

ESCAPE TO BARBUDA DEVELOPMENT PROJECT

Project Proposal Narrative

Antigua and Barbuda Planning Department Approval In-Principle Application

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A. CONCEPTUAL DESIGN NARRATIVE

a. Introduction and Project Description

The **Escape to Barbuda** project development team (Escape to (Barbuda) Inc) wishes to build a world class boutique hotel on 30 acres of beachfront land on the Southern Coast of Barbuda as indicated in the Project Site Analysis site location plan. The developers were seeking to create a project on the pristine island of Barbuda since 2015. The physical and ecological uniqueness of the island along with its unusual array of white and pink sandy beaches and the laid back, friendly and engaging local community were the main attraction to this destination.

The development team of Escape to (Barbuda) Inc. will contribute significantly towards the efforts by the Government of Antigua and Barbuda, the local Barbuda Council and The Department of the Environment to achieve the national targets for the Sustainable Development Goals in enabling the economy of local communities; safeguarding environmental land, coastal and marine assets; prudent use of natural resource and the application of renewable energy and water efficiency strategies across the development operations.

The mission of **Escape to Barbuda** is to develop a sustainable, energy efficient project and construct buildings that enable resource use efficiency with a design and layout that embraces climate change resilience.

The Client has engaged the Design Architectural and Engineering Team (assembled specifically for this project) of BCL/ BOA Architects and Engineers of St Kitts and Nevis in association with Sean Keane Architect located in Antigua and Barbuda. The Consulting team also comprises Maya Blue UK (Environmental Consultants) and CBCL Halifax (Coastal Engineering Consultants).

b. Concept

Focus Anchors for Design Concept

The design concept for **Escape to Barbuda** is aimed as presenting a celebration of beauty of Barbuda: its visual landscape, terrain, flora and fauna and culture.

This has served to focus the design team and the developer to optimise the potential of the site by focusing on beach access, direct picturesque terrestrial and marine viewpoints, including views of the sister island Antigua.

Escape to Barbuda also aims to retain the desirable attributes of the tranquillity, clear nearshore water and aesthetically appealing flora and fauna treasured by both local community and visiting guests.

Integrating Environmental Attributes

The concept design incorporates the structure and function of shade and protection that local vegetation species found in this zone provide due to their biological adaptation strategies which enable them to thrive in the dry environment of the south coast.

The design and layout of buildings, use of materials and application of engineering systems present opportunities to realise the aim of site optimisation and enhancement. This is aligned with the need to enable climate adaptation strategies regarding drainage, construction setback and coastal protection, without losing the very essence of the development ethos.

Creating a memorable place and space

The development footprint lies within the zone designated for tourism development. The developer is driven to create an iconic development that is aesthetically appealing, memorable, flexible in its function while retaining core elements of remoteness with a harmonious integration with nature.

Flow and form

The importance of being environmentally conscious and sustainable living for both the Client and Consulting team led to the design of a proposed development that unites the landscape and blurs the line between outdoor and indoor spaces, the built and the natural environment. The need for a structurally sound building that is also environmentally responsive, to resist the seasonal climatic hazards, was a major consideration from the inception.

Site Analysis and Approach to Layout Design

At the outset of the preliminary design process, the design team carried out a detailed analysis of the site to understand existing conditions and how to best move forward with land use, massing and overall design. The lease agreement requires a mixture of 15 resort units and 10 residential units with no particular requirements for the Central Facilities. To enhance this community with facilities to attract a high-end conscious clientele, Escape to Barbuda will include a main lobby, restaurant, events center, tennis court, gym, spa, children's day-care center and central swimming pool. It will also include a jogging trail constructed from natural materials of local sand and gravel that will flow along the perimeter of the community site boundary.

Engineering Systems

The remoteness of the site encourages a self-reliant and self-supplying initiative. The project will include a sustainable and low maintenance sewage treatment plant, a desalination plant, water storage tanks, and an adequately sized solar generation field to supplement grid tied power usage, all placed in close proximity to each other. Escape to

Barbuda is also taking a sustainable approach with the chosen materials for the site that promote longevity and resilience to climatic conditions.

With the aim to be environmentally responsible, the design concept is simple, yet effective in achieving the design goal. Each building is to have a small environmental footprint, from construction through to occupation and constant use. The design of each building is done using a repetitive structural design, comprising of a series of 20 x 24 feet bases aligned/augmented as necessary to fit the program requirements of each building. This allows the construction process to be simplified repetitive and expedient, as the quantity of formwork molds for construction is reduced and can be easily reused. This approach ensures construction time is reduced, and the impact on the land will be minimized.

Site Optimisation and Sustainable Use of Space

The full development is designed to optimize the use of the site as much as possible. By utilizing the easiest access point of the land, this helped to influence the design team's determination of where the residential and resort sections should be placed. The access is used to serve as a natural and easy separation of the two spaces. The resort is placed to the East of the main accessway as it is more conducive to a resort development with better beach access. The residential portion is placed to the West of the accessway. The entry to the main lobby has been aligned with the natural entry access point. The goal is to create a sense a relaxation and connectivity to nature.

The main buildings feature "floating" concrete elements with recessed vertical supports and lush garden development that masks the support of these concrete elements. The walls appear visually open, further accentuating the concept of having the design or the built structure lightly touch the site.

Each building fully incorporates the natural environment to create a Caribbean tropical haven. The main resort buildings huddle around a central pond area comprising of a freshwater koi pond, adjacent to a saltwater pond connected to the sea. Large openings and glass façade invite the water features indoors, with tropical landscaping to give the feel of the indoor spaces naturally spilling into nature. The internal spaces make use of collapsible interior walls to encourage adjustable, customizable spaces to fit the needs of interior spaces, as necessary.

West of the Resort's main buildings, the linear placement of the cottages provide shared access to the beach and the spectacular views of Antigua on the horizon. BOA advocates for all designs to incorporate standards of safety in the event of natural disasters. The hotel cottage rooms have been designed to hurricane standards with secure spaces on the second storey to ensure minimal damage to the property and greater safety for its residents.

Coastal Setback

Estimated coastal setback from the beach was guided by the CBCL Coastal Erosion Analysis Report. The resort itself was designed with a coastal setback sufficient to mitigate the effects of storm surges that the island may experience.

Parking, punctuated by landscape verges, is spread across the site and is all at grade level. A separate and secondary service area to the East of the site has been incorporated to facilitate deliveries.

Layout and Development Components

This proposed Boutique Hotel Development will include the following facilities:

- A Reception Building
- Flexible Conference Facility
- Restaurant
- Gym and Spa
- Central Swimming Pool
- Children's Play Area
- Back of House Facilities along with Back up Facilities
- A Jogging Trail
- 10 Villa Land Lots for Sale and for High End Residential Construction.
- 15 individual Hotel Rooms/Cottages

It is anticipated that this development will occupy approximately 38,750 sq.ft (3,600 sq.m) of building interior space and 22,600 sq.ft (2,100 sq.m) of outdoor building space (including swimming pool and deck). The Hotel will therefore account for total building area of approximately 61,000 sq.ft (5,700) in area.

B. ENVIRONMENTAL CONSTRUCT

1. Physical Environment

The site is located on the south coast on the flank of marginal plain known locally as the Lowlands, with a gentle dip to the shoreline. The rock formation which lies beneath the site is young sandstones and limestone, with exposed areas along the coast. The rock formations are overlain by thin, poorly developed soil loam soils which are common for this area. The coastal sediment is a medium to fine sand with young sand dunes of 0.5 m height on average. The site footprint is dry, well drained with good porosity and permeability and is devoid of any waterlogged soils.

The Escape nearshore and marine profile is gentle and shallow and lies within the sheltered side of the island (not exposed to the regular swell driven storms), but is not fully protected by coral reefs, as is the eastern coast of the island. A modest number of scattered reef mounds are present. The water is clear and devoid of any land-based discharge.

2. Natural Environment

The site footprint is dominated by dry open scrub with a vegetational assemblage that comprises stunted growth due to the dry environment. It comprises sparse broad-leaved evergreen and dense dwarf-shrubs including common species such as balsam, sweet sage, wild tamarind, dagger plant, bilbush, duldul, poison ash, loblolly and wild frangipani. Non-native climax species such as logwood and mesquite are in great abundance. The site, as with the whole southern coastal stretch, is frequently grazed by donkeys with several ground-feeding birds such as the helmeted guinea fowl, Zenida dove and other small bird species and invertebrates such as the Caribbean Hermit crab. No endangered terrestrial flora or fauna are known to occur within the development footprint. The endemic Barbuda warbler does not feed nor nest in these scrublands.

3. Socioeconomic Context

The socioeconomic impact will be significant for the citizens of both Antigua and Barbuda during the construction of the project as well as after the opening and operation of this high-end boutique development. The development is not an inclusive development nor is it intended to be a private gated community development.

The development intent incorporates elements that encourage use by the local community and non Barbudan guests with its children's day care center, spa and gym, restaurant, conference facilities and open pool. The natural jogging trail is a novel feature not embraced by any other development of island.

The project will require an investment of at least US\$40 M of foreign direct investment capital into the project.

The construction phase will see the employment of at least 80 local workers for the construction works over a period of at least two years. Additionally, management consultants, architects, and engineers will be employed by the development team to provide quality control supervision of the works.

Private sector building material supply companies will also see direct benefit from the significant purchases of locally supplied materials such as concrete, reinforcement, masonry blocks, lumber and other essential materials. Government entities will also financially benefit from the payment of Social Security contributions and other "spin off" benefits.

Additionally, when the doors of the project open, we anticipate well over fifty (50) full time employees to be employed by the Hotel. The Conference/Entertainment/Banquet facilities will attract small discerning groups looking for a change in environment.

The project as conceptualized will consist of a low density, low environmental impact, sustainable, high end facility. The landscape will be carefully designed to world class and

international standards while also using native fauna. Private sector landscape suppliers will also benefit from this investment.

C. CLIMATE CHANGE CONSIDERATION

1. Drainage

Climate change does not only involve an increase in average temperature, it also results in changes to natural phenomena such as extreme temperatures, wind, rainfall, and an increase in sea level that directly and indirectly affect human life. Over the past three decades in the Caribbean, we have seen the negative impact of Climate Change on our Small Island Developing States with the devastating economic impact that storms and extreme rainfall events have caused. The Caribbean Islands of Dominica and Barbuda being prime examples of such unfortunate occurrences.

Such disasters have caused enormous physical and mental damage to our Caribbean islands and our people. This requires us all to prepare and adapt accordingly. Increases in localized intensive rainfall and extreme rainfall events have resulted in the need for diverse research about climate change and its effects on urban areas.

It is important in all aspects of the design parameters for this project and other projects to take into consideration Climate Change impact and adapt the design criteria accordingly. Design safety factors will also be reviewed accordingly.

We have gathered statistical rainfall data for the Leeward Islands and Barbuda for the past 55 years (1965). The raised floor elevations of the various buildings will not only provide resilience for hurricane coastal damage but will also provide resilience for rainfall extreme flood events (flood levels), it is important that computer simulation rainfall hydrologic models are fully developed and investigated along with consideration for Climate Change as mentioned above.

2. Coastal Profile & Modelling

Sea level is expected to rise 0.84 m (RCP8.5) by 2100. This will inevitably increase the risk of flooding and potentially coastal erosion. Natural coastal adaptation such as sustaining or improving existing coral reef coverage and enhancing natural beach stability may be possible. However, this will depend on multiple factors, like water quality (for healthy coral growth), sediment availability (to allow for natural beach build up), and broader impacts from climate change.

The most significant coastal hazard for the project site is hurricane events, leading to extreme surge, wave run-up and erosion. Barbuda has experienced the devastation of hurricanes in recent history. First with Hurricane Luis in 1995 and more recently with Hurricane Irma in 2017. An analysis of hurricane frequency was completed using all hurricanes on record (170 years of hurricane tracks dating back to 1851). This provided

representative storm conditions that were used as input for the numerical modelling component of this project.

3. Design Adaptation

Layout

Building design

The building design incorporates the critical requirements of set back and incorporates this into an open use concept for the ground level of the units. The main complex honours the construction setback requirement and with its form celebrates the physical environment and visual landscape linking the hinterland to the seascape.

The infrastructure attributes enable climate resilience while maintaining function.

Utilities

The systems to be employed on site for augmentation of energy, water, and waste management needs embrace the requirement for high reliability and have incorporated renewable systems to augment and sustain operations. The systems will be located to optimise on the function of the solar array and the desalination systems.

An aeration sewage treatment system has been selected because of its reliability, low energy consumption and its uncomplicated operational framework. The tertiary effluent will be disinfected with ultraviolet light and stored for use in landscape irrigation.

Drainage and Retention Pond

The location of the site suggests the need for stormwater drainage which will be managed by a series of catch basins and bio swales with a pond which will act as a retention pond but will also be a water feature for the site. The water quality will be similar to that of the seawater and will have local aquatic plant and animal species that are able to survive in variable salinities. Precedent for such a stormwater drainage feature can be found on the old K Club site. However, the pond for this site will be augmented with bioswale features.

Landscaping

There are certain plant species on Barbuda that serve will as buffers for storm surge protection. These will be incorporated into the landscaping and serve to protect infrastructure and enable a natural resilience framework for the site.

Lighting

Even though the site footprint his not known as a turtle nesting site, turtle friendly lighting will be used for the coastal lighting and all coastal facing illumination

4. Operational

The site will incorporate aspects that are uncommon in Barbuda as part of the guest offering. The natural spa and wellbeing aspects alongside with its conference center and children's day-care center will be seen as welcomed facilities on the island. *Escape to Barbuda* is not a gated community and as such encourages the engagement of the local community with the amenities. The restaurant will engage with local farmers and fisher folk, guides and tour operators and other local entrepreneurs and contribute to the maintenance of the local economy.

D. ENGINEERING & CRITICAL INFRASTRUCTURE

a. Water – Desalination

A Potable water supply connection will be unlikely and as such, an onsite desalination water supply system will be designed and installed in order to provide 24-hour reliability of water resources infrastructure services.

An expandable desalination plant will be installed that will be solar powered with most of the desalination process taking during the solar powered time frames and the treated water will be stored in two large tanks. This process will save approximately 70% in costs over and above traditional treatment methods. The plant will be expanded to supply the future residential phase of the project.

The existing APUA desalination plant located to the west of the site, close to the port has an abstracted water quality of 24 ppt and a discharge quality of 34ppt (seawater is 35ppt). this is the expected water quality of the incoming water from the wells that will be constructed on site for the desalination plant . The discharge brine is expected to be similar to that of the APUA desalination plant.

b. Runoff – Storm Water Drainage

There is a natural fall of approximately 5 ft (1.5 m) across the site from the perimeter road to the shoreline on the hotel east end of the site which facilitates natural rainfall runoff from the development. However, stormwater drainage will be managed by a series of catch basins and bio swales to the perimeter of the pond. Some drainage pipes will be installed to control runoff to avoid erosion at discharge points to the pond. In addition, several "Storm Chambers" will be introduced to provide on-site storage, infiltration and attenuation. Both retention and detention ponds will be applied to the site as part of drainage management for the site.

A retention pond will be designed with an adequately sized outfall discharge pipe to the sea and this outfall discharge will only be activated in extreme rainfall flood events. This pond will be incorporated into the site layout as an aesthetic water feature, therefore maintaining stable water level.

To the Western end of the site at the Residential lots zone of the site there is a natural fall of approximately 6 ft (1.8 m) in this section of the site. The land plots will be designed with drainage detention zones and bio swales between the lot line boundaries and landscaped accordingly. During extreme rainfall events, these detention zones are expected to fill and flood and will retain flood water for a number of days before dissipating.

It is recognized that flooding can have significant short and long-term social, economic and environmental impact on a project. Although most current regulations do not contain requirements that relate directly to flood risk, it is important to implement a multi-disciplinary approach to develop integrated control and mitigation measures to achieve resilience.

It is known that runoff from the North of the site overtops and crosses the south coast road on to the site footprint. This existing knowledge has served to ensure appropriate elevation is applied for the backup systems, desalination plant and sewage treatment plant and equipment to safeguard against flooding in extreme events.

Typical storm drainage studies for this type of project located in the Caribbean often require return periods of a 25-year return rainfall event. Building floor level elevations and backup systems should be raised above the 100 -year return rainfall event flood plain. In the meantime, it is anticipated that minimum floor elevations of 10 ft. above mean sea level would meet such a criteria.

The 24 hour 1 in 25 - year rainfall event has a precipitation of approximately 10". An additional safety factor will be added for Climate Change considerations.

It is also typical to have light to moderate but steady rain for up to a few days before a significant rainfall event occurs. This causes the ground to become saturated prior to the event and resulting in increased runoff volumes. Also, when impermeable structures and surfaces are added to the landscape and significant areas are grassed, the volume and rate of runoff generated during a rainfall event is expected to increase significantly.

It is a design objective that peak pond levels for a 25-year return rainfall event are contained within the designed embankment heights around the pond.

c. Sewage – Sewage Treatment

A state-of-the-art sewage treatment system will be designed and installed for the Hotel to meet international standards and produce effluent suitable for reuse in landscape irrigation.

Each residential lot and building will have an independent installed residential domestic type treatment plant installed on each lot with minimum capacity of 1,000 Usgpd.

An aeration sewage treatment system is being selected because of its reliability in an island environment, low energy consumption, very few mechanical components and simple low-tech skills for operation. The main elements of the treatment system include the following:

- Primary treatment at source by low energy use aeration pumps, the effluent from the aeration tank is transported to the irrigation storage tanks. Average daily flow estimated at **4,000 Usgpd** for the Hotel facility.
- The tertiary quality effluent will be disinfected with Ultraviolet Light before storage in a tank for landscape irrigation.

d. Solid Waste – Solid Waste Disposal

A private solid waste collection and disposal service will be implemented for this development. Solid waste will be collected daily and stored in the controlled environment of an enclosed mechanically ventilated room fitted with screened vents, tiled floors and walls, and internal floor drains to facilitate regular sanitizing and wash down. Waste from the kitchens will also be stored in special plastic bags in the solid waste storage room. Solid waste will be transported weekly to the approved sanitary landfill on Barbuda, located to the East of Codrington, for controlled disposal.

The commercial kitchen in the development will be fitted with appropriately sized grease traps to intercept grease discharged from the kitchens. Grease traps will be cleaned monthly by a subcontractor with a suction hose to extract grease and sediment for disposal off-site at the approved landfill site.

e. Power – Renewable Energy Production

Electricity Power - Underground electrical distribution will be installed by the developers within the project. The developer will make an application for a grid connection to the main electrical HV supply system. We understand that there is a supply line approximately 1600 ft away from the project. The developer will provide an onsite electrical transformer in order to step down the high voltage supply to useable power.

The appropriately sized transformer will be located in consultation with the local Electricity Authority. Street and parking lighting will be provided. Alternative sources of energy will be encouraged. Main Back Up Power will be provided for the project via the installation of a diesel generator.

Solar Power - High performance PV panels (minimum 460 W each panel) will be ground mounted on supporting stainless steel frames and designed to resist hurricane force winds. These PV panels will supplement the power requirements of the building facilities and desalination plant thereby reducing the carbon footprint of the project. The Solar field will have a perimeter safety fence.

E. DEVELOPMENT CHARACTER

1. Finishes and Material Use

Though the final specification for finishes are yet to be determined, they will be selected to guarantee Client requirements for long term resilience specifications are met using sustainable materials and methods of construction. The following materials have been employed in the design:

- **Windows and Doors** will comply with Hurricane Impact doors and windows that meet Florida Building Code High Velocity Hurricane Zone (HVHZ) and ASTM International E 1996/ E 1886 standards that are required and recommended for coastal projects such as this project.
- **Floors** - Interior and exterior floors will be constructed of concrete and finished with polished concrete or and combination of porcelain or stone tile (24" x 24" industrial ivory porcelain or equivalent or superior). Exterior timber decks and interior timber floors will be finished with ipe or equivalent hardwood finishes.
- **Walls** - All exterior and interior structural walls will be constructed of cast-in-place reinforced concrete and/or reinforced concrete block work sealed with a cement plaster render and finished in one of five ways: paint, trowel on finish, indigenous volcanic stone, hardwood timber or ceplank siding. Interior walls will have a smooth plaster finish or a Marmaron textured veneer finish or equivalent.
- **Roof** - The roof will be constructed of reinforced concrete and will be laid to falls with adequate storm drainage and will be adequately waterproofed.
- **Ceilings** - will be hung from the concrete slab above with 5/8" water resistant gypsum board (where required) and painted.
- **Air Conditioning** - All interior spaces will be cooled using a VRV system (Diakin or approved equivalent). This will provide maximum energy efficiency and flexibility of use. It is proposed that an energy management system be used to achieve maximum efficiency.
- **Plumbing Fixtures** - Bathroom sanitary ware will be selected from the Kohler collection or approved equivalent. The kitchenettes will feature Kohler faucets or equivalent and under mount sinks. Taking into consideration environmental concerns, heat sensitive flushing mechanisms will be utilized.
- **Finish Carpentry** - All kitchen and bathroom cabinetry will be selected from a Client-approved International high-end supplier line. Both the kitchens in the hotel rooms and bathroom countertops will have the available option of using granite or Quartz.

- *Electrical Fixtures & Fittings* – Energy efficient light fixtures such as LED lighting fixtures will be utilized throughout the project. PV solar lighting fixtures will be used for car park and some external lighting.

2. Landscaping and Visual Character

Landscaping

An important goal for this development is harmonizing the landscape design with the native Barbuda fauna while prioritizing views that enhance the experience of visitors and locals to the site. As Barbuda is a water-scarce country, landscape irrigation will be provided by reuse of the tertiary treated wastewater from the development. Furthermore, the selection of species will focus on a variety of planting that is both robust and hardy and requires modest quantities of irrigation water.

3. Infrastructure

Roads, Parking & External Sidewalk - The proposed parking and internal roadways on the site are indicated in the master plan. The finish surface for all roads and parking facilities will be poured in place reinforced concrete. Parking zones will have porous pavers to reduce the impact of stormwater runoff.

Water & Back Up Water Supply Arrangements - The project will receive its water supply via the operations of an onsite desalination plant. Water supply mains will be fed from a water supply storage tank(s). The project will have water storage with a minimum capacity 36,000 gallons (approximately two weeks supply) along with pressure-controlled supply pumps. Two storage tanks will be designed and installed.

Irrigation and Landscape Water – Landscape and fauna with modest irrigation water supply requirements will be planted. An irrigation water supply tank will be constructed under one of the main buildings. All of the Hotel main buildings will have water storage tanks constructed in the foundations. Rainwater will be collected on the flat concrete roof slabs and diverted to the irrigation storage tanks.

Fire Fighting Arrangements - Fire hydrants will be strategically located within the compound. Additionally, localized firefighting equipment will be designed and installed to support the buildings as required by The Local Planning Authority as well as meeting the requirement of the local fire codes.

4. Jogging Trail

A jogging trail will be built along the perimeter of the boundary as indicated in the master plan. The trail will be constructed from local sand and gravel materials.