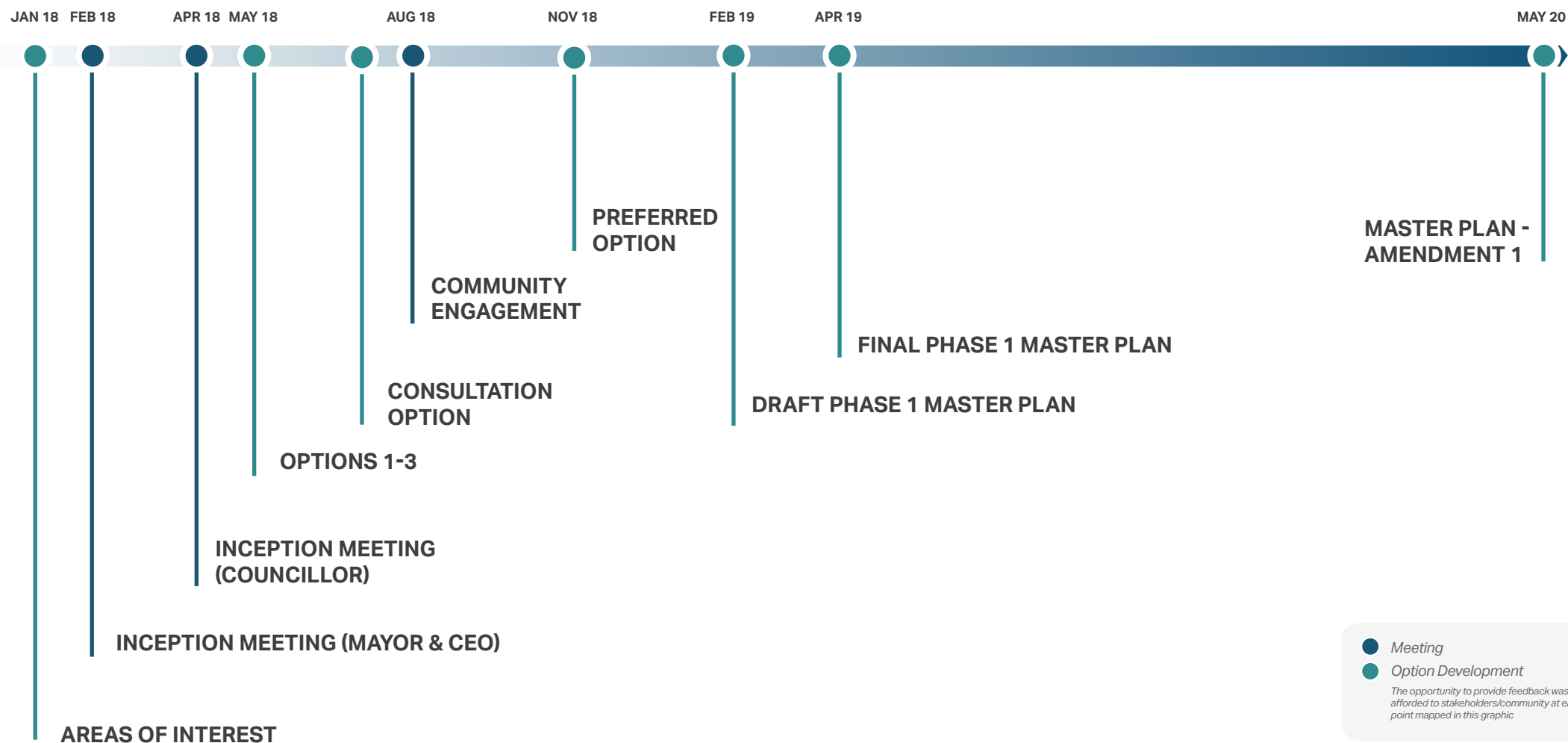


Table 6 provides an overview of consultation activities for the project. To facilitate discussion and engagement with Council and community stakeholders an initial “areas of interest” figure (Figure 17) was prepared. Further detail regarding this initial concept is provided in Section 06.

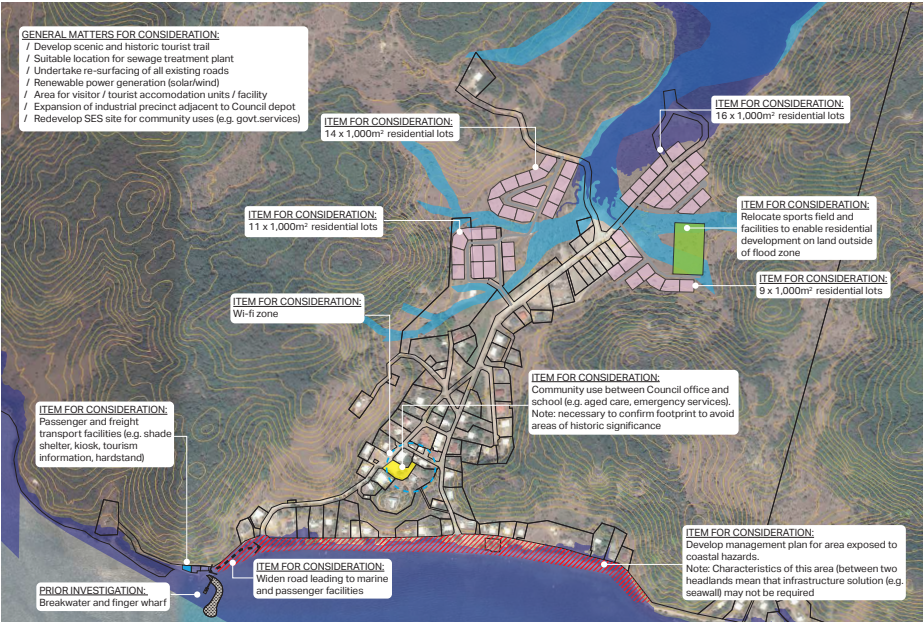
Following initial consultation with Council, a Community “Have Your Say” day was held on 11 August 2018 at the Hammond Island Community Hall. Figure 12 shows the flier which advertised the engagement session.

DATE	LOCATION	PARTICIPANTS	DETAILS
February 2018	-	Fred Gela (Mayor), CEO, Allen Cunneen (DATSIP), David Faulkner (DATSIP) and Robert Zigterman (DATSIP)	Inception meeting with TSIRC Mayor and CEO to discuss Master Planning and consultation approach
11 April 2018	TSIRC Hammond Island Office	Cr Mario Sabatino, Kelly Beckley (Divisional Manager), Robert Zigterman (DATSIP), John Conroy (DATSIP).	Inception meeting with local Councillor to present draft areas of interest and confirm community engagement approach.
11 August 2018	Hammond Island Community Hall	Cr Mario Sabatino, Robert Zigterman (DATSIP), Bronwyn van Gool (AECOM), various community members	Community engagement day to explain Master Planning and obtain ideas and feedback.

TABLE 6: PROJECT MEETINGS

Have your say

about future land use needs for Hammond Island



Your input on the future of Hammond Island is important.

Where: Hammond Island Community Hall
When: Saturday 11th August 2018
Time: 1:00pm - 3:00pm
Covenor: Torres Strait Island Regional Council

For more information, please email: info@TSIRC.qld.gov.au

FIGURE 12: AREAS OF INTEREST



RESIDENTIAL LOW DENSITY - DETACHED HOUSE



TOURISM - CARAVAN PARK



COMMERCIAL - SHOP AND OFFICE BUILDING



RESIDENTIAL LOW DENSITY - DETACHED HOUSE



RECREATION / OPEN SPACE - PARK



INDUSTRIAL - SHEDS / WORKSHOP



RESIDENTIAL MEDIUM DENSITY - UNITS



RECREATION / OPEN SPACE - SPORTING FACILITIES

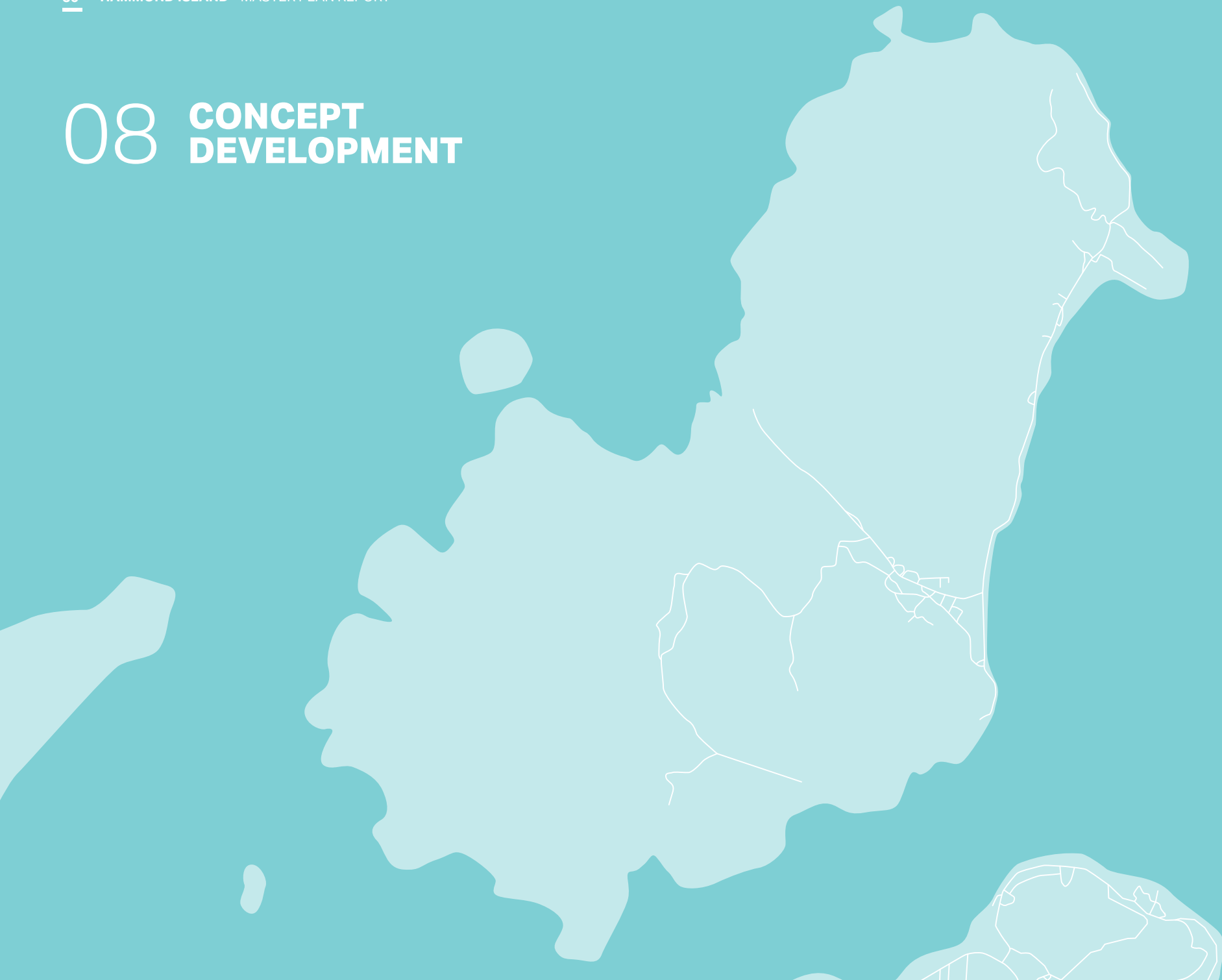


INDUSTRIAL - SHEDS / WORKSHOP / LAYDOWN

LAND USE EXAMPLES

FIGURE 13: LAND USE EXAMPLES FOR COMMUNITY CONSULTATION

08 CONCEPT DEVELOPMENT



OVERVIEW

As part of the Master Planning process, it is also important to understand how Hammond Island functions now and in the future within the broader Torres Strait region (encompassing island communities within both Torres Shire Council and Torres Strait Island Regional Council).

Hammond Island is located adjacent to Thursday Island and Horn (Wasaga) Island, which are collectively the gateway and administrative centre of the Torres Strait. It is noted that Thursday Island has experienced significant residential and non-residential development to an extent that limited areas remain for future growth. Without significant increases to density, future development for housing, commercial, industrial and administrative uses, may need to be accommodated on surrounding islands.

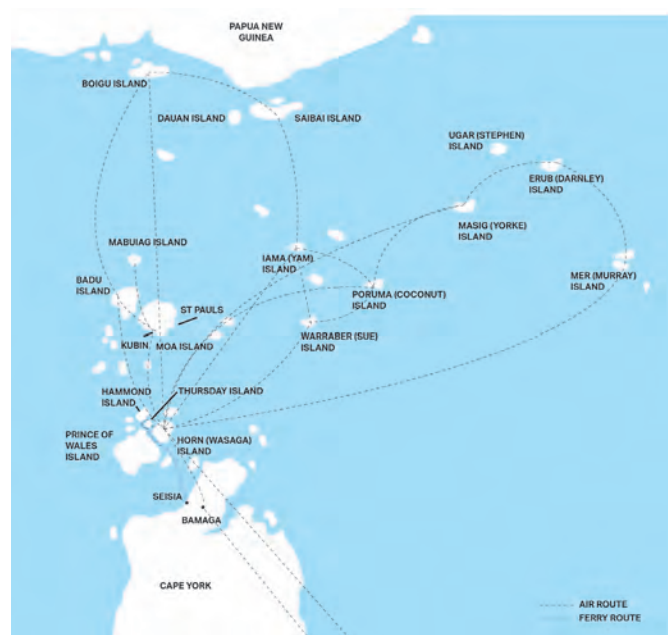


FIGURE 14: TORRES STRAIT REGION AND TRANSPORT ROUTES

Key questions which will influence the future planning and development on Hammond Island therefore include:

- Should Hammond Island become the administrative hub for Torres Strait Island Regional Council?
- Should residential areas and improved ferry facilities be provided to facilitate people to be able to commute to Thursday Island for work?
- Is there a desire to develop further tourism activities and accommodation?

AREAS OF INTEREST

Based on an understanding of the regional context of Hammond Island, an initial concept for the township was developed to facilitate initial discussions with Council (Figures 15-17).

Items for consideration included:

- Town Centre - suitability of approximately 2,160 m² site between TSIRC Office and School for development of community facilities such as Aged Care, Police and Ambulance
- Marine Facility - development of passenger and freight transport facilities (e.g. waiting shelter, tourism kiosk/facility, hardstand) adjacent to the jetty and boat ramp
- Residential Expansion - subdivision for 30 x 1,000 m² residential lots on the north-east side of the township
- Coastal Zone - are cost-effective strategies and solutions available to address potential risks posed by coastal processes?



FIGURE 15: ITEM FOR CONSIDERATION - TOWN CENTRE



FIGURE 16: ITEM FOR CONSIDERATION - MARINE FACILITY



FIGURE 17: AREAS OF INTEREST

OPTION DEVELOPMENT

Following the initial discussions with Council representatives, three options were developed for broader engagement with the Hammond Island Community. Common features across the three options included:

- Creation of a Wi-Fi zone in the centre of town
- Infill development between the Council Office and School for a community use
- Development of a coastal management plan for the area exposed to coastal hazards (area extending north from the marine facility). It is noted that the characteristics of this area, being located between two headlands, mean that infrastructure solutions (e.g. seawall) may not be required
- Widening of the road leading to the marine and passenger facilities
- Identification of a site for passenger and freight transport facilities (e.g. shade shelter, kiosk, tourism information point and hardstand)
- General matters for consideration (no specific site identified)
 - / Creation of scenic and historic tourist trail
 - / Suitable location for sewage treatment plant
 - / Undertake re-surfacing of all existing roads
 - / Renewable power generation (solar/wind)
 - / Area for visitor / tourist accommodation / facility
 - / Expansion of industrial precinct adjacent to Council depot
 - / Redevelop SES site for community uses.

The following sections outline the different approaches to residential expansion for each option. The purpose of these options was to demonstrate how the limited supply of land could be used to create new residential lots, depending on different lot sizes and flood mitigation works.

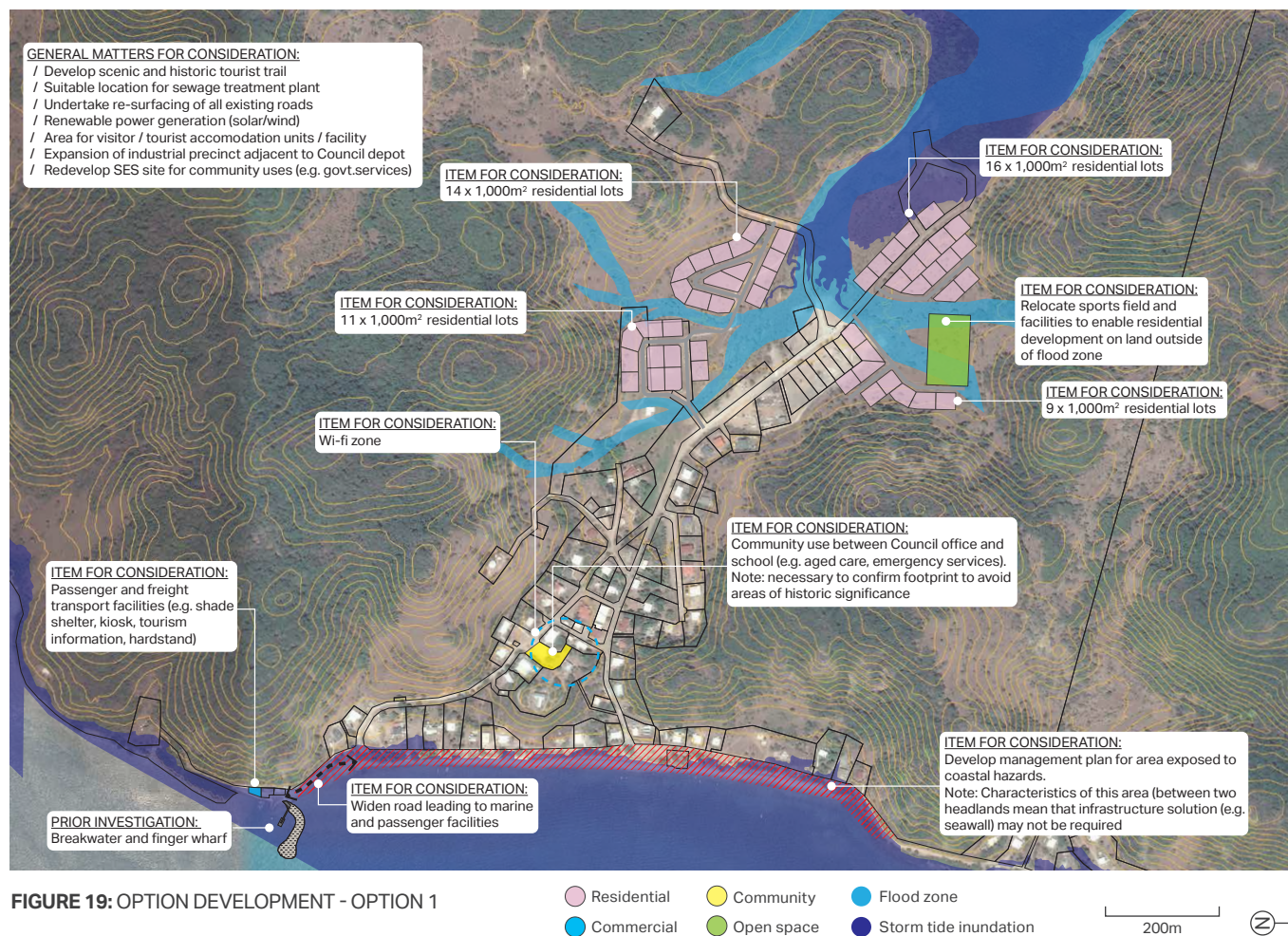


FIGURE 18: OPTION DEVELOPMENT - CONTEXT

OPTION 1

Option 1 was a large-lot approach which sought to accommodate development without significant civil works to mitigate flooding and overland flow. Details included:

- Relocation of sports field north to within the floodplain to accommodate 11 x 1,000 m² residential lots
- Three discrete residential subdivisions, located outside of the flood and storm tide inundation zones to create 39 x 1,000 m² lots.



OPTION 2

Option 2 was a standard-lot approach which sought to accommodate development without significant civil works to mitigate flooding and overland flow. Details included:

- Relocation of sports field north to within the floodplain to accommodate 17 x 750 m² residential lots
- Three discrete residential subdivisions, located outside of the flood and storm tide inundation zones to create 58 x 750 m² lots.

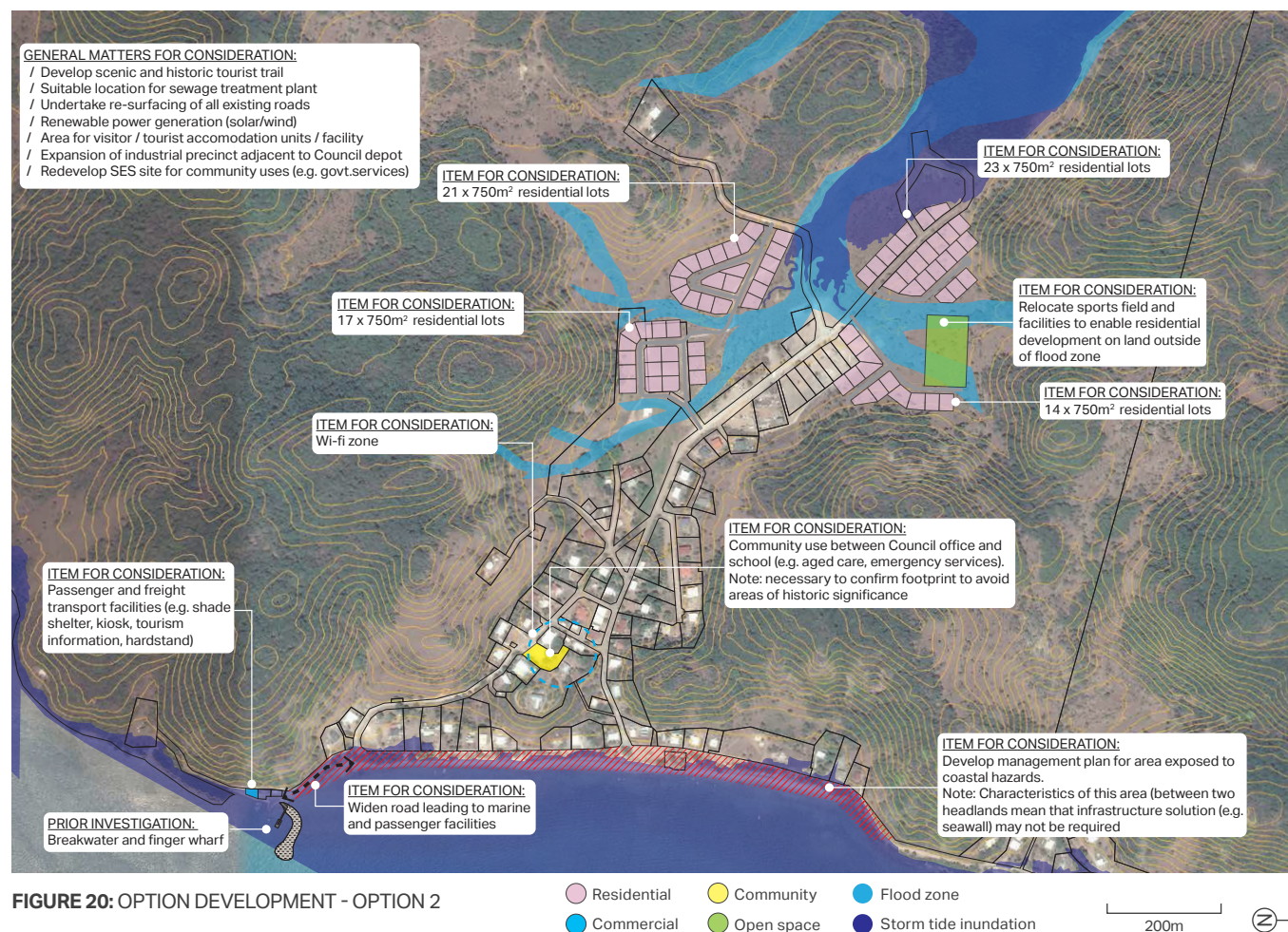


FIGURE 20: OPTION DEVELOPMENT - OPTION 2

OPTION 3

Option 3 was a large-lot approach which sought to retain the existing sporting field and instead accommodate development by redirecting flooding and overland flow. Details included:

- Creation of a northern bund and channel to reduce floodplain extent
- Three discrete residential subdivisions, two located outside of existing the flood and storm tide inundation zones and one within an area protected by the new bund to create 74 x 1,000 m² lots.

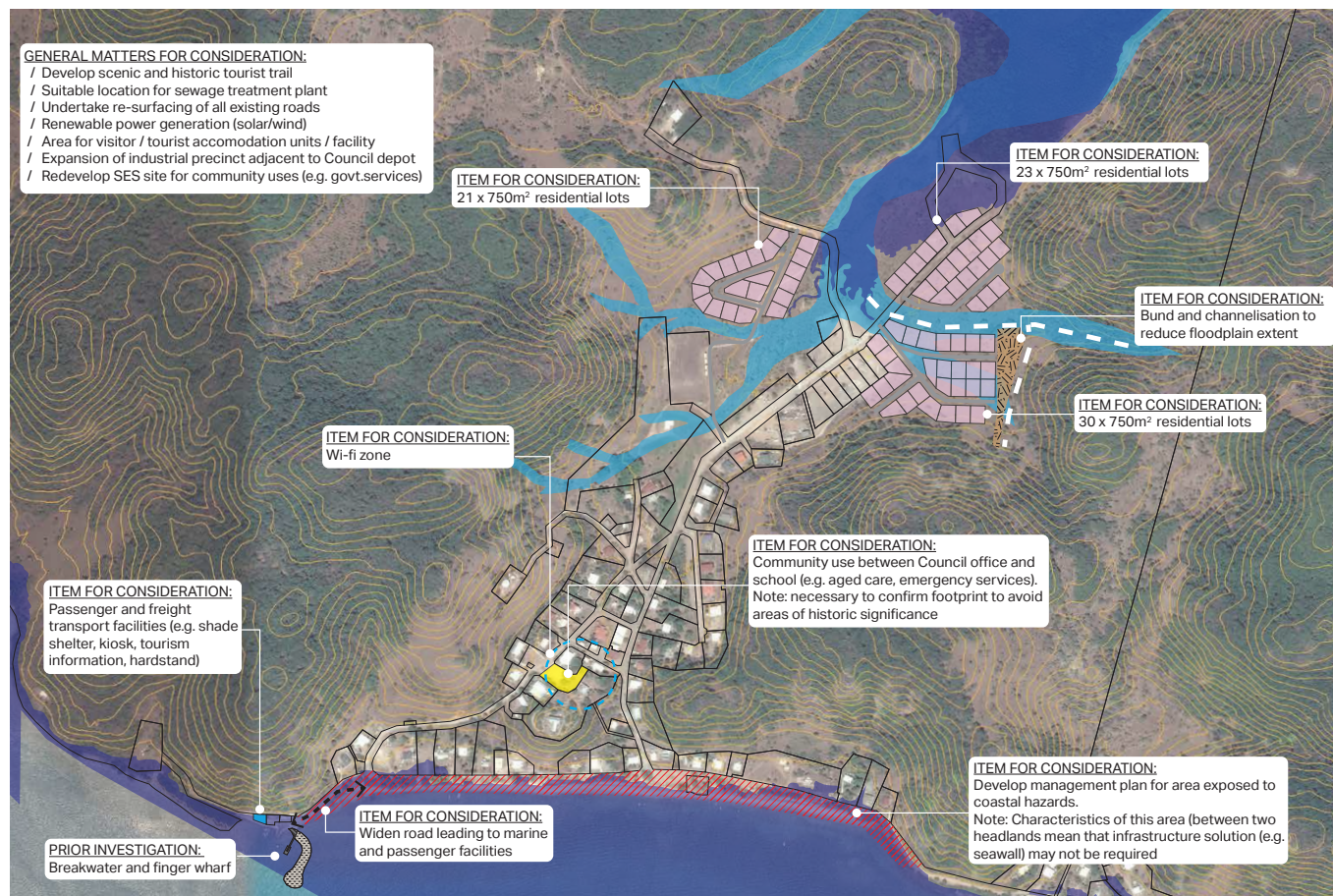
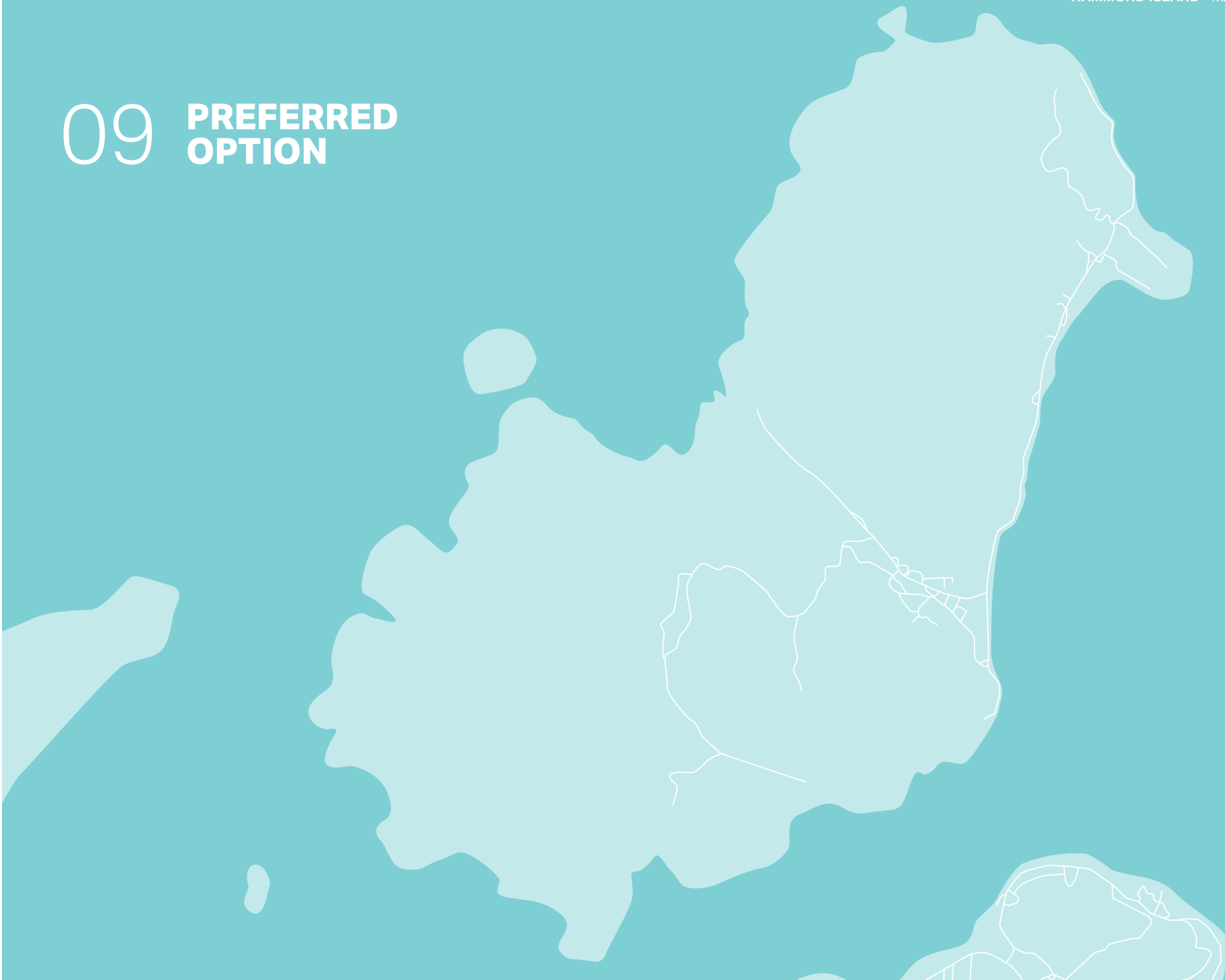


FIGURE 21: OPTION DEVELOPMENT - OPTION 3

09 PREFERRED OPTION



Based on the feedback provided by Council and community members on the three options, a preferred option was developed for further infrastructure assessment and costing. The preferred option adopted the expansion approach shown in Option 3 and included additional long-term expansion areas to the north and west. A water storage location was also identified to the south.

The preferred option, shown in Figure 22, comprises of residential, commercial, community facilities and industrial uses.

General matters for consideration:

- Develop scenic and historic tourist trail
- Suitable location for sewage treatment plant
- Undertake re-surfacing of all existing roads
- Renewable power generation (solar/wind)
- Area for visitor / tourist accommodation units / facility
- Expansion of industrial precinct adjacent to Council depot
- Redevelop SES site for community uses (e.g. govt.services)
- Investigation to identify feasibility/location of a quarry
- Seal all roads
- Footpaths.

It is noted that the proposed residential expansion areas would likely facilitate a level of population growth which exceeds the projected growth rate of 45 persons in the next 15 years.

The following sections provide a summary of each component of the Master Plan, outlining cost, related projects and priority within the following timeframes:

- Short term (0-5 years)
- Medium term (5-15 years)
- Long term (>15 years).

 RESIDENTIAL	R1	Residential West
	R2	Residential North
	R3	Residential South
	R4	Long term Western expansion
	R5	Long term Northern expansion
 COMMERCIAL	C1	Passenger and freight transport facilities
	C2	Nursery operation
 COMMUNITY FACILITIES	CF1	Community use between Council office and school
	CF2	Health centre and aged persons accommodation
	CF3	Art centre redevelopment

 INDUSTRY	I1	Breakwater and finger wharf
	I2	Road widening - marine and passenger facilities
	I3	Management plan for area exposed to coastal hazards
	I4	Bund and channelization to reduce floodplain extent.
	I5	West Coast road connection
	I6	Community WiFi zone
	I7	Potential water supply/storage location
	I8	Retain sports field as emergency helicopter landing

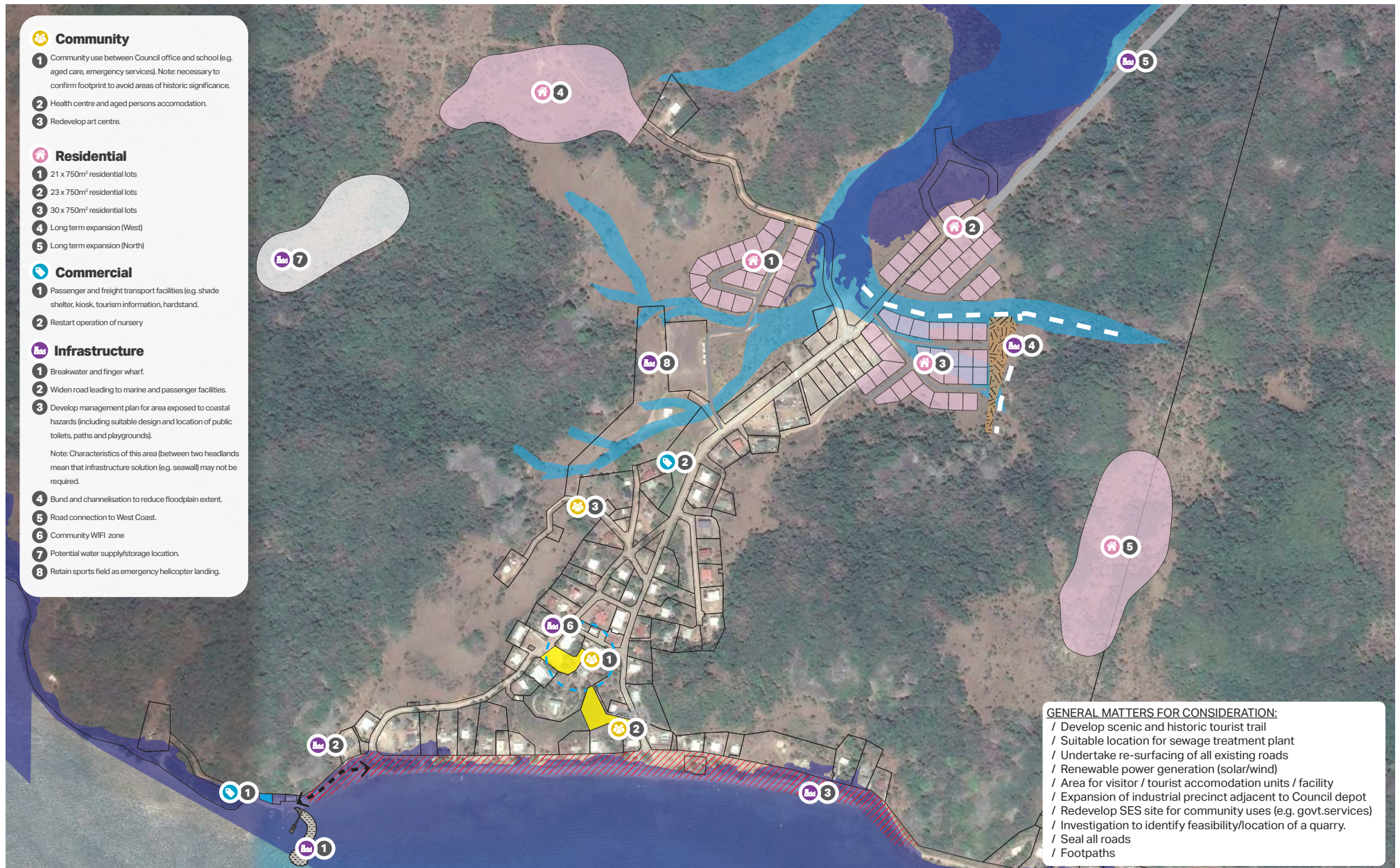


FIGURE 22: PREFERRED MASTER PLAN OPTION - TOWN



FIGURE 23: PREFERRED OPTION - ISLAND

R1 - RESIDENTIAL WEST

Summary

21 x 750m² residential lots west of Marietta Road.



New Lots	21
Lot Size	750 m ²
Associated Projects	-
Priority	Medium term
Infrastructure Cost	\$2,074,901 (incl. septic) \$3,845,784 (incl. sewer)

Recommendations

R1.1: Undertake planning scheme amendment to incorporate area into the Township zone.

R1.2: Address *Native Title Act 1993* requirements and amend Indigenous Land Use Agreement (ILUA).

R1.3: Address duty of care requirements under the *Torres Strait Islander Cultural Heritage Act 2003* (e.g. cultural heritage survey and cultural heritage management plan).

R1.4: Obtain approvals under the planning scheme and State legislation (e.g. reconfiguring a lot, operational works etc).

R1.5: Undertake civil engineering design for necessary infrastructure upgrades and extension.

R2 - RESIDENTIAL NORTH

Summary

23 x 750m² residential lots north of Marietta Road.



New Lots	23
Lot Size	750 m ²
Associated Projects	-
Priority	Short term
Infrastructure Cost	\$1,933,308 (incl. septic) \$3,660,140 (incl. sewer)

Recommendations

R2.1: Undertake planning scheme amendment to incorporate area into the Township zone.

R2.2: Address *Native Title Act 1993* requirements and amend Indigenous Land Use Agreement (ILUA).

R2.3: Address duty of care requirements under the *Torres Strait Islander Cultural Heritage Act 2003* (e.g. cultural heritage survey and cultural heritage management plan).

R2.4: Obtain approvals under the planning scheme and State legislation (e.g. reconfiguring a lot, operational works etc).

R2.5: Undertake civil engineering design for necessary infrastructure upgrades and extension.

R3 - RESIDENTIAL SOUTH

Summary

30 x 750m² residential lots south of Marietta Road.



New Lots	30
Lot Size	750 m ²
Associated Projects	I4
Priority	Long term
Infrastructure Cost	\$2,031,588 (incl. septic) \$2,545,452 (incl. sewer) +\$1,444,716 for bund (refer I4)

Recommendations

R3.1: Undertake planning scheme amendment to incorporate balance of the area into the Township zone.

R3.2: Address *Native Title Act 1993* requirements and amend Indigenous Land Use Agreement (ILUA).

R3.3: Address duty of care requirements under the *Torres Strait Islander Cultural Heritage Act 2003* (e.g. cultural heritage survey and cultural heritage management plan).

R3.4: Obtain approvals under the planning scheme and State legislation (e.g. reconfiguring a lot, operational works etc).

R3.5: Undertake civil engineering design for necessary infrastructure upgrades and extension.

R4 - WESTERN EXPANSION

Summary

Preserve land for long term residential expansion.



New Lots	-
Lot Size	-
Associated Projects	-
Priority	Long term
Infrastructure Cost	TBC

Recommendations

R4.1 - Undertake residential land supply assessment to confirm requirement / timeframe for utilisation of the area.

R4.2 - Prepare enabling infrastructure cost estimate.

R4.3 - Undertake planning scheme amendment to incorporate area into the Township zone.

R5 - NORTHERN EXPANSION

Summary

Preserve land for long term residential expansion.



New Lots	-
Lot Size	-
Associated Projects	-
Priority	Long term
Infrastructure Cost	TBC

Recommendations

R5.1 - Undertake residential land supply assessment to confirm requirement / timeframe for utilisation of area.

R5.2 - Prepare enabling infrastructure cost estimate.

R5.3 - Undertake planning scheme amendment to incorporate area into the Township zone.

C1 - PASSENGER & FREIGHT FACILITIES

Summary

New passenger and freight transport facilities (e.g. shade shelter, kiosk, tourism information, hardstand).



New Lots	-
Lot Size	350 m ²
Associated Projects	I1, I2
Priority	Short term
Infrastructure Cost	-

Recommendations

C1.1 - Undertake planning scheme amendment to incorporate area into the Township zone.

C1.2 - Seek expressions of interest for individuals / businesses to enter in to commercial lease.

C1.3 - Obtain development permit for reconfiguring a lot and operational works.

C2 - NURSERY

Summary

Reopen nursery to generate employment and training opportunities.



New Lots	-
Lot Size	6,177 m ²
Associated Projects	-
Priority	Short term
Infrastructure Cost	\$0*
Recommendations	C2.1 - Seek expressions of interest for individuals / businesses to enter in to commercial lease.

*Existing site - no further enabling infrastructure required - subject to further detailed design / assessment.

CF1 - COMMUNITY USE

Summary

Community use between Council office and school (e.g. aged care, emergency services).



New Lots	-
Lot Size / Area	-
Associated Projects	CF8
Priority	Long term
Infrastructure Cost	\$0*

Recommendations

CF1.1 Prepare facility Master Plan to confirm footprints to avoid areas of historical significance.

CF1.2 - Liaise with Department of Education to confirm site utilisation plans and discuss potential for interim co-use of facilities.

*Existing site - no further enabling infrastructure required - subject to further detailed design / assessment.

CF2 - HEALTH CARE & AGED CARE

Summary

Development of Healthcare Centre and Aged persons accommodation.



New Lots	-
Lot Size / Area	3,020 m ²
Associated Projects	CF7
Priority	Long term
Infrastructure Cost	\$0*

Recommendations

CF2.1: Seek expressions of interest for health and aged care service providers.

CF2.2 Prepare facility Master Plan for development and operation of health centre and aged persons accommodation.

CF2.3 - Obtain development permit for reconfiguring a lot and operational works.

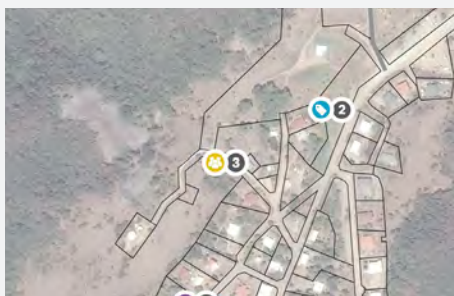
*Existing site - no further enabling infrastructure required - subject to further detailed design / assessment.



CF3 - ART CENTRE REDEVELOPMENT

Summary

Redevelopment of the existing art centre.



New Lots	-
Lot Size / Area	417 m ²
Associated Projects	-
Priority	Short term
Infrastructure Cost	\$0*

Recommendations

CF3.R1 - Prepare facility Master Plan for development and operation of centre.

CF3.R2 - Obtain development permits (e.g. material change of use, operational works).

*Existing site - no further enabling infrastructure required - subject to further detailed design / assessment.



I1 - BREAKWATER AND FINGER WHARF

Summary

Breakwater and renewal of finger wharf.



New Lots	-
Lot Size	-
Associated Projects	C1, I2
Priority	
Infrastructure Cost	*Existing committed project

Recommendations

Nil (existing committed project).



I2 - WIDEN MARINE ACCESS ROAD

Summary

Widen road leading to marine and passenger facilities.



New Lots	-
Lot Size	-
Associated Projects	C1, I1
Priority	Short term
Infrastructure Cost	\$134,447

Recommendations

I2.1 - Undertake civil engineering design.

I3 - MANAGEMENT PLAN

Summary

Develop management plan for area exposed to coastal hazards (incl. Suitable design & location of public toilets, paths and playgrounds).



New Lots	-
Lot Size	-
Associated Projects	-
Priority	Short term
Infrastructure Cost	-

Recommendations

- I3.1 - Undertake assessment to confirm existing hazard risk.
- I3.2 - Prepare detailed design for public toilets, paths and playgrounds.
- I3.3 - Prepare management plan.

I4 - BUND & CHANNELISATION

Summary

Bund and channelisation to reduce floodplain extent impacting township and new residential development.



New Lots	-
Lot Size	-
Associated Projects	R3
Priority	Long term
Infrastructure Cost	\$1,444,716

Recommendations

- I4.1 - Undertake engineering assessment and modelling to confirm requirements for bund and channelisation.
- I4.2 - Undertake civil engineering design.
- I4.3 - Obtain development permit for operational works.

I5 - WEST COAST ROAD CONNECTION

Summary

Road connection to access West Coast.



New Lots	-
Lot Size	-
Associated Projects	-
Priority	Medium term
Infrastructure Cost	\$4,201,470

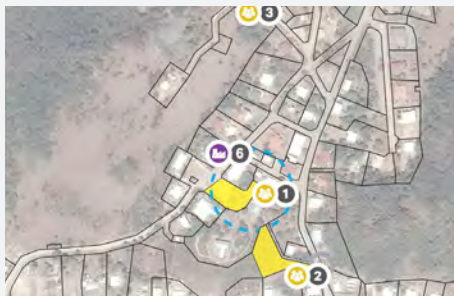
Recommendations

- I5.1 - Undertake civil engineering design.

I6 - COMMUNITY WIFI ZONE

Summary

Creation of a wi-fi zone in the centre of town.



New Lots	-
Lot Size	-
Associated Projects	-
Priority	Short term
Infrastructure Cost	-

Recommendations

I6.1 - Prepare business case and feasibility assessment.

I7 - WATER SUPPLY/STORAGE

Summary

Potential location for water supply and storage.



New Lots	-
Lot Size	-
Associated Projects	-
Priority	Long term
Infrastructure Cost	-

Recommendations

I7.1 - Undertake water supply assessment to confirm requirement for additional storage capacity on Hammond Island.

I8 - EMERGENCY ACCESS

Summary

Retain sports field as emergency helicopter landing zone.



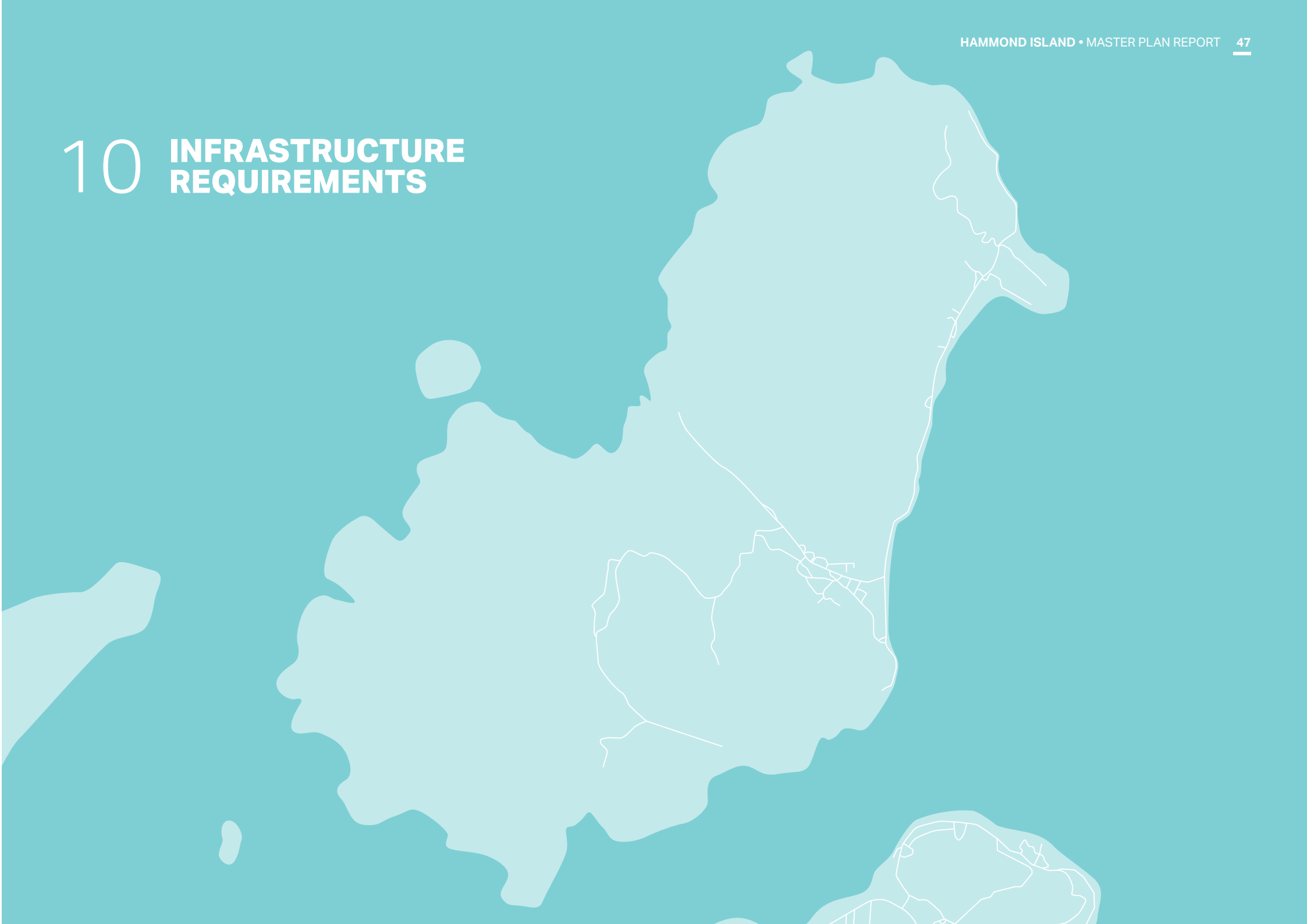
New Lots	-
Lot Size	-
Associated Projects	-
Priority	Short term
Infrastructure Cost	\$0*

Recommendations

I8.1 - Prepare facility Master Plan which considers requirement for site to function as emergency helicopter access.

*Existing site - no further enabling infrastructure required.

10 INFRASTRUCTURE REQUIREMENTS

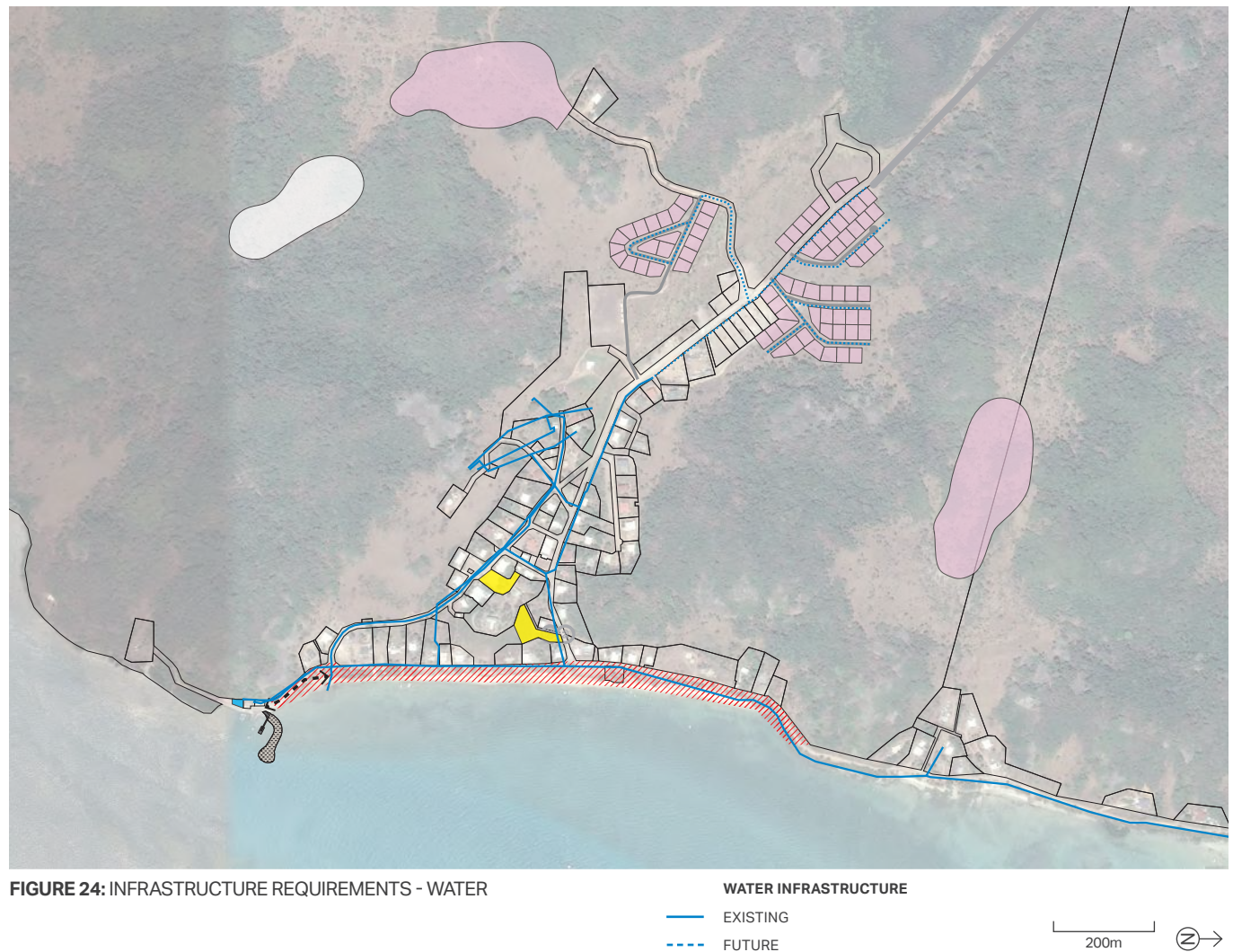


The following sections provide an overview of infrastructure requirements to support development of the Master Plan preferred concept. Further detailed information regarding assumptions and infrastructure requirements is provided in Appendix B.

WATER SUPPLY

There are no formal drinking water allocations for supply between Thursday and Hammond Islands. The supply from Thursday Island is also limited by the yield of the raw water source, capacity of the water treatment plant and flow rate through both the high lift pumps and the settling clarifier on Thursday Island. Based on expected population increases on Horn Island and Thursday Island from the Torres Shire Council Drinking Water Quality Management Plan (February 2013), there should be sufficient capacity to accommodate the development areas identified in the Master Plan.

The existing water storage infrastructure is slightly undersized for the proposed additional development and a new 150 kL reservoir may be required. Additional DN100 mm water mains are required to service the new development areas.



SEWERAGE

Two scenarios are proposed for the sewerage of the new residential areas.

The first scenario involves each lot having a separate septic system similar to the existing households in the community. The cost of the septic tank would be included in the cost of housing and therefore does not have a separate infrastructure cost. However, currently there are plans to implement a reticulated sewerage system on the island. If constructed, the new residential areas would also form part of this system. This would require the excavation of newly constructed roads in the development areas to lay a reticulation sewer. Therefore, this scenario comes with the risk of significant re-construction.

The second scenario assumes that the wider community's sewerage system, first designed in 2009, is constructed between now and this Master Plan being implemented. New DN150 gravity sewers, two pump stations and two rising mains to connect the new residential areas to the community's sewerage system would also be required.



FIGURE 25: INFRASTRUCTURE REQUIREMENTS - SEWER

2009 PLANNED SEWER		SEWER INFRASTRUCTURE	
---	PRESSURE MAIN	●	EXISTING SEPTIC
—	RISING MAIN	—	FUTURE RISING MAIN
---	GRAVITY MAIN	---	FUTURE GRAVITY MAIN
□	PUMP STATION	■	FUTURE PUMP STATION

200m



EARTHWORKS

As well as earthworks for landscaping of individual lots, earthworks are required for the bund and channelisation to reduce floodplain extent (Items R2 and I4).

ROADS AND ACCESS TRACKS

New roads are required for the new residential areas to widen the road leading to the marine and passenger facilities and to connect the township to the west coast.

STORMWATER

There is no existing piped drainage system to connect new developments to. Generally, road drainage at Hammond Island directs runoff towards the ocean and it is recommended that drainage for future developments also be managed this way.

ELECTRICITY SUPPLY AND COMMUNICATIONS

Communications will require the installation of pits and conduits for any sites located on new roads. The length of conduit for the communications has assumed to be generally the same as the length of proposed new water mains. The electrical supply will require the installation of overhead supply and new poles for any sites located on new roads. Poles will be required every 80 m and at changes in direction. The same alignment has been assumed for communications and electrical services.

The following table provides an overview of proposed infrastructure and costs for the key components of the Master Plan.

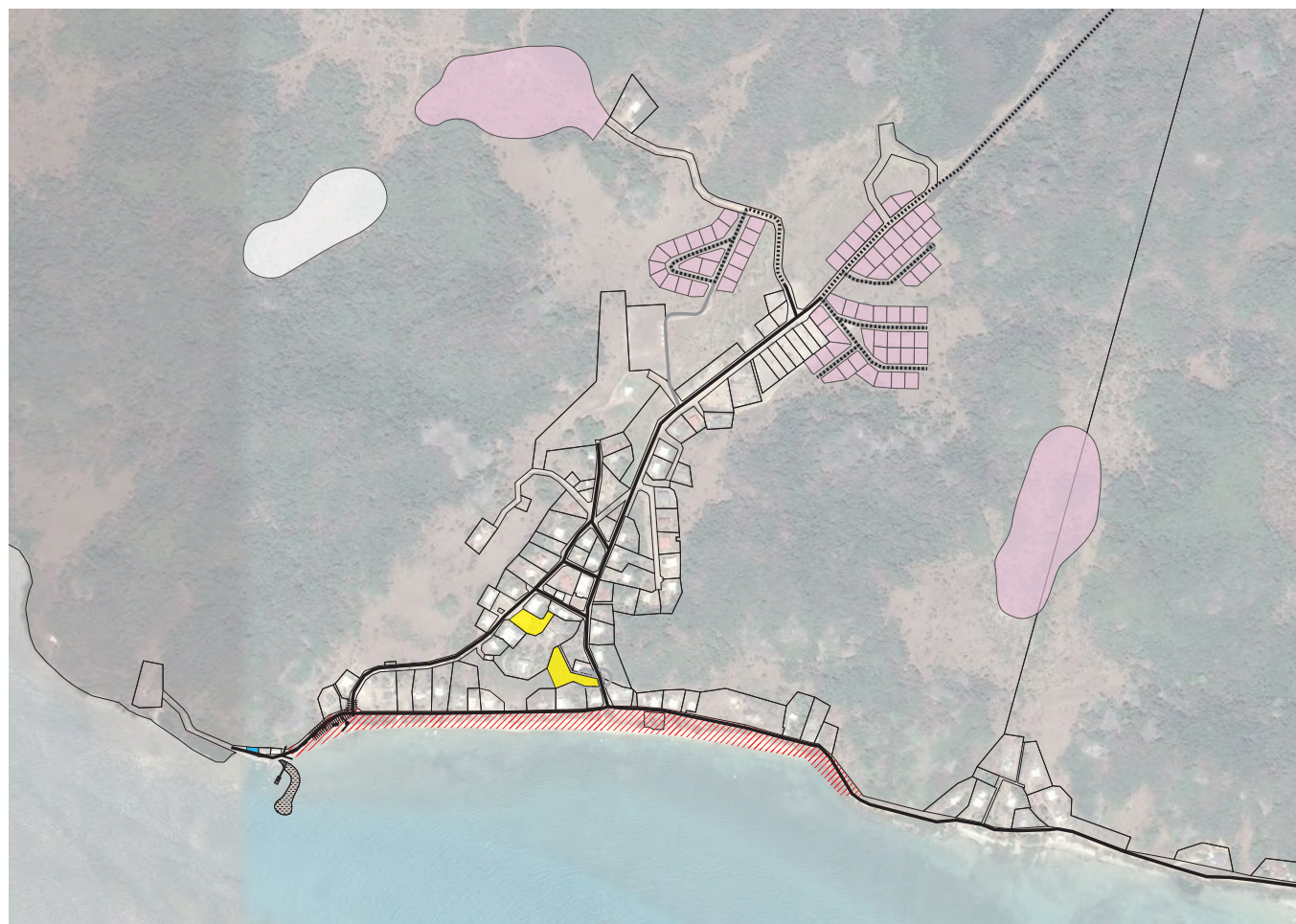


FIGURE 26: INFRASTRUCTURE REQUIREMENTS - ROADS

ROAD INFRASTRUCTURE

- EXISTING ROAD
- - - - FUTURE ROAD
- ||||| ROAD WIDENING

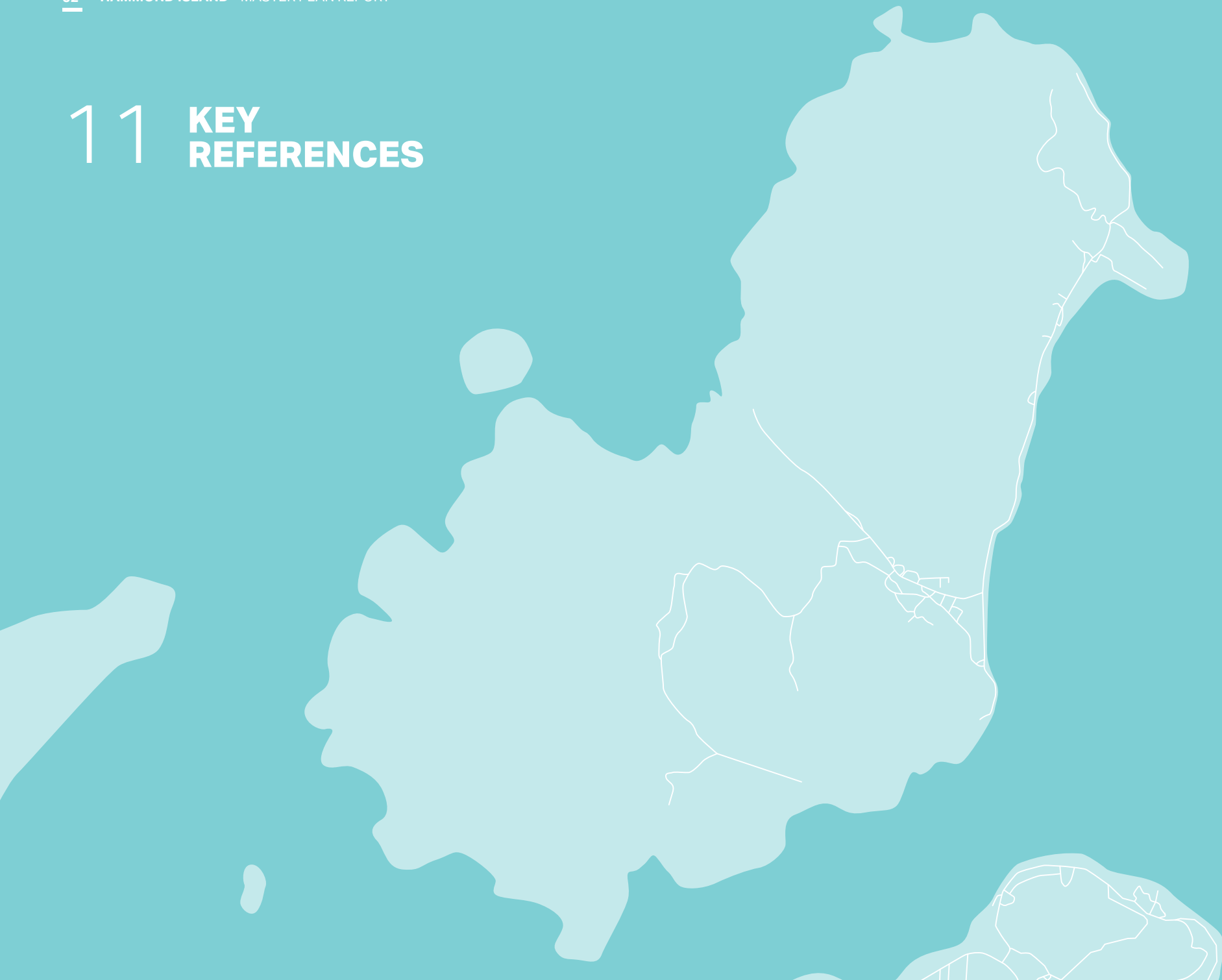
200m



ITEM	UNIT	RATE	SCENARIO 1 - SEPTIC						SCENARIO 2 - RETICULATED SEWERAGE						12. WIDEN ROAD TO MARINE FACILITIES	14. BUND AND CHANNELISATION	15. ROAD TO WEST COAST			
			R1. RESIDENTIAL WEST	R2. RESIDENTIAL NORTH	R3. RESIDENTIAL SOUTH	R1. RESIDENTIAL WEST	R2. RESIDENTIAL NORTH	R3. RESIDENTIAL SOUTH												
Yield			21	23	30				21	23	30				-			-		
PRELIMINARIES																				
Establishment / disestablishment and miscellaneous site preparation		20%	20%	\$236,456	20%	\$220,320	20%	\$231,520	20%	\$438,266	20%	\$417,110	20%	\$290,080	20%	\$15,322	20%	\$164,640	20%	\$478,800
PROJECT MANAGEMENT																				
Survey, design and construction administration		15%	15%	\$177,342	15%	\$165,240	15%	\$173,640	15%	\$328,700	15%	\$312,833	15%	\$217,560	15%	\$11,491	15%	\$123,480	15%	\$359,100
WATER SUPPLY																				
Water Mains - DN50	m	\$234.0																		
Water Mains - DN100	m	\$280.0	700	\$196,000	500	\$140,000	700	\$196,000	700	\$196,000	500	\$140,000	700	\$196,000						
ROADS																				
Bitumen sealed / concrete paved road, 5.5 m wide	m	\$1,170.4	350	\$409,640					350	\$409,640										
Bitumen sealed / concrete paved road, 6.5 m wide	m	\$1,383.2	200	\$276,640	500	\$691,600	500	\$691,600	200	\$276,640	500	\$691,600	500	\$691,600						
Bitumen sealed / concrete paved road, 7.5 m wide	m	\$1,596.0																1500	\$2,394,000	
Widen road, additional 3.0 m road width	m	\$638.4													120	\$76,608				
SEWERAGE																				
Gravity Sewer - DN150	m	\$465.0							450	\$209,250	220	\$102,300	500	\$232,500						
Rising main - DN50	m	\$234.0																		
Rising main - DN80	m	\$280.0							150	\$42,000	550	\$154,000								
Manhole	no.	\$10,050.0							6	\$60,300	3	\$30,150	6	\$60,300						
Sewerage Pump Station	item	\$697,500.0							1	\$697,500	1	\$697,500								
EARTHWORKS																				
Import Fill	m³	\$196.0															4200	\$823,200		
COMMUNICATIONS																				
Communications	m	\$450.0	550	\$247,500	500	\$225,000	500	\$225,000	550	\$247,500	500	\$225,000	500	\$225,000						
ELECTRICAL																				
Electrical	pole	\$7,500.0	7	\$52,500	6	\$45,000	6	\$45,000	7	\$52,500	6	\$45,000	6	\$45,000						
CONTINGENCY																				
Contingency		30%	30%	\$478,823	30%	\$446,148	30%	\$468,828	30%	\$887,489	30%	\$844,648	30%	\$587,412	30%	\$31,026	30%	\$333,396	30%	\$969,570
TOTAL				\$2,074,901		\$1,933,308		\$2,031,588		\$3,845,784		\$3,660,140		\$2,545,452		\$134,447		\$1,444,716		\$4,201,470

TABLE 7: OPINION OF PROBABLE CONSTRUCTION COSTS

11 KEY REFERENCES



This chapter provides an overview of other key reference documents and design strategies which should be considered by Council as part of implementation of the Hammond Island Master Plan.

CORPORATE PLAN BISNIS PLAN 2020-2025

The Corporate Plan 2020-2025 was prepared by the Torres Strait Island Regional Council. The Corporate Plan is the lead document for Council's service provision. The Corporate Plan fulfils the Council's obligations under the *Local Government Act 2009*.

The Corporate Plan highlights the following mission statement:

"For youmpla for strete ples blo youmpla ene weis kaine youmpla stap lor pless blo youmpla - To improve our Communities' liveability in all we do."

The goals identified in the Corporate Plan are:

- Bisnis Pipol - People
 - / We preserve cultural heritage, history and place
 - / Our communities are safe, healthy and active
 - / We ensure accessibility to community support services
 - / We are a transparent, open and engaging Council
- Bisnis Mekem las long - Sustainability
 - / We plan effectively for the future of our individual communities and region
 - / Our communities remain resilient to the effects of climate change and natural disasters
 - / Our communities are consulted around liveable places, aligned to lifestyle and environmental suitability
 - / We manage Council affairs responsibly to the benefit of our communities
 - / We actively reduce our environmental footprint and manage our resources sustainability
- Bisnis Pruittpul - Prosperity
 - / We advocate and foster regional prosperity through enterprise development
 - / We invest in the retention of key skills within our region
 - / We bring opportunity to our region and put our culture on the world stage.

TORRES STRAIT ISLAND REGIONAL COUNCIL OPERATIONAL PLAN 2019 - 2020

The Operational Plan 2019 - 2020 provides detailed strategies, activities, timing and budget links for implementation of the following core program themes identified in the Corporate Plan 2020-2025:

- Executive office
- Corporate affairs and engagement
- Community and environment
- Engineering services
- Building services
- Housing and tenancy services
- Strategic projects and logistics
- Business services.

ACTIVATE! QUEENSLAND 2019-2029

Activate! Queensland 2019–2029 is the Queensland Government's 10 year strategy to further enrich the Queensland way of life; harnessing the pride of great sporting traditions, embracing iconic natural environment and building on strong community foundations to deliver better health and wellbeing outcomes, especially for those most vulnerable.

Activate! Queensland will be rolled out through three multi-year action plans. The first action plan, Our Active8, will outline the practical, whole-of-government actions to be implemented from 2019 to 2022 and will be delivered through eight strategies across four priority areas:

- Activate Queenslanders
 - / 01 Enhance equity and inclusion
 - / 02 Transform attitudes and behaviours
- Activate Environments
 - / 03 Deliver quality and accessible places and spaces
 - / 04 Improve liveability and activity in our communities
- Activate Success
 - / 05 Grow elite success and keep Queensland winning
 - / 06 Provide world-class fan experiences through major sports and entertainment facilities
- Activate Collaboration
 - / 07 Transform the active industry's role
 - / 08 Leverage knowledge, technology and innovation.

CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

Crime Prevention Through Environmental Design (CPTED) is designing using the built environment to create safer neighbourhoods.

Growing interest in environmental criminology led to the use of natural surveillance, access control and territoriality as a natural method in crime prevention.

The 'broken window' principle demonstrated how neglected zones invite crime, and reinforced the need for good property maintenance to assert visible ownership of space.

Appropriate environmental design can also increase the perceived likelihood of detection and apprehension, known to be the biggest single deterrent to crime.

HEALTHY BY DESIGN

Healthy by Design has been developed in response to local government requests for practical guidance in designing walkable, and ultimately more liveable communities.

This is encouraged by providing:

- Well planned networks of walking and cycling routes
- Streets with direct, safe and convenient access
- Local destinations within walking distance from homes
- Accessible open spaces for recreation and leisure
- Conveniently located public transport within walkable distances
- Neighbourhoods fostering community.

WATER SENSITIVE URBAN DESIGN

Water-Sensitive Urban Design (WSUD) is a land planning and engineering design approach which integrates the urban water cycle, including stormwater, groundwater and wastewater management and water supply, into urban design to minimise environmental degradation and improve aesthetic and recreational appeal.

This is encouraged through:

- Natural channel design
- Stormwater outlets as park and waterway systems
- Erosion treatment for urban waterways
- Sediment and retention basins as natural features
- Landscape design of urban water systems.

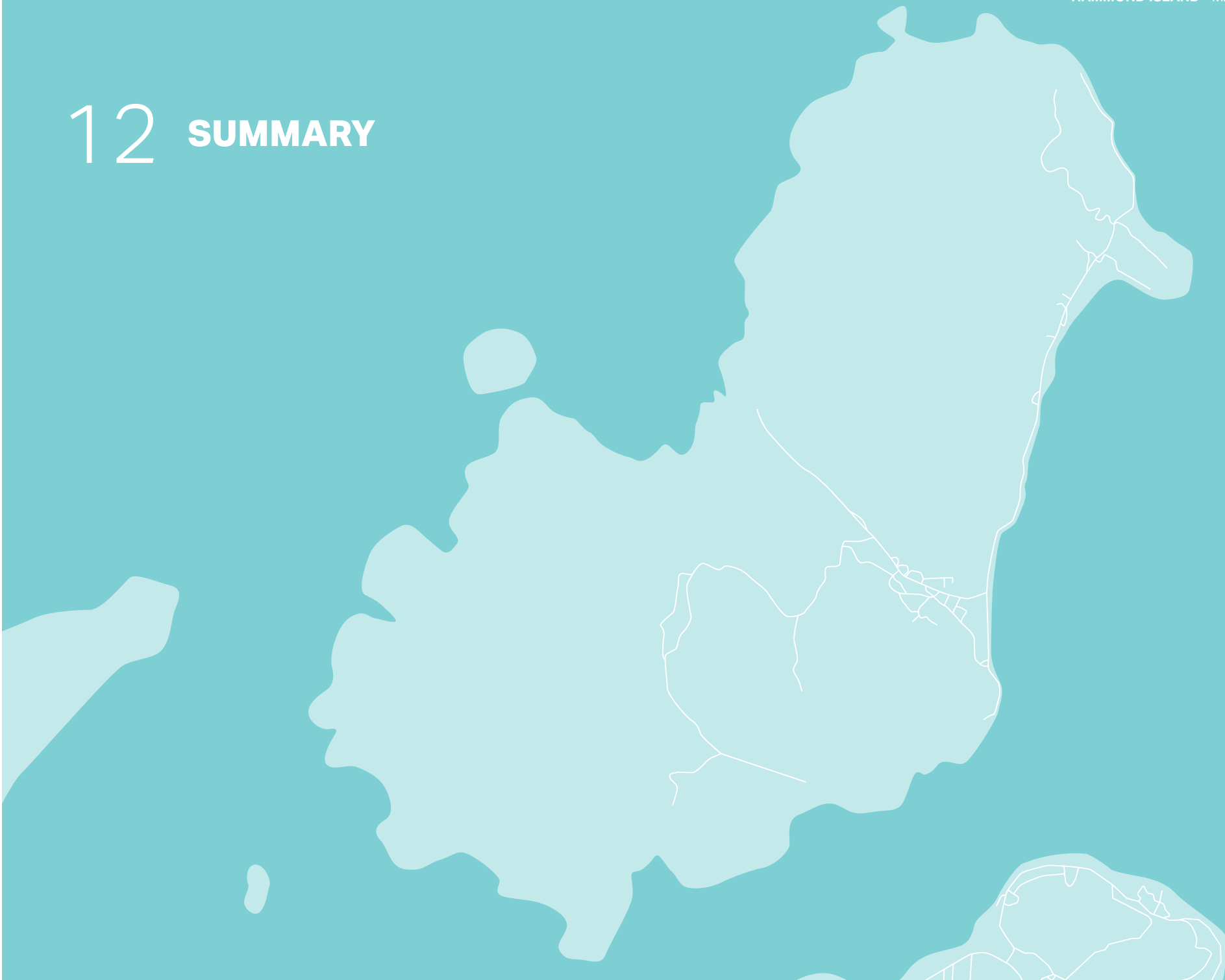
COASTAL BLUE CARBON: AN INTRODUCTION FOR POLICY MAKERS

Coastal blue carbon: an introduction for policy makers provides an introduction to the concept of blue carbon and coastal blue carbon ecosystems – mangroves, tidal marshes and sea grasses. It outlines:

- Why blue carbon ecosystems are important
- The basic science of blue carbon as a basis for policy and practical action
- An overview of relevant policy frameworks
- A summary of finance sources that can support practical action.

It describes some of the challenges and opportunities in developing policies and undertaking projects to protect and restore coastal blue carbon ecosystems. It also highlights some of the projects and countries that are leading the way in managing these challenges and opportunities. It serves as a reference for those who are new to blue carbon and those who are seeking to bring a greater focus on blue carbon in their jurisdictions.

12 SUMMARY



The preferred Master Plan identifies a range of development opportunities which provide Council with a clear set of options to progress residential, industrial, commercial and community development into the future. The right combination of housing choice and employment opportunity will promote a successful and vibrant community with a diversified and strong local economy. Whilst each development area will require extension and/or connection to existing infrastructure and services, the overall capacity of these systems will not constrain implementation of the Master Plan.

The enabling infrastructure cost for new residential areas will vary significantly depending on timing with respect to construction of reticulated sewerage and treatment throughout the existing township. Table 8 outlines the estimated costs of the two scenarios:

- Scenario 1 - development of proposed residential areas with provision of septic systems. On-site sewerage treatment and disposal is not enabling trunk infrastructure and has been excluded from the cost estimate
- Scenario 2 - development of proposed residential areas with reticulated services (gravity mains, rising mains and pump stations). The estimate excludes costs for sewerage throughout the existing township and establishment of a sewage treatment plant.

Whilst residential expansion is a key element of the preferred Master Plan (and associated enabling infrastructure costs), it should also be noted that there are a number of smaller infill opportunities such as community use facilities, supported accommodation, arts centre redevelopment and marine transport facilities which would serve to enhance quality of life for residents and provide employment opportunities.

The preferred Master Plan represents a long term guide for development throughout the Hammond Island community. Figure 22 provides an indication of the potential future land use framework based on the preferred Master Plan. Council will consider the indicative yields and enabling infrastructure costs when staging future development and infrastructure outlay. The yields and costs will also provide an important basis of information to inform discussions and negotiations with key agencies and stakeholders.

	DETAILS	YIELD	ENABLING INFRASTRUCTURE COST	
			OVERALL	PER LOT / UNIT
	R1. Residential west	21	\$2,074,901 (Septic) \$3,845,784 (Sewer)	\$98,805 (Septic) \$183,133 (Sewer)
	R2. Residential north	23	\$1,933,308 (Septic) \$3,660,140 (Sewer)	\$84,057 (Septic) \$159,137 (Sewer)
	R3. Residential south	30	\$2,031,588 (Septic) \$2,545,452 (Sewer)	\$67,720 (Septic) \$84,848 (Sewer)
	R4. Western expansion	-	TBC	TBC
	R5. Northern expansion	-	TBC	TBC
	C1. Passenger & freight facilities	-	-	-
	C2. Nursery	-	-	-
	CF1. Community use	-	-	-
	CF2. Health care & aged care	-	-	-
	CF3. Art centre redevelopment	-	-	-
	I1. Breakwater & finger wharf	-	-	-
	I2. Widen marine access road	-	\$134,447	-
	I3. Management plan	-	-	-
	I4. Bund & channelisation	-	\$1,444,716	-
	I5. West coast road connection	-	\$4,201,470	-
	I6. Community wifi zone	-	-	-
	I7. Water supply / storage	-	-	-
	I8. Emergency access	-	-	-

TABLE 8: ENABLING INFRASTRUCTURE COST

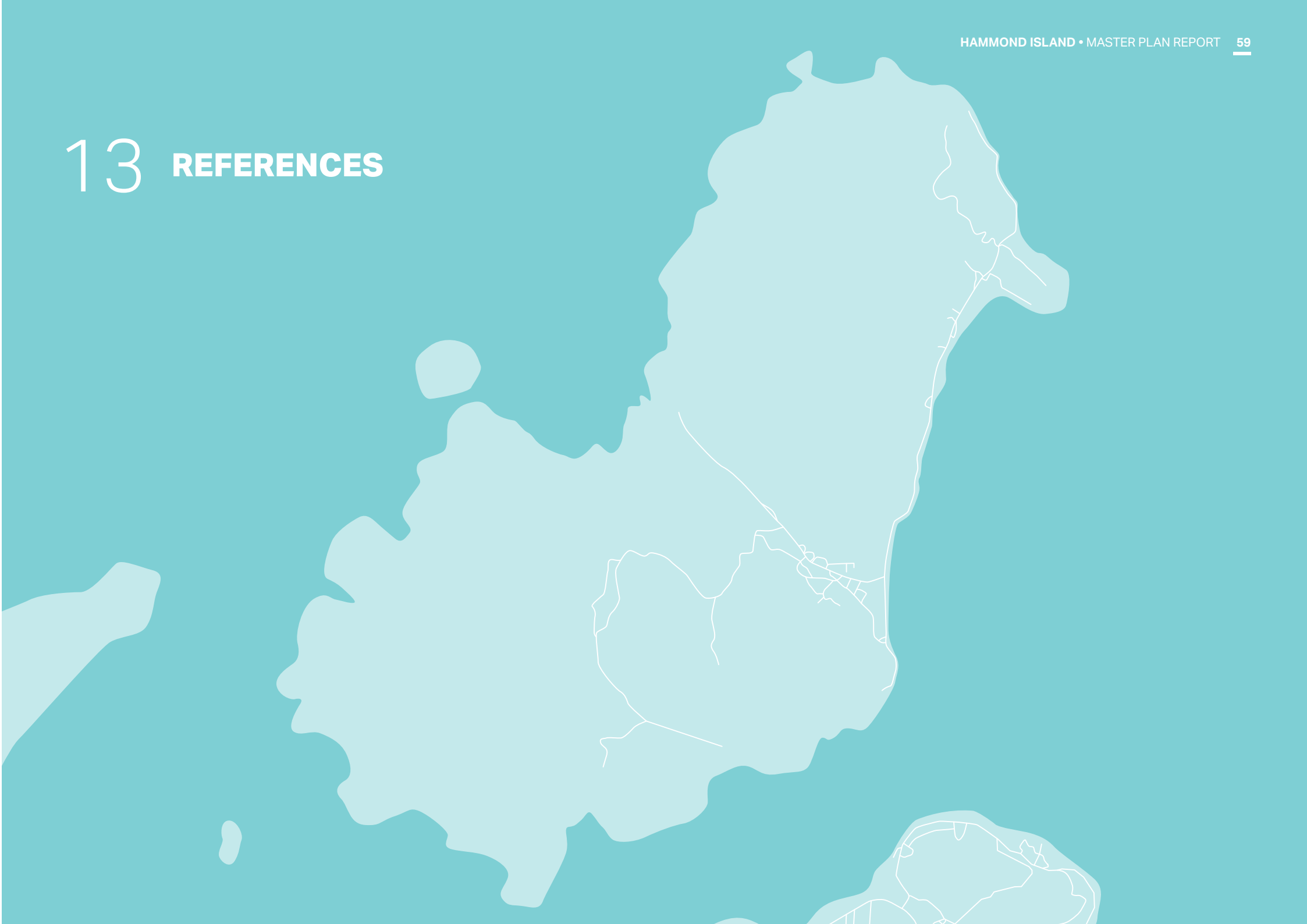
REF.		DETAILS	RECOMMENDATIONS / ACTIONS
R1		RESIDENTIAL WEST	R1.1: Undertake planning scheme amendment to incorporate area into the Township zone. R1.2: Address <i>Native Title Act 1993</i> requirements and amend Indigenous Land Use Agreement (ILUA). R1.3: Address duty of care requirements under the <i>Torres Strait Islander Cultural Heritage Act 2003</i> (e.g. cultural heritage survey and cultural heritage management plan). R1.4: Obtain approvals under the planning scheme and State legislation (e.g. reconfiguring a lot, operational works etc). R1.5: Undertake civil engineering design for necessary infrastructure upgrades and extension.
R2		RESIDENTIAL NORTH	R2.1: Undertake planning scheme amendment to incorporate area into the Township zone. R2.2: Address <i>Native Title Act 1993</i> requirements and amend Indigenous Land Use Agreement (ILUA). R2.3: Address duty of care requirements under the <i>Torres Strait Islander Cultural Heritage Act 2003</i> (e.g. cultural heritage survey and cultural heritage management plan). R2.4: Obtain approvals under the planning scheme and State legislation (e.g. reconfiguring a lot, operational works etc). R2.5: Undertake civil engineering design for necessary infrastructure upgrades and extension.
R3		RESIDENTIAL SOUTH	R3.1: Undertake planning scheme amendment to incorporate balance of the area into the Township zone. R3.2: Address <i>Native Title Act 1993</i> requirements and amend Indigenous Land Use Agreement (ILUA). R3.3: Address duty of care requirements under the <i>Torres Strait Islander Cultural Heritage Act 2003</i> (e.g. cultural heritage survey and cultural heritage management plan). R3.4: Obtain approvals under the planning scheme and State legislation (e.g. reconfiguring a lot, operational works etc). R3.5: Undertake civil engineering design for necessary infrastructure upgrades and extension.
R4		WESTERN EXPANSION	R4.1 - Undertake residential land supply assessment to confirm requirement / timeframe for utilisation of the area. R4.2 - Prepare enabling infrastructure cost estimate. R4.3 - Undertake planning scheme amendment to incorporate area into the Township zone.
R5		NORTHERN EXPANSION	R5.1 - Undertake residential land supply assessment to confirm requirement / timeframe for utilisation of area. R5.2 - Prepare enabling infrastructure cost estimate. R5.3 - Undertake planning scheme amendment to incorporate area into the Township zone.
C1		PASSENGER & FREIGHT FACILITIES	C1.1 - Undertake planning scheme amendment to incorporate area into the Township zone. C1.2 - Seek expressions of interest for individuals / businesses to enter in to commercial lease. C1.3 - Obtain development permit for reconfiguring a lot and operational works.
C2		NURSERY	C2.1 - Seek expressions of interest for individuals / businesses to enter in to commercial lease.

TABLE 9: ACTION PLAN (TABLE 1 OF 2)

REF.		DETAILS	RECOMMENDATIONS / ACTIONS
CF1		COMMUNITY USE	CF1.1 Prepare facility Master Plan to confirm footprints to avoid areas of historical significance. CF1.2 - Liaise with Department of Education to confirm site utilisation plans and discuss potential for interim co-use of facilities.
CF2		HEALTH CARE & AGED CARE	CF2.1: Seek expressions of interest for health and aged care service providers. CF2.2 Prepare facility Master Plan for development and operation of health centre and aged persons accommodation. CF2.3 - Obtain development permit for reconfiguring a lot and operational works.
CF3		ART CENTRE REDEVELOPMENT	CF3.R1 - Prepare facility Master Plan for development and operation of centre. CF3.R2 - Obtain development permits (e.g. material change of use, operational works).
I1		BREAKWATER AND FINGER WHARF	Nil - existing committed project.
I2		WIDEN MARINE ACCESS ROAD	I2.1 - Undertake civil engineering design.
I3		MANAGEMENT PLAN	I3.1 - Undertake assessment to confirm existing hazard risk. I3.2 - Prepare detailed design for public toilets, paths and playgrounds. I3.3 - Prepare management plan.
I4		BUND & CHANNELISATION	I4.1 - Undertake engineering assessment and modelling to confirm requirements for bund and channelisation. I4.2 - Undertake civil engineering design. I4.3 - Obtain development permit for operational works.
I5		WEST COAST ROAD CONNECTION	I5.1 - Undertake civil engineering design.
I6		COMMUNITY WIFI ZONE	I6.1 - Prepare business case and feasibility assessment.
I7		WATER SUPPLY / STORAGE	I7.1 - Undertake water supply assessment to confirm requirement for additional storage capacity on Hammond Island.
I8		EMERGENCY ACCESS	I8.1 - Prepare facility Master Plan which considers requirement for site to function as emergency helicopter access.

TABLE 9: ACTION PLAN (TABLE 1 OF 2)

13 REFERENCES



Australian Bureau of Statistics, 2016, 'Mapoon (S) (LGA34830), General Community Profile' (Catalogue number 2001.0), viewed 22 January 2018, https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/communityprofile/LGA34830?opendocument

Australian Bureau of Statistics, 2016, 'Mapoon (S) (LGA34830), Aboriginal and Torres Strait Islander Peoples Profile' (Catalogue number 2002.0), viewed 22 January 2018, https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/communityprofile/LGA34830?opendocument

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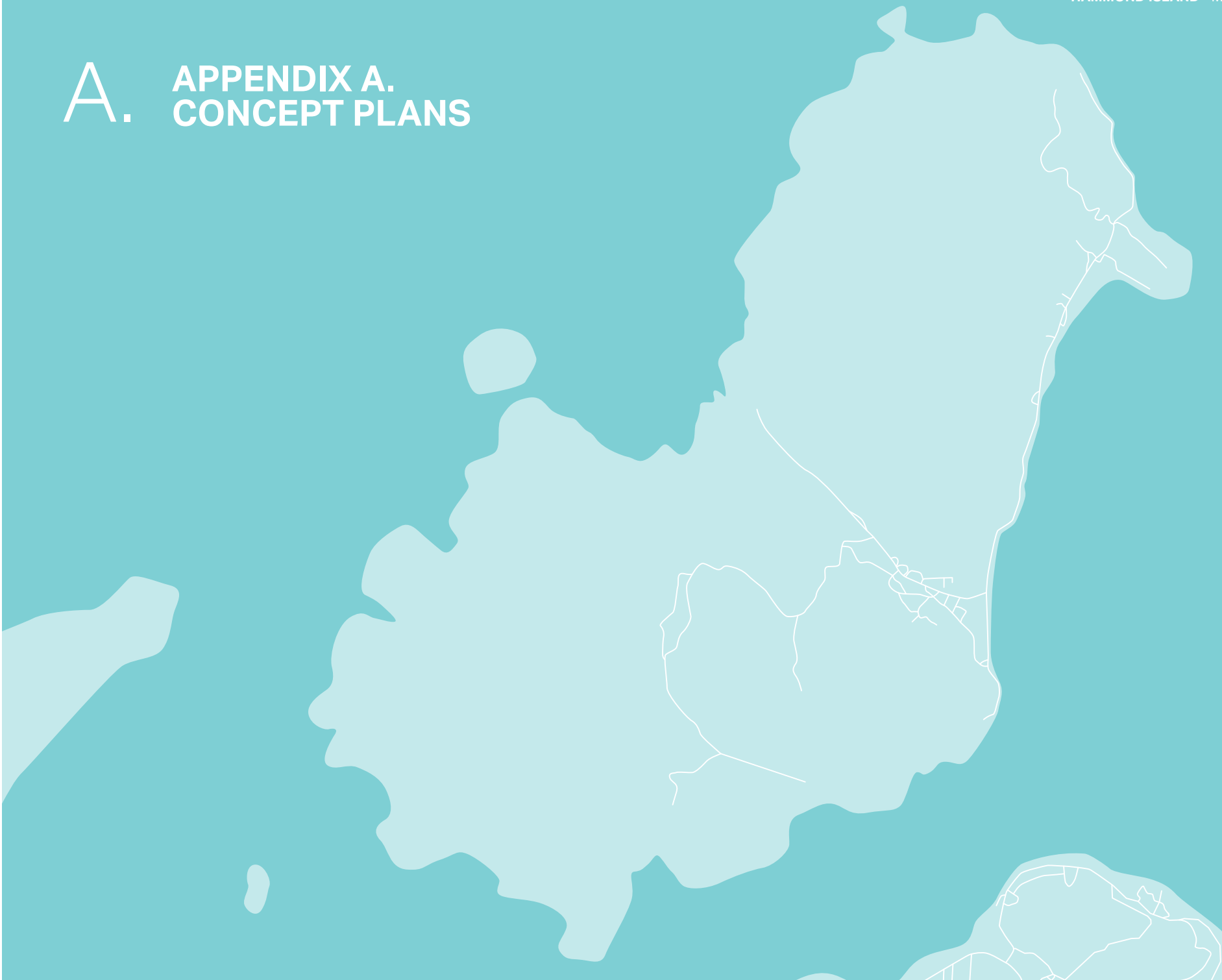
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Queensland Government, 2009, Torres Strait Island and Northern Peninsula Regional Plan 2009 - 2029.

Queensland Government, 2015, Projected Population, by local government area, Queensland, 2011 to 2036, viewed 26 September 2017, <http://www.qgso.qld.gov.au/subjects/demography/population-projections/tables/proj-pop-lga-qld/index.php>

A. APPENDIX A. CONCEPT PLANS





HAMMOND ISLAND
AREAS OF INTEREST
FOR DISCUSSION PURPOSES ONLY

200 m



Queensland
Government

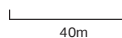
Department of Aboriginal and
Torres Strait Islander Partnerships

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FIGURE A1: AREAS OF INTEREST



HAMMOND ISLAND
EXPANSION AREA
FOR DISCUSSION PURPOSES ONLY



Queensland
Government

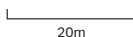
Department of Aboriginal and
Torres Strait Islander Partnerships

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FIGURE A2: AREAS OF INTEREST - EXPANSION AREA



HAMMOND ISLAND
TOWN CENTRE
FOR DISCUSSION PURPOSES ONLY



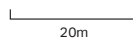
Department of Aboriginal and
Torres Strait Islander Partnerships

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FIGURE A3: AREAS OF INTEREST - TOWN CENTRE



HAMMOND ISLAND
JETTY
FOR DISCUSSION PURPOSES ONLY



Queensland
Government

Department of Aboriginal and
Torres Strait Islander Partnerships

AECOM

FIGURE A4: AREAS OF INTEREST - JETTY



FIGURE A5: OPTION DEVELOPMENT - CONTEXT PLAN

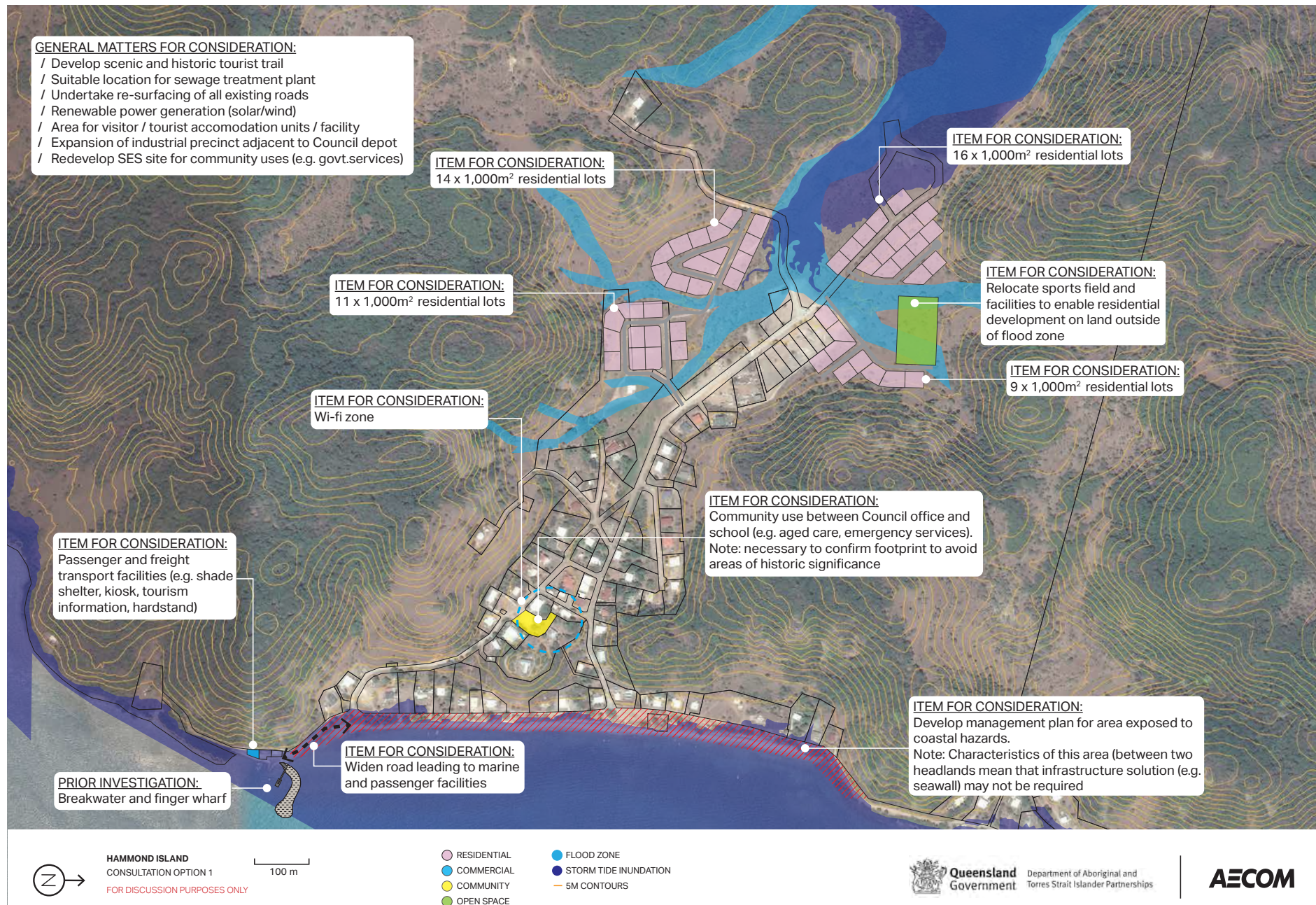


FIGURE A6: OPTION 1

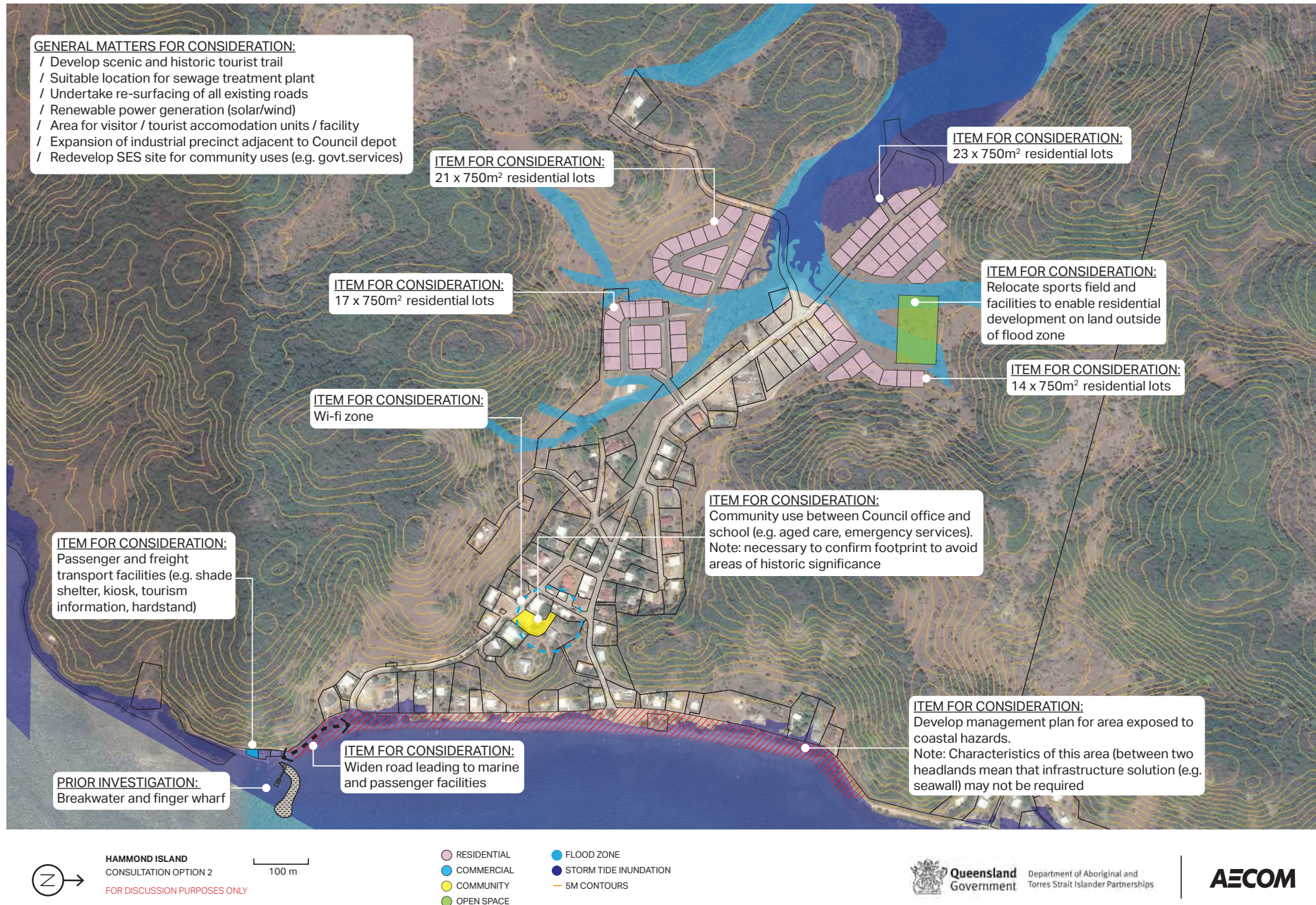


FIGURE A7: OPTION 2

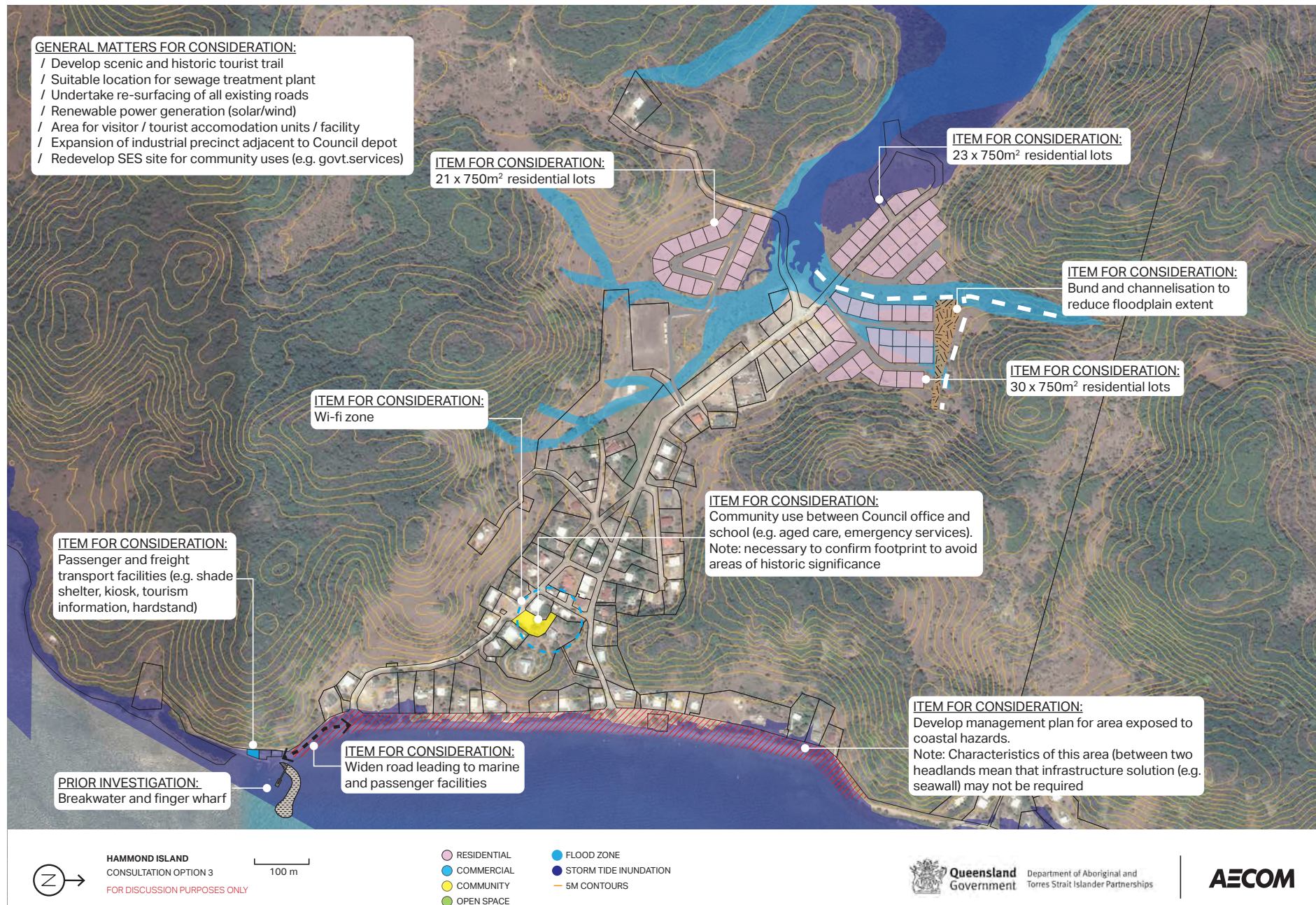


FIGURE A8: OPTION 3

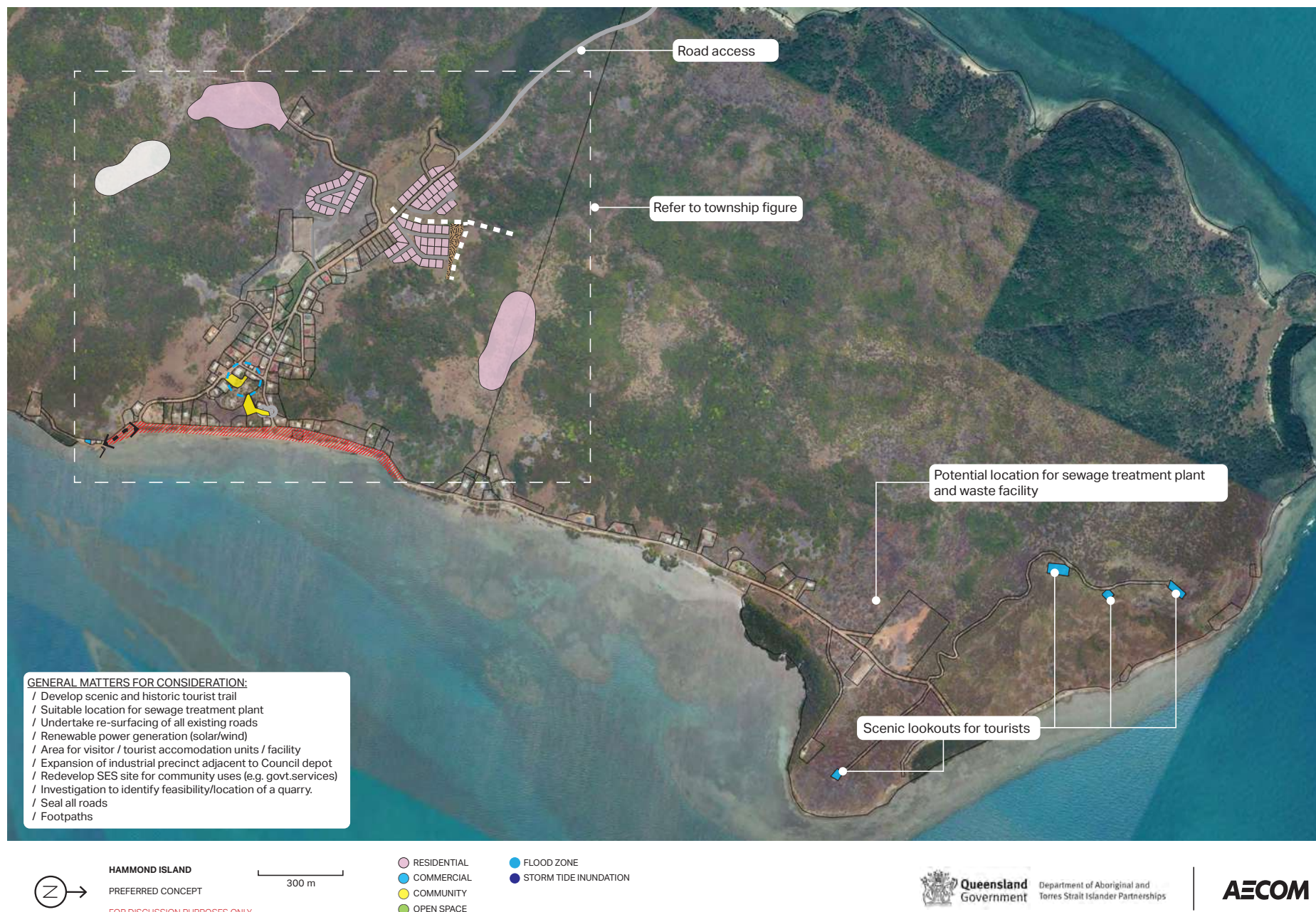


FIGURE A9: PREFERRED OPTION - CONTEXT

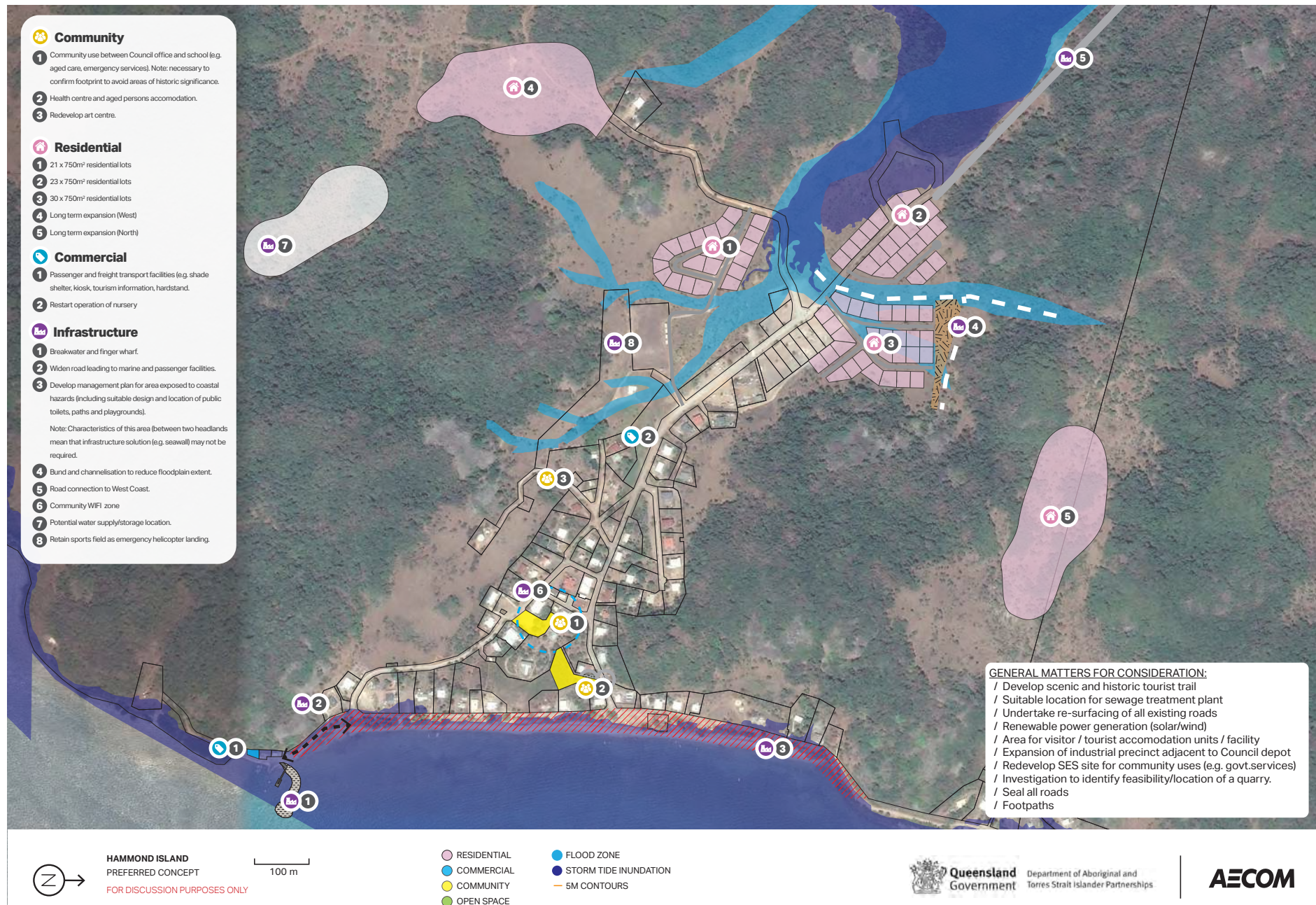
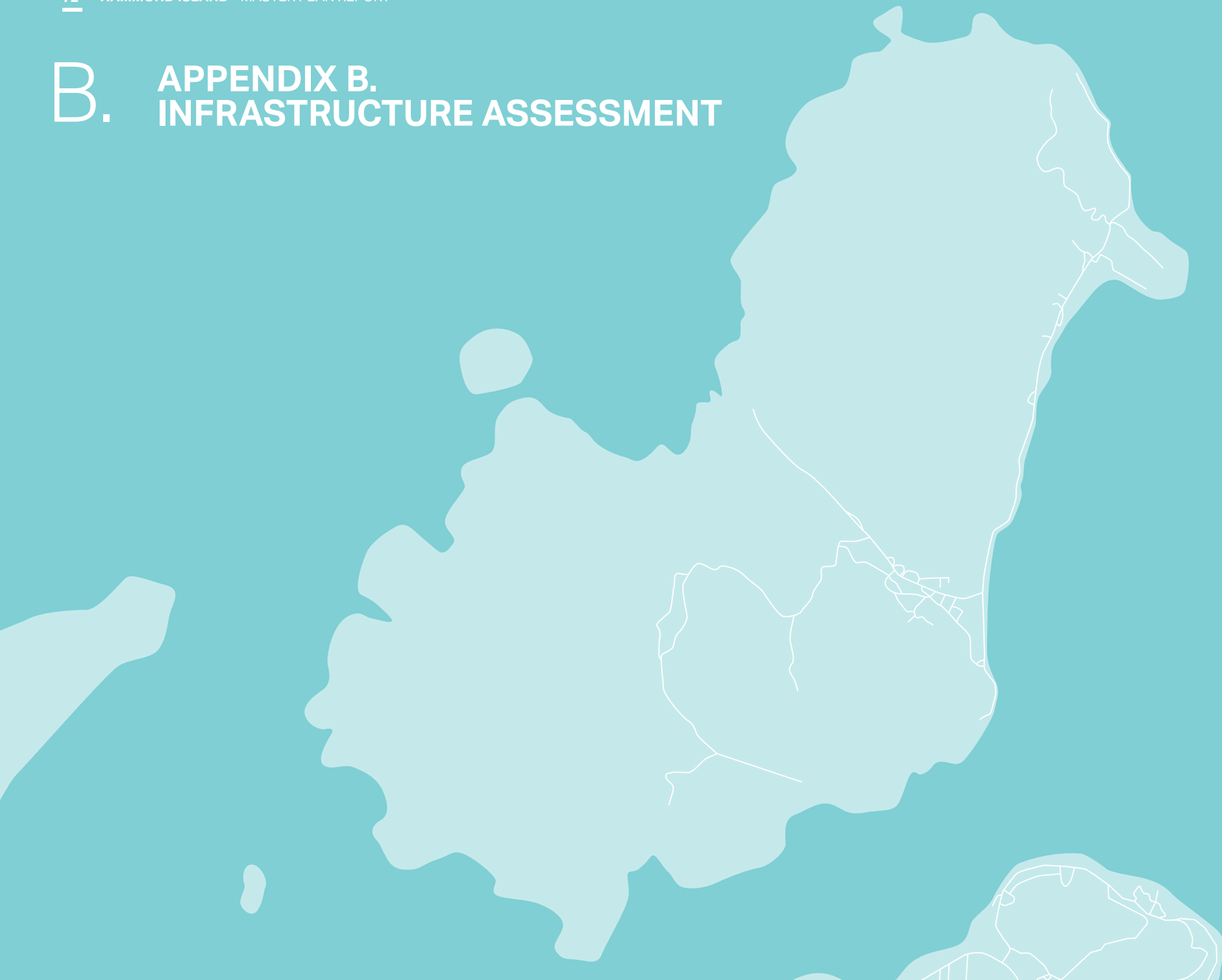


FIGURE A10: PREFERRED OPTION - TOWN

B. APPENDIX B. INFRASTRUCTURE ASSESSMENT



B1 INFRASTRUCTURE REVIEW

WATER SUPPLY

Existing water supply infrastructure

Raw water sources

The raw water intake for Hammond Island comprises:

- Loggy Creek dam on Horn Island. This dam supplies Horn Island with a connection to Thursday Island through to Hammond Island
- There are also household rainwater tanks on some houses for drinking purposes
- In the past, groundwater wells have been used on Hammond Island. However, due to septic tank and overland flow contamination they are no longer in use. A filter upgrade project is currently underway to investigate the potential of resuming use of the wells.

Raw water rising main

Hammond Island's storage reservoirs are connected to Thursday Island through a 3.25 km, DN150 mm submarine pipeline. The pipeline is constructed of HDPE for the submerged section (1.6 km) and uPVC for the overland section on each island (770 m on Thursday Island and 865 m on Hammond Island).

Water Treatment

Water from the submarine pipeline is treated on Thursday Island.

Potable water storage reservoirs

Water storage is comprised of a 430 kL concrete tank and a 90 kL fibreglass tank located on an elevated site to the west of the township.

Gravity feed reticulation system

The majority of underground mains servicing the township are made up of DN80 mm uPVC or older DN80 mm galvanised pipe. The valves and hydrants in the system, also DN80 mm and over 30 years old, are in excess of their anticipated design life span.

Upgrades to the water distribution system were identified in the TSIRC Regional Water and Sewerage Upgrades Design Report (AECOM, 2015) including selective valve and hydrant replacements, and approximately 2.8km of water mains. However, these have not yet been completed.

Design Criteria

The adopted design criteria as summarised in Table B1 are generally in accordance with:

- Planning Guidelines for Water Supply and Sewerage (DEWS 2010)
- Water Supply Code of Australia (WSAA)
- Far North Queensland Regional Organisation of Councils (FNQROC) Design Manual D6 – Water Reticulation: Note that the Torres Strait Island Regional Council does not form part of the FNQROC, however the design manual consists of comprehensive guidelines developed for other Councils in Far North Queensland
- The desired standards of service provided in the TSIRC Planning Scheme (Jul 2016).

ITEM	DETAIL	REFERENCE
Pressures under normal flow conditions		
Minimum Pressure	22 m	FNQROC Section D6.07.2
Maximum Pressure	60 m	
Fire Flow Conditions		
Residential buildings	7.5 L/s for 2-hour duration ¹	Planning Guidelines for Water Supply and Sewerage, section 6.6.2 (small community category)
Non-residential buildings	15 L/s for 2-hour duration ¹	
Residual Pressure at the hydrant	12 m head	Planning Guidelines for Water Supply and Sewerage, section 6.6.3
Residual Pressure for all other areas of the water supply zone	6 m head	
Background Demand	2/3 Peak Hour demand	Planning Guidelines for Water Supply and Sewerage, section 6.6.4
Reservoirs		
Ground Level Reservoir	3 (PD-MDMM) + greater of emergency storage / firefighting storage)	FNQROC Section D6.07.4
Pumping Parameters		
Treated water pumps feeding a ground level reservoir	MDMM over 20 hours	FNQROC Section D6.07.5
Trunk Mains		
Flow	PH + fireflow	FNQROC Section D6.07.6
Maximum Velocity	2.5 m/s	
Reticulation Mains		
Flow	PH + fireflow	FNQROC Section D6.07.6
Maximum Velocity	2.5 m/s	
Water Treatment Plant	MDMM-Delivery flow rate from source (over 20 hrs)	Planning Guidelines for Water Supply and Sewerage, section 5.4.4

¹ This represents the minimum allowable provision. Consultation between Council and the Rural Fire Service is required to confirm the adopted flow provision.

TABLE B1: EXISTING WASTEWATER FLOWS

Design water demand

Average Day (AD) demands

An Average Day (AD) demand of 360 L/EP/day was adopted for the existing population of Hammond Island, as per the TSIRC Regional Water and Sewerage Upgrades Design Report (2015). For future demand, 400 L/EP/day was adopted as per the FNQROC Design Manual D6 – Water Reticulation.

Peaking factors

The following peaking factors were adopted for this assessment, consistent with the FNQROC Design Manual D6 – Water Reticulation (Version No. 03/17):

- Mean Day Maximum Month (MDMM): 1.5 x AD
- Peak Day (PD): 2.25 x AD
- Peak Hour (PH): 4.5 x AD.

Existing water supply demands

The existing water supply demands for Hammond Island are shown in Table B2.

DESCRIPTION	POPULATION (EP)	AD (L/S)	PD (L/S)	PH (L/S)
Residential Lots	290	1.2	2.7	5.4
Non-Residential Lots	-	0.1	0.2	0.5
TOTAL		1.3	2.9	5.9

TABLE B2: DESIGN FLOW RATES - EXISTING DEMANDS

SEWERAGE

Hammond Island is currently not serviced by a reticulated sewer system. Wastewater produced in the community is captured and treated via septic systems connected to each property, with effluent being disposed of via absorption trenches and sludge periodically pumped out and disposed of to landfill on the island. The majority of septic systems operate satisfactorily, however there are problems on some lots due to the low permeability of the clay soil which is causing the absorption trenches to fail. This primarily occurs during the wet season.

The MIP4 Hammond Island Sewerage Reticulation & Treatment Project (AECOM, 2009) outlined the infrastructure requirements and cost of a reticulated sewerage system to service the community. The new sewerage system would consist of gravity sewers, sewage pump stations, rising mains and a treatment facility. The treatment facility is most likely to be located to the north of the island, north of the existing solid waste depot. The treated effluent would then be discharged into the ocean via an ocean outfall. However, this sewerage system has not yet been constructed.

Design Criteria

The design criteria from the following sources were adopted for this assessment:

- Planning Guidelines for Water Supply and Sewerage (DEWS 2010)
- Sewage Code of Australia – WSA 02 – 2002 (WSAA)
- Sewage Pumping Station Code of Australia – WSA 04 – 2005 (WSAA)
- Far North Queensland Regional Organisation of Councils (FNQROC) Design Manual D7 – Sewerage System: Note that the Torres Strait Island Regional Council does not form part of the FNQROC, however the design manual consists of comprehensive guidelines developed for other Councils in Far North Queensland
- The desired standards of service provided in the TSIRC Planning Scheme (Jul 2016).

Design Flow Rates

The following design rates were adopted for this assessment, consistent with the FNQROC Design Manual D7 – Sewerage System (Version No. 03/17):

- Average Dry Weather Flow (ADWF):
/ 270 L/EP/day
- Peak Wet Weather Flow (PWWF):
/ C1 x ADWF, where C1 = 5.47; 1,476 L/EP/day.

Existing wastewater flows

The existing wastewater flows for Hammond Island are shown in Table B3.

DESCRIPTION	ADWF (L/S)	PWWF (L/S)
Residential Lots	0.9	5.0
Non-Residential Lots	0.2	1.2
TOTAL	1.0	6.2

TABLE B3: EXISTING WASTEWATER FLOWS

TRANSPORT

Hammond Island contains a small network of sealed / paved internal roads and unsealed tracks. Where new developments are proposed that require new roads to access the sites, sealed / paved roads complying with the minimum requirements of FNQROC Design Manual D1 – Road Geometry and the desired standards of service provided in the TSIRC Planning Scheme (Jul 2016) will be required.

STORMWATER

There is limited piped drainage at Hammond Island. There are several road culverts at intervals along Hammond-1 Street that direct stormwater runoff to the sea.

Stormwater infrastructure will be required to service drainage at any new development. It is anticipated that this can be managed by drainage associated with roadways.

ELECTRICITY SUPPLY AND COMMUNICATIONS

The existing electrical supply on Hammond Island is a combination of overhead and underground supply to the property boundary. Extension of existing supply to new properties will be required.

Communications is provided by conduiting. Extension of conduiting to the frontage of new properties will be required.

B2 INFRASTRUCTURE REQUIREMENTS

The assumptions used to assess the infrastructure requirements for each site are summarised in the following sections.

Design populations for residential lots

The infrastructure requirements for the proposed residential lots are based on the lot layouts presented in Section 08. The following assumptions were adopted in determining the infrastructure requirements for the proposed residential lots:

1. 21 x 750 m² residential lots (West)
2. 23 x 750 m² residential lots (North)
3. 30 x 750 m² residential lots (South).

The following occupancy rates were adopted for the proposed residential lots:

- Single family dwelling (detached house): 3.9 EP/house, based on the existing population density from the 2016 Australian Bureau of Statistics data
- 2-bedroom units: 1.6 EP/unit.

The design populations adopted for the proposed residential lots are summarised in Table B4.

LOCATION	NO. OF LOTS	EP/LOT	POPULATION
1 - 21 x 750 m ² residential lots (West)	21	3.9	82
2 - 23 x 750 m ² residential lots (North)	23	3.9	90
3 - 30 x 750 m ² residential lots (South)	30	3.9	117
TOTAL	74	12	289

TABLE B4: DESIGN POPULATIONS - RESIDENTIAL LOTS

Design populations for non-residential lots

The following assumptions were adopted in determining the infrastructure requirements for the proposed non-residential lots.

Passenger and freight transport facilities

- Land near the transport terminal has been identified as a potential site for passenger and freight transport facilities such as a shade

shelter, kiosk, tourism information and hardstand

- Water demand and sewer loads were based on the typical usage for a shop provided in the DEWS guidelines, as follows:
 - / A water demand of 700 L/day/100 m² GFA was adopted (Planning Guidelines for Water Supply and Sewerage (DEWS 2010), Table A, Shop)
 - / A wastewater flow of 365 L/day/100 m² GFA was adopted (reference: Planning Guidelines for Water Supply and Sewerage (DEWS 2010), Table A, Shop)

Nursery

- A parcel of vacant land in the west has been identified as a site for a nursery
- The nursery is assumed to have an area of 0.2 ha
- The water demand was based on the lower end of the light industrial category of 10,000 L/day per hectare (reference: Planning Guidelines for Water Supply and Sewerage (DEWS 2010), Table A, Light Industry)
- No sewer loads were assumed.

Health centre and aged persons accommodation

- A parcel of land to the east of the centre of the township has been identified as a potential health centre and aged persons accommodation
- Water demand and sewer loads were based on the typical usage for a medical centre provided in the DEWS guidelines, as follows:
 - / A water demand of 550 L/day/100 m² GFA was adopted (reference: Planning Guidelines for Water Supply and Sewerage (DEWS 2010), Table A, Medical Centre).
 - / A wastewater flow of 365 L/day per site was adopted (Planning Guidelines for Water Supply and Sewerage (DEWS 2010), Table A, Medical Centre).

Land for community use

- A parcel of land, near the current Council office, has been identified for a range of potential community uses such as aged care or emergency services

- The footprint is to be confirmed to avoid areas of historical significance
- Water demand and sewer loads were based on the typical usage for a public building provided in the DEWS guidelines, as follows:
 - / A water demand of 550 L/day/100 m² GFA was adopted (Planning Guidelines for Water Supply and Sewerage (DEWS 2010), Table A, Public Building)
 - / A wastewater flow of 365 L/day per site was adopted (Planning Guidelines for Water Supply and Sewerage (DEWS 2010), Table A, Public Building).

Arts centre

- No additional demand was forecast as it is assumed that the redeveloped arts centre will use the same amount of water as the current arts centre.

WATER

The water supply infrastructure requirements to service the preferred future development option for Hammond Island were identified by reviewing the layout of the existing water network and the capacity of the pumps, storage reservoirs and water treatment plant. Water network modelling was not undertaken for this study. The infrastructure requirements are summarised in the following sections.

Design water demand

Design water demand for residential lots

The following occupancy rates were adopted for the proposed residential lots:

- Single family dwelling (detached house): 3.9 EP/house
- 2-bedroom units: 1.6 EP/unit.

The design water demand adopted for the proposed residential lots are summarised in Table B5.

LOCATION	NO. OF LOTS	EP	AD (L/s)	PD (L/S)	PH (L/S)
1 - 21 x 750 m ² residential lots (West)	21	82	0.4	0.9	1.7
2 - 23 x 750 m ² residential lots (North)	23	90	0.4	0.9	1.9
3 - 30 x 750 m ² residential lots (South)	30	117	0.5	1.2	2.4
TOTAL	74	289	1.3	3.0	6.0

TABLE B5: DESIGN WATER DEMAND - RESIDENTIAL LOTS

Design water demand for non-residential lots

The design water demand adopted for the proposed non-residential lots are summarised in Table B6.

LOCATION	DEVELOPMENT SIZE	AD (L/s)	PD (L/S)	PH (L/S)
Passenger and freight transport facilities	400 m ² GFA	0.02	0.04	0.09
Nursery	2,000 m ² GFA	0.02	0.04	0.08
Health centre and aged persons accommodation	3,500 m ² GFA	0.13	0.30	0.60
Land for community use	1,800 m ² GFA	0.07	0.15	0.31
TOTAL		0.2	0.5	1.1

TABLE B6: DESIGN WATER DEMAND - NON-RESIDENTIAL LOTS

The total design water demand is summarised in Table B7.

DESCRIPTION	AD (L/S)	PD (L/S)	PH (L/S)
Existing Demands	1.3	2.9	5.9
New Residential Lots	1.3	3.0	6.0
New Non-Residential Facilities	0.2	0.5	1.1
TOTAL	3	6	13

TABLE B7: SUMMARY TOTAL DESIGN RATES - WATER

Review of trunk infrastructure

A review of trunk infrastructure requirements was undertaken and is summarised in Table B8.

ITEM	EXISTING CAPACITY	ESTIMATED REQUIRED CAPACITY			CAPACITY DEFICIENCY
		HORN IS.	THURS. IS.	HAMMOND IS.	
Raw Water Source	761 ML/yr ¹	190 ML/yr	234 ML/yr	164 ML/yr	Marginal ²
Water Treatment ³	912 ML/yr	NA	234 ML/yr	164 ML/yr	Nil
High-lift Pump Station on Thursday Island ⁴	854 ML/yr	NA	234 ML/yr	164 ML/yr	Nil
Water Storage	0.52 ML	NA	NA	0.67 ML	0.15 ML

Notes:

1. The existing raw water source yield is the estimated safe yield of Loggy Creek Dam based on the Torres Shire Council Drinking Water Quality Management Plan (February 2013). It is estimated that the yield of Loggy Creek Dam could be up to 1000 ML/yr
2. This is based on estimated water demand from the Torres Shire Council Drinking Water Quality Management Plan (February 2013). If the water demand increases on Thursday Island and Horn Island at the same rate as on Hammond Island, it is likely that there would be a capacity shortfall.
3. Capacity based on 2.5 MLD (megalitres per day) from the Torres Shire Council Key Performance Indicators for the Drinking Water Quality Management Plan
4. The high-lift pump station on Thursday Island transfers water from the pipeline between Horn Island and Thursday Island and the settling reservoir to the Thursday Island Milman Hill reservoirs and the submarine pipeline between Thursday Island to Hammond Island. The capacity is based on a conservative 10 hours of operation per day.

TABLE B8: HAMMOND ISLAND REVIEW OF WATER SUPPLY

Infrastructure requirements

The water supply infrastructure requirements for the Master Plan are summarised in Table B9.

DESCRIPTION	INFRASTRUCTURE REQUIREMENT
1. 21 x 750 m ² residential lots (West)	600 m of new DN100 mm mains to connect to the existing water mains and along the new residential roads
2. 23 x 750 m ² residential lots (North)	500 m of new DN100 mm mains to connect to the existing water mains and along the new residential roads
3. 30 x 750 m ² residential lots (South)	700 m of new DN100 mm mains to connect to the existing water mains and along the new residential roads

TABLE B9: WATER SUPPLY INFRASTRUCTURE REQUIREMENTS

WASTEWATER

Design wastewater flow rates for proposed residential lots

The following occupancy rates were adopted for the proposed residential lots:

- Single family dwelling (detached house): 3.9 EP/house
- 2-bedroom units: 1.6 EP/unit.

The design flow rates adopted for the proposed residential lots are summarised in Table B10.

LOCATION	NO. OF LOTS	EP	ADWF (L/S)	PWWF (L/S)
1. 21 x 750 m ² residential lots (West)	21	82	0.26	1.40
2. 23 x 750 m ² residential lots (North)	23	90	0.28	1.53
3. 30 x 750 m ² residential lots (South)	30	117	0.37	2.00
TOTAL	74	289	0.9	4.9

TABLE B10: DESIGN WASTEWATER FLOW RATES - RESIDENTIAL LOTS

Design wastewater flow rates for proposed non-residential lots

The design flow rates adopted for the proposed non-residential lots are summarised in Table B11.

LOCATION	DEVELOPMENT SIZE	ADWF (L/S)	PWWF (L/S)
Passenger and freight transport facilities	400 m ² GFA	0.01	0.06
Nursery	2,000 m ² GFA	-	-
Health centre and aged persons accommodation	3,500 m ² GFA	0.09	0.48
Land for community use	1,800 m ² GFA	0.05	0.25
TOTAL		0.1	0.8

TABLE B11: DESIGN WASTEWATER FLOW RATES - NON-RESIDENTIAL LOTS

The total design flow rates for wastewater are summarised in Table B12.

DESCRIPTION	ADWF (L/S)	PWWF (L/S)
Existing loads	1.1	6.1
New Residential Lots	0.9	4.9
New Non-Residential Facilities	0.1	0.8
TOTAL	2	12

TABLE B12: SUMMARY TOTAL DESIGN RATES - WASTEWATER

Infrastructure requirements

Two scenarios are proposed for the sewerage of the new residential areas.

The first scenario involves each lot having a separate septic system similar to the existing households in the community. The cost of the septic tank would be included in the cost of housing and therefore does not have a separate infrastructure cost. However, currently there are plans to implement a reticulated sewerage system on the island. If constructed, the new residential areas would also form part of this system. This would require the excavation of newly constructed roads in the development areas to lay a reticulation sewer. Therefore, this scenario comes with the risk of significant re-construction.

The second scenario assumes that the wider community's sewerage system, first designed in 2009, is constructed between now and this Master Plan being implemented. New DN150 gravity sewers to connect the new residential areas to the community's sewerage system would then be required.

The wastewater infrastructure requirements for the second scenario are summarised in Table B13.

DESCRIPTION	INFRASTRUCTURE REQUIREMENT
1. 21 x 750 m ² residential lots (West)	450 m of new DN150 mm gravity sewers and 150 m of new DN80 rising main to connect to proposed community sewerage system One pump station to connect these lots to the proposed community sewerage system
2. 23 x 750 m ² residential lots (North)	220 m of new DN150 mm gravity sewers and 550 m of new DN80 rising main to connect to proposed community sewerage system
3. 30 x 750 m ² residential lots (South)	500 m of new DN150 mm gravity sewers to connect to proposed community sewerage system
General	One pump station to transport sewage from the residential expansion area to the proposed community sewerage system

TABLE B13: WASTEWATER INFRASTRUCTURE REQUIREMENTS – SCENARIO 2

TRANSPORT

New sealed / paved roads will be required for the proposed development sites as listed in Table B14.

DESCRIPTION	INFRASTRUCTURE REQUIREMENT
1. 21 x 750 m ² residential lots (West)	New access place will be required, approximately 350 m (5.5 m seal, 14.5 m wide road reserve) New access street will be required, approximately 200 m (6.5 m seal, 15.5 m wide road reserve)
2. 23 x 750 m ² residential lots (North)	New access street will be required, approximately 500 m (6.5 m seal, 15.5 m wide road reserve)
3. 30 x 750 m ² residential lots (South)	New access street will be required, approximately 500 m (6.5 m seal, 15.5 m wide road reserve)
Road widening from town to marine facilities	Widen road, approximately 120 m (additional 3.0 m road width)
Road to West Coast	New minor collector road will be required, approximately 1,500 m (7.5 m seal, 16.5 m wide road reserve)

TABLE B14: TRANSPORT INFRASTRUCTURE REQUIREMENTS

STORMWATER

New stormwater infrastructure will be required for the proposed development sites as listed in Table B15.

DESCRIPTION	INFRASTRUCTURE REQUIREMENT
Bund and channelisation	Bund and channelisation is required for a length of 350 m (4,200 m ³) to protect the new residential developments from flood waters

TABLE B15: STORMWATER INFRASTRUCTURE REQUIREMENTS

ELECTRICAL SUPPLY AND COMMUNICATIONS

Communications will require the installation of pits and conduits for any sites located on new roads. The length of conduit for the communications has assumed to be generally the same as the length of new water main required. The electrical supply will require the installation of overhead supply and new poles for any sites located on new roads. Poles will be required every 80 m and at changes in direction. The same alignment has been assumed for communications and electrical services. The electricity supply and communications services required are summarised in Table B16.

DESCRIPTION	INFRASTRUCTURE REQUIREMENT
1. 21 x 750 m ² residential lots (West)	Approximately 550 m to service the new lots and 7 electricity poles
2. 23 x 750 m ² residential lots (North)	Approximately 500 m to service the new lots and 6 electricity poles
3. 30 x 750 m ² residential lots (South)	Approximately 500 m to service the new lots and 6 electricity poles

TABLE B16: ELECTRICAL SUPPLY AND COMMUNICATIONS INFRASTRUCTURE REQUIREMENTS

COST ESTIMATES

An Opinion of Probable Construction Costs was developed based on the approximate quantities derived from the planning level assessment undertaken for this report and costs obtained from recent similar projects with an adjustment to account for cost escalation. The estimate includes costs associated with construction only. A summary of the probable construction costs is provided in Table B17.

PROPOSED DEVELOPMENT	ESTIMATED CONSTRUCTION COST
1. 21 x 750 m ² residential lots (West)	\$3,845,784
2. 23 x 750 m ² residential lots (North)	\$3,660,140
3. 30 x 750 m ² residential lots (South)	\$2,545,452
Widen Road to marine facilities	\$134,447
Road to West Coast	\$4,201,470
Bund and channelisation	\$1,444,716
TOTAL	\$15,832,009

TABLE B17: OPINION OF PROBABLE CONSTRUCTION COSTS

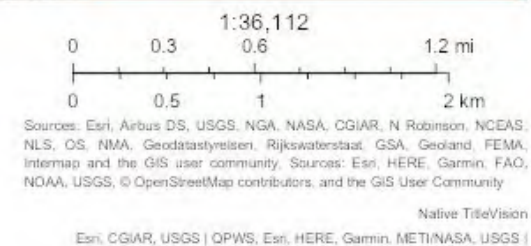
C. APPENDIX C. NATIVE TITLE VISION MAPPING



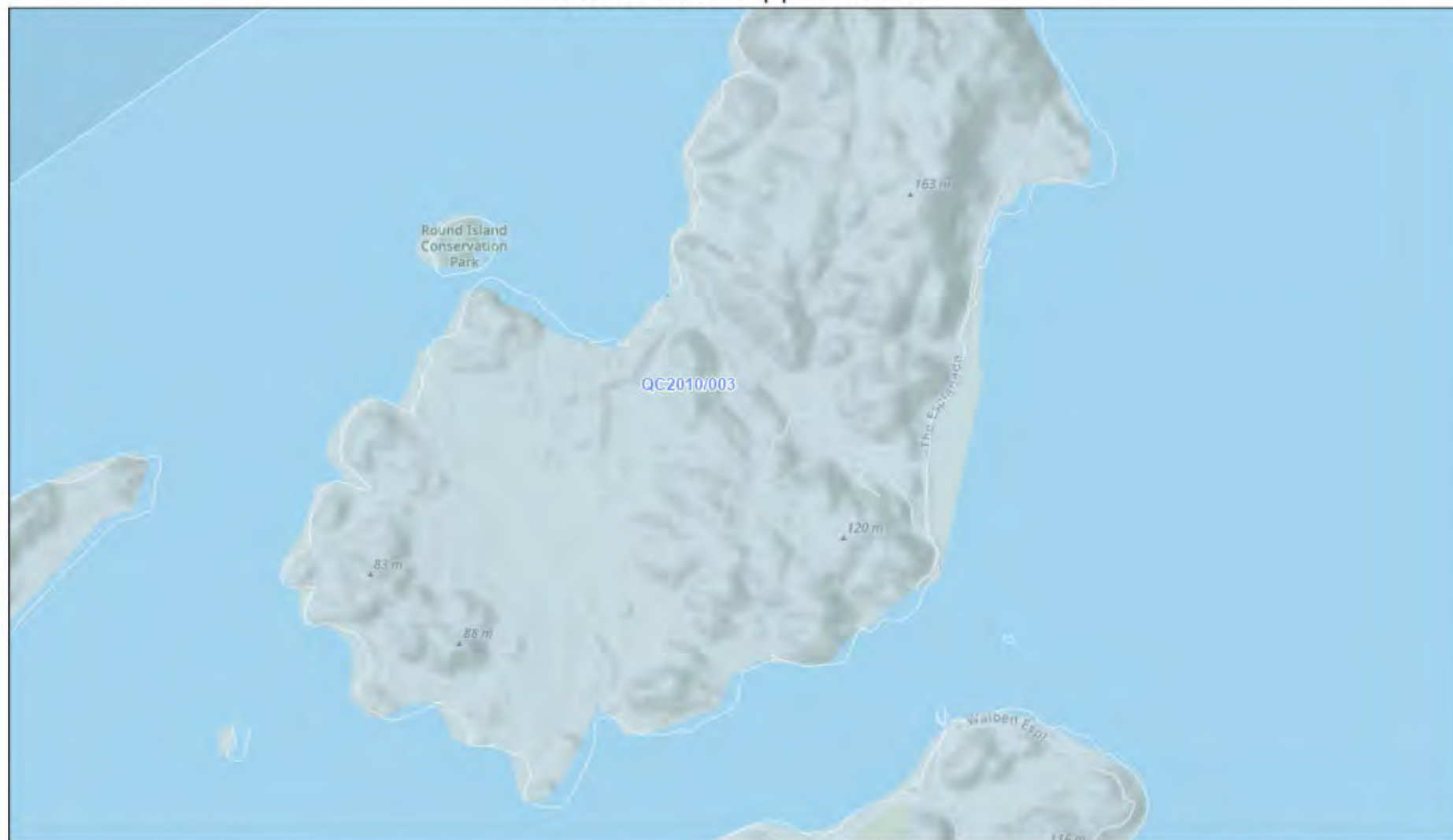
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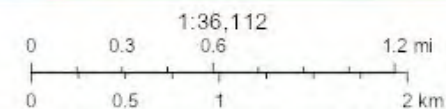


Native Title - Applications



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Applications (Schedule)



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatasysteisen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community. Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

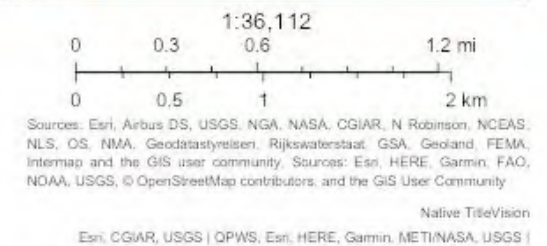
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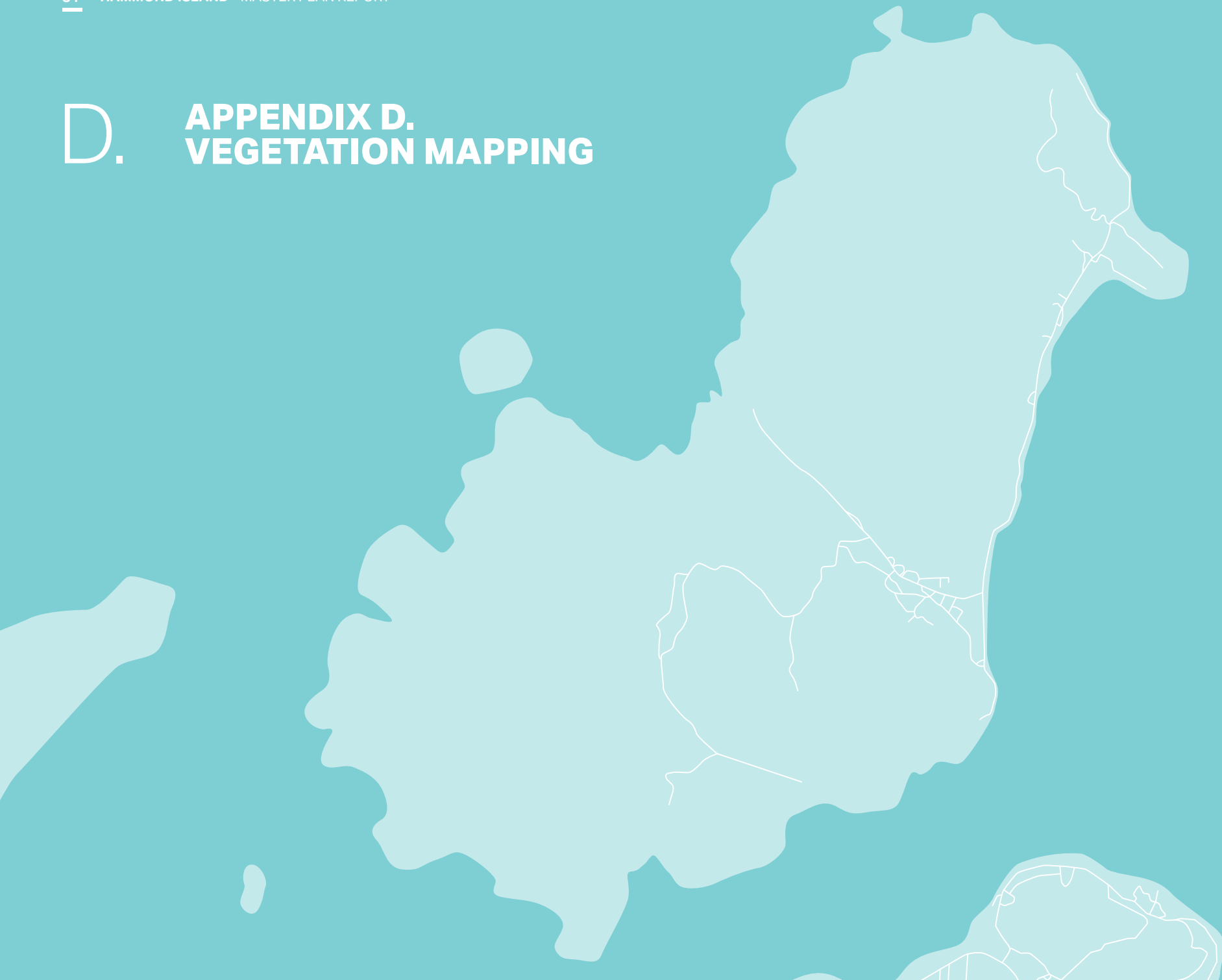
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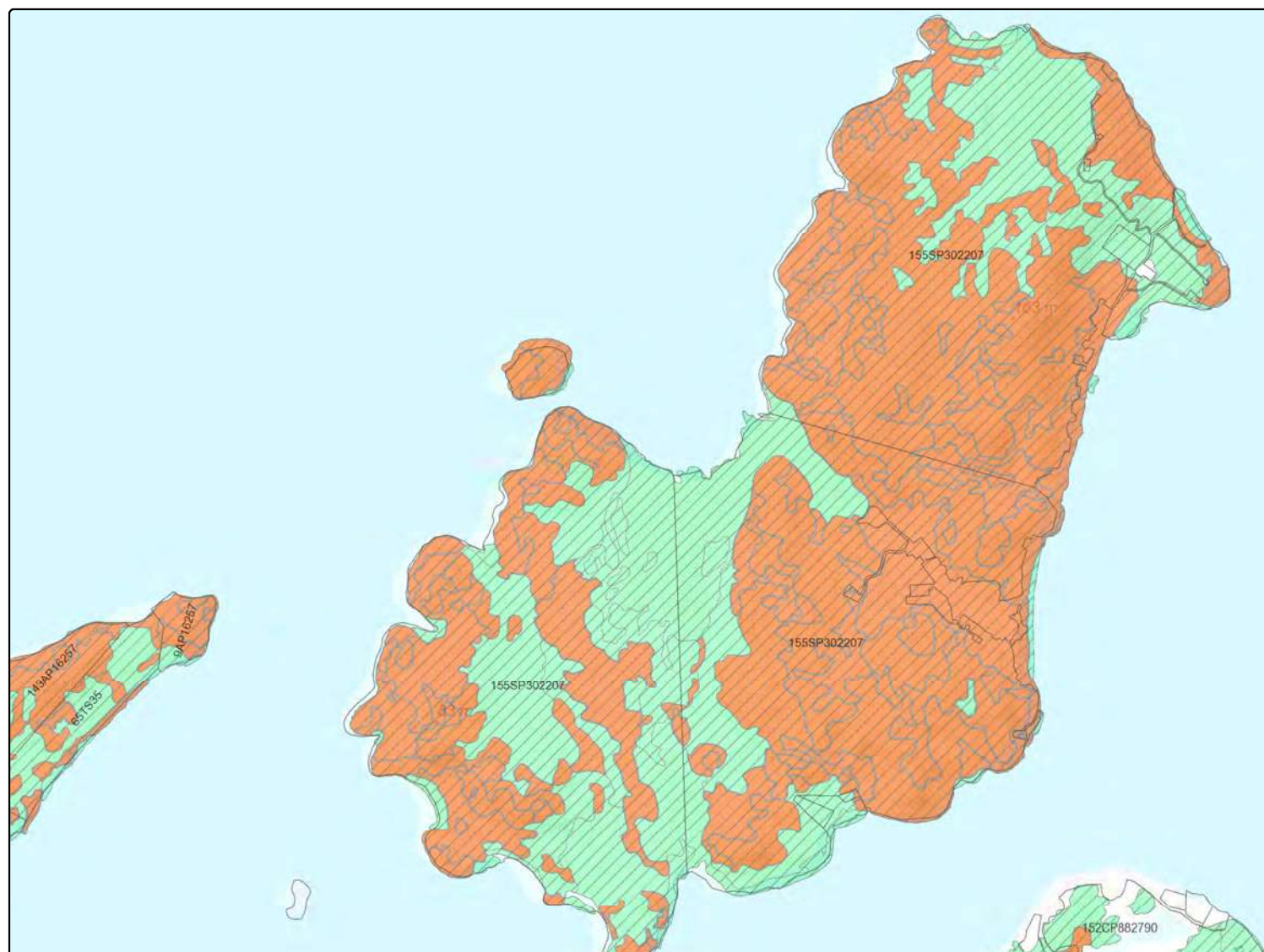


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D. APPENDIX D. VEGETATION MAPPING





Legend

Cadastral (50k)

 Cadastral (50k)

Regulated vegetation management map (Category A and B extract)

 Category A on the regulated vegetation management map

 Category B on the regulated vegetation management map

Vegetation management regional ecosystem map

 Category A or B area containing endangered regional ecosystems

 Category A or B area containing of concern regional ecosystems

 Category A or B area that is a least concern regional ecosystem

 Non remnant

 Water

DA Mapping System – Print Screen



Department of State
Development, Manufacturing,
Infrastructure and Planning

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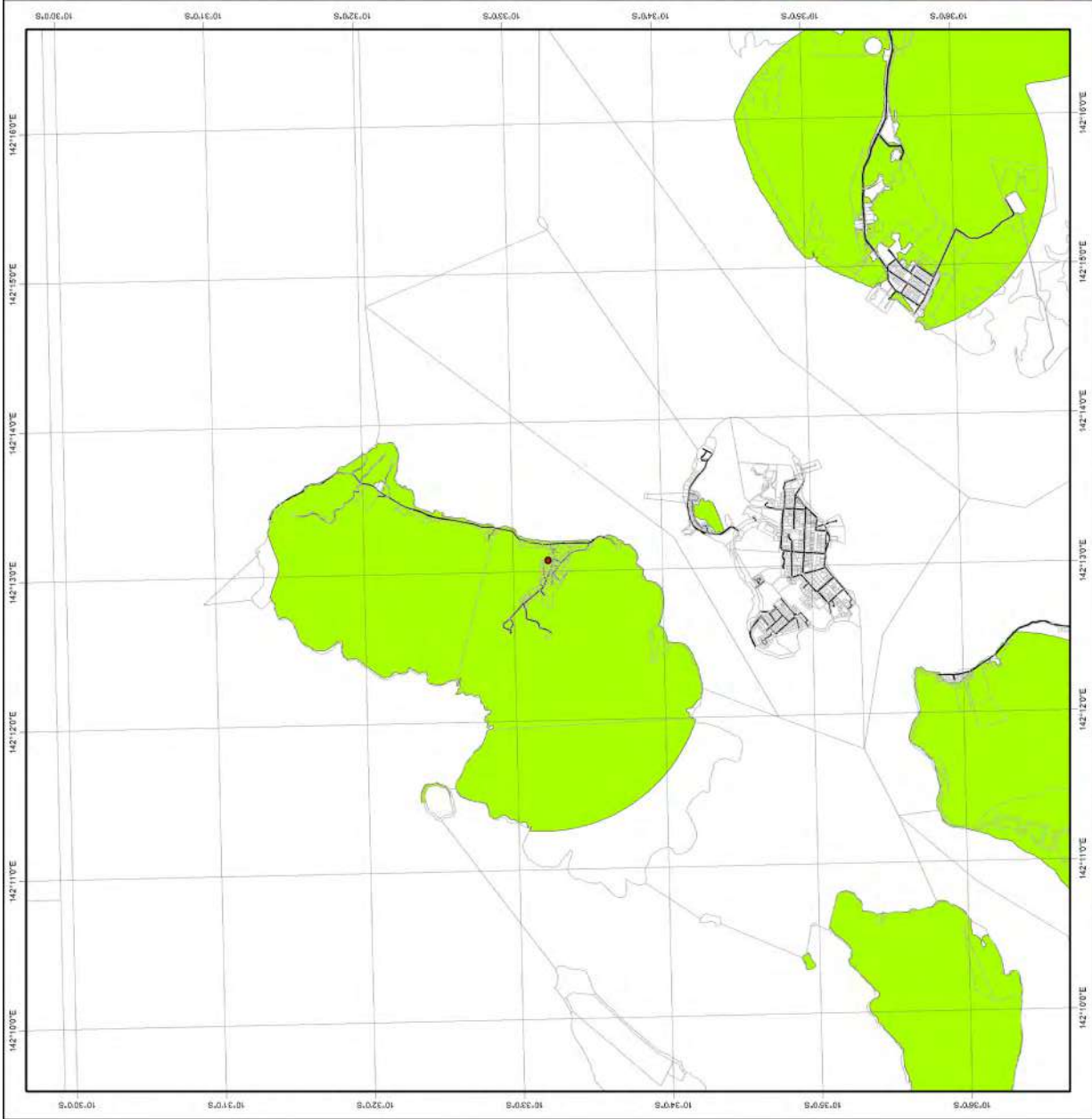
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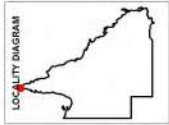
Disclaimer:

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21/04/2020 16:00:27
Longitude: 142.2179 Latitude: -10.5539



Protected Plants Flora Survey Trigger Map



Legend

- Coordinates
- High risk area
- Cadastral line
- Property boundaries shown are provided as a locational aid only
- Freeways / motorways / highways
- Secondary roads / streets

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

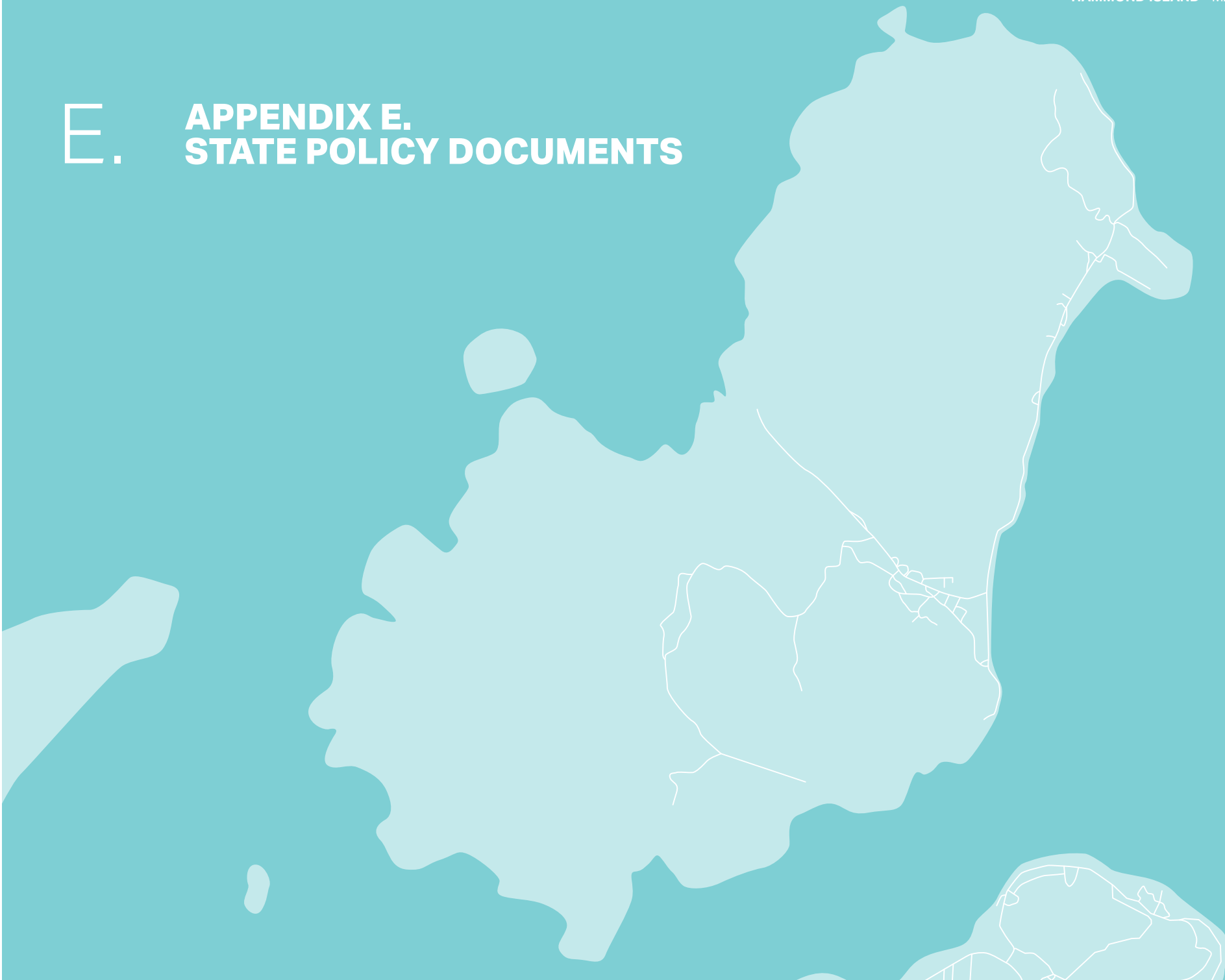
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E. APPENDIX E. STATE POLICY DOCUMENTS



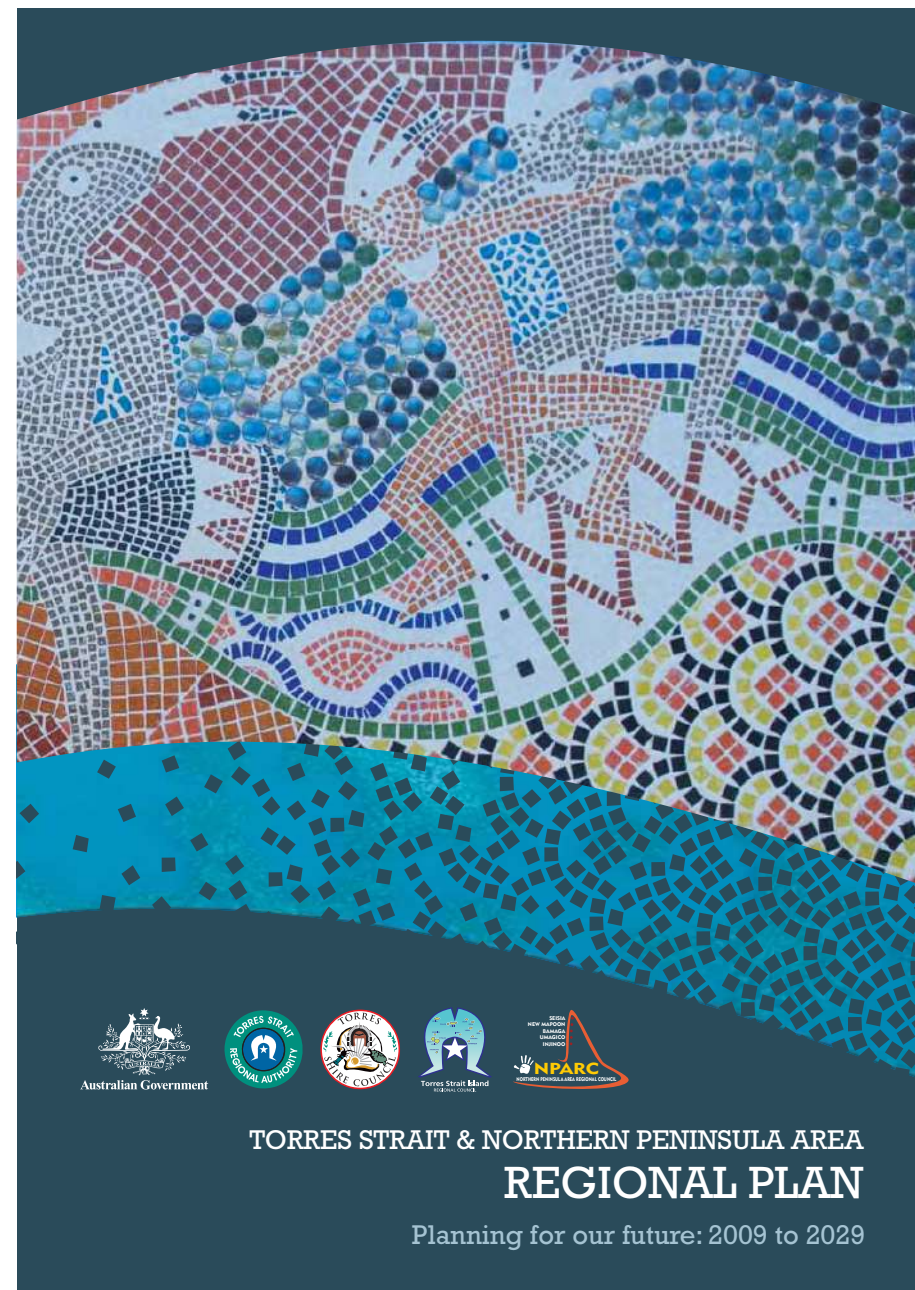
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Department of Infrastructure, Local Government and Planning

July 2017

State Planning Policy

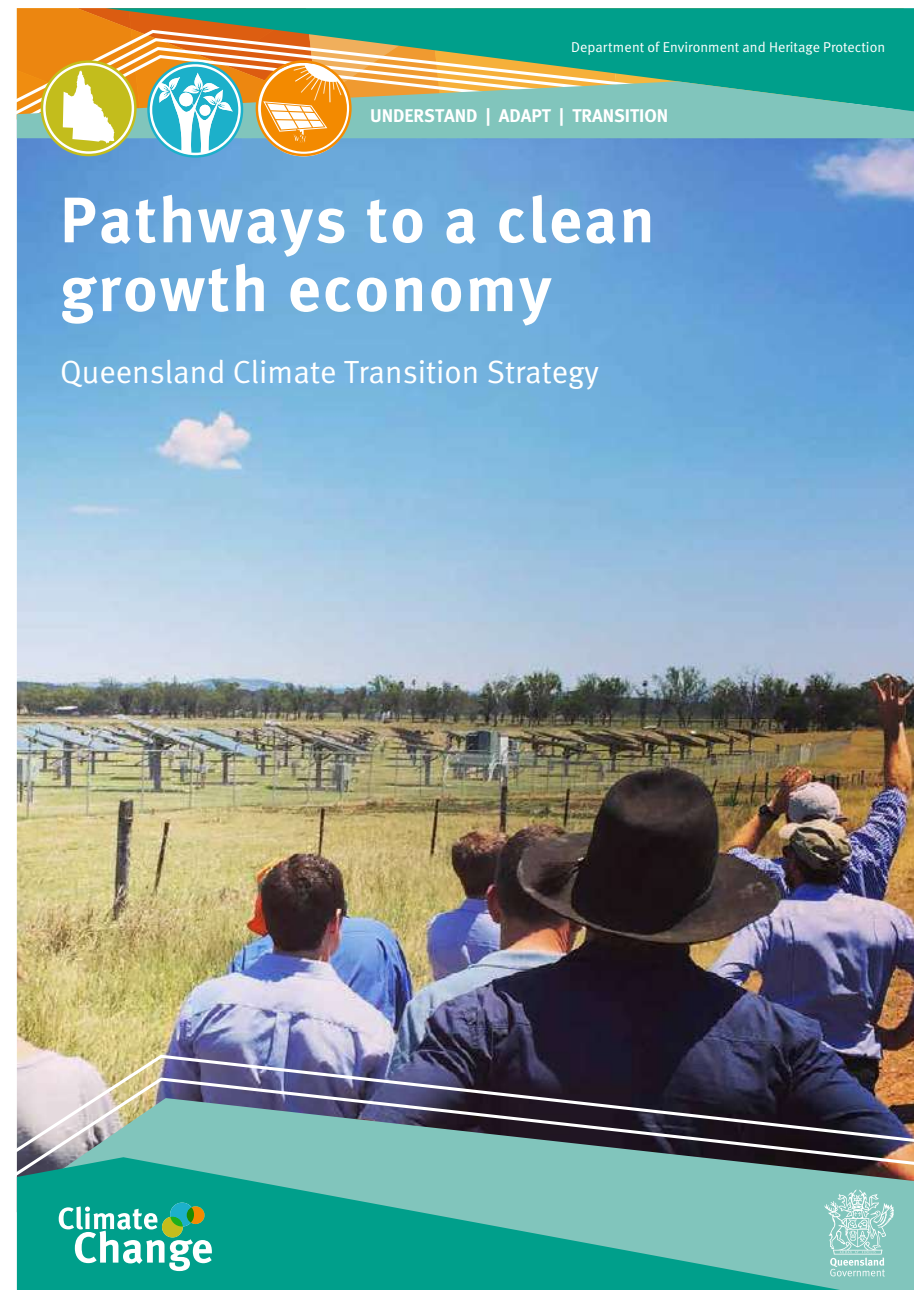
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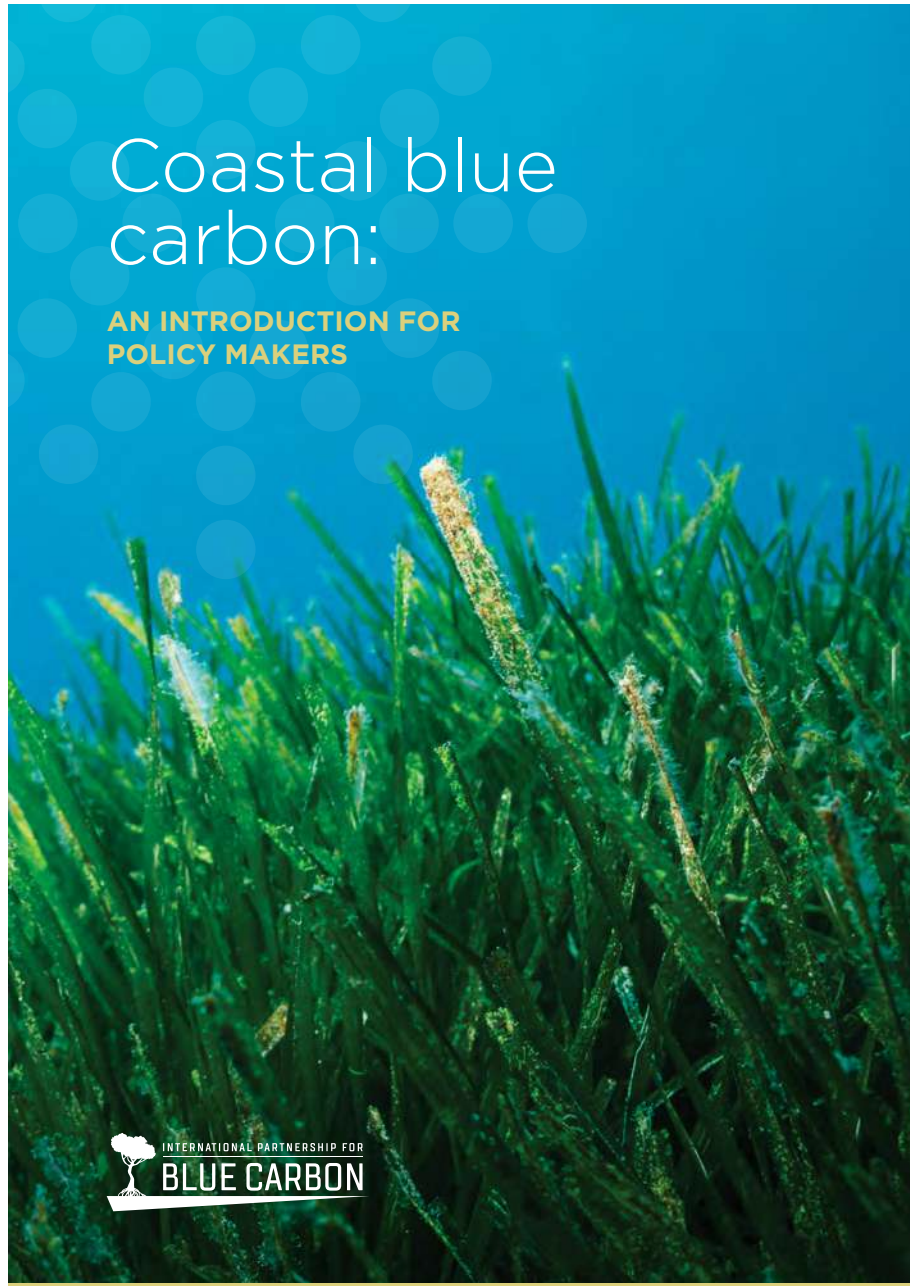


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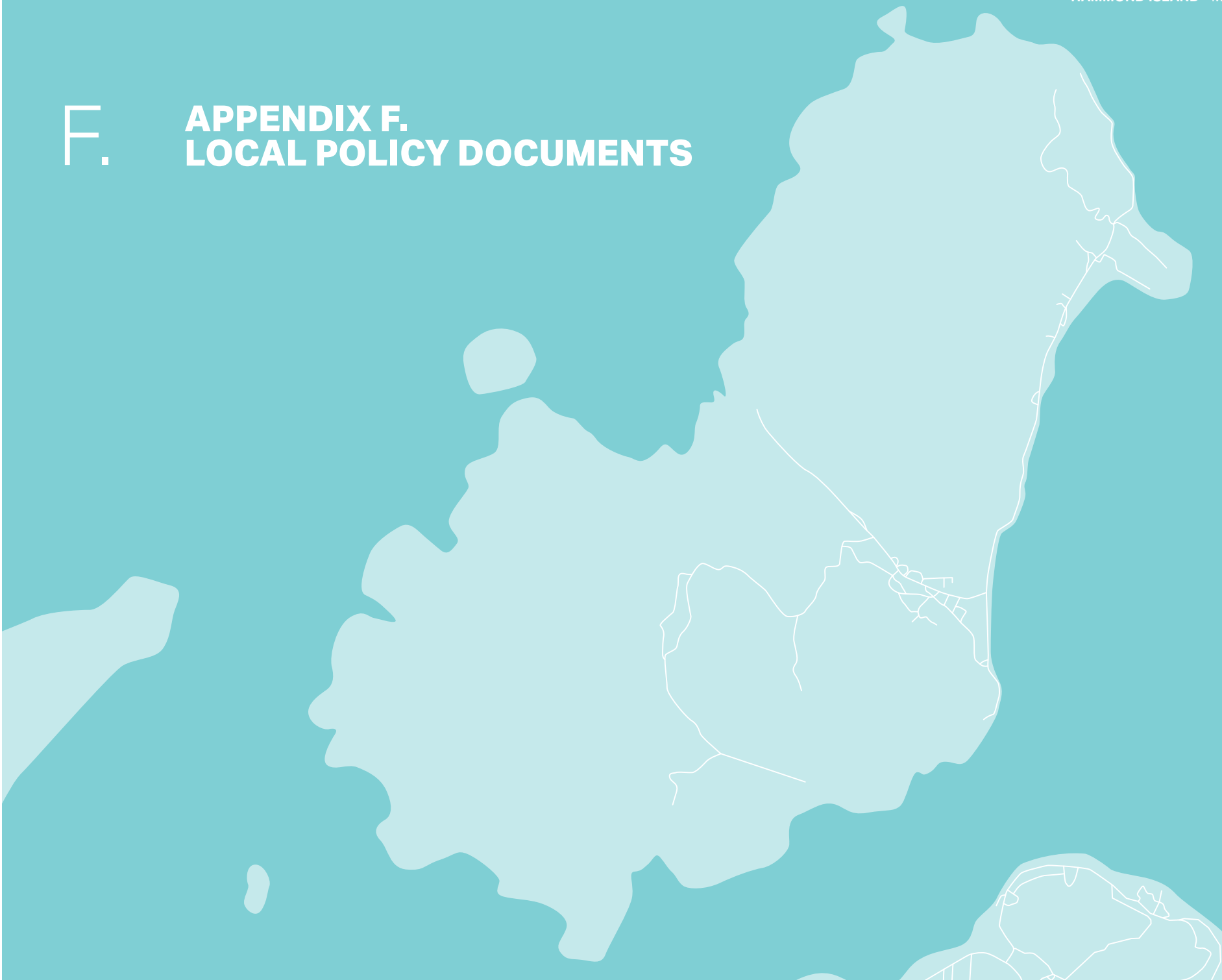


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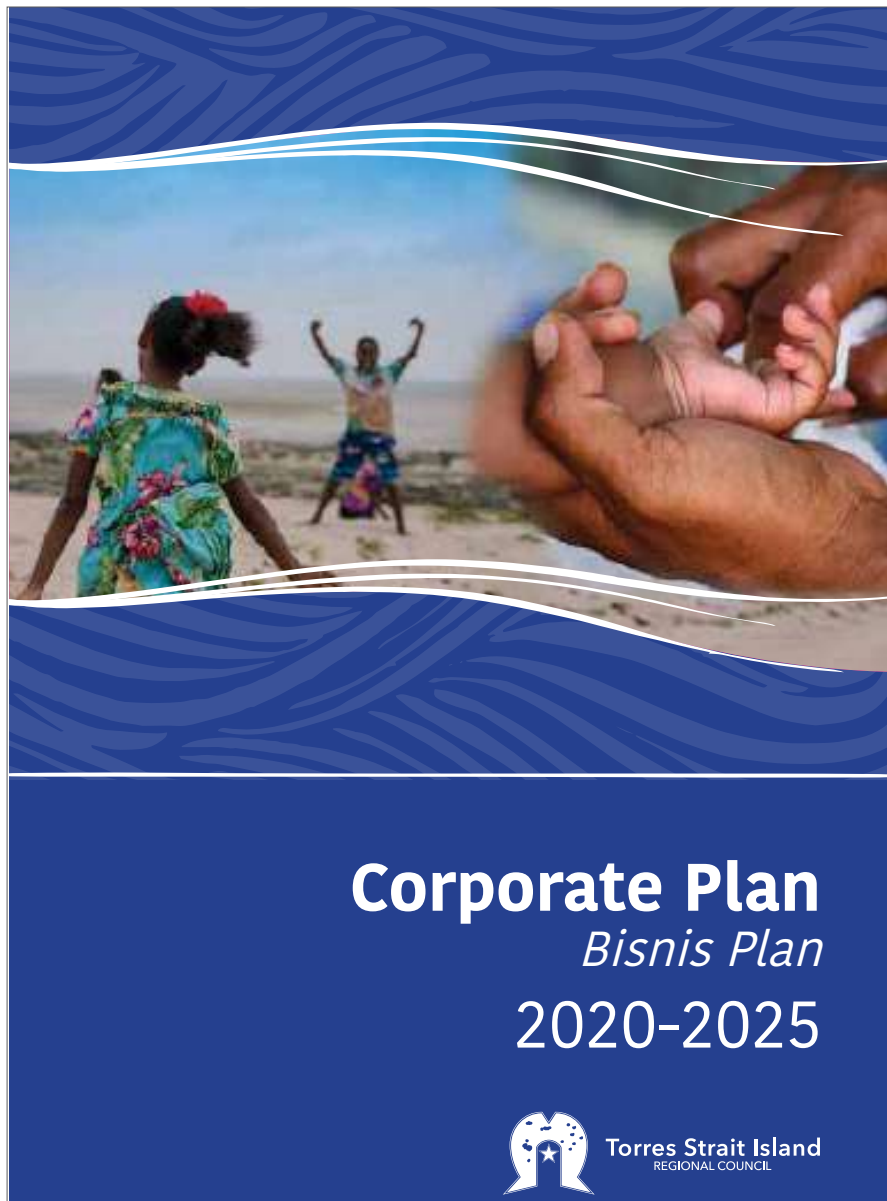
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F. APPENDIX F. LOCAL POLICY DOCUMENTS



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